



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

दिनांक: 12.08.2025

14

सेवा में

As per attached list of Members and Other invitees

विषय: संरक्षण उप-समिति की 61 वीं बैठक की कार्यवृत्त।

Subject: Minutes for 61st Protection Sub-Committee Meeting-reg

संरक्षण उप-समिति की 61 वीं बैठक, दिनांक 26.06.2025 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 61st meeting of Protection Sub-Committee was held on 26.06.2025 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/>).

(डी.के. मीना)

(D.K. Meena)

निदेशक (संरक्षण)

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

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18	Adani Renewable Energy (RJ) limited Rawara	
19	Adani Solar Energy Jaisalmer One Pvt. Ltd. _450MW (Solar)	
20	Adani Solar Energy Four Private Limited	
21	Adani Solar Energy Jaisalmer Two Private Limited	
22	Adani Solar Energy Jaisalmer Two Private Limited Project Two	
23	SB ENERGY FOUR PRIVATE LIMITED, Bhadla	
24	SB Energy Six Private Limited, Bhadla	
25	Adani Solar Energy 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)	
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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.	
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3	Parbati Koldam Transmission Company Limited		
4	Patran Transmission Company Ltd		
5	NRSS-XXXI(B) Transmission Ltd	SEKURA	neeraj.verma@energy-sel.com
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11	Bikaner Khetri Transmission Limited		

61st Protection Sub-Committee Meeting (26th June, 2025)-MoM

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61st Protection Sub-Committee Meeting (26th June, 2025)-MoM

Minutes of
61st Meeting of Protection Sub-Committee (PSC) of
Northern Regional Power Committee

Date and time of meeting : 26.06.2025 10.30 Hrs.

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

SE (Protection), NRPC welcomed all the participants. List of participants is attached as **Annexure-P**.

Part-A: NRPC

A.1. Confirmation of minutes of 60th meeting of Protection Sub-Committee

A.1.1 EE (P), NRPC apprised that 60th PSC meeting was held on 26.05.2025. Minutes of the meeting were issued vide letter dt. 16.06.2025. No comment has been received till the date.

Decision taken by Forum:

Forum approved the minutes of 60th PSC meeting as issued.

A.2. Status of action taken on decisions of 60th Protection Sub-Committee meeting (agenda NRPC Secretariat)

A.2.1 Status of action taken on the decisions of 60th PSC meeting were informed to the Forum.

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

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

Decision taken by Forum

Forum instructed utilities to take necessary action on pending issues.

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

A.3.1 EE (P), NRPC apprised that as per clause 15 (6) of IEGC 2023;

- *Users shall submit the following protection performance indices of previous month to their respective RPC and RLDC on monthly basis for 220 kV and above (132 kV and above in NER) system, which shall be reviewed by the RPC:*

a) The **Dependability Index** defined as $D = N_c / N_c + N_f$

b) The **Security Index** defined as $S = N_c / N_c + N_u$

c) The **Reliability Index** defined as $R = N_c / N_c + N_i$

where,

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

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

N_u is the number of unwanted operations,

N_i is the number of incorrect operations and is the sum of N_f and N_u

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

A.3.3 Accordingly, the status of the indices reported for the month of **May-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.3.4 Following issues were highlighted by EE (P):

- i. Some Utilities have not submitted data for May-2025.
- ii. Utilities have submitted data for some plants but not all.
- iii. Utilities have not mentioned corrective action taken for indices less than unity.

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- iv. Some utilities have sent data after cut-off date of 7th.

A.3.5 Following utilities were found non-compliant as indices (May-2025) have not been received as of now:

- i. **NTPC (Auriya, Koldam)**
- ii. **NPCIL (RAP-D)**
- iii. **PSTCL**
- iv. **MEJA Urja Nigam Ltd.**
- v. **JSW Energy Ltd. (KWHEP)**
- vi. **UT of J&K**
- vii. **UT of Ladakh**
- viii. **UT of Chandigarh**
- ix. **INDIGRID**
- x. **Altra Xergi Pvt. Ltd.**
- xi. **AMP Energy Green Five Pvt. Ltd.**
- xii. **AMP Energy Green Six Pvt. Ltd.**
- xiii. **Ayana Renewable Power Three Private Limited**
- xiv. **Ayaana Renewable Power One Pvt. Ltd.**
- xv. **Azure Power Forty One Pvt limited**
- xvi. **Azure Power Forty Three Pvt. Ltd._RSS**
- xvii. **Azure Maple Pvt. Ltd.**
- xviii. **AZURE POWER INDIA Pvt. Ltd., Bhadla**
- xix. **Azure Power Thirty Four Pvt. Ltd.**
- xx. **SB Energy Six Private Limited, Bhadla**
- xxi. **Clean Solar Power (Jodhpur) Pvt. Ltd.**
- xxii. **Clean Solar Power (Bhadla) Pvt. Ltd**
- xxiii. **Eden Renewable Cite Private Limited**
- xxiv. **Mahindra Renewable Private Limited**
- xxv. **Mega Surya Urja Pvt. Ltd. (MSUPL)**
- xxvi. **AURAIYA Solar**
- xxvii. **DADRI SOLAR**
- xxviii. **SINGRAULI SOLAR**
- xxix. **Anta Solar**
- xxx. **Unchahar Solar**
- xxxi. **Rising Sun Energy-K Pvt. Ltd.**
- xxxii. **Serentica Renewables India 4 Private Limited**
- xxxiii. **Thar Surya Pvt. Ltd.**
- xxxiv. **TP Surya Pvt. Ltd.**
- xxxv. **TRANSITION ENERGY SERVICES PRIVATE LIMITED**
- xxxvi. **Transition Green Energy Private Limited**
- xxxvii. **Transition Sustainable Energy Services Private Limited**

A.3.6 Incidents, where indices were found less than one, were discussed (Annexure-A.III.).

It was found that utilities have already taken corrective action except few. Utilities were directed to take corrective action wherever it was pending.

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- A.3.7 Subsequently, SE, 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.3.8 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:

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. Submission of performance of SPS (agenda by NRPC Secretariat)

- A.4.1 EE (P), NRPC apprised that as per clause 16 of IEGC 2023;
- *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.*
 - *The performance of SPS shall be assessed as per the protection performance indices specified in these Regulations. In case, the SPS fails to operate, the concerned User shall take corrective actions and submit a detailed report on the corrective actions taken to the concerned RPC within a fortnight.*
- A.4.2 Lucknow, Gorakhpur zone from UPPTCL, PPGCL, RVUNL submitted the protection performance indices for the SPS. However, it has been observed that reporting of operation/failure of SPS is not being done regularly by other utilities.
- A.4.3 In view of above, Forum requested that following may be complied by utilities:

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- I. Utilities 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.
- II. SLDCs may submit protection performance indices for SPS on monthly basis by 7th date of each month in the same format as that of protection performance indices of elements (lines/ICT etc).

- A.4.4 EE (P), NRPC highlighted that SLDCs may submit the protection performance indices for all SPSs pertaining to their control area in the same format used for Line/ICT along with justification for indices less than unity.
- A.4.5 EE (P), NRPC requested NRLDC that if it can share a list of monthly events when SPS has operated in Northern Region, then tracking of failure issues may be easier.
- A.4.6 NRLDC representative agreed to share the available information.

Decision of the Forum:

- I. Utilities 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.
- II. SLDCs may submit protection performance indices for SPS on monthly basis by 7th date of each month in the same format as that of protection performance indices of elements (lines/ICT etc).

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

- A.5.1 EE (P), NRPC apprised that as per clause 15 (1) of IEGC 2023;
- *All users shall conduct internal audit of their protection systems annually, and any shortcomings identified shall be rectified and informed to their respective RPC. The audit report along with action plan for rectification of deficiencies detected, if any, shall be shared with respective RPC for users connected at 220 kV and above (132 kV and above in NER).*

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- A.5.2 All power utilities were requested in every PSC meeting starting from 48th PSC to submit the annual protection audit plan. However, there are lot of utilities who have not completed audit in last financial year i.e. FY 2024-25. Status of the same is enclosed as **Annexure- A.IV**.
- A.5.3 In 59th PSC meeting, 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.5.4 Audit reports have been received from HPPCL, ReNew and UPPTCL.

Decision of the Forum:

Utilities were requested to submit reports of internal audit done in FY 2024-25. Compliance report for the audited substation may be submitted.

A.6. Annual protection audit plan for FY 2025-26 (agenda by NRPC Secretariat)

- A.6.1 EE (P), NRPC apprised that as per clause 15 of IEGC 2023;
- *Annual audit plan for the next financial year shall be submitted by the users to their respective RPC by 31st October. The users shall adhere to the annual audit plan and report compliance of the same to their respective RPC.*
- A.6.2 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, 59th & 60th PSC meeting.
- A.6.3 Audit plan submitted by utilities were presented. Status of submitted annual audit plans is enclosed as **Annexure- A.V**.
- A.6.4 It was observed that following utilities have not submitted their audit plans and thus are non-compliant:
- i. **PSTCL**
 - ii. **Aravali Power Company Pvt. Ltd**
 - iii. **MEJA Urja Nigam Ltd.**
 - iv. **Adani Power Rajasthan Limited**
 - v. **UT of J&K**
 - vi. **UT of Ladakh**

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- vii. **UT of Chandigarh**
- viii. **ADHPL**
- ix. **Barsingar Plant (Rajasthan Control Area)**
- x. **Rajwest plant**
- xi. **Altra Xergi Pvt. Ltd.**
- xii. **AMP Energy Green Five Pvt. Ltd.**
- xiii. **AMP Energy Green Six Pvt. Ltd.**
- xiv. **Amplus Ages Private Limited**
- xv. **Ayana Renewable Power Three Private Limited**
- xvi. **Ayaana Renewable Power One Pvt. Ltd.**
- xvii. **Azure Power Forty One Pvt limited**
- xviii. **Azure Power Forty Three Pvt. Ltd._RSS**
- xix. **Azure Maple Pvt. Ltd.**
- xx. **AZURE POWER INDIA Pvt. Ltd., Bhadla**
- xxi. **Azure Power Thirty Four Pvt. Ltd.**
- xxii. **Clean Solar Power (Jodhpur) Pvt. Ltd.**
- xxiii. **Clean Solar Power (Bhadla) Pvt. Ltd**
- xxiv. **Eden Renewable Cite Private Limited**
- xxv. **Grian Energy private limited**
- xxvi. **Mahindra Renewable Private Limited**
- xxvii. **Mega Surya Urja Pvt. Ltd. (MSUPL)**
- xxviii. **AURAIYA Solar**
- xxix. **DADRI SOLAR**
- xxx. **SINGRAULI SOLAR**
- xxxi. **Anta Solar**
- xxxii. **Unchahar Solar**
- xxxiii. **NTPC Devikot Solar plant_240MW**
- xxxiv. **NTPC Kolayat_400kV**
- xxxv. **Nedan Solar NTPC**
- xxxvi. **NTPC Nokhra_300MW**
- xxxvii. **One Volt energy Pvt. Ltd.**
- xxxviii. **RENEW SOLAR POWER Pvt. Ltd. Bhadla**
- xxxix. **Rising Sun Energy-K Pvt. Ltd.**
- xl. **Serentica Renewables India 4 Private Limited**
- xli. **Solzen Urja Private Limited**
- xl. **TRANSITION ENERGY SERVICES PRIVATE LIMITED**
- xl. **Transition Green Energy Private Limited**
- xliv. **Transition Sustainable Energy Services Private Limited**

A.6.5 Utilities were requested to submit the audit plan at the earliest.

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.

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A.7.1 EE (P), NRPC apprised that as per clause 15 of IEGC 2023:

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

A.7.2 In view of above, some utilities have submitted their third-party protection audit plans (enclosed as **Annexure-A.VI**).

A.7.3 It was observed that audit plan has not been received from following:

- i. **NPCIL (RAPS)**
- ii. **RVPNL**
- iii. **PSTCL**
- iv. **UJVNL (Tiloth, Khodri, Chibro, Vyasi)**
- v. **PSPCL (RSD)**
- vi. **HPSEBL (except Kunihar, Baddi, Upera Nangla)**
- vii. **Aravali Power Company Pvt. Ltd**
- viii. **UT of J&K**
- ix. **UT of Ladakh**
- x. **UT of Chandigarh**
- xi. **Barsingsar plant**
- xii. **Rajwest Plant**
- xiii. **ABC Renewable Pvt. Ltd**
- xiv. **ACME Heeragarh powertech Pvt. Ltd**
- xv. **ACME Pholidi**
- xvi. **ACME Deagarh**
- xvii. **ACME Raisar**
- xviii. **ACME Dhoulpar**
- xix. **ACME Chittorgarh Solar Energy Pvt Ltd**
- xx. **Adani Hybrid Energy Jaisalmer One Ltd.**
- xxi. **Adani Hybrid Energy Jaisalmer Two Ltd.**
- xxii. **Adani Hybrid Energy Jaisalmer Three Ltd.**

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- xxiii. **Adani Hybrid Energy Jaisalmer Four Ltd.**
- xxiv. **Adani Renewable Energy (RJ) limited Rawara**
- xxv. **Adani Solar Energy Jaisalmer One Pvt. Ltd._450MW (Solar)**
- xxvi. **Adani Solar Enegry Four Private Limited**
- xxvii. **Adani Hybrid Energy Jaisalmer Four Ltd. (AEML 2-350)**
- xxviii. **Adani Solar Energy Jaisalmer Two Private Limited Project Two**
- xxix. **SB Energy Six Private Limited, Bhadla**
- xxx. **Adani Solar Enegry Jodhpur Two Limited, Rawara**
- xxxi. **Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)**
- xxxii. **Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)**
- xxxiii. **Adani Green Energy 24 Limited (Bhimsar)**
- xxxiv. **Adani Green Twenty-Five Limited (Badisid)**
- xxxv. **Amplus Ages Private Limited**
- xxxvi. **Azure Power Forty One Pvt limited**
- xxxvii. **Azure Power Forty Three Pvt. Ltd._RSS**
- xxxviii. **Azure Maple Pvt. Ltd.**
- xxxix. **AZURE POWER INDIA Pvt. Ltd., Bhadla**
 - xl. **Azure Power Thirty Four Pvt. Ltd.**
 - xli. **Clean Solar Power (Jodhpur) Pvt. Ltd.**
 - xl.ii. **Clean Solar Power (Bhadla) Pvt. Ltd**
 - xl.iii. **Eden Renewable Cite Private Limited**
 - xl. iv. **Grian Energy private limited**
 - xl. v. **Mahindra Renewable Private Limited**
 - xl. vi. **Mega Surya Urja Pvt. Ltd. (MSUPL)**
 - xl. vii. **AURAIYA Solar**
 - xl. viii. **DADRI SOLAR**
 - xl. ix. **SINGRAULI SOLAR**
 - I. **Anta Solar**
 - li. **Unchahar Solar**
 - lii. **NTPC Devikot Solar plant_240MW**
 - liii. **NTPC Kolayat_400kV**
 - liv. **Nedan Solar NTPC**
 - lv. **NTPC Nokhra_300MW**
 - lvi. **One Volt energy Pvt. Ltd.**

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- lvii. **ReNew Solar Energy (Jharkhand Three) Private Limited**
- lviii. **RENEW SOLAR POWER Pvt. Ltd. Bhadla**
- lix. **ReNew Solar Urja Private Limited**
- lx. **Renew Sun Bright Pvt. Ltd. (RSBPL)**
- lxi. **Renew Surya Partap Pvt. Ltd.**
- lxii. **Renew Surya Ravi Pvt. Ltd.**
- lxiii. **Renew Surya Roshni Pvt. Ltd.**
- lxiv. **Renew Surya Vihan Pvt. Ltd.**
- lxv. **Renew Surya Ayaan Pvt. Ltd.**
- lxvi. **Renew Solar Photovoltaic Pvt Ltd**
- lxvii. **RENEW SOLAR POWER Pvt. Ltd. Bikaner**
- lxviii. **Rising Sun Energy-K Pvt. Ltd.**
- lix. **Serentica Renewables India 4 Private Limited**
- lxx. **TRANSITION ENERGY SERVICES PRIVATE LIMITED**
- lxxi. **Transition Green Energy Private Limited**
- lxxii. **Transition Sustainable Energy Services Private Limited**

A.7.4 PSTCL informed that plan shall be submitted after paddy season.

A.7.5 RVPN informed that their management has approved proposal for audit to be done by HVPNL. Detailed plan shall be submitted soon.

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

A.8.1 EE (P), NRPC apprised that as per clause 15 of IEGC 2023;

- ***All users shall conduct internal audit of their protection systems annually, and any shortcomings identified shall be rectified and informed to their respective RPC. The audit report along with action plan for rectification of***

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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.8.2 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.8.3 Following internal audit report (FY 2024-25) were discussed in the meeting and observation was given:

S.N.	Utility	Stations	Observation of forum
1	HPPCL	400kV Sainj HEP	Distance Settings (pick up) has not been mentioned in report, however, it has been ticked 'OK'. In future reports, settings also may be mentioned so that PSC forum can also get information in detail.
2	RE Plants ReNew	ReNew (6 Plants) Renew Hans Urja Pvt Ltd ReNew Solar Energy Jharkhand Three Pvt. Ltd.	Details of settings (pickup, time) is not mentioned in report. Breaker failure fail and load encroachment has been disabled in 400

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			kV line. Main and backup both relay of transformer differential is same.
		Renew Solar Photovoltaic Pvt Ltd Renew Solar Power Private Limited	There is no relay for back up protection (E/F) in lines. Main and backup both relay of transformer differential is same.
		Renew Surya Aayan Private Limited ReNew Sun Bright Pvt. Ltd.	Main and backup both relay of transformer differential is same.
3	UPPTCL	Gorakhpur Zone- (19 Substations) 400kV Substations- Azamgarh, Rasara, Kasara, Basti, Gorakhpur, 220kV Substations- Badgahan, Azamgarh, Rasara, Bansi, Basti, Dulhipar, Gorakhpur, Deoria, Hata, Anandnagar, Maharajganj, Gola, Khorabar, Barahua Prayagraj Zone- (24 Substations) 400kV Substations- Sarnath,	1. 2nd harmonic and 5th harmonic settings of transformer/ reactor are not in line with NRPC philosophy. Further, E/F, O/C High Set time is also not in line with NRPC philosophy. 2. PSB has been made operative for distance protection. This is not in line with NRPC Philosophy. (Sarnath, Bhadoi, Rewa Road, Cantt, Orai, Banda,

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		Sahupuri, Machhali Shahar, Masauli 220kV Substations-Sahupuri, Bhelupur, Gajokhar, Harahua, Raja Ka Talab, Bhadaura, Ghazipur, Jaunpur, Mirzapur, Bhadoi, Robertsganj, Malwan, Jhunsi, Phoolpur, Sanglpur, Bhuplamau, Fatehpur, Sirathu, Rewa Road, Cantt Jhansi Zone- (10 Substations) 400kV Substations- Orai, Banda 220kV Substations- Orai, Banda, Pahadi, Mahoba, Kalyanpura, Dunara, Moth, Babina Lucknow Zone- (39 Substations) 765kV Substations- Unnao 400kV Substations- Sultanpur, Bareilly 220kV Substations- Sarojini Nagar, Bahraich, Balrampur, Gonda, Unnao, Kanpur Road, CG City, Hardoi Road, Bijnore, Bachhrawan, Ayodhya, New Tanda, Sohawal, Amethi, Sultanpur, Barabanki, BKT, Chinhat, Gomtinagar, Khursi	Kidwai Nagar, Bithoor, 220 kV Panki) 3. A/R not enabled/ Unhealthy. (Sahupuri, Orai, RPH, Bithoor, 220 kV Panki, Mainpuri) 4. Voltage grading has not been revised. (Sarnath) 5. Main-2 relay is not available. (Gajokhar, Sarnath, Raja ka Talab) 6. Bus bar is not operational/ available. (Harahua, Macchli Shahar, Mahoba, Deoria, Khorabar, Kurshi road) 7. T/F REF not working/ Disabled (Robertsganj, Neebkarori) 8. T/F O/F disabled (Phoolbagh, Rainia, Naubasta, Saifai, Sikandara) 9. Main-1 and Main-2 is of same make (Azamgarh, 400 kV

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		Road, CB Ganj, Faridpur, Dataganj, Badaun (GIS), Badaun Road, Dohna, Amariya, Pilibhit, Mallawa, Hardoi, Azizpur, Shahjahanpur, Gola, Nighasan, Kandauni, Seetapur Agra Zone- (16 Substations) 400kV Substation- Panki 220kV Substations- Chhibramau, Neebkarori, Bhartana, Saifai, Farrukhabad, Sarh, Kanpur South, Naubasta, Kidwai Nagar, Phoolbag, RPH, Bithoor, Panki, Rania, Sikandara Meerut Zone- (62 Substations) 400kV Substations- Moradabad, Sector-148 Noida, Sector-123 Noida, Muzaffarnagar, Shamli, Muradnagar 1st, 400KV S/S Muradnagar 2nd, Greater Noida, 220kV Substations- Bhagpat, Nirpura, Baraut, Charla, Gheja, Modipuram, Partapur, Shatabadinagar, Nahtaur, Chandpur, Amroha, Moradabad, Chandausi, Rampur, Sambhal, Gajraula, Jewar, Dadri, RC Green, KP5, Sector-20 Noida,	Panki) 10. GPS Unhealthy/Syn issue (Amamgarh, Rasara, Hafizpur, Gomti nagar, Chinhat) 11. Both DC Unhealthy (Azamgarh, Hafizpur, Maharajganj) 12. Carrier unhealthy (bansi, dulhipar) 13. Event Logger Not Installed (basti, deoria) 14. DTPC Issues (220 kV Gorakhpur, Deoria,) 15. Non availability of main-2 relay (Sarojini Nagar) 16. Requirement of differential protection in short lines (Sarojini Nagar)

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		Sector-38 Noida, Sector-129 Noida, Jalpura, Sector-62, Saharanpur, Behat, Sarsawa, Nanauta, Deoband, Nara, Shamli, Badhaikalan, Khatauli, Jansath, Loni, Madhuban Bapudham, Pratap Vihar, Sahibabad, Mandola Vihar, Morti, Morta, Muradnagar, Faridnagar, Khurja, Debai, Jahingirabad, Rukhi, Sikandrabad, Simbholi, Hapur (Hybrid), IIT GNL, KC SEC 24 Yeida, KC SEC 18 Yeida	

A.8.4 Following reports of 3rd Party audit was discussed in forum and observation was given:

S.N.	Utility	Stations	Observation of forum
1	HPSEBL	Baddi, Uperla Nangal	Bus bar protection defective. PLCC/DTPC Unavailable.
2	RE Plant	Ayana Renewable Power 3 Pvt. Ltd at Bikaner	5 th harmonic has been kept at 35%. O/C has been enabled for line.

A.8.5 The above submitted reports were made available at NRPC website:
<http://164.100.60.165/meetings/prsub.html>

A.8.6 Utilities were asked to submit compliance report of the issues highlighted by audit.

Decision of the Forum:

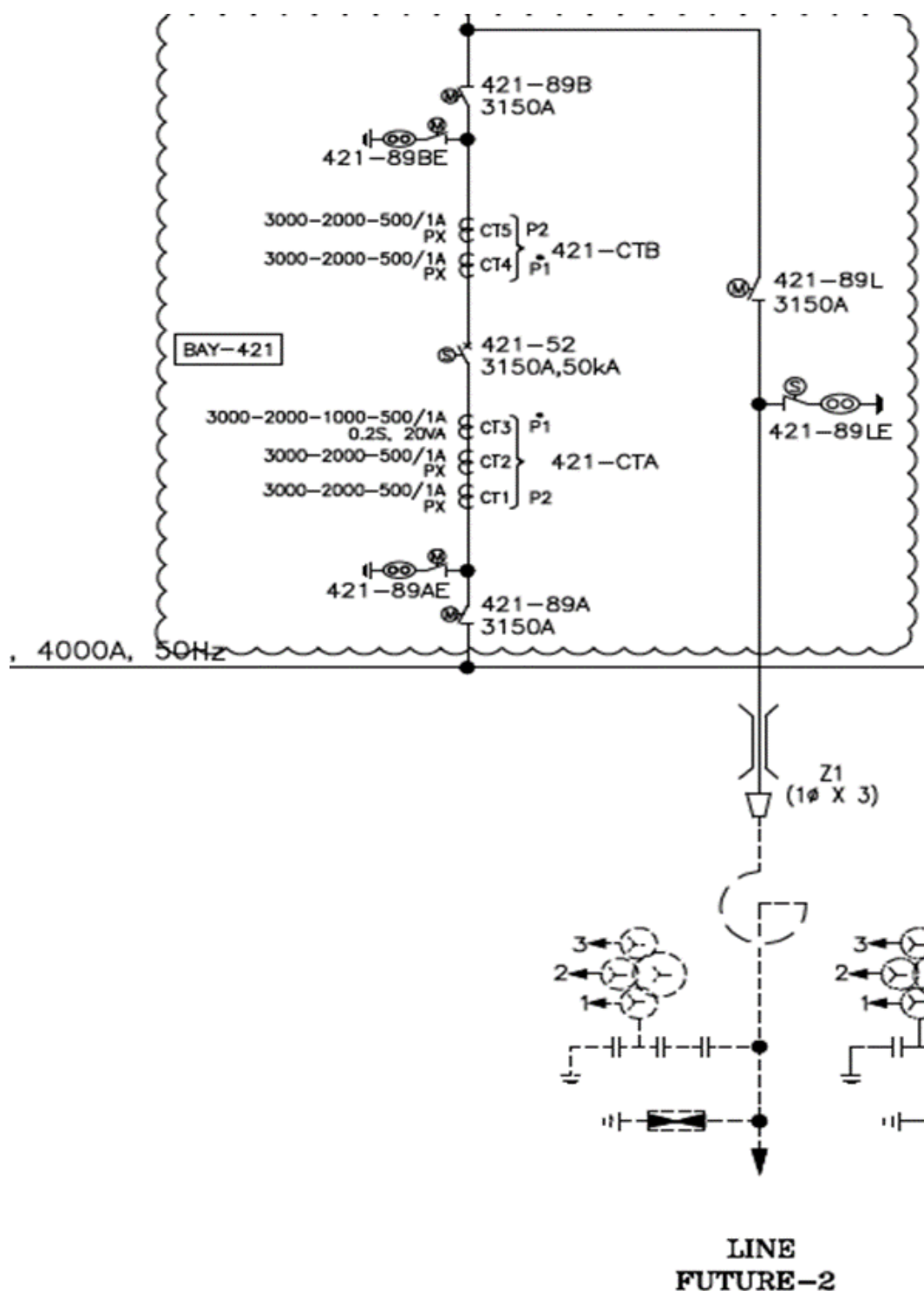
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Forum discussed the audit report and directed utilities to submit compliance report. Protection settings may be aligned with NRPC's protection philosophy. Further, other utilities were directed to submit the protection audit report (for audited S/s as per submitted plan) to NRPC Secretariat and to update the compliance status regularly.

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

- A.9.1 EE (P), NRPC apprised that in 59th PSC meeting, POWERGRID NR-3 representative submitted that protection philosophy may be reviewed and standardized 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.

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- 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 During the discussion in the 59th PSC meeting, for case of Protection settings for idle charge of future bay up to LA (Lightning arrestor), UPPTCL representative conveyed

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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 is not much accurate. RVUN representative highlighted that any phase over current protection would be better.

A.9.3 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.9.4 Accordingly, mail was sent to all members on 24.04.2025. AESL and BBMB have shared comments.

A.9.5 Further, AESL representative conveyed the following philosophy for antitheft Line charging as shared by AESL by email

- I. Zone-2 setting time delay should be Zero.
- II. Over Voltage setting should be 105% and 3 sec delay.
- III. Auto reclosure function should be OFF.
- IV. Overcurrent setting with minimum (20%) with instantaneous trip.

A.9.6 Further, shared comments of BBMB were conveyed as below-

- i. For idle charging or Anti-theft charging of transmission line (765kV, 400kV and 220kV), Zone-1 setting in the distance protection relay may be kept as 110 % of the protected line with instantaneous time setting as per protection philosophy for radial lines.
- ii. For idle charge of future bay up to LA (Lightening arrestor) in case of GIS (Gas Insulated S/S) or AIS
 - a) **Future Bay equipped with all standard protection (Main-1, Main-II, LBB and BCU)** - In BCU (it is assumed having backup protection) and Main-I and Main-II relays second stage of High set with instantaneous time setting with appropriate current settings be enabled for both over current and earth fault protection functions.
 - b) **Future Bay equipped with LBB & BCU protection**- In BCU (it is assumed having backup protection) second stage of High set with instantaneous time

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setting with appropriate current settings be enabled for both over current and earth fault protection functions

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

- a) In case of transmission line element, Zone-4 time setting should be kept as 160msec with reach adequate to cover Bus faults during the period Bus Bar Protection is kept out of service.
- b) In case of ICT and Bus reactor, High set protection function stage with instantaneous time setting be introduced and current setting of such function be coordinated with existing High set protection function stages.

A.9.7 Accordingly, following philosophy were decided for antitheft Line charging as below-

- a. Zone-1 settings may be kept as actual settings of transmission line.
- b. Zone-2 setting time delay may be kept as Zero with impedance settings as actual criteria.
- c. Auto reclosure function to be kept as OFF.
- d. Non directional earth fault may be kept enabled with definite time of 100msec.
- e. In case of 400kV transmission lines, Over Voltage setting may be kept as 105%-107% pick up with 3-4 secs time delay and in case of 765kV transmission lines, it may be kept as 104%-106% pick up with 3-4 secs time delay.

A.9.8 In the meeting, RVPN representative commented that during the shutdown of any line, settings still remain same as charged line. Therefore, for Future Bay equipped with all standard protection (Main-1, Main-II, LBB and BCU), all actual settings may be implemented as it is done for actual line if line length is known. UPPTCL representative added that over voltage protection settings may be kept on lower side as DT is not available from other side due to unavailability of another end.

A.9.9 Further, it was conveyed that for idle charge of future bay up to LA (Lightening arrestor) with all standard protection (Main-1, Main-II, LBB and BCU) and line availability, stub protection (false status of open line isolator is needed to be kept i.e. physically line isolator is closed), Teed and over current protection may be applied.

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Over voltage protection settings may be kept as normal way. If in this case line is present, then distance protection philosophy for antitheft charged line may be applied.

- A.9.10 For idle charge of future bay up to LA (Lightening arrestor) equipped with LBB & BCU protection, over current protection may be kept in BCU.
- A.9.11 Subsequently, MS, NRPC stated that draft may be prepared based on discussion and may be considered for finalization in the next PSC meeting. He directed utilities to share the suggestions/comments if any.
- A.9.12 In 61st PSC meeting, EE (P), NRPC apprised that no new comment has been received. Thereafter, forum approved the philosophy as finalized in 60th PSC meeting.

Decision of the Forum:

Forum approved philosophy as below:

- A. Protection setting for idle charging or Anti-theft charging of transmission line (765kV, 400kV and 220kV)
- a. **Zone-1 settings may be kept as actual settings of transmission line.**
 - b. **Zone-2 setting time delay may be kept as Zero with impedance settings as actual criteria.**
 - c. **Auto reclosure function to be kept as OFF.**
 - d. **Non directional earth fault may be kept enabled with definite time of 100msec.**
 - e. **In case of 400kV transmission lines, Over Voltage setting may be kept as 105%-107% pick up with 3-4 secs time delay and in case of 765kV transmission lines, it may be kept as 104%-106% pick up with 3-4 secs time delay.**
- B. Protection settings for idle charge of future bay up to **LA** (Lightning arrestor) in case of GIS (Gas insulated S/S) or AIS

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- i. Future Bay equipped with all standard protection (Main-I, Main-II, LBB and BCU): **Stub protection (false status of open line isolator is needed to be kept i.e. physically line isolator is closed), Teed and over current protection may be applied.**
- ii. Future Bay equipped with LBB & BCU protection: **over current protection may be kept in BCU.**

Part-B: Agenda by NRLDC

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

- B.1.1 As per the discussion in pervious PSC meetings, necessary remedial actions were recommended based on the analysis and discussion of the grid events. It is expected that necessary actions would have taken place. In view of the same, constituents were requested to share the status of remedial actions taken. List of points discussed in 61st PSC meeting is attached as Annexure-B.I of agenda.

*NRLDC representative presented all the points and discussion was held with all the respective constituents. Constituents were requested to apprise the status of the remedial actions. Updated status on the basis of discussion held in 61st PSC meeting is attached as **Annexure-B.I**. Further, concerned members were requested to take expeditious corrective actions and resolve the issues at the earliest.*

Decision of the Forum:

PSC forum requested all the concerned members to take necessary corrective actions at their, actions need to be expedited, and healthiness of protection & control system need to be ensured.

B.2 Multiple Elements Tripping Events in Northern region in the month of May 2025 (agenda by NRLDC)

- B.2.1 A total of 21 grid events occurred in the month of May 2025 of which 15 are of GD-1 category and 06 are of GI-2 Category. The tripping report of all the events have been issued from NRLDC. A list of all these events along with the status of DR/EL & tripping

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detail submission is attached at Annexure-B.II of agenda.

- B.2.2 Maximum delayed clearance of fault observed in event of multiple elements tripping at 765/400kV Meerut(PG), 400kV Koteswar(PG), 400kV Koteswar HEP & Tehri HEP at 19:55 hrs on 21st May 2025. (As per PMU at Meerut(PG), B-N fault at 19:55:19 hrs (cleared within 100msec) and R-N fault with delayed clearance of ~1640msec is observed).
- B.2.3 Delayed clearance of fault (more than 100ms for 400kV and 160ms for 220kV system) observed in total 08 events out of 21 grid events occurred in the month. In 04 (no.) of grid event, there was no fault in the grid.
- B.2.4 NRLDC representative presented the reporting status of DR/EL & tripping reports w.r.t. grid events occurred in May 2025. It was highlighted that detailed reports of majority of the tripping events have not been received. Complete DR & EL and tripping report of grid event at 400kV Dadri(NTPC), 400/220kV Obra_B(UP), 765/400kV Bhadla2(PG), 400/220kV Ludhiana(PG), 400kV Kabulpur and CLP Jhajjar TPS have not been received.
- 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 SLDC-UP, POWERGRID, SLDC-Punjab and NTPC agreed to share the tripping details at the earliest and assured to submit the tripping details as per timeline specified in IEGC.
- B.2.7 NRLDC requested utilities to start preparing the detailed report of the tripping events as per timeline mentioned in IEGC 2023 and share the report with NRLDC, NRPC and PSC forum. Remedial actions taken by constituents to avoid such multiple elements tripping may also be included in the detailed report.
- B.2.8 As per IEGC clause 37.2 (c), Disturbance Recorder (DR), station Event Logger (EL), Data Acquisition System (DAS) shall be submitted within 24 hrs of the event and as per IEGC clause 37.2 (e), the user shall submit a detailed report in the case of grid disturbance or grid incidence within one (1) week of the occurrence of event to RLDC

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and RPC.

Decision of the Forum

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

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

a) Frequent elements tripping during May 2025:

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

S. NO.	Element Name	No. of forced outages	Utility/SLDC
1	220 KV Samaypur(BB)-Palli(HV) (HVPNL) Ckt-2	7	BBMB/Haryana
2	400 KV Rewa Road-Panki (UP) Ckt-1	6	UP
3	220 KV Ballabgarh-Charahi Dadri (BB) Ckt-1	6	BBMB
4	200 MW Parbati II HEP - UNIT 1	6	NHPC
5	220 KV Debari(RS)-RAPS_A(NP) (RS) Ckt-1	5	NPCIL/Rajasthan
6	400 KV Agra-Unnao (UP) Ckt-1	5	UP
7	60 MW Bairasiul HPS - UNIT 3	5	NHPC
8	220 KV Bhilwara(RS)-Kota(PG) (RS) Ckt-1	4	PGCIL/Rajasthan
9	220 KV Fatehgarh_III(PG)-RSJPL_SL_Ftg3(PG) (ReNew_SJPL) Ckt-1	4	PGCIL/Renew
10	220 KV Jauljivi (PG)-Baram_Jauljibi GIS(UK) (PTCUL) Ckt-2	4	PGCIL/Uttarakhand
11	220 KV Kaithal(PG)-Kaithal(HV) (HVPNL) Ckt-1	4	PGCIL/Haryana
12	220 KV Mandola(PG)-Gopalpur(DTL) (DTL) Ckt-1	4	PGCIL/Delhi
13	400 KV Kankani-GSS Pachpadra (RS) Ckt-1	4	Rajasthan
14	500 kV HVDC Rihand-Dadri (PG) Ckt-2	4	PGCIL
15	765 KV Gr.Noida_2(UPC)-Meerut(PG) (PG) Ckt-1	4	PGCIL/UP

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

B.3.3 NRLDC representative highlighted that frequent tripping of transmission elements

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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.

- B.3.4 NRLDC presented all the tripping incidents of all frequently tripped elements and asked respective constituents to share the root cause of frequent faults, A/R operation related status and details of remedial actions taken to avoid frequent tripping of line.
- B.3.5 Transmission element wise details received from the constituents regarding reason of faults, any protection related issue and status of remedial actions have been attached as **Annexure-B.II**.
- B.3.6 NRLDC representative emphasized that A/R (auto re-closer) issue was found in many of these tripping. All the utilities were 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 were 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.
- B.3.7 It was requested that 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 also highlighted, constituents were requested to ensure the time syncing of DR/EL. In addition, utilities were requested to take necessary actions to ensure the Right of Way and other operation & maintenance issues to minimize the frequent faults in the line. All the utilities agreed for the same.

Decision of the Forum

PSC forum reiterated that frequent outages of transmission 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.3.8 The list of major tripping events occurred during **May 2025** is attached as Annexure-B.IV of agenda. Concerned constituents/utilities were requested to share the detailed analysis of the tripping elements along with the status of remedial action taken/to be

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taken. Utilities were requested to prepare detailed analysis report and present the event details during 61st PSC meeting. Events involving more than one utility may be jointly prepared and presented.

B.3.9 Discussion during the meeting:

Tripping Events

A. Tripping event at 400/220kV Ludhiana(PG) at 00:00 hrs on 02nd May, 2025

NRLDC representative shared the following observations w.r.t. tripping event:

- 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 along with tripping report for each element was not received. Same need to be shared from both the ends.
- iv) Exact cause of Bus-Bar protection operation needs to be shared.
- v) SCADA data was suspected after the tripping. Availability and healthiness of SCADA data need to be ensured.
- vi) Remedial action taken report to be shared.

POWERGRID representative present the tripping analysis of the event.

Major findings were as follows:

- i) During antecedent condition, weather condition was inclement. There was heavy windstorm, rain and thunderstorm.
- ii) At 00:00:01:826 Hrs, R-N fault occurred due to snapping of earth wire of 220kV Shanewal line near the gantry at dead end tower, conductor of R-Ph found detached from the pilot string. Fault current was ~40kA.
- iii) On this fault, line protection operated and R-ph pole of line also opened. However, due to heavy fault current, arc didn't quench properly leading to blast of CB.
- iv) As the arc didn't quench, fault current existed which led to the operation of LBB protection of 214 bay.
- v) LBB operation further led to tripping of all the elements connected to 220kV Bus-2 at Ludhiana(PG).

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- vi) As fault cleared after operation of LBB protection whose time delay setting is ~200msec, there was delayed clearance of fault.

PSC Recommendations:

- *Timely submission of DR/EL & tripping report need to be ensured.*

B. Multiple elements tripping event at 400kV Deepalpur(JHKT) and Kabulpur(HV) at 04:25 hrs and 400kV Daulatabad(HV) at 05:22 hrs on 02nd May, 2025

NRLDC representative shared the following observations w.r.t. tripping event:

- i) Reason of delayed clearance of fault need to be shared.
- ii) Exact reason and sequence of protection operated during tripping need to be shared.
- iii) DR/EL(.cfg/.dat) along with tripping report for each element need to be shared from both the ends.
- iv) Remedial action taken report to be shared.

Representatives from CLP Jhajjar and HVPNL informed the following:

- i) During antecedent condition, weather condition was inclement. There was heavy windstorm, rain and thunderstorm.
- ii) CLP Jhajjar representative informed that at 04:25 hrs, 400kV CLP Jhajjar-Kabulpur D/C tripped from their end in Z-2 with Z-2 time delay. It is suspected that the fault was in 400kV Deepalpur-Kabulpur section and due to non-clearance of fault from their end line tripped from CLP Jhajjar end.
- iii) Further, at 05:22 hrs, 660 MW Unit-1 & 2 at CLP Jhajjar tripped on over-frequency protection operation and 400kV CLP Jhajjar-Dhanonda D/C deenergized.
- iv) HVPNL representative informed that their 400kV Dhanonda-Daultabad line didn't trip during the event hence, evacuation path was available.

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- v) NRLDC representative stated that as confirmed by HVPNL that evacuation path was available through 400kV CLP Jhajjar-Dhanonda D/C-Daultabad line, tripping of units at CLP Jhajjar may be occurred due to load generation imbalance. It is suspected that due to tripping of multiple 400kV lines, island would have formed. However, with ring connectivity at 220kV level also, it needs to be confirmed whether there was island formation during this event.
- vi) Representatives from INDIGRID were not present in the meeting.

PSC Recommendations:

- *HVPNL & NRLDC may inspect whether there was any island formed during the event. The grid event needs to be further analysed.*
- *INDIGRID need to share the details of protection operation at their end and reason of delayed clearance of fault.*
- *Timely submission of DR/EL & tripping report need to be ensured.*

C. Multiple elements tripping at 765/220 kV Lalitpur TPS(UP) at 15:32 hrs on 03rd May, 2025

NRLDC representative shared the following observations w.r.t. tripping event:

- i) Details of A/R operation in all the lines need to be shared.
- ii) Reason of delayed clearance of fault (B-N fault) at 15:32hrs need to be shared.
- iii) Reason of LBB operation of Jhansi bay during A/R operation need to be identified. Necessary corrective action need to be taken to rectify the issue.
- iv) Details of protection operation and sequence of the tripping need to be shared.
- v) DR/EL (.dat/.cfg file) of all tripped elements along with detailed tripping report and remedial action taken report need to be shared.
- vi) Remedial action taken needs to be shared.

Representatives from Lalitpur TPS informed the following:

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- i) During antecedent condition, weather condition was inclement. There was heavy windstorm.

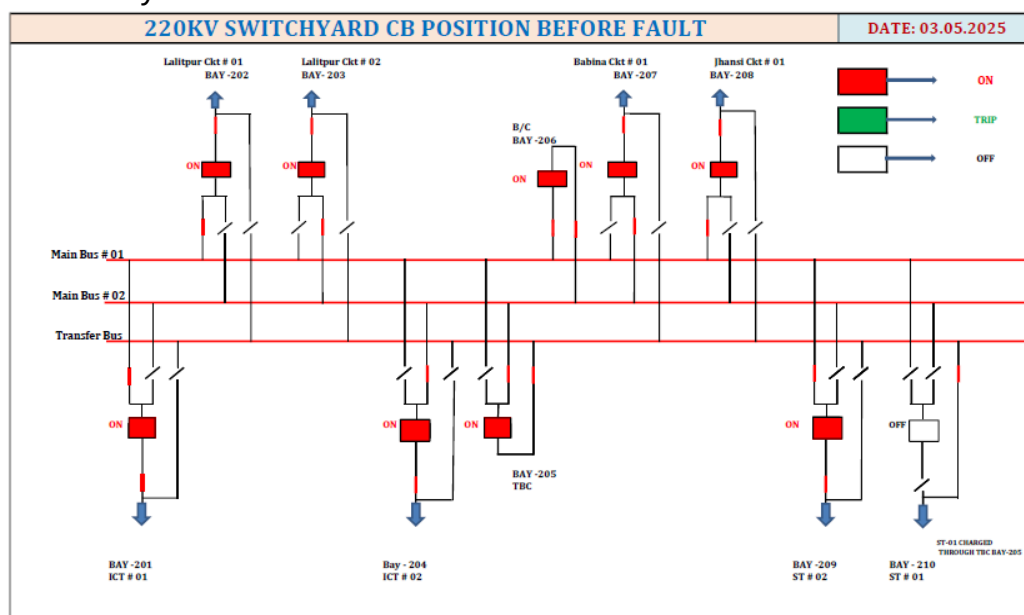


Fig: SLD of 220kV side of 765/220kV Lalitpur before the event

- ii) At 15:19 hrs, 220kV Lalitpur-Babina line tripped on R-N fault in reclaim time. Protection system operated correctly however, A/R operation in the line will be reviewed during opportunity shutdown.
- iii) Further at 15:26 hrs, B-N fault occurred on 220kV Lalitpur-Jhansi line, A/R in B-ph started however, during dead time, LBB relay of Jhansi line sensed current in B-ph and initiated LBB tripping after 200msec time delay. LBB operation led to the tripping of all the elements connected to 220kV Bus-1 at Lalitpur TPS. 765/220kV 315MVA ICT-1, 220kV feeders to Jhansi, Kalyanpur-I (Lalitpur) and 100MVA ST-2 tripped on LBB operation.

During the shutdown of 220KV main Bus-1 & 220KV Dunara Line on **19th May 25, B-Phase CT additional grounding was found at Field JB Cable gland. Rectification has been done.** But A/R Function was not initiated from Dunara end during fault, therefore, A/R operation in the line will be reviewed during opportunity shutdown. LBB operation logic has also been proposed to change from I<Only to I < AND Protection reset function.

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- iv) Further at 15:32:37 hrs, B-N fault occurred on 765 KV Agra Fatehabad(UP)-Lalitpur(LPG) (UP) Ckt-1 and A/R started. At the same instant, 765 KV Agra Fatehabad(UP)-Lalitpur(LPG) (UP) Ckt-2 tripped on operation of OV stage-2 protection. As per DR of line, voltage of R-ph of 765kV Lalitpur-Agra Fatehabad line-II increased from 441kV to ~845kV for ~140msec.

O/V Stage -2 was Operated in R-Phase at 845kV (Setting -618kV i.e. 140%, Trip Time-100ms) in 765 KV Agra Fatehabad(UP)-Lalitpur(LPG) (UP) Ckt-2. During review it was found that voltage selection was Phase-ground in ABB-REL670(M1) but other Relay M2 (MICOM-P545) and both M1 & M2 Relay in Agra -2nd Circuit was not affected due to phase-phase selection.

Configuration of ABB M1-Relay in 765 KV Agra Fatehabad(UP)-Lalitpur(LPG) (UP) Ckt-2 was changed to Phase-Phase instead of Phase-Ground on 4th May 2025. It was done to avoid unwanted operation of OV stage-2 protection due to rise in other phase voltage during ph-N fault in one phase.

NRLDC representative stated that such incidents have been observed during event analysis however root cause of significant fluctuation in healthy ph voltage during ph-N fault also need to be identified.

POWERGRID representative stated that ph-ph selection may lead to wrong measurement of fault location by distance relay. Therefore, proper neutral grounding and wiring need to be ensured.

- v) Further after dead time of A/R operation, 765 KV Agra Fatehabad(UP)-Lalitpur(LPG) (UP) Ckt-1 also tripped due to permanent nature of fault.
- vi) Due to tripping of both the 765kV evacuating lines, case-4 for SPS for safe evacuation of Lalitpur generation operated. As per SPS case-4, in case of tripping of both the 765kV lines, one 660MW unit (in this case unit-3) shall come to house load and remaining unit shall trip. 220kV lines to Lalitpur and Jhansi shall also trip.
- vii) However, as 100MVA ST-2 already tripped at 15:26 hrs during LBB operation of 220kV Bus-1, BFP for Unit-3 was not available and therefore,

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660MW Unit-3 also tripped along with 660MW Unit-1&2. 220kV line to Lalitpur(2nd ckt) also tripped on SPS operation.

- viii) Due to tripping of both the units and all the 220kV feeders on loss of evacuation path and SPS operation, complete 765/220kV Lalitpur S/s got blackout.

Representatives from Lalitpur TPS stated that following preventive actions has been proposed:

- i) In internal protection audit, additional checklist for CT current measurement shall be implemented.
- ii) LBB Protection function should be initiated on Current as well as persisting Fault initiation instead of Current magnitude only in the case of line feeders.
- iii) Over voltage phase selection philosophy is to be explored for 765KV System.
- iv) AR function to be performed on regular basis for both ends in coordination with UPPTCL.
- v) At our 220kV remote end, DT signals are not considered for Overvoltage & LBB. Implementation of DT scheme shall be done in coordination with UPPTCL.

PSC Recommendations:

- *Healthiness of protection system need to be ensured. Periodic review of A/R scheme, CT measurement and other protection system need to be done.*
- *In line with the NRPC protection philosophy, UPPTCL shall implement the DT scheme at 220kV level also.*
- *Exact root cause of surge in healthy phase voltage during single phase to earth fault need to be identified. Necessary remedial measures need to be taken to avoid this.*

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D. Multiple elements tripping at 400/220KV Jaisalmer(RS) at 01:53 hrs on 05th May, 2025

NRLDC representative shared the following observations w.r.t. tripping event:

- i) Exact location and nature of fault need to be shared.
- ii) Reason of delayed clearance of fault even after operation of bus bar protection also need to be shared.
- iii) Reason of tripping of ICT-1 and 400kV Akal-Jaisalmer line from Akal end only need to be shared.
- iv) DR/EL along with tripping report need to be shared for each element from both the ends.
- v) Power flow in all the remaining ICTs (ICT-2 & 5) and other 220kV feeders also became zero after the event. Reason of the same also need to be shared.

Representatives from RVPNL informed the following:

- i) 220kV Jaisalmer-NTPC Solar line and 400/220kV ICT-1,3&4 were connected to 220kV Bus-2 and rest of the elements were connected at 220kV Bus-1.
- ii) At 01:53 hrs, R-N fault occurred on 220kV Jaisalmer-NTPC Solar line at distance ~3.5km from Jaisalmer end. At the same time, the bus side jumper of the NTPS Solar line snapped and created R-N bus fault on 220kV Bus-2.
- iii) On this fault, bus bar relay sensed differential current of ~15kA in R-ph however tripping was not initiated. After ~800msec, Y-ph also involved in bus fault and on this R-Y fault, bus bar relay, initiated bus bar tripping.
- iv) A fault was persisting till ~800msec, during that time 400kV Akal-Jaisalmer line, 220kV Jaisalmer-Akal D/C tripped in Z-2 and 400/220kV ICT-2 tripped on backup O/C E/F protection (with delay of ~600msec).
- v) Delayed fault clearance was due to non-operation of bus bar protection on R-N fault.

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- vi) NRLDC representative stated that Z-2 reach of 400kV Akal-Jaisalmer line distance protection need to be reviewed as it shouldn't have tripped on fault at 220kV level.
- vii) RVPNL representative agreed the same and stated that Z-2 reach setting and non-operation of bus bar protection shall be reviewed. Necessary corrective actions shall be taken to rectify the protection related issue at 400/220kV Jaisalmer S/s.

PSC Recommendations:

- *Reach setting of distance protection in 400kV lines at Jaisalmer(RS) need to be reviewed and corrected.*
- *Reason of non-operation of bus bar protection on R_N fault need to be identified and necessary corrective actions need to be taken to ensure its proper operation.*
- *Healthiness of protection system need to be ensured.*
- *Timely submission of DR/EL and tripping analysis report need to be ensured.*

E. Multiple elements tripping at 400 kV Uri-II HEP (NHPC) at 21:35 hrs on 18th May, 2025

NRLDC representative shared the following observations w.r.t. tripping event:

- i) Reason and location of fault need to be shared.
- ii) Reason for delayed fault clearance needs to be shared.
- iii) Reason of SOTF initiation during reclaim time fault.
- iv) Remedial action taken report to be shared.

Representatives from NHPC informed the following:

- i) Both the 400kV lines from Uri_2 HEP i.e., Wagoora and Uri_I line tripped on R-N fault in reclaim time. Fault was in Z-1 from Uri_2 end.

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- ii) Regarding delayed clearance of fault, it was informed that fault cleared within 100msec from Uri_2 end.
- iii) Regarding SOTF operation it was informed that it is TOR (Trip on Re-close), therefore, terminology need to be corrected.
- iv) NRLDC representative stated that as per PMU, fault cleared with the delay of 400msec. As per DR of Wagoora end, fault was sensed in Z-2 and tripped with the delay of Z-2. It seems that carrier aided tripping didn't occur. Hence, carrier aided protection needs to be reviewed.

PSC Recommendations:

- *NHPC in coordination with the POWERGRID(NR-2) shall review the healthiness of carrier protection in 400kV Uri_2-Wagoora line.*
- *Healthiness of protection system need to be ensured.*

F. Multiple elements tripping at 765/400 kV Meerut(PG) and 400kV Dadri TPS(NTPC) at 19:55 hrs & 20:00 hrs respectively on 21st May, 2025

NRLDC representative shared the following observations w.r.t. tripping event:

- i) Tripping of 400kV Meerut-Bareilly ckt-2 on SOTF, 400kV Merrut-Muzaf-farnagar ckt and 400kV Meerut-Mandola ckt from remote end need to be further analysed.
- ii) Reason of tripping of 490 MW unit-2 at Dadri Stage-II at 20:17 hrs need to be shared.
- iii) As per DR of 400kV Dadri-Mandola ckt-1, line tripped at 20:04 hrs from Dadri end only. Line successfully autoreclosed from Mandola end. Details w.r.t. the tripping need to be shared.
- iv) As reported, 400kV Dadri-Mandola ckt-2 tripped during power swing from Dadri end only. DR(.dat/.cfg) file of the tripping need to be shared.
- v) Remedial action taken report to be shared.

Representatives from POWERGRID informed the following:

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- i) During antecedent condition, 765kV Meerut-Moga line was under tripped condition. Line tripped on R-N fault in reclaim time. 400kV Meerut-Bareilly line was also tripped at 19:54:57 hrs on R-N fault in reclaim time.
- ii) At 19:55:21 hrs, R-N fault occurred on 765 KV Koteswar- Meerut (PG) Ckt-2 due to earth wire broken during inclement weather condition at ~1km from Meerut end. Line tripped from Koteswar end in Z-2 but didn't trip from Meerut end due to non-operation of Distance Protection. During investigation it was found that at 19:55:18 hrs, R-Ph dropper connector on IPS connected to CVT of 765kV Meerut-Koteswar Line-II failed at Meerut Substation leading to loss of R-ph voltage. Due to this, distance protection at Meerut end didn't operate.
- iii) As fault was still persisting, 765kV Meerut-Bhiwani ckt and 765kV Meerut-Gr. Noida ckt tripped from remote end in Z-2. At ~19:55:22:000 hrs, all three 1500 MVA ICT at Meerut tripped on operation of back up impedance protection operation (Z-2).
- iv) Further at 19:55:22:600 hrs, 400kV Tehri-Koteswar ckt-1, 2 & 3 along with 765kV Meerut-Koteswar (PG) ckt-1 tripped from Tehri and Koteswar(PG) end respectively on O/C E/F protection (67N relay). With this, evacuation path of Koteswar HEP and Tehri HEP lost.
- v) Further, tripping of subsequent elements occurred as per following:
 - a) At 19:55:22.682, 400kV Mandola-Maharanibagh-2 Tripped on operation of DEF
 - b) At 19:55:22.866, 400kV Mandola-Meerut-1 Tripped on Operation of Zone-3
 - c) At 19:56:47.313, 220kV Meerut-Simbhawali line tripped on B-N fault.
 - d) At 19:56:57.523, 400kV Meerut-Baghpat-II Tripped on Persisting B-N Fault.
 - e) At 19:57:00.517, 400kV Meerut-Baghpat-I Tripped on Persisting Y-N Fault.
 - f) At 19:57:07.210, 220kV Meerut-Shatabdinagar Tripped on B-N Fault.
 - g) At 19:57:09.823, 220kV Meerut-Modipuram-II Tripped on B-N Fault
 - h) At 20:00:27.287, 400kV Dadri-Kaithal tripped after successful AR due to persisting nature of R-N Fault.

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- i) At 20:04:45.049, 400kV Mandola-Dadri-1 tripped after successful AR due to persisting RN Fault. Second fault 8 Sec after AR. Flash mark at Tower Location no. 80.
- j) At 20:20:59.448, 400kV Mandola-Maharnibagh-1 on persisting R-N Fault. Conductor from gantry Opened at Mandola.
- k) At the same time, large power swing was observed on the Mandola–Dadri Line-2 and the frequency at the Mandola Substation began to drop rapidly. Due to the frequency decline, the under-frequency islanding scheme at Mandola Substation was triggered at 20:21:01.784 Hrs. Islanding Scheme at Mandola is owned by DTL and the operating threshold is 47.9 HZ, instantaneous.
- l) At 20:21:01.797, 400kV Meerut-Mandola-II, III & IV Opened on Operation of Islanding Scheme at Mandola and DT Receipt at Meerut.
- vi) Further, since starting from 20:20:58:2785 Hrs. 12 successive commutation failures were detected and as evident from the Event list these failures were detected at a gap of less than 500ms, at 20:21:00:8782 both Poles of the Rihand Dadri HVDC Link tripped on Commutation failure protection from HVDC Dadri Sub-station.
- vii) **NRLDC representative stated that islanding of 400kV Mandola-Dadri line need to be reviewed again. It shouldn't go into island before tripping of HVDC Rihand-Dadri. Further, it was also asked whether any remedial measures can be suggested for taking care of protection system in case of VT fail. As in this event, due to VT fail, a major grid event occurred.**
- viii) POWERGRID representative stated that our protection team is reviewing the same and it is being planned to implement non directional O/C E/F protection in case of VT fail alarm in both Main-&II. This proposal is being reviewed internally at POWERGRID.

PSC Recommendations:

- *DTL shall review whether any UFR relay is still in service at 400kV Dadri, Mandola complex or any other stations which is not part of present Delhi islanding scheme.*

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- *POWERGRID shall study the philosophy for implementing O/C E/F relay as back up in case of VT fuse fail in both Main-I & II relay to avoid such major grid event.*
- *Healthiness of protection system need to be ensured.*
- *Timely submission of DR/EL and tripping analysis report need to be ensured.*

G. Multiple elements tripping at 400/220KV Bareilly(UP) and 220kV Tanakpur HEP at 20:24 hrs – 20:52 hrs on 31st May, 2025

NRLDC representative shared the following observations w.r.t. tripping event:

- i) Reason of bus bar protection operation at 20:24 hrs at Bareilly (UP) need to be shared.
- ii) DR, EL & tripping report need to be shared from both the ends.
- iii) Details of protection operation and sequence of the tripping need to be shared.
- iv) Severe voltage fluctuation observed in the complex during the grid event
- v) Remedial action taken report to be shared.

Representatives from UPPTCL & NHPC informed the following:

- v) As reported, at 20:24 hrs, 315MVA, 400/220KV ICT 2 was charged after CT replacement at LV side. After ~15 sec of ICT charging, 220KV Bus-Bar Zone 2 (Y-ph differential) protection operated. During inspection it was found that CT was charged with the wrong polarity and pick up setting was also sensitive.
- vi) Bus bar differential protection setting has been reviewed and corrected.
- vii) NRLDC representative raised concern over severe voltage fluctuation after tripping of all the ICTs at Bareilly(UP) and also highlighted that at 20:42 hrs **ICT-1 was charged without taking code from NRLDC which is violation of IEGC and NR Operation Procedure.**

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- viii) **UPPTCL representative agreed and stated that site engineers have been sensitized to strictly follow the NR Operating Procedure.**
- ix) **NRLDC representative also raised concern over disabling of SPS at Bareilly(UP) without approval at OCC forum.**
- x) UPPTCL representative stated that as per internal office order of October 2021, it was internally decided for disabling of SPS at Bareilly(UP) as ICTs were N-1 complaint during that time and SPS was shifted to So-hawal S/s.

NRLDC representative requested UPPTCL to review the SPS requirement at 400/220kV Bareilly(UP) and propose the SPS logic for reinstallation of SPS scheme at 400/220kV Bareilly(UP). Agenda may be put up in OCC meeting with proposed logic.

Further, in view of severe voltage fluctuation during the grid event, it was requested to review the load management in the complex and take necessary remedial measures to avoid such event in future.

PSC Recommendations:

- *UPPTCL shall review the SPS requirement at 400/220kV Bareilly(UP) and put up an agenda in OCC meeting with proposed SPS logic.*
- *IEGC and NR Operating Procedure need to be strictly followed during any grid operations. Necessary instructions may be given to site engineer in this regard.*
- *Healthiness of protection system need to be ensured.*
- *In view of severe voltage fluctuation during the event, SLDC-UP shall re-view the load management in CB Ganj-Sitarganj-Tanakpur complex to avoid such event in future.*

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

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

- B.4.1 A total of 11 inter-regional lines tripping occurred in the month of **May 2025**. The list is attached at Annexure-B.V of agenda. The status of receipt of preliminary reports, DR/EL within 24hrs of the event and fault clearing time as per PMU data has also been mentioned in the table. The non-receipt of DR/EL & preliminary report within 24hrs of the event from SLDCs / ISTS licensees / ISGSs is in violation of regulation 37.2(c) of IEGC and regulation 15(3) of CEA Grid Standards. As per regulations, all the utilities shall furnish the DR/EL, flag details & preliminary report to RLDC/RPC within 24hrs of the event. They shall also furnish the detailed investigation report within 7 days of the event if fault clearance time is higher than that mandated by CEA (Grid Standard) Regulations.
- B.4.2 NRLDC representative raised concern over non-operation of A/R in 400 KV Gorakhpur(PG)-Motihari(BS) (PG) Ckt-2 and 765 KV Fatehpur-Sasaram (PG) Ckt-1. POWERGRID(NR-III) representative was not available during the discussion.
- B.4.3 Regarding tripping of 220 KV Auraiya(NT)-Malanpur(MP) (PG) Ckt-1, NTPC was requested to review the A/R operation in line. DR/EL of the tripping also not received. NTPC representative agreed to take necessary remedial actions.

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."*

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B.5.2 As per IEGC clause 16.3

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

B.5.3 There are 56 numbers of System Protection Scheme (SPS) approved in Northern Region. These SPS are implemented at major generation complexes, important evacuating transmission lines and ICTs which are N-1 non-complaint. System Protection Scheme Document of Northern Region has been revised/updated on 31st January, 2025.

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

B.5.5 In this regard, communication has already been sent to constituents through NRLDC letter dated 01.05.2024, 21.02.2025, 05.03.2025 & 04.04.2025 and continuous follow up is being done in OCC & PSC meeting since May 2024.

B.5.6 During 2024-25, mock testing of 14 SPS out of total 55 SPS were not conducted. In view of high demand scenario during summer 2025-26, concerned constituents / utility were requested to conduct the mock testing of pending SPS by the end of April 2025 month through NRLDC letter dated 04.04.2025. However, as reported, mock testing of 03 SPS out of pending 14 SPS have been done. In this regard, discussion was also held in 60th PSC meeting conducted on 26.05.2025. PSC forum requested all the members to conduct the mock testing of all the SPS in their respective control area at the earliest.

B.5.7 Status of mock testing of all the SPS in NR is attached as Annexure-B.VI of agenda.

B.5.8 In view of the above, members were requested to take following actions:

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- i. Concerned constituents / utility shall conduct the mock testing of pending SPS (whose mock testing was not conducted in FY 2024-25) at the earliest.**
- ii. In compliance with IEGC clause 16.2, users shall ensure that mock testing along with the review of SPS logic of all the SPS is conducted at least once a year. Hence utilities are also requested to share the tentative schedule and conduct the mock testing of SPS schemes in their respective control area w.r.t. FY 2025-26.**
- iii. 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.**

During 60th PSC meeting, forum also decided to not disable the SPS where ICTs are now N-1 compliant after augmentation. It was decided that SPS may be kept enabled with logic based on loading instead of ICT tripping. Members may share the status in this regard.

- B.5.9** Regarding SPS of Ropar S/s, representative of SLDC-Punjab stated that this SPS was implemented in 2012. SPS was installed by Synergy Solutions and presently system is not in healthy condition. Service engineer inspected the SPS system, and it was observed that PLCs of CPC cards have become faulty and obsolete also. Therefore, SPS system need to be reinstalled. Necessary follow up is being done at management level. Timeline and actions plan shall be shared.
- B.5.10** Regarding review of “SPS for contingency due to tripping of evacuating lines from Narora Atomic Power Station”, updated network and base case details need to be shared by SLDC UP. NRLDC asked UPPTCL to share the details regarding the same.
- B.5.11** UPPTCL representative informed that as confirmed at site, no SPS is in service at Narora station. SPS scheme mentioned in SPS document need to be reviewed.
- B.5.12** NRLDC representative requested members to share the schedule for SPS mock testing w.r.t. their respective control area and to share the mock test report of SPS whose mock testing have already conducted.

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- B.5.13 UPPTCL representative informed that SPS Mock testing of 400/220kV Muradnagar and Muzaffarnagar is scheduled in March 2026. Mock test of Bara S/s has been done on 23.05.2025.
- B.5.14 DTL representative informed that SPS mock testing of Bawana is scheduled in December 2025.
- B.5.15 PTCUL representative informed that mock testing of Kashipur SPS is scheduled in September 2025. Further, it was stated that when enough intra state generation is available then this SPS is not needed. Therefore, a logic may be incorporate to block SPS operation when generation is available. NRLDC representative requested PTCUL to share the details by mail so that internal review can be done and then case can be discussed at OCC forum.
- B.5.16 POWERGRID was requested to share the SPS mock test report of Mandola, Maharaniabagh and Jhatikara S/s. Further, mock testing of pending SPS schemes also need to be conducted.
- B.5.17 Members were also requested to revise the logic of SPS from TRIPPING based logic to LAODING based logic at stations where ICTs are now N-1 compliant after ICT augmentation. Members were requested to take necessary actions in this regard and share the confirmation.

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)

- B.6.1 During 60th PSC meeting, NRLDC representative raised concern about reporting status of J&K. J&K representative informed that they will provide DR/EL of the events occurring at their SAS based station. NRLDC representative also requested J&K to share a list of substations under J&K control area mentioning whether it is SAS based or not (DR/EL available or not). J&K through mail dt 26.05.2025 informed the list of S/s where SCADA is installed.
- B.6.2 Further NRLDC mail communication dt 28th May 2025 regarding the same was sent

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to J&K to share the station wise details of protection system in format attached with the mail. J&K vide mail dt 12th & 13th June 2025 shared the details regarding the subject matter and also highlighted the name of the S/s under J&K control area who have not yet submitted the data till date. Details of the communications along with attachments is attached as Annexure-B.VII of agenda. J&K is requested to follow up with the S/s under J&K control area who have not yet submitted the data till date and submit the same at the earliest.

- B.6.3 During 60th PSC meeting, J&K representative stated that work of installation of OPGW was delayed due to payment issues. However, payment has been processed now and they will expedite the installation.
- B.6.4 NRLDC representative highlighted that protection audit must be done at majorly affected substations of J&K control area to identify protection related issues and resolve them at the earliest. Further, it was also requested to share the current status of OPGW installation work.
- B.6.5 J&K representative stated that they would take necessary follow up actions in this regard. It was also informed that third party is planned to be conducted from POWERGRID. Present status will be shared.

Decision of Forum:

PSC forum requested J&K to conduct the internal protection audit of majorly affected stations in case third party protection audit has not been scheduled. J&K shall also ensure to share the DR/EL & tripping reports as per specified timeline.

B.7 Recent frequent tripping of HVDC Champa-Kurukshetra (agenda by NRLDC)

- B.7.1 HVDC Champa-Kurukshetra inter-regional link is a very important link for fulfilling the Northern Region demand requirement. It has been observed that frequency of tripping of HVDC Champa-Kurukshetra has increased in the recent past.
- B.7.2 As reported, at 22:50 hrs on 21st May 2025, 800 KV HVDC Kurukshetra(PG) Pole-2 blocked from Champa end due to DC Line Fault and Pole-4 blocked due to CAT-B Protection in Pole-2.

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- B.7.3 Further, at 14:08 hrs on 28th May 2025, 800 KV HVDC Kurukshetra(PG) Pole-2 & 4 blocked due to maloperation of Pole 4 active lane i.e. Pole 4 lane 1 (unable to lane changeover) at Champa end.
- B.7.4 Again, at 12:20 hrs on 09th June 2025, 800 KV HVDC Kurukshetra(PG) Pole-4 blocked due to differential protection operation in Y-Y connected B phase converter transformer at Kurukshetra end. Further at 12:22 hrs Pole-1 & 3 blocked due to Instability from Champa end. This led to demand drop in Rajasthan, Haryana, Punjab and Uttar Pradesh. As per SCADA, approx. 900 MW change in demand in NR region was observed. Rajasthan Demand changed by 609 MW, Haryana demand dropped by 220MW, Punjab demand dropped by 100MW, UP demand dropped by 602 MW and NR solar generation dropped by 150MW. After the tripping of all the poles in HVDC Kurukshetra, low voltages were observed in NR region. 765KV Aligarh – Gr. Noida Ckt increased upto 3100MW while 1000 MVA, 765/400KV ICT-2 at Bhiwani got overloaded to 1071MW.
- B.7.5 POWERGRID was requested to share the details of action taken to avoid frequent outage of HVDC Champa-Kurukshetra.
- B.7.6 POWERGRID representative informed that during 09th June event, one of the differential protections of converter transformer (star-star) maloperated and blocked pole-4.
- B.7.7 After the event, necessary inspection was done during which physical Inspection of Valve side CT terminal box of turret was done and no irregularity was found. Relay testing was carried out, and a faulty CT card was found in the Main 2 TY2 relay. Faulty CT card in TY2 relay has been replaced.
- B.7.8 NRLDC representative highlighted that on 9th June event, all poles of HVDC Champa-Kurukshetra had tripped and as a result, low voltages were observed in NR grid especially in Haryana due to high power flow on AC network. The tripping caused alarming conditions in the Northern Region grid.

Decision of Forum:

PSC forum requested POWERGRID to take suitable measures to avoid frequent tripping of HVDC Champa-Kurukshetra inter-regional link.

61st Protection Sub-Committee Meeting (26th June, 2025)-MoM**B.8 Corrective action for healthiness of 500kV Mundra-Mahindergarh SPS (agenda by NRLDC)**

- B.8.1 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.8.2 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.8.3 Following actions were decided during the meeting:
- 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.
 - 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.
 - 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.8.4 Load end details have been received from UP, Haryana, Punjab Rajasthan & Delhi. Details and communications are attached as Annexure-B.VIII of agenda.
- B.8.5 ADANI via mail dated 29.08.2024 has submitted the status of healthiness of communication network and hardware system at different locations on the basis of preliminary inspection. As per details submitted, counter status was found OFF at Alwar, Ratangarh, Gobindgarh, Malerkotla, Bamnauli, Shamli and Dhanonda.
- B.8.6 Details of nodal officer of different substation involved in SPS scheme has already been shared with ADANI team for coordination and further remedial actions.

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- B.8.7 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.8.8 ADANI agreed for the same and stated that update would be given within 01 week. However, no detail received yet from ADANI.
- B.8.9 During discussion in 55th PSC meeting it was decided that ADANI shall take lead in rectification work as this SPS scheme was commissioned by them. Protection nodal officers from States will provide possible necessary assistance from their end. Further, states were also requested to ensure incorporation of revised decided feeders during work at their stations. States representative assured to provide all necessary coordination from their end.
- B.8.10 During 56th PSC meeting, ADANI was requested to apprise the forum about the present status of remedial actions. ADANI representative stated that they have raised 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 April 2025. Thereafter, after financial approval, rectification of issues will be done. ADANI was requested to ensure completion of whole work before summer 2025. State representatives were also requested to coordinate with the ADANI team and ensure incorporation of identified revised feeders for load relief in SPS.
- B.8.11 Further, through mail dt 3rd April 2025, ADANI has informed that they awarded the rectification work service to M/s COMTEL for survey and restoration of possible elements installed at the locations and engineers from M/s COMTEL shall be visiting respective stations as per the schedule.
- B.8.12 During 57th PSC meeting, ADANI representative informed that visit by COMTEL engineers at all the sites is completed and COMTEL will submit the report within 10 days.
- B.8.13 ADANI was requested to share the report at the earliest and make Action Plan accordingly to ensure completion of whole work before summer 2025.
- B.8.14 ADANI agreed to take expeditious actions and to share the action plan at the earliest.
- B.8.15 During 58th PSC meeting, ADANI representative shared the observations made by

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COMTEL engineers and informed that it would at least require 6 months to complete the work.

- B.8.16 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.8.17 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. They will look into the regulatory aspect of the same for finalising the action plan.
- B.8.18 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.
- B.8.19 PSC forum emphasized that considering the growing energy demands in summer season, healthiness of 500kV Mundra-Mahindergarh SPS is of utmost importance for secure & reliable grid operation. State representatives were also requested to coordinate with the ADANI team and also ensure incorporation of identified revised feeders for load relief in SPS. Desired remedial actions need to be expedited.
- B.8.20 During 60th PSC meeting, ADANI representative informed that internal approval is taken for placing the order and order will be released to vendor by end of May 2025. They have expedited the execution of upgradation activity and now it is expected to get completed by August 2025.
- B.8.21 NRLDC representative requested to share weekly progress report once the execution work starts and ADANI agreed for the same.
- B.8.22 ADANI was requested to apprise the forum about identified issues at various stations, action plan and progress in rectification work.
- B.8.23 During 61st PSC meeting, ADANI representative informed that order will be released by 1st week of July to the vendor for completion of work. The vendor has given 06 (six) months' timeline for completion of whole work however, we will follow up with the vendor and try to complete the whole work within 04 months.
- B.8.24 NRLDC representative requested ADANI to expedite the necessary actions at their end

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as corrective actions has already been delayed. It was also requested to give action plan of corrective actions for smooth coordination and actions. Weekly progress and status of actions may also be shared.

Decision of the Forum

PSC 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. ADANI was requested to expedite the necessary actions at their end. It was also requested to give action plan of corrective actions for smooth coordination and actions. Weekly progress and status of actions may also be shared. State representatives were also requested to coordinate with the ADANI team and also ensure incorporation of identified revised feeders for load relief in SPS. Desired remedial actions need to be expedited.

B.9 Confirmation regarding implementation of proposed Overvoltage protection setting by committee (agenda by NRLDC)

- B.9.1 A committee was formed by NRPC during 52nd PSC meeting held on 20th September 2024 to review the Overvoltage Protection settings of 400kV and 765kV transmission lines in Northern Region. This committee was formed for compliance of the recommendation given by the committee formed by CEA for analysis of Grid incident occurred on 17th June 2024. The committee reviewed the Overvoltage Protection settings of 400kV and 765kV transmission lines in Northern Region, finalized the protection settings for overvoltage protection and proposed the revised overvoltage protection settings. The proposed Overvoltage protection settings were discussed and approved in 58th Protection Sub-Committee (PSC) meeting held on 26th March 2025. The PSC forum requested all to implement the proposed overvoltage protection settings in 400kV and 765kV transmission lines in their respective control area. Details of the revised overvoltage protection setting to be implemented is attached as Annexure-B.IX of agenda.
- B.9.2 Further, the agenda in this regard was again discussed in 230th OCC meeting held on 17th April 2025 and 60th PSC meeting held on 26th May 2025. It was observed that many members are yet to confirm the implementation of revised overvoltage settings.

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- B.9.3 NRLDC representative stated that status of confirmation received from UPPTCL (partially implemented), DTL, Lalitpur TPS (LPGCL), NHPC (Chamera-I &II, Uri-I& II, Dulhasti HEP), POWERGRID NR-1, NUPPL and Rampur HEP. SLDC Punjab vide mail dt 5th June 2025 informed that over-voltage settings implementation will take 3-4 months.
- B.9.4 UPPTCL & HVPNL representative confirmed that proposed overvoltage protection settings have been implemented at all the stations in their respective control area.
- B.9.5 PSTCL representative stated that due to shortage of manpower in protection team, 3-4 month time is required for implementation of revised OV settings.
- B.9.6 PSC forum suggested PSTCL to address the issue and propose to form separate protection wing so that protection related compliance and grid event analysis may be done in stipulate time frame.
- B.9.7 All the members were requested to ensure the implementation of proposed overvoltage settings in their control area at the earliest to avoid any unwanted tripping during the ongoing high demand scenario. In this regard, e-mail communication was also sent dated 07.05.2025 & 03.06.2025 to all members.

Decision of the Forum

PSC Forum requested all the to share the confirmation regarding implementation of revised overvoltage protection setting in 400kV and 765kV transmission lines in their respective control area at the earliest and send a confirmation regarding this to NRPC and NRLDC.

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

A. May 2025

- C.1.1 EE (P), NRPC informed that NRLDC has submitted the FTCs allowed in month of May-2025. The same may be found on NRPC website:
<http://164.100.60.165/meetings/prsub.html>

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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 utility has submitted agenda for approval of settings:

- i. RVPNL
- ii. UPRVUNL
- iii. HVPN
- iv. PGCIL

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

- i. UPPTCL
- ii. RSDCL
- iii. PBTS
- iv. Juna REPL
- v. SJVN Green Energy Limited
- vi. ACME Sikar Solar Private Limited
- vii. NTPC Green Energy Limited
- viii. GORBEA SOLAR PRIVATE LIMITED
- ix. THDC

B. June 2025

C.1.5 Khidrat Renewable Energy Private Ltd has submitted agenda for final approval of protection settings of its 300 MW solar power project in the Bikaner for which FTCs were allowed by NRLDC vide letter dated 30.05.2025 & 04.06.2025.

C. April 2025

C.1.6 UPRVUNL has submitted agenda for final approval of protection settings of 110 MVA Station Transformer-II & 80 MVA Bus Reactor at 1X660MW PTEP, Panki for which FTCs were approved in the month of April, 2025 by NRLDC.

C.1.7 UPRVUNL has submitted agenda for final approval of protection settings of 1500MVA ICT-1 of 2x660 MW Jawaharpur TPS for which FTC was approved in the month of

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April, 2025 by NRLDC.

C.1.8 PPGCL has submitted agenda for final approval of protection settings of 413 bay and 75 MVA Transformer at PPGCL Bara for which FTCs were approved in the month of April, 2025 by NRLDC.

C.1.9 These all submitted settings are available at NRPC website:
<http://164.100.60.165/meetings/prsub.html>.

C.1.10 Above settings were discussed in the meeting.

C.1.11 EE (P), NRPC 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.1.12 EE (P), NRPC mentioned that JSW has submitted settings for 240 MW Hydro plant getting connected at Kutehar. NRLDC informed that these protection settings have been scrutinized, however, FTC formalities is pending from HPPTCL side.

Decision of the Forum:

After detailed deliberation, following were decided as below-

1) Forum approved the above settings with following remarks:

- a) **KHIDRAT SOLAR PROJECT:** Power Swing Blocking and Zone reach of 220 kV line may be aligned to NRPC protection philosophy.
- b) **HVPN:** SOTF Delay time 10 sec may be re-checked.

2) Utilities were requested to put up agenda for final approval of settings timely in future.

61st Protection Sub-Committee Meeting (26th June, 2025)-MoM**Table Agenda****1. Multiple elements tripping event in Delhi control area on 15.06.2025: (agenda by NRLDC)**

- 1.1 On 15.06.2025 between 03:48 hrs – 03:55 hrs, tripping of multiple transmission elements has been reported in Delhi control area leading to blackout of 220/66kV Pragati(DTL). During the event, ~640 MW load and ~275 MW generation got affected in Delhi control area and major affected substations were 220/66kV Pragati(DTL) and 220/66kV Maharaniabagh(DTL).
- 1.2 The tripping event was analysed based on the data available at NRLDC and tripping details received from DTL. Detailed analysis of the event hasn't been received yet from DTL. During analysis it was observed that recording instruments (disturbance recorders) haven't been configured as per standard, and they are not GPS time synced also. Reason of tripping of both 220kV Maharaniabagh-Gajipur Line-1&2 yet to be identified which led to the load loss in Gajipur and Patparganj area. Operation of autorecloser is also not observed during any of the single phase to earth fault during the event.
- 1.3 Apart from above mentioned events, frequent multiple elements tripping event leading to load loss in Delhi control area have occurred in recent past. Summary of the events are as follows:
 - i. Multiple elements tripping at 400/220kV Bamnauli(DV) on 01.06.2025: GI-2, Load loss in Delhi control area: 75 MW
 - ii. Multiple elements tripping at 220kV Dwarka(DV) on 20.06.2025: GI-1, Load loss in Delhi control area: 314 MW
- 1.4 In view of the above, SLDC-Delhi / DTL were requested to carry out the Root Cause Analysis of the aforementioned grid event and share the detailed report to NRLDC / NRPC.
- 1.5 DTL representative stated that there is issue in PU of few bays of bus bar protection at 220kV Maharaniabagh S/s. Necessary corrective actions shall be taken to make complete bus bar protection healthy.
- 1.6 NRLDC representative also highlighted the outage of ICTs in Delhi control area which are yet to be revived and also raised concerned over frequent-tripping

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incidents in Delhi control area. In view of increasing demand scenario, outage of transmission elements and frequent tripping event affected the reliability and security of regional grid. DTL was requested to take expeditious remedial measures to avoid frequent tripping events in future and also follow up for expeditious revival of transmission elements (ICTs).

Decision of Forum:

PSC forum requested DTL to review of protection system at affected substations to avoid undesired tripping in future. Expeditious remedial measures to avoid frequent tripping events in future and for revival of transmission elements (ICTs) need to be taken.

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45	Rohit Kumar Jain	A.E.	SLDC, Rajasthan	se.sold@nnp.co.in
46	Vishnu Shankar		Khednl	vishnu.shanker@jakson.com
47	Rohit Gera		KM. DRAT	rohit.gera@statkraft.com
48	Sandeep Kumar		HPGCL Panipat	xensyd.pts@hpgc.org.in
49	Mahendra Vishnor		Enel Anan Power (TSLPL)	mahendra.vishnor2@enel.com
50	Harshit Shukla	Manager	PPGCL	harshit.shukla@ppgcl.co.in
51	Anuraj Agarwal	GM	JSW	agarwal.anurag@jsw.in
52	Shashi Saini	Sr. Manager	Apraava Energy	shashi.saini@apraava.com
53	V.K. Singhal	DGM	ACME	
54	Shivam Gupta	AM	ACME	dsm.onm@acme.in
55	Neeraj Kumar Verma	A.V.P.	Sekura Energy Pvt.Ltd.	neeraj.verma@energy_sel.com
56	R.C. Juyal	EE	UPPTCL	rah.rcjutal1965@gmail.com
57	Uma Shankar	EE	UJVNL	atestdharasu@gmail.com
58	Sumit Kumar		Renew	sumit.kumar@renew.com

Status of action taken on decisions of 60th PSC

S.N.	Agenda No.	Agenda	Decision of 60 th PSC	Status of action Taken (Discussed in 61 st PSC)
1	A.3	Submission of protection performance indices along with reason and corrective action taken for indices less than unity to NRPC Secretariat on monthly basis (agenda by NRPC Secretariat)	Non-compliant utilities were asked to submit the Protection performance indices timely by 7 th day of month element wise along with corrective action taken for indices less than unity.	Status of reporting of indices was discussed as an agenda.
2	A.4	Intimation of performance of SPS (agenda by NRPC Secretariat)	I. Utilities 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. II. SLDCs may submit protection performance indices for SPS on a monthly basis by 7 th date of each month in the same format as that of protection performance indices of elements (lines/ICT etc).	RVUN, PPGCL, Gorakhpur & Lucknow Zone (UPPTCL) have shared performance indices of the May, 2025 month for SPS.

Status of action taken on decisions of 60th PSC

3	A.6	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. PSTCL representative informed that the Annual Protection Audit Plan for FY 2025-26 will be submitted within 15 days. J&K representative informed that Annual protection audit plan for FY 2025-26 will be submitted within 15 days. HPGCL representative informed that audit plan will be submitted before next PSC meeting. Rajasthan SLDC was requested to arrange the internal protection audit plan for Barsingar Plant pertaining to Rajasthan	Report submitted by utilities were discussed as agenda. Updated audit plan has been attached in Minutes of the meeting.

Status of action taken on decisions of 60th PSC

			control area. AESL representative and NTPC representative assured to communicate the Adani Power limited and Meja Urja Nigam Limited respectively to arrange the protection audit plan.	
4	A.7	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.	Report submitted by utilities were discussed as agenda.
5	A.9	Review of Standard protection philosophy to be adopted in various cases (agenda by POWERGRID Nr-3)	Forum decided that philosophy for the above cases may be finalized in the next meeting, considering the above discussion. Utilities may share the suggestions/comments if any.	Agenda was discussed.

Status of action taken on decisions of 60th PSC

6	A.11.	Tripping of 400 kV Transmission Lines and Delay in Restoration of these 400kV lines emanating from JPL Power Station (agenda by Apraava Energy)	Forum directed IndiGrid and HVPN to provide the tripping related inputs to NRLDC. Any required remedial measures will be directed by Forum based on the discussion in the next meeting during grid event analysis.	Event was discussed in agenda of grid event analysis.
4	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 relief in SPS. Desired remedial actions need to be expedited.	Agenda was discussed.

Status of performance indices report of May 2025 (Last date of submission 07.06.2025)								
S. No.	Utility		Received Status (Yes/No)	Vide mail dated	Remarks	Indices less than 1 (Yes/No)	Reason submitted and corrective action taken	
1	PGCIL	Central Government owned Transmission Company	Yes	05.06.2025	NR-1	No	NA	
			Yes	20.06.2025	NR-2	Yes		
			Yes	06.06.2025	NR-3	No	NA	
2	NTPC	Central Generating Company	Yes	05.06.2025	Anta	No	NA	
					Auriya			
			Yes	06.06.2025	Dadri	No	NA	
					Koldam			
			Yes	09.06.2025	Rihand	No	NA	
			Yes	25.06.2025	Singrauli			
			Yes	06.06.2025	Unchahar	No	NA	
			Yes	05.06.2025	Tanda	No	NA	
3			BBMB	Yes	23.06.2025		No	NA
4			THDC	Yes	06.06.2025	Tehri	No	NA
	Yes			06.06.2025	Koteshwar			
5	SJVN		Yes	06.06.2025	RHPS	No	NA	
			Yes	05.06.2025	NJHPS	No	NA	
6	NHPC		Yes	04.06.2025		Yes	Yes	
7	NPCIL		Yes	06.06.2025	RAPS-A	No	NA	
				Yes	05.06.2025	RAPS-B	No	NA
				Yes	03.06.2025	RAPS-C(5&6)	No	NA
						RAP -D (7 & 8)		
			Yes	04.06.2025	NAPS-1&2	No	NA	
8	DTL		Yes	06.06.2025		Yes	Yes	
9	HVPNL		Yes	13.06.2025		Yes	No	
10	RRVNL		Yes	06.06.2025		Yes	Yes	
11	UPPTCL		Yes	03.06.2025	Meerut Circle	Yes	Yes	
		Yes	04.06.2025	Agra Circle	Yes	No		
		Yes	03.06.2025	Jhansi Circle	Yes	Yes		
		Yes	04.06.2025	Prayagraj Circle	No	NA		
		Yes	04.06.2025	Gorakhpur Circle	No	NA		
		Yes	04.06.2025	Lucknow Circle	No	NA		
		Yes	06.06.2025		No	NA		
12	PTCUL							
13	PSTCL							
14	HPPTCL		Yes	06.06.2025		No	NA	
15	IPGCL		Yes	05.06.2025	PPS-I	No	NA	
		Yes	05.06.2025	PPS-III, Bawana	No	NA		
16	HPGCL	Yes	04.06.2025	PTPS, Panipat	No	NA		
		Yes	04.06.2025	DCRTPP, Yamunanagar	No	NA		
		Yes	04.06.2025	RGTPP (Khedar)	No	NA		
		Yes	04.06.2025	KTPS	No	NA		
17	RRVUNL		Yes	05.06.2025	CSCTPP Chhabra	No	NA	
		Yes	03.06.2025	RGTPP, Ramgarh	No	NA		

			Yes	03.06.2025	Ctpp,Chhabra	No	NA
			Yes	01.06.2025	DCCPP, Dholpur	No	NA
			Yes	05.06.2025	kATPP, Jhalawar	No	NA
			Yes	05.06.2025	STPS Suratgarh	No	NA
			Yes	05.06.2025	SSCTPS Suratgarh	No	NA
18	UPRVUNL	State Generating Company	Yes	24.06.2025	Parichha B (220 kV)	No	NA
			Yes	02.06.2025	Parichha C (400 kV)	No	NA
			Yes	05.06.2025	DTPS Anpara	No	NA
			Yes	06.06.2025	Obra A & B	No	NA
			Yes	06.06.2025	Obra C	No	NA
			Yes	24.06.2025	Harduaganj 400 kV	No	NA
			Yes	06.06.2025	Ghatampur 765 kV	No	NA
			Yes	06.06.2025	Anpara-A&B	Yes	Yes
			Yes	06.06.2025	Panki TPS	No	NA
			Yes	06.06.2025	Jawaharpur	No	NA
19	UJVNL		Yes	04.06.2025	Dharasu	Yes	Yes
			Yes	04.06.2025	Tiloth	No	NA
			Yes	04.06.2025	Khodri	No	NA
			Yes	04.06.2025	Chibro	No	NA
			Yes	04.06.2025	Vyasi	No	NA
			Yes	12.06.2025	Kashang HEP	No	NA
20	HPPCL		Yes	12.06.2025	Sawara Kuddu	No	NA
			Yes	12.06.2025	Sainj	No	NA
			Yes	01.06.2025	RSD	No	NA
21	PSPCL	State Generating Company & State owned Distribution Company	Yes	06.06.2025	GGSTPS, Rupnagar	No	NA
			Yes	02.06.2025	GVK Power Goindwal Shahib Ltd.	No	NA
			Yes	06.06.2025	GHSTPS, Lehra Mohabbat	No	NA
			Yes	05.06.2025	Hamirpur Circle	No	NA
22	HPSEBL	Distribution company having Transmission connectivity ownership	Yes	06.06.2025	Shimla Circle	No	NA
23	Prayagraj Power Generation Co. Ltd.		Yes	01.06.2025		Yes	Yes
24	Aravali Power Company Pvt. Ltd.	IPP having more than 1000 MW installed capacity	Yes	09.06.2025			
25	Apraava Energy Private Limited		Yes	04.06.2025		No	NA
26	Talwandi Sabo Power Ltd.		Yes	03.06.2025		No	NA
27	Nabha Power Limited		Yes	02.06.2025		No	NA
28	MEIL Anpara Energy Ltd (Anpara-C)		Yes	14.06.2025		No	NA
29	Rosa Power Supply Company Ltd		Yes	03.06.2025		No	NA
30	Lalitpur Power Generation Company Ltd		Yes	04.06.2025		No	NA
31	MEJA Urja Nigam Ltd.						
32	Adani Power Rajasthan Limited		Yes	04.06.2025		No	NA
33	JSW Energy Ltd. (KWHEP)						
34	UT of J&K	UT of Northern Region	Yes	05.08.2025		No	NA
35	UT of Ladakh						
36	UT of Chandigarh						

	ISTS Transmission Utilities						
37	INDIGRID						
38	ADHPL		Yes	05.06.2025		No	NA
39	Adani Transmission Limited	AESL	Yes	12.06.2025		No	NA
40	Bikaner Khetri Transmission Limited		Yes	12.06.2025		No	NA
41	Fatehgarh Bhadla Transmission Limited		Yes	12.06.2025		No	NA
42	Powergrid Sikar Transmission Limited	POWERGRID, NR-1	Yes	05.06.2025		No	NA
43	Powergrid Aligarh Sikar Transmission Limited		Yes	05.06.2025		No	NA
44	Powergrid Ajmer Phagi Transmission Limited		Yes	05.06.2025		No	NA
45	Powergrid Bikaner Transmission System Limited		Yes	05.06.2025		No	NA
46	Powergrid Khetri Transmission System Limited		Yes	05.06.2025		No	NA
47	Powergrid Ramgarh Transmission Limited		Yes	05.06.2025		No	NA
48	Powergrid Fatehgarh Transmission Limited		Yes	05.06.2025		No	NA
49	Powergrid Bhadla Transmission Limited		Yes	05.06.2025		No	NA
50	Powergrid Meerut Simbhavli Transmission Limited		Yes	05.06.2025		No	NA
51	Powergrid Kala Amb Transmission Limited	POWERGRID, NR-2	Yes	20.06.2025		No	NA
	State Utilities						
	Uttar Pradesh						
52	Vishnuprayag Hydro Electric Plant (J.P.)		Yes	03.06.2025		No	NA
53	Alaknanda Hydro Electric Plant (GVK)		Yes	05.06.2025		No	NA
54	Khara Power House (Khara)		Yes	03.06.2025		Yes	Yes
55	WUPPTCL		Yes	03.06.2025		No	NA
56	SEUPPTCL		Yes	24.06.2025			
57	ATSCL	AESL	Yes	12.06.2025		No	NA
58	GTL	AESL	Yes	12.06.2025		No	NA
59	HPTSL	AESL	Yes	12.06.2025		No	NA
60	MTSCL	AESL	Yes	12.06.2025		No	NA
61	OCBTL	AESL	Yes	12.06.2025		No	NA
69	STSL	AESL	Yes	12.06.2025		No	NA
	Rajasthan						
70	Barsingsar Plant	NLC	Yes	11.06.2025		No	NA
71	Rajwest Plant	JSW	Yes	11.06.2025		No	NA

	RE Utilities						
72	ABC Renewable Pvt. Ltd		YES	07.07.2025		NO	NA
73	ACME Heeragarh powertech Pvt. Ltd						
74	ACME Chittorgarh Solar Energy Pvt Ltd						
75	Adani Hybrid Energy Jaisalmer One Ltd.		Yes	24.06.2025			
76	Adani Hybrid Energy Jaisalmer Two Ltd.		Yes	24.06.2025			

77	Adani Hybrid Energy Jaisalmer Three Ltd.		Yes	24.06.2025			
78	Adani Hybrid Energy Jaisalmer Four Ltd.		Yes	24.06.2025			
79	Adani Renewable Energy (RJ) limited Rawara		Yes	24.06.2025			
80	Adani Solar Energy Jaisalmer One Pvt. Ltd., 450MW (Solar)		Yes	24.06.2025			
81	Adani Solar Energy Four Private Limited		Yes	24.06.2025			
82	Adani Hybrid Energy Jaisalmer Four Ltd. (AEML 2-350)		Yes	24.06.2025			
83	Adani Solar Energy Jaisalmer Two Private Limited Project Two		Yes	24.06.2025			
84	Adani Solar Energy Jodhpur Two Limited, Rawara		Yes	24.06.2025			
85	Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)		Yes	24.06.2025			
86	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)		Yes	24.06.2025			
87	Adani Green Energy 24 Limited (Bhimsar)		Yes	24.06.2025			
88	Adani Green Twenty-Five Limited (Badisid)		Yes	24.06.2025			
89	Altra Xergi Pvt. Ltd.		Yes	07.06.2025		No	NA
90	AMP Energy Green Five Pvt. Ltd.						
91	AMP Energy Green Six Pvt. Ltd.						
92	Amplus Ages Private Limited	AmPlus Solar	Yes	06.06.2025		No	NA
93	Avaada RJHN_240MW	Avaada	Yes	07.06.2025		No	NA
94	Avaada sunce energy Pvt limited		Yes	07.06.2025		No	NA
95	Avaada Sunrays Pvt. Ltd.		Yes	07.06.2025		No	NA
96	Avaada Sustainable RJ Pvt. Ltd.		Yes	07.06.2025		No	NA
97	Ayana Renewable Power Three Private Limited						
98	Ayaana Renewable Power One Pvt. Ltd.						
99	Azure Power Forty One Pvt limited						
100	Azure Power Forty Three Pvt. Ltd., RSS						
101	Azure Maple Pvt. Ltd.						
102	AZURE POWER INDIA Pvt. Ltd., Bhadla						
103	Azure Power Thirty Four Pvt. Ltd.						
104	SB Energy Six Private Limited, Bhadla						
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		Yes	06.06.2025		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-1	NGEL	Yes	16.06.2025		No	NA
117	NTPC Devikot Solar plant-2		Yes	16.06.2025		No	NA
118	NTPC Kolayat 400kV						
119	Nedan Solar NTPC						
120	SKB NTPC -1 (250MW)	NGEL	Yes	16.06.2025		No	NA
121	SKB NTPC-2 (300MW)		Yes	16.06.2025		No	NA
122	NTPC Nokhra 300MW		Yes	16.06.2025		Yes	No
123	NTPC Fatehgarh 296MW		Yes	16.06.2025		No	NA
124	One Volt energy Pvt. Ltd.		Yes	06.06.2025		No	NA
125	ReNew Solar Urja Private Limited	IndiGrid	Yes	04.06.2025		No	NA
126	ReNew Solar Energy (Jharkhand Three) Private Limited		Yes	25.06.2025			
127	RENEW SOLAR POWER Pvt. Ltd. Bhadla		Yes	25.06.2025			
128	Renew Sun Bright Pvt. Ltd. (RSBPL)		Yes	25.06.2025			
129	Renew Surya Partap Pvt. Ltd.		Yes	25.06.2025			
130	Renew Surya Ravi Pvt. Ltd.		Yes	25.06.2025			
131	Renew Surya Roshni Pvt. Ltd.		Yes	25.06.2025			
132	Renew Surya Vihan Pvt. Ltd.		Yes	25.06.2025			
133	Renew Surya Ayaan Pvt. Ltd.		Yes	25.06.2025			
134	Renew Solar Photovoltaic Pvt Ltd		Yes	25.06.2025			
135	RENEW SOLAR POWER Pvt. Ltd. Bikaner	ReNew	Yes	25.06.2025			
136	Rising Sun Energy-K Pvt. Ltd.						
137	Serentica Renewables India 4 Private Limited						
138	Solzen Urja Private Limited		Yes	24.06.2025		No	NA
139	Tata Power Green Energy Ltd. (TPGEL)	TATA POWER	Yes	08.06.2025		No	NA
140	Tata Power Renewable Energy Ltd. (TPREL)		Yes	08.06.2025		No	NA
141	Banderwala Solar Plant TP Surya Ltd.		Yes	08.06.2025		No	NA
142	Thar Surya Pvt. Ltd.						
143	TP Surya Pvt. Ltd.						
144	TRANSITION ENERGY SERVICES PRIVATE LIMITED						
145	Transition Green Energy Private Limited						
146	Transition Sustainable Energy Services Private Limited						

PERFORMANCE INDICES

Annexure-A.III

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

Month:MAY-2025

S.N	Sub-station	Unit/equipment	Nc	Nf	Nu	Ni	Dependability index(D)	Security index(S)	Reliability index (R)	Remarks
1	765kV S/S Fatehabad Agra	765kV Lalitpur-1	2	0	0	0	1	1	1	
2		765KV LR-1	2	0	0	0	1	1	1	
3		765kV Lalitpur-2	2	0	0	0	1	1	1	
4		765KV LR-2	2	0	0	0	1	1	1	
5		400kV Agra-PG	1	0	0	0	1	1	1	
6		400kV Agra-2	1	0	0	0	1	1	1	
7		400kV Mathura-1	1	0	0	0	1	1	1	
8		400kV Agra South	2	0	0	0	1	1	1	
9	400 KV S/S AGRA	400 KV UNNAO	4	0	0	0	1	1	1	
10		400 KV PG II	1	0	0	0	1	1	1	
11		400/220/33KV 315 MVA ICT III	0	0	1	1	0	0	0	Due to DC terminal contact shorting of OSR contact in Marshalling box Tripping time 09:59Hrs Dt. 6.5.2025 & Closing time 13:44Hrs Dt 6.5.2025.
12		220 KV IOCL I	1	0	0	0	1	1	1	
13		220 KV Shamshabad	1	0	0	0	1	1	1	
14		220/132/11KV 160 MVA ICT I	1	0	0	0	1	1	1	
15		220/132/11KV 160 MVA ICT II	1	0	0	0	1	1	1	
16		220/132/11KV 160 MVA ICT III	1	0	0	0	1	1	1	
17	220 KV S/S Shamshabad	220 KV Agra4	1	0	0	0	1	1	1	
18	220 KV S/S TUNDLA	220KV AGRA PGCIL LINE	1	0	0	0	1	1	1	
19	220 KV S/S BAH	220 KV Bah -Mainpuri	2	0	0	0	1	1	1	
20	220 KV S/S SIKANDRA	220 KV Saifai Line	2	0	0	0	1	1	1	
21		220 KV Kirawali	2	0	0	0	1	1	1	
22	400 KV S/S	400 KV Panki - Rewa Road Line	5	0	1	0	1	2	1	For unwanted tripping - 400 KV Panki - Rewa Road line trip from Panki end in zone-2 and Same time at Rewa Road S/S 400 KV Rewa- Banda Line-1st tripped on Y Ph, zone-1, F/C=19000A, F/L=2 Km, (Relay sense fault in Zone-4, but not tripped at Rewa end. Line tripped at panki end only.) Tripping time 17:54Hrs Dt. 11.05.2025 & Closing time 19:05Hrs Dt 11.05.2025.
23		400 KV Panki - Unnao Line	1	0	0	0	1	1	1	
24	220 KV Phoolbagh S/S	220 KV Phoolbag - Unnao-Ist	1	0	0	0	1	1	1	
25	220 KV Panki S/S	60 MVA T/F-I	1	0	0	0	1	1	1	
26		220 KV Panki- Bithoor	1	0	0	0	1	1	1	
27		220 KV Chibramau	1	0	0	0	1	1	1	
28	220 KV Sikandara S/S	220 KV Sikandra - Orai line	1	0	0	0	1	1	1	
29	220 KV Rania	220 KV Rania - PGCIL line	1	0	0	0	1	1	1	
30	132 KV Pukharayan	132 kv Pukhrayan-lalpur TSS ckt 1	1	0	0	0	1	1	1	

31	220 KV Chhibramau	220 KV Mainpuri	1	0	0	0	1	1	1	
32		220kv Panki	1	0	0	0	1	1	1	
33	220 KV Sarh	220 KV Fatehpur PG CKT-II	1	0	0	0	1	1	1	
34	220 KV Saifai	220 KV Sikandra, Agra	2	0	0	0	1	1	1	
35		220 KV Bharthna	1	0	0	0	1	1	1	
36	220 KV Bharthana	220 KV Saifai	1	0	0	0	1	1	1	
37		220 KV Parichha	1	0	0	0	1	1	1	
38	400kV S/S Aligarh	220kV Boner line 1	1	0	0	0	1	1	1	
39		220kV Sikandrarao line 1	1	0	0	0	1	1	1	
40		220kV Sikandrarao line 2	1	0	0	0	1	1	1	
41		400kV Sikandrabad line	1	0	0	0	1	1	1	
42		400kV Shamli line	1	0	0	0	1	1	1	
43		400kV Harduaganj line	1	0	0	0	1	1	1	
44	220kV S/S Sikandrarao	220kV Aligarh line 1	1	0	0	0	1	1	1	
45		220kV Aligarh line 2	1	0	0	0	1	1	1	
46	220kV S/S Boner	220kV Akrabad line 1	1	0	0	0	1	1	1	
47		220kV Harduaganj line	1	0	0	0	1	1	1	
48		160 MVA T/F-II	1	0	0	0	1	1	1	
49	220kV S/S Mainpuri	220kV Bah line	2	0	0	0	1	1	1	
50		220kV PGCIL Kanpur line	2	0	0	0	1	1	1	
51		220kV Chhibramau line	1	0	0	0	1	1	1	
52		220kV PGCIL Mainpuri line	1	0	0	0	1	1	1	
53		220kV JTPS line	2	0	0	0	1	1	1	
54	220kV S/S Kasganj	220kV JTPS line	1	0	0	0	1	1	1	
55	220 KV S/S Gokul	220 KV Gokul Agra Line	1	0	0	0	1	1	1	
56		220 KV Gokul Mant Line(400KV Mant)	1	0	0	0	1	1	1	
57	400 KV S/ Mant Mathura	400 KV MURADNAGAR LINE	1	0	0	0	1	1	1	
58		400 KV FATEHABAD-II LINE	1	0	0	0	1	1	1	
59		500 MVA ICT-III	1	0	0	0	1	1	1	
60	400 KV GIS Agra South	400 KV Firozabad Line	1	0	0	0	1	1	1	
61	Agra	400 KV Fatehabad Line	1	0	0	0	1	1	1	
62	220 KV Kirawali	220 KV Sikandra	1	0	0	0	1	1	1	
63		220 KV PGCIL Line	1	0	0	0	1	1	1	
64		100 MVA TF-I	1	0	0	0	1	1	1	
		TOTAL	82	0	2	1				
Dependability index (D) $D=(Nc/(Nc+Nf))$			1							
Security Index (S) $S=(Nc/(Nc+Nu))$			0.98							
Relibality Index (R) $R=(Nc/(Nc+Ni))$			0.99							

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
Superintending Engineer

S.No.	Substation	Element name	Date & Time of the tripping	Categorization (F/U) F = Failures to operate at internal power system faults U = Unwanted operations	Reason for failures/Unwanted operation	Corrective action taken/ to be taken
1	Anpara BTPS	Anpara-Sarnath ckt-2	01.05.2025 04:40 HR	U	Line tripped on Zone -1 fault, B phase earth fault,Auto reclose not operated due to carrier fail.	PLCC is working healthy now. Auto reclose logic modified for carrier fail condition as discussed with UPSLDC,UPPTCL.Checking of PLCC panel is planned this month by OEM for counter reading.

Format No. -PI-01
Reporting of performance indices for protection system
(for elements connected at 220KV and above)
Name of utility: DHARASU POWER HOUSE MB-II
Month: May-2025

S.No.	Sub Station	unit (SPS/Line/ICT/GT/etc)	FROM	TO	Total Outage	Outage Reason	Nc	Nf	Nu	Ni	Dependability Index (D=Nc/Nc+Nf)	Security Index (S=Nc/Nc+Nu)	Reliability Index (R=Nc/Nc+Ni)	Reason of Failure to operate or unwanted/incorrect operation	Corrective Action Taken
1	MB-II 220KV S/Y	UK-1 Feeder (86)	15.05.2025, 15:23 Hr	20:08 Hrs	04:45 Hrs	Distance pickup on L3E at 23.3Km.	1	Nil	Nil	Nil	1	1	1	NA	NA
2	MB-II 220KV S/Y	UK-2 Feeder (82)	15.05.2025, 16:32 Hr	17:01 Hrs	00:31 Hrs	Distance pickup on L3E at 26.3Km.	1	Nil	Nil	Nil	1	1	1	NA	NA
3	MB-II 220KV S/Y	RK-1 Feeder (88)	04.05.2025, 16:34 Hr	17:01 Hrs	00:27 Hrs	Busbar protection optd.	1	Nil	1	1	1	0.5	0.5	LBB contact stick which results the operation of Busbar protection during the closing of feeder# 81 after resetting the L2E fault. Due to this Fdr # 88, 84, 81, 5MVA, B/C, Gen. Unit # 3 & 4 tripped. Also due to the unavailability of power evacuation path the running units of upstream Plant (Tiloth Power House) also tripped.	Checked the functionality of relays installed in Feeder # 81 & found ok. Also OEM/Authorized service provider is being called to analyse the root cause of tripping & further testing of relays. Dex files of Dis. Protection, BU & MCU is already forwarded to OEM for analysis.
4	MB-II 220KV S/Y	RK-2 Feeder (81)	04.05.2025, 16:10 Hrs 16:34 Hr	16:34 Hrs 10:36 Hrs	00:24 Hrs 18:02 Hrs	Distance pickup on L2E at 62.3Km. Busbar protection optd.	2	Nil	1	1	1	0.66	0.66		
5	MB-II 220KV S/Y	Chamba Feeder (84)	04.05.2025, 16:34 Hrs 06.05.2025 19:29 Hr	17:02 Hrs 20:03 Hrs	00:28 Hrs 00:34 Hrs	Busbar protection optd. Distance pickup on L1E at 9.3Km.	2	Nil	1	1	1	0.66	0.66		
6	MB-II 220KV S/Y	Stn. T/F	04.05.2025, 16:34 Hr	17:09 Hrs	00:35 Hrs	Busbar protection optd.	1	Nil	1	1	1	0.5	0.5		

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

JE(Test)

AE(Test)

Executive Engineer (Test)
UJVNL Ltd.
Dharasu Power House
Chinyalisaut (Uttarakhand)

Month: May 2025

[illegible]

S. No.	Substation	Unit (SPS/Line/ICT/GT etc)	Nc	Nf	Nu	Ni	Dependability Index (D=Nc/(Nc+Nf))	Security Index (S=Nc/(Nc+Nu))	Reliability Index (R=Nc/(Nc+Ni))	Remedial Action Taken (if applicable)
7	220kV Narela	220kV Mandola Ckt-2	1	0	0	0	1	1	1	
		220kV Rohtak Road Ckt-1	1	0	0	0	1	1	1	
		220kV Panipat Ckt-3	2	0	0	0	1	1	1	
8	220kV BTPS	220kV Alwar Ckt-1	4	0	0	0	1	1	1	
		220kV Ballabgarh Ckt-1	2	0	0	0	1	1	1	
		220kV Ballabgarh Ckt-2	3	0	0	0	1	1	1	
		220kV Noida Sector-38A Ckt-1	1	0	0	0	1	1	1	
		220kV Okhla Ckt-1	1	0	0	0	1	1	1	
9	220kV DIAL	220kV Bamnauli Ckt-2	3	0	0	0	1	1	1	
10	220kV IP	220kV Patparganj Ckt-1	2	0	0	0	1	1	1	
		220kV Patparganj Ckt-2	2	0	0	0	1	1	1	
11	220kV Kanjhawala	220kV Najafgarh Ckt	1	0	0	0	1	1	1	
12	220kV Maharani Bagh	220kV Gazipur Ckt-1	1	0	0	0	1	1	1	
		220kV Gazipur Ckt-2	1	0	0	0	1	1	1	
13	220kV Mehrauli	220kV DIAL Ckt-2	1	0	0	0	1	1	1	
		220kV Tuglakabad Ckt-1	1	0	0	0	1	1	1	
		220kV Tuglakabad Ckt-2	2	0	0	0	1	1	1	
14	220kV Najafgarh	220kV Bamnauli Ckt-1	1	0	0	0	1	1	1	
		220kV Bamnauli Ckt-2	1	0	0	0	1	1	1	
15	220kV Okhla	100MVA Transformer-III (220/33kV)	1	0	0	0	1	1	1	
		100MVA Transformer-IV (220/33kV)	1	0	0	0	1	1	1	
		100MVA Transformer-V (220/33kV)	1	0	0	0	1	1	1	
		100MVA Transformer-II (220/66kV)	1	0	0	0	1	1	1	
16	220kV Pappankalan-I	220kV Bamnauli Ckt-2	1	0	0	0	1	1	1	
17	220kV Ridge Valley	160MVA Transformer-I (220/66kV)	1	0	0	0	1	1	1	
18	220kV Rohini	220kV Shalimar Bagh Ckt-1	1	0	0	0	1	1	1	
19	220kV Sarita Vihar	220kV Pragati Ckt-1	2	0	0	0	1	1	1	
		220kV Maharani Bagh	1	0	0	0	1	1	1	
20	220kV SGTN	220kV Shalimar Bagh Ckt-1	1	0	0	0	1	1	1	
		220kV Shalimar Bagh Ckt-2	1	0	0	0	1	1	1	

S. No.	Substation	Unit (SPS/Line/ICT/GT etc)	Nc	Nf	Nu	Ni	Dependability Index (D=Nc/(Nc+Nf))	Security Index (S=Nc/(Nc+Nu))	Reliability Index (R=Nc/(Nc+Ni))	Remedial Action Taken (if applicable)
21	220kV Shalimar Bagh	220kV SGTN Ckt-1	1	0	0	0	1	1	1	
		220kV SGTN Ckt-2	1	0	0	0	1	1	1	
22	220kV Geeta Colony	100MVA Transformer-1 (220/33kV)	1	0	0	0	1	1	1	
		220kV South of Wazirabad Ckt-1	1	0	0	0	1	1	1	
23	220kV Subzi Mandi	220kV Timarpur Ckt-2	1	0	0	0	1	1	1	
		100MVA Transformer-2 (220/33kV)	2	0	0	0	1	1	1	
24	220kV Timarpur	220kV Subzi Mandi Ckt-2	1	0	0	0	1	1	1	
25	220kV Tuglakabad	220kV BTPS Ckt-1	1	0	0	0	1	1	1	
		220kV BTPS Ckt-2	1	0	0	0	1	1	1	
		220kV Mehrauli Ckt-2	2	0	0	0	1	1	1	
26	220kV Wazirpur	220kV Peeragarhi Ckt-2	1	0	0	0	1	1	1	
27	220kV Rajghat	100MVA Transformer-1 (220/33kV)	1	0	0	0	1	1	1	
		100MVA Transformer-2 (220/33kV)	1	0	0	0	1	1	1	
28	220kV Vasant Kunj	100MVA Transformer-1 (220/66kV)	1	0	1	1	1	0.5	0.5	Transformer tripped on HV REF. After DR analysis and SLG testing, HV NCT ratio revised as per actual.
29	220kV Masjid Moth	100MVA Transformer-1 (220/33kV)	1	0	0	0	1	1	1	
		100MVA Transformer-2 (220/33kV)	1	0	0	0	1	1	1	

Justification for less than one index may be attached separately.

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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

Format No.-PI-01

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

Name of Utility: HVPNL

Month: May 2025

S.N.	Substation	Unit (SPS/Line/ICT/GT/ etc)	Nc	Nf	Nu	Ni	Dependability Index (D=Nc/Nc+Nf)	Security Index (S=Nc/Nc+Nu)	Reliability Index (R=Nc/Nc+Ni)
M&P Division Gurugram									
1	400kV Daultabad	400kV Jhajjar-Daultabad Ckt -2	1	0	0	0	1	1	1
2	400kV Daultabad	400kV Jhajjar-Daultabad Ckt-1	1	0	0	0	1	1	1
3	400kV Daultabad	400kV Daultabad - Sector-72_PG Gurugram Ckt- 1	1	0	0	0	1	1	1
4	400kV Daultabad	400kV Daultabad - Sector-72_PG Gurugram Ckt- 2	1	0	0	0	1	1	1
5	400KV Dhanonda	400kV Dhanonda-Daultabad Ckt-1	1	0	0	0	1	1	1
6	400KV Dhanonda	220kV Dhanonda- Lula Ahir Ckt-1	1	0	0	0	1	1	1
7	220KV Mau	220KV Mau-Manesar_PG Ckt-1	1	0	0	0	1	1	1
8	220KV Rewari	220KV Rewari-Bhiwadi Ckt-1	1	0	0	0	1	1	1
9	220KV Mau	220KV Mau-MSIL line	1	0	0	0	1	1	1
10	220KV Badshapur	220KV Badshapur-BBMB Samaypur Ckt-1	1	0	0	0	1	1	1
11	220KV Badshapur	220KV Badshapur-BBMB Samaypur Ckt-2	1	0	0	0	1	1	1
12	220KV Sector-65 Gurugram	220KV Sector-65 Gurugram-Kadarpur Ckt-2	1	0	0	0	1	1	1
13	400KV Daultabad	400KV Daultabad-Dhanonda Ckt-2	1	0	0	0	1	1	1
14	400KV Daultabad	400KV Sector-72 Gurugram_PG-Daultabad Ckt-1	1	0	0	0	1	1	1
15	220KV Sector-95 Gurugram	220KV Sector-95 (Gurugram)-MSIL line	1	0	0	0	1	1	1
16	220KV Rewari	220KV Rewari-Bhiwadi Ckt-1	1	0	0	0	1	1	1
17	220KV Rewari	220KV Rewari-Bhiwadi Ckt-2	1	0	0	0	1	1	1
18	400KV Daultabad	400KV Daultabad to Sec-72_PG Ckt-1	1	0	0	0	1	1	1

19	400KV Daultabad	400KV Daultabad to Sec-72_PG Ckt-2	1	0	0	0	1	1	1
20	220KV Panchgaon	220/33KV 100MVA T-1	1	0	0	0	1	1	1
21	220kv Daultabad	220kv Bus Coupler	1	0	0	0	1	1	1
22	400kv Daultabad	400/220KV 315MVA ICT-2	1	0	0	0	1	1	1
23	400kv Daultabad	400/220KV 315MVA ICT-3	1	0	0	0	1	1	1
24	400kv Daultabad	400/220KV 315MVA ICT-4	1	0	0	0	1	1	1
25	220KV Lula Ahir	220KV Dadri(BBMB)-Lula Ahir line	1	0	0	0	1	1	1
26	220KV Mau	220KV Mau-IMT Bawal line	1	0	0	0	1	1	1

M&P Division Hisar

1	220 KV S/Stn. Sangwan	220 KV Hisar PG – Sangwan Ckt. I	1	0	0	0	1	1	1
2	220 KV S/Stn. Sangwan	220 KV Hisar PG – Sangwan Ckt. II	1	0	0	0	1	1	1
3	220 KV S/Stn. Sirsa	220 KV Fatehabad PG – Sirsa Line	1	0	0	0	1	1	1
4	220 KV S/Stn. Hukmawali	220 KV Fatehabad PG – Hukmawali Ckt. I	1	0	0	0	1	1	1
5	220 KV S/Stn. Bhiwani	220 KV BBMB – Bhiwani Ckt. 01	3	0	0	0	1	1	1
6	220 KV S/Stn. Bhiwani	220 KV BBMB – Bhiwani Ckt. 02	3	0	0	0	1	1	1
7	220 KV S/Stn. Bhiwani	220 KV Bhiwani PG – Bhiwani Ckt. 02	1	0	0	0	1	1	1
8	400 KV S/Stn. Kirori	400 KV Kirori – Jind PG Ckt. 01	2	0	0	0	1	1	1
9	220 KV S/Stn. Jind	220 KV Jind – PTPS Ckt. 02	1	0	0	0	1	1	1
10	220 KV S/Stn. Fatehabad	220 KV Hisar PG – Fatehabad Ckt. 02	1	0	0	0	1	1	1
11	220 KV S/Stn. Narwana	220 KV Jind PG – Narwana Ckt. 02	1	0	0	0	1	1	1

M&P Division Faridabad

1	400KV Nawada	400LV Nawada-Greater Noida line. (03.05.2025)	1	0	0	0	1	1	1
2	220KV Palli	220KV BBMB S/Pur-Palli Ckt-2. (05.05.2025)	1	0	0	0	1	1	1
3	220KV FGPP	220KV FGPP-Sector-58 Faridabad Ckt-1	1	0	0	0	1	1	1
4	220KV Palli	220KV Palli-BBMB Samaypur Ckt-2. (15.05.2025)	1	0	0	0	1	1	1
5	220KV Harfali	220KV Harfali-BBMB Samaypur Line (15.05.2025)	1	0	0	0	1	1	1

6	220KV Palwal	220KV Palwal-BBMB Samaypur Ckt-1. (15.05.2025)	1	0	0	0	1	1	1
7	220KV Sector-58 Faridabad	220KV FGPP- Sector-58 Faridabad Ckt-1. (16.05.2025)	1	0	0	0	1	1	1
8	220KV Sector-58 Faridabad	220KV FGPP- Sector-58 Faridabad Ckt-2. (16.05.2025)	1	0	0	0	1	1	1
9	220KV Sector-78 Faridabad	220KV FGPP- Sector-78 Faridabad Ckt-1. (16.05.2025)	1	0	0	0	1	1	1
10	220KV Sector-78 Faridabad	220KV FGPP- Sector-78 Faridabad Ckt-2. (16.05.2025)	1	0	0	0	1	1	1
11	220KV Palla	220KV FGPP- Palla line.(16.05.2025)	1	0	0	0	1	1	1
12	220KV Palli	220KV Palli-Kadarpur Ckt-1. (16.05.2025)	0	0	1	1	0	0	0
13	220KV Palli	220KV Palli-Kadarpur Ckt-2. (16.05.2025)	1	0	0	0	1	1	1
14	220KV Palli	220KV S/Pur(BBMB)- Palli Ckt-2. (16.05.2025)	1	0	0	0	1	1	1
15	400KV Nawada	220KV Nawada- DFCCIL Ckt-2. (16.05.2025)	1	0	0	0	1	1	1
16	400KV Nawada	220KV Nawada- DFCCIL Ckt-1. (16.05.2025)	1	0	0	0	1	1	1
17	400KV G/Noida	400KV G/Noida-Nawada line. (16.05.2025)	1	0	0	0	1	1	1
18	400KV Nawada	400/220MVA 315MVA ICT-3	0	0	1	1	0	0	0
19	220KV Palli	220KV Palli-Kadarpur Ckt-1. (17.05.2025)	1	0	0	0	1	1	1
20	400KV Nawada	400KV Nawada-G/Noida Ckt-1. (17.05.2025)	1	0	0	0	1	1	1
21	220KV Palwal	220KV Palwal-Prithala Ckt-1. (17.05.2025)	1	0	0	0	1	1	1
22	220KV Palli	220KV S/pur-Palli Ckt-2. (21.05.2025)	1	0	0	0	1	1	1
23	220KV Palli	220KV Kadarpur-Palli Ckt-2. (21.05.2025)	1	0	0	0	1	1	1
24	220KV Palwal	220KV S/pur-Palwal line. (21.05.2025)	0	0	1	1	0	0	0
25	220KV Palwal	220KV Palwal-Harfali line	1	0	0	0	1	1	1
26	220KV Harfali	220KV BBMB S/pur-Harfali line. (21.05.2025)	0	0	1	1	0	0	0
27	220KV Palli	220KV Samaypur(BBMB)-Palli Ckt-1. (25.05.2025)	0	0	1	1	0	0	0
28	220KV Palli	220KV Samaypur(BBMB)-Palli Ckt-2. (25.05.2025)	0	0	1	1	0	0	0
29	220KV Palli	220KV Palli- Kadarpur Ckt-1. (25.05.2025)	1	0	0	0	1	1	1
30	220KV Palli	220KV Palli- Kadarpur Ckt-2. (25.05.2025)	1	0	0	0	1	1	1

31	220KV Rangala Rajpur	220KV Sohna Road-Rangala Rajpur Ckt-1. (25.05.2025)	1	0	0	0	1	1	1
32	220KV Rangala Rajpur	220KV Sohna Road-Rangala Rajpur Ckt-2. (25.05.2025)	1	0	0	0	1	1	1
33	220KV Palwal	220KV Prithla-Palwal Ckt-2. (25.05.2025)	1	0	0	0	1	1	1
34	220KV Palwal	220KV Samaypur(BBMB)-Palwal line. (25.05.2025)	1	0	0	0	1	1	1
35	220KV Palli	220KV Palli-Kadarpur Ckt-2. (26.05.2025)	1	0	0	0	1	1	1
36	220KV Palli	220KV Palli-Kadarpur Ckt-1. (26.05.2025)	0	0	1	1	0	0	0
37	220KV Palli	220KV Palli-Kadarpur Ckt-1. (26.05.2025)	0	0	1	1	0	0	0
38	220KV Palli	220KV Palli to Sec-46 Ckt-1. (26.05.2025)	1	0	0	0	1	1	1
39	220KV Palli	220KV Palli to Sec-46 Ckt-2. (26.05.2025)	1	0	0	0	1	1	1
40	220KV Palli	220KV Palli-Kadarpur Ckt-1. (27.05.2025)	0	0	1	1	0	0	0
41	220KV Palli	220KV Palli-Kadarpur Ckt-1. (28.05.2025)	0	0	1	1	0	0	0
42	220KV Palli	220KV BBMB S/Pur-Palli Ckt-1. (29.05.2025)	1	0	0	0	1	1	1
43	220KV Palli	220KV BBMB S/Pur-Palli Ckt-2. (29.05.2025)	1	0	0	0	1	1	1
44	220KV Rangala Rajpur	220/33KV 100MVA T-1. (30.05.25)	1	0	0	0	1	1	1

M&P Division Dhulkote

1.	220 KV Madanpur	220 KV Madanpur- Raiwali Line(02.05.2025)	1	0	0	0	1	1	1
2.	220 KV Sec.-32 Panchkula	220 kV Sec.-32Panchkula-PKL-PG ckt-2(07.05.2025)	1	0	0	0	1	1	1
3.	220 KV Pinjore	220 kV Pinjore- Naggal PG ckt-2(15.05.2025)	1	0	0	0	1	1	1
4.	220 KV Shahbad	220 KV Shahbad - Durala Ckt.-1(19.05.2025)	1	0	0	0	1	1	1
5.	220 KV Pinjore	220 kV Pinjore- Naggal PG ckt-1(21.05.2025)	1	0	0	0	1	1	1
6.	220 KV Pinjore	220 kV Pinjore- Baddi ckt-1(21.05.2025)	1	0	0	0	1	1	1
7.	220 KV Pinjore	220 kV Pinjore- Baddi ckt-2(21.05.2025)	1	0	0	0	1	1	1

M&P Division Rohtak

1	220kv Daultabad	220kv Daultabad - Nuna Majra line	1	0	0	0	1	1	1
2	400kv Kabulpur	220kv Kabulkpur - Badhana Ckt.-1	1	0	0	0	1	1	1

3		220kV Kabulkpur - Badhana Ckt.-2	1	0	0	0	1	1	1
4	220kV Chhajpur	220kV Sewah (BBMB) - Chhajpur Ckt.-2	1	0	0	0	1	1	1
5	220kV Rohtak	220kV Rohtak - PTPS Ckt.-2	1	0	0	0	1	1	1
6	220kV Chajipur	220kV Sewah (BBMB) - Chajipur Ckt.-1	1	0	0	0	1	1	1
7	220kV Nuna Majra	220kV B/Garh_PG - Nuna Majra Ckt-1	1	0	0	0	1	1	1
8		220kV B/Garh_PG - Nuna Majra Ckt-2	1	0	0	0	1	1	1
9	220kV GIS Rai	220kV Sonipat_PG - GIS Rai Ckt.-1	1	0	0	0	1	1	1

M&P Division Karnal

1	220KV Substation kaithal	220KV Kaithal-PG-kaithal ckt-I	2	0	0	0	1	1	1
2	220KV substation Bastara	220KV Bastara- Kurukshetra PG Ckt-2	1	0	0	0	1	1	1
3	220KV substation Kaul	220KV kaul- Kurukshetra PG Ckt-2	2	0	0	0	1	1	1
4	220KV Substation Neemwala	220KV PGCIL kaithal –Neemwala Ckt-1	2	0	0	0	1	1	1
5	220KV Substation Neemwala	220KV PGCIL kaithal –Neemwala Ckt-2	2	0	0	0	1	1	1

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

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

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

Nu is the number of unwanted operations

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

Sr. No.	Dated	Divn.	Name of sub/station	Tripping /Break down element	Length of line	Duration of Tripping /Break down			Relays Operated along with Relay Data		Reasons of Tripping /break-down	Area Affected if any	Analysis of Tripping/Break down by designated committee.	Remarks if any.
						From (Hrs.)	To (Hrs.)	Total (Hrs.)	This end (Reporting Substation)	Other end (in case of line)				
1	03.05.25	XEN 400 KV	400KV Nawada	400LV Nawada- Greater	29.93 Km	15:49	16:30	00:41	Not Tripped	Bus bar protection operated	Transient fault	NIL	The 400kV Nawada – Greater Noida line tripped due to operation of Bus Bar Protection at 400kV S/Stn. Noida end. No tripping	

		Nawada		Noida line									occurred at 400kV S/Stn.Nawada. The line is under the jurisdiction of UPPCL and being maintained by them.	
2	05.05.25	XEN TS Faridabad	220KV Palli	220KV BBMB S/Pur-Palli Ckt-2	9.85Km	12:23	16:20	03:57	DPR, Z-4 RYB-Ph &D=26.46Km	RYB-Ph & MR-86	Transient Fault	3No 66KV S/Stn up to 12:45hrs * 66KV NH-3, Load affected 25MW & Population affected 39300 * 66KV FCI Load affected 25MW & Population affected 68500 * 66KV Dhauj Load affected 14MW & Population affected 20000	The 220kV Pali – Samaypur Ckt-2 tripped from both ends with following relays. At 220kV Pali end: DPS Main – 1,Started Phase–A,B,C, Tripped Phase ABC. At 220kV Samaypur BBMB end : DPS Main-1,Z-4, RYB Phase Distance = 26.46 km. During patrolling of the line no fault was found. Line probably tripped due to transient fault.	
3	16.05.25	XEN TS Faridabad	220KV Sector-58 Faridabad	220KV FGPP-Sector-58 Faridabad Ckt-1	16.3Km	17:31	19:39	02:08	DPR, Z-2, R&B-ph, Master86 relay	DPR, Z-1, D=0.071 Km, R-ph, Master86 relay	Transient fault	NIL	The 220kV FGPP – Sector 58 Ckt-1 tripped with the operation of following relays. At Sector 58 end: DPS, Z-1, R-ph, Dist.: 0.071km, Fault current: 27kA. At FGPP end: DPS z-2, R-ph, Dist.: 23.95km, fault current: 1.93kA. The line tripped on transient nature of fault as there was heavy rain and thunder storm in the area.	
4	16.05.25	XEN TS Faridabad	220KV Sector-58 Faridabad	220KV FGPP-Sector-58 Faridabad Ckt-2	16.3Km	17:31	19:52	02:21	DPR, Z-1, D=23.95 Km, RYB-ph, Master86 relay	DPR, Z-1, D=0.258 Km, B-ph, Master86 relay			The 220kV FGPP – Sector 58 Ckt-2 tripped with the operation of following relays: At 220kV Sector 58 end: DPS, Z-1, Dist.: 0.258km, fault current: 26kA, R-ph. At 220kV FGPP end: Over voltage protection. The line	

													tripped on transient nature of fault as there was heavy rain and thunder storm in the area.	
5	16.05.25	XEN TS Faridabad	220KV Sector-78 Faridabad	220KV FGPP-Sector-78 Faridabad Ckt-2	8.65Km	17:28	21:30	04:02	O/V, Master8 6 relay	Not tripped	Transient fault		The supply of 220kV GIS Sec-78, HVPNL, Fbd failed from FGPP end, and no tripping was observed at 220kV GIS Sector 78.	
6	16.05.25	XEN TS Faridabad	220KV Palla	220KV FGPP-Palla line	17.6Km	17:30	21:24	03:54	Over voltage, Y&b-ph, Master8 6 relay	Not tripped	Transient fault	NIL	The 220kV Palla – FGPP line tripped from FGPP end with the operation of over/under voltage protection relay. No relay operated at 220kV Palla end. The line probably tripped on transient nature of fault due to heavy wind storm and rain in the area.	
	16.05.25	XEN TS Faridabad	220KV Palli	220KV Palli-Kadarpur Ckt-1	19Km	15:48	21:29	05:41	Not tripped	DPR, Z-3, D=36.01 Km, E/F, B-ph, Master8 6 relay	Transient fault	NIL	The 220kV Pali – Kaderpur Ckt-1 tripped from 400kV Kaderpur end and no tripping occurred at 220kV Pali end. The line probably tripped due to transient nature of fault as no fault observed during patrolling of the line.	
7	16.05.25	XEN 400 KV Nawada	400KV Nawada	220kV Nawada-DFCCIL Ckt-2	3.4Km	17:31	21:30	03:59	DPr, Z-1, D=1.806 Km, B-ph, Master8 6 relay	Not tripped	Transient fault	NIL	The 200kV Nawada – DFCCIL Ckt-2 tripped at 400kV S/Stn. Nawada end with the operation of DPS, Z-1, B-ph, Fault current = 10.73kA, dist.: 1.806km. During patrolling of the line it was gathered that the line tripped due to higher sag of line jumper on TL no. 10. Additional insulator string is to be provided by TS wing to avoid any future false tripping.	
8	16.05.25	XEN 400 KV Nawada	400KV Nawada	220kV Nawada-DFCCIL Ckt-1	3.4Km	17:41	18:55	01:14	DPr, Z-, D=3.4Km, R-ph, Master8 6 relay	Not tripped			The 200kV Nawada – DFCCIL Ckt-1 tripped at 400kV S/Stn. Nawada end with the operation of DPS, Z-1, R-ph, Fault current = 2.196kA. During patrolling of the line it was gathered that the line tripped due to higher sag of line jumper on TL no.	

													10. Additional insulator string is to be provided by TS wing to avoid any future false tripping.	
9	16.05.25	Power Grid	400KV G/Noida	400KV G/Noida-Nawada line	29.93 Km	14:30	23:10	08:40	DPR, Z-1, D=20.16 Km, B-ph, Master86 relay	DPR, Z-1, O/C B-ph, Master86 relay	Transient fault	NIL	The 400kV Nawada – Greater Noida loop in circuit tripped with the operation of following relays. At 400kV Nawada end: DPS, Z-1, B-ph, O/C with fault current = 12.08kA. At 400kV Greater Noida end: DPS, Z-1, B-ph, O/C, fault location = 20.16km. The line is being maintained by PGCIL authorities. During patrolling of the line OPGW was found snapped between tower no. 62 & 63.	
10	16.05.25	XEN 400 KV Nawada	400KV Nawada	400/220MVA 315MVA ICT-3		17:30	18:40	01:10	O/C Y-ph, Master86 relay		No fault found	NIL	The 315 MVA, 400/220/33kV ICT-3 tripped due to maloperation of Master 86 relay. The suspected master relay was replaced and the ICT was successfully charged.	
	17.05.25	XEN TS Fariadabad	220KV Palli	220KV Palli-Kadarpur Ckt-1	19Km	09:03	14:48	05:45	DPR Main-1, Z-1, AR Lockout, R-Ph & D=14.13 Km	DPR, Z-3, R-Ph, E/F & MR-86	Transient Fault	NIL	The 220kV Pali – Jaderpur Ckt-1 tripped with following relays. At 220kV S/Stn. Pali : DPS M-1, Z-1, R-ph, Dist: 14.13km, AR lockout. At 400kV S/Stn. Kaderpur end : DPS, Z-3, R-ph, E/F and master relay. The line probably tripped due to transient nature of Fault. The line is maintained by XEN/TS Gurugram.	
11	17.05.25	XEN 400 KV Nawada	400KV Nawada	400KV Nawada-Noida Ckt-1	29Km	15:30	19:35	04:05	DPR, Z-1, B-Ph, O/C & D=11.93 Km	DPR, Z-1, B-Ph & D=12.66 Km	Transient Fault	NIL	The 400kV Nawada – Greater Noida line tripped with the operation of following relays. At Nawada end: DPS M-1, B-ph, AR L/O, Fault current= 10.19kA, Distance= 11.93km. At Noida end : DPS M-2, Z-1, B-ph, Fault current = 1.33kA, Distance = 16.33km. The line pertains to PGCIL. NO fault was found during patrolling of the line. Line tripped probably due to transient nature of fault.	

12	21.05.25	XEN TS Fari daba d	220KV Palli	220KV S/pur- Palli Ckt-2	9.85K m	20:3 0	00:5 0 (22. 05.2 5)	4:20	DPR, Z- 1, D=5.4k m, B-ph, master8 6	DPR, Z- 1, R-ph, master8 6	Transie nt fault	NIL	The 220kV Pali - Samaypur Ckt-2 tripped with the operation of following relays. At 220kV Pali end: DPS Main – 1 = Blue – Phase, Zone – 1, Fault Current = IC = 14.86 KA. At 220kV Samaypur end: DPS Main-1 Zone-1, Fault location-5.420 km, Phase C – N, IC = 15.46 KA. The line tripped due to conductor being in close proximity to roof of unauthorized constructed house not maintaining proper horizontal and vertical clearance between tower no 13 and 14. There was heavy wind storm in the area.
13	21.05.25	XEN TS Palwal	220KV Palwal	220KV S/pur- Palwal line	18.09 Km	20:2 1	00:4 2 (22. 05.2 5)	4:21	DT send	DT received	Transie nt fault	NIL	The 220kV Samaypur – Palwal line tripped from 220kV Samaypur end due to receiving of DT command from 220kV S/Stn. Palwal end. Issue of false DT to be resolved, to avoid further tripping of the line.
14	21.05.25	XEN TS Palwal	220KV Harfali	220KV BBMB S/pur- Harfali line	6Km	20:3 5	23:2 5	02:50	DT received	DT send	Transie nt fault	NIL (220KV Harfali on no load)	The 220kV Samaypur - Harfali line tripped due to DT trip command operated at 220kV Samaypur end. No tripping operated at 220kV Harfali end. There was heavy windstorm in the area and line probably tripped on transient nature of fault.
15	25.05.25	XEN TS Fari daba d	220KV Palli	220KV Samay pur(BB MB)- Palli Ckt-1	9.85K m	02:0 5	06:2 8	04:23	DPR, Z- 2, D=7.7K m, R&Y- ph, Master8 6 relay	R&Y- ph, Maste r86 relay	Transie nt fault	NIL	The 220KV Samaypur(BBMB)-Palli Ckt-1 tripped with the operation of following relays. At 220kV S/Stn. Pali end : DPS Main – 1 = Phase R & Y , Tripped element – NO, Under Voltage – V < I, Started Phase = A, B. At 220kV Samaypur end: DPS Main-1

													Started Phase- A,B, Tripped Phase- A,B,C, Fault location 7.742 km, Zone-2, Ia-6.286kA, Ib-5.817kA, Ic-448.3A DPS Main-2 Started Phase- A,B,C, Tripped Phase- A,B,C, Fault location 8.594 km, Zone-2, Ia-6.211 kA, Ib-722.7 A, Ic-485.6 A. No fault was found during patrolling of the line.	
16	25.05.25	XEN TS Faridabad	220KV Palli	220KV Samaypur(BBMB)-Palli Ckt-2	9.85Km	02:05	06:28	04:23	DPR, Z-2, D=8.69Km, R&Y-ph, Master86 relay	R&Y-ph, Master86 relay			The 220kV Pali Samaypur Ckt-II tripped from 220kV Samaypur end. Relay operated are as under. DPS Main-1 Started Phase- A,B,N, Tripped Phase- A,B,C, Fault location 8.690 km, Zone-2, Ia-6.213 kA, DPS Main-2 Started Phase- A,B,N, Tripped Phase- A,B,C, Fault location 8.671 km, Zone-2, Ia-6.242 kA. No tripping occurred at 220kV S/Stn. Pali end. The line tripped simultaneously with the tripping of 220kV Pali – Kaderpur Ckt-1 & Ckt-2. Protection relays settings were checked along with relay coordination. There was no fault in the 220kV Pali – Samaypur line.	
	25.05.25	XEN TS Faridabad	220KV Palli	220KV Palli- Kaderpur Ckt-1	19Km	01:56	14:39	12:43	D=10.1Km, R-ph, Master86 relay	D=6.6Km, B-ph to E/F, Master86 relay	Transient fault	NIL	The 220kV Pali – kaderpur Ckt-1 tripped from both ends with following relays. At 220kV S/Stn. Pali end: DPS relay, Distance = 10.1km, R-ph, master relay. At 400kV S/Stn. Kaderpur end: DPS relay, Distance : 6.6km, B-phase E/F, Master relay. The line tripped on transient nature of fault.	
	25.05.25	XEN TS	220KV Palli	220KV Palli- Ka	19Km	02:05	14:39	12:34	D=11.09Km, B-ph,	R-ph to E/F,			The 220kV Pali – Kaderpur Ckt – 2 tripped from both ends with following operatio	

		Farid abad		darpur Ckt-2					Arlockout, Master86 relay	Master86 relay			of relays. At 220kV Pali end: DPS relay, Distance: 11.9km, B-ph, AR lockout and master relay. At 400kV S/Stn. Kaderpur end: DPS relay, R-ph E/F and master relay. Line probably tripped on transient nature of fault.	
17	25.05.2 5	XEN TS Palwal	220KV Palwal	220KV Prithla- Palwal Ckt-2	6.6Km	02:02	09:50	07:48	DPR, Z-1, D=3.78Km , B-ph to E/F, Master86 relay	Not tripped	Transien t fault	NIL	The 220kV Prithla – Palwal Ckt-2 tripped from prithla end with the operation of DPS M1 showing :- Z-1, distance- 3.78km, Fault current – 12kA, B-ph earth fault. No relay operated at 220kV Palwal end. The line tripped due to transient nature of fault.	
18	25.05.2 5	XEN TS Palwal	220KV Palwal	220KV Samaypur (BBMB)- Palwal line	18.09Km	01:53	09:54	08:01	DPR, Z-1, D=7.56Km , R-phase to earth fault. Master86 relay	Not tripped	Transien t fault	NIL	The 220kV BBMB Samaypur – Palwal line tripped from 220kV Samaypur end with the operation of DPS M1 Zone-1, distance-7.56km, Fault current – 16kA, R phase earth fault. NO tripping occurred at 220kV S/Stn. Palwal. Line probably tripped due to transient nature of fault.	
	26.05.2 5	XEN TS Farid abad	220KV Palli	220KV Palli- Kadarpur Ckt-1	19Km	15:07	17:15	02:08	DPR, Z-2, Y-Ph & D=26Km	DPR, Z-3, Y-Ph, E/F & D=43.57Km	Tripped while taking charging try of 220KV Palli- Kadarpur Ckt-2	NIL	The 220kV Pali – Kaderpur ckt-1 tripped from both ends while charging of 220kV Pali – Kaderpur Ckt-2. At 220kV Pali end: DPS relay, Z-2, Y- ph, Distance: 26km. At 400kV S/Stn. Kaderpur end: DPS relay, Z-3, Y-ph E/F, Distance = 43.57km. The line is maintained by XEN/TS Division, Gurugram. There was no fault in the line.	
	26.05.2 5	XEN TS Farid abad	220KV Palli	220KV Palli- Kadarpur Ckt-1	19Km	23:02	01:07 (27.0 5.25)	02:05	DPR, Z-2, Y-Ph &D=25.7Km	DPR, Z-3, Y-Ph, E/F &D=43.54 Km	Again Tripped while taking charging try of 220KV Palli- Kadarpur Ckt-2	NIL	The 220kV Pali – Kaderpur ckt-1 tripped for the second time with the operation of following relays. AT 220kV Pali end: DPS relay, Z-2, Y- ph, Distance : 25.7km. At 400kV S/Stn. Kaderpur end: DPS relay, Z-3, Y-ph E/F , distance=43.54km. There was no fault in the line.	

	27.05.25	XEN TS Faridabad	220KV Palli	220KV Palli-Kadarpur Ckt-1	19Km	20:05	22:55	02:50	DPR, D=(-26.04km), Y-Ph master86	DPR, B-Ph & D=49Km, master86	This line tripped while trying to charge 220KV Palli-Kadarpur Ckt-2 due to some unidentified fault for which testing/patrolling is being carried out since 26.05.2025.	NIL	The 220kV Pali – Kaderpur ckt-1 tripped from both ends while charging of 220kV Pali – Kaderpur Ckt-2. At 220kV Pali end: DPS relay, Y-ph, Distance: -26.04km. At 400kV S/Stn. Kaderpur end: DPS, B-ph, Distance = 49 km. The line is maintained by XEN/TS Division, Gurugram. There was no fault in the line.	
	28.05.25	XEN TS Faridabad	220KV Palli	220KV Palli-Kadarpur Ckt-1	19Km	20:31	19:52 (30.05.25)		DPR, D=-27.9Km, Y-ph, Master86 relay	DPR, Z-3, D=45.22Km, Y-ph to E/F, Master86 relay	This line tripped while trying to charge 220KV Palli-Kadarpur Ckt-2 & now charged after the replacement work of polymer disc insulator at T.no.35.	220KV Sector-46(Faridabad) up to 20:40hrs, load affected=55MW, population affected=48000 aprox.	The 220kV Pali – Kaderpur ckt-1 tripped from both ends while charging of 220kV Pali – Kaderpur Ckt-2. At 220kV Pali end: DPS relay, Y-ph, Distance: -27.9km. At 400kV S/Stn. Kaderpur end: DPS, Z-3, Y-ph, Distance = 45.22 km. The line is maintained by XEN/TS Division, Gurugram. There was no fault in the line.	
	29.05.25	XEN TS Faridabad	220KV Palli	220KV BBMB S/Pur-Palli Ckt-1	9.85Km	17:15	19:17	02:02	DPR, Z-3, R-Ph, D=18.90Km & MR-86	Not tripped	Tripped due to heavy windstorm	220KV Palli & 220KV Sec-46 up to 17:35hrs * 220KV Palli, total Load affected: 100MVA & Population affected 10000 * 220KV Sec-	The 220kV Pali – Samaypur Ckt-1 tripped from 220kV BBMB Samaypur end during heavy wind storm in the area. Relays operated are as under: DPS Main-1 Started Phase- A,B, Tripped Phase- A, Fault location 18.9 km, Zone-3, Ia-8.987kA, Ib-8.028kA.	

											46, total load affected: 45MW & Population affected 45000	DPS Main-2 Started Phase- A,N, Tripped Phase- A, Fault location 10.60 km, Zone-2, Ia-8.922 kA.No fault was found during patrolling of the line.	
19	29.05.25	XEN TS Farid abad	220KV Palli	220KV BBMB S/Pur- Palli Ckt- 2	9.85K m	17:15	19:17	02:02	DPR, Z-2, R-Ph, D=10.62K m & MR- 86	Not tripped		The 220kV Pali – Samaypur Ckt-2 tripped from 220kV BBMB Samaypur end during heavy wind storm in the area. Relays operated are as under: DPS Main-1 Started Phase- A,N,Tripped Phase- A, Fault location 10.62 km, Zone-2, Ia-8.963 kA,Ic-1.034 kA DPS Main-2 Started Phase- A,N, Tripped Phase- A, Fault location 10.54 km, Zone-2, Ia-8.985 kA, Ic-1.053kA. No fault was found during patrolling of the line.	

U.P. POWER TRANSMISSION CORPORATION LIMITED

उ०प्र० पावर ट्रान्समिशन कारपोरेशन लिमिटेड
(उ०प्र० सरकार का उपक्रम)

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GST No. :- 09AAACU8823E1Z9

कार्यालय
अधीक्षण अभियन्ता
विद्युत परीक्षण एवं परिचालन मण्डल
132 के०वी० सब-स्टेशन हंसारी, झाँसी
दूरभाष :- 9458096679
ई-मेल :- setncjhansi@upptcl.org
Dated:- 03/06/25

No- 153 /ET&CC(J) Protection Performance indices

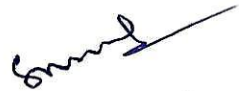
Subject:- Calculation of Protection Performance indices report for the month of May 2025.

Chief Engineer (A)
Director Operation
U.P. Power Transmission Corp. Ltd.,
Shakti Bhawan Extention,
Lucknow.

Via:- E-mail

Kindly find enclosed herewith the Calculation of Protection Performance indices report of 220KV and above Sub station for the month of May-2025, Under TSC Zone Jhansi for your kind information and necessary action.

Encls:- As above


(Sandeep Singh Kushwaha)
Superintending Engineer
ET&CC-Jhansi

No- 153 /ET&CC(J) Protection Performance indices

Dated:- 03/06/25

Copy via E-mail to :-

1. Chief Engineer, TSC Jhansi .
2. Superintending Engineer(R&A), U.P. Power Transmission Corp. Ltd., Lucknow.
3. Superintending Engineer, T&C, Meerut.


(Sandeep Singh Kushwaha)
Superintending Engineer
ET&CC-Jhansi

Format No.-PI-01
Reporting of performance indices for protection system
(for elements connected at 220 KV and above)
Name of Utility: ET&CC-JHANSI

Protection Performance Indices of Transmission Elements For The Month- MAY-2025

S.N.	Sub-Station	Unit (SPS/Line/ICT/GT/etc)	Nc	Nf	Nu	Ni	Dependability Index (D) $D=(NC/(NC+Nf))$	Security Index (S) $S=(NC/(NC+Nu))$	Reliability Index (R) $R=(NC/(NC+Ni))$	Remark
1	400KV ORAI	400KV PARICHA-I LINE	1	0	0	0	1	1	1	
2	400KV ORAI	400KV PARICHA-II LINE	2	0	0	0	1	1	1	
3	400KV BANDA	400KV REWA-I LINE	2	0	0	0	1	1	1	
4	400KV BANDA	400KV REWA-II LINE	3	0	0	0	1	1	1	
5	400KV ORAI	400KV PGCIL-I LINE	1	0	0	0	1	1	1	
6	400KV ORAI	400KV PGCIL-II LINE	1	0	0	0	1	1	1	
7	400KV ORAI	400KV BANDA-I LINE	1	0	0	0	1	1	1	
8	400KV ORAI	400KV BANDA-II LINE	2	0	0	0	1	1	1	
9	220KV DUNARA	220KV LPGCL LINE	3	0	0	0	1	1	1	
10	220KV BABINA	220KV LPGCL LINE	3	0	0	0	1	1	1	
11	220KV LALITPUR	220KV LPGCL-I LINE	2	0	0	0	1	1	1	
12	220KV LALITPUR	220KV LPGCL-II LINE	2	0	0	0	1	1	1	
13	220KV ORAI	220KVMOTH LINE	1	0	0	0	1	1	1	
14	220KV PAHADI	220KV REWA-I LINE	1	0	0	0	1	1	1	
15	220KV PAHADI	220KV REWA-II LINE	2	0	0	0	1	1	1	
16	220KV PAHADI	220KV BANDA-I LINE	1	0	0	0	1	1	1	
17	PTPS	220KV BHARTHANA LINE	1	0	0	0	1	1	1	
18	400KV ORAI	220KV SIKANDRA LINE	1	0	0	0	1	1	1	
19	220KV DUNARA	220KV PARICHA-I LINE	1	0	0	0	1	1	1	
20	220KV ORAI	220KV PARICHA-III LINE	1	0	0	0	1	1	1	
21	400KV BANDA	315 MVA ICT-I	0	0	1	1	0	0	0	220KVBUS-II TRIPPED DUE TO OPERATION OF LBB. CONSEQUENTLY, ALL LINES CONNECTED TO BUS-II WERE ALSO TRIPPED. NOTE:-A DEFECTIVE LBB CONTRACTOR OF 220KV BANDA-PAHADI-II LINE WAS CONTINUOUSLY SENDING LBB INITIATION TO THE BUSBAR RELAY PU. WHEN 220KV PAHADI-REEWA LINE TRIPPED BECAUSE OF WHICH LOAD INCREASED ON 220KV BANDA-PAHADI-II LINE. THIS LOAD INCREASED, COMBINE WITH THE FALSE LBB INITIATION, LED TO THE ACTIVATION OF THE LBB PROTECTION SYSTEM AND BUS-II GOT DEAD. ABOVE FAULTY LBB CONTRACTOR HAS BEEN CHANGED AND NOW LBB PROTECTION IS HEALTHY.
22		220KV BUS COUPLER	0	0	1	1	0	0	0	
23		220KV BANDA-II LINE	0	0	1	1	0	0	0	
24		220KV MAHOBA LINE	0	0	1	1	0	0	0	
25		220KV PAHADI-II LINE	0	0	1	1	0	0	0	

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

(Signature)
EE(A)

(Signature)
(Sandeep singh Kushwaha)
Superintending Engineer
ET&CC-Jhansi

Protection Performance Indices (PPI) for the month of May 2025 of KPH, Khara.

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	Khara Power House (Khara)	220 KV Khara - Saharanpur (PG)	05/05/2025, 00:35 Hrs	F	Distance Protection Z1, SOTF	SOTF disabled after consultation with Testing & Commissioning Engineer.
2		220 KV Khara - Behat	13/05/2025, 13:27 Hrs	F	SOTF	
3		220 KV Khara - Saharanpur (PG)	13/05/2025, 13:27 Hrs	F	SOTF	
4		220 KV Khara - Saharanpur (PG)	28/05/2025, 19:52 Hrs	F	Distance Protection Z1	

Reporting of performance indices for protection system
(For element connected at 220kV and above)
Name of Utility : ET&CC,UPPTCL,MEERUT
Month : May-2025

ET&CD, Gr. Noida		Unit (SPS/Line/ICT/GT/etc)	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index (S)	Reliability Index (R)	REMARK
1	220 kV Sikandrabad	220 K.V Sikandrabad-400K.V.Sikandrabad -I	2	0	0	0	1	1	1	
		220 K.V Sikandrabad-400K.V.Sikandrabad -I	1	0	0	0	1	1	1	
		220 K.V Sikandrabad-400K.V.Sikandrabad -I	1	0	0	0	1	1	1	
2	220 kV Simbhaoli	220 kV Matore Line	2	0	0	0	1	1	1	
		765 kV Hapur line ckt-I	1	0	0	0	1	1	1	
		765 kV Hapur line ckt-II	1	0	0	0	1	1	1	
		400 kV GIS Simbhaoli line	2	0	0	0	1	1	1	
		200 MVA T/F-I	1	0	0	0	1	1	1	
3	220 kV Hybrid Hapur	765 kV Hapur line	1	0	0	0	1	1	1	
		400kV Gr.Noida -Dadri line	3	0	0	0	1	1	1	
4	400kV Gr.Noida	400kV Gr.Noida -Nawada line	2	0	1	1	1	0.67	0.67	400kV Gr.Noida-Nawada line initiated false LBB on single phase to ground fault.Later on checking the LBB circuit and circuit breaker found in order thus line charged accordingly. Remedial measures taken:- LBB relay of this line shall be checked during next shutdown.
		400kV Gr.Noida ckt-1	2	0	0	0	1	1	1	
		400kV Gr.Noida ckt-2	3	0	0	0	1	1	1	
		315MVA 400/220kV ICT-1	1	0	0	0	1	1	1	
		315MVA 400/220kV ICT-2	1	0	0	0	1	1	1	
		500MVA 400/220kV ICT-3	2	0	0	0	1	1	1	
		500MVA 400/220kV ICT-4	2	0	0	0	1	1	1	
		220kV Gr.Noida-Noida sec-129	1	0	0	0	1	1	1	
		220kV Gr.Noida-Noida sec-20 ckt-2	1	0	0	0	1	1	1	
		220kV Gr.Noida-RC Green ckt-2	1	0	0	0	1	1	1	
		132kV Gr.Noida-Surajpur ckt-2	1	0	0	0	1	1	1	
		CB No. - 88 , 220kV Khurja- Napp Line	2	0	0	0	1	1	1	
5	220 kV KHURJA	CB No. - 86 , 220kV Khurja- Jahangirabad Line	1	0	0	0	1	1	1	
		CB No. - 83 , 220kV Khurja- Harduaganj ckt-1st Line	1	0	0	0	1	1	1	
		CB No. - 82 , 220kV Khurja- Sikandrabad Line	1	0	0	0	1	1	1	
		200 MVA T/F -1 (CB NO - 883/783)	1	0	0	0	1	1	1	
		200 MVA T/F -2 (CB NO - 884/784)	1	0	0	0	1	1	1	
		160 MVA T/F -3 (CB NO - 887 /787)	1	0	0	0	1	1	1	
6	220 kV Jahangirabad	CB No. - 88 , 220kV Jahangirabad - Khurja Line	1	0	0	0	1	1	1	
		CB No. - 87 , 220kV Debai - NAPP Line	2	0	0	0	1	1	1	

P. Rao

ET&CD, Ghaziabad										
S.N.	Sub-station	Unit (SPS/Line/ICT/GT/etc)	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index (S)	Reliability Index (R)	REMARK
1	220 kV Muradnagar	220 kV Dadri line	1	0	0	0	1	1	1	
2		220 kV Sikandra bad line	1	0	0	0	1	1	1	
3		220kV I/C- 2nd line 400kV Muradnagar-1st	1	0	0	0	1	1	1	
4	220kV Faridnagar	220kVNCRTC -1st line	1	0	0	0	1	1	1	
5		220 kV Modipuram line	1	0	0	0	1	1	1	
6		220 kV line 400kV Muradnagar-1st	1	0	0	0	1	1	1	
7	220kV Sahibabad	CB NO. 84 220kV SBB-Muradnagar Line	1	0	0	0	1	1	1	
8	220kV MORTI	220kV NRCTC II	1	0	0	0	1	1	1	
9	220kV Sahibabad	CB NO. 84 220kV SBB-Muradnagar Line	1	0	0	0	1	1	1	
10	220kV Pratap Vihar	220kV Muradnagar Line	1	0	0	0	1	1	1	
11	220kV MORTA	220kV Muradnagar Line	1	0	0	0	1	1	1	
12	220kV Pratap Vihar	60 MVA T/F I	1	0	0	0	1	1	1	
13	400 kV Muradnagar-I	400 kV Aligarh Line	3	0	0	0	1	1	1	
14		400 kV Ataur Line	1	0	0	0	1	1	1	
15		400 kV Hapur Line	1	0	0	0	1	1	1	
16		220 kV Sahibabad Line	2	0	0	0	1	1	1	
17		220 kV Pratapvihar Line	1	0	0	0	1	1	1	
18		220 kV Faridnagar Line	1	0	0	0	1	1	1	
19		220 kV Interconnector-II	1	0	0	0	1	1	1	
20	400 kV -II MURADNAGAR	400kV MATHURA LINE	7	0	0	0	1	1	1	
21		400kV DADRI LINE	1	0	0	0	1	1	1	
22		400kV SIMBHAOLI CKT-I	1	0	0	0	1	1	1	
23		400kV SIMBHAOLI CKT-II	1	0	0	0	1	1	1	
24		400kV BUSBAR-II	0	0	1	1	NA	0	0	Unwanted operation of LBB protection due to false operation of LBB in idle Bay 3 thereby resulting into Bus 2 tripping. There was no supply interruption as all element connected to bus 2 was charged through TIE CB. Substation has one and half breaker scheme busbar arrangement. Remedial measures taken:- Trip initiation of this idle bay has been removed
25	ET&CD, Moradabad-I	220kV BARAUT LINE	1	0	0	0	1	1	1	
26		220kV MORTA LINE	3	0	0	0	1	1	1	
S.N.	Sub-station	Unit (SPS/Line/ICT/GT/etc)	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index (S)	Reliability Index (R)	REMARK
1	400 kV Moradabad	400 kV Moradabad-Hapur Line	1	0	0	0	1	1	1	
2	220 kV Sambhal	220 kV Moradabad-Bareilly Line	1	0	0	0	1	1	1	
		220 kV Sambhal - Napp Line	1	0	0	0	1	1	1	

P. S. Singh

ET&CD, Moradabad-II

S.N.	Sub-station	Unit (SPS/Line/ICT/GT/etc)	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index (S)	Reliability Index (R)	REMARK
2	220 kV SS NEHTAUR	220 kV NEHTAUR- MATAUR (PG) Line	3	0	0	0	1	1	1	
4	220 kV Gajraula	220 kV Gajraula Matore line	1	0	0	0	1	1	1	

ET&CD, Muzaffarnagar

S.N.	Sub-station	Unit (SPS/Line/ICT/GT/etc)	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index (S)	Reliability Index (R)	REMARK
1	400 kV Muzaffarnagar	400 kV ALAKNANDA LINE	1	0	0	0	1	1	1	
		400 kV MATOR LINE	3	0	0	0	1	1	1	
		400 kV ATAUR LINE	3	0	0	0	1	1	1	
		220 kV CHARLA LINE	3	0	0	0	1	1	1	
2	220 kV SHAMLI	220 kV BAGHAPAT LINE	1	0	0	0	1	1	1	
		220 kV SRE PGCIL LINE	2	0	0	0	1	1	1	
		220 kV NIRPURA LINE	1	0	0	0	1	1	1	
3	400 kV GIS SHAMLI	400 kV THDC KHURJA LINE	2	0	0	0	1	1	1	
		400 kV ALIGARH LINE	1	0	0	0	1	1	1	
4	220kV Deoband	220 kV DBD-PGCIL CKT-2	1	0	0	0	1	1	1	
		220kV Nara- Motor LINE	1	0	0	0	1	1	1	
5	220kV Nara	220kV Nara- ROORKE LINE	2	0	0	0	1	1	1	
		160MVA T/F	1	0	0	0	1	1	1	
6	220kV SAHARANPUR	220kV KHODRI LINE	1	0	0	0	1	1	1	
		220kV BEHAT LINE	1	0	0	0	1	1	1	
		220kV PGCIL LINE	1	0	0	0	1	1	1	
7	220kV SARSAWA	220kV KHODRI	2	0	0	0	1	1	1	

ET&CD, NOIDA

S.N.	Sub-station	Unit (SPS/Line/ICT/GT/etc)	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index (S)	Reliability Index (R)	REMARK
1	220 kV S/S KP-5	220kV KP5- SEC148 Line	3	0	0	0	1	1	1	
2		220 kV KP5 - Metro Depot Line	3	0	0	0	1	1	1	
3		220 kV Dadri - Muradnagar Line	1	0	0	0	1	1	1	
4	220 kV S/S Dadri	160 MVA T/F	1	0	0	0	1	1	1	
5		220 kV RC Green-Gr noida Ckt 2	1	0	0	0	1	1	1	
6		220kV SEC148 -KP5Line	3	0	0	0	1	1	1	
7	400kV s/s sector 148	220kV SEC148 -sec 129Line	2	0	0	0	1	1	1	
8		100MVA T/F 1	2	0	0	0	1	1	1	
9		100MVA T/F 2	1	0	0	0	1	1	1	

10	400kV SEC 148- JAHANGIRPUR CKT 1	1	0	0	0	1	1	1	1	
11	400kV SEC 148- JAHANGIRPUR CKT 2	1	0	0	0	1	1	1	1	
12	220 kV S/S SEC 20 NOIDA	1	0	0	0	1	1	1	1	
13	220 kV SEC 20 TO GHAZIPUR LINE (CB82)	1	0	0	0	1	1	1	1	
14	220 kV SEC 20 TO PALI LINE (CB84)	1	0	0	0	1	1	1	1	
	220 kV SEC 38A TO BTPS LINE	1	0	0	0	1	1	1	1	

ET&CD, MEERUT

S.N.	Sub-station	Unit (SPS/Line/CT/GT/etc)	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index (S)	Reliability Index (R)	REMARK
1	220kV S/S Nirpura	220kV Nirpura - Shamli Line	1	0	0	0	1	1	1	
2	220kV S/S Baraut	220 kV Baraut - Nirpura	1	0	0	0	1	1	1	
3	220kV S/S Baraut	220 kV Baraut - Muradnagar	1	0	0	0	1	1	1	
4	220kV S/S Shatabdinagar	220kV Shatabdinagar-Matore Line	1	0	0	0	1	1	1	
5	220kV S/S Partapur (Jagriti Vihar)	220kV Partapur (J.V.) - Hapur-I	1	0	0	0	1	1	1	
6	220kV S/S Partapur (Jagriti Vihar)	220kV Partapur (J.V.) - Hapur-II	1	0	0	0	1	1	1	
7	220kV S/S Shatabdinagar	220kV Shatabdinagar-Matore Line	1	0	0	0	1	1	1	
8	220kV S/S Modipuram	220kV Modipuram - Matore-1 Line	1	0	0	0	1	1	1	
9	220kV S/S Modipuram-2	220kV Modipuram-2 - Shamli-1 Line	1	0	0	0	1	1	1	
10	220kV S/S Modipuram-2	220kV Modipuram-2 - Shamli-2 Line	1	0	0	0	1	1	1	
11	220kV S/S Modipuram-2	220kV Modipuram-2 - Baghpat-2 Line	1	0	0	0	1	1	1	
12	220kV S/S Charla	220kV Charla - Muzaffar Nagar	3	0	0	0	1	1	1	
		GRAND TOTAL	149	0	2	2				

PERFORMANCES INDICES FROM TW ZONE UPPTCL

Dependability index (D) $D = (Nc / (Nc + Nf))$	1
Security Index (S) $S = (Nc / (Nc + Nu))$	0.99
Reliability Index (R) $R = (Nc / (Nc + Ni))$	0.99

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

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

(Pramod Kumar Mishra)
Superintending Engineer

Reporting of Performance Indices for NHPC Power Stations In NR-Region
Month-MAY '2025

SI No	Name of Utility	Name of PS	Elements (Line/ Unit)	From		To		Total Outage	Outage Reason	Nc	Nf	Nu	Ni	Dependability Index ($D = Nc / (Nc + Nf)$)	Security Index ($S = Nc / (Nc + Nu)$)	Reliability Index ($R = Nc / (Nc + Ni)$)	Reason for wrong operation	Action Taken
1	NHPC Ltd	TANAKPUR	132 KV Tanakpur-Mahendranagar Line#3	8-May-25	15:04	8-May-25	15:46	0:42	Over Current protection Operated	1	0	0	0	1	1	1	NA	NA
2	NHPC Ltd	URI-II	400 KV Uri-II-Woogora Line#1	8-May-25	23:08	12-May-25	16:13	89:05	Distance Protection relay operated in Z1 at B-N Phase fault	1	0	0	0	1	1	1	NA	NA
3	NHPC Ltd	URI	400 KV Uri-Amargarh Line#2	13-May-25	16:15	13-May-25	18:15	2:00	Distance Protection relay operated in Z1 at B-N Phase fault	1	0	0	0	1	1	1	NA	NA
4	NHPC Ltd	DULHASTI	400 KV Dulhasti-Kishanpur L#2	15-May-25	18:30	15-May-25	19:44	1:14	Distance Protection relay operated in Z1 at Y-N Phase fault	1	0	0	0	1	1	1	NA	NA
5	NHPC Ltd	URI	400 KV Uri-Amargarh Line#2	15-May-25	17:49	15-May-25	19:11	1:22	Distance Protection relay operated in Z1 at B-N Phase fault	1	0	0	0	1	1	1	NA	NA
6	NHPC Ltd	SEWA-II	132 KV Sewa-II-Hiranagr Line#4	16-May-25	18:31	16-May-25	19:44	1:13	Distance Protection relay operated in Z1 at R-N Phase fault	1	0	0	0	1	1	1	NA	NA
7	NHPC Ltd	URI	400 KV Uri-Amargarh Line#2	16-May-25	18:42	17-May-25	08:26	13:44	Distance Protection relay operated in Z1 at B-N Phase fault	1	0	0	0	1	1	1	NA	NA
8	NHPC Ltd	URI	400 KV Uri-Amargarh Line#1	16-May-25	20:10	16-May-25	21:59	1:49	Distance Protection relay operated in Z1 at B-N Phase fault	1	0	0	0	1	1	1	NA	NA
9	NHPC Ltd	URI	400 KV Uri-Uri-II Line#3	18-May-25	22:34	18-May-25	22:59	0:25	Distance Protection relay operated in Z1 at R-N Phase fault	1	0	0	0	1	1	1	NA	NA
10	NHPC Ltd	URI-II	400 KV Uri-II-Woogora Line#1	18-May-25	21:35	Not Restored			Distance Protection relay operated in Z1 at R-N Phase fault	1	0	0	0	1	1	1	NA	NA

11	NHPC Ltd	URI-II	400 KV Uri-Uri-II Line#2	18-May-25	22:34	18-May-25	22:59	0:25	Distance Protection relay operated in Z1 at R-N Phase fault	1	0	0	0	1	1	1	NA	NA
12	NHPC Ltd	SEWA-II	132 KV Sewa-II-Hiranagr Line#4	19-May-25	07:09	19-May-25	07:54	0:45	Distance Protection relay operated in Z1 at R-N Phase fault	1	0	0	0	1	1	1	NA	NA
13	NHPC Ltd	PARBATI-II	400 KV Parbati-II_Banala Line#1	21-May-25	21:05	21-May-25	22:45	1:40	LBB protection operated (initiated from Unit#3)	1	0	1	1	1	0.5	0.5	Due to improper logic/ scheme, LBB protection was initiated from Unit#3	Proper logic/ scheme is incorporated
14	NHPC Ltd	PARBATI-II	400 KV Parbati-II_Sainj Line#2	21-May-25	21:05	21-May-25	22:41	1:36	LBB protection operated (initiated from Unit#3)	1	0	1	1	1	0.5	0.5	Due to improper logic/ scheme, LBB protection was initiated from Unit#3	Proper logic/ scheme is incorporated
15	NHPC Ltd	PARBATI-II	400 KV Parbati-II_Banala Line#1	23-May-25	10:37	23-May-25	12:04	1:27	LBB protection operated (initiated from Unit#3)	1	0	1	1	1	0.5	0.5	Due to improper logic/ scheme, LBB protection was initiated from Unit#4	Proper logic/ scheme is incorporated
16	NHPC Ltd	PARBATI-II	400 KV Parbati-II_Sainj Line#2	23-May-25	10:37	23-May-25	12:49	2:12	LBB protection operated (initiated from Unit#4)	1	0	1	1	1	0.5	0.5	Due to improper logic/ scheme, LBB protection was initiated from Unit#4	Proper logic/ scheme is incorporated
17	NHPC Ltd	DULHASTI	400 KV Dulhasti-Kishanpur L#2	27-May-25	20:49	29-May-25	17:26	44:37	Distance Protection relay operated in Z1 at R-Y Phase fault	1	0	0	0	1	1	1	NA	NA
18	NHPC Ltd	SALAL	220 KV Salal-Jammu Line#1	30-May-25	00:00:06	30-May-25	00:00:07	00:00:01	Distance Protection relay operated in Z1 at R-N Phase fault & Sucessfully auto reclosed from Salal end	1	0	0	0	1	1	1	NA	NA
19	NHPC Ltd	SALAL	220 KV Salal-Jammu Line#1	30-May-25	02:52	30-May-25	19:16	16:24	LBB protection operated (initiated from captive bay)	1	0	1	1	1	0.5	0.5	Due to improper logic/ scheme, LBB protection operated	Proper logic/ scheme is incorporated
20	NHPC Ltd	SALAL	220 KV Salal-Jammu Line#2	30-May-25	02:52	30-May-25	05:49	2:57	LBB protection operated (initiated from captive bay)	1	0	1	1	1	0.5	0.5	Due to improper logic/ scheme, LBB protection operated	Proper logic/ scheme is incorporated
21	NHPC Ltd	SALAL	220 KV Salal-Kishanpur Line#1	30-May-25	02:52	30-May-25	04:12	1:20	LBB protection operated (initiated from captive bay)	1	0	1	1	1	0.5	0.5	Due to improper logic/ scheme, LBB protection operated	Proper logic/ scheme is incorporated
22	NHPC Ltd	SALAL	220 KV Salal-Kishanpur Line#2	30-May-25	02:52	30-May-25	04:14	1:22	LBB protection operated (initiated from captive bay)	1	0	1	1	1	0.5	0.5	Due to improper logic/ scheme, LBB protection operated	Proper logic/ scheme is incorporated
23	NHPC Ltd	SALAL	220 KV Salal-Kishanpur Line#3	30-May-25	02:52	30-May-25	04:06	1:14	LBB protection operated (initiated from captive bay)	1	0	1	1	1	0.5	0.5	Due to improper logic/ scheme, LBB protection operated	Proper logic/ scheme is incorporated

[illegible]

Station	Description		April'25	May'25
300 MW NGEL Nokhra Solar Station	Number of Correct Operations at internal power system faults	(Nc)	1	1
	Number of failures Operations at internal power system faults	(Nf)	0	0
	Number of Unwanted Operations	(Nu)	0	1
	Number of Incorrect Operations	(Ni) = (Nf) + (Nu)	0	1
	Dependability Index	$D = Nc / (Nc + Nf)$	1	1
	Security Index	$S = Nc / (Nc + Nu)$	1	0.5
	Reliability Index	$R = Nc / (Nc + Ni)$	1	0.5

PPGCL

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	BARA	765 kV BARA - MAINPURI- 2	22-05-2025 01:01:36:390	U	Main 1 Distance protection relay (P444) sensed single phase to earth fault in zone 1 with fault current IB = 3.415kA. Main and Tie CB "B" Phase CB opened as per Zone 1 protection philosophy. But after 350 ms Main 2 distance protection relay (7SA522) Zone 2 operated and issued the three-phase tripping.	The matter has been discussed and relay file shared with M/s Siemens (OEM) to find the root cause. PPGCL asked to OEM to share the corrective action plan to avoid the future reoccurrence .

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

Case-1 400kV 125 MVAR Bus Reactor at 400 KV GSS HINDAUN on 06.05.2025

No. of Unwanted operation – 1

Reason of unwanted operation –

Interruption occurred due to VT selection relay problem.

Corrective Action taken – YES

VT selection relay problem rectified.

Case-2 400/220 KV, ILT-II at 400KV GSS HEERAPURA on 26.05.2025

No. of Unwanted operation – 1

Reason of unwanted operation –

Interruption occurred due to manual error during reading taken.

Corrective Action taken – YES

Technicians instructed to work carefully

Case-3 220 KV Sakatpura- KTPS ckt. No.4 at 220KV GSS SAKATPURA on 05.05.2025

No. of Unwanted operation – 1

Reason of unwanted operation –

MBCI line differential relay defective.

Corrective Action taken – Partial

Defective relay has been put out of circuit, other line differential relay of this circuit is healthy.

Case-4 220 KV Khetri-Dadri II Line at 220KV GSS KHETRI on 08.05.2025

No. of Unwanted operation – 1

Reason of unwanted operation –

Tripping occurred due to cable damage by wild rodent animal.

Corrective Action taken – YES

Damaged cable repaired.

Case-5 220 KV LALSOT-ANTA at 220 KV GSS LALSOT on 21.05.2025

No. of Unwanted operation – 1

Reason of unwanted operation –

Interruption occurred due to VT selection relay problem.

Corrective Action taken – YES

VT selection relay problem rectified.

Case-6 220 KV KOTPUTLI (RVPN) – KOTPUTLI (PG) LINE at 220 KV GSS KOTPUTALI on 25.05.2025

No. of Unwanted operation – 1

Reason of unwanted operation –

EPAC distance protection relay defective.

Corrective Action taken – Partial

Defective relay put out of circuit, Main-2 distance protection relay is healthy.

Case-7 220 KV BARAN- KAWAI Line at 220 KV GSS BARAN and 220kV D/C Beawar-Gulabpura line at 220 KV GSS BEAWAR on 31.05.2025

No. of Unwanted operation – 2

Reason of unwanted operation –

Interruption occurred due to VT selection relay problem.

Corrective Action taken – YES

VT selection relay problem rectified.

Case-8 220/132 KV 160 MVA EMCO Make TRF-I at 220KV GSS ALWAR on 15.05.2025

No. of Unwanted operation – 1

Reason of unwanted operation –

REF relay was recently commissioned and have wrong neutral CT Polarity.

Corrective Action taken – YES

CT polarity checked and corrected.

Case-9 220/132 KV 100 MVA NGEF Tr. AT 220 KV GSS JODHPUR on 30.05.2025

No. of Unwanted operation – 1

Reason of unwanted operation –

NDR relay was wired for TRIP.

Corrective Action taken –YES

NDR relay tripping removed and put on ALARM only.

Status of Internal Protection Audit for FY 2024 -25									
S. No.	NRPC Member	Category	Status	Schedule submitted as per utility	Present Status Completed (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		POWERGRID NR-3 (765kV Bareilly, Aligarh, Fatehpur, Orai, Rampur, Varanasi, 400kV Allahabad, Bareilly, Firozabad, Jauljibi, Mainpuri, Mohanlalganj, Pithoragarh, Sambhal, Sohawal	May, July, Sept, Oct, Dec- 2024, Jan-Feb-March, 2025	21.03.2025 (by mail)	60	
2	NTPC	Central Generating Company	Received						
3	BBMB		Received						
4	THDC		Received		Tehri	Feb-25	28.02.2025	58	
5	SJVN		Received		RHPS, NIHPS	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, Indrapuram, Nahtaur, ataur, hapur)		(25.03.2025)	59	
12	Uttarakhand SLDC								
13	Punjab SLDC								
14	Himachal Pradesh SLDC								
15	DTL		Received						
16	HVPNL		Received		Mohana	Jan-25	17.1.2025	58	complied
17	RRVPNL	State Transmission Utility	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, Sujargarh, Tehendesar, Akal, Chittorgarh			58 57	Pending 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				
					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)		Completed		24.05.2025	61	
19	PTCUL		Received						
20	PSTCL		Received						
21	HPPTCL		Received		Gumma, Lahal, Phozal			56	Pending
22	IPGCL		Received (PPCL-I,III)						
23	HPGCL		Received		RGTTP (Khedar)	Jan-25	07.02.2025	58	Pending
24	RRVUNL		Received		KSTPS, Kota	Jan-25	22.02.2025	60	
					CSCTPP, Chhabra	Dec-24	19.02.2025	58	

				DCCPP, Dholpur	Nov-24	19.02.2025	58	
				SSTPS, Suratgarh	Jan-25	06.02.2025	58	
		State Generating Company		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		Completed	Sainj	17.03.2025	24.05.2025	61	
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.		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	Nov' 24			
34	Nabha Power Limited	IPP having more than 1000 MW installed capacity	Received	400 kV NPL Sub-station			56	Pending
35	MEIL Anpara Energy Ltd		Received					
36	Rosa Power Supply Company Ltd		Received					
37	Lalitpur Power Generation Company Ltd		Received	Yes	Jan-25	11.02.2025	59	
38	MEJA Urja Nigam Ltd.				Oct-Nov 2024	30.11.2024	57	Pending
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, MTSSL, ATSSL, HPTSL, BKTLL, GTL)					
42	Tata Power Renewable Energy Ltd.		Received (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							
44	UT of Ladakh	UT of Northern Region						
45	UT of Chandigarh							
46	INDIGRID		Received					
47	ADHPL		Received	Completed	Mar-25	08.03.2025	58	Issue taken up with HPPTCL
48	ReNew	Renew Hans Urja Pvt Ltd ReNew Solar Energy Jharkhand Three Pvt. Ltd. Renew Solar Photovoltaic Pvt Ltd Renew Solar Power Private Limited ReNew Sun Bright Pvt. Ltd. Renew Surya Aayan Private Limited		Completed		13.06.2025	61	
49	AMP ENERGY GREEN PVT.LTD	AEGPL_BHDL2, AEGSPL_BHDL2, AEGFPL_BHDL2, and AEG4PL_BHDL2	Received	Completed	7-Jul-25			

Annexure-A.V

Status of Internal Protection Audit Plan for FY 2025 -26								
S. No.	NRPC Member	Category	Status	Schedule submitted as per utility	Present Status Completed (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		Received (RAP C)	July, 2025				
			Conducted (RAPS-1,2)	Jun-25			61	
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		Received	July-December 2025				
20	PSTCL							
21	HPPTCL							
22	IPGCL	State Generating Company	Received					
23	HPGCL		Received (PPS-III, I)	Aug'25				
24	RRVUNL		Received					
25	UPRVUNL		Received (Anpara B)	Jun-25				
			Received (Obra A & B)	Jan - March 2026				
			Received (Anpara D)	May-25				
			Received (Harduaganj)	April -May 2025				
			Received (Harduaganj D)	April -May 2025				
			Received (Harduaganj E)	April -May 2025				
			Received (Parichha)	May-25				
			Received (Parichha Ext)	Feb-26				
			Received (Obra C)	Mar-26				
			Received (Jawaharpur)	Jul-25				
26	UJVNL		Received (Chibro)	Oct-25				
			Received (Khodri)	Nov-25				
			Received (Vyasi)	Dec-25				
			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	UT of J&K	UT of Northern Region						
42	UT of Ladakh							
43	UT of Chandigarh							
	ISTS Transmission Utilities							

44	INDIGRID		Received	Aug-25 to March-26				
45	ADHPL							
46	Adani Transmission Limited		Received(400kV Mohindergarh SS)	October, 2025				
47	Bikaner Khetri Transmission Limited		Received (765 kV Bikaner and Khetri extension bays)	September, 2025				
48	Fatehgarh Bhadla Transmission Limited		Received (400 kV Fatehgarh SS)	September, 2025				
49	Powergrid Sikar Transmission Limited		Received	Sikar- August,25				
50	Powergrid Aligarh Sikar Transmission Limited		Received	Aligarh- April, 25 August,25	Sikar-			
51	Powergrid Ajmer Phagi Transmission Limited		Received	March,2025				
52	Powergrid Bikaner Transmission System Limited		Received	Bikaner-II Feb,2025				
53	Powergrid Khetri Transmission System Limited		Received	Khetri-Feb,2025				
54	Powergrid Ramgarh Transmission Limited		Received	Fatehgarh-II Dec, 2025 Fatehgarh-III May, 2025				
55	Powergrid Fatehgarh Transmission Limited		Received	Fatehgarh-II Dec, 2025 Bhadla-II Jan, 2025				
56	Powergrid Bhadla Transmission Limited		Received	Fatehgarh-II Dec, 2025 Bhadla-II Jan, 2025				
57	Powergrid Meerut Simbhavli Transmission Limited		Received	Nov, 2025				
58	Powergrid Kala Amb Transmission Limited		Received	September, 2025				
	State Utilities							
	Uttar Pradesh							
59	Vishnuprayag Hydro Electric Plant (J.P.)		Received	Jun-25				
60	Alaknanda Hydro Electric Plant (GVK)		Received	Dec'25 -Mar'26				
61	Ghatampur TPS		Received	February, 26				
62	Khara Power House (Khara)		Received	Dec'25				
63	WUPPTCL		Received	Oct-25				
64	SEUPPTCL		Received	Jan-26				
65	ATSCL	AESL	Received (400/220KV Alwar SS)	September, 2025				
66	GTL	AESL	Received (765 kV Hapur extension bays)	September, 2025				
67	GTL	AESL	Received (765 kV Agra and Gr. Noida extension bays)	September, 2025				
68	HPTSL	AESL	Received (220kV Ranpur SS)	August, 2025				
69	MTSCL	AESL	Received (400/220/132KV Deedwana SS)	August, 2025				
70	OBTL	AESL	Received (400/220/132KV Badaun SS)	Jan'2026				
71	STSL	AESL						
	Rajasthan							
72	Barsingsar Plant	NLC						
73	Rajwest Plant	JSW						

	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		Sep-25				
86	Adani Solar Energy Jaisalmer One Pvt. Ltd. 450MW (Solar)	Received		Oct-25				
87	Adani Solar Enegry Four Private Limited	Received		Sep-25				
88	Adani Hybrid Energy Jaisalmer Four Ltd. (AEML 2-350)	Received		Sep-25				
89	Adani Solar Energy Jaisalmer Two Private Limited Project Two	Received		Oct-25				
90	SB Energy Six Private Limited, Bhadla	Received		Oct-25				
91	Adani Solar Enegry Jodhpur Two Limited, Rawara	Received		Sep-25				
92	Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)	Received		Nov-25				
93	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)	Received		Nov-25				
94	Adani Green Energy 24 Limited (Bhimsar)	Received		Nov-25				
95	Adani Green Twenty-Five Limited (Badisid)	Received		Dec-25				
96	Altra Xergi Pvt. Ltd.							
97	AMP Energy Green Five Pvt. Ltd.							
98	AMP Energy Green Six Pvt. Ltd.							
99	Amplus Ages Private Limited							
100	Avaada RJHN 240MW	Received		Oct-25				
101	Avaada sunce energy Pvt limited	Received		Oct-25				
102	Avaada Sunrays Pvt. Ltd.	Received		Oct-25				
103	Avaada Sustainable RJ Pvt. Ltd.	Received		Oct-25				
104	Ayana Renewable Power Three Private Limited							
105	Ayaana Renewable Power One Pvt. Ltd.							
106	Azure Power Forty One Pvt limited							
107	Azure Power Forty Three Pvt. Ltd. RSS							
108	Azure Maple Pvt. Ltd.							
109	AZURE POWER INDIA Pvt. Ltd., Bhadla							
110	Azure Power Thirty Four Pvt. Ltd.							
111	Clean Solar Power (Jodhpur) Pvt. Ltd.							
112	Clean Solar Power (Bhadla) Pvt. Ltd							
113	Eden Renewable Cite Private Limited							
114	Grian Energy private limited							
115	Mahindra Renewable Private Limited							
116	Mega Surya Urja Pvt. Ltd. (MSUPL)							
117	AURAIYA Solar							
118	DADRI SOLAR							
119	SINGRAULI SOLAR							
120	Anta Solar							
121	Unchahar Solar							
122	NTPC Devikot Solar plant 240MW							
123	NTPC Kolayat 400kV							
124	Nedan Solar NTPC							
125	NTPC Nokhra 300MW							
126	One Volt energy Pvt. Ltd.							
127	ReNew Solar Energy (Jharkhand Three) Private Limited	Received		19-11-2025				
128	RENEW SOLAR POWER Pvt. Ltd. Bikaner	Received		17-11-2025				
129	ReNew Solar Urja Private Limited							
130	Renew Sun Bright Pvt. Ltd. (RSBPL)	Received		20-11-2025				
131	Renew Surya Partap Pvt. Ltd.	Received		21-11-2025				
132	Renew Surya Ravi Pvt. Ltd.	Received		18-11-2025				
133	Renew Surya Roshni Pvt. Ltd.	Received		24-11-2025				
134	Renew Surya Vihan Pvt. Ltd.	Received		28.11.2025				
135	Renew Surya Ayaan Pvt. Ltd.							
136	Renew Solar Photovoltaic Pvt Ltd	Received		25-11-2025				
137	Renew Hans Urja Pvt Ltd	Received		26-11-2025				
138	Renew Surya Jyoti Pvt Ltd	Received		27-11-2025				
139	RENEW SOLAR POWER Pvt. Ltd. Bhadla							
140	Rising Sun Energy-K Pvt. Ltd.							
141	Serentica Renewables India 4 Private Limited							
142	Solzen Urja Private Limited	Received		Oct-25				
143	Tata Power Green Energy Ltd. (TPGEL) (225MW)	Received		30-1-2026				

144	Tata Power Renewable Energy Ltd. (TPREL) (300MW)		Received	28-1-2026				
145	Thar Surya Pvt. Ltd.							
146	TP Surya Ltd., Noorsar (110MW)		Received	30-1-2026				
147	Banderwala Solar Plant TP Surya Ltd. (300MW)		Received	28-02-2026				
148	TRANSITION ENERGY SERVICES PRIVATE LIMITED							
149	Transition Green Energy Private Limited							
150	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 Completed (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				
3	BBMB		Received (Tanda)	By 17.07.2025				
4	THDC		Received	Feb-27				
5	SJVN		Received	March 2026-Tehri, F.Y. 2025-26- Koteswar				
6	NHPC		Received	Nov-Dec 2025 for RHPS, Nov 24- March 25 for NJHPS				
7	NPCIL		Received	FY-2025-26				
8	Delhi SLDC	SLDC	Completed (220kV) (NAPS)	Jan'25	Completed	18.01.2025	57	
9	Haryana SLDC		RAPS-C (6&8)	-	Completed	23.06.2025	Planned for 62	
10	Rajasthan SLDC							
11	Uttar Pradesh SLDC		Received (Tanda extension)	17.07.2025				
12	Uttarakhand SLDC		Received (Tanda)	17.07.2025				
13	Punjab SLDC							
14	Himachal Pradesh SLDC							
15	DTL	State Transmission Utility	Received	September, 2025 to November, 2026				
16	HVPNL		Received	June-Oct 2025				
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		Received	Aug'25				
24	RRVUNL		Received					
25	UPRVUNL		Obra-B	2026-27				
			Obra-C	Feb-26				
			Anpara D	2025	Under tendering			
			Anpara B	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	2025				
26	UJVNL		Dharasu		Completed in Nov, 2024		56	submitted
			Others					
27	HPPCL		Swara Kuddu	2026				
			Kashang HEP	FY 2025-26				
28	PSPCL	State Generating Company & State owned Distribution Company	Received (GHTP)					
				Dec. 2025				
			Received (GATP)	May 2025				
			GGSSTP	2026				
			RSD/ Sahapur Kandi	Mar'26				
29	HPSEBL	Distribution company having Transmission connectivity ownership	Kunihar	Conducted			55	
			Upper Nangal	Conducted			61	
			Baddi	Conducted			61	
30	Prayagraj 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	completed	20.12.2024	60	
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	Kawal		56	Pending
40	JSW Energy Ltd. (KWHEP)		Received	December 2024 to March 2025	Completed		57	Pending

41	UT of J&K	UT of Northern Region						
42	UT of Ladakh							
43	UT of Chandigarh							
	ISTS Transmission Utilities							
44	INDIGRID		Received (PTCL)	FY 25-26				
			Received (NRSS 29)	FY 24-25				
45	ADHPL		Received	* September 2026				
46	Adani Transmission Limited		Received (400kV Mohindergarh SS)	October, 2025				
47	Bikaner Khetri Transmission Limited		Received (765 kV Bikaner and Khetri extension bays)	September, 2025				
48	Fatehgarh Bhadla Transmission Limited		Received (400 kV Fatehgarh SS)	September, 2025				
49	Powergrid Sikar Transmission Limited							
50	Powergrid Aligarh Sikar Transmission Limited							
51	Powergrid Ajmer Phagi Transmission Limited							
52	Powergrid Bikaner Transmission System Limited							
53	Powergrid Khetri Transmission System Limited							
54	Powergrid Ramgarh Transmission Limited							
55	Powergrid Fatehgarh Transmission Limited							
56	Powergrid Bhadla Transmission Limited							
57	Powergrid Meerut Simbhavli Transmission Limited							
58	Powergrid Kala Amb Transmission Limited							
	State Utilities							
	Uttar Pradesh							
59	Vishnuprayag Hydro Electric Plant (J.P.)		Received	December, 2028				
60	Alaknanda Hydro Electric Plant (GVK)		Received	Mar-25				
61	Ghatampur TPS		Received	FY 27-28				
62	Khara Power House (Khara)		Received	Dec-25				
63	WUPPTCL		Conducted		Completed		59	
64	SEUPPTCL		Completed on Oct 2024		Completed		59	
65	ATSCL	AESL	Received (400/220KV Alwar SS)	September, 2025				
66	GTL		Received (765 kV Hapur extension bays)	September, 2025				
		AESL						
67	GTL		Received (765 kV Agra and Gr. Noida extension bays)	September, 2025				
		AESL						
68	HPTSL		Received (220kV Ranpur SS)	August, 2025				
69	MTSCL		Received (400/220/132KV Deedwana SS)	August, 2025				
		AESL						
70	OCBTL		Received (400/220/132KV Badaun SS)	FY 24-25				
		AESL			Completed			
71	STSL	AESL						
	Rajasthan							
72	Barsingsar Plant	NLC						
73	Rajwest Plant	JSW						
	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 Energy Four Private Limited							
88	Adani Hybrid Energy Jaisalmer Four Ltd. (AEML 2-350)							
89	Adani Solar Energy Jaisalmer Two Private Limited Project Two							
90	SB Energy Six Private Limited, Bhadla							
91	Adani Solar Energy Jodhpur Two Limited, Rawara							
92	Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)							
93	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)							
94	Adani Green Energy 24 Limited (Bhimisar)							

95	Adani Green Twenty-Five Limited (Badisid)							
96	Altra Xergi Pvt. Ltd.		Conducted		Completed	03.02.2025-04.02.2025	60	
97	AMP Energy Green Five Pvt. Ltd.		Received	Nov-27				
98	AMP Energy Green Six Pvt. Ltd.		Received	Nov-27				
99	Amplus Ages Private Limited							
100	Avaada RJHN 240MW		Received	Aug-26				
101	Avaada sunce energy Pvt limited		Received	Aug-26				
102	Avaada Sunrays Pvt. Ltd.		Received	Aug-27				
103	Avaada Sustainable RJ Pvt. Ltd.		Received	Aug-26				
104	Ayana Renewable Power Three Private Limited		Conducted		18.05.2025		61	
105	Ayaana Renewable Power One Pvt. Ltd.		Conducted		09.03.2025		59	
106	Azure Power Forty One Pvt limited							
107	Azure Power Forty Three Pvt. Ltd., RSS							
108	Azure Maple Pvt. Ltd.							
109	AZURE POWER INDIA Pvt. Ltd., Bhadla							
110	Azure Power Thirty Four Pvt. Ltd.							
111	Clean Solar Power (Jodhpur) Pvt. Ltd.							
112	Clean Solar Power (Bhadla) Pvt. Ltd.							
113	Eden Renewable Cite Private Limited							
114	Grian Energy private limited							
115	Mahindra Renewable Private Limited							
116	Mega Surya Urja Pvt. Ltd. (MSUPL)							
117	AURAIYA Solar							
118	DADRI SOLAR							
119	SINGRAULI SOLAR							
120	Anta Solar							
121	Unchahar Solar							
122	NTPC Devikot Solar plant 240MW							
123	NTPC Kolayat, 400kV							
124	Nedan Solar NTPC							
125	NTPC Nokhra 300MW							
126	One Volt energy Pvt. Ltd.							
127	ReNew Solar Energy (Jharkhand Three) Private Limited							
128	RENEW SOLAR POWER Pvt. Ltd. Bhadla							
129	ReNew Solar Urja Private Limited							
130	Renew Sun Bright Pvt. Ltd. (RSBPL)							
131	Renew Surya Partap Pvt. Ltd.							
132	Renew Surya Ravi Pvt. Ltd.							
133	Renew Surya Roshni Pvt. Ltd.							
134	Renew Surya Vihan Pvt. Ltd.							
135	Renew Surya Ayaan Pvt. Ltd.							
136	Renew Solar Photovoltaic Pvt Ltd							
137	RENEW SOLAR POWER Pvt. Ltd. Bikaner							
138	Rising Sun Energy-K Pvt. Ltd.							
139	Serentica Renewables India 4 Private Limited							
140	Solzen Urja Private Limited		Received	Oct-26				
141	Tata Power Green Energy Ltd. (TPGEL) (225MW)		Received	31-03-2027				
142	Tata Power Renewable Energy Ltd. (TPREL) (300MW)		Received	31-03-2027				
143	Thar Surya Pvt. Ltd.							
144	TP Surya Ltd., Noorsar (110MW)		Received	31-03-2027				
145	Banderwala Solar Plant TP Surya Ltd. (300MW)		Received	31-03-2027				
146	TRANSITION ENERGY SERVICES PRIVATE LIMITED							
147	Transition Green Energy Private Limited							
148	Transition Sustainable Energy Services Private Limited							

Status of actions points recommended during previous PSC meetings

S. No	Agenda	Remdial actions recommended during PSC meeting	Status of remdial action taken	
			60th PSC (26.05.2025)	61st PSC (26.06.2025)
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 they are going for combined scheme through PSDF fund for rectification of issues. NRLDC representative highlighted that this issue is going on for last several PSC meetings, hence HP need to have proper action plan and cost estimate for rectification of issues to ensure healthiness of protection system at the earliest. CGM(SO), NRLDC also emphasized that if there is any problem in getting PSDF fund for rectification of issues, HP need to expedite the process at their own cost and action plan may be made accordingly. <i>PSC forum requested HPSEBL to take expeditious actions at their end and ensure the healthiness of protection system in this complex.</i>	HPSEBL representative stated that option of PSDF fund haven't been successful. Therefore, followup is being done to complete the work through own fund sources. Further update will be shared. <i>PSC forum requested HPSEBL to take expeditious actions at their end and ensure the healthiness of protection system in this complex.</i>
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 work will be completed within 1 month. <i>PSC forum recommended HVPNL to expedite the implementation of differential protection in short lines and also share the expected timeline.</i>	HVPNL representative informed that status mentioned in 60th PSC minutes need to be corrected. As informed during earlier PSC meetings, all the differential protection requirement in state is being compiled and shall be processed. <i>PSC forum recommended HVPNL to expedite the implementation of differential protection in short lines and also share the expected timeline.</i>
3	Multiple elements tripping at 400kV Sainj (HP), 400kV Parbati2 & Parbati3 (NHPC) Stations on 07th May 2024, 16:17 hrs	51 PSC: a) NHPC shall follow up with the relay engineer and taken necessary remedial actions to ensure proper operation of A/R scheme at Parbati2 end. b) NHPC and HPPTCL shall review the healthiness of PLCC at Parbati3 and Sainj end and take necessary actions to ensure their proper operation. c) Expedite the implementation of differential protection in 400kV Parbati2-Sainj line. d) Standardisation of recording instruments (DR/EL) need to be ensured.	NHPC representative informed that relays are already purchased, they will be commissioned after OPGW work is completed. NRLDC representative raised concern over PLCC maloperation issue at Sainj end. Sainj representative stated that Over-voltage protection is disabled at Sainj end and PLCC will be made available/healthy within 15-20 days. <i>PSC forum recommended NHPC & HPPCL to take expeditious action at their end and ensure healthiness of protection system.</i>	NHPC representative stated that status is same. Estimate time for completion of OPGW work and differential protection implementation is by Oct-Nov 2025. HPPCL representative stated that they will confirm the status and share. No further updates received during the meeting. <i>PSC forum recommended NHPC & HPPCL to take expeditious action at their end and ensure healthiness of protection system.</i>
4	Multiple elements tripping at 400kV Koteshwar(PG) on 17th May 2024, 17:21 hrs	51 PSC: a) In view of short line length of 400kV Koteshwar(PG)-Tehri D/C, POWERGRID shall plan for the differential protection in the line on priority in near future to avoid overreach of distance protection.	POWERGRID(NR-1) representative informed that differential protection scheme implementation on 400kV Koteshwar(PG)-Tehri(TH) D/C is in tendering stage and work will be completed within 4-5 months. <i>PSC forum requested POWERGRID to expedite the work related to implementation of differential protection scheme on 400kV Koteshwar(PG)-Tehri(TH) D/C.</i>	POWERGRID(NR-1) representative informed that status is same as previous meeting, estimated time for completion of work is ~6months. <i>PSC forum requested POWERGRID to expedite the work related to implementation of differential protection scheme on 400kV Koteshwar(PG)-Tehri(TH) D/C.</i>
5	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 materials arrived at site. Due to shutdown unavailability during paddy season, bus bar protection will be commissioned after paddy season. <i>PSC forum requested PSTCL to expedite the work related to implementation of bus bar protection at Sarna S/s.</i>	PSTCL representative informed that status is same as previous meeting, estimated time for completion of work is by October 2025. <i>PSC forum requested PSTCL to expedite the work related to implementation of bus bar protection at Sarna S/s.</i>
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 representatives were not present. <i>PSC forum requested RVUNL for expeditious actions at their end.</i>	RVUNL representatives were not present. <i>PSC forum requested RVUNL for expeditious actions at their end.</i>

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 by 2 months due to issue (plan change) in civil work. <i>PSC forum requested RVPNL to expedite the actions at their end.</i>	RVPNL representative informed that work is getting delayed due to trench issue in yard. Control room is ready but due to space constraint work is getting delayed. <i>PSC forum requested RVPNL to expedite the actions at their end.</i>
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.	SLDC UP representative informed that relays are available at site. Relay replacement will be done as per shutdown availability. <i>PSC forum requested UPPTCL to expedite the replacement of relay at Khara(UP) end.</i>	SLDC UP representative informed that status is same as previous meeting. <i>PSC forum requested UPPTCL to expedite the replacement of relay at Khara(UP) end.</i>
9	Multiple elements tripping event at Patiala(PG) on 19th July 2024, 18:50 hrs	52 & 53 PSC: POWERGRID was requested to expedite the process of commissioning of new bus bar scheme.	POWERGRID(NR-2) representative informed that implementation of bus bar protection at Patiala(PG) will be completed by 15th June 2025. <i>PSC forum requested POWERGRID(NR-2) to expedite the process.</i>	POWERGRID(NR-2) representative informed that relay has been installed and testing will be completed in next 15 days. <i>PSC forum requested POWERGRID(NR-2) to confirm after completion of testing.</i>
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 Khodri-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 offer is received from GE and tender is at approval stage. <i>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.</i>	UJVUNL representative informed that status is same as previous meeting. <i>PSC forum requested UJVUNL & HPSEBL to expedite the necessary remedial action at their end and ensure proper operation of protection system. UJVUNL shall expedite the action plan at khodri end and HPSEBL shall review the protection setting of 220kV Khodri-Majri line-II.</i>
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 work will be completed within 4 months and LBB relay will be replaced by FY 2026-27. <i>PSC forum requested UPPTCL for expedited corrective actions.</i>	UPPTCL representative informed that status is same as previous meeting. <i>PSC forum requested UPPTCL for expedited corrective actions.</i>
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 work will be completed within 4 months and LBB relay will be replaced by FY 2026-27. <i>PSC forum requested UPPTCL for expedited corrective actions.</i>	UPPTCL representative informed that status is same as previous meeting. <i>PSC forum requested UPPTCL for expedited corrective actions.</i>
13	Frequent tripping of 220 KV RAPS_A(NP)-Sakatpura (RS) (RS) Ckt-1 & 2	55 PSC Recommendations: Expeditious corrective actions to minimise frequent faults in line.	RVPNL representative informed that RVPNL representative informed that work in 220kV RAPS_B(NP)- Sakatpura (RS) (RS) Ckt is completed. NRLDC representative raised concern about the fact that A/R is disabled at RAPS_A end. However, NPCIL representatives were not present in the meeting. <i>PSC forum requested NPCIL to enable A/R at RAPS_A end of 220kV RAPS_A(NP)-Sakatpura (RS) (RS) Ckt-1 & 2.</i>	RAPS representative stated that A/R scheme is not available at RAPS-A end. Issue has been raised to the NPCIL design team. Necessary actions will be taken after review by design team. Estimate time required is ~2 months. <i>PSC forum requested RAPS to expedite the necessary remedial actions.</i>
14	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 PO (Purchase order) is in process and work will be completed before foggy 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. <i>PSC forum requested PSTCL to for expeditious actions for insulators replacement.</i>	PSTCL representative informed that work will be coompleted by October 2025. <i>PSC forum requested PSTCL for expeditious actions and esnure insulators replacement before November 2025 to avoid frequent trippings during fog.</i>
15	Multiple element tripping event at 400kV Aligarh(UP) on 02nd November, 2024	55 PSC Recommendations: UPPTCL shall ensure the healthiness of carrier communication and A/R operation at Muradnagar_1(UP) end.	UPPTCL representative informed that carrier cabinet is to be installed at both Aligarh(UP) and Muradnagar_1(UP) end, but they are yet not allotted. <i>PSC forum requested UPPTCL for expedited corrective actions.</i>	UPPTCL representative informed that status is same as previous meeting. <i>PSC forum requested UPPTCL for expedited corrective actions.</i>
16	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 representative informed that carrier cabinet is yet to be allotted. <i>PSC forum requested UPPTCL for expedited corrective actions.</i>	UPPTCL representative informed that status is same as previous meeting. <i>PSC forum requested UPPTCL for expedited corrective actions.</i>

17	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 that issue couldn't be resolved by third party, hence they are again trying to do the work through OEM which is under process. <i>PSC forum requested UPPTCL to take necessary follow up actions for expeditious completion of work.</i>	UPPTCL representative informed that status is same as previous meeting. Temporarily, A/R has been enabled through separate relay. <i>PSC forum requested UPPTCL to take necessary follow up actions for expeditious completion of work.</i>
18	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	PSPCL representative was not present. <i>PSC forum requested PSPCL to share detailed report along with observations and remedial action taken.</i>	Event details was not shared by PSPCL representative. PSPCL agreed to share the event analysis report within 01 week. <i>PSC forum requested PSPCL to share detailed report along with observations and remedial action taken.</i>
19	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 estimated timeline for bus bar relay replacement is approx. 6 months (by Nov 2025). <i>PSC forum requested RVPNL to share the timeline of replacement of relays and take expedited corrective actions at their end.</i>	RVPNL representative informed that case has been moved for both 220kV & 400kV bus. Estimated timeline for bus bar relay replacement is approx. 6 months (by Nov 2025). <i>PSC forum requested RVPNL to share the timeline of replacement of relays and take expedited corrective actions at their end.</i>
20	Frequent tripping of 220 KV Debari(RS)- RAPS_A(NP) (RS) Ckt-1	58 PSC Recommendations: Expeditious corrective actions to minimise frequent faults in line.	RVPNL representative informed that strengthening work has already been started as complete line refurbishment will require long shutdown. Work is expected to get completed within 4 months (by Sep 2025). <i>PSC forum requested RVPNL to take expeditious corrective action to minimise frequent faults in line.</i>	RVPNL representative informed that 2-3 towers need to be replaced estimate time required for completion of work is 6-7 months (by end of Dec25). <i>PSC forum requested RVPNL to take expeditious corrective action to minimise frequent faults in line.</i>
21	Frequent tripping of 400 KV Merta-Kankani (RS) Ckt-1	59 PSC Recommendations: A/R operation need to be reviewed at both the ends.	RVPNL representative stated that A/R operation review is already done at Merta end and the same at Kankani end will be done by June 2025. <i>PSC forum requested RVPNL to review A/R operation at Kankani end at the earliest.</i>	RVPNL representative stated that A/R is enabled at Kankani end also. Review is to be done on the next available shutdown. <i>PSC forum requested RVPNL to review A/R operation at Kankani end at the earliest.</i>
22	Multiple elements tripping at 220/132/33kV Baraut(UP) at 01:06 hrs on 12th March, 2025	59 PSC Recommendations: DT scheme of 220 KV Baghpat(PG)- Shamli(UP) (UP) Ckt need to be checked during earliest available shutdown.	UPPTCL representative stated that if there is delay in getting shutdown, DT scheme will be checked by removing the actual connection to lockout relay. The work is expected to get completed within 1 month (by June 2025). <i>PSC forum requested UPPTCL to expedite checking of DT scheme of 220 KV Baghpat(PG)- Shamli(UP) (UP) Ckt.</i>	UPPTCL representative stated that DT scheme testing has been done. DT signals were found swapped in adjacent feeder at Barot stations itself. Issue has been corrected. End to End testing with POWERGRID S/s (remote S/s) shall be done as per opportunity. <i>PSC forum requested UPPTCL to conduct end to end testing with POWERGRID s/s at the earliest.</i>
23	Multiple elements tripping at 400kV AGE25L & 220kV Nokhra(IP) at 10:00 hrs on 18th March, 2025	59 PSC Recommendations: NTPC need to ensure over-voltage is disabled at Nokhra end of 220kV Nokhra-Bhadla2 Ckt.	NTPC representative informed that they are yet to confirm the status of over-voltage protection operation (disabled or not) at Nokhra end. <i>PSC forum requested NTPC to ensure over-voltage is disabled at Nokhra end of 220kV Nokhra-Bhadla2 Ckt.</i>	NTPC representative informed that they are yet to confirm the status of over-voltage protection operation (disabled or not) at Nokhra end. <i>PSC forum requested NTPC to ensure over-voltage is disabled at Nokhra end of 220kV Nokhra-Bhadla2 Ckt. Further, it was suggested to take up the issue in RE subcommittee meeting scheduled in July 2025.</i>

Annexure-B.II

Sr No	Element Name	Outage Date	Outage Time	Reason	Discussion related to remedial actions during the 61st PSC Meeting	
1	220 KV Samaypur(BB)-Palli(HV) (HVPNL) Ckt-2	05-May-25	12:23	Phase to earth fault R-N	NRLDC representative raised concern over frequent tripping of the lines and asked reason of frequent faults. HVPNL representative stated that there was issue with the PT selection at Palli end due to which unwanted tripping was initiating during fault in next line. Issue has been resolved. Few of the faults of transient nature during inclement weather condition. A/R is also operational in line.	
		05-May-25	12:23	Phase to earth fault R-N		
		15-May-25	19:31	LBB operated		
		16-May-25	15:43	Phase to earth fault B-N		
		21-May-25	20:30	Transient fault		
		25-May-25	02:05	Phase to earth fault R-N		
2	400 KV Rewa Road-Panki (UP) Ckt-1	29-May-25	17:05	Transient fault	NRLDC representative raised concern over frequent tripping of line. UPPTCL representative informed that in case of overvoltage tripping, overvoltage protection was operated at Panki end and tripping was correct. One of the tripping due to maloperation relay need to be investigated again and details will be shared.	
		08-May-25	03:33	Phase to earth fault Y-N		
		11-May-25	14:52	Over Voltage		
		11-May-25	17:54	Phase to earth fault R-N		
		11-May-25	21:37	Maloperation of Relay		
		14-May-25	10:57	Phase to earth fault R-N		
3	220 KV Ballabgarh-Charkhi Dadri (BB) Ckt-1	21-May-25	02:01	Phase to earth fault B-N	NRLDC representative raised concern over frequent tripping of line and non-operation of A/R. BBMB representative informed that faults were of transient nature and as A/R has been kept disabled in line hence, there was no A/R operation observed. Further, it was informed that A/R has been kept disabled due to cable portion in line.	
		01-May-25	09:18	Phase to earth fault B-N		
		02-May-25	05:17	Phase to earth fault B-N		
		16-May-25	16:51	Phase to earth fault R-N		
		21-May-25	20:01	Phase to earth fault Y-N		
		25-May-25	03:33	Phase to earth fault B-N		
4	200 MW Parbati II HEP - UNIT 1	29-May-25	16:30	Phase to Ground Fault R-N	1. Physically pressure was low due to Low reservoir level. 2. As per OEM recommendation, the pressure setting was 3 bar. In consultation with OEM, the pressure setting has been changed to 2 bar from 3 bar. NHPC representative stated that all the necessary remedial actions have been taken and frequent tripping of units at parbati2 HEP have also been minimised.	
		15-May-25	04:45	Tripped due to butterfly valve mal-operation.		
		21-May-25	21:05	LBB operated		
		23-May-25	10:37	LBB operated		
		27-May-25	17:13	Generator Rotor Earth Fault		
		28-May-25	20:59	Generator Rotor Earth Fault		
5	220 KV Debari(RS)-RAPS_A(NP) (RS) Ckt-1	28-May-25	19:48	Generator Fault	1. Problem has been rectified. 2. All the supporting insulating blocks of CC leads has been replaced. 3. All the sleeves of connecting joints has been replaced. Vibration sensor malfunction. The vibration sensor has been recalibrated	
		14-May-25	14:29	Phase to earth fault Y-N		
		22-May-25	19:28	Phase to earth fault B-N		
		24-May-25	13:40	Phase to earth fault B-N		
		27-May-25	16:34	Phase to earth fault B-N		
		28-May-25	13:30	Phase to Phase Fault Y-B		
6	400 KV Agra-Unnao (UP) Ckt-1	06-May-25	04:10	Phase to earth fault Y-N	Line tripped on OV stage-1 operation at Unnao end. Line tripped on R-N fault in reclaim time UPPTCL representative stated that necessary remedial actions have been taken.	
		07-May-25	16:24	Phase to earth fault R-N		
		08-May-25	02:07	Phase to earth fault Y-N		
		12-May-25	21:57	Phase to earth fault R-N		
		22-May-25	00:05	Phase to earth fault R-N		
7	60 MW Bairasiul HPS - UNIT 3	02-May-25	05:23	Generator Fault	NHPC representative stated that tripping occurred due to operation of shaft overcurrent protection whose setting was instantaneous. Shaft overcurrent setting has been reviewed and corrected. Thereafter, no tripping is observed.	
		04-May-25	10:46	Generator Fault		
		16-May-25	19:32	Unit-3 tripped on Generator Shaft Current Very High.		
		19-May-25	09:17	Generator Rotor Earth Fault		
		20-May-25	21:41	Generator Fault		
8	220 KV Bhilwara(RS)-Kota(PG) (RS) Ckt-1	03-May-25	15:42	Bus Bar Protection Operated	Bus bar operation due to CT damage RVPNL was requested to take necessary remedial actions to avoid frequent tripping of line.	
		06-May-25	05:35	Phase to Phase Fault R-Y		
		17-May-25	02:30	Bus Bar Protection Operated		
		24-May-25	12:07	Phase to earth fault B-N		
9	220 KV Fatehgarh_III(PG)-RSJPL_SL_Ftg3(PG) (ReNew_SJPL) Ckt-1	02-May-25	10:35	Phase to earth fault B-N	RENEW representative stated that frequent faults were occurred due to clearance issue with jumper. Corrective actions have been taken and issue has been resolved.	
		04-May-25	01:21	Phase to earth fault B-N		
		05-May-25	03:32	Phase to earth fault B-N		
		08-May-25	17:13	Phase to earth fault B-N		
10	220 KV Jauljivi (PG)-Baram_Jauljibi GIS(UK) (PTCUL) Ckt-2	05-May-25	05:35	Phase to Phase Fault Y-B	PTCUL representative informed that ph-ph faults were occurred due to clearance related issue which has been resolved. As informed by POWERGRID, in case of single phase fault, line tripped due to fault in reclaim time.	
		11-May-25	18:35	Phase to Phase Fault Y-B		
		16-May-25	16:49	Phase to Phase Fault R-B		
		19-May-25	15:26	Phase to earth fault Y-N		
11	220 KV Kaithal(PG)-Kaithal(HV) (HVPNL) Ckt-1	11-May-25	18:57	Phase to earth fault Y-N	No information received from HVPNL. NRLDC representative requested HVPNL to review the A/R operation in line and reason of frequent faults in line. It was requested to necessary remedial actions to avoid frequent tripping of line.	
		16-May-25	14:35	Phase to earth fault B-N		
		21-May-25	18:30	Phase to earth fault B-N		
		24-May-25	23:09	Phase to earth fault B-N		

12	220 KV Mandola(PG)-Gopalpur(DTL) (DTL) Ckt-1	03-May-25	17:57	Phase to earth fault Y-N	No information received from DTL. NRLDC representative requested DTL to review the A/R operation in line and reason of frequent faults in line. It was requested to necessary remedial actions to avoid frequent tripping of line.	
		11-May-25	20:11	Phase to earth fault Y-N		
		12-May-25	14:19	Phase to earth fault R-N		
		19-May-25	09:43	Phase to earth fault R-N		
13	400 KV Kankani-GSS Pachpadra (RS) Ckt-1	03-May-25	21:26	Phase to earth fault R-N	RVPNL representative informed that faults occurred during incliment weather condition. Line tripped on unsuccessful A/R operation due to permanent nature of fault. Further, it was informed that fault location was almost same in all four incidents. Reason of frequent fault will be reviewed.	
		04-May-25	01:43	Phase to earth fault R-N		
		05-May-25	05:53	Phase to earth fault R-N		
		29-May-25	20:02	Transient fault		
14	500 kV HVDC Rihand-Dadri (PG) Ckt-2	21-May-25	20:21	Pole-2 trip on commutation failure.	POWERGRID representative informed that firstly both pole-2 tripped due to commutation failure. Further during revival of system at 23:00 hrs onwards through DG sets, however, complete auxilliary supply was not met and system tripped. Review of rating of DG sets and present requirement of auxilliary supply is being done accordingly necessary remedial actions will be taken.	
		21-May-25	23:01	AC Supply Fail		
		21-May-25	23:57	AC Supply Fail		
15	765 KV Gr.Noida_2(UPC)-Meerut(PG) (PG) Ckt-1	02-May-25	03:58	Phase to Phase Fault Y-B	Due to insulator flashover	POWERGRID representative stated that all four tripping was correct as per protection operation.
		16-May-25	18:08	Phase to earth fault B-N	During inclement weather condition, flashover mark in B-ph jumper found at fault location.	
		17-May-25	16:03	Phase to earth fault B-N	Fault in LA at Gr. Noida end, permanent fault.	
		21-May-25	21:19	Phase to earth fault R-N	Line tripped on backup distance protection operation due to non clearance of fault of 765kV Meerut-Koteshwar line	

Multiple Element Tripping Event at 400/220kV Ludhiana(PG)

At 00:00 hrs on 02.05.2025

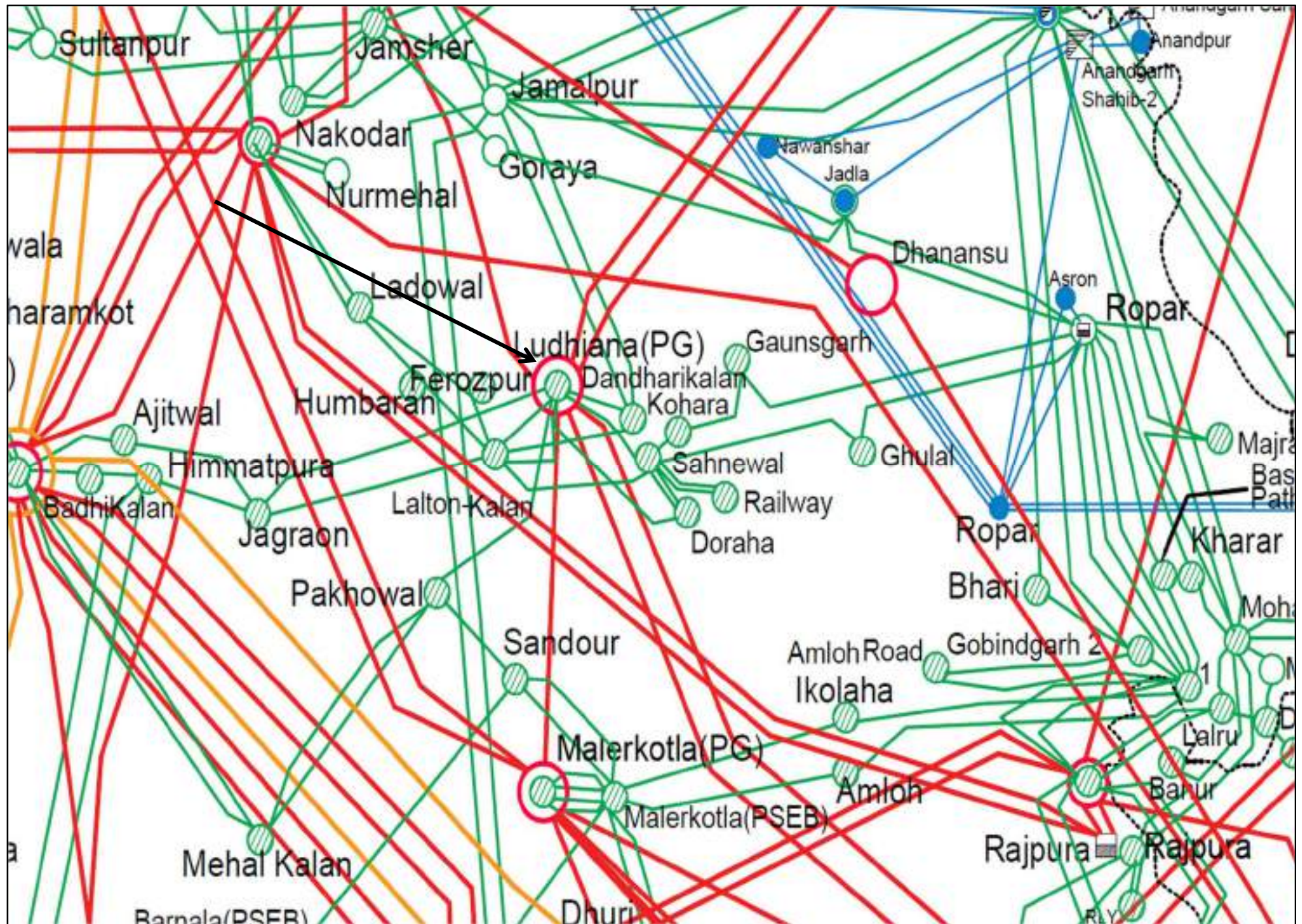
Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	400/220 kv 500 MVA ICT 4 at Ludhiana(PG)	00:00 hrs	01:48 hrs	220kV Bus bar protection operation of Bus-2 at Ludhiana(PG)
2.	400/220 kv 500 MVA ICT 1 at Ludhiana(PG)		01:47 hrs	
3.	220 KV Pakhowal(PS)- Ludhiana(PG) (PSTCL) Ckt-1		01:59 hrs	
4.	220KV Bus 2 at Ludhiana(PG)		01:29 hrs	
5.	220 KV Ludhiana(PG)- Jagraon(PS) (PSTCL) Ckt			
6.	220 KV Ludhiana(PG)- Dandhari(PS) (PSTCL) Ckt-1			
7.	220 KV Ludhiana(PG)- Laltokalan(PS) (PSTCL) Ckt-2			

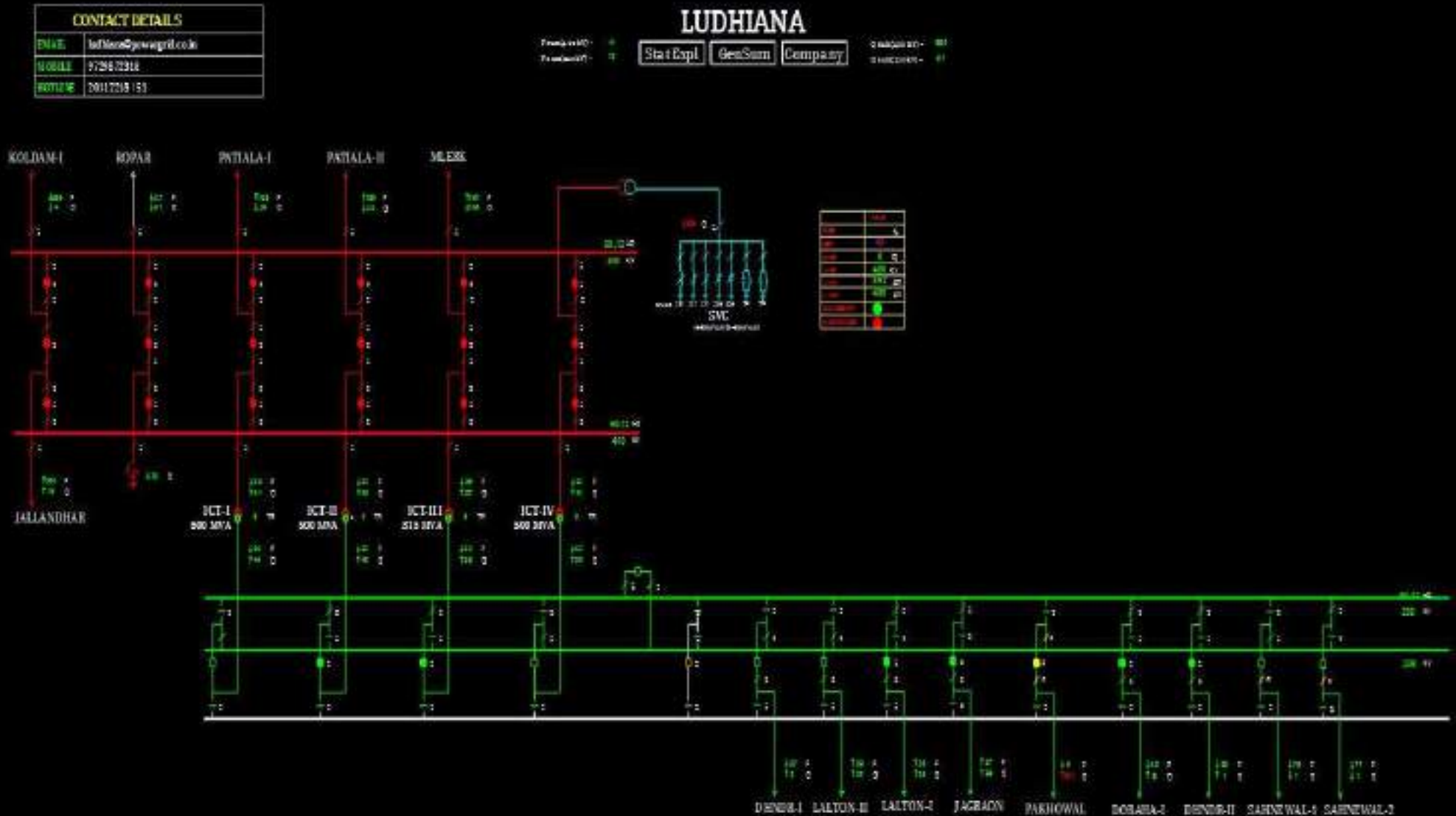
Brief details of the event

- i) 400/220KV Ludhiana has one and half breaker scheme at 400KV level and has double main transfer scheme at 220KV level.
- ii) As reported, at 00:00hrs, due to operation of 220KV Bus Bar 2 protection 220KV Bus 2 at Ludhiana(PG) tripped. The tripping details for the exact cause of Bus Bar protection are still awaited.
- iii) Due to the bus bar protection operation, 400/220 kV 500 MVA ICT 1 & 4 at Ludhiana(PG) and 220 KV feeders to Pakowal, Jagraon, Dandhari Kalan-I and Lalto kaalan-II tripped.
- iv) As per PMU at Malerkotla(PG), R-N phase to earth fault with delayed fault clearance time of respectively 320ms is observed.
- v) As per SCADA, change in demand of approx. 110MW is observed in Punjab control area.

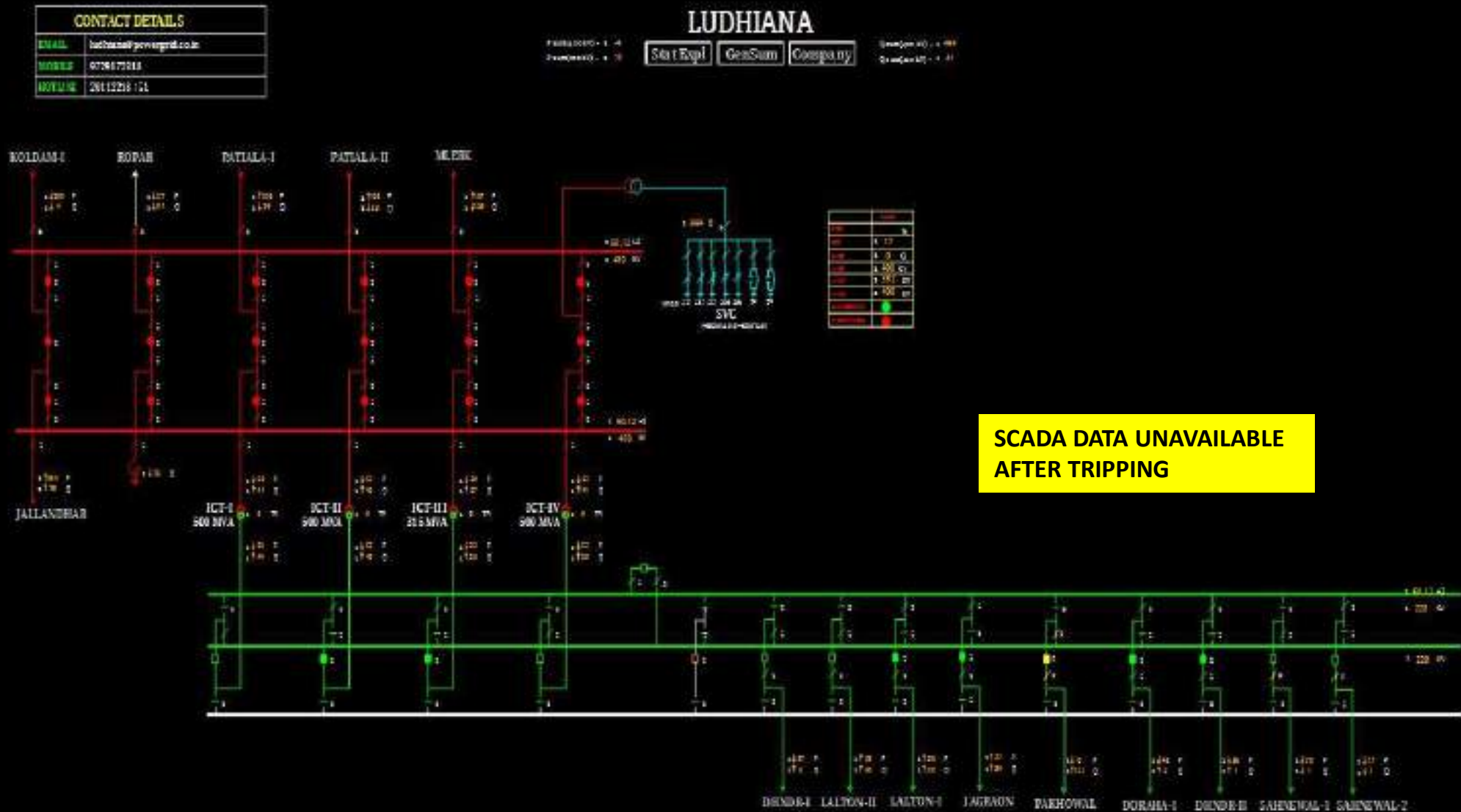
Network diagram



SLD of 400/220kV Ludhiana(PG) before the event

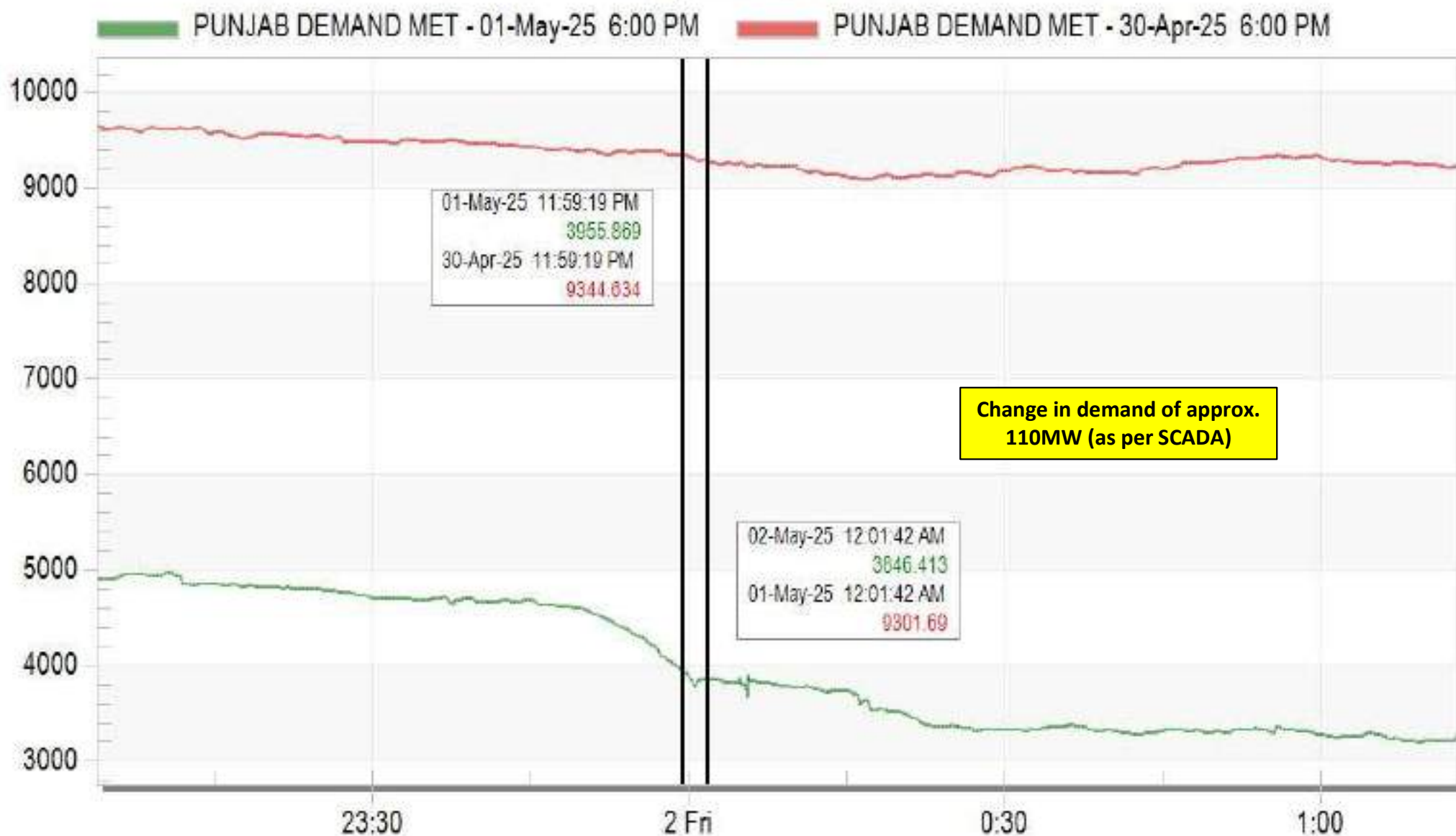


SLD of 400/220kV Ludhiana(PG) after the event



Punjab demand during the event

Punjab Demand



May 1 Thu 2025

PMU Plot of frequency at Malerkotla(PG)

00:01hrs/02-May-25



PMU Plot of phase voltage magnitude at Malerkotla(PG)

00:01hrs/02-May-25



R Y B Phase Voltages Angles

SCADA SOE

Time	Station Name	Voltage Level	Element Name	Element Type	Element Status	Remarks
00:00:01,650	LUDHIANA	220kV	14SHNWL1	Circuit Breaker	Open	Opening of main CB of 220 KV Ludhiana(PG)-Sahnewal(PS) (PSTCL) Ckt-1 at Ludhiana(PG)
00:00:01	LUDHIANA	220kV	14SHNWL1	Circuit Breaker	Open	
00:00:01,867	LUDHIANA	220kV	08JGRAO	Circuit Breaker	Open	Opening of main CB of 220 KV Ludhiana(PG)-Jagraon(PS) (PSTCL) Ckt at Ludhiana(PG)
00:00:01,869	LUDHIANA	220kV	07DNDRI1	Circuit Breaker	Open	Opening of main CB of 220 KV Ludhiana(PG)-Dandhari(PS) (PSTCL) Ckt-1 at Ludhiana(PG)
00:00:01,876	LUDHIANA	220kV	06T4	Circuit Breaker	Open	Opening of 220KV CB 400/220 kV 500 MVA ICT 4 at Ludhiana(PG)
00:00:01,884	LUDHIANA	220kV	01T1	Circuit Breaker	Open	Opening of 220KV CB 400/220 kV 500 MVA ICT 1 at Ludhiana(PG)
00:00:01,940	LUDHIANA	220kV	03MBC	Circuit Breaker	Open	
00:00:02,319	LUDHIANA	220kV	15LALTO3	Circuit Breaker	Open	Opening of main CB of 220 KV Ludhiana(PG)-Laltokalan(PS) (PSTCL) Ckt-2 at Ludhiana(PG)

Points for Discussion

- i) Exact location and nature of fault need to be shared.
- ii) Reason of delayed clearance of fault.
- iii) DR/EL along with tripping report for each element need to be shared from both the ends.
- iv) Exact cause of Bus-Bar protection operation needs to be shared.
- v) 400KV and 220KV data is unavailable in SCADA after tripping. Availability and healthiness of SCADA data need to be ensured.
- vi) Remedial action taken report to be shared.

**Tripping of 220kV Busbar-II at
400/220kV Ludhiana SS on
02.05.2025 at 00:00:01hrs**

Ludhiana BB Tripping

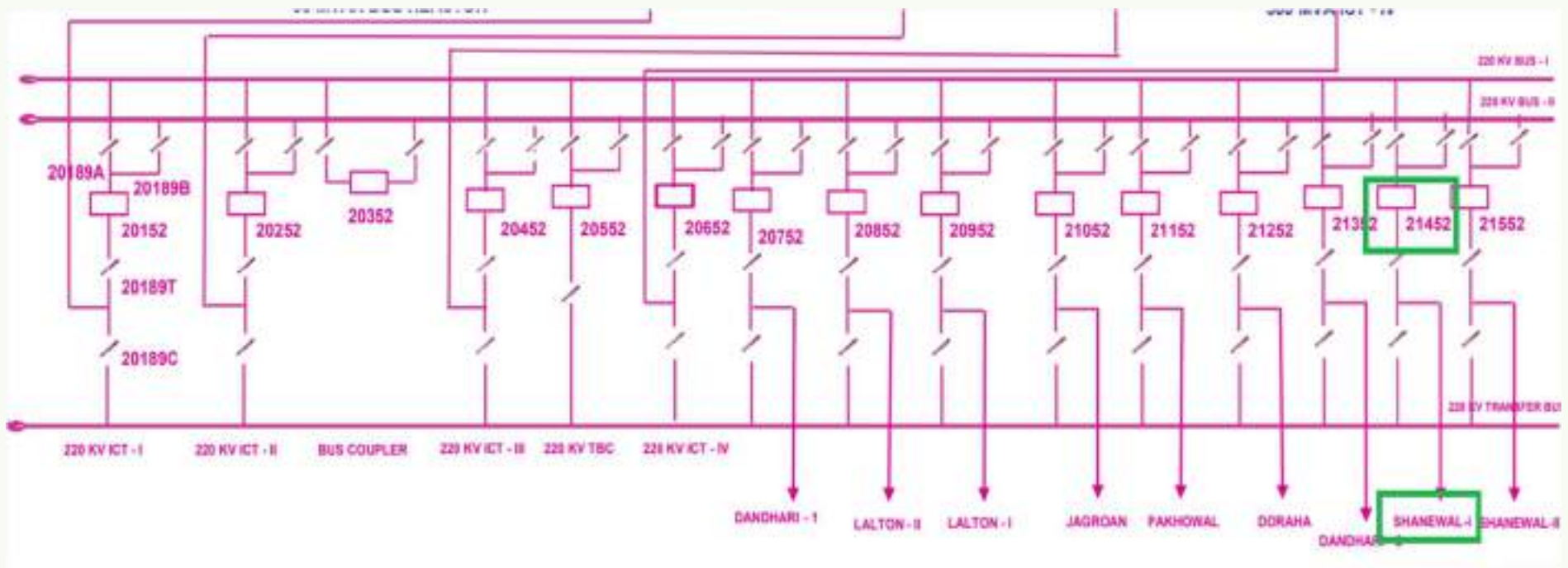
- On 02.05.2025 at 00:00:01:826 Hrs LBB operated in Shanewal ckt-1 due to blast in 214 CB which was connected to Bus-2 & hence 220kV Bus-2 tripped (Fault current of 40kA, R-N Fault)
- Due to heavy storm Earth wire of 220kV Shanewal line had snapped near the Gantry,
- Conductor of R-Ph detached from pilot string



Ludhiana BB Tripping

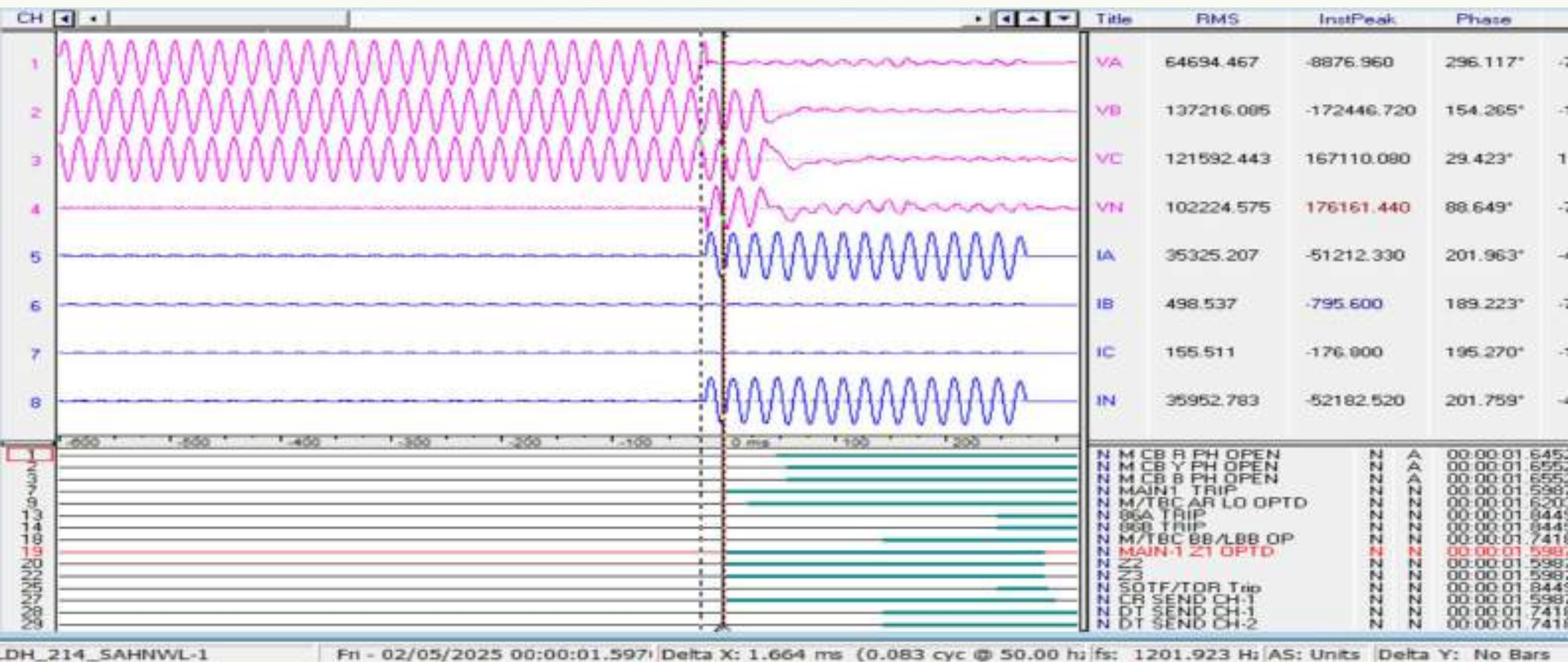
• Following elements connected to Bus-2 tripped due to tripping of 220KV Bus-2 at Ludhiana

1. 500 MVA ICT-1 (tripped from 220KV side)
2. 500 MVA ICT-4 (tripped from 220KV side)
3. 220KV Dandhari line-1 (PSTCL)
4. 220KV Lalto line-2 (PSTCL)
5. 220KV Pakowal-1(PSTCL)
6. 220KV Shanewal-1(PSTCL)
7. 220KV Shanewal-2(PSTCL)
8. 203 bay (Bus coupler)



Ludhiana BB Tripping

- DR 214 (Shanewal line-1)



ABB

3	MAIN2 TRIP	On	02-05-2025 00:00:01:600
15	O/C E/F START	Off	02-05-2025 00:00:01:657
15	O/C E/F START	On	02-05-2025 00:00:01:681
15	O/C E/F START	Off	02-05-2025 00:00:01:690
23	BUSBAR OPTD	On	02-05-2025 00:00:01:826
24	M/T LBB OPTD	On	02-05-2025 00:00:01:826
36	DT SEND	On	02-05-2025 00:00:01:831
25	M2 Z1 START	Off	02-05-2025 00:00:01:897
26	MAIN2 Z1 OPTD	Off	02-05-2025 00:00:01:897
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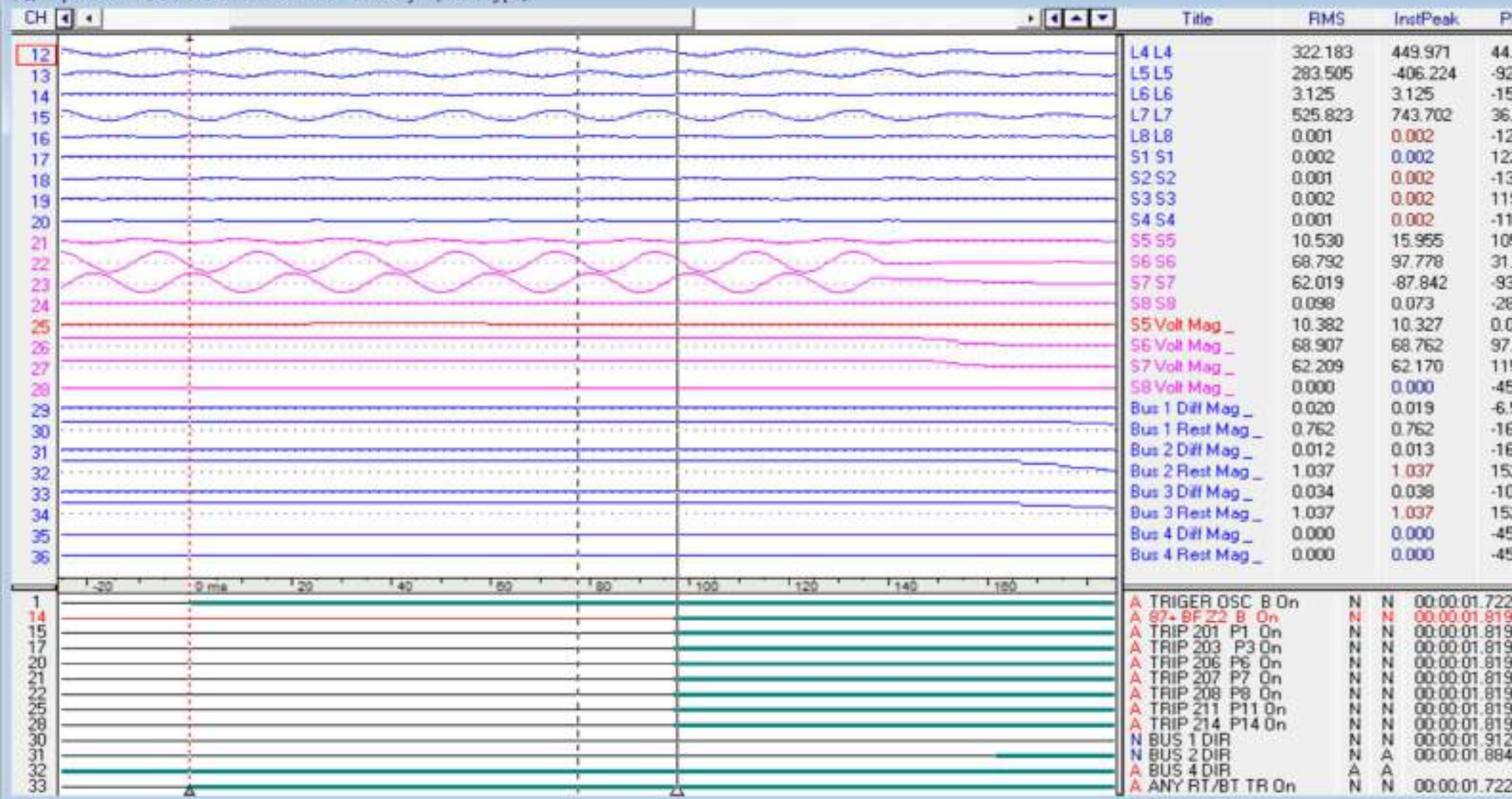
- Storm was so intense that for about 30 mins entry into switchyard seemed unsafe .
- Blast in 214 CB R-phase (Shanewal line-1)



Ludhiana BB Tripping

Bus bar DR

Y ph.dat - 02/05/2025 - 00:00:01.722 - Primary - (Peak Type)



608 BB_B90-B Fri - 02/05/2025 00:00:01.820 Delta X: 98.046 ms (4.902 cyc @ 50.00 fs: 1600 Hz AS: Units Delta Y: No Bars

- 220kVBus-2 was charged at 01:29hrs on 02.05.2025
- 500MVA ICT-1 charged at 01:47hrs
- 500MVA ICT-1 charged at 01:48hrs

Multiple elements tripping at 400kV Jhajjar TPS (MGTPS)

On 02.05.2025

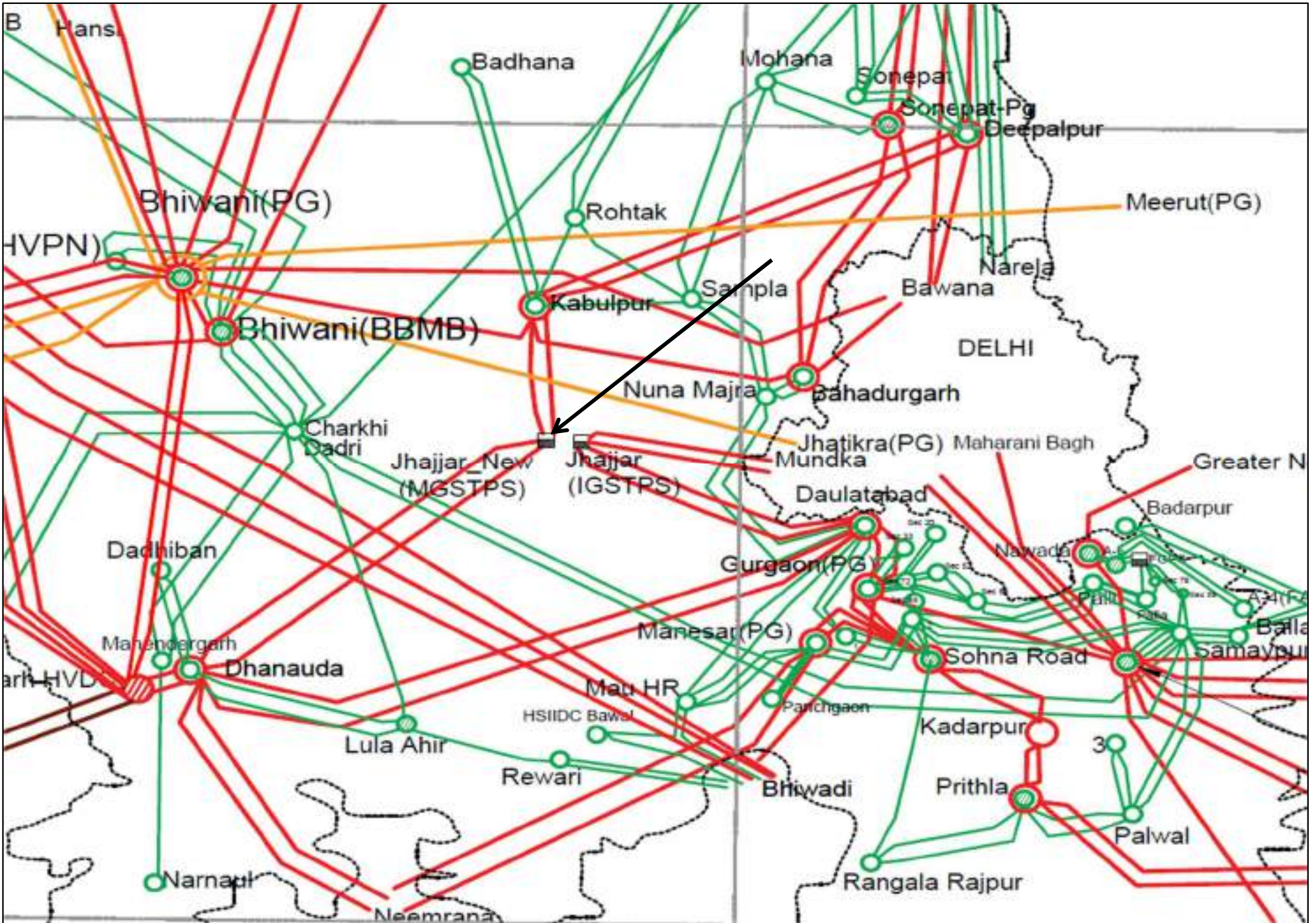
Tripped element:

400 KV CLP Jhajjar(CLP)-Dhanonda(HV) (HVPNL) Ckt-1
400 KV CLP Jhajjar(CLP)-Dhanonda(HV) (HVPNL) Ckt-2
660 MW JHAJJAR(CLP) - UNIT 2
660 MW JHAJJAR(CLP) - UNIT 1

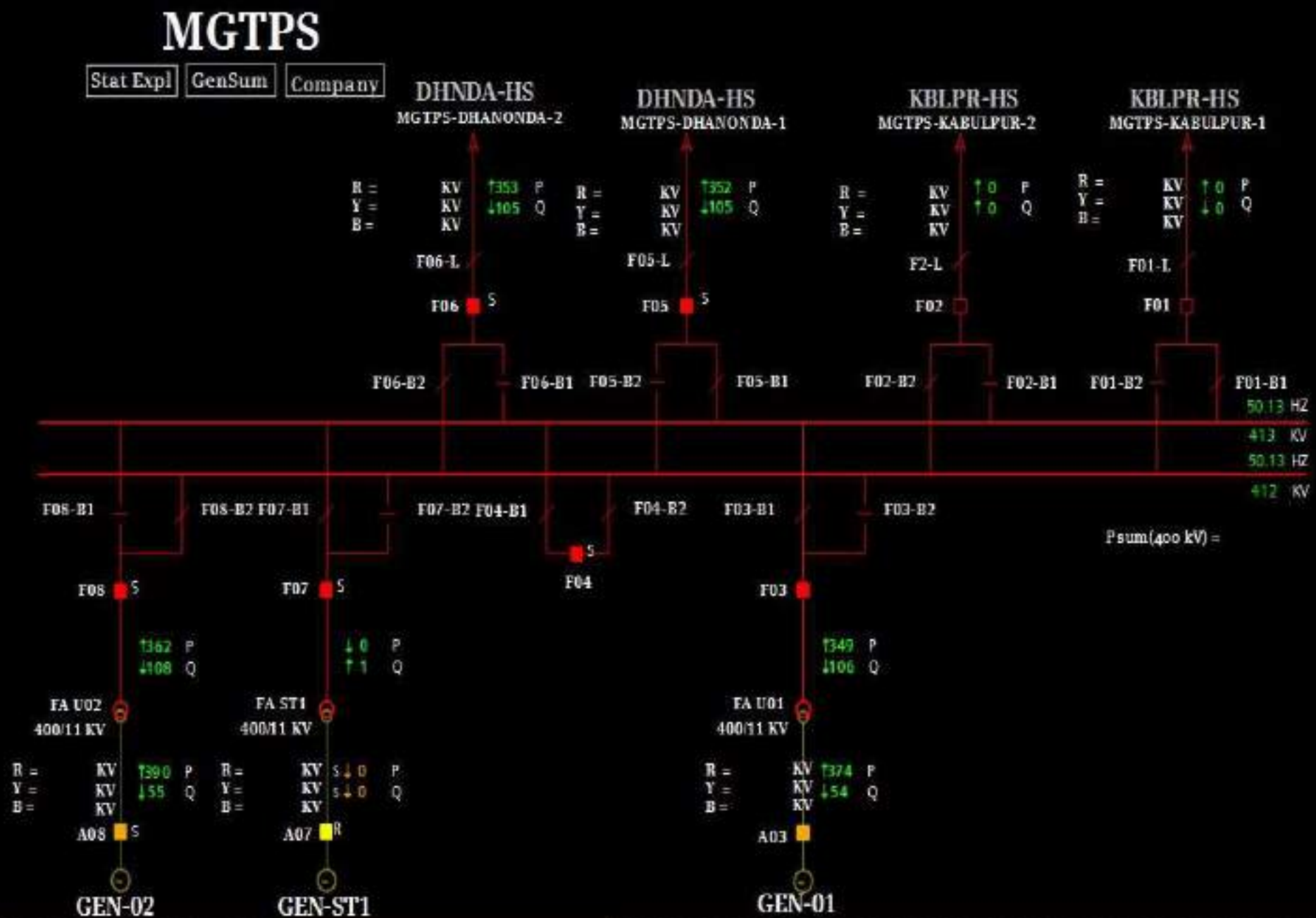
Brief description of event:

- i) 400kV CLP Jhajjar(CLP) has one and half breaker arrangement at 400kV side.
- ii) During antecedent condition, 660MW Unit 1, 2 at Jhajjar(CLP) were generating approx. 374MW and 390MW each. Unit 3 was under shutdown and 400 KV CLP Jhajjar(CLP)-Kabulpur(HV) (HVPNL) Ckt-1 and Ckt-2 were already under tripped condition.
- iii) As reported, at 05:22 hrs, Jhajjar(CLP)(end)-Dhanonda(HV) (HVPNL) Ckt-1 & 2 tripped (exact reason of tripping yet to be received). As per DR of 400 KV CLP Jhajjar (CLP)(end)-Dhanonda (HV) (HVPNL) Ckt-1 & 2 submitted, there was a momentary loss of current in all the 3 phases. However, no fault was observed in the DR.
- iv) Following this, 660 MW JHAJJAR(CLP) - UNIT 1 and 2 also tripped due to loss of evacuation path. This led to complete blackout of 400KV Jhajjar sub-station.
- v) As per PMU at Gurgaon(PG), no fault in system is observed.
- vi) As per SCADA, generation loss of 763MW at Jhajjar CLP is observed.

Network Diagram before the event



SLD of 400kV Jhajjar(MGSTPS) before the event



SLD of 400kV Jhajjar(MGSTPS) after the event

MGTPS

Stat Expl

GenSum

Company

DHND-A-HS
MGTPS-DHANONDA-2

DHND-A-HS
MGTPS-DHANONDA-1

KBLPR-HS
MGTPS-KABULPUR-2

KBLPR-HS
MGTPS-KABULPUR-1

R = KV ↑ 0 P
Y = KV ↑ 0 Q
B = KV

R = KV ↑ 0 P
Y = KV ↑ 0 Q
B = KV

R = KV ↑ 0 P
Y = KV ↑ 0 Q
B = KV

R = KV ↑ 0 P
Y = KV ↓ 0 Q
B = KV

F06-L

F05-L

F2-L

F01-L

F06 S

F05 S

F02

F01

F06-B2

F06-B1

F05-B2

F05-B1

F02-B2

F02-B1

F01-B2

F01-B1

5 50.12 HZ

0 KV

5 50.12 HZ

0 KV

P sum (400 kV) =

F08-B1

F08-B2

F07-B1

F07-B2

F04-B1

F04-B2

F03-B1

F03-B2

F08

F07 S

F04 S

F03

FA U02
400/11 KV

FA ST1
400/11 KV

FA U01
400/11 KV

R = KV ↑ 0 P
Y = KV ↓ 0 Q
B = KV

R = KV ↓ 0 P
Y = KV ↓ 0 Q
B = KV

R = KV ↑ 0 P
Y = KV ↑ 0 Q
B = KV

A08 S

A07 R

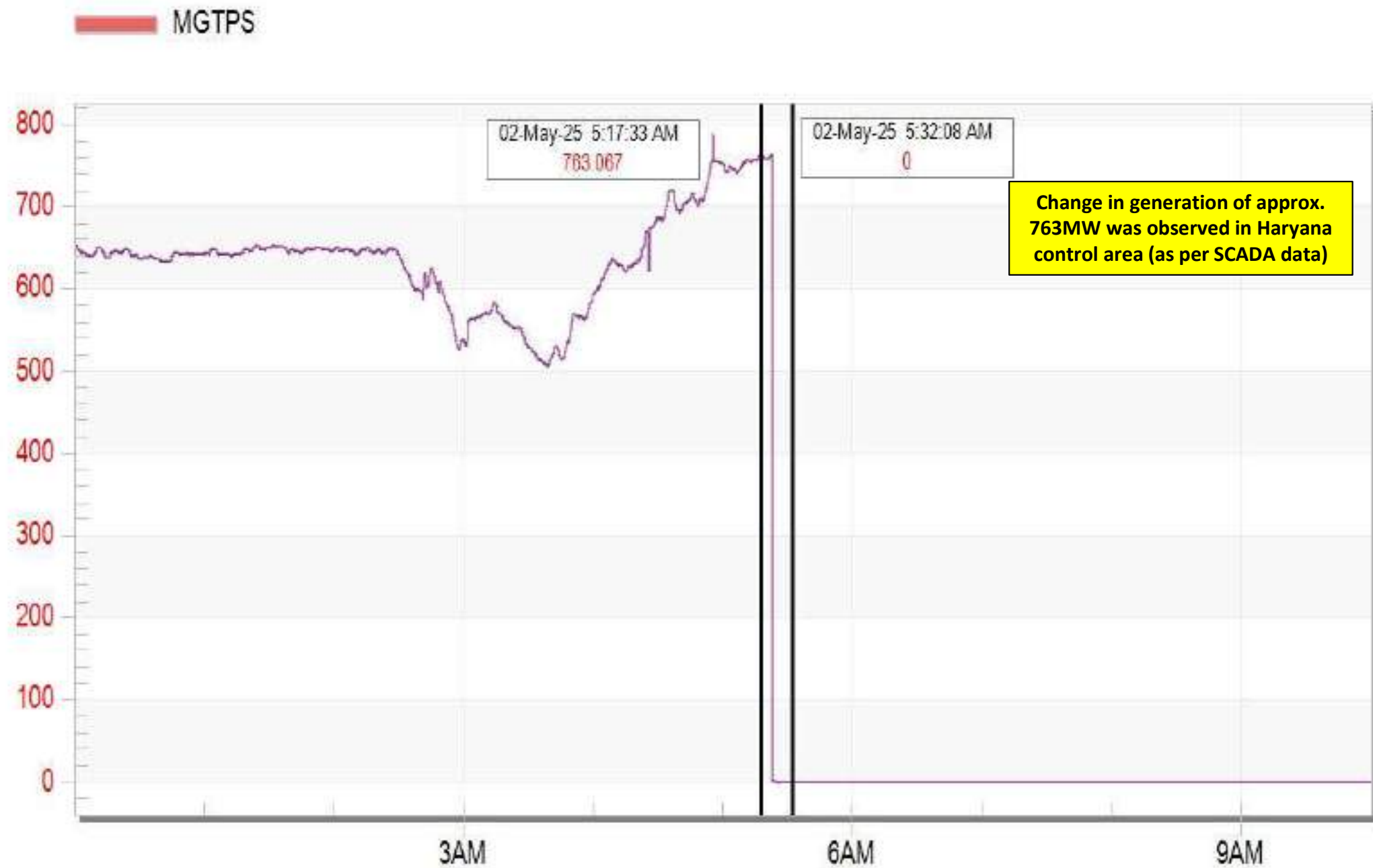
A03

GEN-02

GEN-ST1

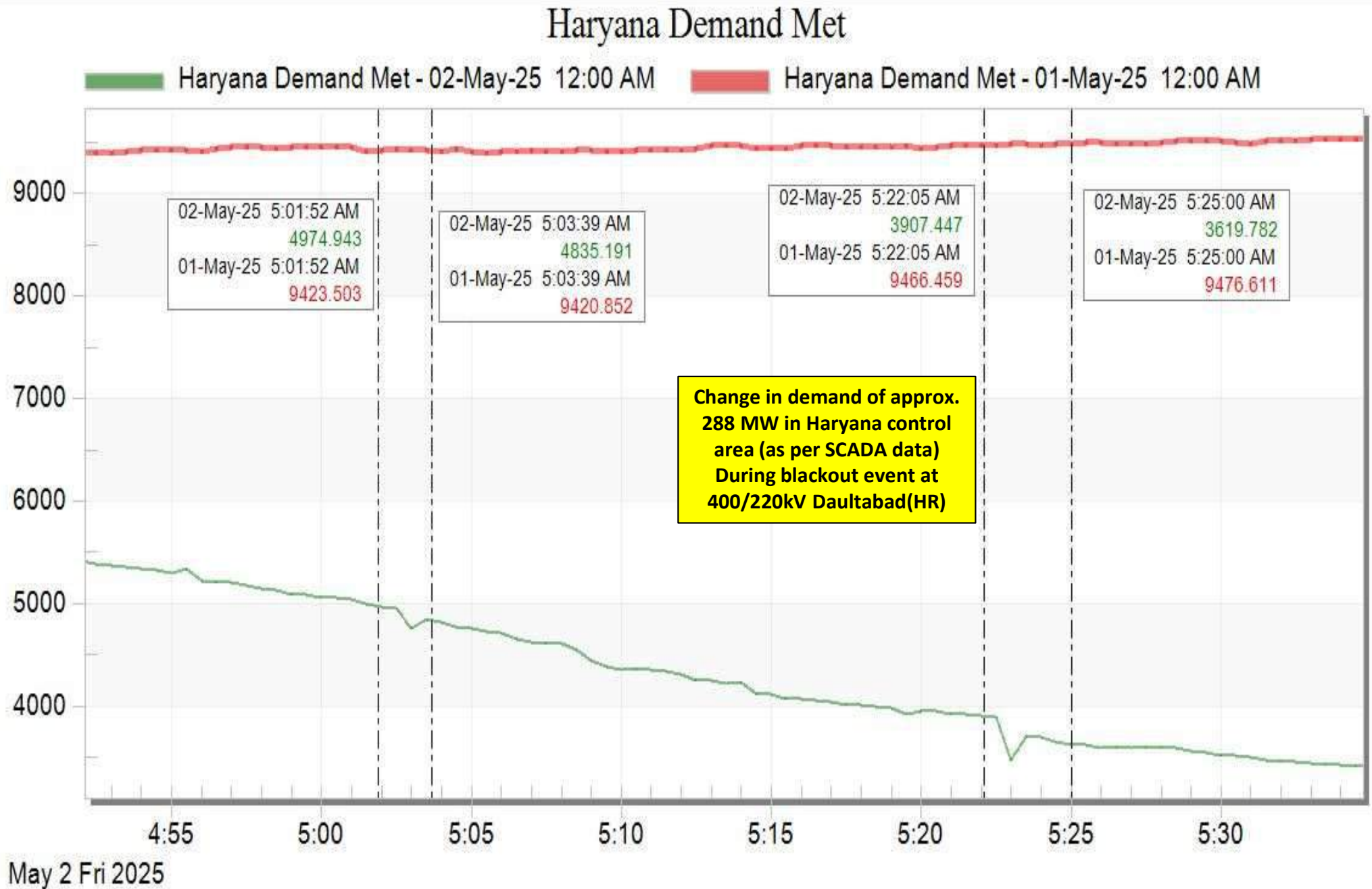
GEN-01

MGTPS generation during the event



May 2 Fri 2025

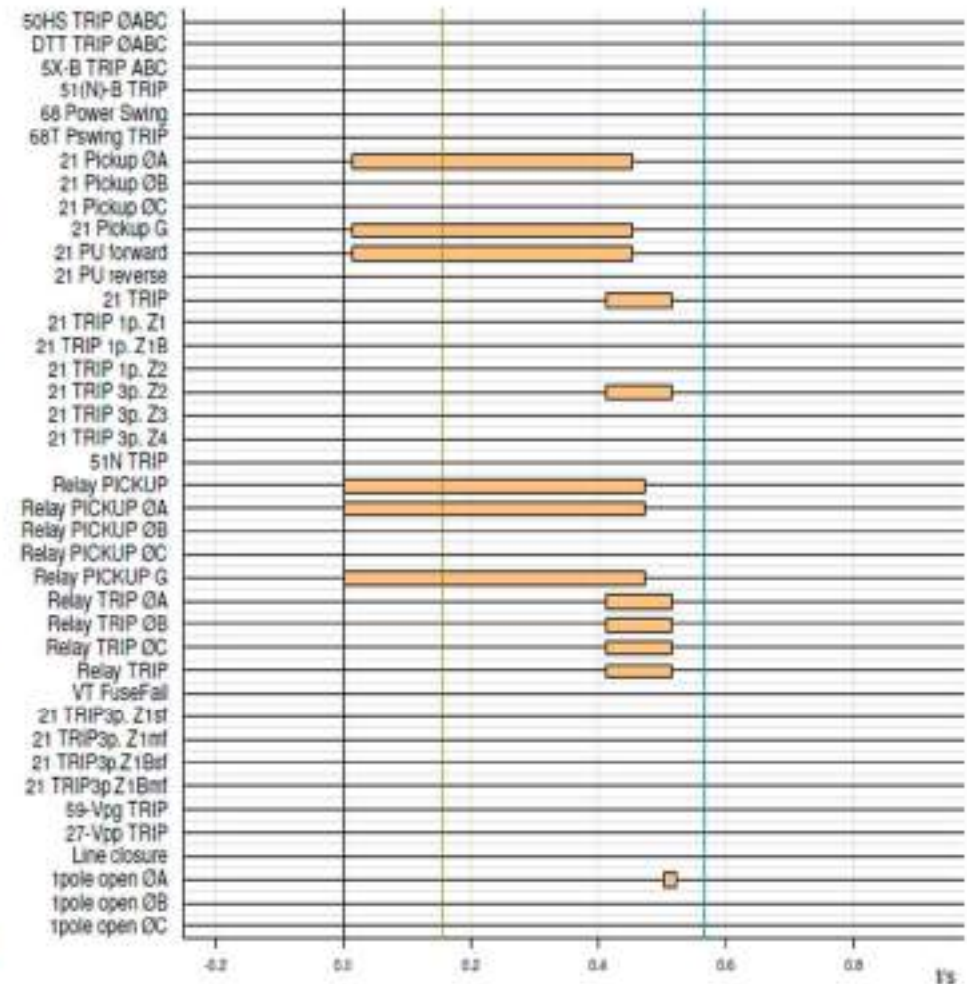
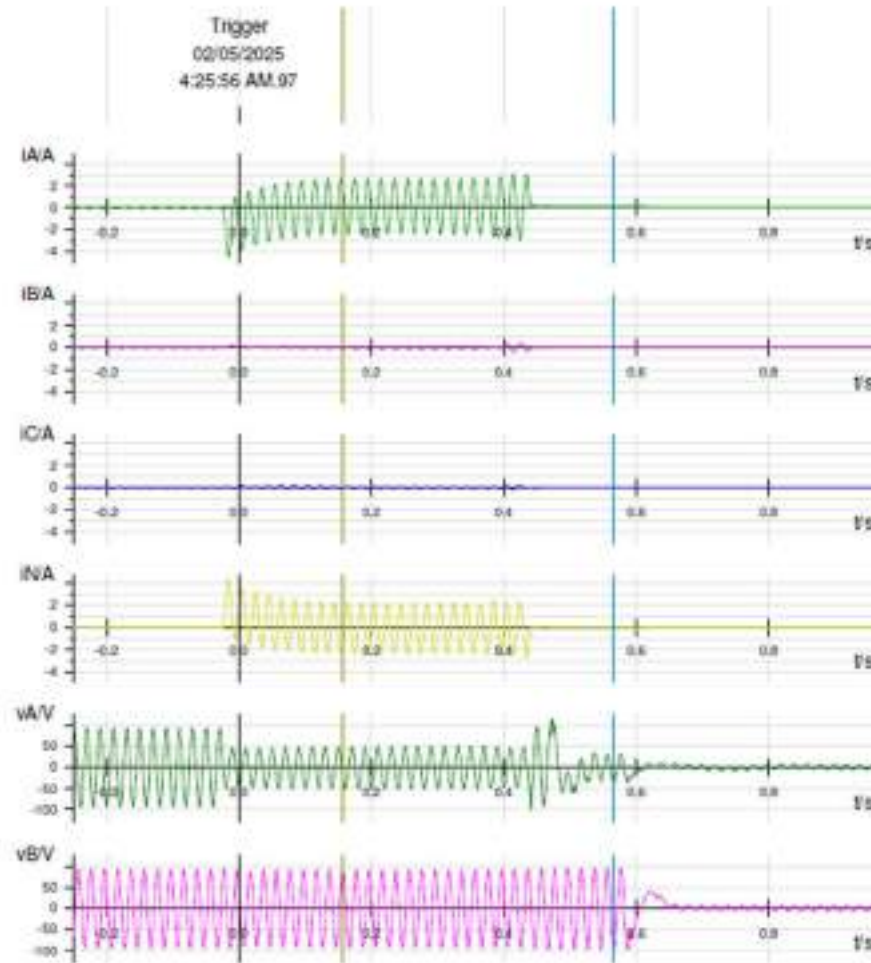
Haryana demand during the event



DR of 400 KV CLP Jhajjar(CLP)(end)-kabulpur Line-1

Station name: 400kv Jhajjar-kabulpur / Folder / New setting 21stMarch 16 Line-1 7SA611 V4.6 21.1
 URL: C:\Siemens\Digsi4\D4PROJ\400kv_
 Start time: 02/05/2025 / 4:25:56 AM.724
 Samplerate: 1000 Hz
 Display type: secondary
 Comment:

400kv Jhajjar-kabulpur / Folder / New setting 21stMarch 16 Line-1 7SA611 V4.6 2102/03/2025 / 4:25:56 AM.724

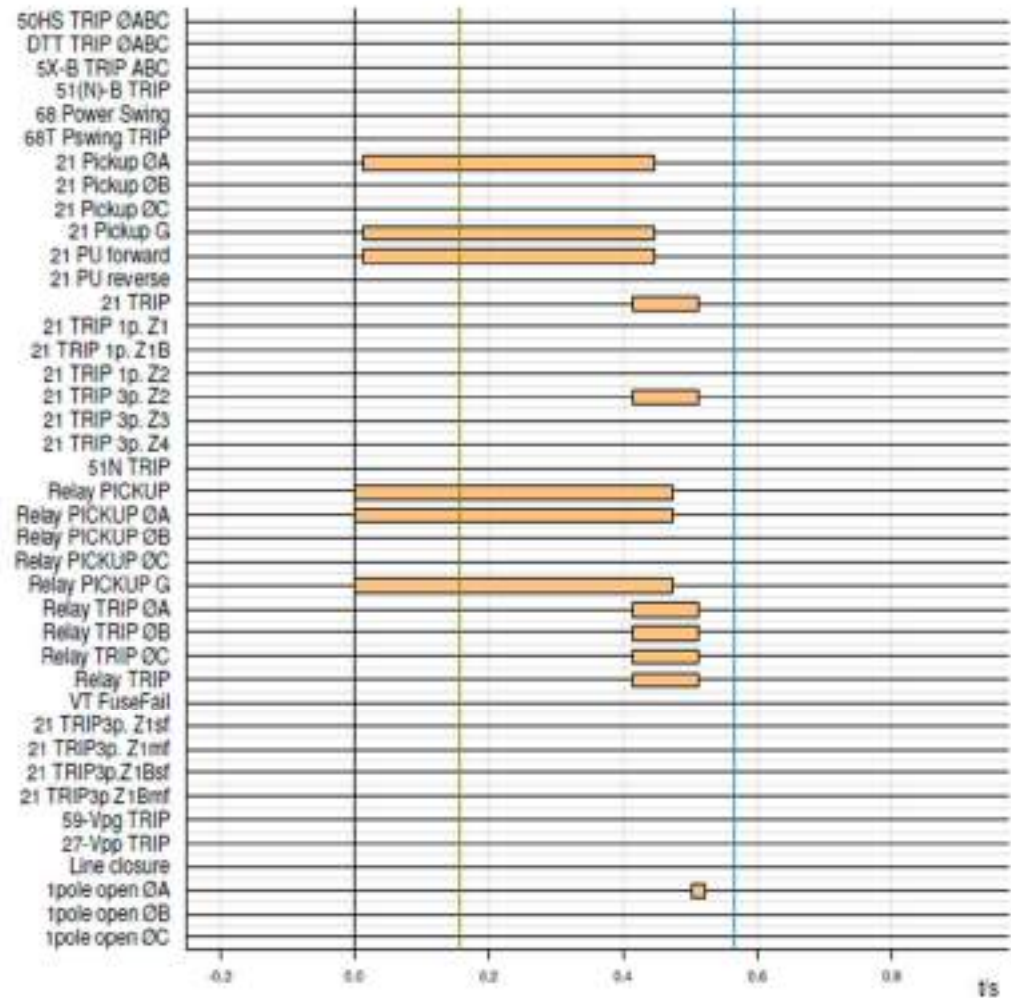
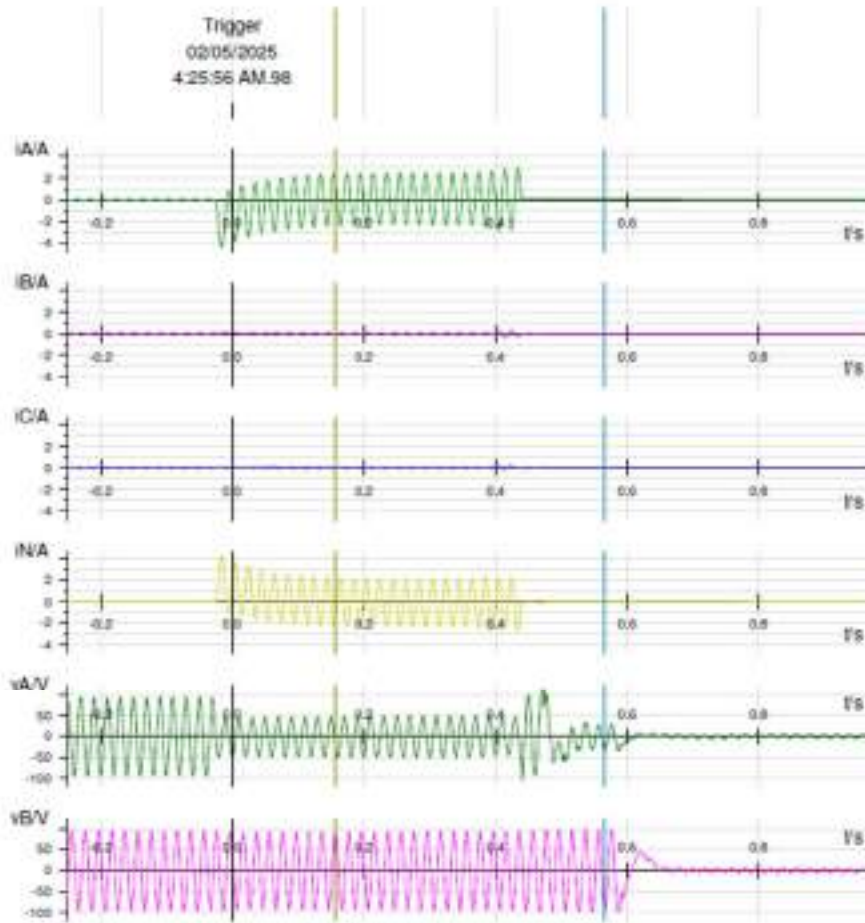


✓ R-N fault, Z-2, tripped with delay (~450msec).

DR of 400 KV CLP Jhajjar(CLP)(end)-kabulpur Line-1

Station name: 400kv Jharli-kabulpur / Folder / New setting 21stMarch 16 Line-2 7SA611 V4.6 21.1
 URL: C:\Siemens\Digsi4\D4PROJ\400kv_
 Start time: 02/05/2025 / 4:25:56 AM.725
 Samplerate: 1000 Hz
 Display type: secondary
 Comment:

400kv Jharli-kabulpur / Folder / New setting 21stMarch 16 Line-2 7SA611 V4.6 2022/05/2025 / 4:25:56 AM.72



✓ R-N fault, Z-2, tripped with delay (~450msec).

DR of 400 KV CLP Jhajjar(CLP)(end)-Daulatabad Line-1

400kv Jhajjar-kabalpur / Folder / New setting 21stMarch 16 Line-3 7SA611 V4.6 2102/05/2025 / 5:22:40 AM.233

Station name: 400kv Jhajjar-kabalpur / Folder / New setting 21stMarch 16 Line-3 7SA611 V4.6 21.1

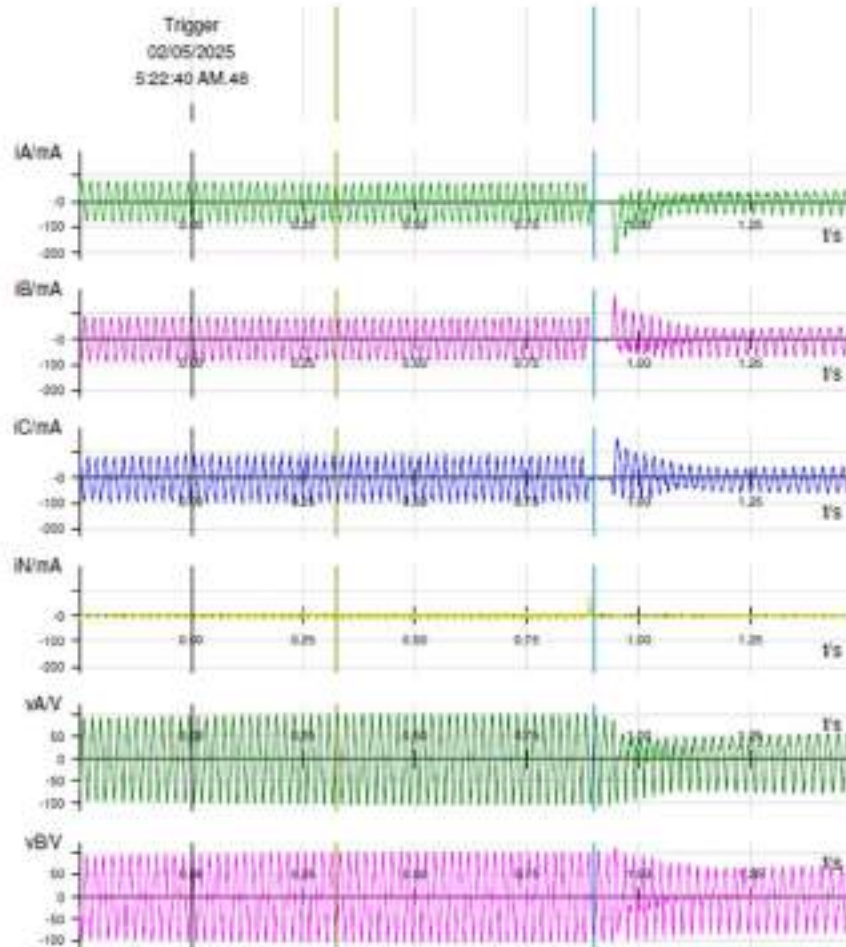
URL: C:\Siemens\Digsi4\PROJ\400kv_

Start time: 02/05/2025 / 5:22:40 AM.233

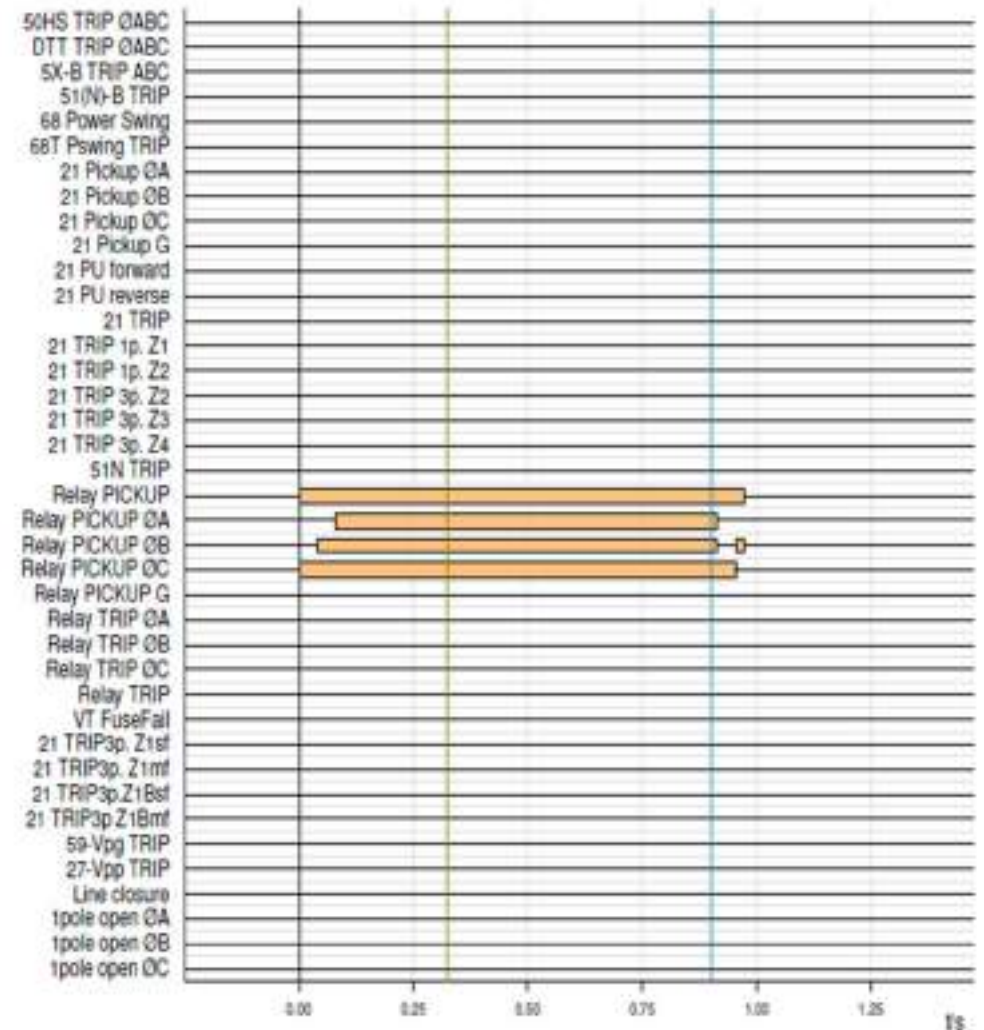
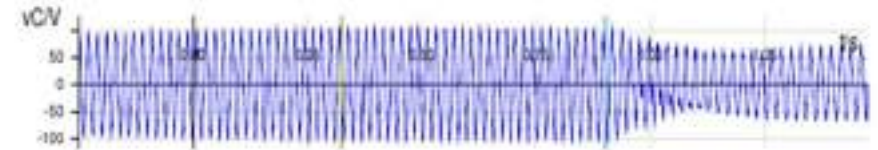
Samplerate: 1000 Hz

Display type: secondary

Comment:



400kv Jhajjar-kabalpur / Folder / New setting 21stMarch 16 Line-3 7SA611 V4.6 2102/05/2025 / 5:22:40 AM.233



✓ Momentary loss in current in all 3 phases observed.

DR of 400 KV CLP Jhajjar(CLP)(end)-Daulatabad Line-2

400kv Jhajjar-kabulpur / Folder / New setting 21stMarch 16 Line-2 YSA611 V4.6 2002/01/2025 / 5:22:40 AM,400

Station name: 400kv Jhajjar-kabulpur / Folder / New setting 21stMarch 16 Line-4 7SA611 V4.6 21.1

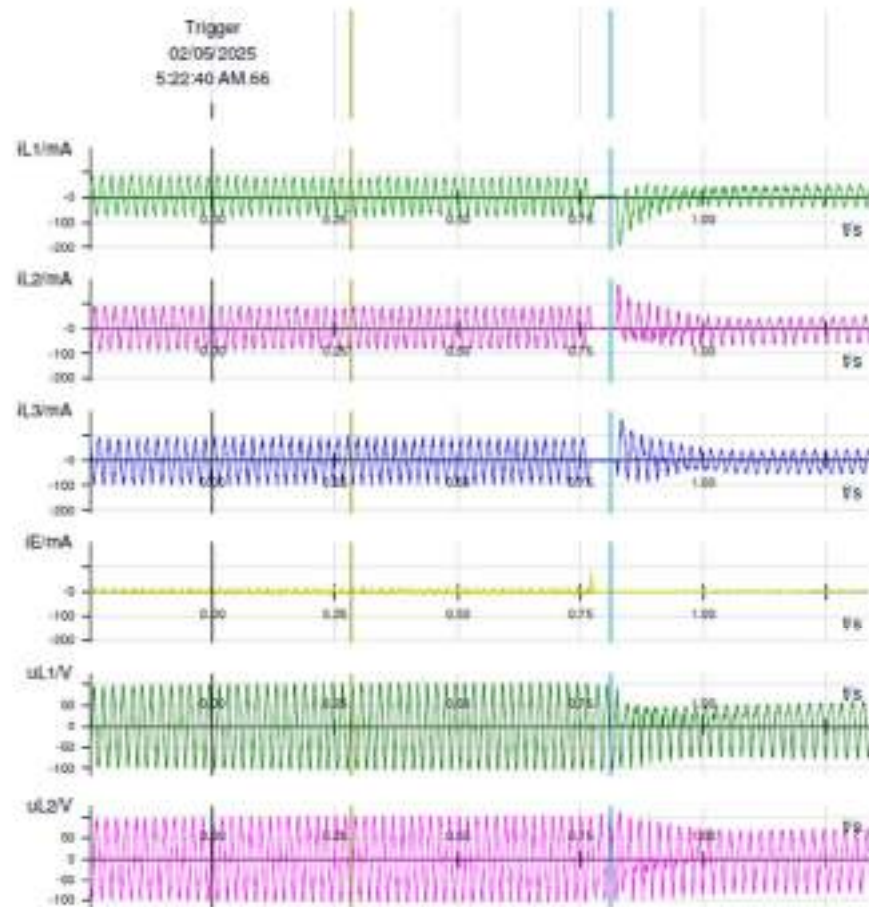
URL: C:\Siemens\Digsi4\4PROJ\400kv_

Start time: 02/05/2025 / 5:22:40 AM,406

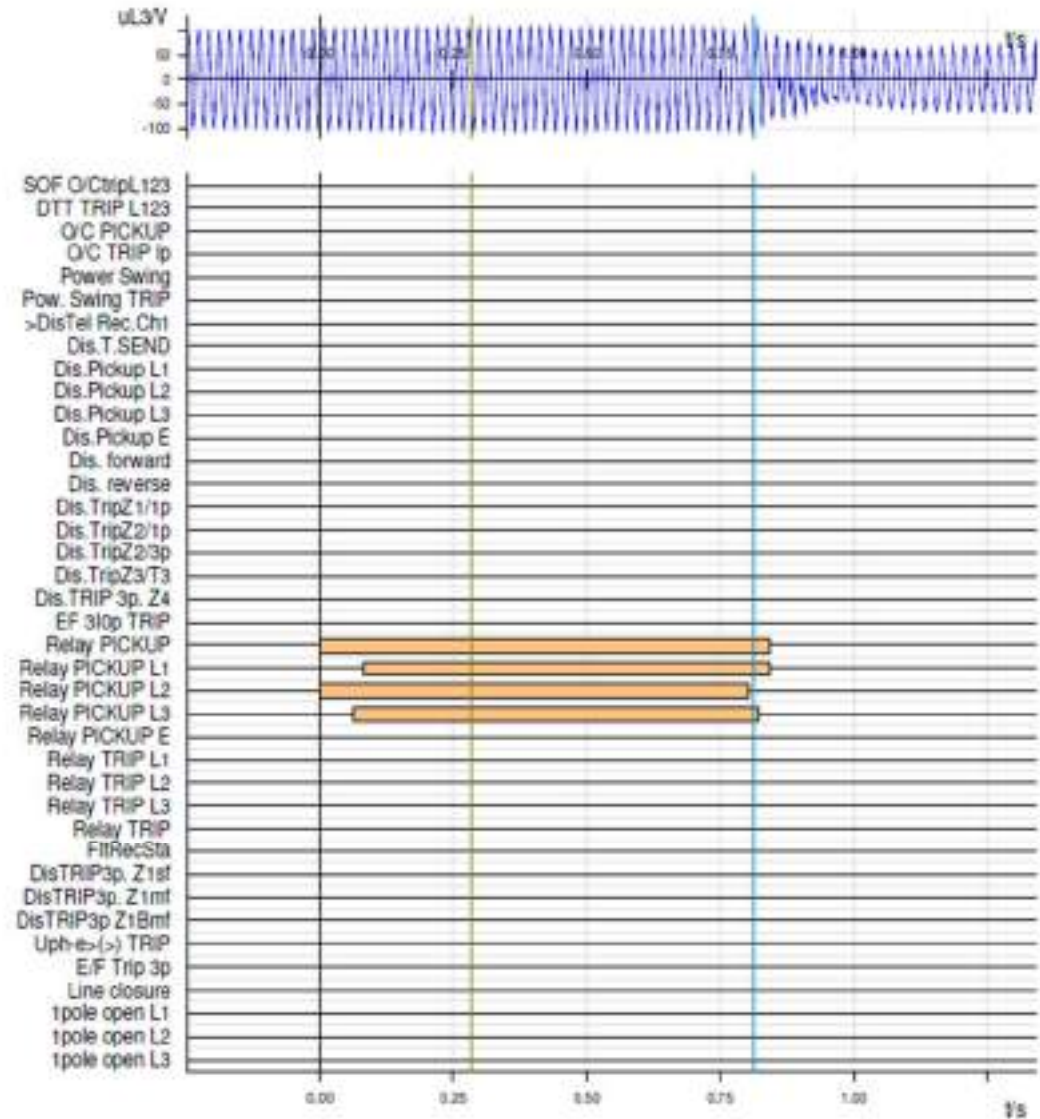
Samplerate: 1000 Hz

Display type: secondary

Comment:



400kv Jhajjar-kabulpur / Folder / New setting 21stMarch 16 Line-4 YSA611 V4.6 2002/01/2025 / 5:22:40 AM,40



✓ Momentary loss in current in all 3 phases observed.

PMU Plot of frequency at Gurgaon(PG)

05:22hrs/02-May-25



PMU Plot of phase voltage magnitude at Gurgaon(PG)

05:22hrs/02-May-25



R Y B Phase Voltages Angles

SCADA SOE

Time	Station Name	Voltage Level	Element Name	Element Type	Element Status	Remarks
05:22:41,389	MGTPS	400kV	MGTPS-UNIT-1	Circuit Breaker	Open	Tripping of main CB of 660 MW JHAJJAR(CLP) - UNIT 1
05:22:41,405	MGTPS	400kV	MGTPS UNIT-2	Circuit Breaker	Open	Tripping of main CB of 660 MW JHAJJAR(CLP) - UNIT 2

Point of discussion

- i) Reason of loss of current in all three phases in both the lines (400 KV CLP Jhajjar(CLP)-Dhanonda(HV) (HVPNL) D/C) and their tripping need to be shared. There was not fault observed in grid during the tripping time.
- ii) Exact reason and sequence of protection operated during tripping need to be shared.
- iii) DR/EL along with tripping report for each element need to be shared from both the ends.
- iv) Remedial action taken report to be shared.

Multiple Element Tripping Event at 400/220kV Kabulpur(HV)

At 04:25 hrs on 02.05.2025

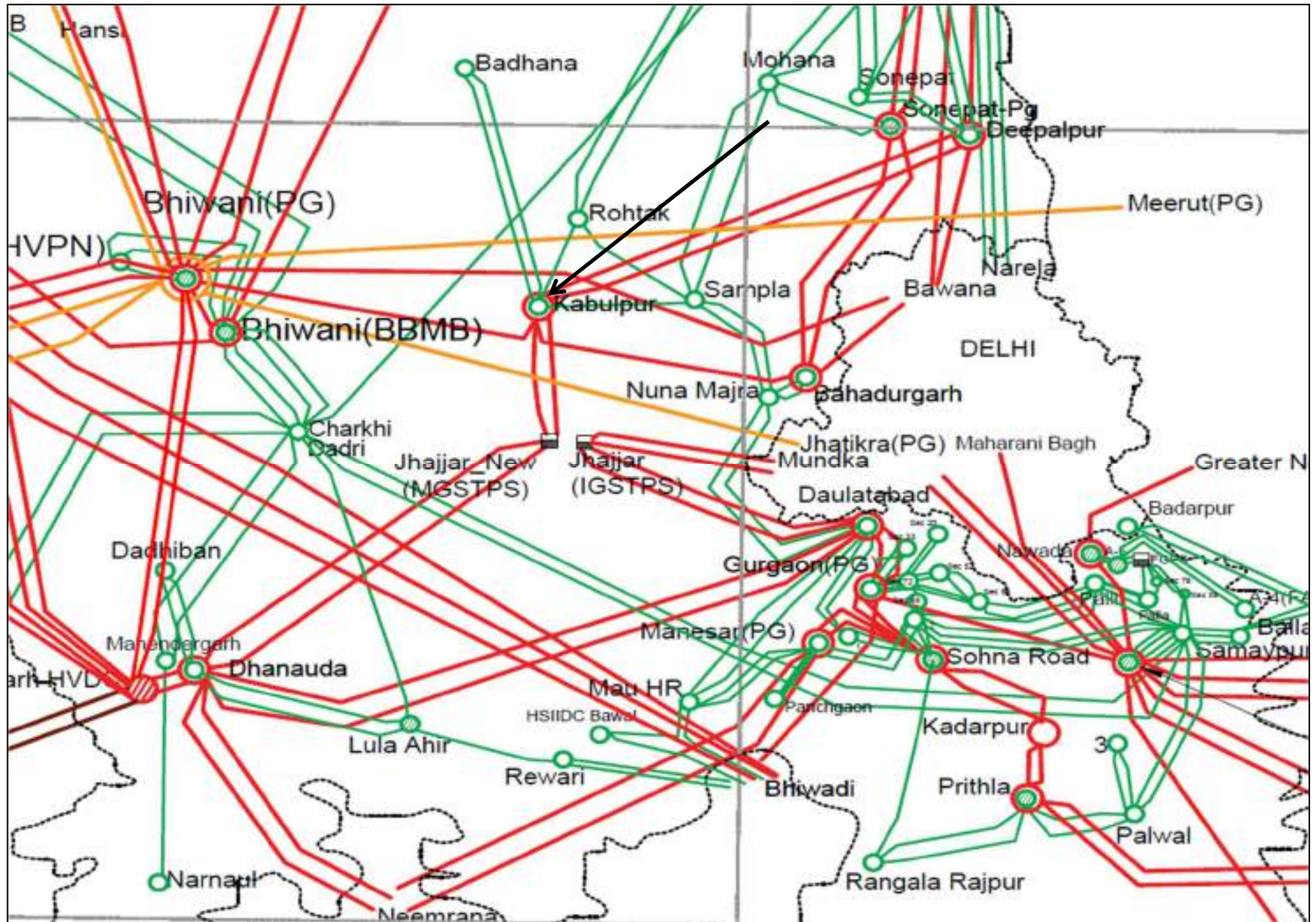
Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	400 KV Deepalpur(JHKT)- <u>Kabulpur(HV) (HVPNL) Ckt-1</u>	04:25 <u>hrs</u>	09:53 <u>hrs</u>	Details Awaited
2.	400 KV Deepalpur(JHKT)- <u>Kabulpur(HV) (HVPNL) Ckt-2</u>		07:32 <u>hrs</u>	Details Awaited
3.	400 KV CLP Jhajjar(CLP)- <u>Kabulpur(HV) (HVPNL) Ckt-1</u>		10:16 <u>hrs</u>	R-N fault
4.	400 KV CLP Jhajjar(CLP)- <u>Kabulpur(HV) (HVPNL) Ckt-2</u>		10:20 <u>hrs</u>	R-N fault
5.	400 KV Bahadurgarh(PG)- <u>Kabulpur(HV) (PG) Ckt-1</u>		08:24 <u>hrs</u>	Details Awaited
6.	400/220 KV 315MVA ICT-2 at <u>Kabulpur(HV)</u>			Details Awaited

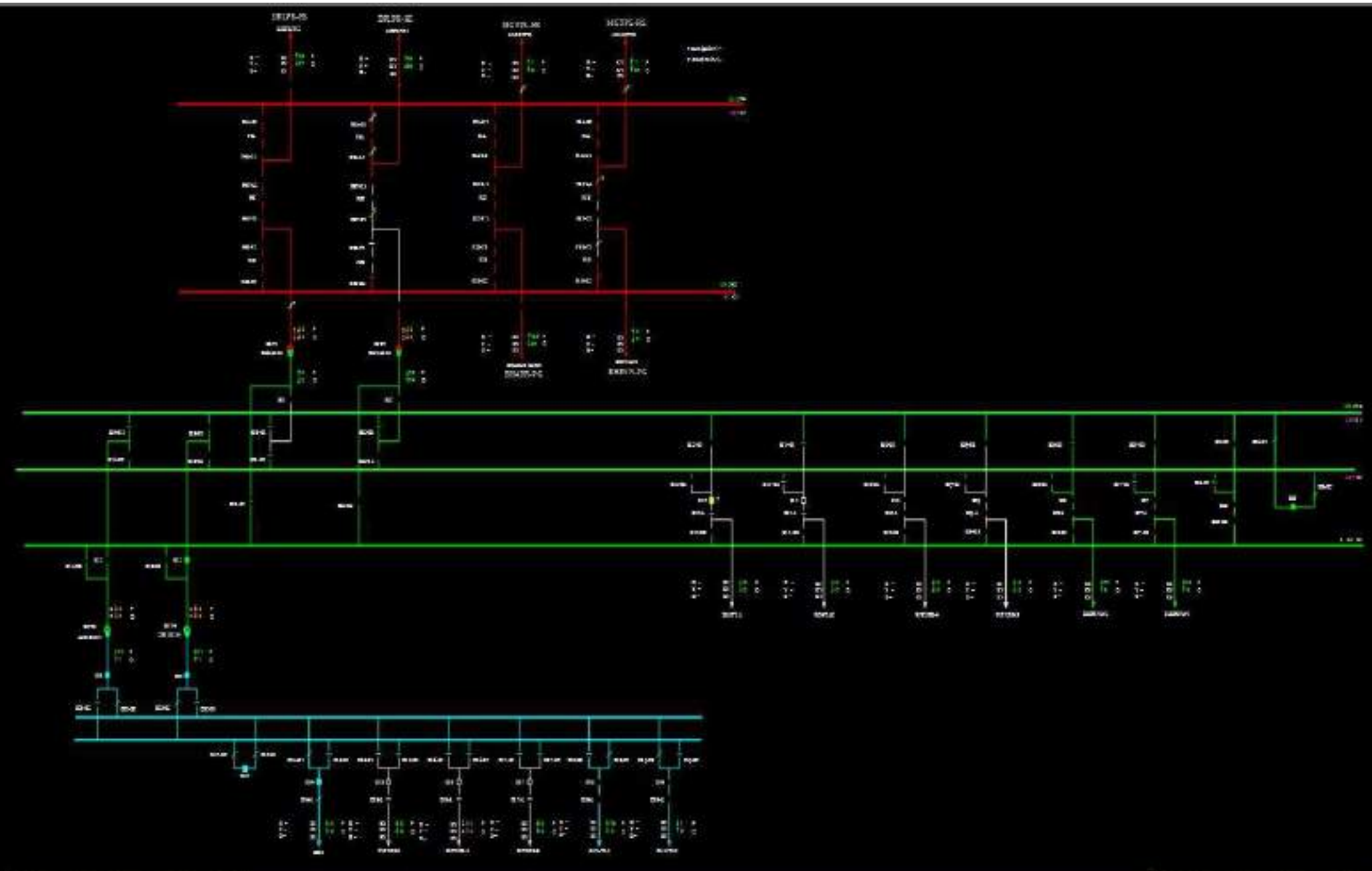
Brief details of the event

- i) 400/220/132kV Kabulpur sub-station has one and half breaker arrangement at 400kV side and double main and transfer bus scheme in 220KV side .
- ii) During antecedent condition, 400 KV Bhiwani(PG)-Kabulpur(HV) (PG) was out of service along with 400/220 KV 315MVA ICT-1.
- iii) As reported, at 04:25 hrs, 400 KV CLP Jhajjar(CLP)-Kabulpur(HV) (HVPNL) Ckt-2 tripped on R-N phase to earth fault. As per DR, Z-2 distance protection operated, with fault current of 5.06 KA and the fault distance was 60.9KM from Jhajjar end.
- iv) At the same time, 400 KV CLP Jhajjar(CLP)-Kabulpur(HV) (HVPNL) Ckt-1 tripped on R-N phase to earth fault. As per DR, Z-2 distance protection operated, with fault current of 5.23 KA the fault distance was 58.23KM from Jhajjar end.
- v) During the same time, 400 KV Deepalpur(JHKT)-Kabulpur(HV) (HVPNL) Ckt-1, Ckt-2, 400 KV Bahadurgarh(PG)- Kabulpur(HV) (PG) Ckt-1 and 400/220 KV ICT-2 at Kabulpur(HV) tripped (tripping details awaited).
- vi) Since the fault was not cleared at 400KV, it led to subsequent complete tripping of all transmission elements at 220KV and 132KV voltage level. This led to blackout of 400/220/132KV station. (Details of protection operation and sequence of tripping not received yet from Haryana)
- vii) As per PMU at Gurgaon(PG), R-N phase to earth fault is observed with delayed fault clearance of 480msec.
- viii) As per SCADA, change in demand of approx. 167MW in Haryana controlled area are observed.

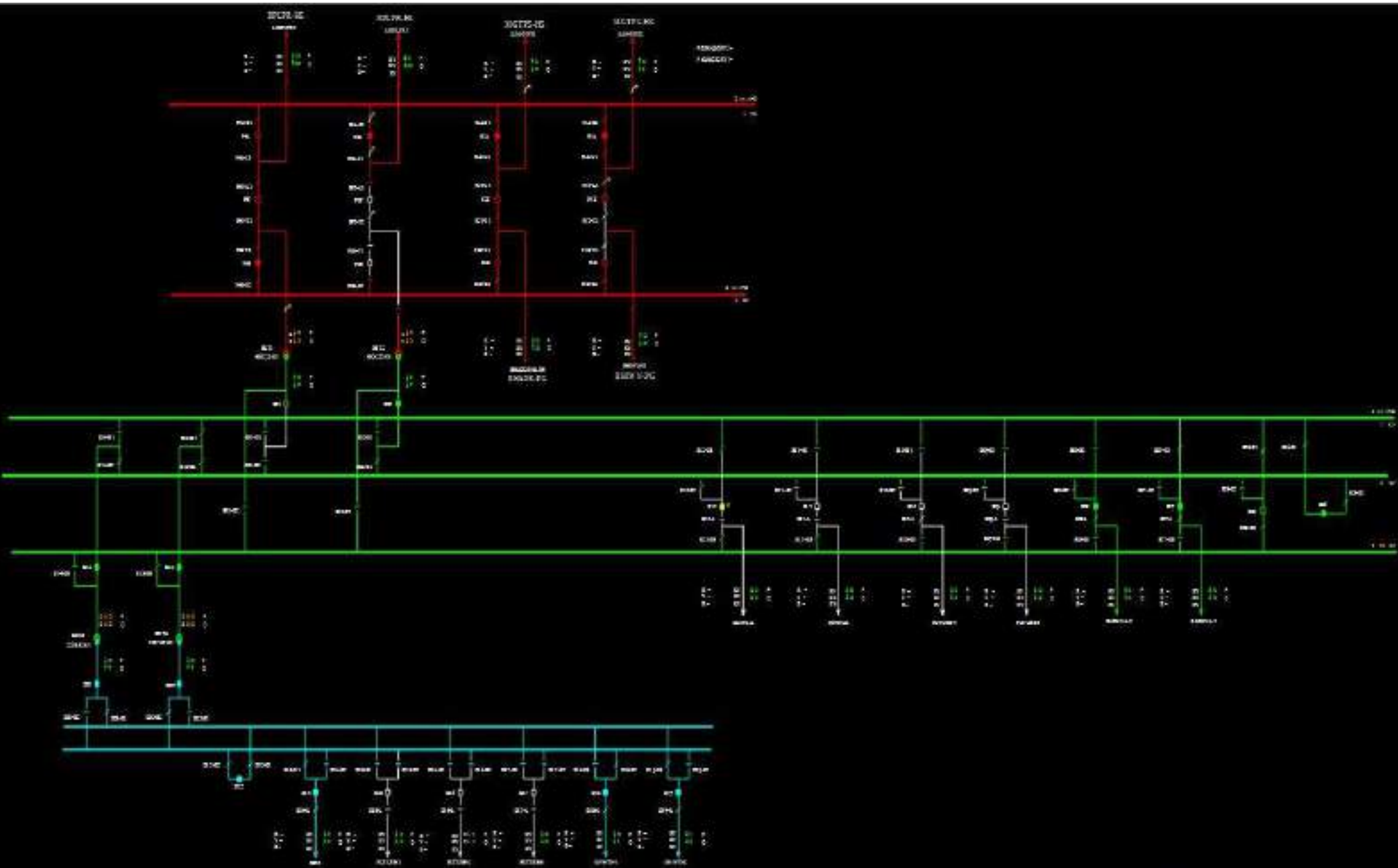
Network Diagram before the event



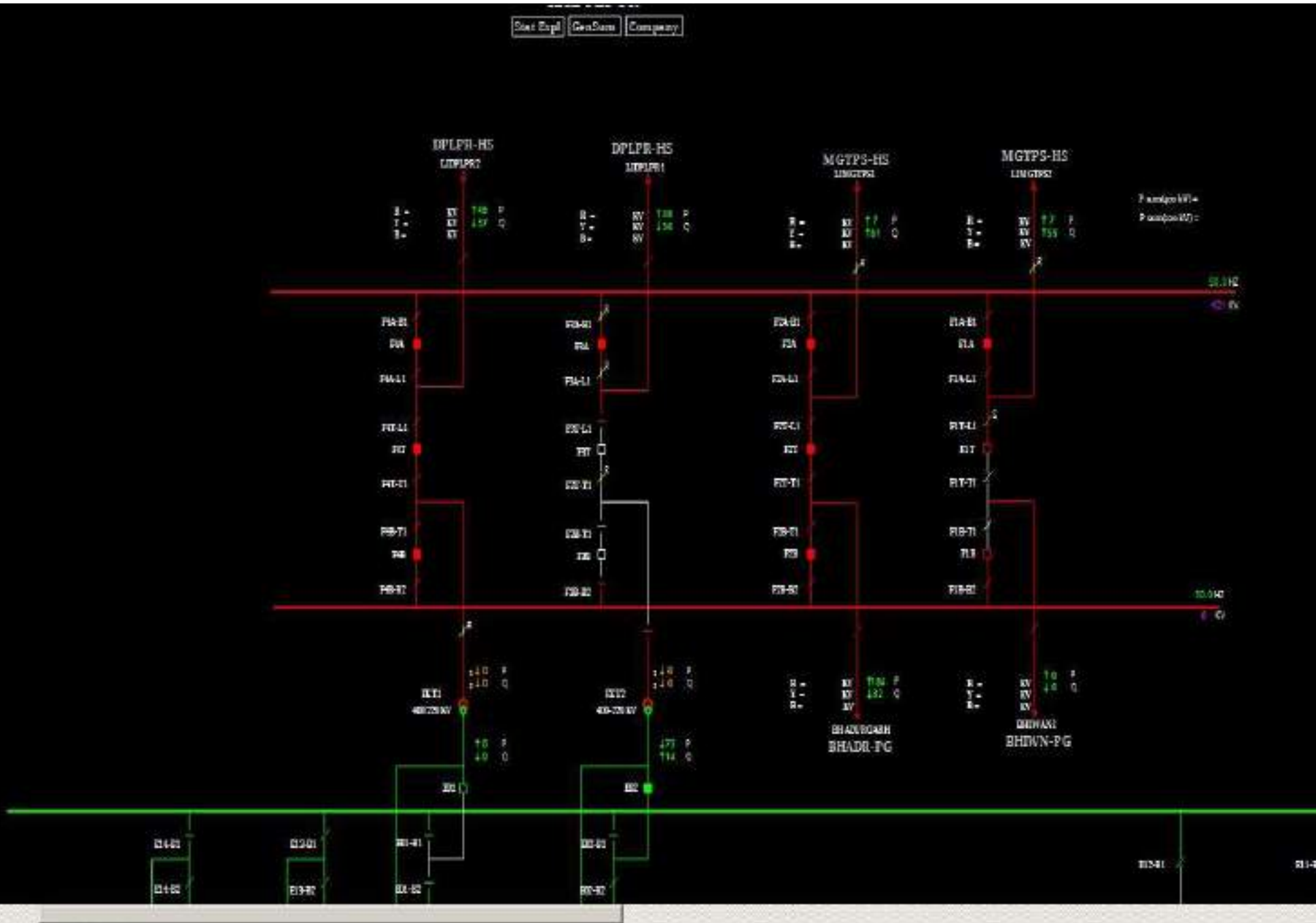
SLD of 400kV Kabulpur(HV) before the event



SLD of 400kV Kabulpur(HV) after the event

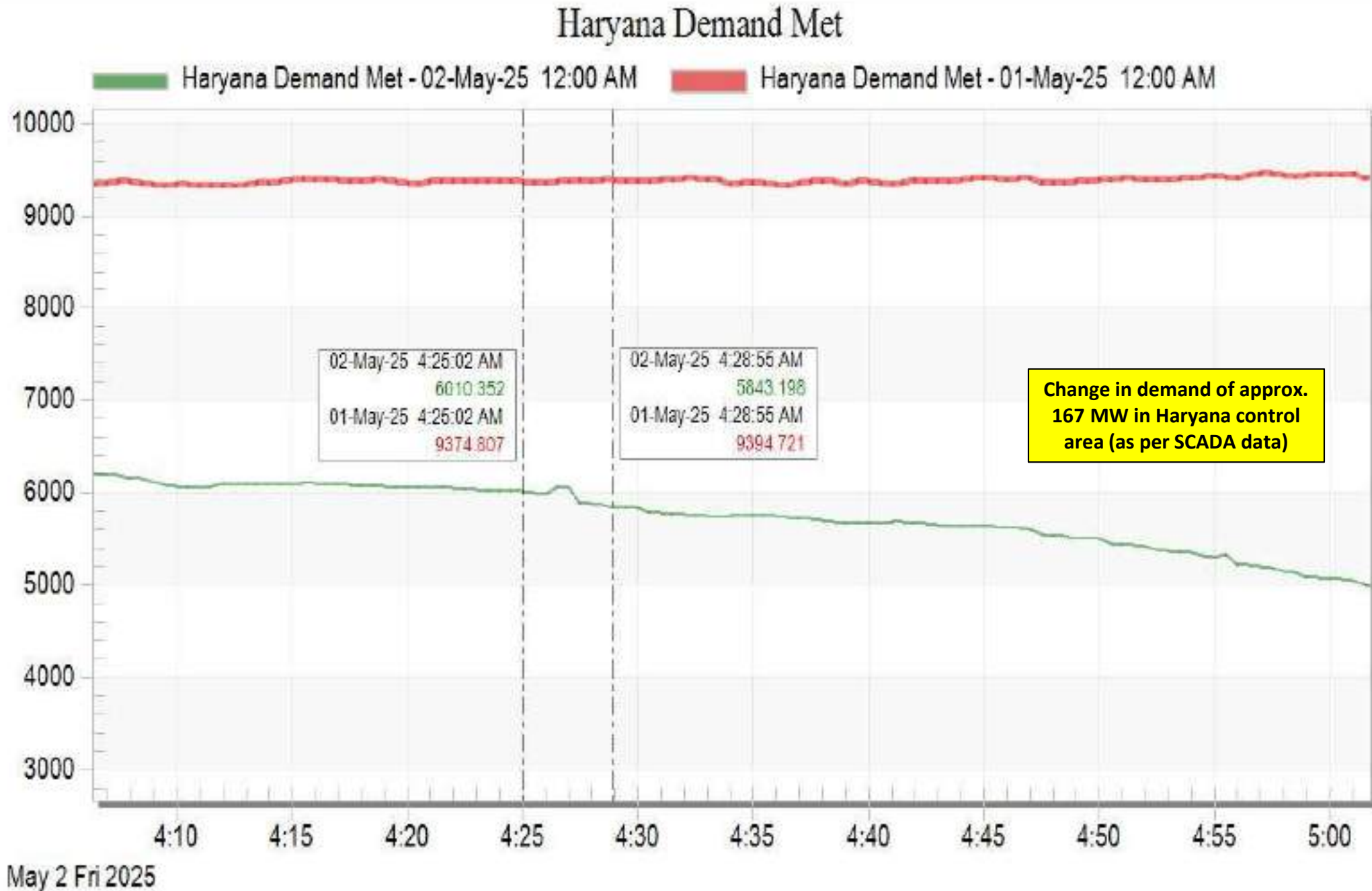


SLD of 400kV Kabulpur(HV) before the event zoomed



SLD of 400kV Kabulpur(HV) after the event zoomed

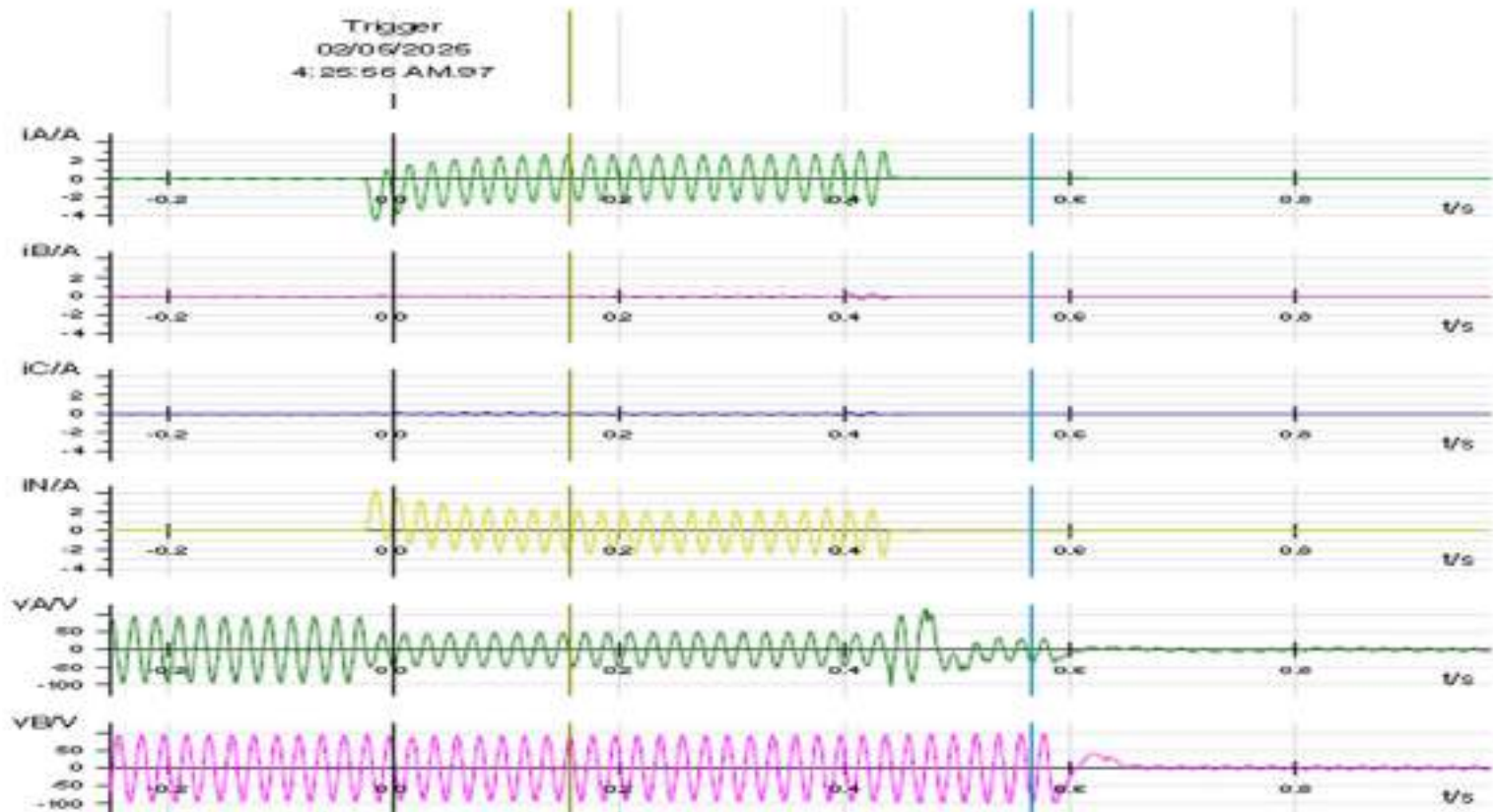
Haryana demand during the event



DR of 400 KV CLP Jhajjar(CLP)(end)-Kabulpur(HV) (HVPNL) Ckt-1

400kv Jharli-kabulpur / Folder / New setting 21stMarch 16 Line-1 75A631 V4.6 2102/05/2025 / 4:25:56 AM.724

Station name: 400kv Jharli-kabulpur / Folder / New setting 21stMarch 16 Line-1 75A611 V4.6 21.1
URL: C:\Siemens\Digsi4\4PROJ\400kv_
Start time: 02/05/2025 / 4 25:56 AM.724
Samplerate: 1000 Hz
Display type: secondary
Comment:

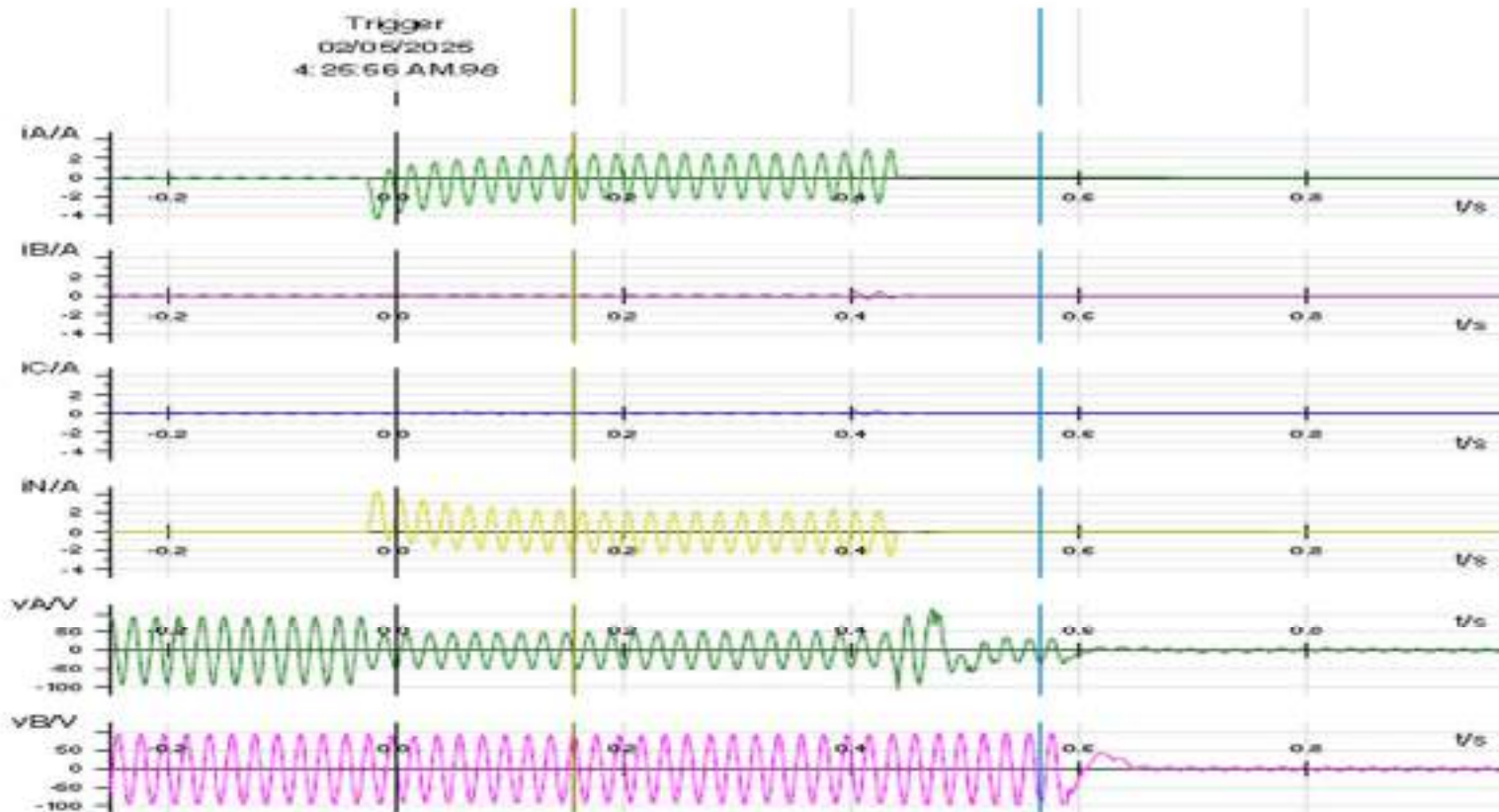


- ✓ R-N phase to earth fault observed.
- ✓ Delayed fault clearance of 480msec observed.

DR of 400 KV CLP Jhajjar(CLP)(end)-Kabulpur(HV) (HVPNL) Ckt-2

400kv Jhajjar-kabulpur / Folder / New setting 21stMarch 16 Line-2 7SA611 V4.6 2102/05/2025 / 4:25:56 AM.725

Station name: 400kv Jhajjar-kabulpur / Folder / New setting 21stMarch 16 Line-2 7SA611 V4.6 21.1
URL: C:\Siemens\Digsi4\D4PROJ\400kv_
Start time: 02/05/2025 / 4:25:56 AM.725
Samplerate: 1000 Hz
Display type: secondary
Comment:



SIGMA4-PlugIn

- 1 -

- ✓ R-N phase to earth fault observed.
- ✓ Delayed fault clearance of 480msec observed.

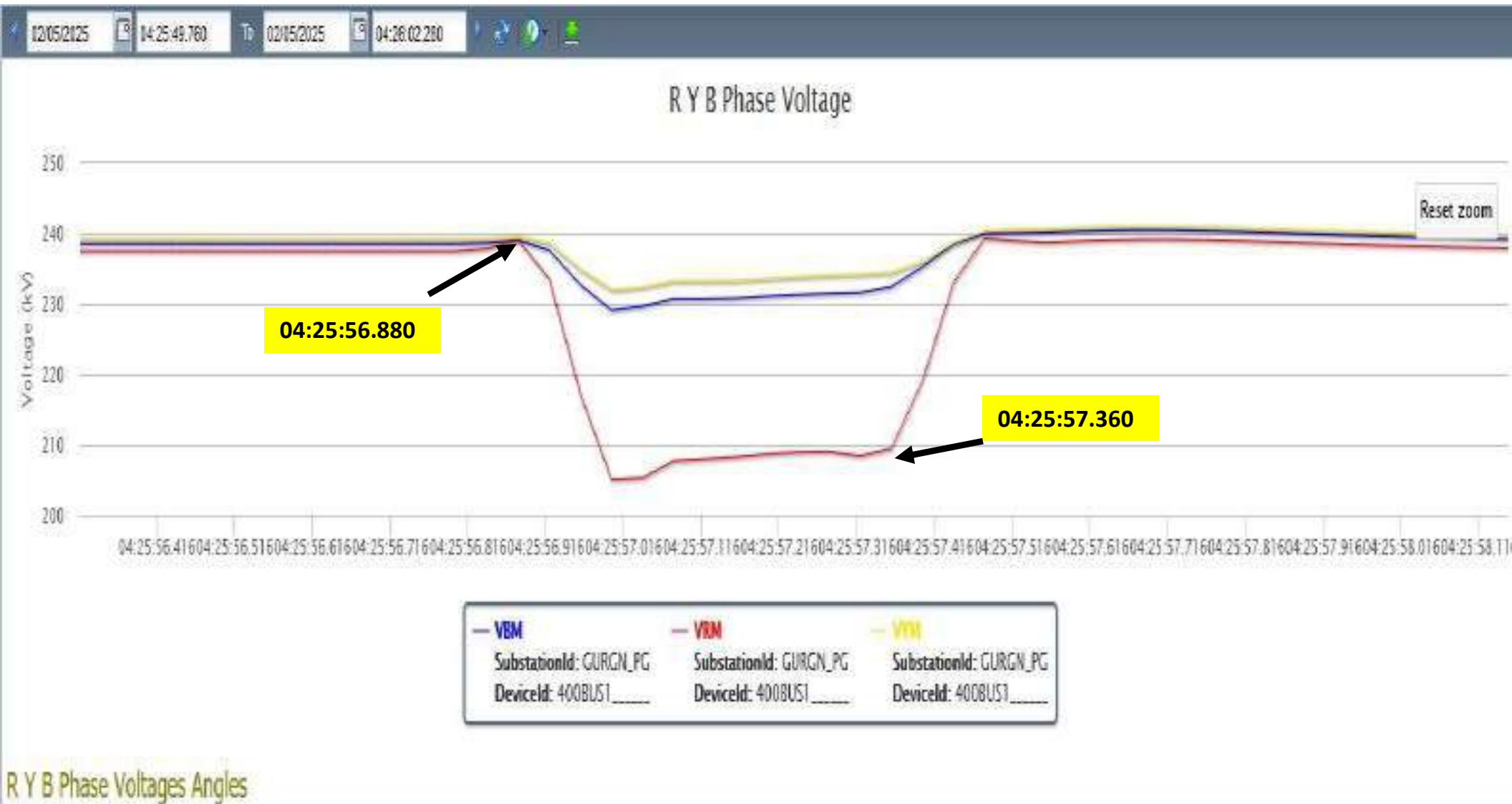
PMU Plot of frequency at Gurgaon(PG)

04:25hrs/02-May-25



PMU Plot of phase voltage magnitude at Gurgaon(PG)

04:25hrs/02-May-25



SCADA SOE

Time	Station Name	Voltage Level	Element Name	Element Type	Element Status	Remarks
04:25:57,626	KABULPUR	400kV	2TMG1TIE	Circuit Breaker	Open	
04:25:57,640	KABULPUR	400kV	2BTIE	Circuit Breaker	Open	
04:25:57,682	KABULPUR	400kV	4TDP1T2	Circuit Breaker	Open	Tripping of Tie CB of 400 KV Deepalpur(JHKT)-Kabulpur(HV) (HVPNL) Ckt-2
04:25:57,689	KABULPUR	400kV	4ADPLPR2	Circuit Breaker	Open	Tripping of Main CB of 400 KV Deepalpur(JHKT)-Kabulpur(HV) (HVPNL) Ckt-2

Points for Discussion

- i) Reason of delayed clearance of fault need to be shared.
- ii) Exact reason and sequence of protection operated during tripping need to be shared.
- iii) DR/EL(.cfg/.dat) along with tripping report for each element need to be shared from both the ends.
- iv) Remedial action taken report to be shared.

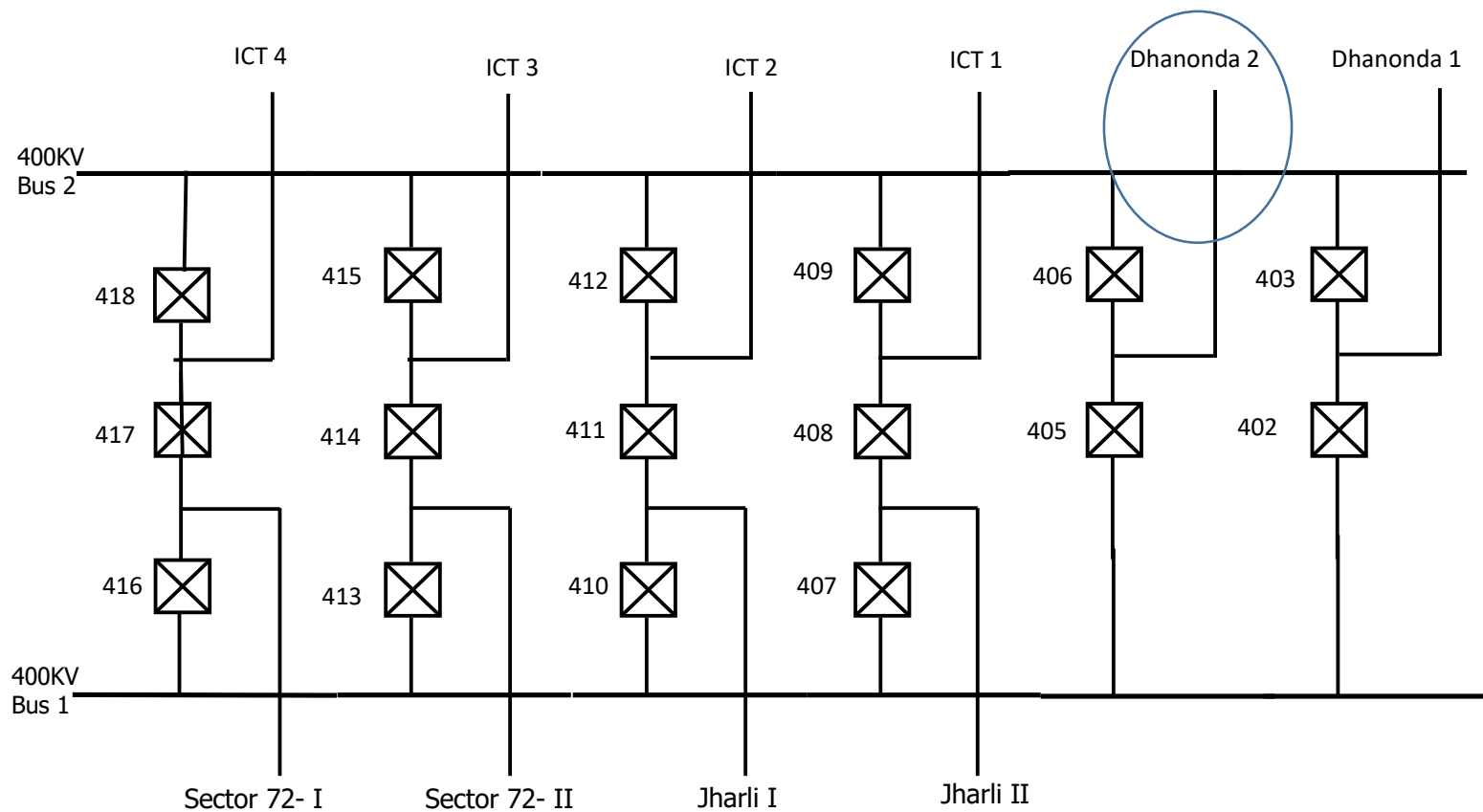
Tripping analysis report in respect of disturbance occurred on 02.05.2025 at 05:25 Hrs. at 400 KV Sub Station, HVPNL Daultabad.

1. Description of Disturbance

On dated 02.05.2025, following transmission elements were already in tripped condition at 400 kV sub-station, HVPNL, Daultabad :

Sr. No.	Name of Element	Line length	Time of Tripping (Hrs)		Relay Operated	
			From	To	This end	Other End
1.	400kV Daultabad-Jhajjar Ckt-2	64	04:07:40	08:27	DPR, Z-1, D=37.6Km, A/R lockout, Ib=6.42 kA	Zone-1 B-ph, D=6.2km, Ib=18.69 kA
2.	400kV Daultabad-Jhajjar Ckt-1	64	04:55:22	09:43	Z-1, D-=3.6Km, Ir= 22.3kA R&Y-ph Master 86 relay	Z-1, D-=44.7Km, R-Ph, Earth fault, Ir=7.03 kA, Master86 relay
3.	400 kV Daultabad-Sector 72 (PG) Ckt-1	20.6	04:55:25	07:52	DPR, Z-1, Dist=10.693 kM, Fault Current=7.522 kA, A/R optd, but again tripped in reclaim time.	Phase-BN, Location=12.8 kM, Fault current=16.5 kA
4.	400kV Daultabad -Dhanonda- Ckt-1	77.6	04:55:35	16:12	Carrier received, DPR, Z-1, D=1.2Km, Ir=20.17 kA R-ph, MR-86	DPR, Z-1, D=61.77Km, R-ph 5.632 kA, Master86 relay
5.	400 kV Daultabad-Sector 72 (PG) Ckt-2	20.6	05:02:38	08:07	Zone-1, Ib=6.49kA, Distance=4.7 km, A/R optd, but again tripped in reclaim time.	Phase-BN, Location=13.2 kM, Fault current=16.69 kA
6.	400kV Dhanonda-Daultabad Ckt-2	77.6	05:23	08:00	Not tripped	Supply failed
7.	400/220KV 315MVA ICT-1, 2, 3 & 4	-	05:25	07:52	Supply failed	

2. SLD of 400 kV Sub-station Daultabad:



3. Sequence of Events:

Time of event	400kV Daultabad-Jhadli ckt-2
4:07:40:833 Hrs	At Daultabad end; DPR sensed B-phase to earth fault and line tripped. As per Main-1 relay : Zone-1, Ib=6.42kA, Distance =37.6km, A/R L/O Line tripped during thunderstorm in the area. No visual fault found during line patrolling.
4:55:22:363 Hrs	400kV Daultabad-Jhadli ckt-1
	At Daultabad end; DPR sensed R-phase to earth fault and line tripped. As per Main-1 relay : Zone-1, Ir= 22.3kA, Distance =3.6km, A/R L/O Line tripped during thunderstorm in the area. No visual fault found during line patrolling.
04:55:22.364Hrs	400kV Daultabad-Sec 72 ckt-1
	At Daultabad end; DPR sensed R-phase to earth fault and line tripped. As per Main-2 relay : Zone 1, Ir=7.52kA, A/R cmd, Ir=7.49kA, Distance=10.75km, A/R L/O Line tripped during thunderstorm in the area. No visual fault found during line patrolling.
04:55:35.260Hrs	400kV Daultabad-Dhanonda ckt-1
	At Daultabad end; DPR sensed R-phase to earth fault and line tripped. As per Main-1 relay : Zone 1, Ir=20.17kA, distance =1.2km. R-ph LA base insulator broken & replaced with new at 400kV Daultabad end
05:02:38.013Hrs	400kV Daultabad-Sec 72 ckt-2
	At Daultabad end; DPR sensed B-phase to earth fault and line tripped. As per Main-1 relay: Zone-1, Ib=6.49kA, Distance=4.7km, A/R cmd, Ib=6.5kA, Distance=4.7km, A/R L/O.

	Line tripped during thunderstorm in the area. No visual fault found during line patrolling.
5:23 Hrs	400kV Daultabad-Dhanonda ckt-2
	Supply failed from 400kV Dhanonda.

- i) DR/EL of the lines/TFs are attached in **Annexure-I**.

4. Observation/Root Cause Analysis:

- a. **400kV Daultabad-Jhadli ckt-2 , 400kV Daultabad-Jhadli ckt-1 , 400kV Daultabad-Sec 72 ckt-1 and 400kV Daultabad-Sec 72 ckt-2** tripped due to single phase to ground fault during windstorm/ thunderstorm in the area. No visual fault found during line patrolling.
- b. **400kV Daultabad-Dhanonda ckt-1** tripped due to single phase to ground fault as R-ph LA base insulator found broken at Daultabad end.
- c. **400kV Daultabad-Dhanonda ckt-2 , 400/220KV 315MVA ICT-1, 400/220KV 315MVA ICT-2, 400/220KV 315MVA ICT-3, 400/220KV 315MVA ICT-4**

Reason : Suuply failed from 400 kV Dhanonda.

5. Remedial Measures :

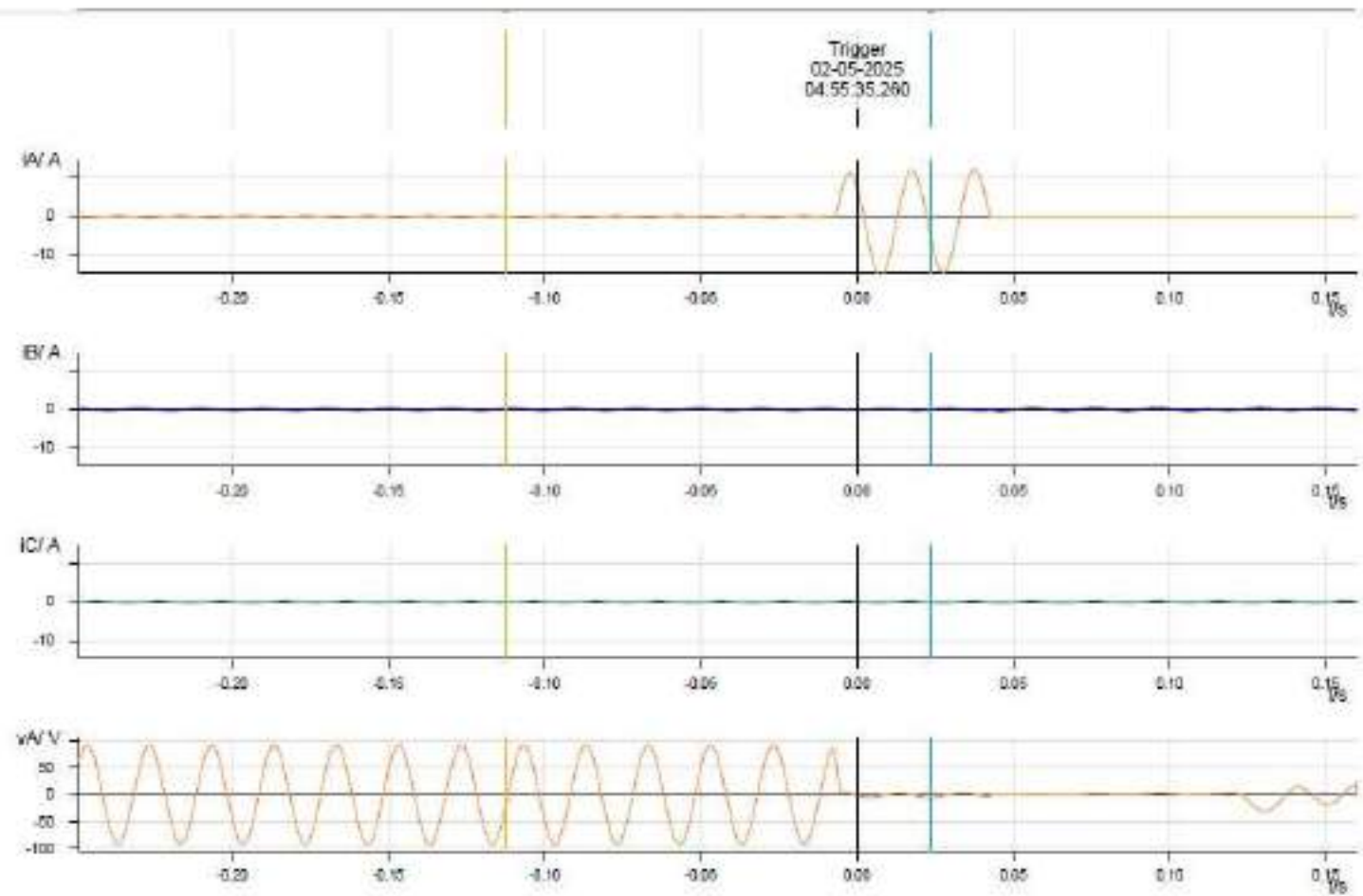
- a. 400 kV R-ph damaged LA of Dhanonda Ckt-1 at Daultabad end replaced with new LA on 02.05.2025.
- b. Auto reclose be made healthy on 400 kV Daultabad-Jhajjar Ckt-2, 400 kV Daultabad-Dhanonda Ckt 1 & 2 at Daultabad end.

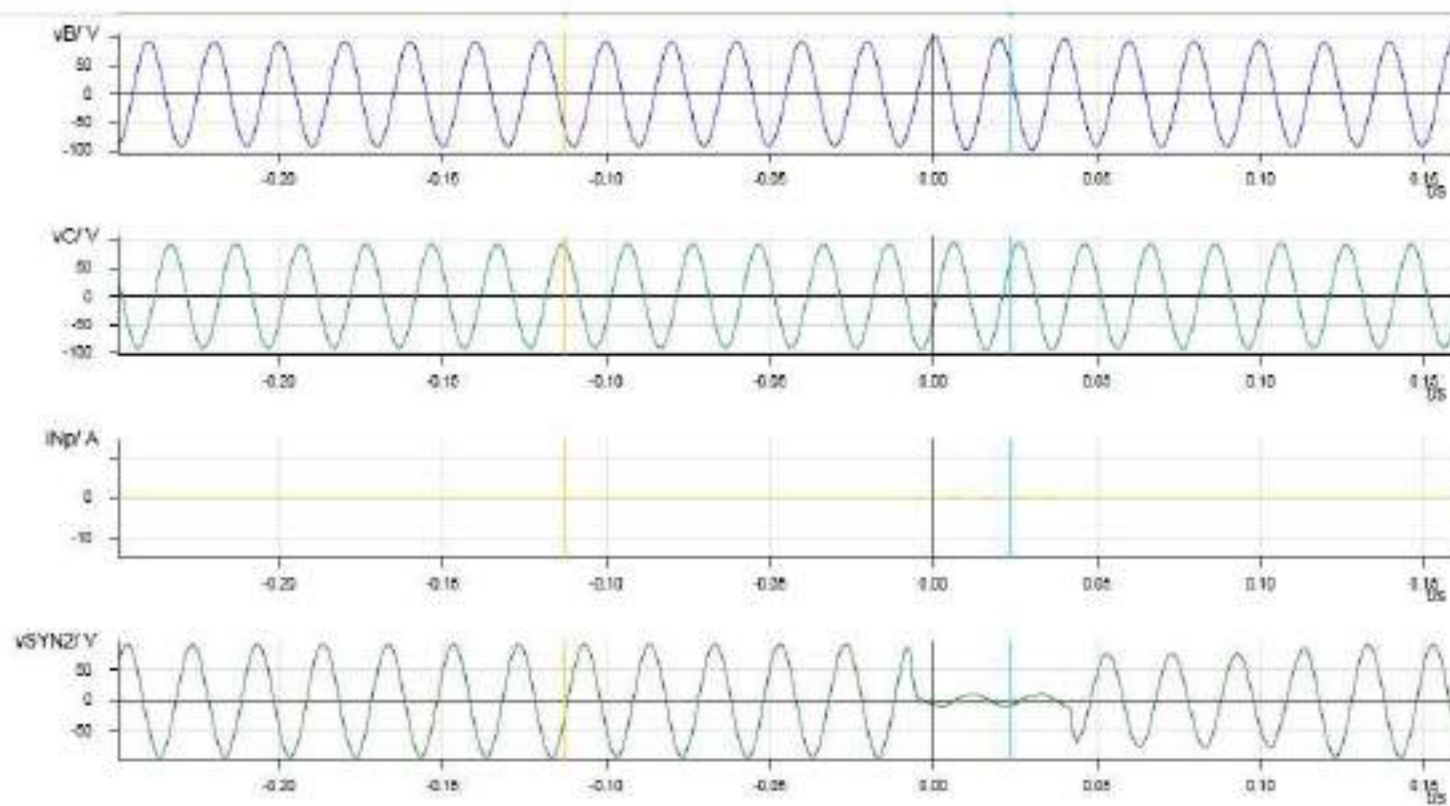
400kV Dhanonda-Daultabad Ckt-1

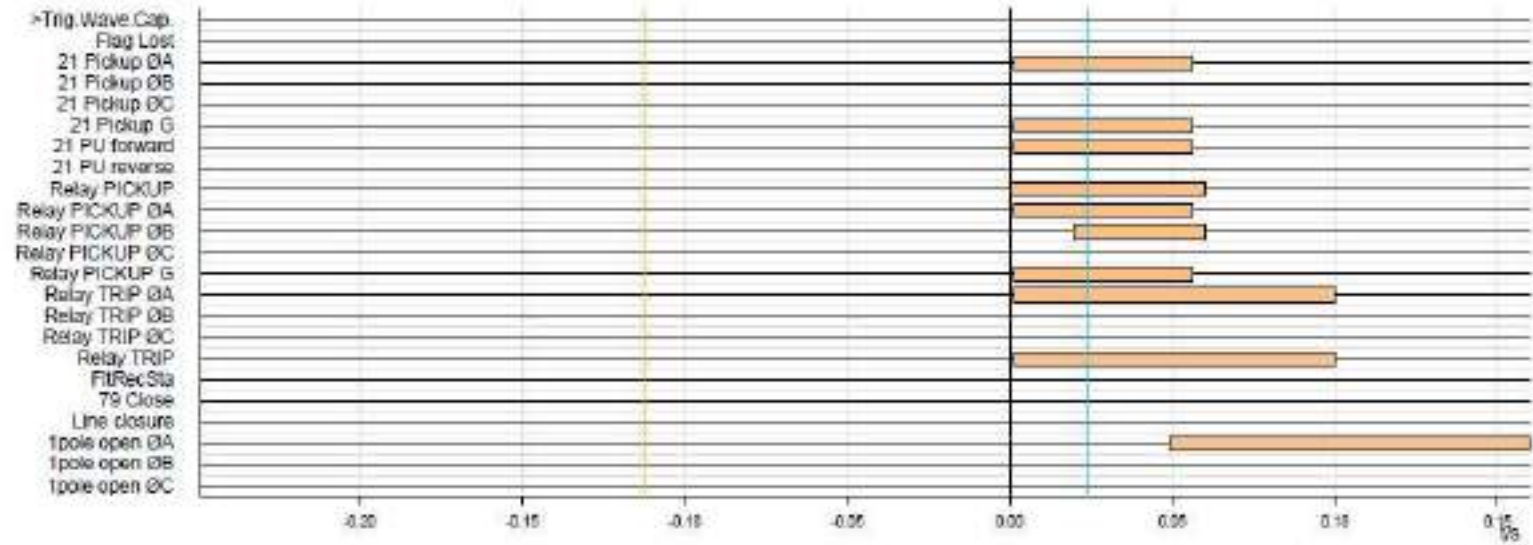
HVPNL_DLTB_030315 / 400KV Bay 403 B403 21.1 7SA522

- 2 -

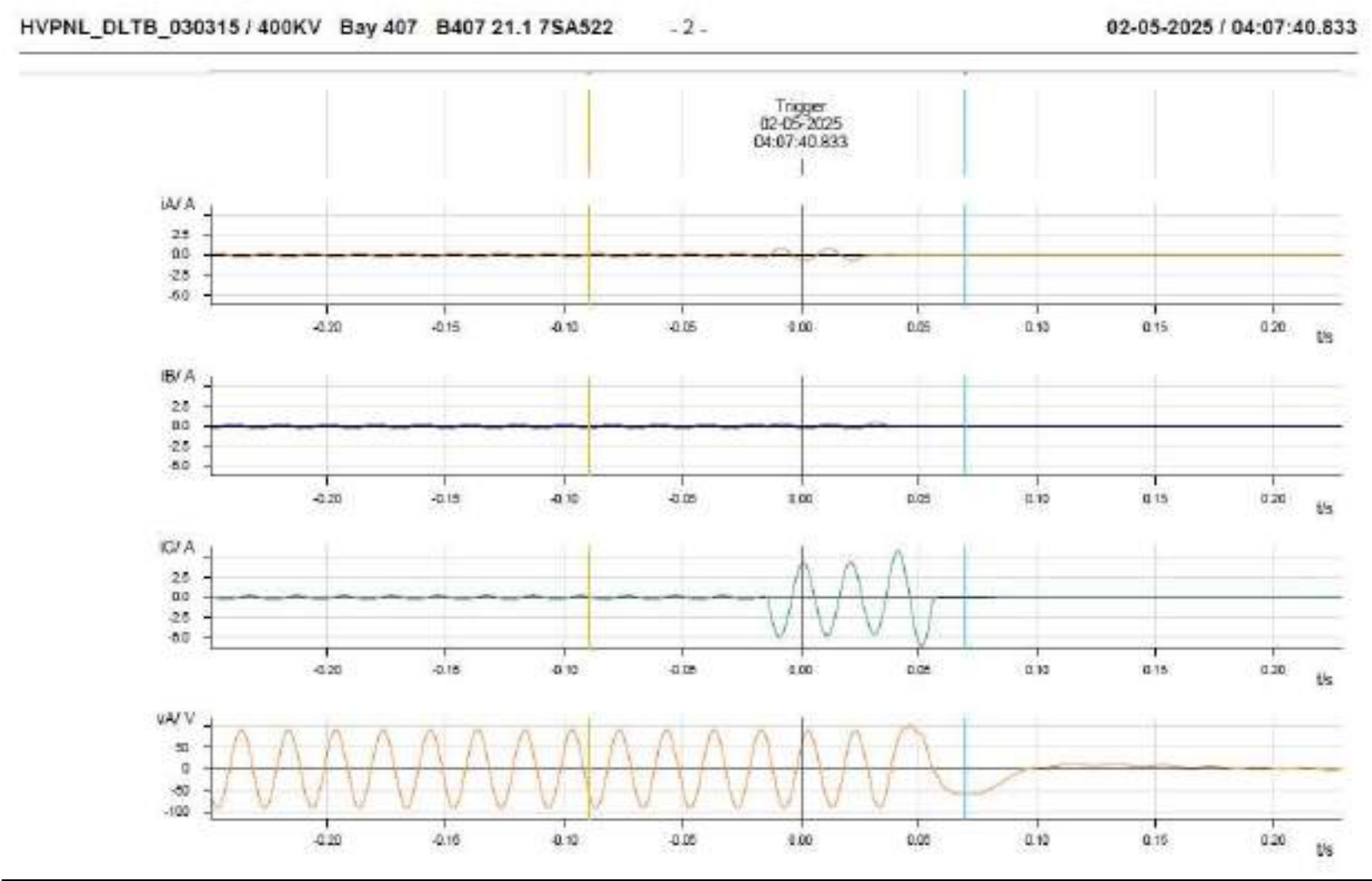
02-05-2025 / 04:55:35.260

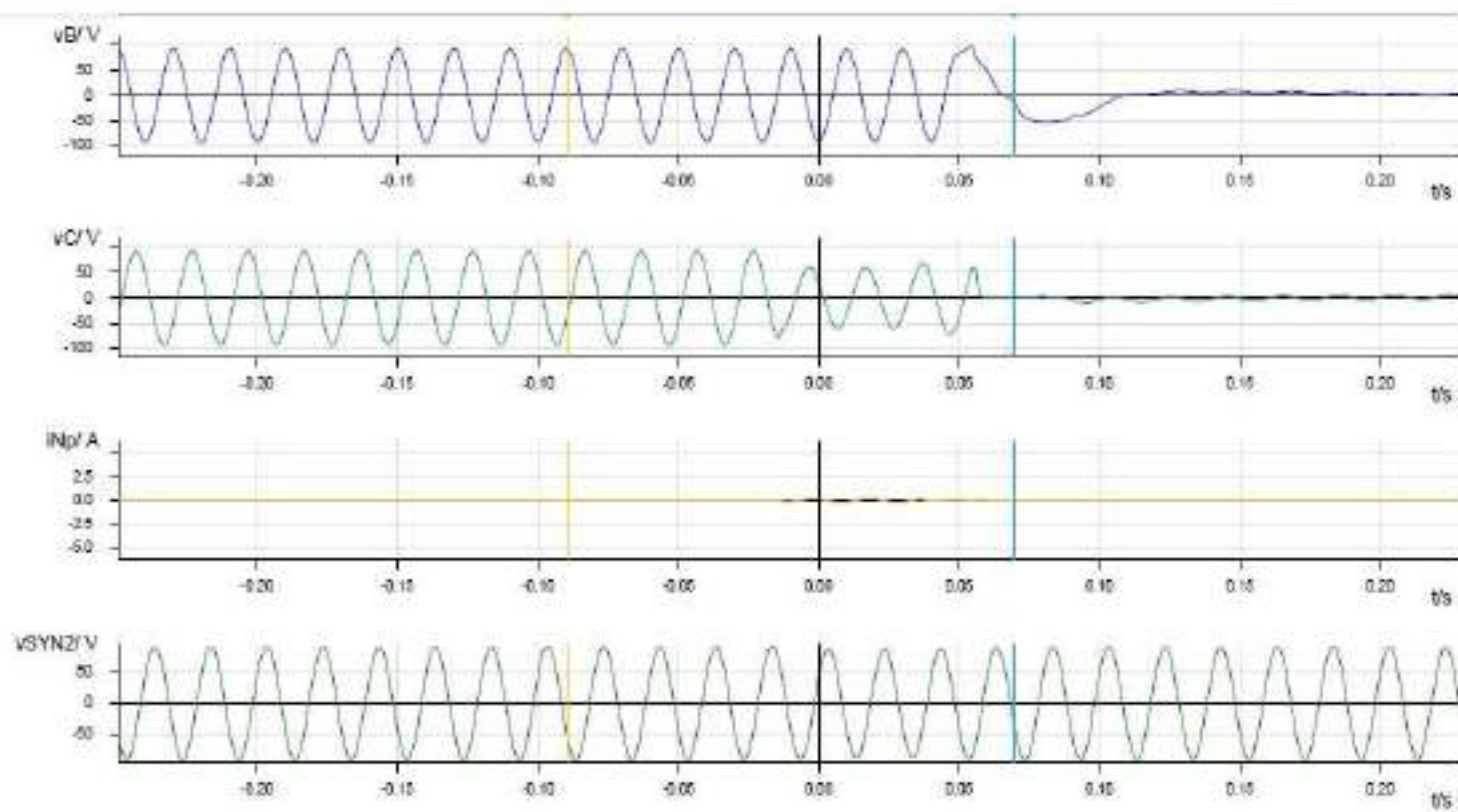


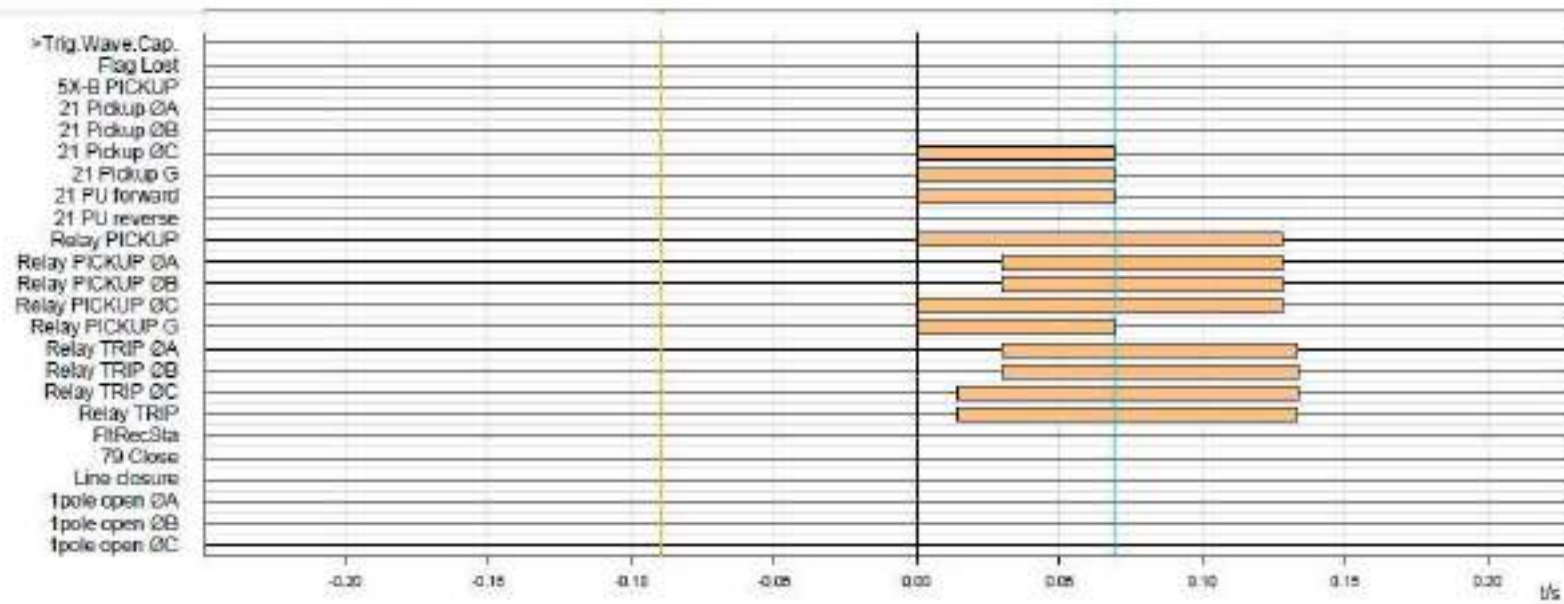




400kV Jhajjar-Daultabad Ckt-2





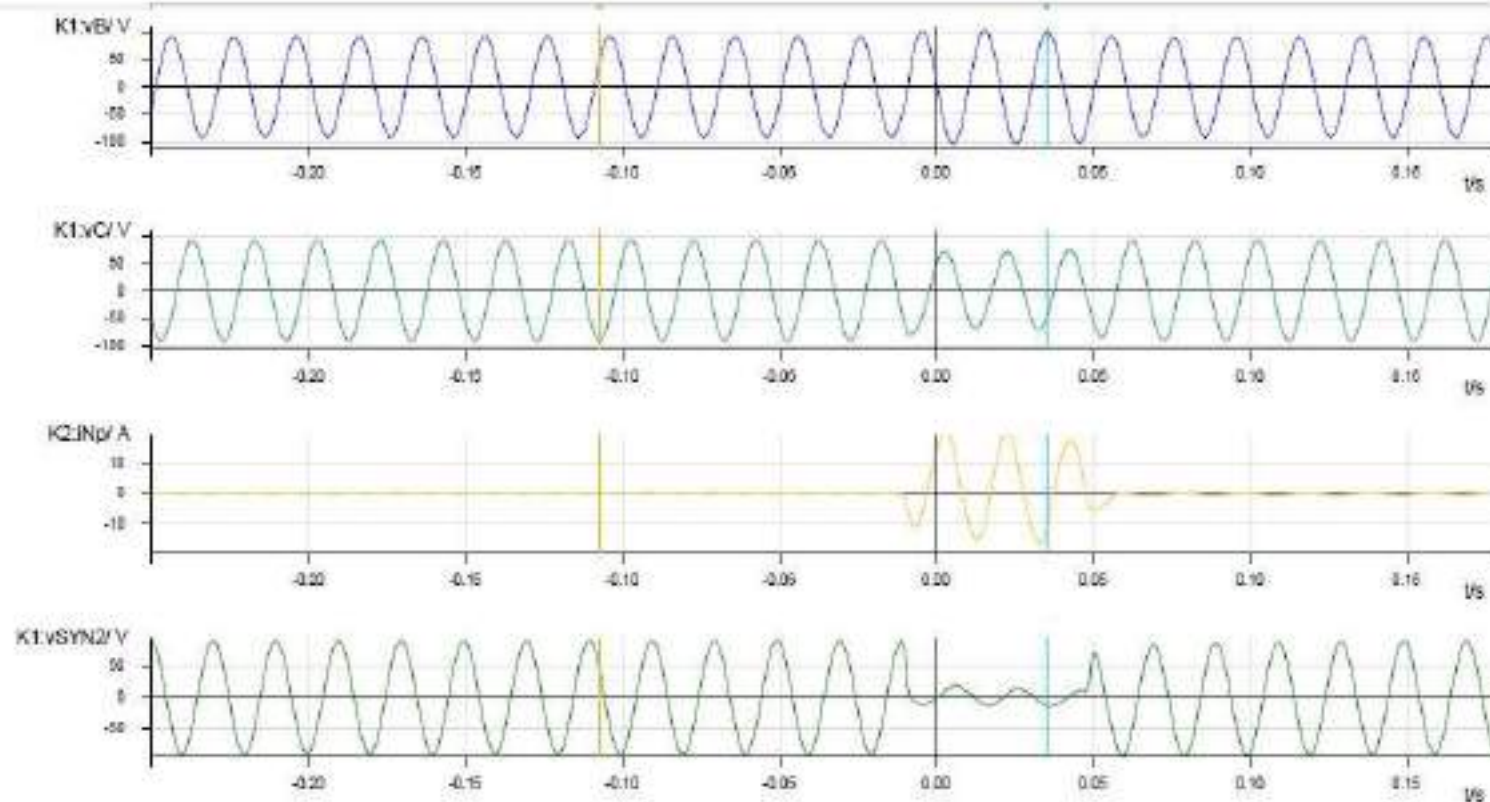


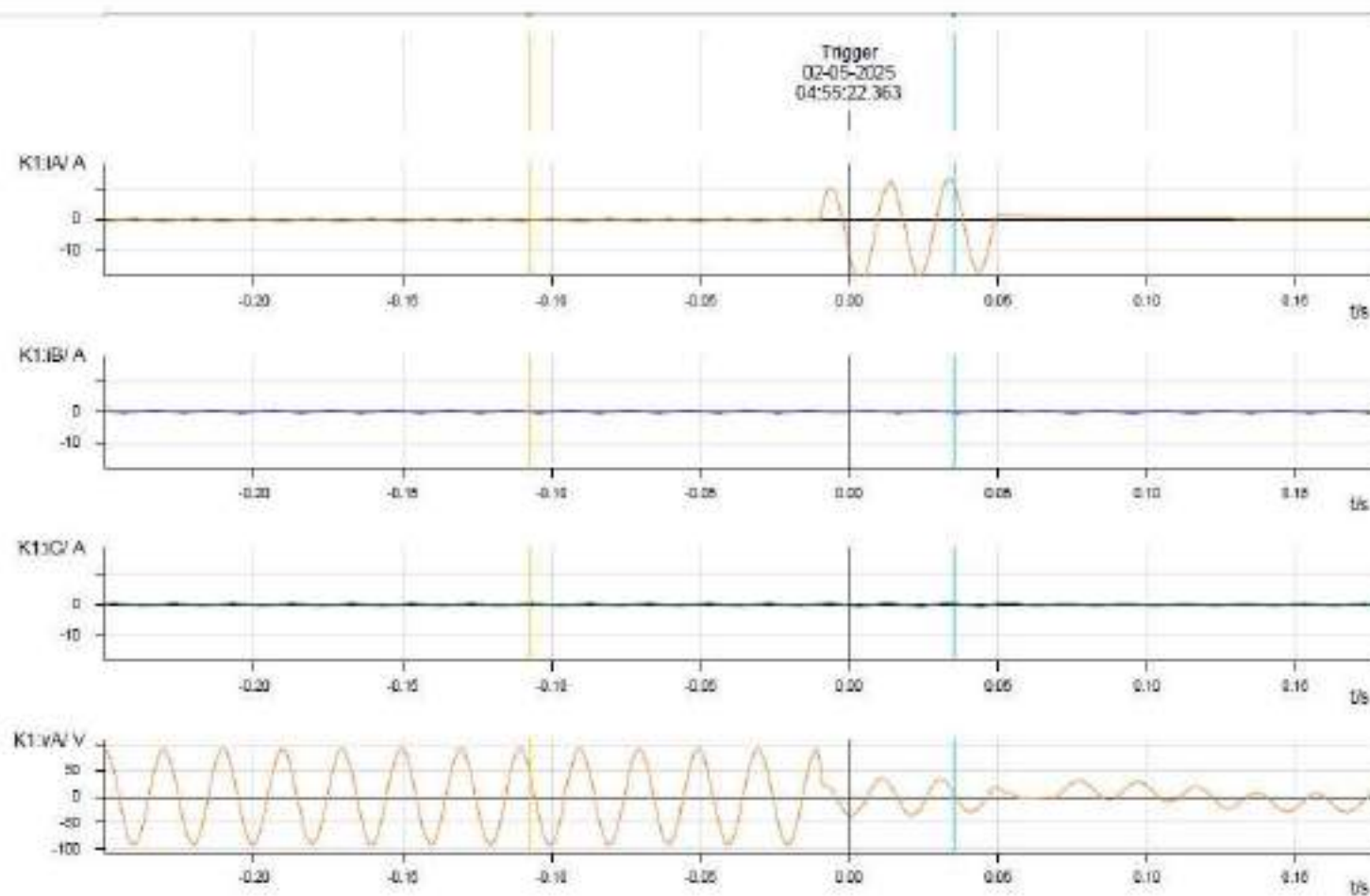
400kV Jhajjar-Daultabad Ckt-1

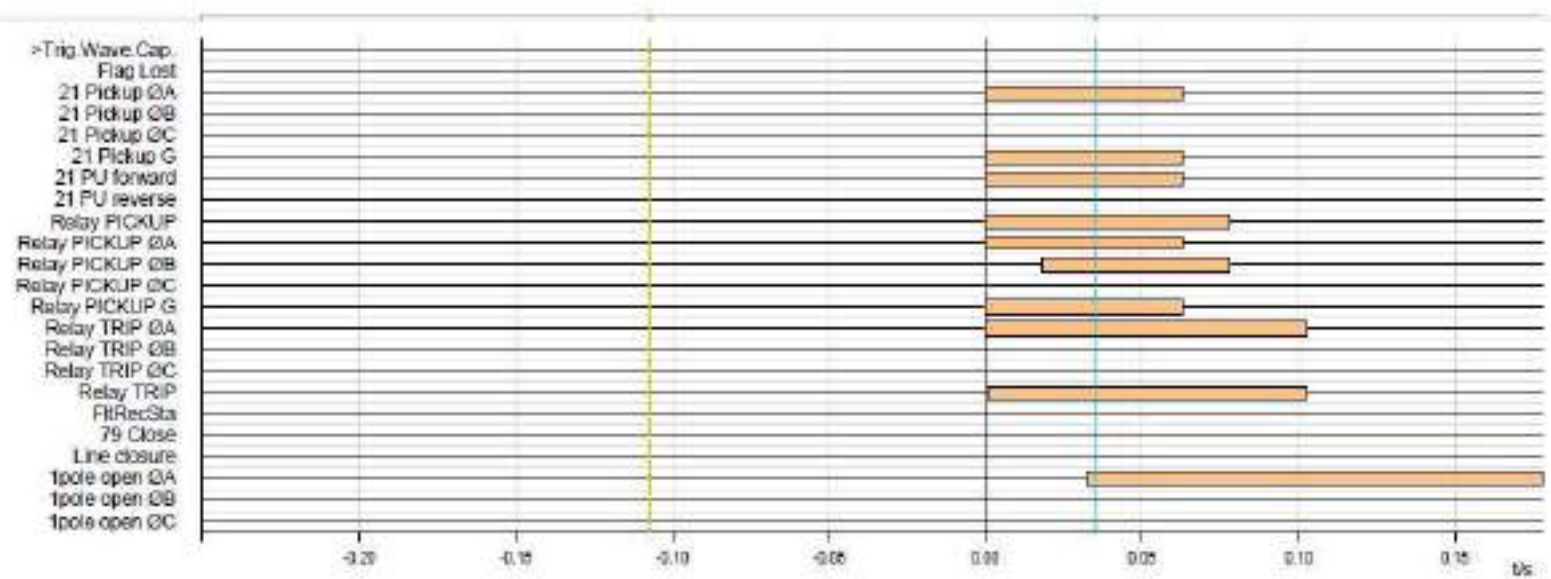
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- 3 -

02-05-2025 / 04:55:22.363





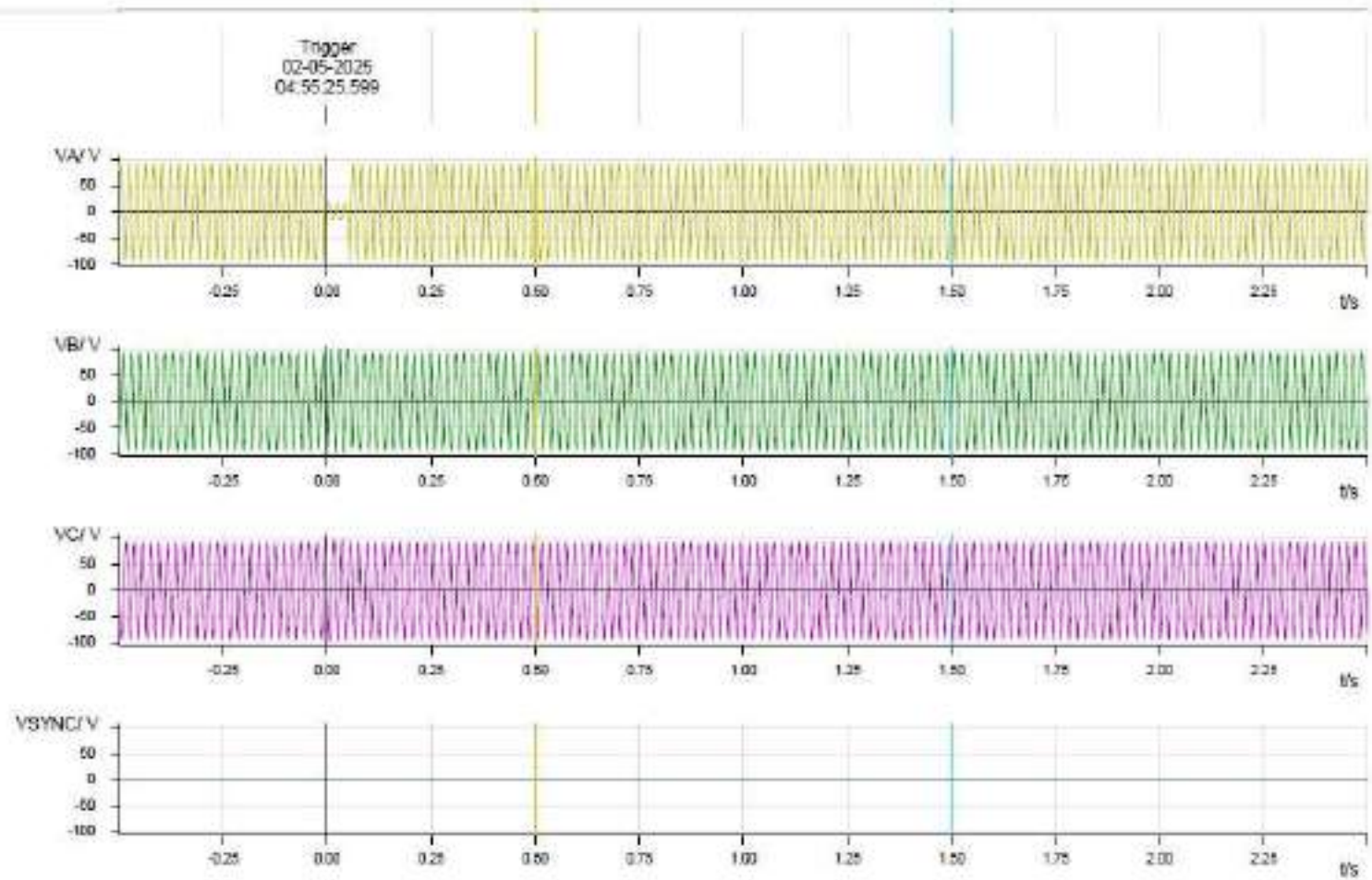


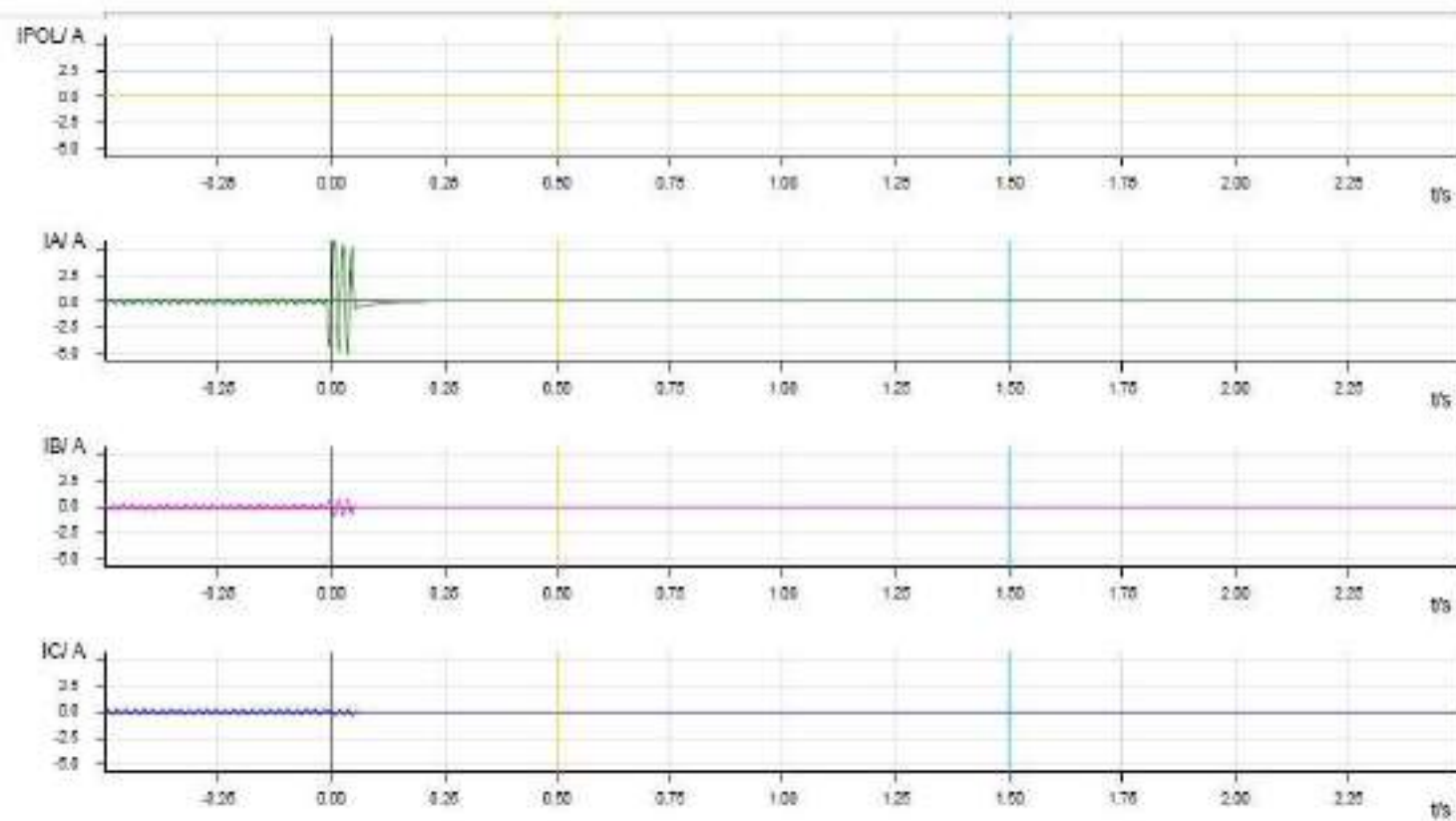
400 kV Daultabad-Sector 72 (PG) Ckt-1

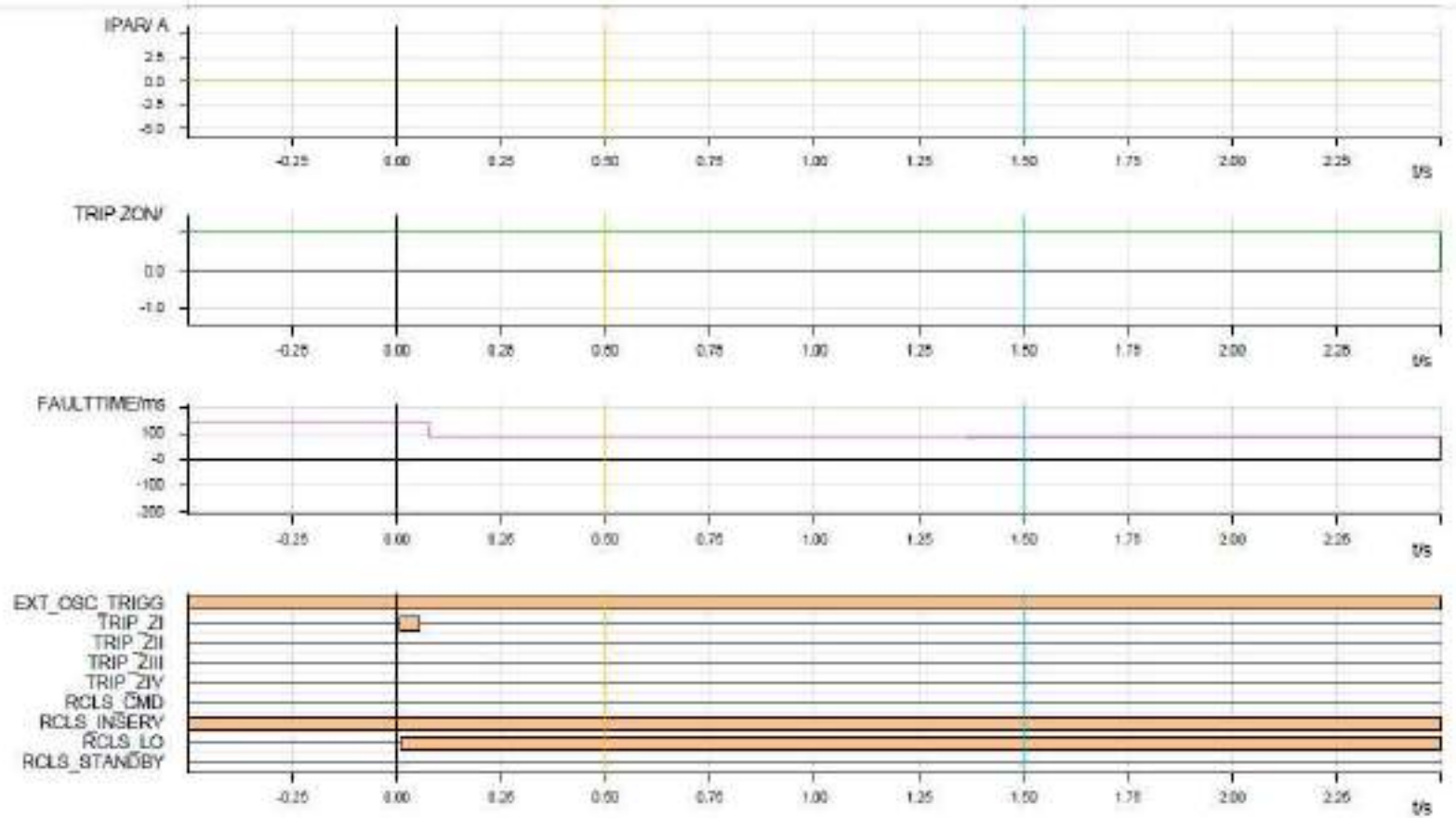
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- 2 -

02-05-2025 / 04:55:25.599



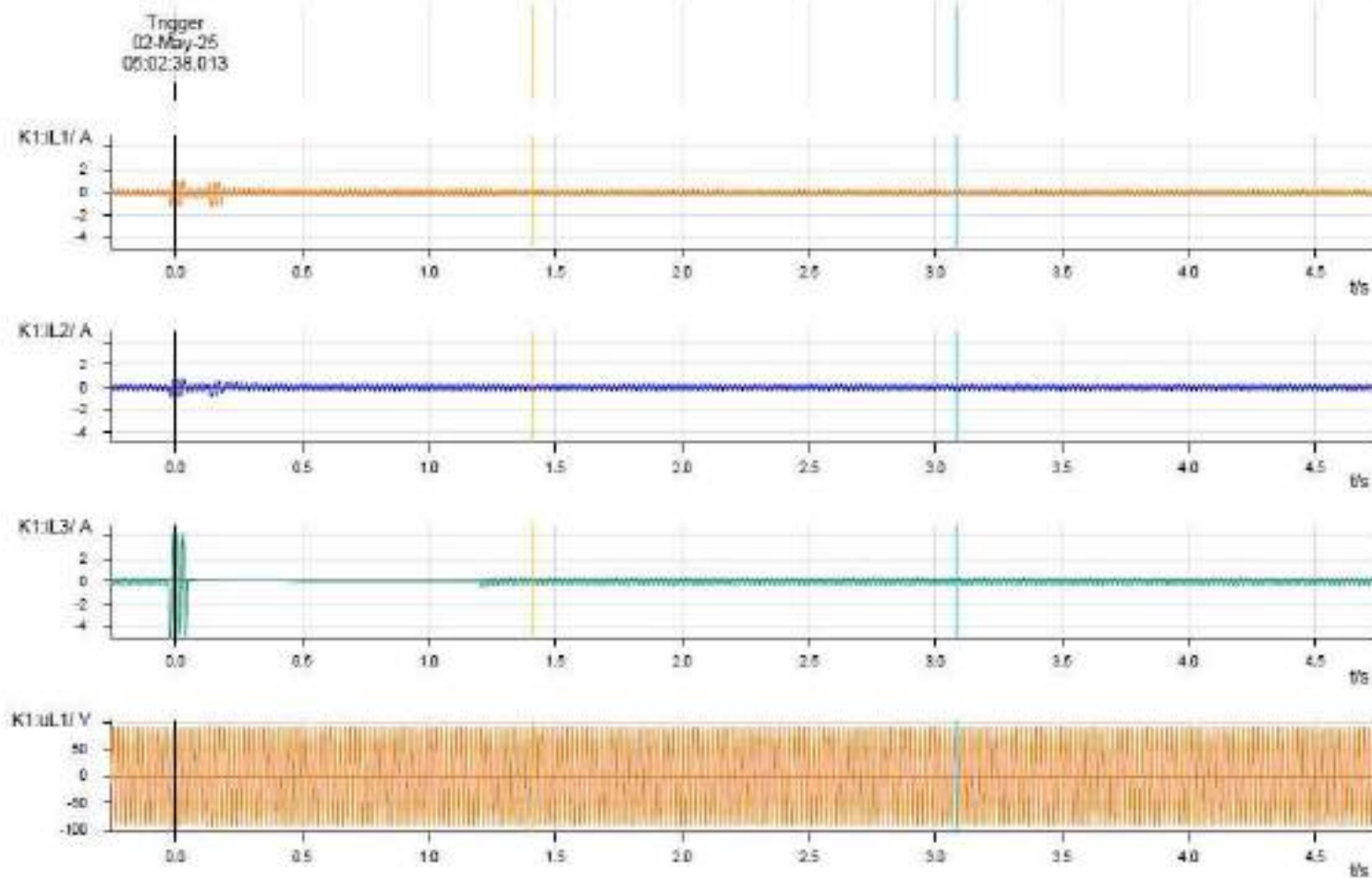


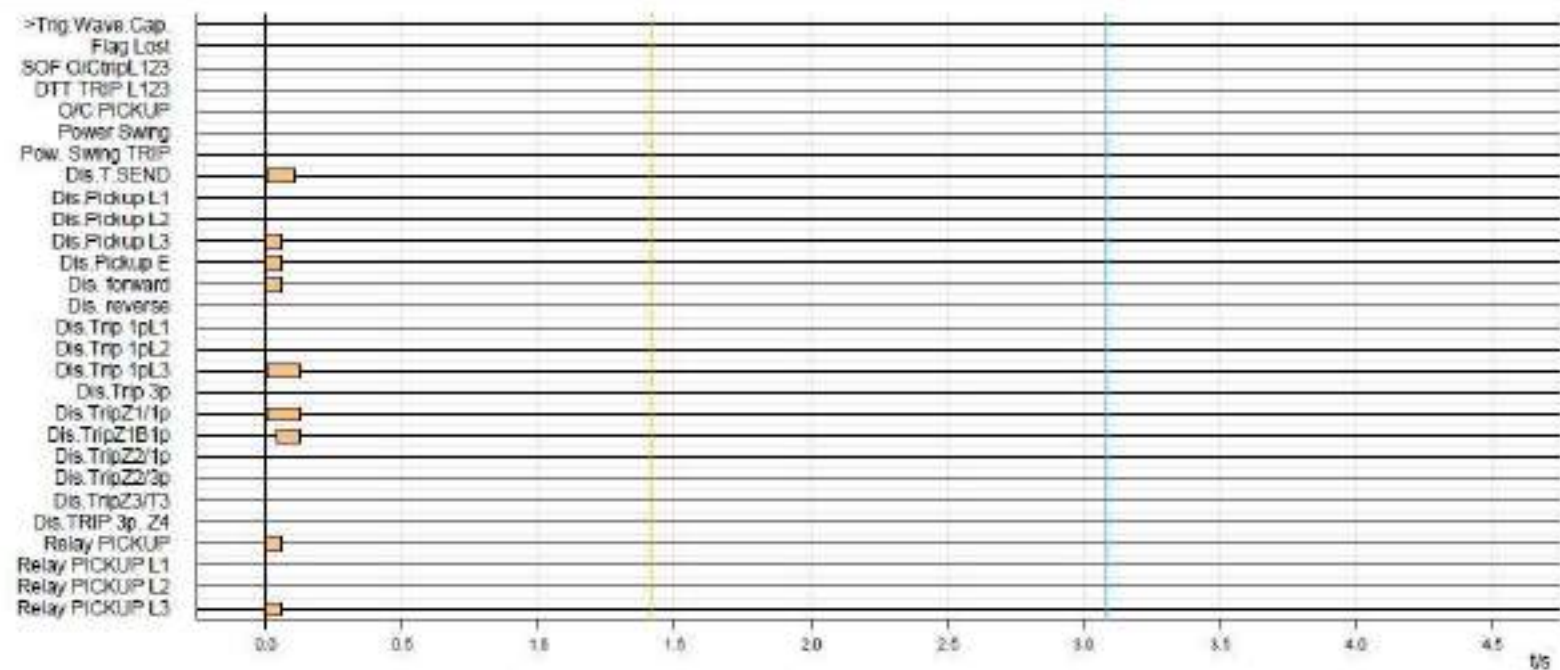


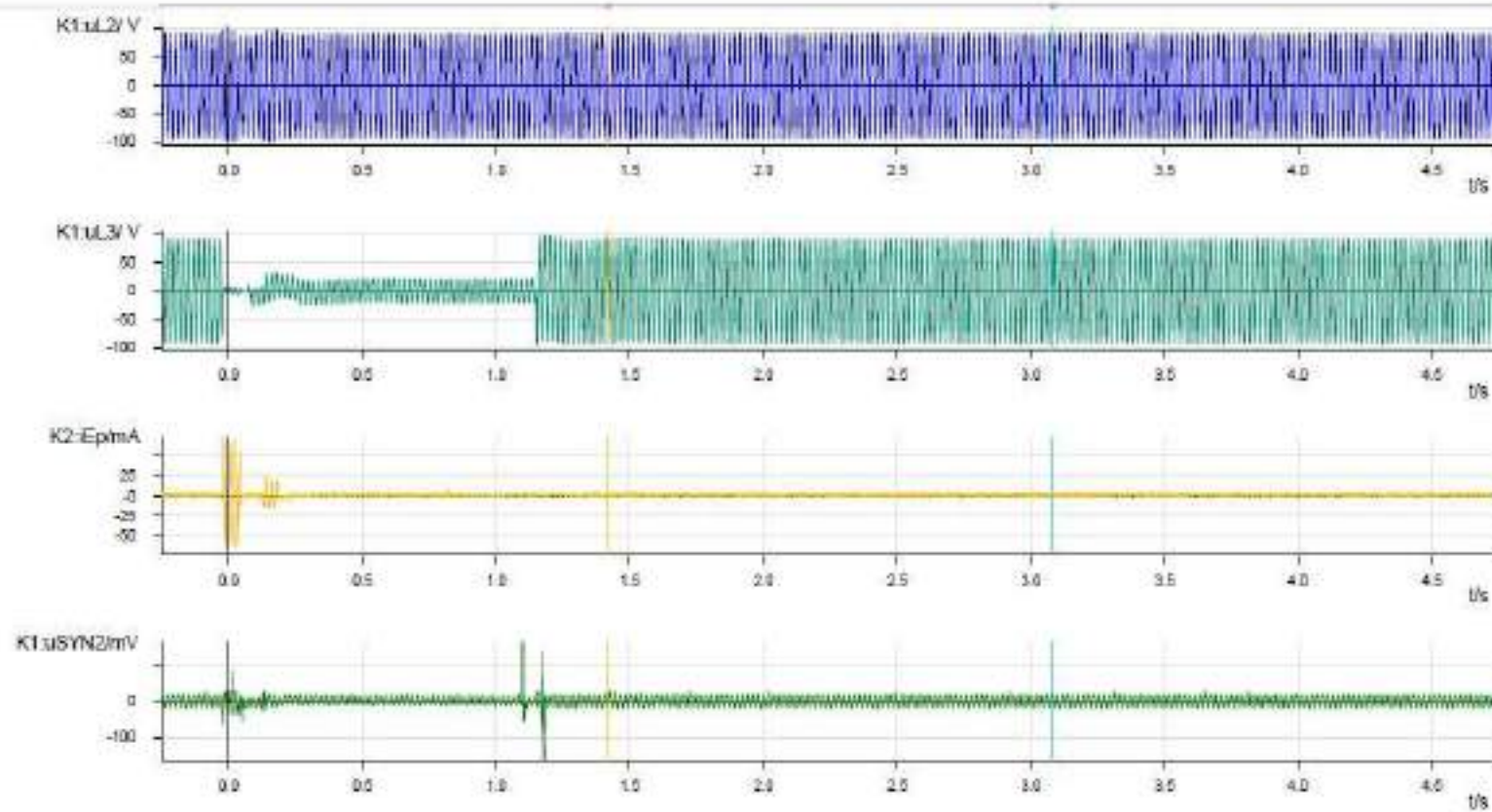
400 kV Daultabad-Sector 72 (PG) Ckt-2

HVPNL_DLTB_030315 / 400KV Bay 413 B413 21.1 7SA522 - 2 -

02-May-25 / 05:02:38.013







Multiple Element Tripping Event at 400kV Daulatabad(HV)

At 05:23 hrs on 02.05.2025

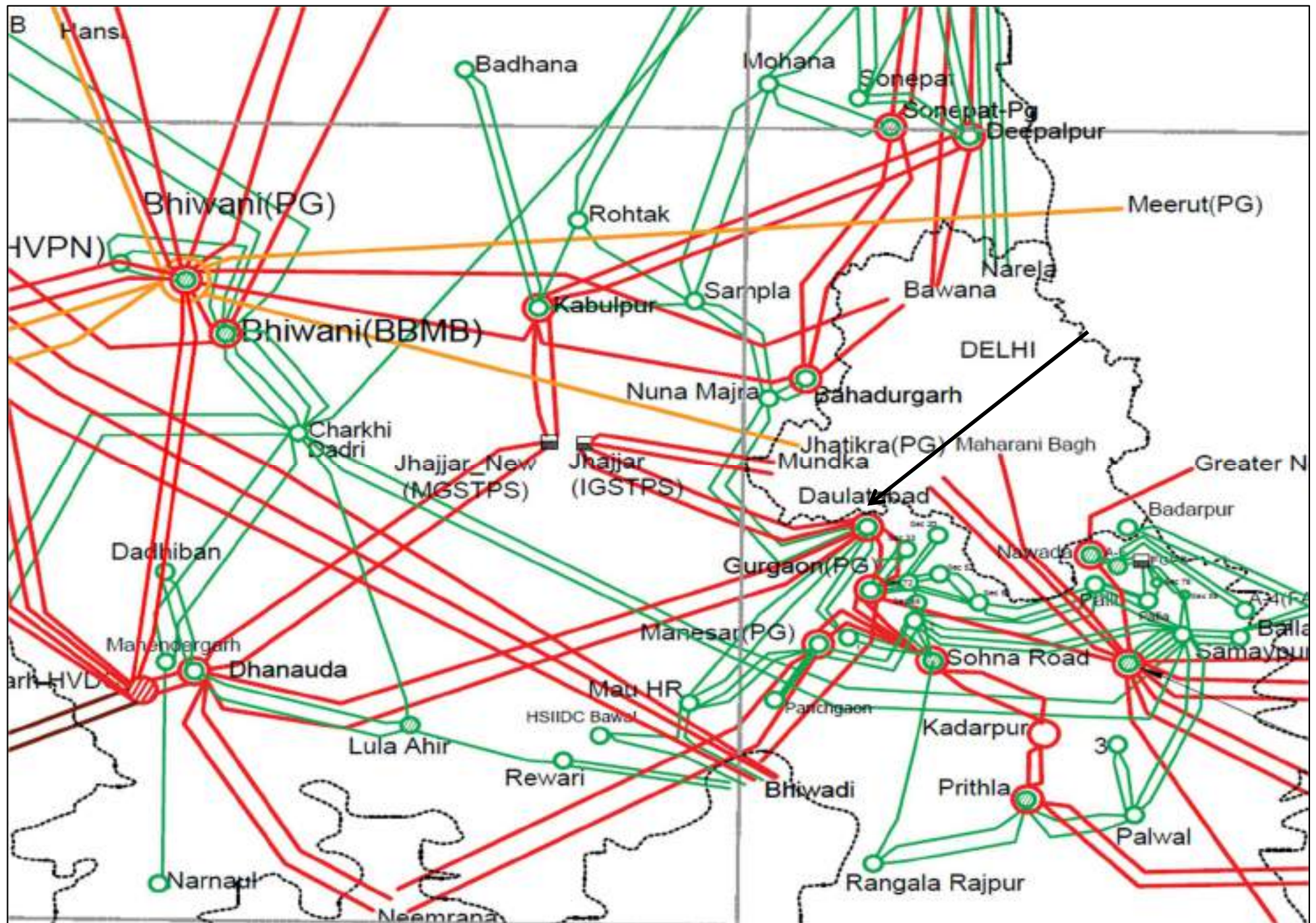
Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	400 KV <u>Dhanoda-Daulatabad</u> (HV) Ckt-2	05:23 <u>hrs</u>	08:00 <u>hrs</u>	B-N fault

Brief details of the event

- i) 400kV Dhanoda has one and half breaker scheme in 400KV voltage level.
- ii) During antecedent condition, 400 KV Gurgaon(PG)-Daulatabad(HV) (HV) Ckt-1, Ckt-2, 400 KV JHAJJAR(APCL)-DAULATABAD(HV) (HV) CKT-1 and Ckt2 and 400KV Dhanoda-Daulatabad (HV) Ckt-1 were already in tripped condition. 400KV Dhanoda-Daulatabad (HV) Ckt-2 (carrying ~409MW) and 400/220kV ICT-1,2,3&4 were under running condition.
- iii) As reported, at 05:23 hrs, 400 KV Dhanoda-Daulatabad (HV) Ckt-2 tripped. The tripping details are yet to be received from Haryana.
- iv) As per PMU at Gurgaon(PG), B-N phase to earth fault with delayed fault clearance of 600msec is observed.
- v) As 400 KV Dhanoda-Daulatabad (HV) Ckt-2 was the only element which was catering power to the 220KV side, loss of the aforementioned line caused tripping of 400KV Bus1 along 400/220 KV ICT 1,2,3 &4.
- vi) Loss of all transmission elements in 400KV system, resulted in Blackout of 400KV Daulatabad Sub station.
- vii) As per SCADA, change in demand of approx. 288MW in Haryana controlled area are observed.

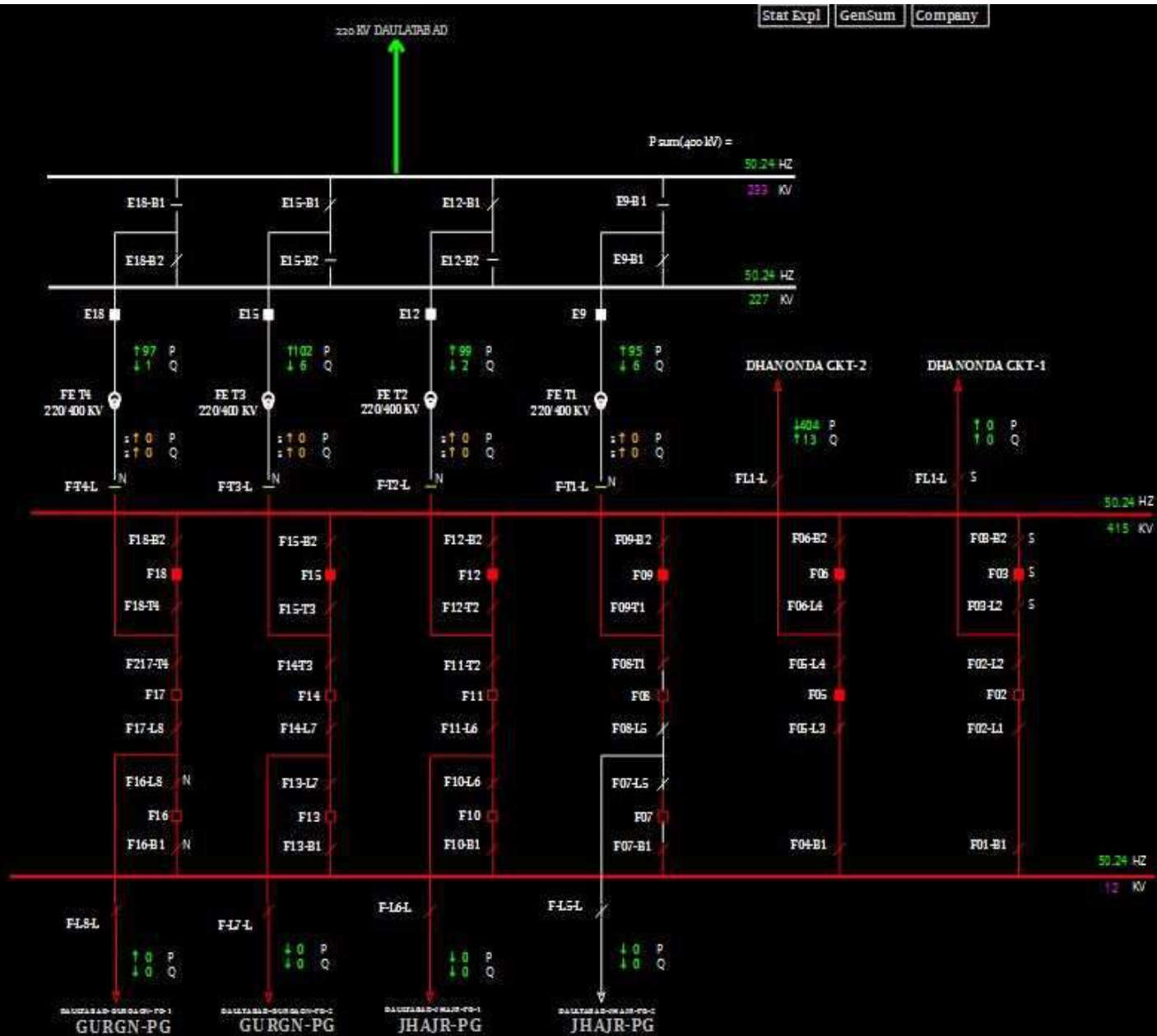
Network Diagram before the event



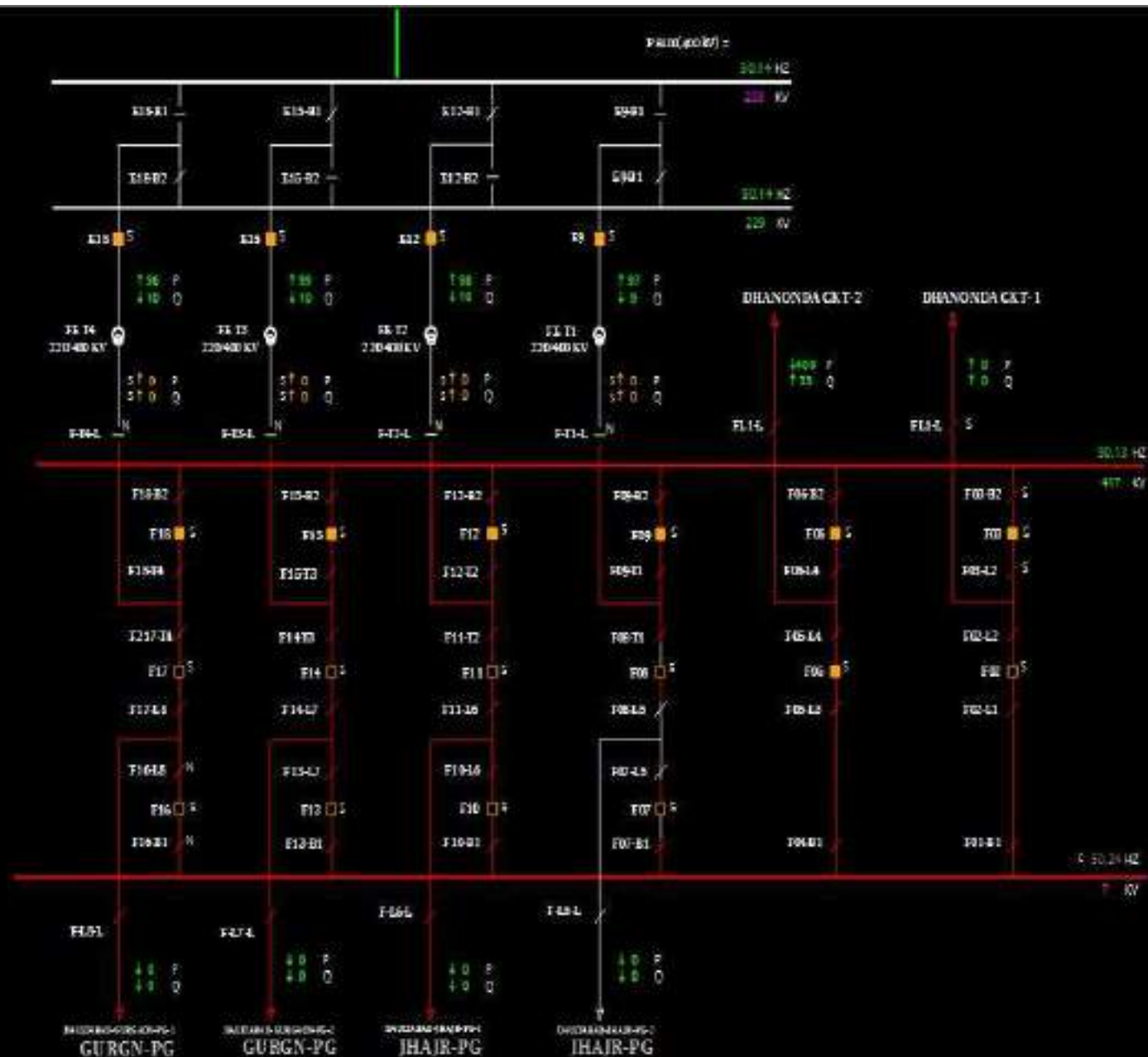
SLD of 400kV Daulatabad(HV) before the event at 05:02



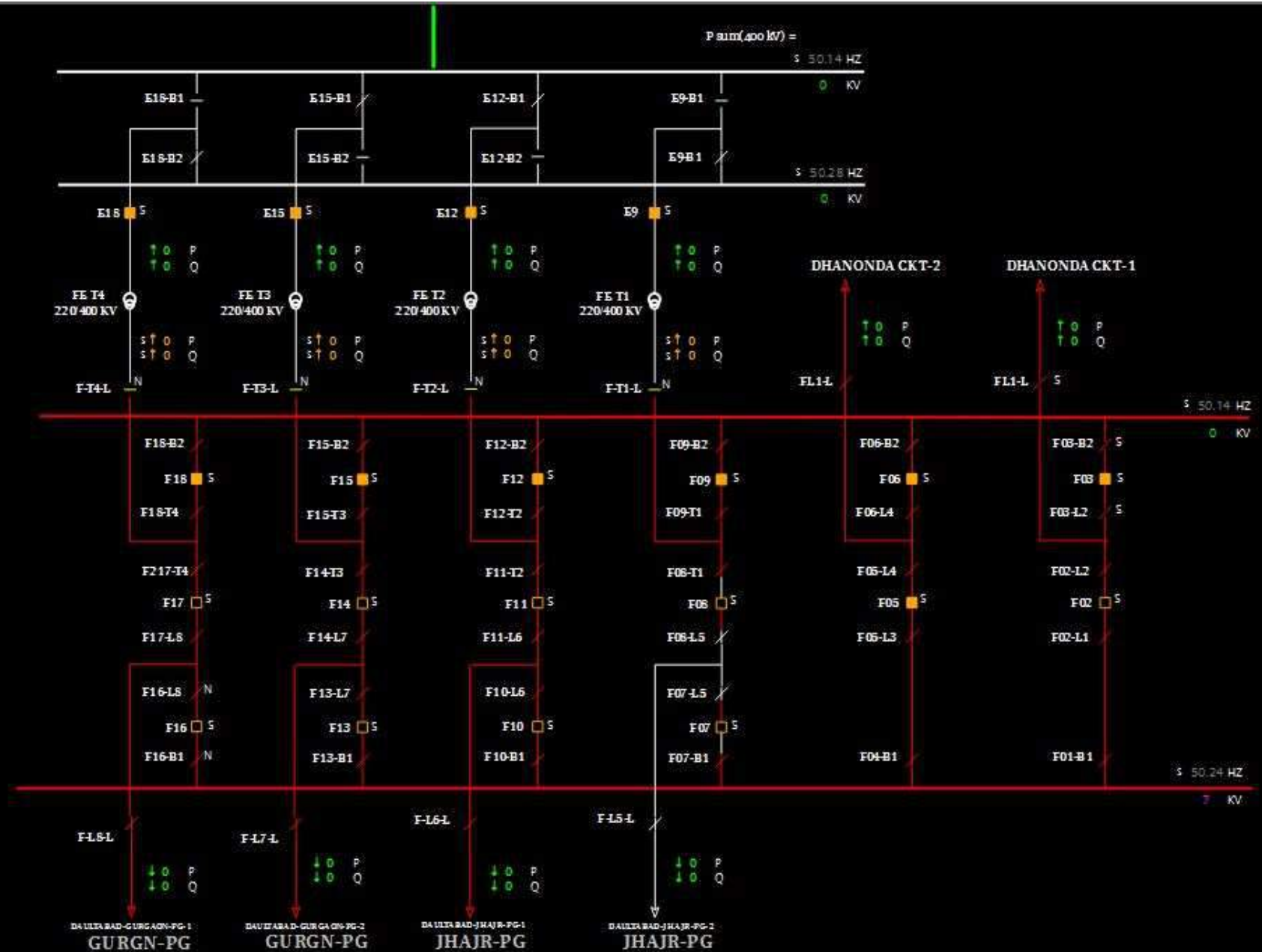
SLD of 400kV Daulatabad(HV) after the event at 05:02



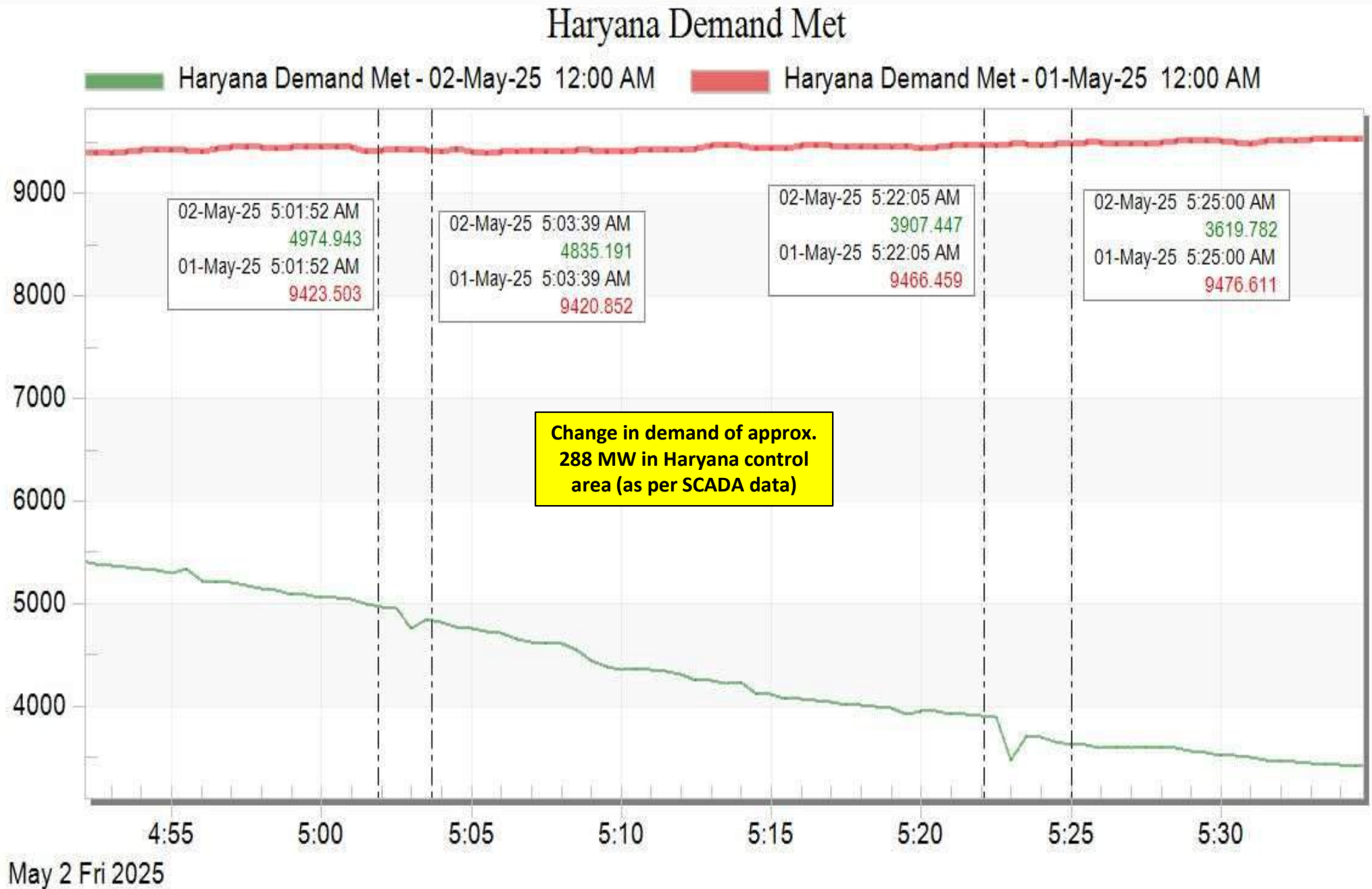
SLD of 400kV Daulatabad(HV) before the event at 05:23



SLD of 400kV Daulatabad(HV) after the event at 05:23



Haryana demand during the event



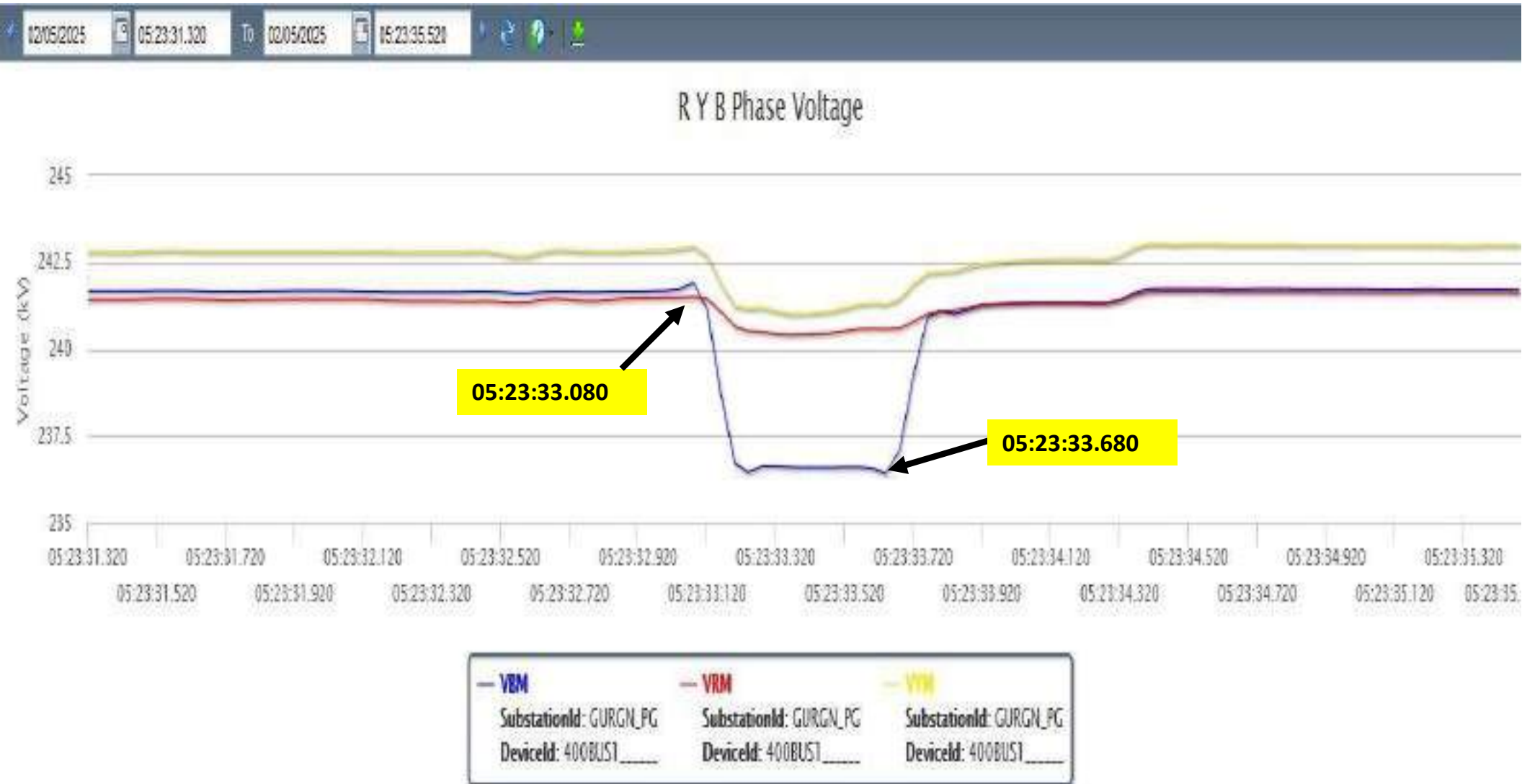
PMU Plot of frequency at Gurgaon(PG)

05:23hrs/02-May-25



PMU Plot of phase voltage magnitude at Gurgaon(PG)

05:22hrs/02-May-25



R Y B Phase Voltages Angles

SCADA SOE

Time	Station Name	Voltage Level	Element Name	Element Type	Element Status	Remarks
05:02:55,010	400KVDAULTABA	400kV	13GURGN2	Circuit Breaker	Open	Tripping of 400KV CB of 400 KV Gurgaon(PG)-Daulatabad(HV) (HV) Ckt-2 at Daulatabad end.
05:02:55,022	400KVDAULTABA	400kV	14GN2T3	Circuit Breaker	Open	
05:02:55,186	GURGAON	400kV	09DLTBD2	Circuit Breaker	Open	Tripping of 400KV CB of 400 KV Gurgaon(PG)-Daulatabad(HV) (HV) Ckt-2 at Gurgaon end.
05:02:58,139	GURGAON	400kV	08DLTBD1	Circuit Breaker	Open	
05:23:42,086	400KVDAULTABA	400kV	12T2	Circuit Breaker	Open	Tripping of 400KV CB of 400/220 KV ICT2 at Daulatabad(HV)

Points for Discussion

- i) Sequence of tripping of line along with details of faults need to be shared.
- ii) Reason of delayed clearance of fault also need to be shared.
- iii) Exact reason and sequence of protection operated during tripping need to be shared.
- iv) DR/EL along with tripping report for each element need to be shared from both the ends.
- v) Remedial action taken report to be shared.

Multiple Element Tripping Event at 765/220KV Lalitpur (UP)

At 15:32 hrs on 03.05.2025

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	220 KV Lalitpur –Babina (UP) CKT	15:19 hrs	16:18 <u>hrs</u>	R-N fault, <u>I_r</u> =10.7kA, Z-1 from Lalitpur
2.	220 KV Lalitpur –Jhansi (UP) CKT	15:26 hrs	16:40 <u>hrs</u>	B-N fault, <u>I_b</u> =2.7kA, Z-1 from Lalitpur
3.	220kV Bus-1 at Lalitpur			LBB of B- <u>ph</u> Jhansi bay operated (maloperation)
4.	765/220kV 315MVA ICT-1 at Lalitpur(UP)			Tripped due to LBB operation (220kV Bus-1)
5.	220kV Lalitpur-Lalitpur220 ckt-1		19:31 <u>hrs</u>	
6.	100MVA ST-2 at Lalitpur(UP)			
7.	765 KV Agra <u>Fatehabad</u> (UP)-Lalitpur(LPG) (UP) Ckt-1		11:35 <u>hrs</u> , 04.05.25	B-N fault, <u>I_b</u> =5.8kA, Z-1 from Lalitpur end, A/R unsuccessful
8.	765 KV Agra <u>Fatehabad</u> (UP)-Lalitpur(LPG) (UP) Ckt-2	15:32 hrs	18:20 <u>hrs</u>	OV stage-2 during B-N fault on Line-I
9.	660 MW Lalitpur Unit-1		21:59hrs 04.05.25	Units tripped due to loss of evacuation path and failure of boiler feed pump supply
10.	660 MW Lalitpur Unit-2		09:23hrs 05.05.25	
11.	660 MW Lalitpur Unit-3		22:46 <u>hrs</u>	
	220kV Lalitpur-Lalitpur220 ckt-2		17:45 <u>hrs</u>	On SPS case-4 operation

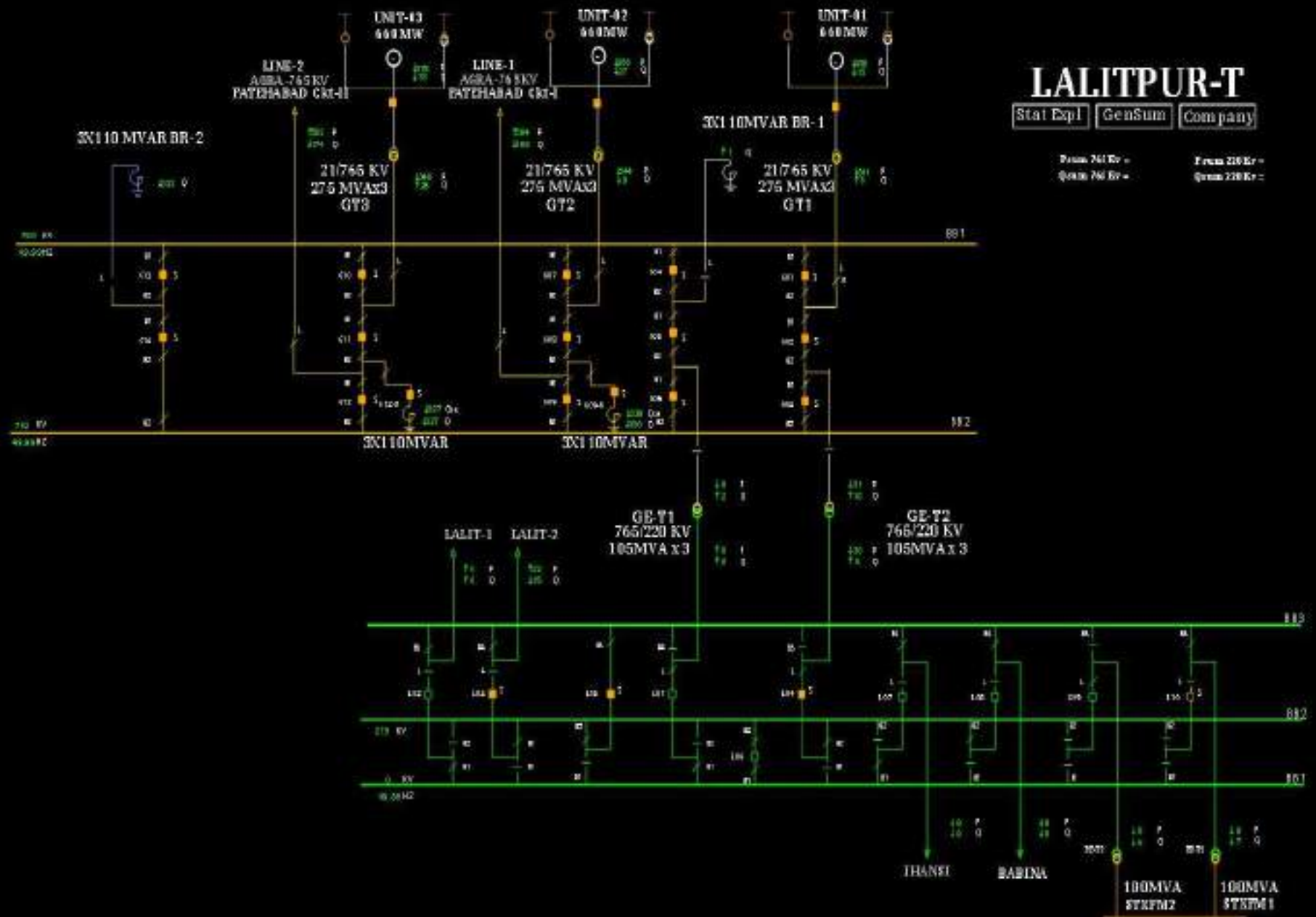
Brief details of the event

- ✓ 765/220KV Lalitpur Sub-station has one and half breaker scheme at 765kV level and double main transfer bus scheme at 220kV level.
- ✓ During antecedent condition, 765/220kV 315MVA ICT-1, 220kV feeders to Jhansi, Lalitpur220-I and 100MVA ST-2 were on 220kV Bus-1 at Lalitpur(UP). Remaining elements were on 220kV Bus-2.
- ✓ Supply to motor driven Boiler Feed Pump(BFP) for 660 MW Unit-1 was fed from 100MVA ST-1 and BFP for Unit-2&3 were being fed from 100 MVA ST-2. Motor driven BFP are being used for speed control operation of unit during house load operation. At a time, only one unit is selected for house load operation in case of SPS operation. During the event, 660MW unit-3 was in selection for house load operation on SPS operation.
- ✓ At 15:19:50 hrs, 220KV Lalitpur- Babina Ckt tripped on R-N fault, Fault was in Z-1 from Lalitpur end ($I_r=10.7\text{kA}$). Line tripped on fault in reclaim time.
- ✓ Further at 15:26:11hrs, B-N fault ($I_b=2.7\text{kA}$, Z-1 from Lalitpur) occurred on 220 KV Lalitpur – Jhansi (UP) Ckt and A/R started. During Auto reclosing condition, the LBB relay of Jhansi bay sensed the pickup current in B-ph and initiated tripping of 220kV Bus-1 leading to tripping of all the elements connected to 220kV Bus-1 at Lalitpur(UP) i.e., 765/220kV 315MVA ICT-1, 220kV feeders to Jhansi, Lalitpur220-I and 100MVA ST-2.
- ✓ Further at 15:32:37 hrs, B-N fault occurred on 765 KV Agra Fatehabad(UP)-Lalitpur(LPG) (UP) Ckt-1 and A/R started. At the same instant, 765 KV Agra Fatehabad(UP)-Lalitpur(LPG) (UP) Ckt-2 tripped on operation of OV stage-2 protection. As per DR of line, voltage of R-ph of 765kV Lalitpur-Agra Fatehabad line-II increased from 441kV to $\sim 845\text{kV}$ for $\sim 140\text{msec}$.

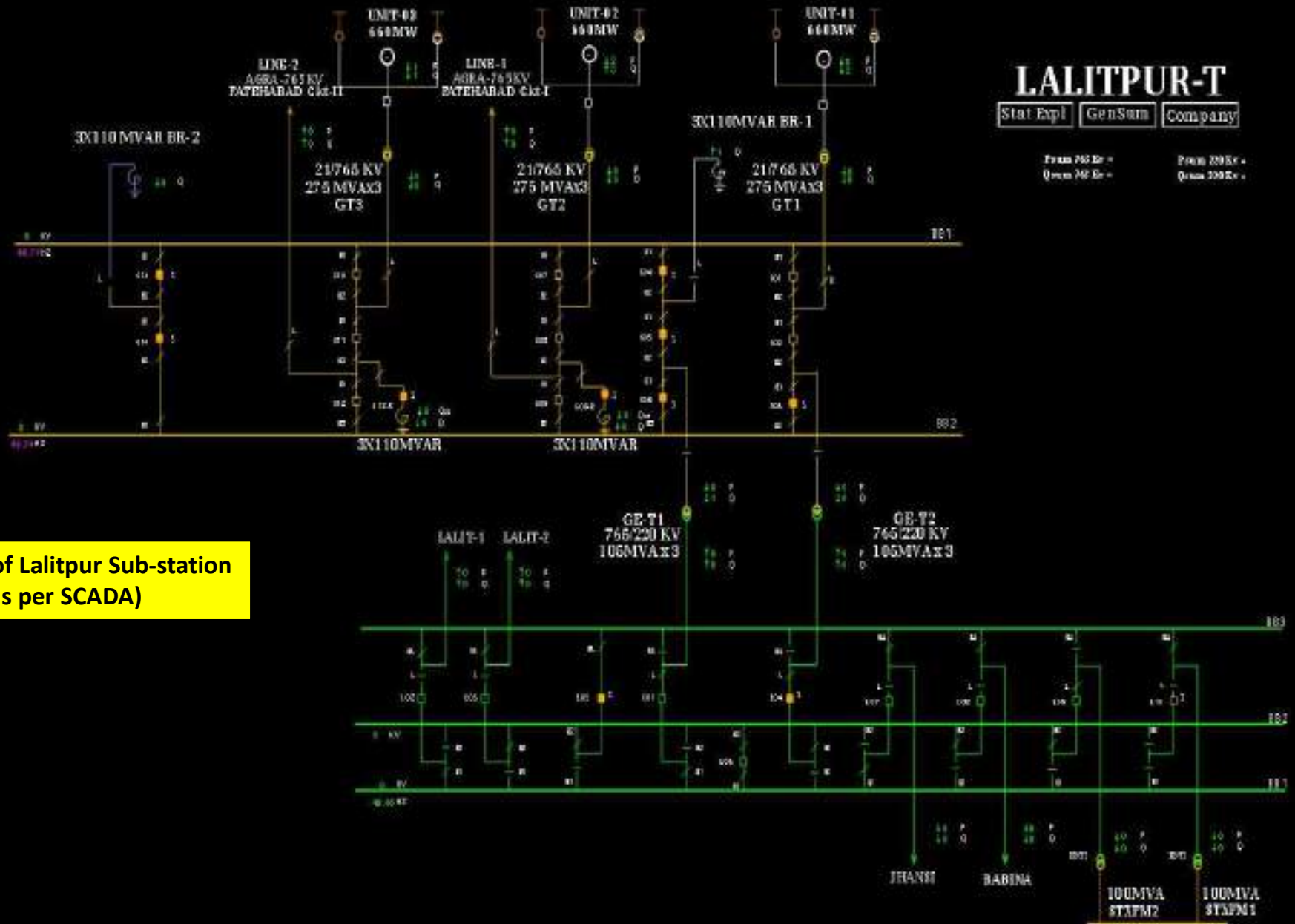
Brief details of the event

- ✓ Further, after dead time of A/R operation, 765 KV Agra Fatehabad(UP)-Lalitpur(LPG) (UP) Ckt-1 also tripped due to permanent nature of fault.
- ✓ As per PMU at Agra765(PG), B-N phase to earth fault with delayed clearance of ~560msec is observed.
- ✓ Due to tripping of both the 765kV evacuating lines, case-4 for SPS for safe evacuation of Lalitpur generation operated. As per SPS case-4, in case of tripping of both the 765kV lines, one 660MW unit (in this case unit-30 shall come to house load and remaining unit shall trip. 220kV lines to Lalitpur and Jhansi shall also trip.
- ✓ However, as 100MVA ST-2 already tripped at 15:26 hrs during LBB operation of 220kV Bus-1, BFP for Unit-3 was not available and therefore, 660MW Unit-3 also tripped along with 660MW Unit-1&2. 220kV line to Lalitpur(2nd ckt) also tripped on SPS operation.
- ✓ Due to tripping of both the units and all the 220kV feeders on loss of evacuation path and SPS operation, complete 765/220kV Lalitpur S/s got blackout.
- ✓ As per SCADA, generation loss of 1040MW at Lalitpur TPS (UP) and change in UP demand of ~90MW is observed.

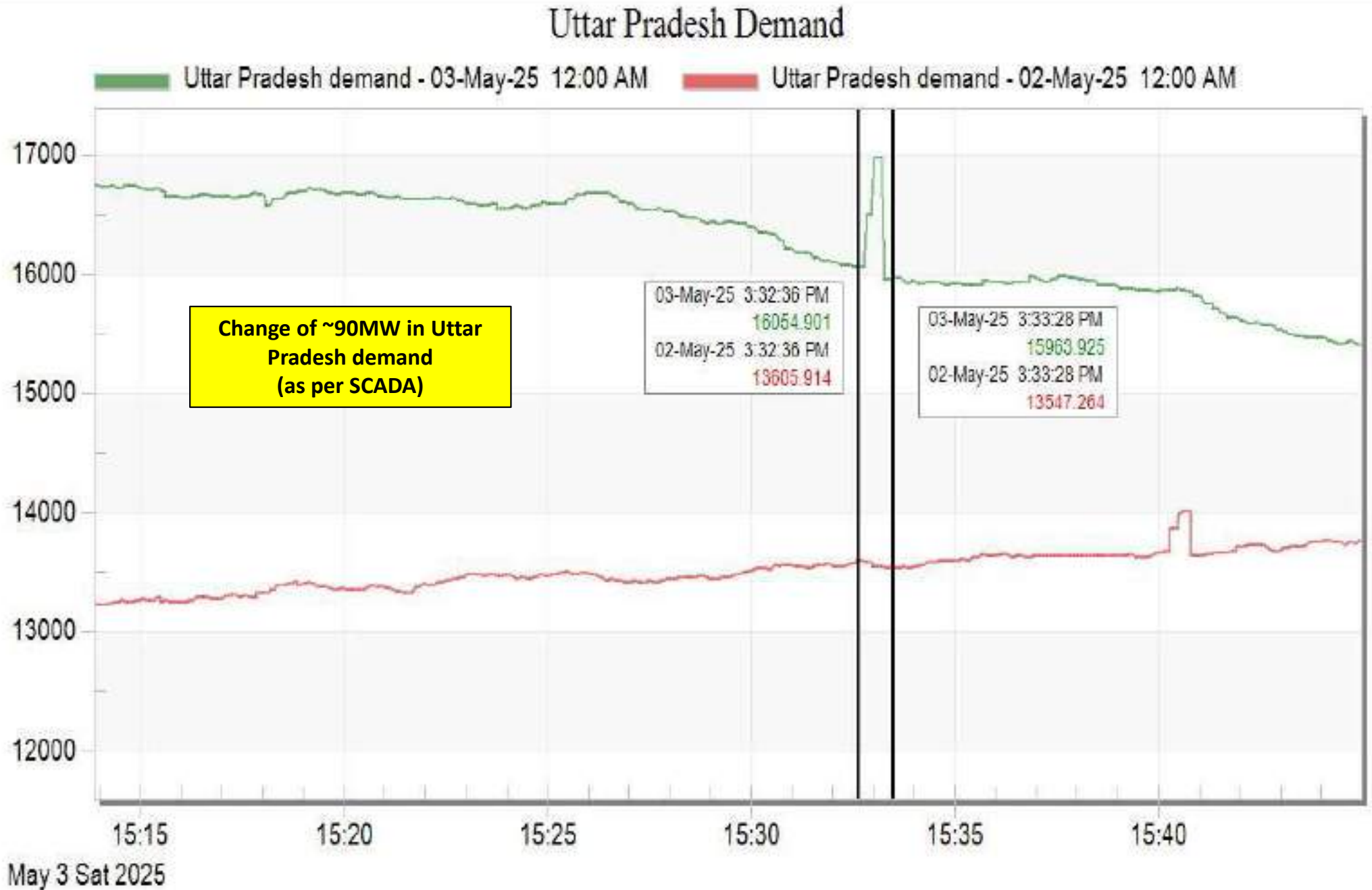
SLD of 765/220KV Lalitpur(UP) before the event



SLD of 765/220KV Lalitpur(UP) after the event

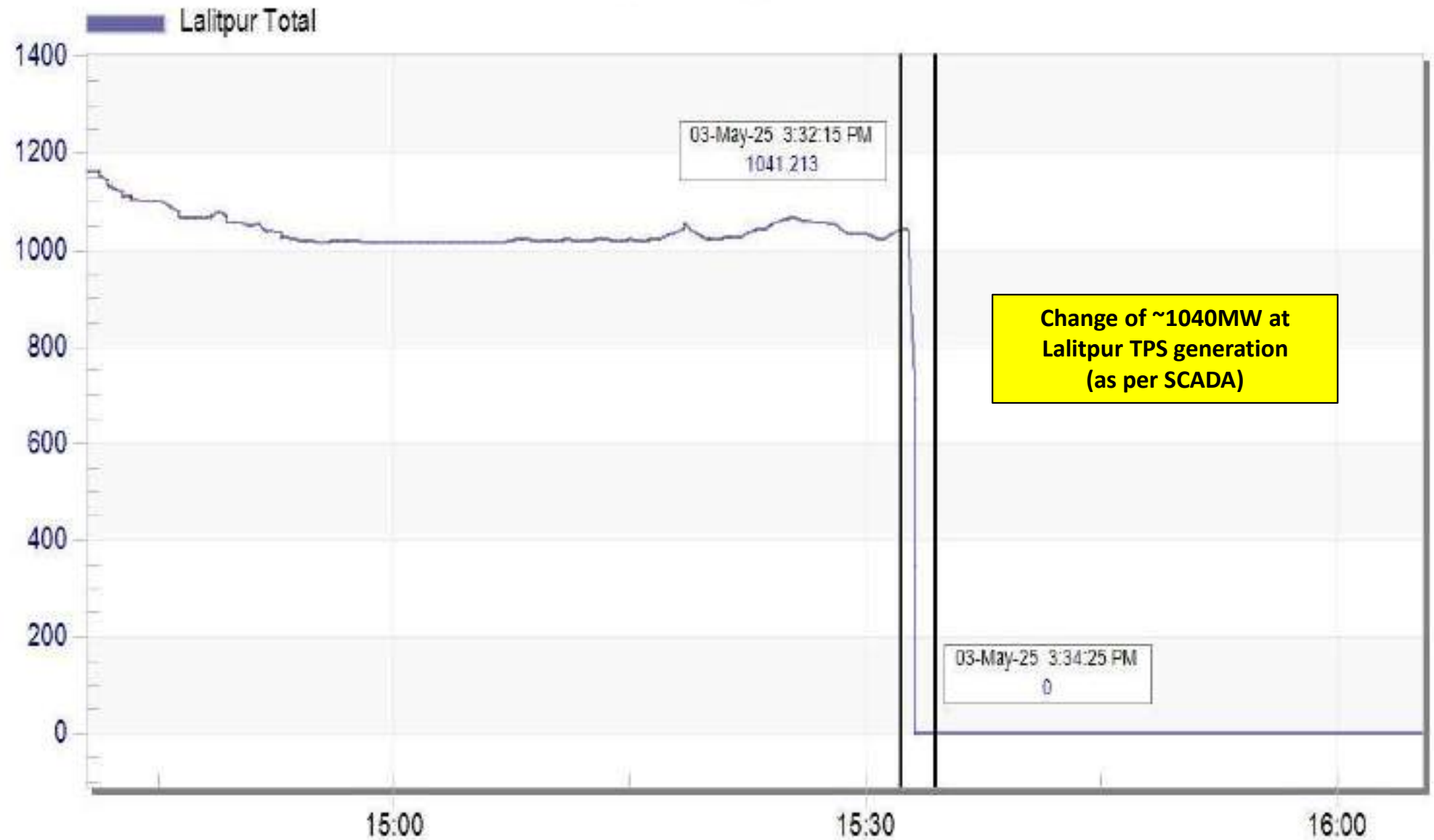


UP Demand during the event



Lalitpur TPS Generation during the event

Lalitpur TPS generation



May 3 Sat 2025

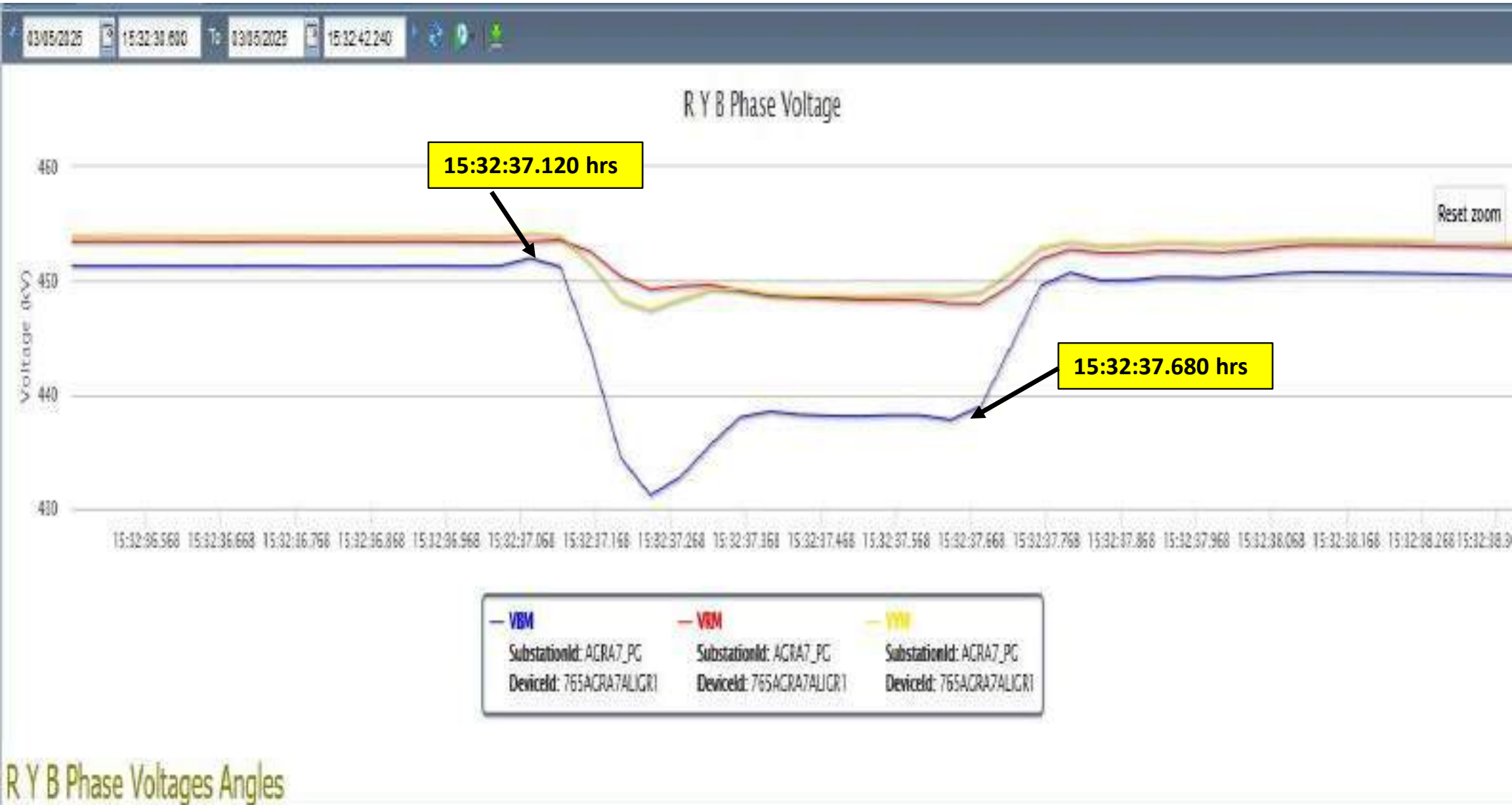
PMU Plot of frequency at 400KV Bassi(PG)

15:32hrs/03-May-25



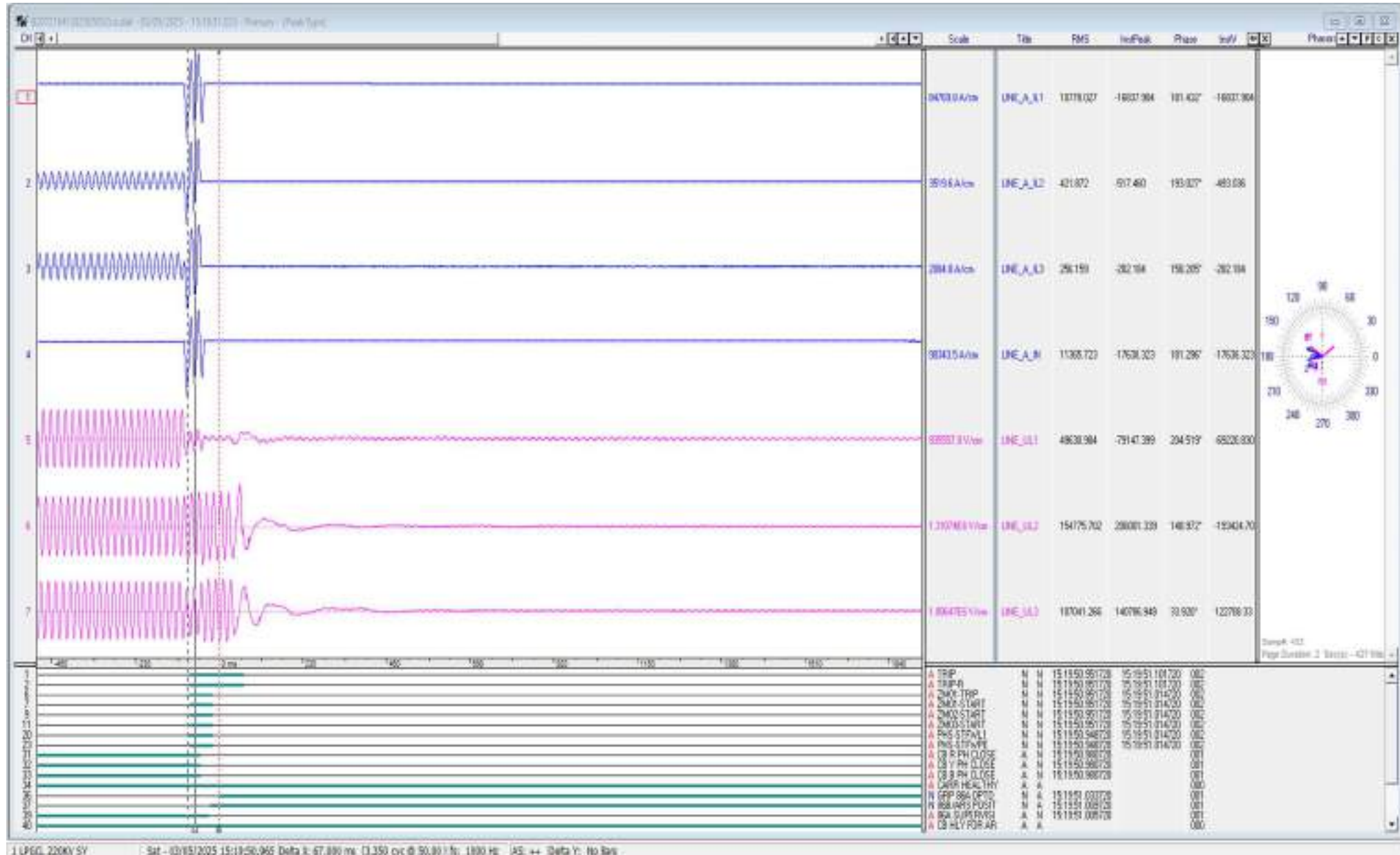
PMU Plot of phase voltage at Anta(NTPC)

15:32hrs/03-May-25



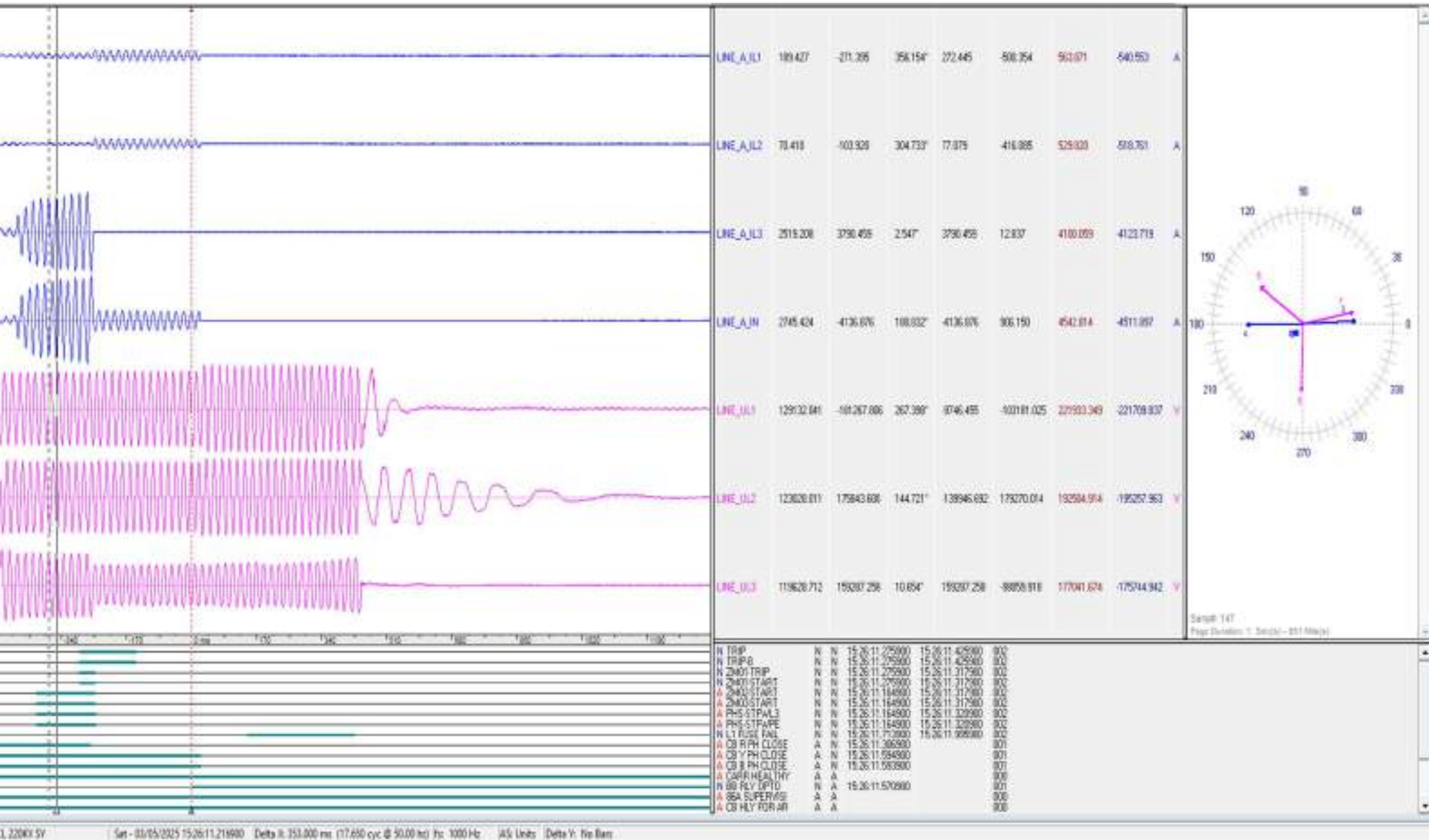
- ✓ As per PMU, B-N fault observed.
- ✓ Delayed fault clearance of 560msec observed.

DR of 220 KV Lalitpur(end) –Babina (UP) CKT (15:19:50hrs)



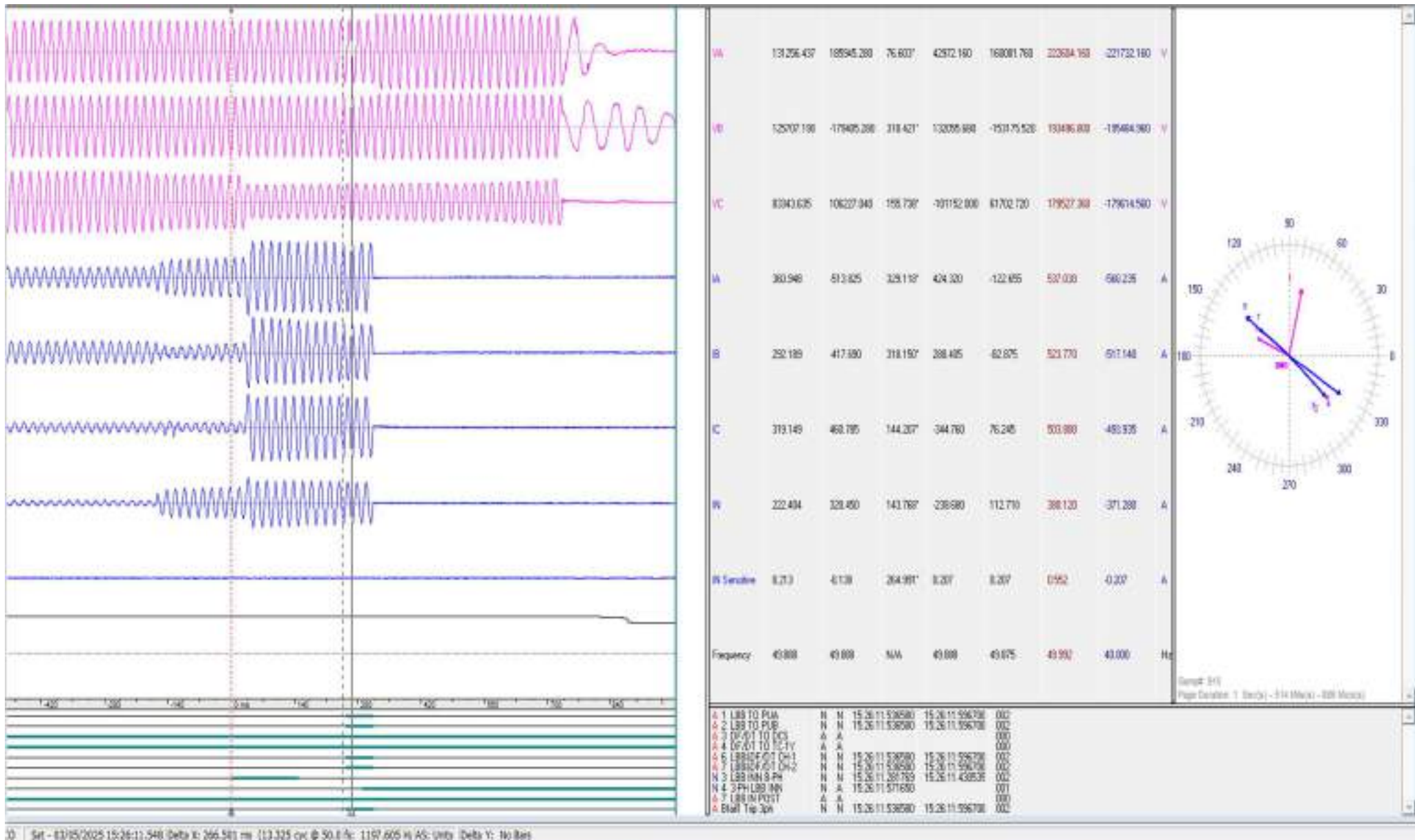
✓ As per DR, R-N phase to earth fault with fault current $I_r = 10.7\text{KA}$, Z-1.

DR of 220 KV Lalitpur(end) –Jhansi (UP) CKT (15:26:11hrs)

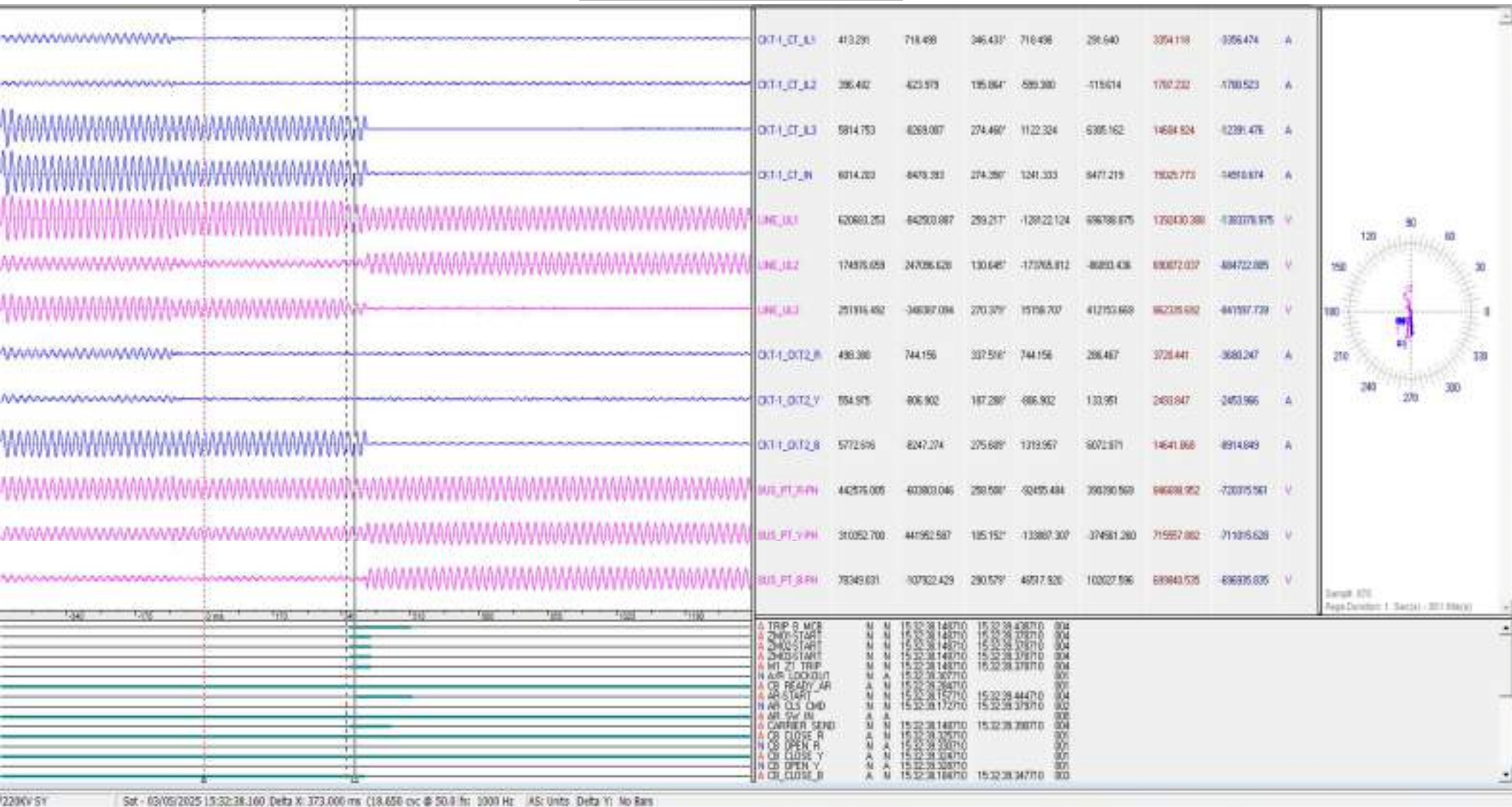


✓ As per DR, B-N phase to earth fault with fault current $I_b = 2.7\text{KA}$.

DR of 220 KV Bus 1 at Lalitpur(UP)

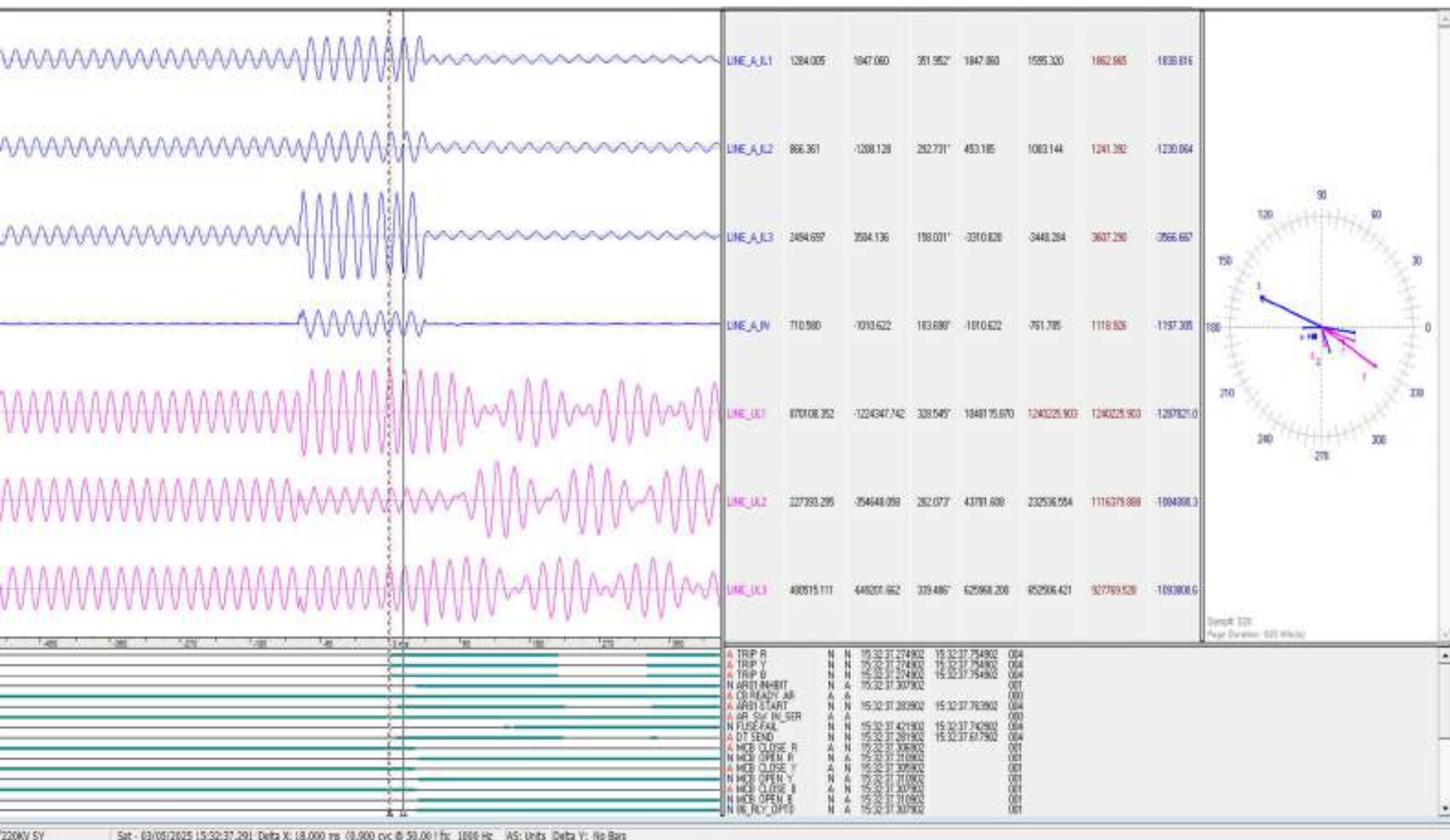


DR of 765 KV Agra Fatehabad(UP)(end)-Lalitpur(LPG) (UP)
Ckt-1(15:32:37)



- ✓ As per DR, B-N phase to earth fault observed. Ib=5.7kA
- ✓ Unsuccessful A/R on permanent fault

DR of 765 KV Agra Fatehabad(UP)(end)-Lalitpur(LPG) (UP) Ckt-2



- ✓ As per DR, Overvoltage Stage 2 operated during B-N fault on line-I.
- ✓ At 15:32:37hrs, voltage of R-ph of 765kV Lalitpur-Agra Fatehabad line-II increased from 441kV to ~845kV.

SCADA SOE

Time	Station Name	Voltage level	Element Name	Element Type	Element Status	Remarks
15:32:37,318	LALIT_UP	765	12AGRA72	Circuit Breaker	Open	Tripping of main CB of 765 KV Agra Fatehabad(UP)-Lalitpur(LPG) (UP) Ckt-2
15:32:37,319	LALIT_UP	765	11TIE	Circuit Breaker	Open	
15:32:39,350	LALIT_UP	765	08TIE	Circuit Breaker	Open	
15:32:39,356	LALIT_UP	765	09AGRA71	Circuit Breaker	Open	Tripping of main CB of 765 KV Agra Fatehabad(UP)-Lalitpur(LPG) (UP) Ckt-1
15:32:39,373	LALIT_UP	220	03LALIT2	Circuit Breaker	Open	Tripping of main CB of 220 KV Lalitpur –Lalitpur220kV CKT-2
15:32:53,955	LALIT_UP	765	02TIE	Circuit Breaker	Open	
15:32:53,955	LALIT_UP	765	01U01	Circuit Breaker	Open	Tripping of main CB of Lalitpur Unit 1 (660MW)
15:32:54,004	LALIT_UP	765	07U02	Circuit Breaker	Open	Tripping of main CB of Lalitpur Unit 2 (660MW)
15:32:54,020	LALIT_UP	765	10U03	Circuit Breaker	Open	Tripping of main CB of Lalitpur Unit 3 (660MW)
15:32:54,108	LALIT_UP	21	01U01	Circuit Breaker	Open	
15:32:54,151	LALIT_UP	21	07U02	Circuit Breaker	Open	
15:32:54,176	LALIT_UP	21	10U03	Circuit Breaker	Open	
15:52:26,023	LALIT_UP	765	13BR	Circuit Breaker	Open	
15:53:05,488	LALIT_UP	765	14TIE	Circuit Breaker	Open	
15:53:17,479	LALIT_UP	765	03T2	Circuit Breaker	Open	Tripping of main CB of 765/220 kV 315 MVA ICT 2 at Lalitpur(LPG)
15:53:17,493	LALIT_UP	220	04T2	Circuit Breaker	Open	Tripping of main CB of 220KV side 765/220 kV 315 MVA ICT 2 at Lalitpur(LPG)
15:53:34,219	LALIT_UP	765	06T1	Circuit Breaker	Open	Tripping of main CB of 765/220 kV 315 MVA ICT 1 at Lalitpur(LPG)
15:53:43,845	LALIT_UP	765	05TIE	Circuit Breaker	Open	
15:53:51,315	LALIT_UP	765	04BR	Circuit Breaker	Open	

Points for Discussion

- i) Details of A/R operation in all the lines need to be shared.
- ii) Reason of delayed clearance of fault (B-N fault) at 15:32hrs need to be shared.
- iii) Reason of LBB operation of Jhansi bay during A/R operation need to be identified.
Necessary corrective action need to be taken to rectify the issue.
- iv) Details of protection operation and sequence of the tripping need to be shared.
- v) DR/EL (.dat/.cfg file) of all tripped elements along with detailed tripping report and remedial action taken report need to be shared.
- vi) Remedial action taken needs to be shared.

3X660MW LPGCL TRIP ANALYSIS REPORT

Date : 03rd May 25 Time : 15:32:39:329

Cause of Tripping : Heavy Thunder storm with high wind speed

Presenter : Abhimanyu Upadhyay
Asst. Vice President – Electrical



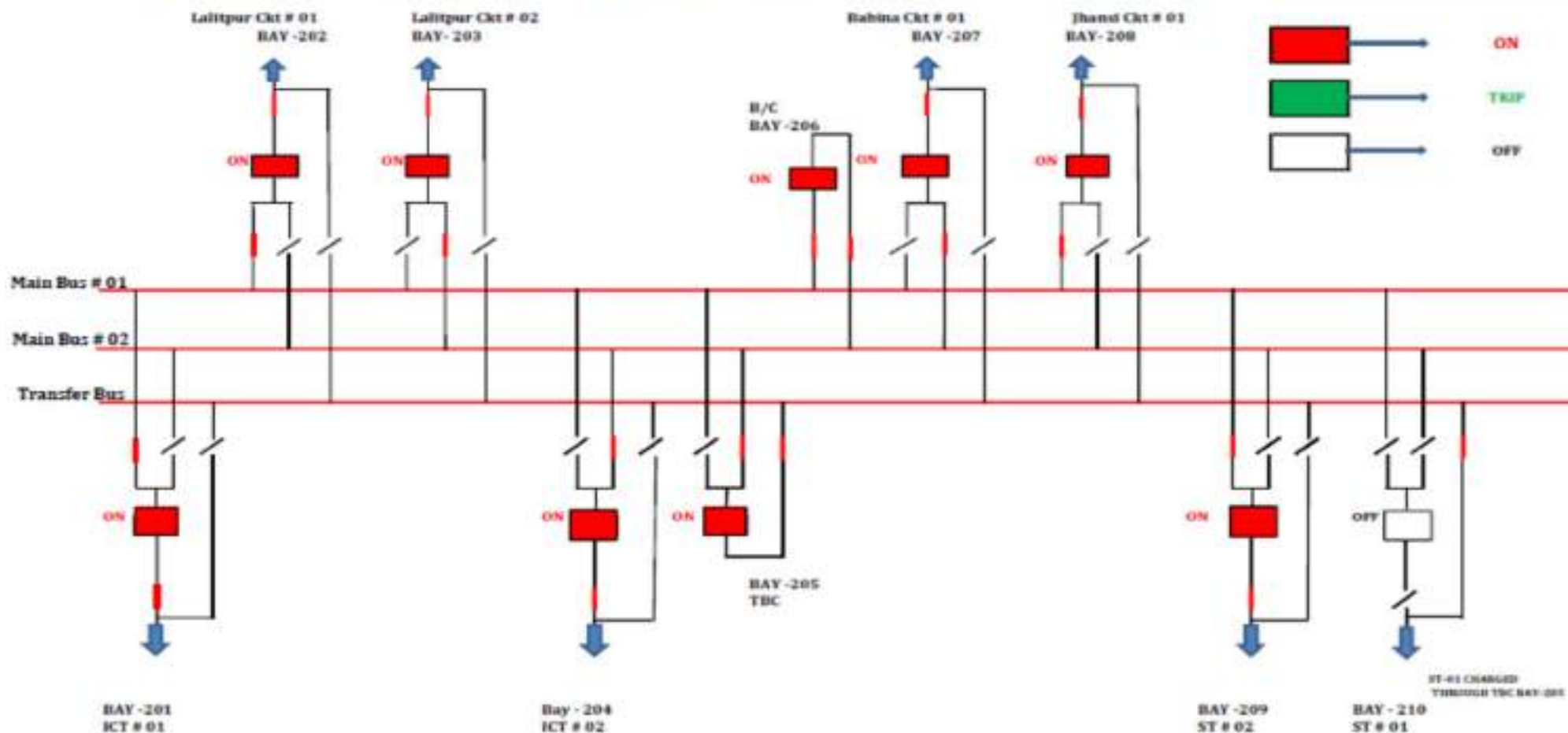


Sl. No	Bay Details	Line Loading before Tripping (MW)	Generation Loss(MU)	Load loss (MW)
1	220KV-Kalyanpura Ckt-1	31 MW	16.77 MU	1106 MW
2	220KV-Kalyanpura Ckt-2	31 MW		
3	220KV-Babina Ckt	10 MW		
4	220KV-Dunara Ckt	10 MW		
5	765KV AGRA (FATEHABAD) Ckt-1	578 MW		
6	765KV AGRA (FATEHABAD) Ckt-2	578 MW		



220KV SWITCHYARD CB POSITION BEFORE FAULT

DATE: 03.05.2025

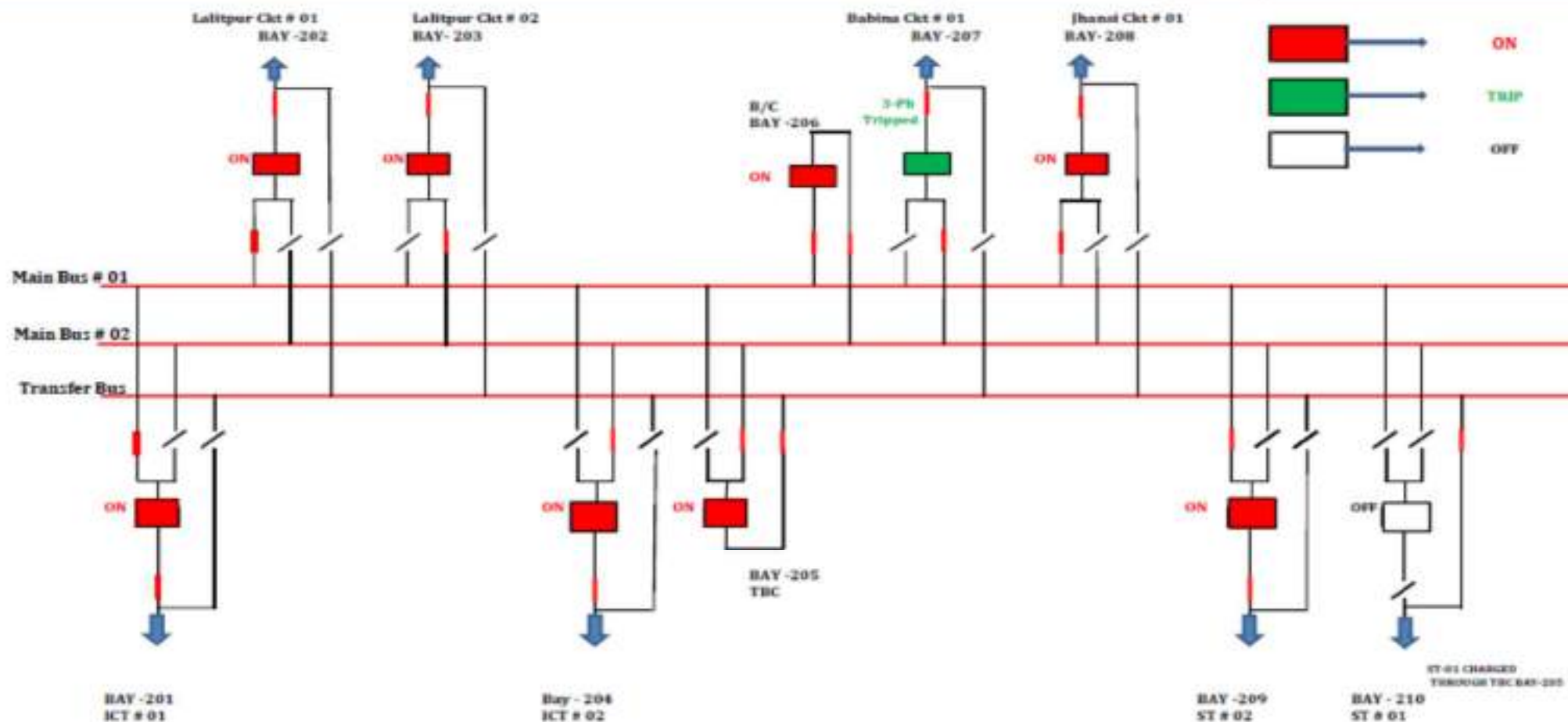


220 KV -BABINA CKT TRIPPING



220KV SWITCHYARD DURING BABINA CKT TRIPPING (15.19:50:980)

DATE: 03.05.2025

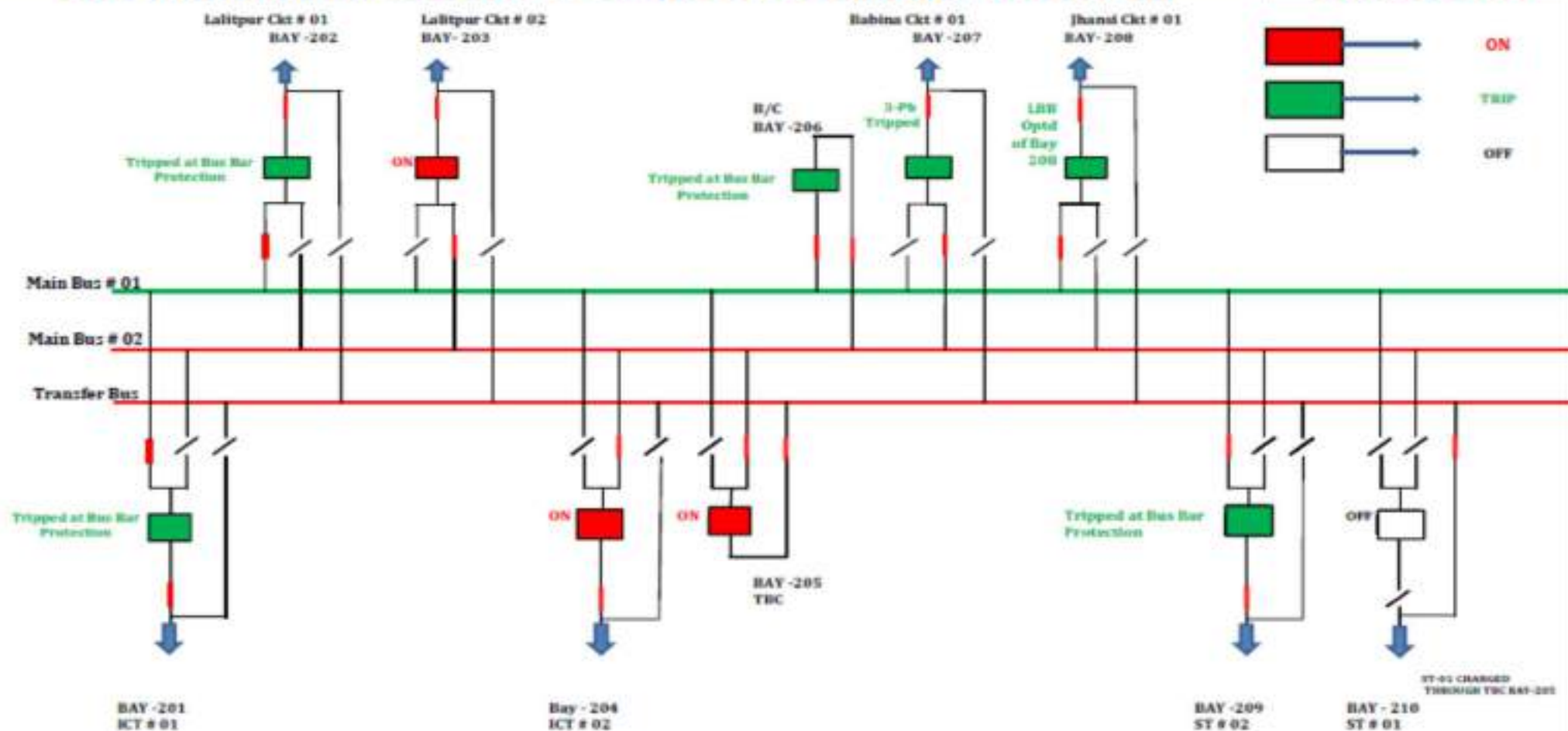


220 KV -DUNARA TRIPPING ON LBB PROTECTION



220KV SWITCHYARD DURING DUNARA CKT TRIPPING ON LBB PROTECTION (15:26:11:536)

DATE: 03.05.2025

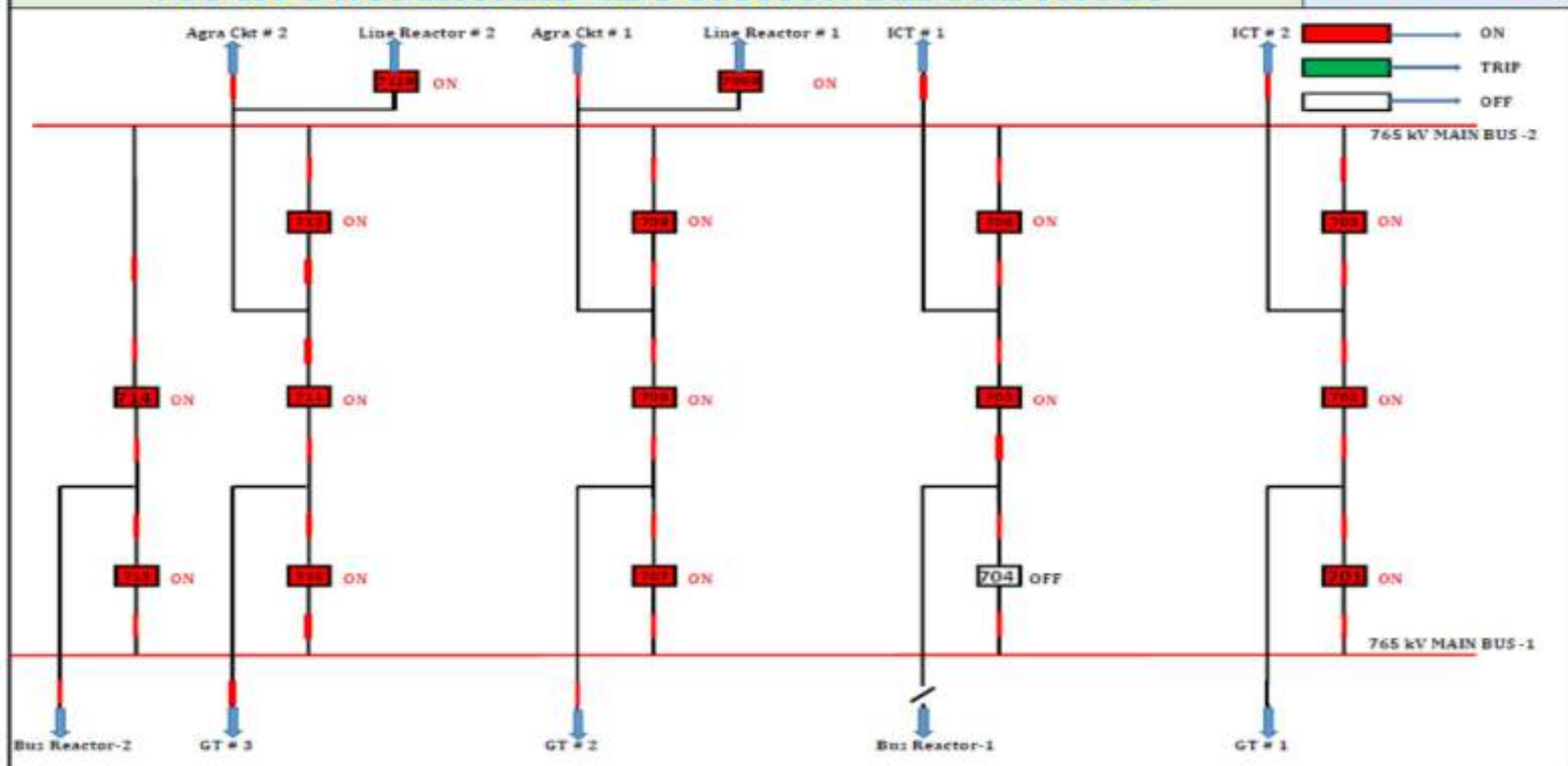


765 KV -SWITCHYARD (BEFORE FAULT CONDITION)



765 KV SWITCHYARD CB POSITION BEFORE FAULT

Date: 03.05.2025

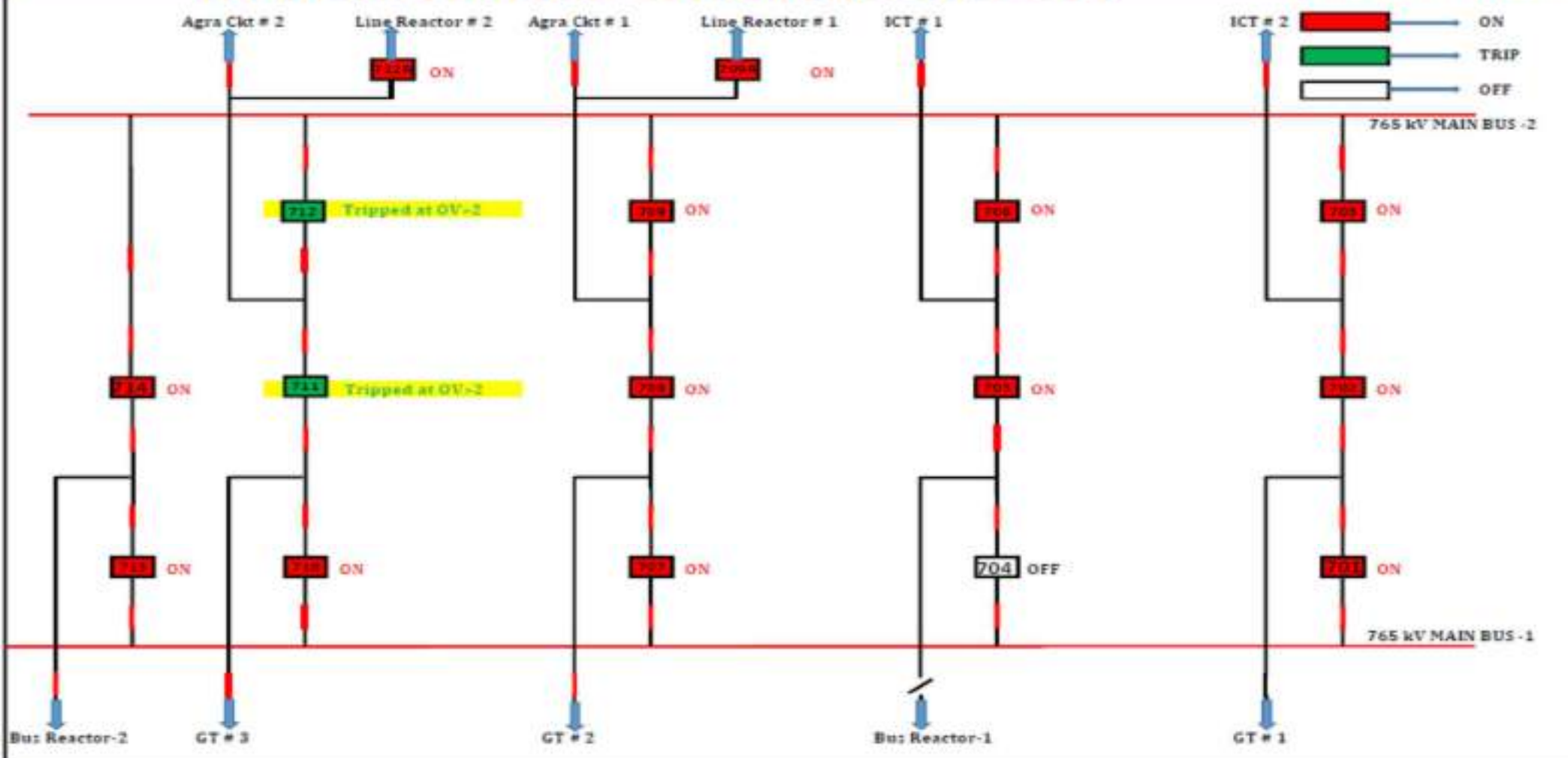


765 KV -AGRA CIRCUIT#2 TRIPPING (O/V STAGE-2)



765 KV AGRA CIRCUIT#2 TRIPPING (15.32.37.310)

Date: 03.05.2025

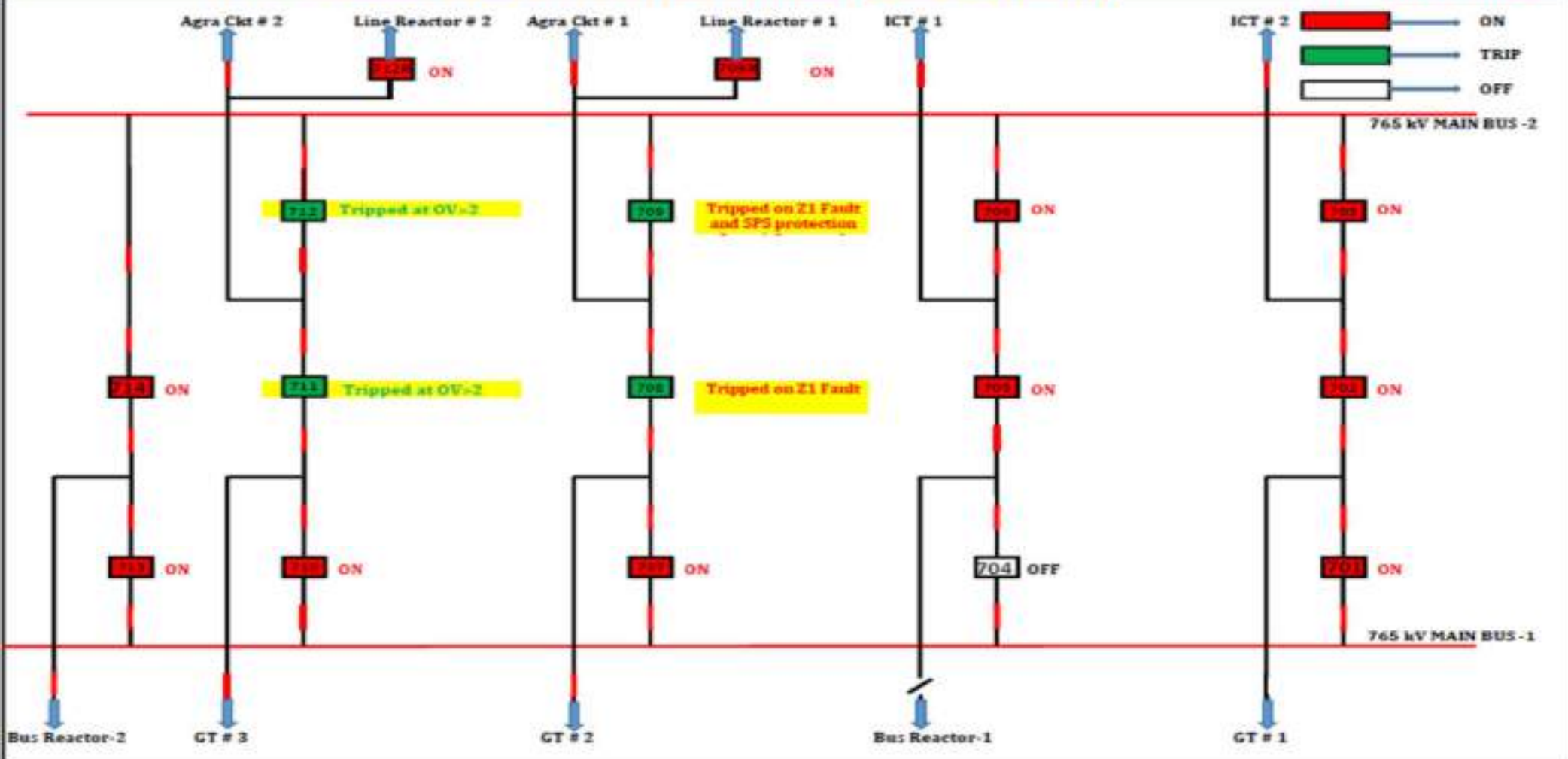


765 KV -AGRA CIRCUIT#1 TRIPPING (FAULT PERSISTING IN A/R TIME)



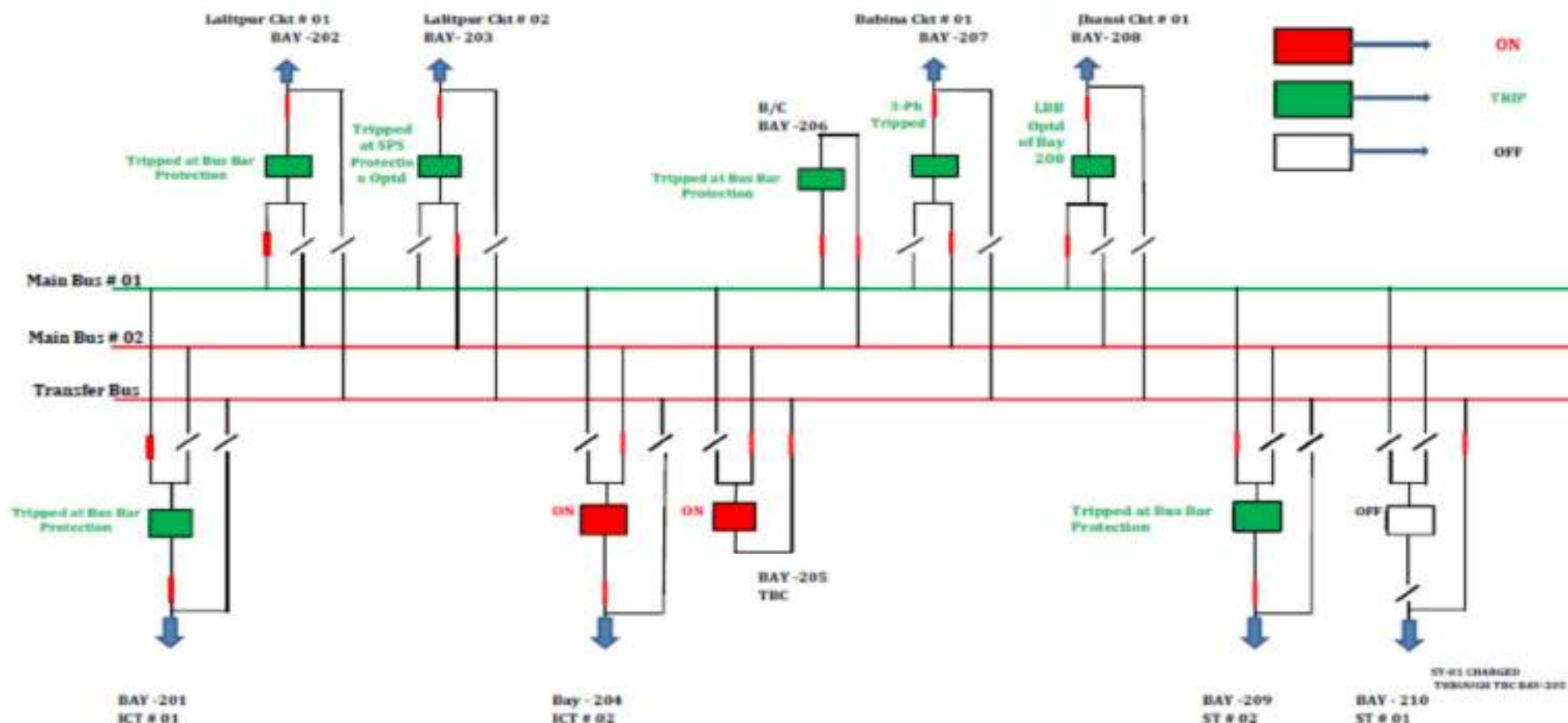
765 KV AGRA CIRCUIT#1 TRIPPING (15:32:39:330)

Date: 03.05.2025



BOTH 765KV AGRA LINES TRIPPED - SPS OPERATED (15:32:39:330)

DATE: 03.05.2025

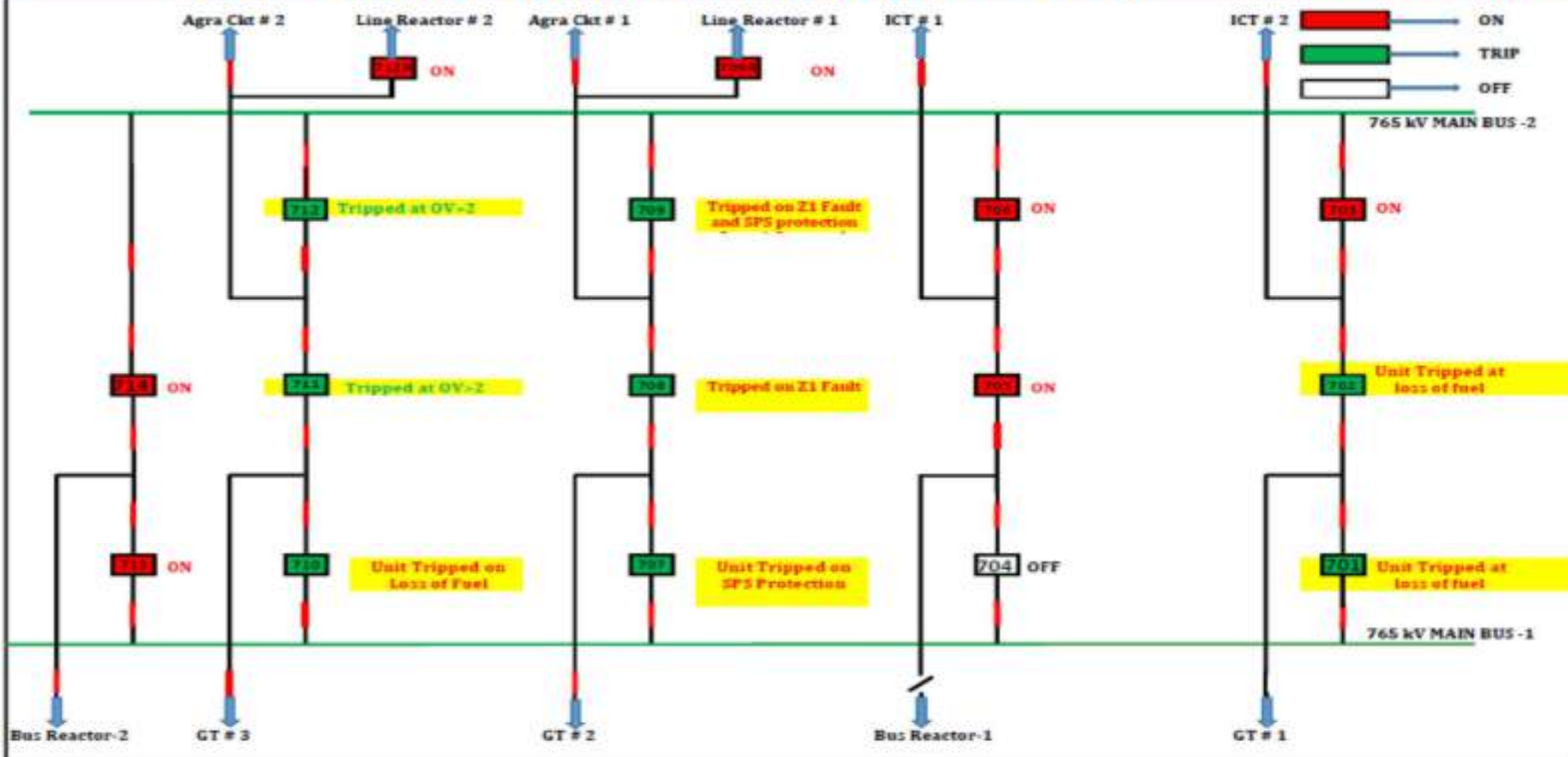


UNIT#1, 2 & 3 TRIPPING



UNIT#1, UNIT#2 AND UNIT#3 TRIPPING (15:32:54)

Date: 03.05.2025

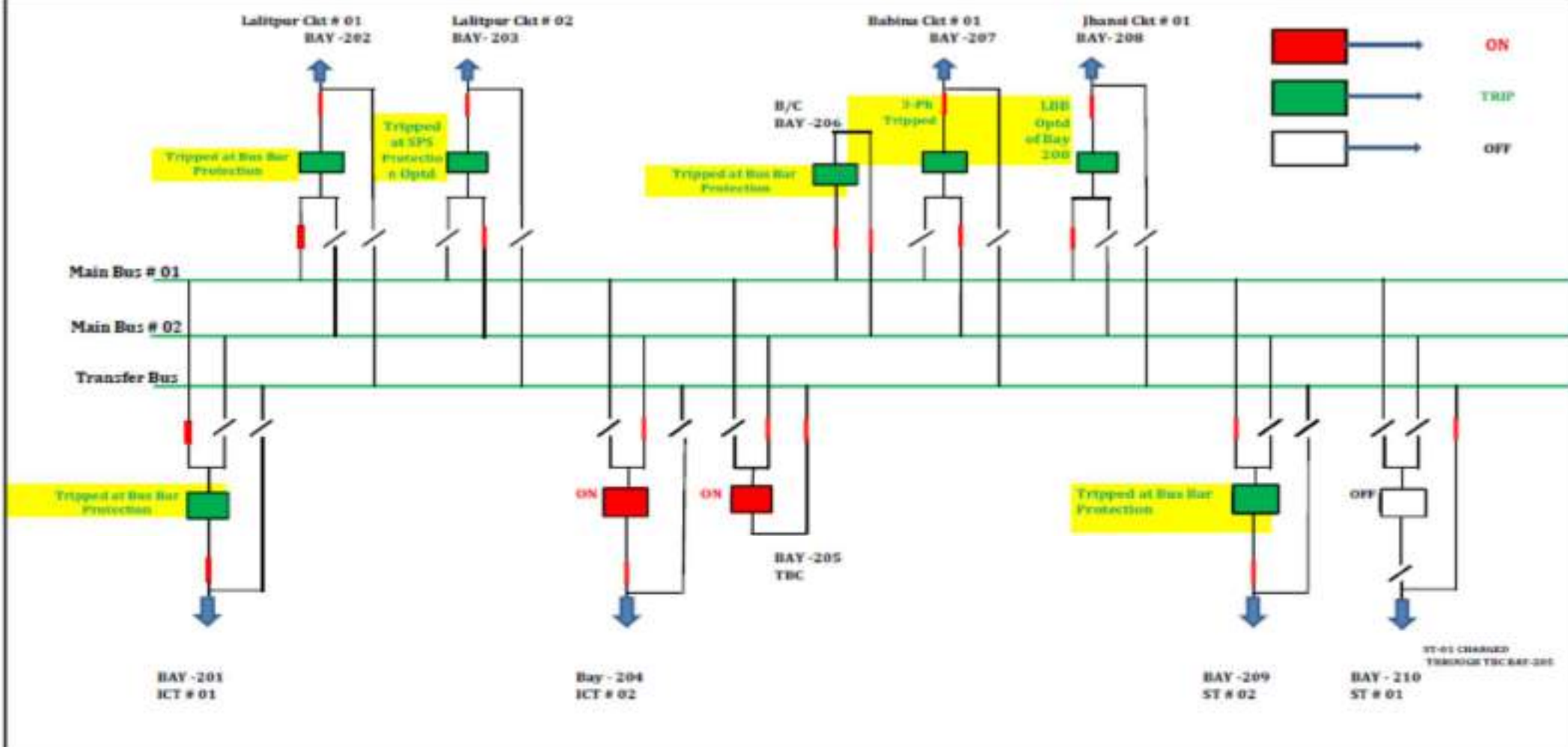


220KV AFTER ALL UNITS TRIPPING



BOTH 765KV AGRA LINES TRIPPED, UNIT#1, 2 & 3 ALSO TRIPPED

DATE: 03.05.2025



SEQUENCE OF EVENTS



Sl No.	Element Tripped	Time	Tripping reason	Element affected due to tripping	Remarks/Finding & action taken /Pending action
1	220KV Babina Ckt	15:19:50:95	Tripped on Zone-1 Protection , R-Phase due to A/R – Unsuccessful	Not applicable	Auto reclose function need to be checked in coordination with UPPTCL during opportunity shutdown as Babina A/R Failed from both the end.
2	220KV Dunara Ckt	15:26:11:536	A/R in B-Phase was in process but LBB Protection operated due to presence of Current in B-Phase in spite of Breaker opening from LPGCL the end only.	220KV Main Bus-1 associated elements were tripped on LBB protection : • 100MVA ST-2 • KALYNAPURA -1 • 315 MVA ICT-1 • BUS COUPLER	During 220KV main Bus-1 & 220KV Dunara Line Shutdown on 19 th May 25 : B-Phase CT additional grounding found at Field JB Cable gland. Rectification done. But A/R Function was not initiated from Dunara end and fault was feeding from other end . Need to be checked in coordination with UPPTCL during opportunity shutdown.

SEQUENCE OF EVENTS



SI No.	Element Tripped	Time	Tripping reason	Element affected due to tripping	Remarks/Finding
3	765KV Agra(Fatehabad) Ckt-2	15:31:37:273	O/V Stage -2 was Operated in R-Phase@ 845kV (Setting -618kV i.e. 140%, Trip Time-100ms) due to earth fault in B-Phase.	NILL	Selection was Phase – ground in ABB-REL670(M1) but other Relay M2 (MICOM-P545) and Agra -2 nd Circuit both M1 &M2 Relay was not affected due to Phase-phase selection . ABB M1-Relay Configuration changed to Phase-Phase instead of Phase-Ground on 4th May 25
4	765KV Agra (Fatehabad) Ckt-1	15:32:39:306	A/R was successful in B-phase but due to persisting fault in Reclaim time , Line was tripped.	SPS Operated and below elements tripped on SPS : 220 KV Kalyanpura-2 - Unit#2	Unit#1 (15:32:38:660) &Unit#3 (15:32:38:990) tripped on loss of Fuel subsequent to Grid disturbances-low voltage conditions

FAULT ANALYSIS

Dunara Ckt LBB Relay- DR

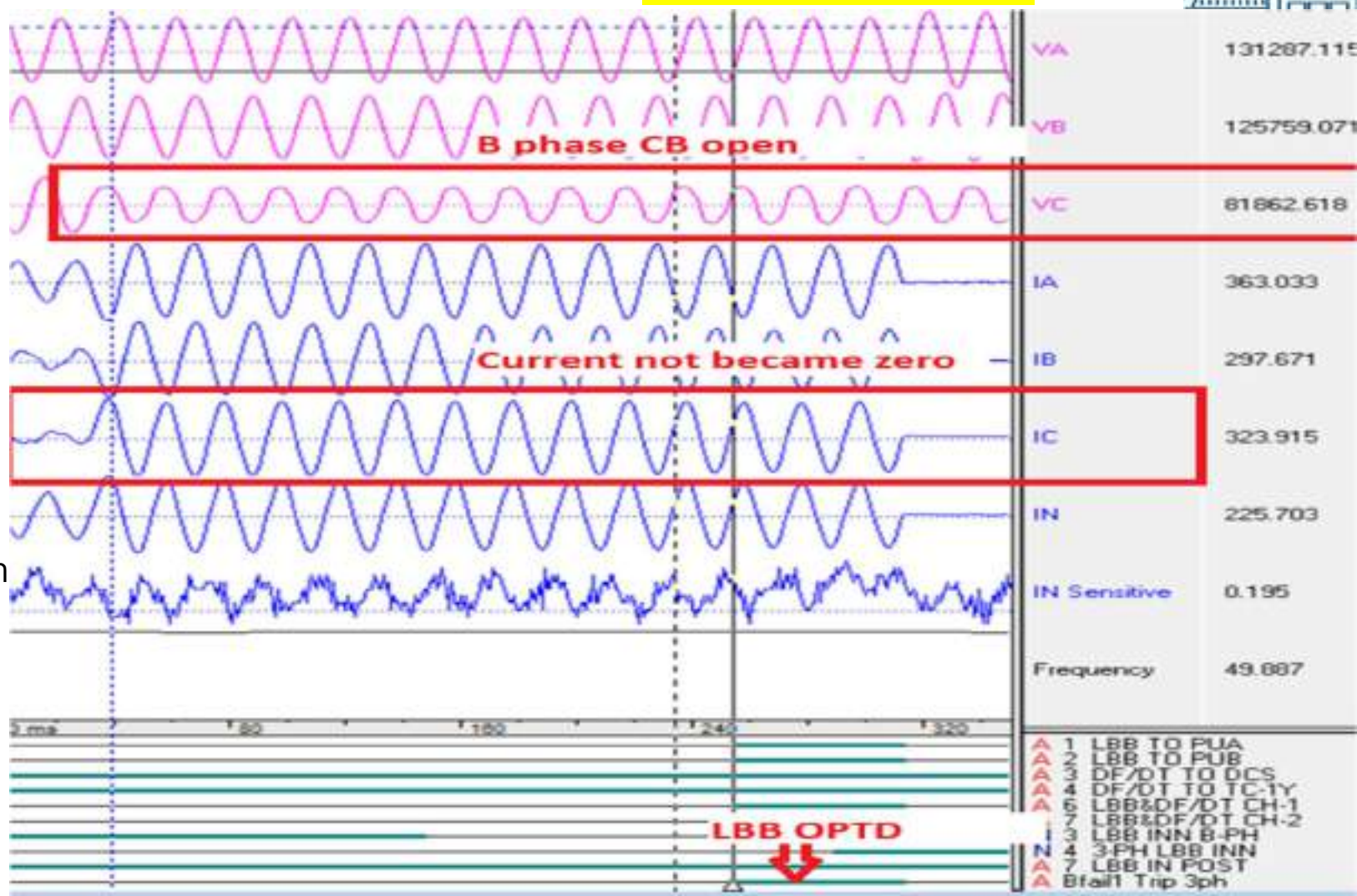


LBB Mal operation of 220kV DUNARA Line.

- During AR operation of B-G phase fault, LPGCL end B phase Breaker opened, But the LBB relay P141 was still sensing the current in B phase which initiated LBB protection.
- UPPTCL Dunara end Breaker was remain in service and was feeding to fault .

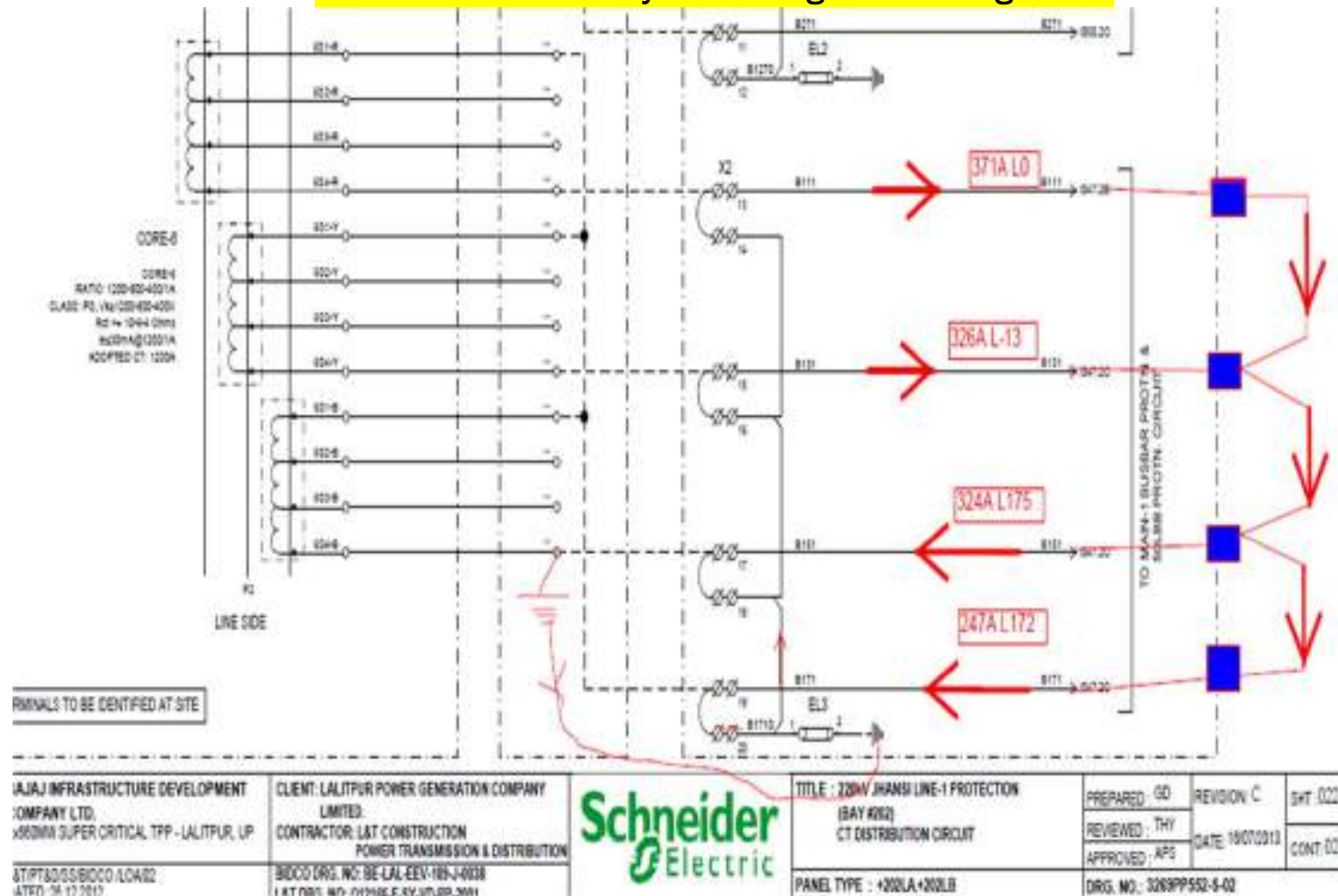
Corrective action taken:

Fault identified in B-phase TB gland earthing .
Rectification done .





Dunara Ckt LBB Relay Circulating current diagram





- 1.) A/R RECLOSE FUNCTION IS NEED TO BE CORSS CHECKED IN CO ORDINATION WITH UPPTCL AS DUNARA LINE WAS CHARGED (B-PHASE) FROM REMOTE END.
- 2.) TRIPPING CONDITION IS NEED TO BE CHANGED FROM I<ONLY TO I < AND PROTECTION RESET FUCTION

Existing Relay Configuration

GROUP 1 CB FAIL : I<		
BREAKER FAIL		
CB Fail 1 Status	Enabled	45.02
CB Fail 1 Timer	200.0 ms	45.03
CB Fail 2 Status	Disabled	45.04
Volt Prot Reset	I< Only	45.06
Ext Prot Reset	I< Only	45.07

Proposed Relay Configuration

New setting:

I< Only

I< Only

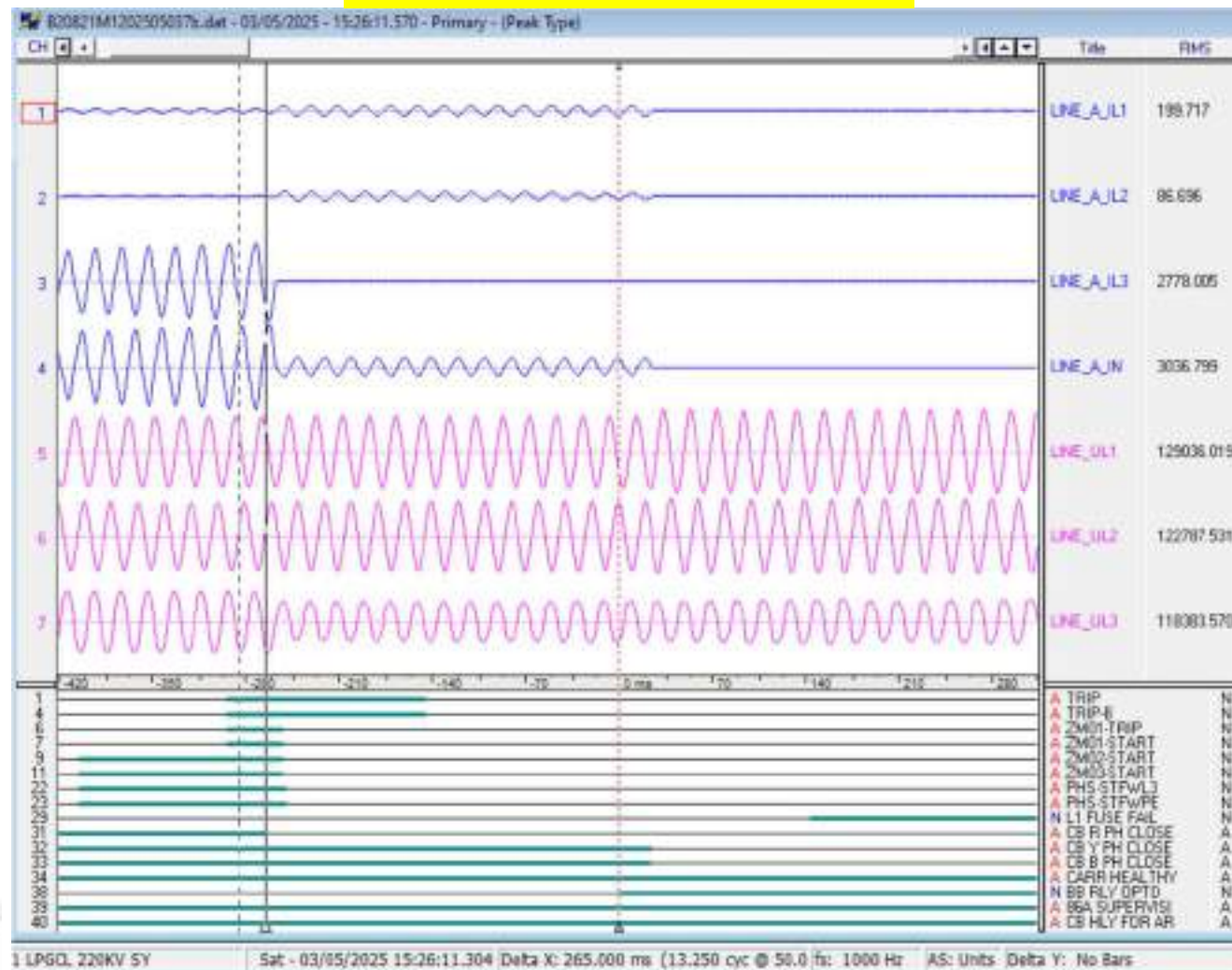
CB Open & I<

Prot Reset & I<

OK

Cancel

Dunara Ckt Distance relay - DR



FAULT ANALYSIS



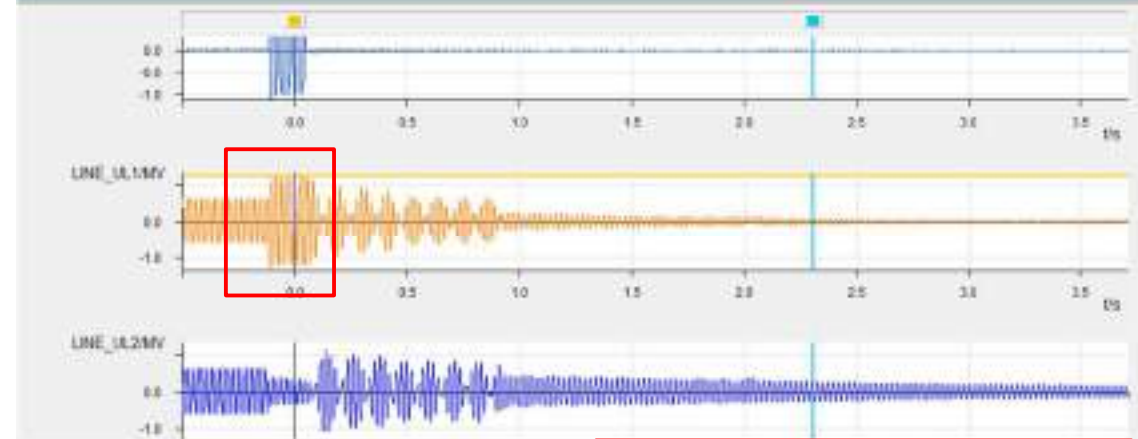
765kV Agra Circuit-2 Tripped on Over Voltage Stage-2

- During Single phase fault in B-Phase, healthy R-phase voltage increased and triggered over voltage stage-2,
- Only ABB Main-1 relay initiated trip command to circuit breaker as due to phase-ground selection.
- After complete DR and setting review , It was observed that , the setting of relay measurement for over voltage selected Ph-N in Main-1 & Ph-Ph in Main-2.
- As per relay manual, if we select Ph-N, then relay will operate on : $(765KV/1,732) \cdot 140\% = 618.36KV$
- If selection was on Ph-Ph they was supposed to be operate on : $765KV \cdot 140\% = 1071 KV$ (But during fault condition maximum Ph-ph voltage was observed 745KV.)

ABB REL670 M1 Relay Setting

OV2PTOV.1	
General	
ConnType	Ph-NFT
Setting Group1	
Operation	On
UBase	765.00 kV 0.05 2000.00

Measuring Signal	Fundamental Sub-Harm	Phase	Extremum	DC	2. Harm / 1. Ist-Harm	3. Harm / 2. Ist-Harm	5. Harm / 4. Ist-Harm
IRE_A_L1	1.2722 kA	31.9°	1.8251 kA	1.2%	0.2%	1.7%	0.4%
IRE_A_L2	0.8613 kA	-31.1°	-1.2660 kA	1.6%	0.2%	1.6%	0.2%
IRE_A_L3	2.4324 kA	-96.5°	-3.5637 kA	1.1%	0.1%	0.5%	0.1%
IRE_UL1	8.5587 MV	2.9°	-1.5862 Mv	1.2%	1.7%	0.9%	0.6%
IRE_UL2	8.2294 MV	-47.5°	-3.3655 Mv	4.6%	7.3%	30.4%	0.5%
IRE_UL3	6.4638 MV	13.1°	0.9665 Mv	2.5%	3.2%	3.6%	0.2%
IRE_A_R	0.7943 kA	-101.9°	-1.0674 kA	0.2%	0.1%	1.1%	0.4%



percentage of the set base voltage U_{Base} . This means operation for phase-to-earth voltage over:

$$U > (\%) \cdot U_{Base}(kV) / \sqrt{3}$$

(Equation 98)

and operation for phase for phase voltage over:

$$U > (\%) \cdot U_{Base}(kV)$$



Corrective Action taken

Entire DR of tripping analyzed and following action were taken to avoid such incident in future.

- CT current in all bays & relays (765kV & 220kV) checked and verified to find any abnormality like 208 P141. Dunara bay. No abnormality observed.
- Ph-N setting changed to Ph-Ph for overvoltage detection in ABB Main-1 relay for in 765KV Agra circuit-2.

Proposed Preventive Action

- In internal protection audit , additional checklist for CT current measurement shall be implemented.
- LBB Protection function should be initiated on Current as well as persisting Fault initiation instead of Current magnitude only in case of line feeders. (It should be part of NRPC Protection philosophy)
- Over voltage phase selection philosophy is to be explored for 765KV System, because there is no such guideline for selecting phase measurement (Ph-Ph or Ph-G) (It should be part of NRPC Protection philosophy).
- AR function to be performed on regular basis for both the ends in coordination with UPPTCL.
- DT philosophy for 220KV Voltage system is to be incorporated NRPC guideline. As at our 220kV remote end, DT signals are not considered for Overvoltage & LBB.



THANK YOU !

Multiple Element Tripping Event at 400/220KV Jaisalmer(RS)

At 11:53 hrs on 05.05.2025

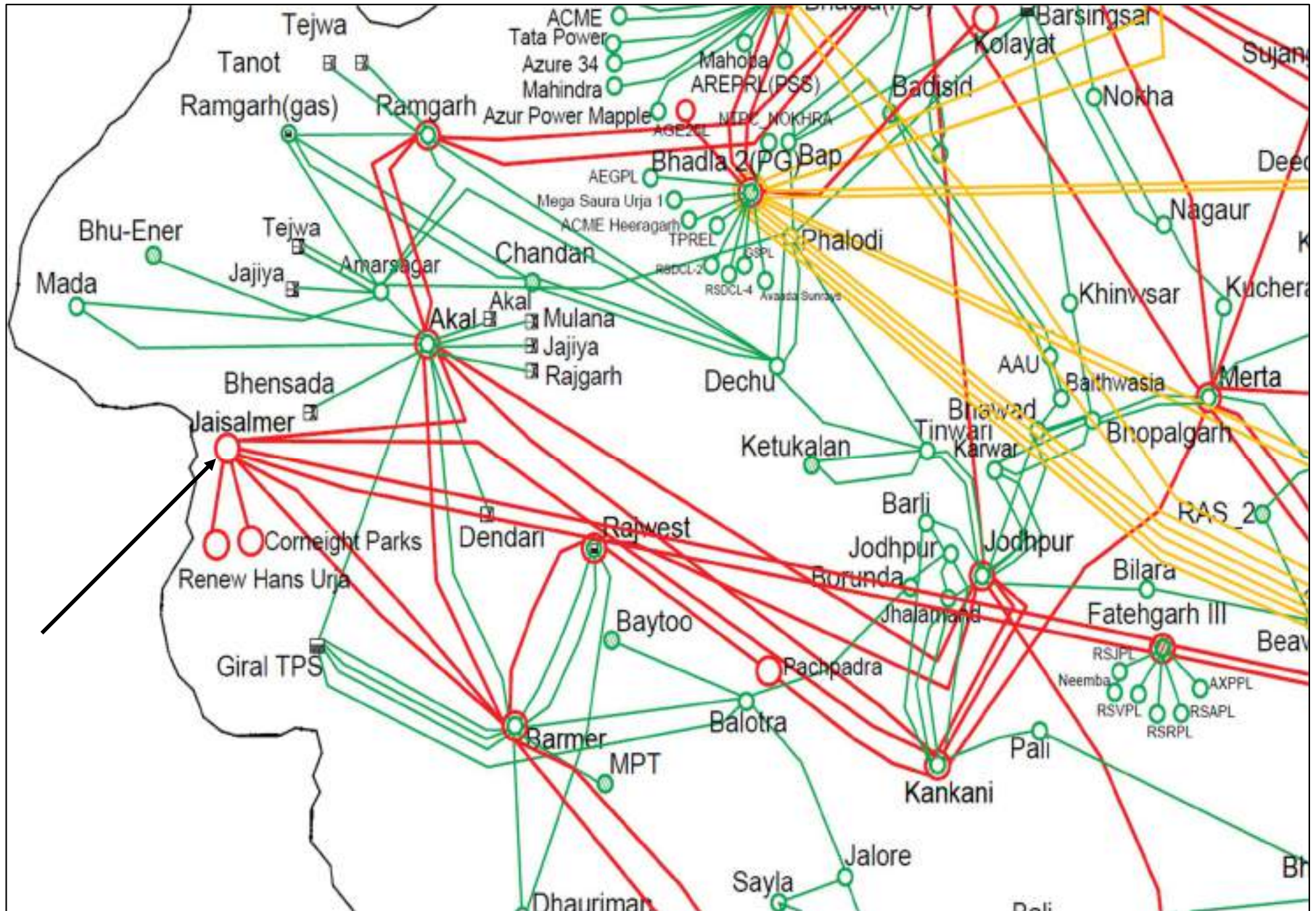
Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	220KV Jaisalmer- NTPC Solar ckt	11:53 hrs		R-N fault due to snapping of R-ph jumper at Jaisalmer end
2.	400/220 kV 500 MVA ICT 3 at Jaisalmer(RS)		12:53 hrs	Bus bar protection of 220kV Bus-2 at Jaisalmer(RS)
3.	400/220 kV 500 MVA ICT 4 at Jaisalmer(RS)			
4.	220kV Jaisalmer-ACME ckt			
5.	220kv Jaisalmer-Green Infra ckt			
6.	220KV Jaisalmer-Akal Ckt 1			
7.	400/220 kV 500 MVA ICT 1 at Jaisalmer(RS)		12:57 hrs	Tripped from both end, details awaited
8.	400 KV Akal-Jaisalmer (RS) Ckt-1		12:53 hrs	R-Y fault, tripped from Akal end only

Brief details of the event

- i) 400/220KV Jaisalmer(RS) has one and half breaker bus scheme at 400kV level and double main and transfer bus scheme at 220kV level.
- ii) During antecedent condition, 400/220kV 500MVA ICT-3 & 4 and 220kV line to NTPC solar, ACME solar, Infra Green Solar and Akal-I were connected at 220kV Bus-2. 400/220kV ICT-1,2&5 and 220kV lines to Akal-II, Green Power solar, Renew Power solar and O2 Power solar were connected at 220kV Bus-1.
- iii) As reported, at 11:53 hrs, R-N fault occurred on 220KV NTPC_Solar – Jaisalmer line due to snapping of tripped at Jaisalmer end. The fault was converted into a bus fault leading to operation of bus bar of 220kV bus-2.
- iv) All the elements connected at 220kV bus-2 i.e., 400/220kV 500MVA ICT-3 & 4 and 220kV line to NTPC solar, ACME solar, Infra Green Solar and Akal-I were tripped on bus bar protection operation.
- v) At the same time, 400/220kV 500MVA ICT-1 also tripped from both HV & LV side and 400kV Akal-Jaisalmer line tripped from Akal end only. As reported, line tripped on R-Y fault in Z-2 from Akal end.
- vi) As per PMU at Fatehgarh3(PG), R-N phase to earth fault converted into R-Y fault with delayed clearance of ~800msec is observed.
- vii) As per SCADA replay of Jaisalmer S/s, power flow in all the remaining ICTs (ICT-2 & 5) and other 220kV feeders also became zero. (reason of the same yet to be received.)
- viii) As per SCADA, total drop in NR solar generation of ~1050MW is observed out of which ~890MW solar generation drop observed in Rajasthan solar.

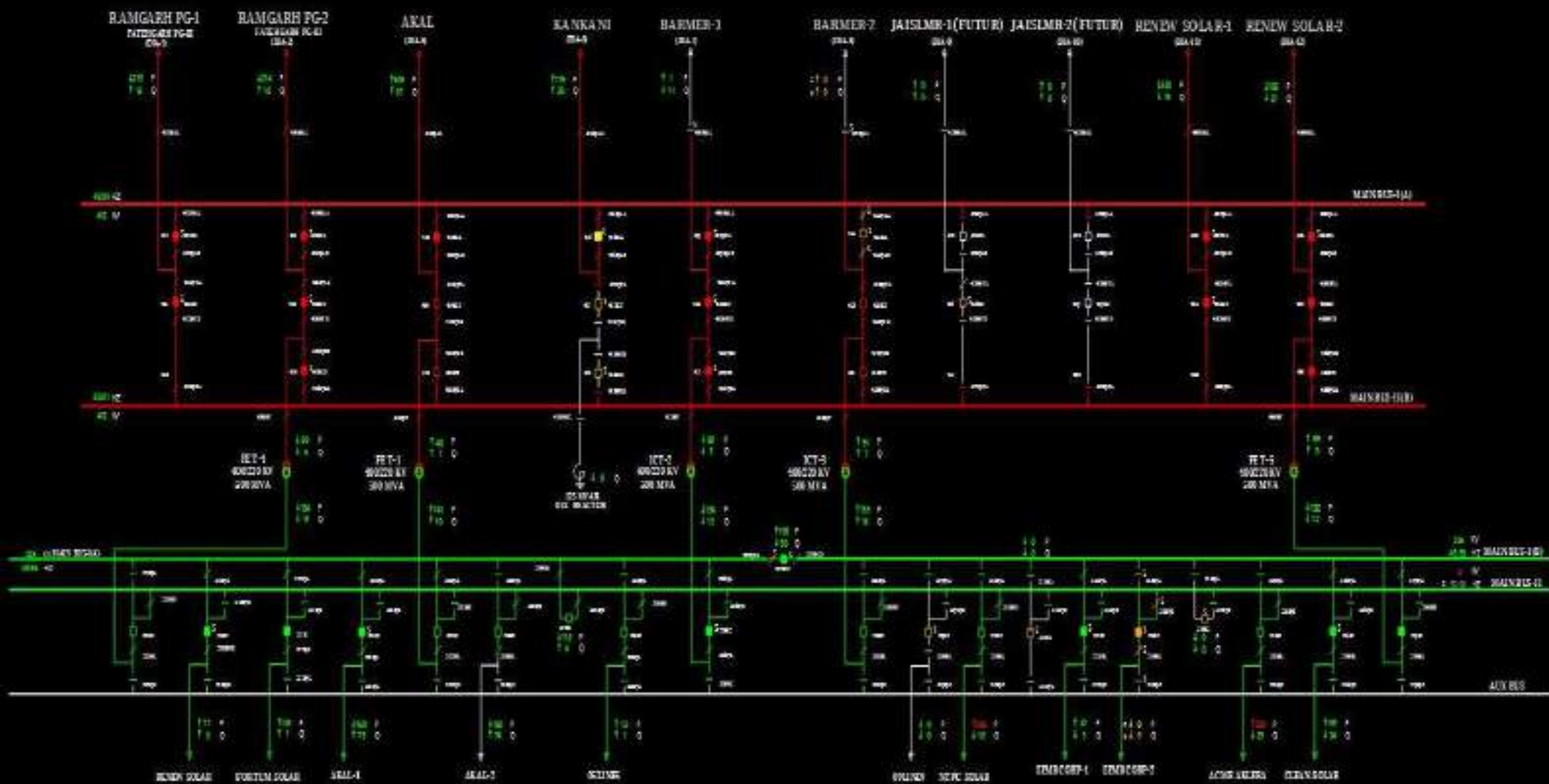
Network Diagram



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

400KV JAISALMER-II (BHAINSRA)

Gen Dpt Genium Company



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

400KV JAISALMER-II (BHAINSRA)

Dist Epl | Faults | Comments



SLD of 220/33KV RSP_Vihan before the event

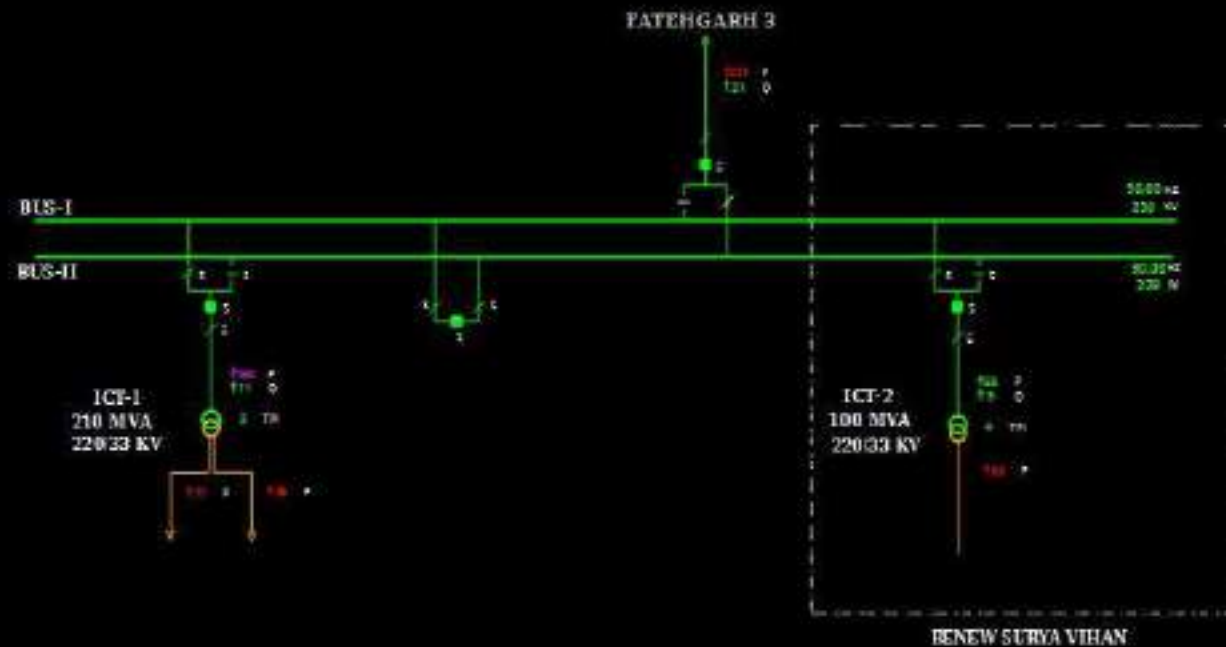
RENEW SURYA PRATAP (200MW) & VIHAN (100MW)

Stat Expl GenSum Company

5.5.25 11:53:30

CONTACT DETAILS	
EMAIL	dinash.laha@cranew.com
MOBILE	988952376 Dinash Laha
PHONE	2012360

Account	Debit	Credit
Accounts receivable	1,000.00	
Accounts payable		1,000.00
Inventory	1,000.00	
Prepaid expenses	1,000.00	
Equipment	1,000.00	
Accumulated depreciation		1,000.00
Common stock		1,000.00
Retained earnings		1,000.00
Dividends	1,000.00	
Salaries expense	1,000.00	
Rent expense	1,000.00	
Utilities expense	1,000.00	
Depreciation expense	1,000.00	
Income tax expense	1,000.00	
Net income		1,000.00
Total	10,000.00	10,000.00



SLD of 220/33KV RSP_Vihan after the event

RENEW SURYA PRATAP (200MW) & VIHAN (100MW)

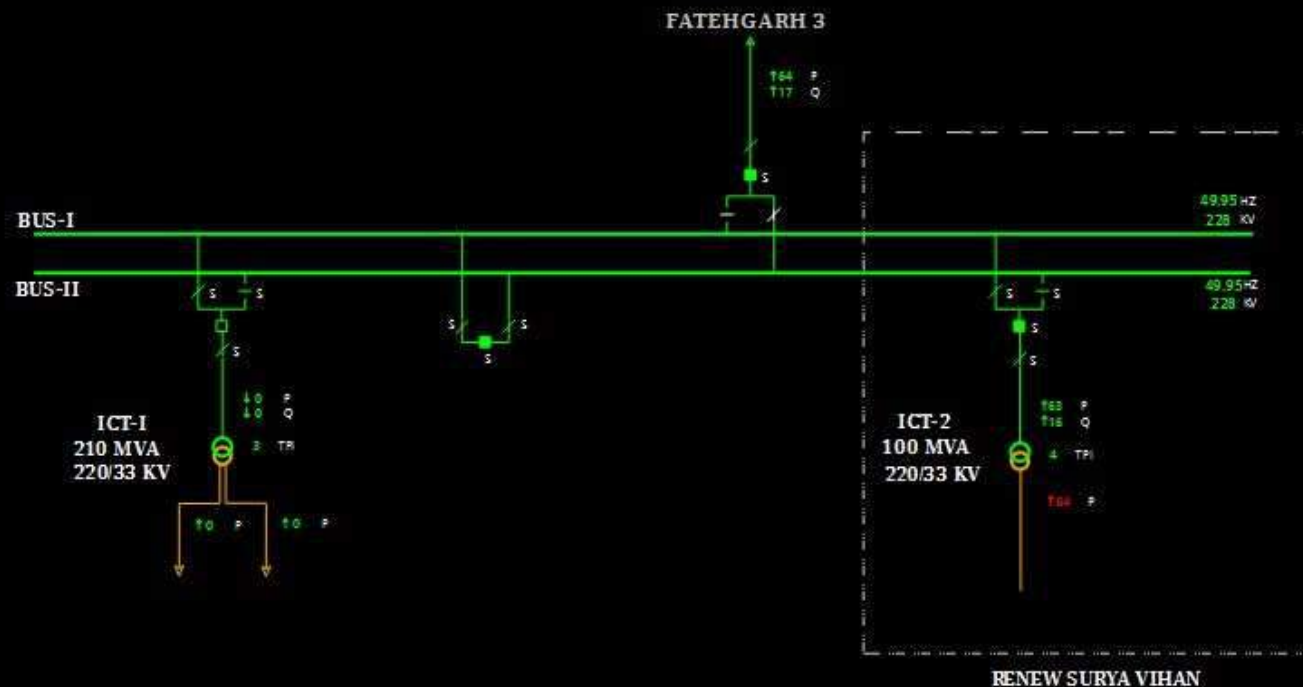
Stat Expl GenSum Company

5 . 5 . 25 11:54:30

CONTACT DETAILS

EMAIL	dinesh.luha@renew.com
MOBILE	7008952836 Dinesh Luha
HOTLINE	20112560

	value
active power (MW)	300.0
reactive power (MVAR)	20.00
complex power (MVA)	320.0
frequency (Hz)	49.97
power factor	0.96
total harmonic distortion	4.00
losses	0.00
total number of meters in use	0.00
total number of meters in use	0.00
total power	7.60
current in 1 phase	0.00
current in 3 phases	0.00
total current	228.0
total power	0.00
total power	584.3
total power	588.5
total power	3.00
total power	0.00
total power	74.71



RE generation before the event

BMSYS	ACME	250	250	199	185	195	198	0	11	250
	ARERL	200	200	155	180	170	155	5	-24	200
	ASBPPL	50	50	41	33	33	52	3	19	50
	ASEZL	50	50	42	45	40	43	-1	2	50
	ASER2PH	150	150	142	95	95	95	4	0	150
	CSPF	250	250	205	200	215	177	2	-23	250
	CSPR	300	200	195	195	180	199	5	-16	300
	RNEW	50	50	46	46	46	\$ 49	\$ 0	\$ 4	50
	SB ENERGY	200	200	165	165	175	198	267	7	200
	SBGPPL	300	300	251	250	185	280	0	31	300
	TPRBL	300	300	245	245	249	141	1	-105	300
	APTRL	130	130	109	118	118	127	25	9	130
	AZURE	200	198	171	158	165	\$ 161	\$ 3	\$ 3	200
	AZURE MAPPLE	300	275	227	245	245	235	1	-10	275
	AZURE 41	300	300	214	235	273	265	1	30	300
	MRPL	250	250	195	195	190	234	-1	40	250
	BHADLA (PG)	3280	3154	2460	2531	2533	\$ 2491	\$ 302	\$ 40	3256

RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MW/HR	DEV	NOC
AHE1L	390 (360+100)	390	338	340	340	210	\$ 21	-130	390
AHE2L	300 (300+75)	300	260	267	269	7	7	2	300
AHE3L	300 (300+75)	300	294	267	267	183	\$ 27	84	300
ASE1L	450 (421+105)	450	389	396	396	422	39	26	450
AGE2PL	405	399	443	399	300	400	8	2	399
ASERGPL	180	180	124	123	155	164	40	42	180
DEVKOT	240	213	206	195	196	185	\$ 56	-6	213
EDBN	300	300	273	257	200	264	\$ 50	7	300
RNEWB	300	300	225	230	190	215	59	-15	300
RSBPL	300	300	239	257	203	244	55	-12	300
RSUPL	300	300	215	228	205	252	28	23	300
RSWPL	300	300	232	223	200		\$ 4	-10	300
PTGH2 (PG)	3765	3732	3227	3180	2917	3024	\$ 299	-157	3732

RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MW/HR	DEV	NOC
AHE1L	700 (600+510)	700	592	595	595	529	-121	-66	700
DEOGARH	300	300	257	265	275	191	38	-73	300
DHOLPUR	300	300	251	265	275	194	38	-71	300
PHALODI	300	300	250	265	275	207	38	-88	300
RAISER	300	300	282	265	275	213	38	-52	300
NIDAN(NT)	295	295	273	252	280	172	33	-80	295
FTGH1	2196	2196	1872	1907	1975	1907	89	-399	2196

RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MW/HR	DEV
ANTA	90	90	81	78	80	16	29	-42
AURANA	40	40	26	16	25	15	\$ 0	-1
DADRI	5	5	3	3	3	2	0	-2
SINGRAULI	15	15	8	9	9	-0	-3	-8
UNCHAHAR	10	10	7	6	6	3	-0	-2

	SCHDL	NXT SCHL	ACTUAL	DEV
TOTAL	15806	\$ 14849	\$ 15113	\$ 493

BMSYS	AVADA, BKN	240	240	220	220	197	200	58	20	240
	AVADA, SUNC	350	350	327	320	270	308	77	-12	350
	AVADA SSTN	300	300	285	280	240	261	62	1	300
	AVANA	300	300	283	260	240	300	44	40	300
	RSRPL	300	289	270	210	112	206	75	-8	289
	RSPPPL BKN	250	250	225	225	225	221	39	-4	250
	TPGEL	225	225	203	205	205	164	39	-41	225
	TPSL	110	89	89	88	89	70	13	-18	88
	TS1PL	300	300	270	260	240	226	52	-84	300
	ASE1L 2L-P1	150	150	140	133	120	143	-49	10	150
	ASE1L 2L-P2	150	150	139	125	75	141	0	16	150
	ARP3PL	300	239	255	210	195	234	43	24	239
	AZURE 43	600	600	558	510	480	522	103	12	600
	BIKANER (PG)	3575	3421	3271	3025	2687	2997	627	-28	3421

RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MW/HR	DEV	NOC
ABCR	300	239	229	205	200	253	30	48	239
AEGPL	100	\$ 0	\$ 0	70	70	80	2	10	80
AEGPL	100	90	89	80	82	75	0	4	80
AEGPL	100	80	85	80	98	76	2	-4	80
AGE2SPL	357	399	89	300	300	342	54	-42	399
AHPL	300	300	237	220	200	247	20	27	300
ASPL	320	320	255	230	200	280	51	50	320
GORBEA	300	\$ 0	\$ 0	68	68	141	-24	73	50
KOLAYAT	550	474	354	474	474	263	42	211	474
MSUPL	250	250	221	200	200	251	\$ -9	51	250
NONHRA	300	239	225	180	180	227	49	47	239
NNSP 2	190	\$ 0	\$ 0	210	210	245	-11	35	245
RSEKPL	190	190	160	190	190	195	55	5	190
BHADLA2 (PG)	2867	\$ 2572	\$ 1948	2506	2382	2678	\$ 204	171	2976

RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MW/HR	DEV	NOC
AAPL	100	80	92	74	55	80	23	6	80
ARTPL	110	88	109	85	67	90	17	6	88
GRAIN	100	80	80	74	59	80	23	6	80
JGCP	100	80	98	71	9	81	31	10	80
JNEPL	100	\$ 0	\$ 0	36	35	38	15	3	40
JUNA	300	\$ 0	\$ 0						
KBNHPC	300	\$ 0	\$ 0	73	73	85	-16	13	85
OVER	100	80	92	74	55	80	23	6	80
SJVN	1000	\$ 0	\$ 0	180	180	198	-29	13	193
SRIPL	168	134	168	130	130	135	-16	5	134
SRIPL	176	140	170	130	131	141	18	11	140
TESPL	844	48	55	47	47	67	24	20	67
TGPPL	100	80	99	79	77	81	17	2	80
TPSB	300	160	182	159	159	240	34	1	239
TSESPL	50	40	48	38	39	40	4	2	40
TSES1PL	55.6	0	0	44	44	35	8	-9	44
BIKANER2	3188	\$ 1025	\$ 1215	\$ 1375	\$ 1180	1434	166	97	\$ 1470

QCA	RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	ACTUAL MW/HR	DEV	NOC
MAL	AXPPL	380	380	336	332	328	279	20	-43	380
	RSVPL	100	100	92	88	88	67	9	-16	100
	RSPPPL - FTG3	200	201	183	170	133	161	12	-8	200
	RSAPL	300	300	278	281	250	245	23	-33	300
	RSRPL FTG3	400	319	357	307	309	186	63	-112	319
	FTG3/CA BH 3	1380	1300	1245	1173	1103	950	127	-215	1259

RE generation after the event

BMSYS	ACME	250	250	199	199	199	199	-1	11	250
	ASERJL	200	200	199	199	199	199	-6	-31	200
	ASERJL	50	50	41	33	33	33	8	18	50
	ASERJL	50	50	42	45	40	40	0	5	50
	ASER2PH	150	150	142	99	99	97	-14	2	150
	CSFPJ	250	250	205	200	215	173	1	-27	250
	CSPP	300	300	199	199	199	197	8	2	300
	RNEW	50	50	46	46	46	46	\$ 49	\$ 0	50
	SB ENERGY	200	200	199	199	199	199	199	5	200
	SBEPJL	300	300	251	250	199	201	19	-31	300
	TPRBL	300	300	245	245	249	199	1	-111	300
	APTRL	130	130	109	118	118	127	25	9	130
	AZURE	200	199	171	169	169	161	\$ 3	\$ 3	200
	AZURE MAPPLE	300	278	227	245	245	229	-11	-22	278
	AZURE 41	300	300	214	235	273	253	0	18	300

BMSYS	MRPL	250	250	199	199	199	199	-2	44	250
	BHADLA (PG)	3280	3154	2460	2531	2533	\$ 2503	\$ 178	\$ -28	3280
	RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	DEV	NOC	
	AHEB1L	390 (360+100)	390	338	340	340	215	\$ -21	-125	390
	AHEB2L	300 (300+75)	300	250	257	257	274	8	7	300
	AHEB3L	300 (300+75)	300	234	257	257	199	\$ -27	-62	300
	ASEB1L	450 (421+105)	450	399	399	399	422	43	26	450
	AGE24PL	405	399	443	399	300	400	8	1	399
	ASERJ2PL	180	180	124	123	155	149	23	27	180
	DEVJOT	240	211	206	199	199	199	\$ 56	-66	213
	EDBN	300	300	279	257	200	279	\$ 50	22	300
	RNEW3	300	300	225	230	190	221	56	-9	300
	RSBPL	300	300	239	257	209	231	70	35	300
	RSUPL	300	300	215	229	205	209	36	36	300
	RSVPL	300	300	222	223	200	200	\$ 4	-8	300

MAL	PTGH2 (PG)	3765	3732	3227	3180	2917	2930	\$ 306	-249	3732
	RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	DEV	NOC	
	AHEB1L	700 (600+510)	700	598	599	599	519	-150	-77	700
	DIEDGARH	300	300	297	295	275	215	39	-90	300
	DHOLPUR	300	300	261	265	275	215	40	-60	300
	PHALODI	300	300	280	285	275	238	37	-27	300
	RAISER	300	300	282	285	275	211	41	-64	300
	NIDHAN(T)	296	296	273	252	280	190		-72	296
	PTGH1	2196	2196	972	1907	1975	1578	-121	829	2196
	RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	DEV	NOC	
	ANTA	90	90	81	78	60	16	29	61	
	AURANA	40	40	29	16	25	15	\$ 0	-1	
	DADRI	5	5	3	3	3	2	0	-2	
	SINGRAULI	1.5	1.5	8	9	9	-0	-3	-6	
	UNOHAR	10	10	7	6	6	3	0	-2	

MAL	RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	DEV	NOC	
	ANTA	90	90	81	78	60	16	29	61	
	AURANA	40	40	29	16	25	15	\$ 0	-1	
	DADRI	5	5	3	3	3	2	0	-2	
	SINGRAULI	1.5	1.5	8	9	9	-0	-3	-6	
	UNOHAR	10	10	7	6	6	3	0	-2	
	RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	DEV	NOC	
	ANTA	90	90	81	78	60	16	29	61	
	AURANA	40	40	29	16	25	15	\$ 0	-1	
	DADRI	5	5	3	3	3	2	0	-2	
	SINGRAULI	1.5	1.5	8	9	9	-0	-3	-6	
	UNOHAR	10	10	7	6	6	3	0	-2	
	RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	DEV	NOC	
	ANTA	90	90	81	78	60	16	29	61	
	AURANA	40	40	29	16	25	15	\$ 0	-1	

TOTAL	SCHDL	NEXT SCHL	ACTUAL	DEV
	15806	\$ 14849	\$ 14893	\$ 813

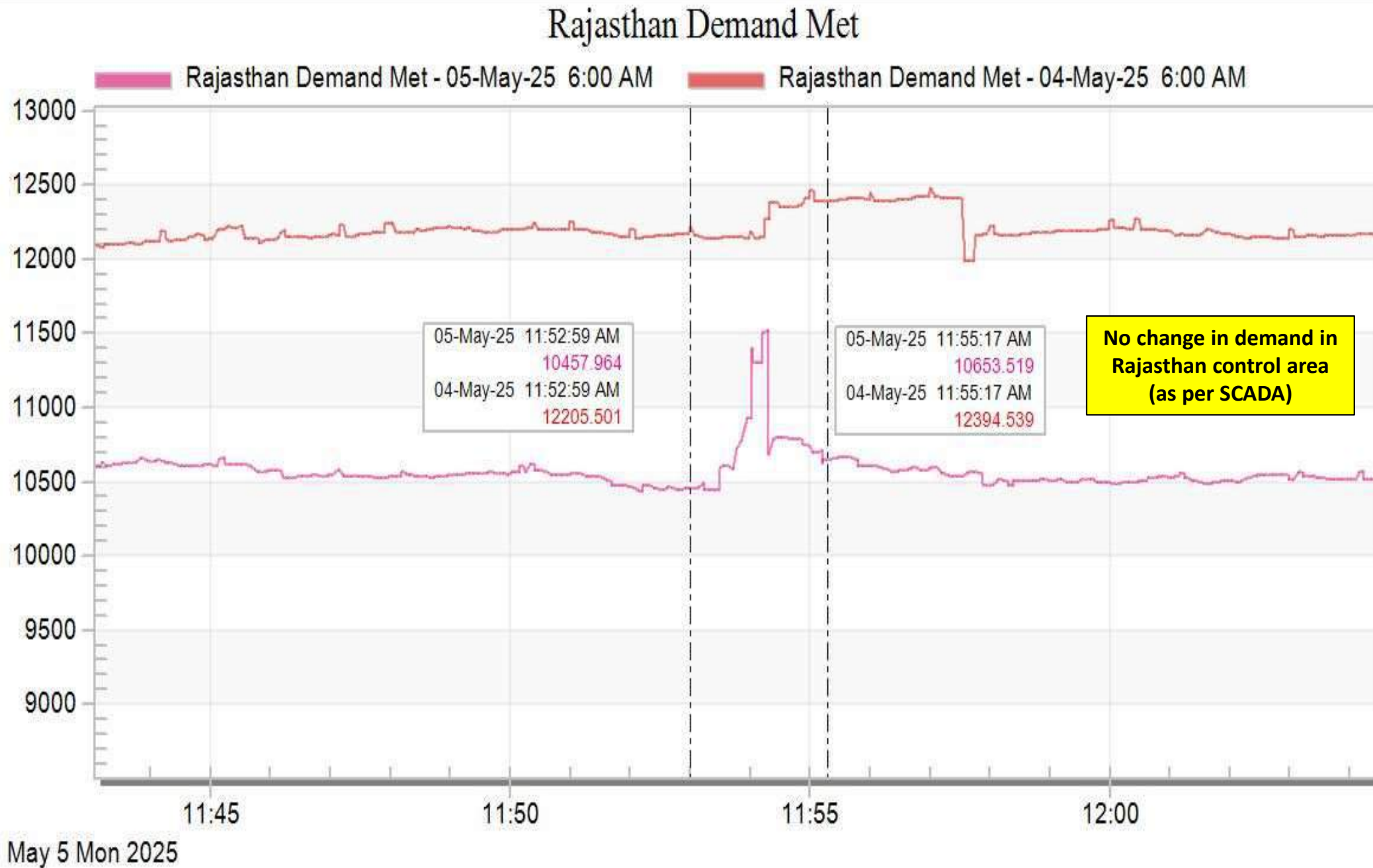
BMSYS	AV/ADA, RHIN	240	240	220	220	197	192	56	-28	240
	AV/ADA, SUNC	350	350	327	320	270	293	76	-27	350
	AV/ADA SSTN	300	300	285	290	240	239	60	-21	300
	AVANA	300	300	283	280	240	239	48	-39	300
	RSRPL	300	299	270	210	112	181	77	-29	299
	RSRPL BWN	250	250	225	225	225	214	40	-11	250
	TPGEL	225	225	203	205	205	199	41	-47	225
	TPSL	110	88	89	88	88	82	9	-6	88
	TS1PL	300	300	270	260	240	266	54	6	300
	ASEB 2L-P1	150	150	140	139	120	165	60	32	150
	ASEB 2L-P2	150	150	139	125	75	138	-0	11	150
	ARP3PL	300	299	255	210	195	230	43	20	299
	AZURE 43	600	600	559	510	480	541	103	31	600
	BIKANER (PG)	3575	3431	3271	3025	2887	2992	613	-21	3431

BMSYS	RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	DEV	NOC	
	ABCRJL	300	299	229	205	200	239	47	34	299
	AGEAPL	100	\$ 0	\$ 0	70	70	80	2	10	80
	AGE5PL	100	80	89	80	62	81	0	-1	80
	AGE6PL	100	80	85	80	55	84	2	5	80
	AGE25PL	357	399	89	300	300	399	54	69	399
	ANPPL	300	300	237	220	200	255	20	35	300
	ASEPL	320	320	255	230	200	268	50	39	320
	GOMBER	300	\$ 0	\$ 0	69	69	140	-17	72	60
	KOLAYAY	550	474	354	474	474	253	40	-218	474
	MSUPL	250	250	221	200	200	251	\$ -9	51	250
	NOMHRA	300	239	229	180	180	217	49	37	239
	NINSP 2	190	\$ 0	\$ 0	210	220	245	-21	35	245
	RSEKPL	190	190	160	190	150	197	54	7	190
	BHADLA2 (PG)	2867	\$ 2572	\$ 1949	2506	2382	2669	\$ 219	163	2976

BMSYS	RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	DEV	NOC	
	AAPL	100	80	92	74	55	80	23	6	80
	ARTPL	110	88	109	85	67	90	17	6	88
	GRAIN	100	80	80	74	59	80	23	6	80
	JGCPPL	100	80	98	71	9	80	36	9	80
	JNEPL	100	\$ 0	\$ 0	35	35	40	15	4	40
	JUNA	300	\$ 0	\$ 0						
	KBNHPC	300	\$ 0	\$ 0	73	73	86	-21	13	86
	OVEPL	100	80	92	74	55	81	22	7	80
	SJVN	1000	\$ 0	\$ 0	180	180	194	-35	13	193
	SRI4PL	168	134	168	130	120	135	-16	9	134
	SRI5PL	176	140	170	130	131	141	18	11	140
	TESPL	844	48	55	47	47	67	24	20	67
	TG6PL	100	80	99	79	77	81	17	2	80
	TPSB	300	160	182	159	159	239	34	0	239

BMSYS	TS6PL	50	40	48	38	39	40	4	2	40
	TS61PL	55.6	0	0	44	44	36	8	-8	44
	BIKANER2	3188	\$ 1028	\$ 1218	\$ 1373	\$ 1160	1432	162	99	\$ 1470
	RE GEN	Ins CAPACITY	Av. CAPACITY	FORECAST	SCHDL	NEXT SCHL	ACTUAL MW	DEV	NOC	
	AXPPL	380	380	336	332	328	280	21	-73	380
	RSVPL	100	100	92	83	83	63	16	-20	100
	RSPL - FTG3	200	201	183	170	133	0	0	-170	200
	RSAPL	300	300	278	281	250	232	22	-48	300
	RSRPL FTG3	400	319	357	307	309	198	62	-109	319
	EXTENSION 3	1380	1360	1246	1173	1163	757	122	-621	1360

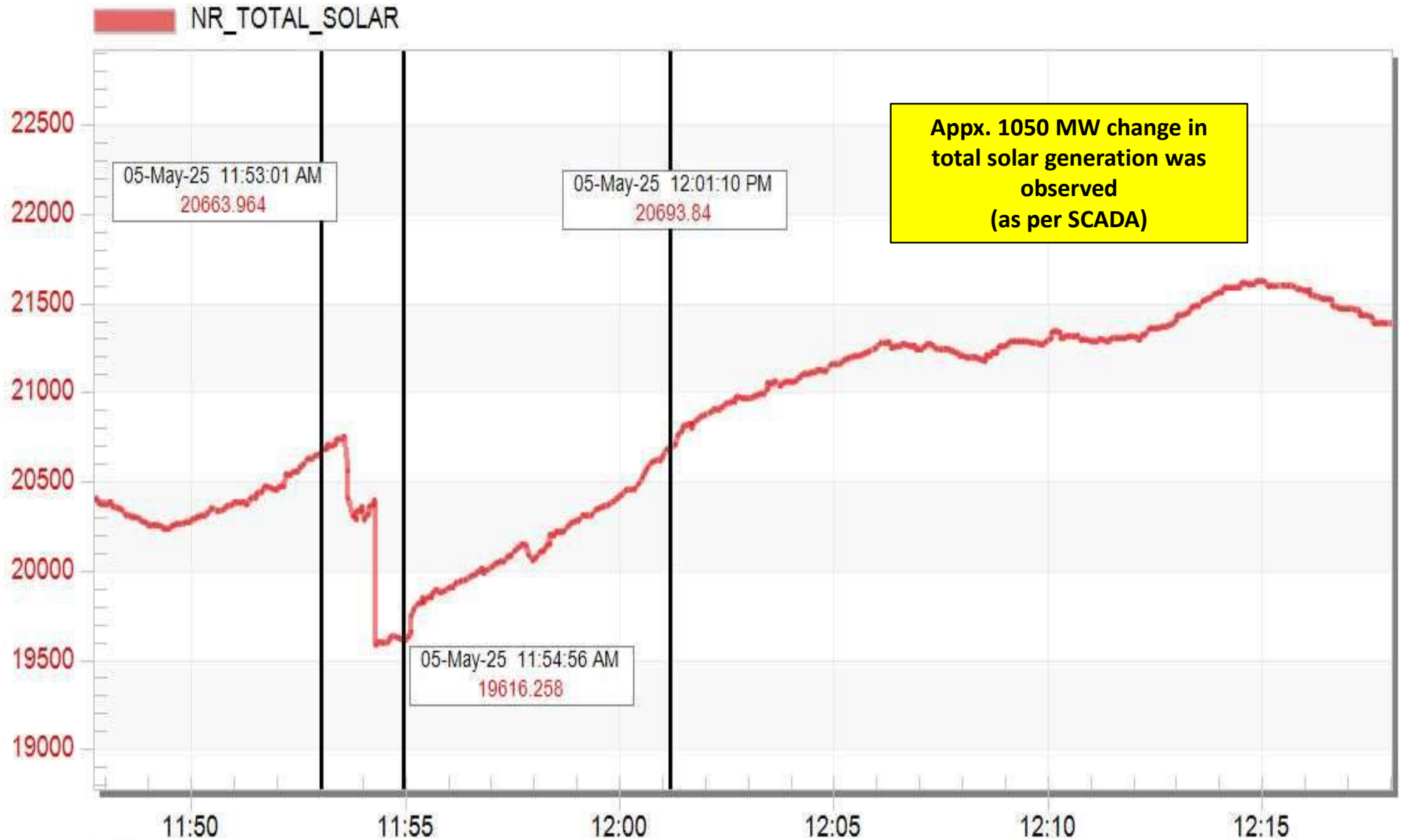
Rajasthan Demand during the event



Total NR Solar Generation during the event

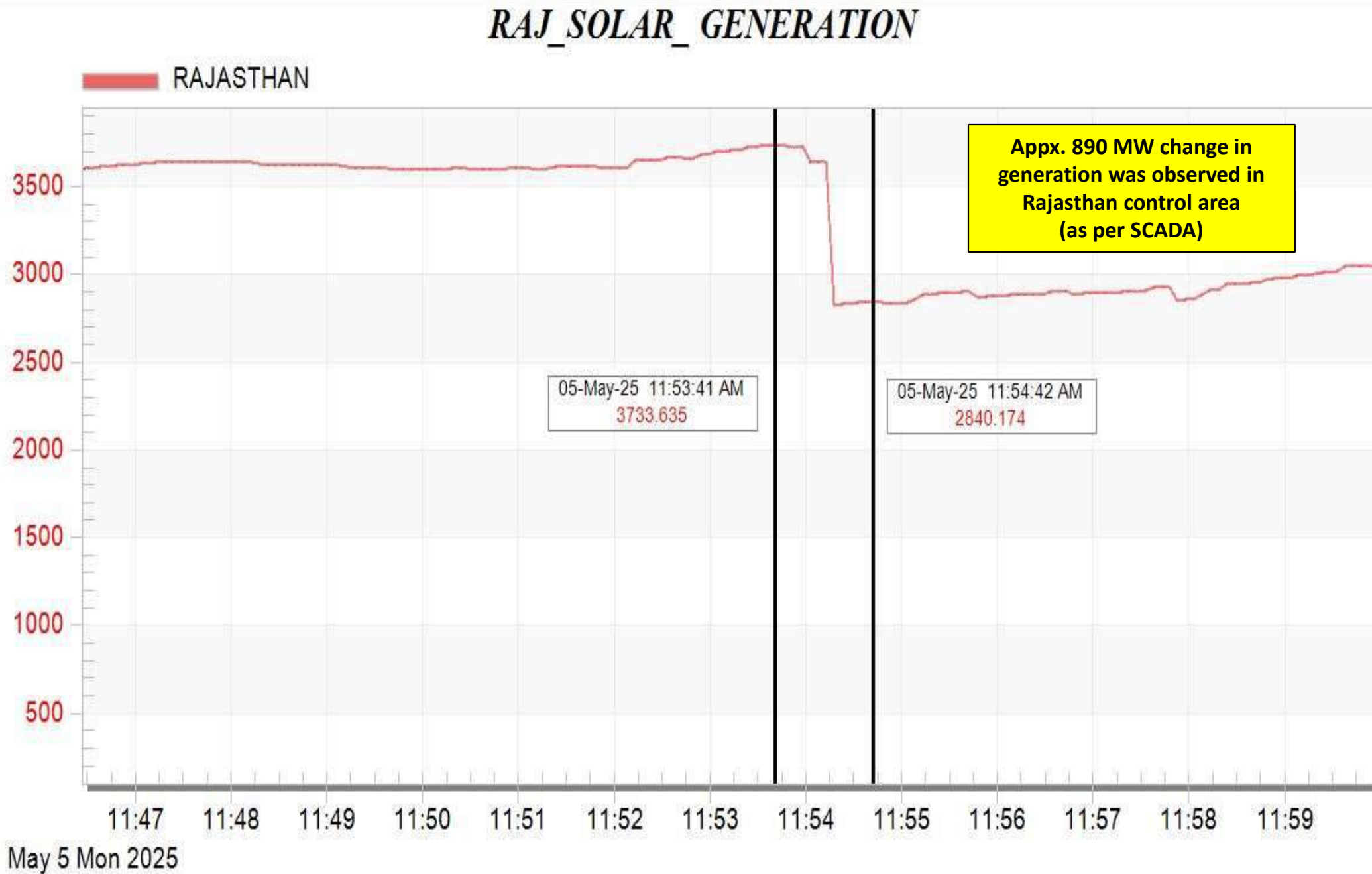
NR_TOTAL_SOLAR (Updated By: SPCAdmin)

NR_TOTAL_SOLAR (MW)



May 5 Mon 2025

Rajasthan Solar Generation during the event



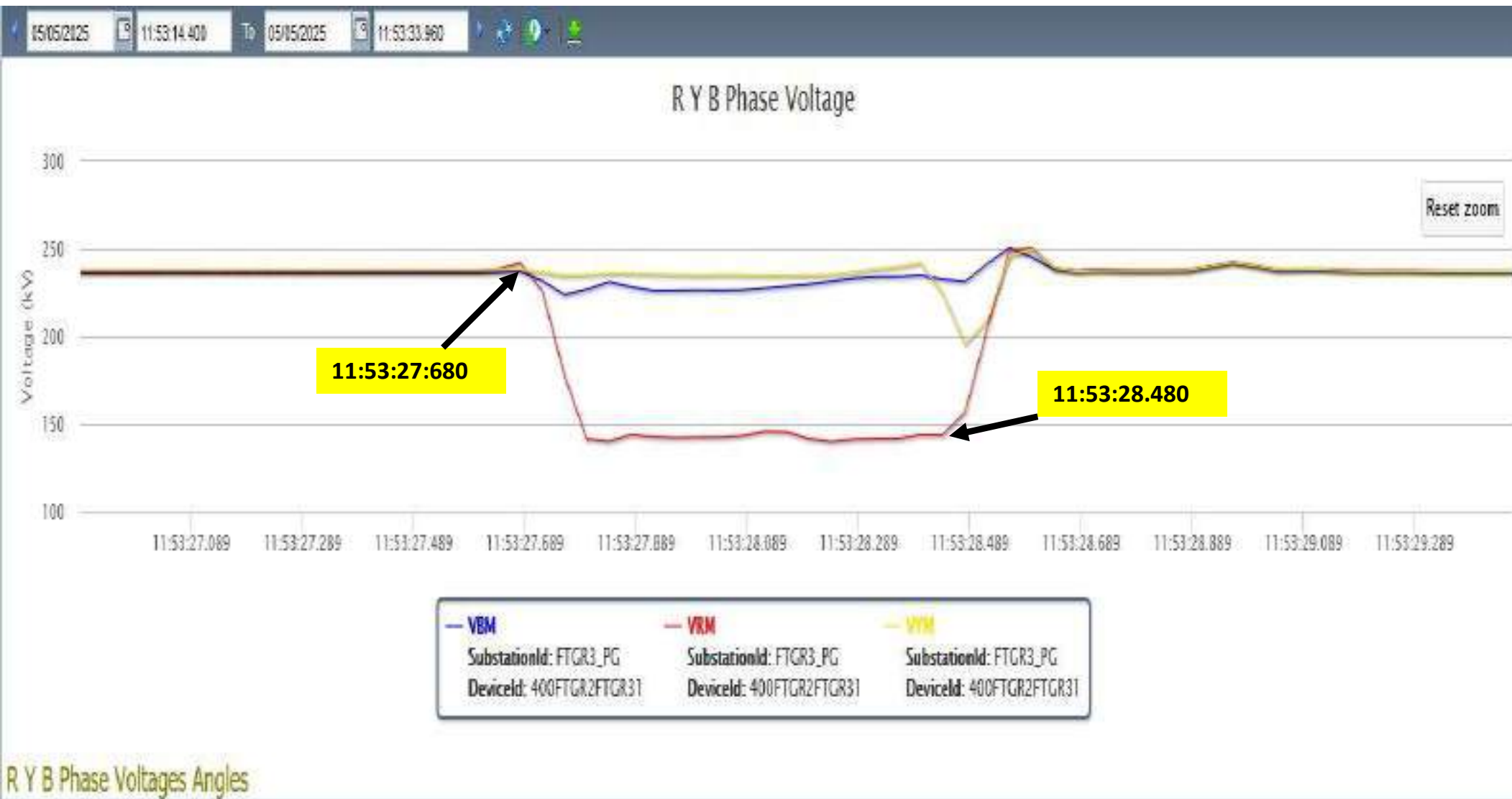
PMU Plot of frequency at Fatehgarh3(PG)

11:53hrs/05-May-25



PMU Plot of phase voltage at Fatehgarh3(PG)

11:53hrs/05-May-25



SCADA SOE

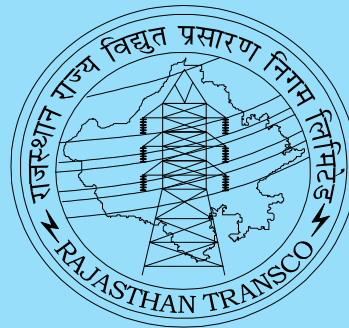
Time	Station Name	Voltage(kV)	Element Name	Element Type	Element Status	Remarks
11:53:27,970	JASL4_R	220	15ACME	Circuit Breaker	Open	Line CB at Jaisalmer end of 220kV Jaisalmer-ACME line opened
11:53:28,111	JASL4_R	220	03AKAL2	Circuit Breaker	Open	Line CB at Jaisalmer end of 220kV Jaisalmer-Akal line-II opened
11:53:28,410	JASL4_R	400	14AKT1	Circuit Breaker	Open	Main & Tie CB of 400/220kV 500MVA ICT-1 opened
11:53:28,410	JASL4_R	400	15T1	Circuit Breaker	Open	
11:53:28,418	JASL4_R	220	02T1	Circuit Breaker	Open	CB at 220kV side of 400/220kV 500MVA ICT-1 opened
11:53:28,476	JASL4_R	400	23BRT3	Circuit Breaker	Open	Main & Tie CB of 400/220kV 500MVA ICT-3 opened
11:53:28,481	JASL4_R	400	24T3	Circuit Breaker	Open	
11:53:28,481	JASL4_R	220	08T3	Circuit Breaker	Open	CB at 220kV side of 400/220kV 500MVA ICT-3 opened
11:53:28,525	JASL4_R	220	05LINE5	Circuit Breaker	Open	
11:53:28,525	JASL4_R	220	04MBC1	Circuit Breaker	Open	Bus coupler CB at 220kV side opened
11:53:28,526	JASL4_R	220	10NTPC	Circuit Breaker	Open	Line CB at Jaisalmer end of 220kV Jaisalmer-NTPC line opened
11:53:28,526	JASL4_R	220	20T4	Circuit Breaker	Open	CB at 220kV side of 400/220kV 500MVA ICT-4 opened

Points for Discussion

- i) Exact location and nature of fault need to be shared.
- ii) Reason of delayed clearance of fault even after operation of bus bar protection also need to be shared.
- iii) Reason of tripping of ICT-1 and 400kV Akal-Jaisalmer line from Akal end only need to be shared.
- iv) DR/EL along with tripping report need to be shared for each element from both the ends.
- v) Power flow in all the remaining ICTs (ICT-2 & 5) and other 220kV feeders also became zero after the event. Reason of the same also need to be shared.
- vi) Remedial action taken report needs to be shared.

61st PSC Meeting -26th June, 2025

Presentation of RVPN



By-

- 1. D.K. Jain, Superintending Engineer (Prot. Engg.) RVPN, Jaipur.**
- 2. Rajesh Jain, Executive Engineer (MPT&S) RVPN, Jodhpur.**

Annex-B. IV _ Grid Events Analysis May25

S.No.-1, GI-1

**Dated 05th May., 2025 at 11.53 Hrs.
at 400 KV GSS , RVPN , Bhensara
(Jaisalmer-2)**

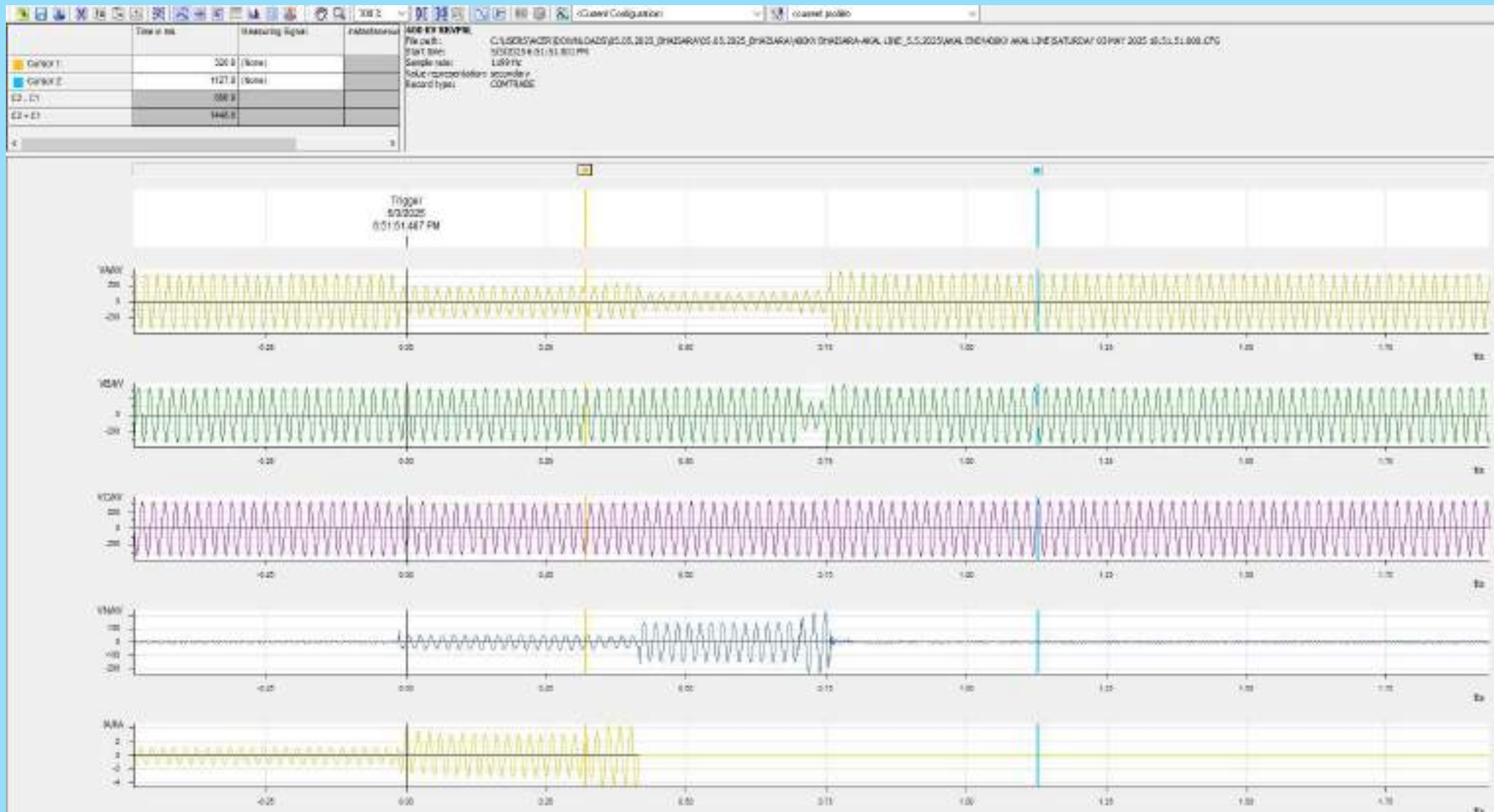
220 KV System at 400 KV GSS, RVPN,BHENSARA (Jaisalpur 2)

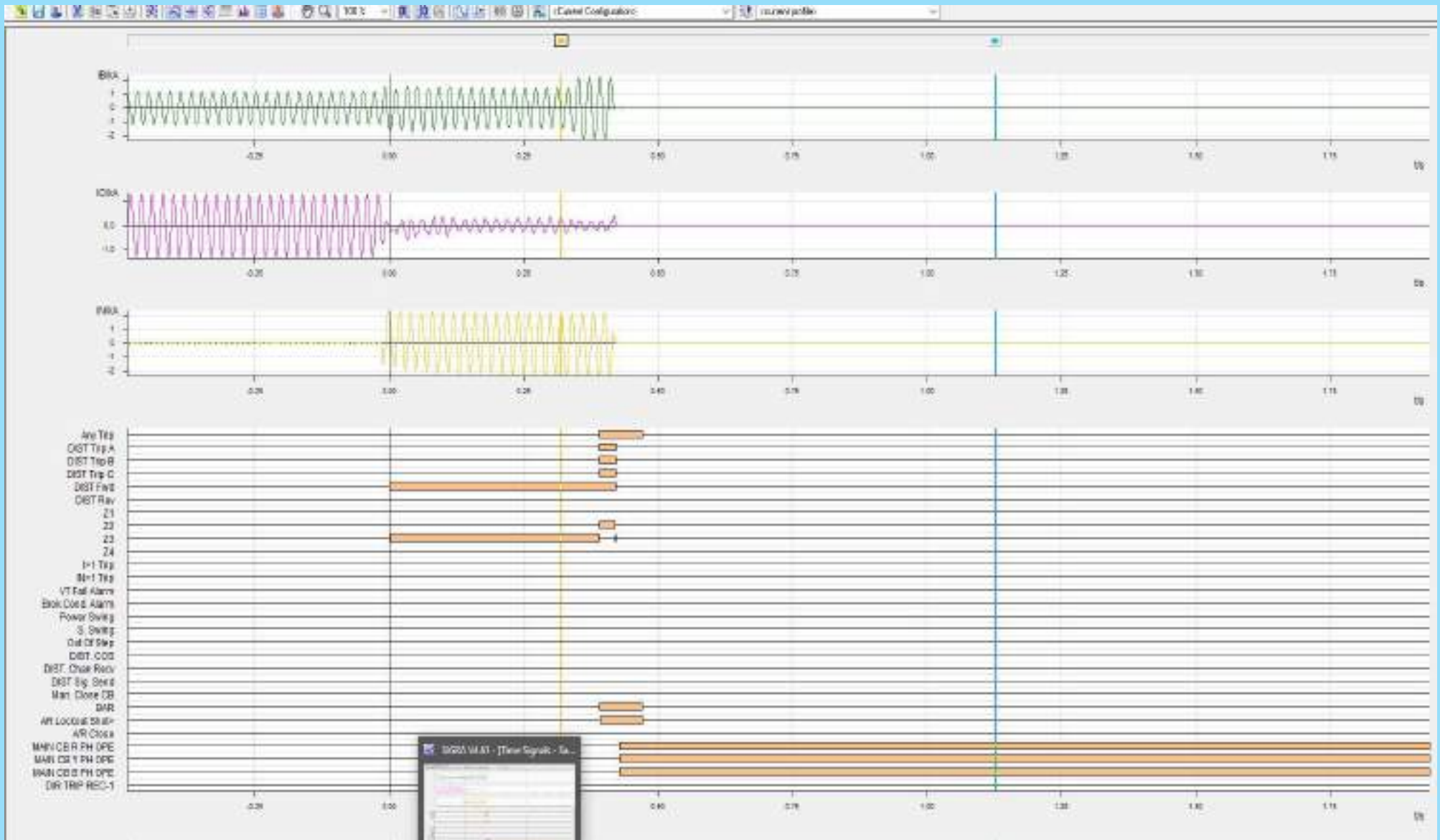
Bus Arrangement:- Two Main and One Transfer Bus (20 Nos, bays)

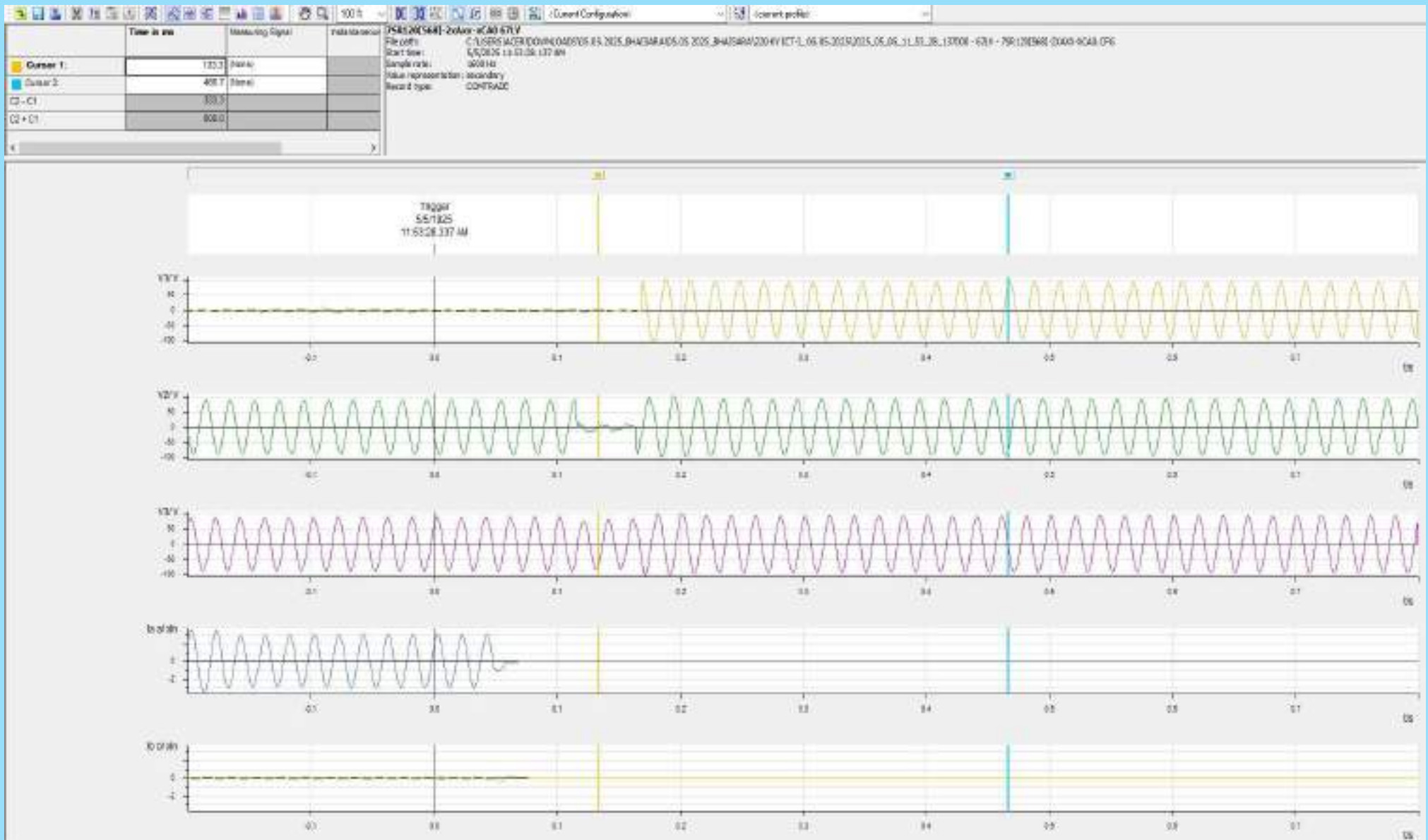
1. 220 kV RVPN lines/circuits (02 nos.)
 - i. 220 kV D/C Jaisalmer2-Akal line (Circuit-I)
 - ii. 220 kV D/C Jaisalmer2-Akal line (Circuit-II)
2. 220 kV Solar Developer lines (07 nos. from Pooling stations of RE)
Renew,Fortum,Acme,O2 Power ,NTPC ,Semcorp-I & II, Inox
3. Two B/C and One TBC
4. 400/220/33 KV Transformer Incomer bays (5 nos.)
6. Spare Bays (1 nos.)

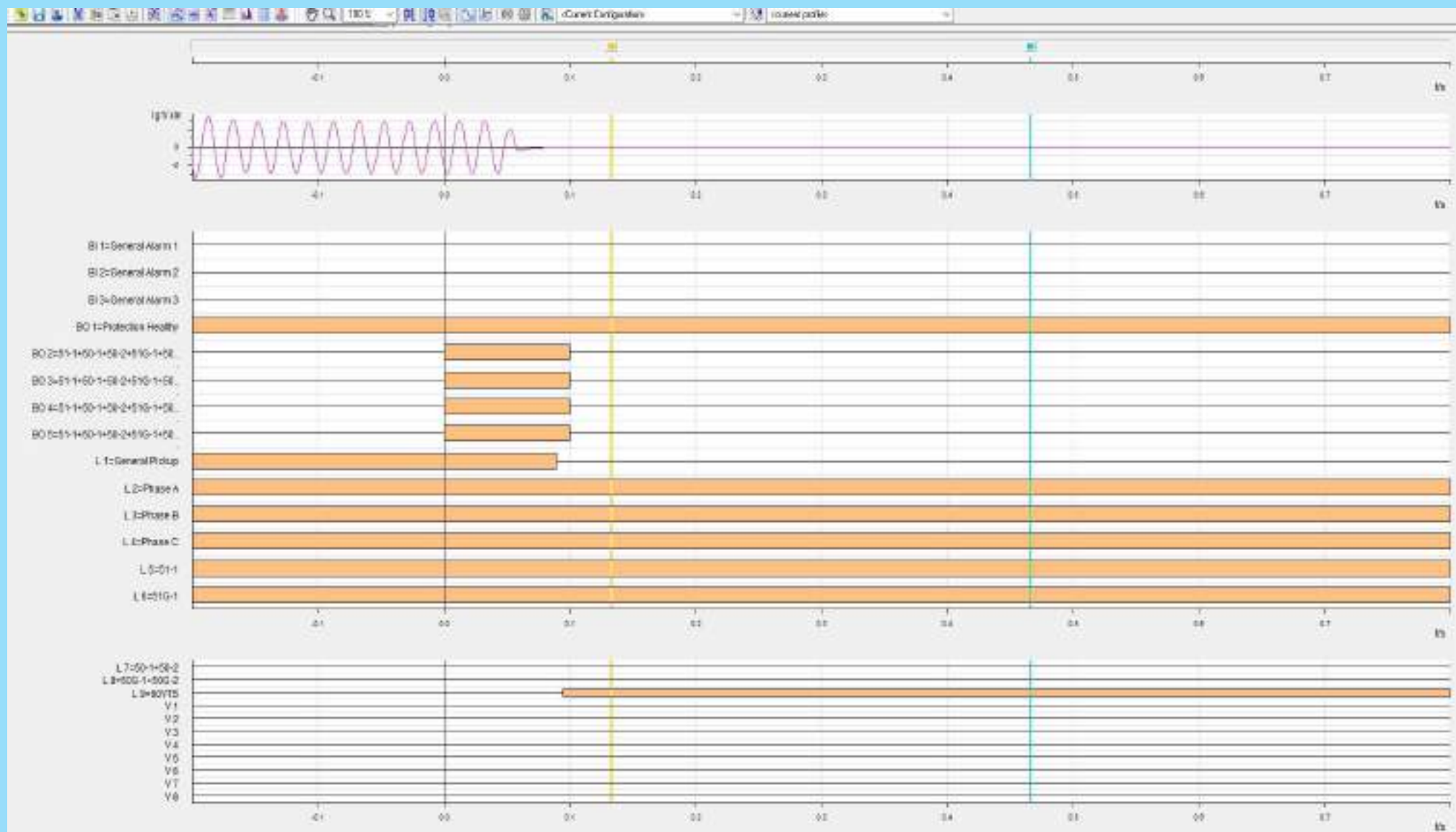
Sr. No	Incident took place	Point of discussion	RVPN Reply	
S.No.1 GI-1	As reported, at 11:53 hrs, fault occurred on 220 KV Bhensara – NTPC line at Location 3.5 KM & R-phase jumper of 220kV bus-2 (Between CB & Isolator) of 220kV Bhensara-NTPC line snapped which created bus fault on 220kV bus-2 at Bhensara (RS). As per PMU at Bhadla(PG), Y-N phase to earth fault with delayed fault clearance time of 720 msec is observed.	Details analysis of the event and remedial action taken details.	<u>Pre Fault Condition:-</u> At the time of fault 220KV Semcorp-2(Former name Green Infra.-2),Acme,NTPC(Faulty Line),ICT-3,Inox,Akal CKT-2 & ICT-4 was connected to 220 kV Bus-2. <u>Post Fault Condition-</u> After fault 220 kV Bus Bar Protection Scheme was operated and all the 220KV lines /220 KV ICTs connected to 220KV BUS-2 got tripped.	

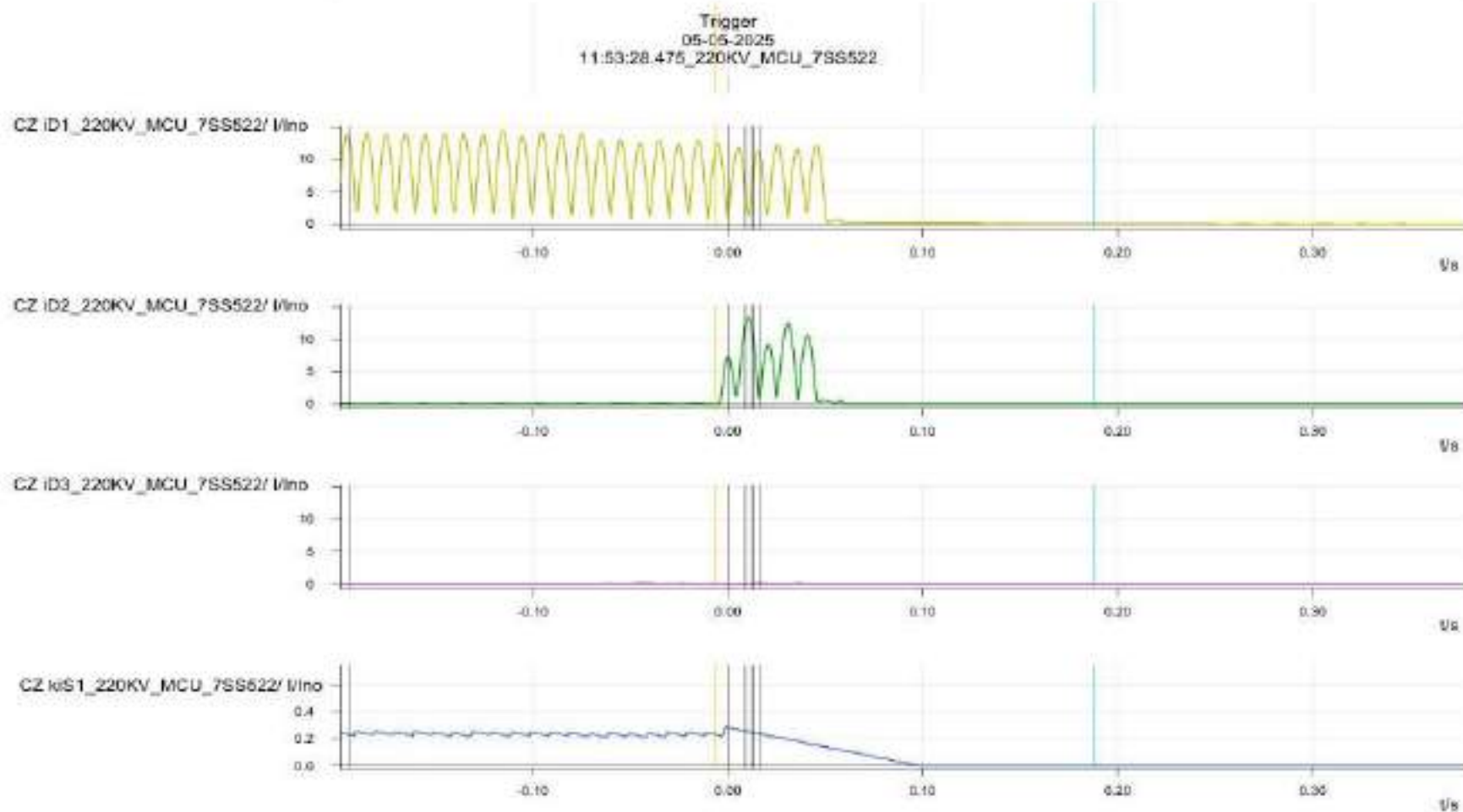
S.No	Name of Equipment/ Line	Trip Time/ Trip Date	Relay Indication Bhensara	Relay Indication OTHER END	Remark
1.	220 kV Bhensara-NTPC	11:53/ 05.05.2025	Z1,R & Y-Phase,3.5 KM		JUMPER BETWEEN CB & ISOLATOR SNAPPED FROM ISOLATOR CLAMP AND CREATED BUS FAULT ON "R- PHASE TO GROUND
2.	220 kV Bhensara-Akal Ckt.-2	11:53/ 05.05.2025	BUS BAR OPTD	Z-2, R&Y-PHASE,57 KM	
3.	220 kV Bhensara-Acme	11:53/ 05.05.2025	BUS BAR OPTD		
4.	220 kV Bhensara-Inox	11:53/ 05.05.2025	BUS BAR OPTD		
5.	220 kV Bhensara-Semcorp Ckt.-2	11:53/ 05.05.2025	BUS BAR OPTD		
6.	220 kV ICT-3	11:53/ 05.05.2025	BUS BAR OPTD		
7.	220 kV ICT-4	11:53/ 05.05.2025	BUS BAR OPTD		
8.	220 kV ICT-I	11:53/ 05.05.2025	E/F OPTD		
9.	220KV Bus-Coupler	11:53/ 05.05.2025	BUS BAR OPTD		
10.	400/220 /33kV 500 MVA ICT-3	11:53/ 05.05.2025	Inter trip	BUS BAR OPTD	Tripping connection of LV to HV removed
11.	400/220 /33kV 500 MVA ICT-1	11:53/ 05.05.2025	Inter trip	E/F OPTD	Tripping connection of LV to HV removed
12.	400 KV Bhensara-Akal Line	11:53/ 05.05.2025	NO	Z-2, R&Y-PHASE, 125.2 KM	











Multiple Element Tripping Event at 400KV Uri-2 HEP(NHPC)

At 21:35 hrs on 18.05.2025

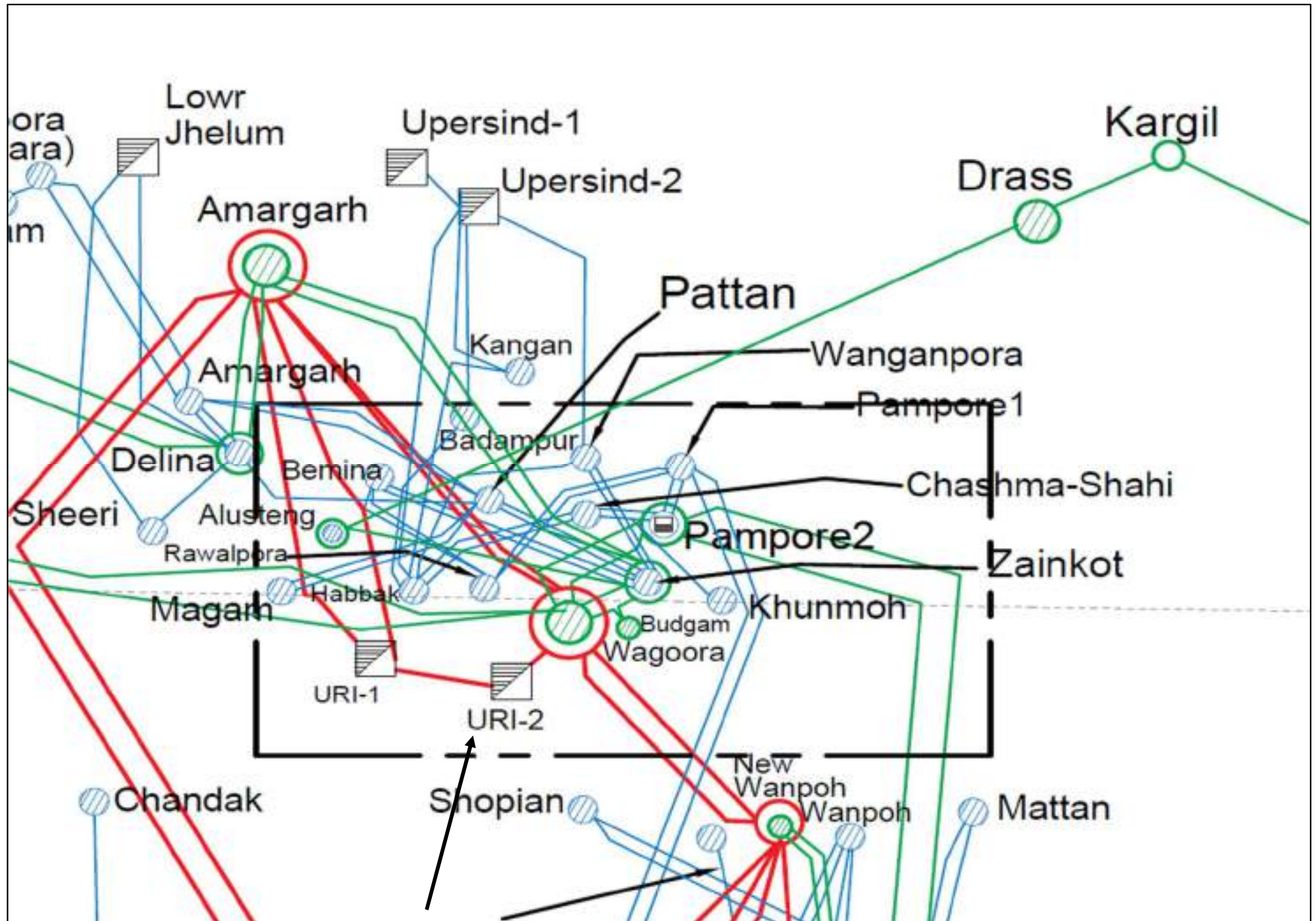
Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	400 KV URI_2(NH)-WAGOORA(PG) (PG) CKT	21:35 <u>hrs</u>	Yet to be revived	R-N phase to earth fault
2.	400 KV URI_2(NH)-URI_1(NH) (PG) CKT		22:59 hrs	R-N phase to earth fault
3.	60 MW URI-II HPS - UNIT 1		23:00 hrs	Tripped due to loss of evacuation path
4.	60 MW URI-II HPS - UNIT 2		23:09 hrs	
5.	60 MW URI-II HPS - UNIT 3		23:10 hrs	
6.	60 MW URI-II HPS - UNIT 4		23:02 hrs	

Brief details of the event

- i) 400kV Uri-2 S/s have double main bus system. There are 4, 60MW Units at Uri-2 HEP and power evacuates through 400 KV URI_2(NH)-WAGOORA (PG) (PG) CKT and 400 KV URI_2(NH)-URI_1(NH) (PG) CKT.
- ii) During antecedent condition, 400 KV URI_2(NH)-WAGOORA (PG) (PG) CKT and 400 KV URI_2(NH)-URI_1(NH) (PG) CKT were carrying ~195 MW and 47 MW respectively. All the 4 units were generating 60MW each.
- iii) As reported, at 21:35 hrs, 400 KV URI_2(NH)-WAGOORA (PG) (PG) CKT tripped from both ends on R-N phase to earth fault. As per DR at Uri-2 end, R-N fault, Z-1 protection operated, fault current was 2.8KA. The fault distance was 26.40KM from Uri_2 end. A/R was successful from Uri_2 end. However, line tripped on SOTF on persisted fault.
- iv) At the same time, 400 KV URI_2(NH)-URI_1(NH) (PG) CKT also tripped on R-N phase to earth fault. As per DR at Uri-2 end, R-N fault, Z-1 protection operated, fault current was 3.1KA. A/R was successful from Uri_2 end. However, line tripped on SOTF on persisted fault
- v) At the same time, all the 4 X 60 MW units at Uri-2 HEP tripped due to loss of evacuation path. This led to complete blackout of 400KV Uri-2 sub-station.
- vi) As per PMU at Amargarh(PG), R-N phase to earth fault which cleared with delayed fault clearance of 400 msec is observed.
- vii) As per SCADA, Generation loss of 244MW at Uri-2 HEP is observed. No load loss in J&K control area observed.

Network Diagram



SLD of 400kV URI-2(NHPC) before the event

CONTACT DETAILS	
EMAIL	uri2hep@gmail.com uri-ii-pho@nhpc.nic.in
MOBILE	9419032642

P sum(400 kV) = -0
Q sum(400 kV) = -23

URI-2 (NHPC)

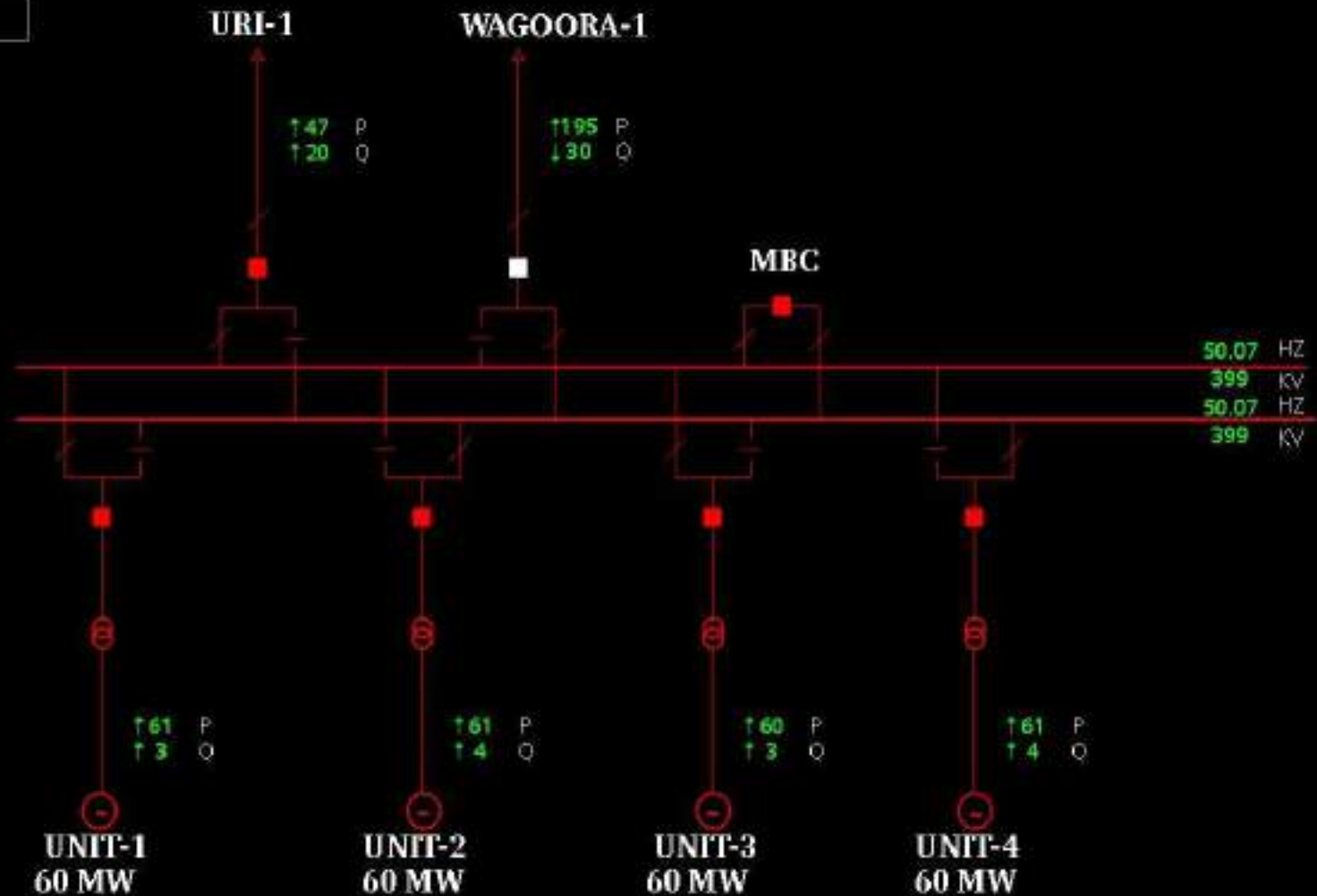
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PL = 243
SENT = 244
```

Stat Expl

GenSum

Company

18. 5 .25 21:34: 0



SLD of 400kV URI-2(NHPC) after the event

CONTACT DETAILS	
EMAIL	uri2hep@gmail.com uri-ii-pho@nhpc.nic.in
MOBILE	9419032642

P sum(400 kV) = 0
Q sum(400 kV) = 0

URI-2 (NHPC)

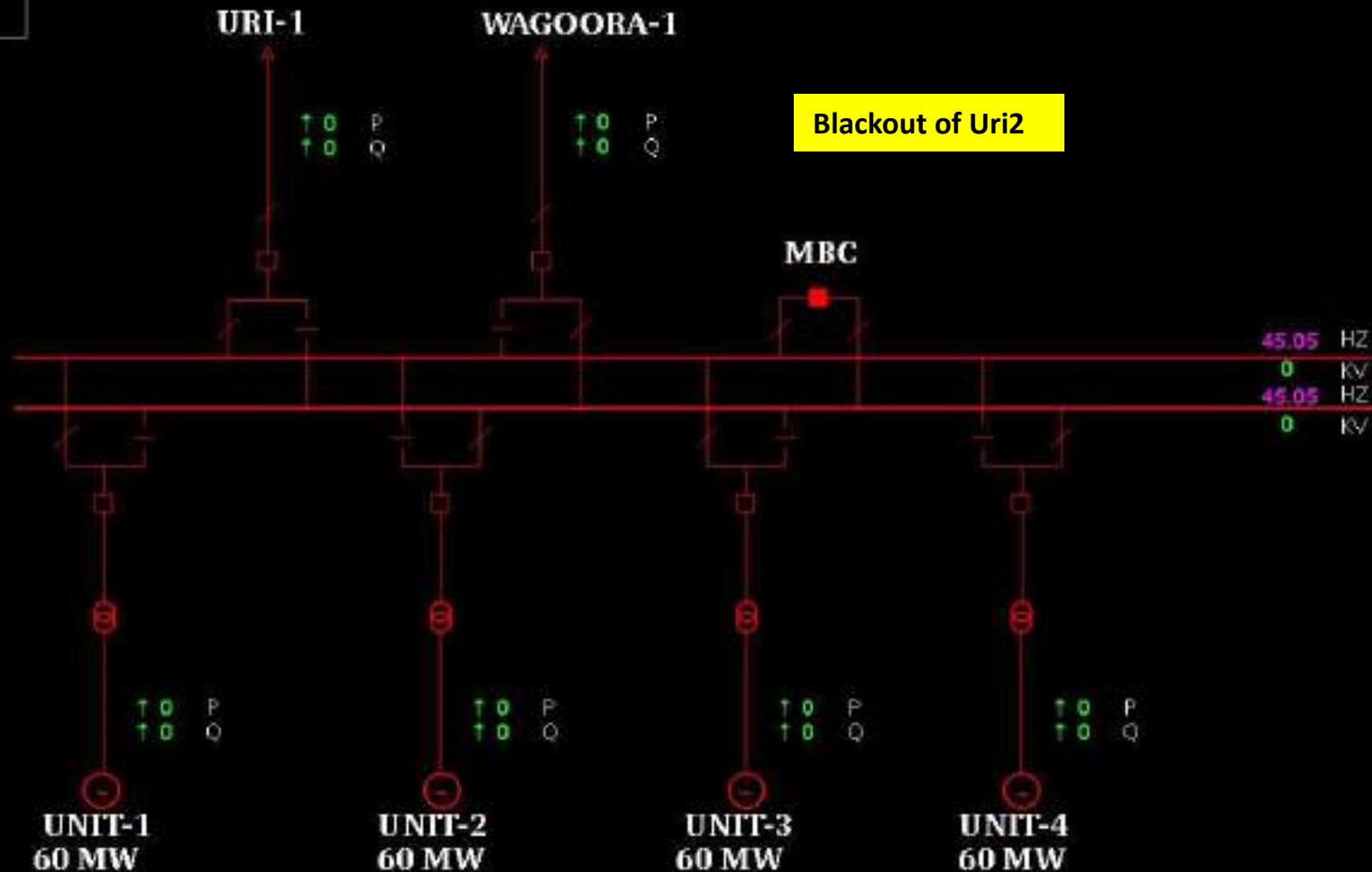
PL = 0
SENT = 0

Stat Expl

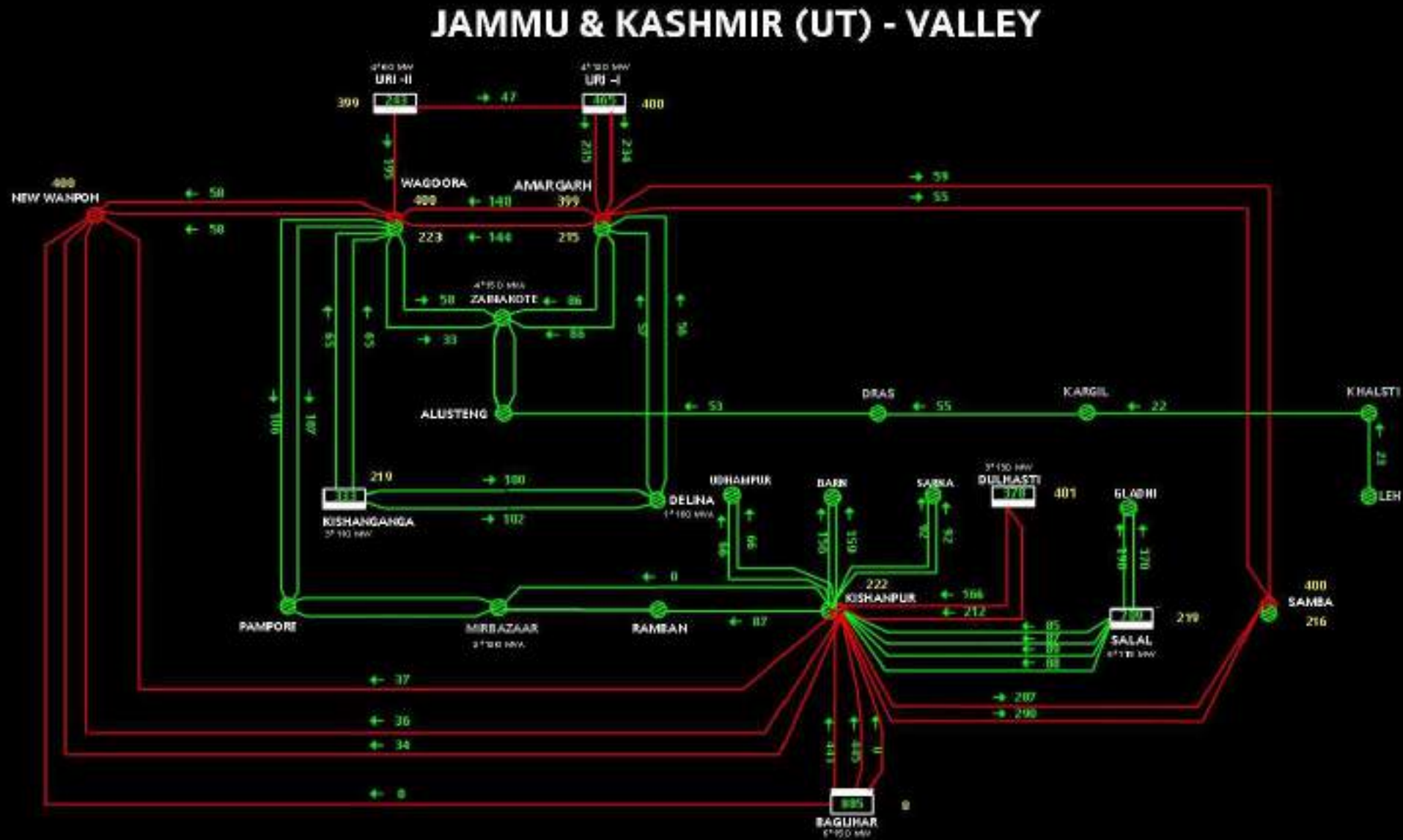
GenSum

Company

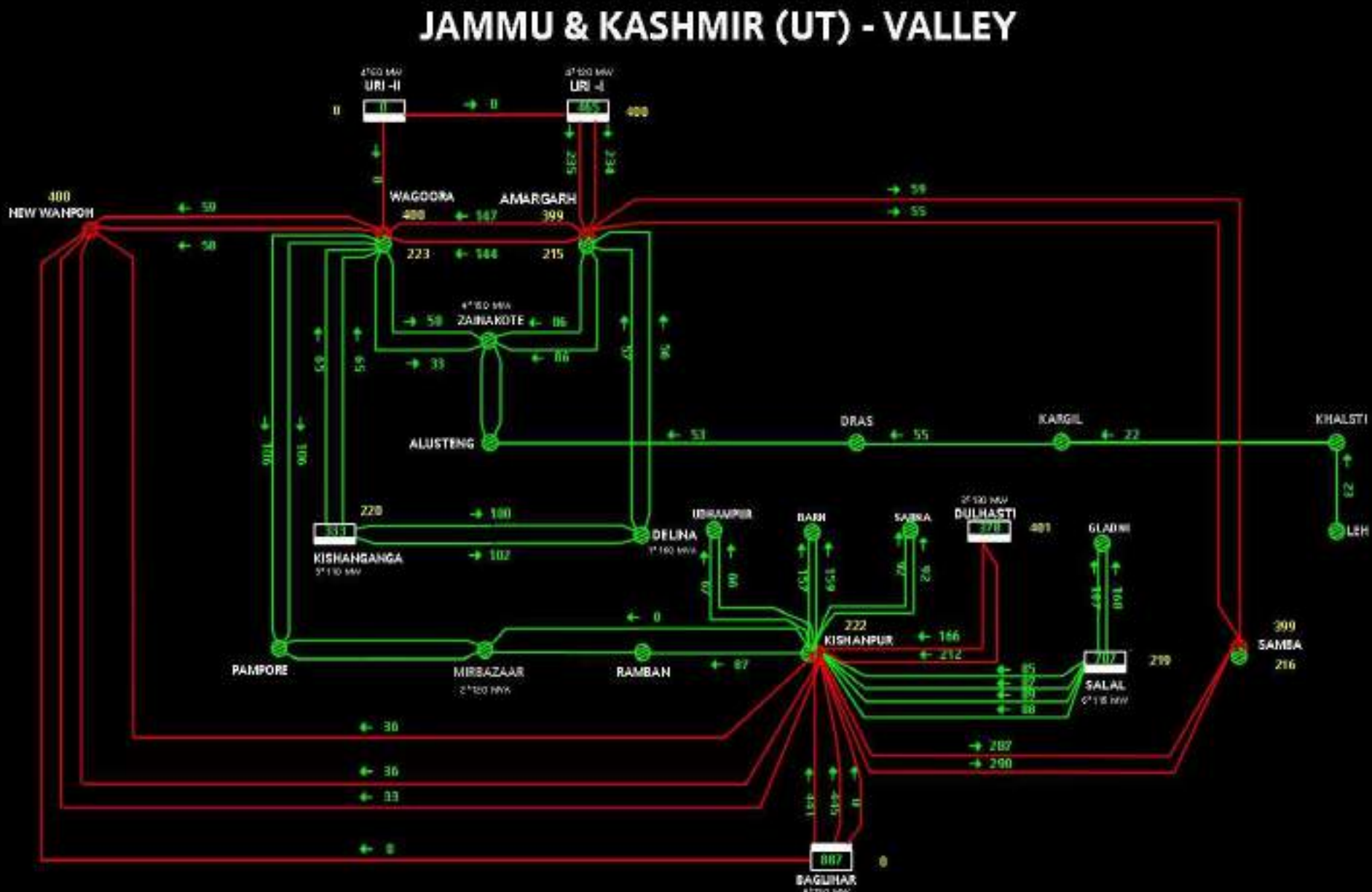
18. 5 .25 21:40:0



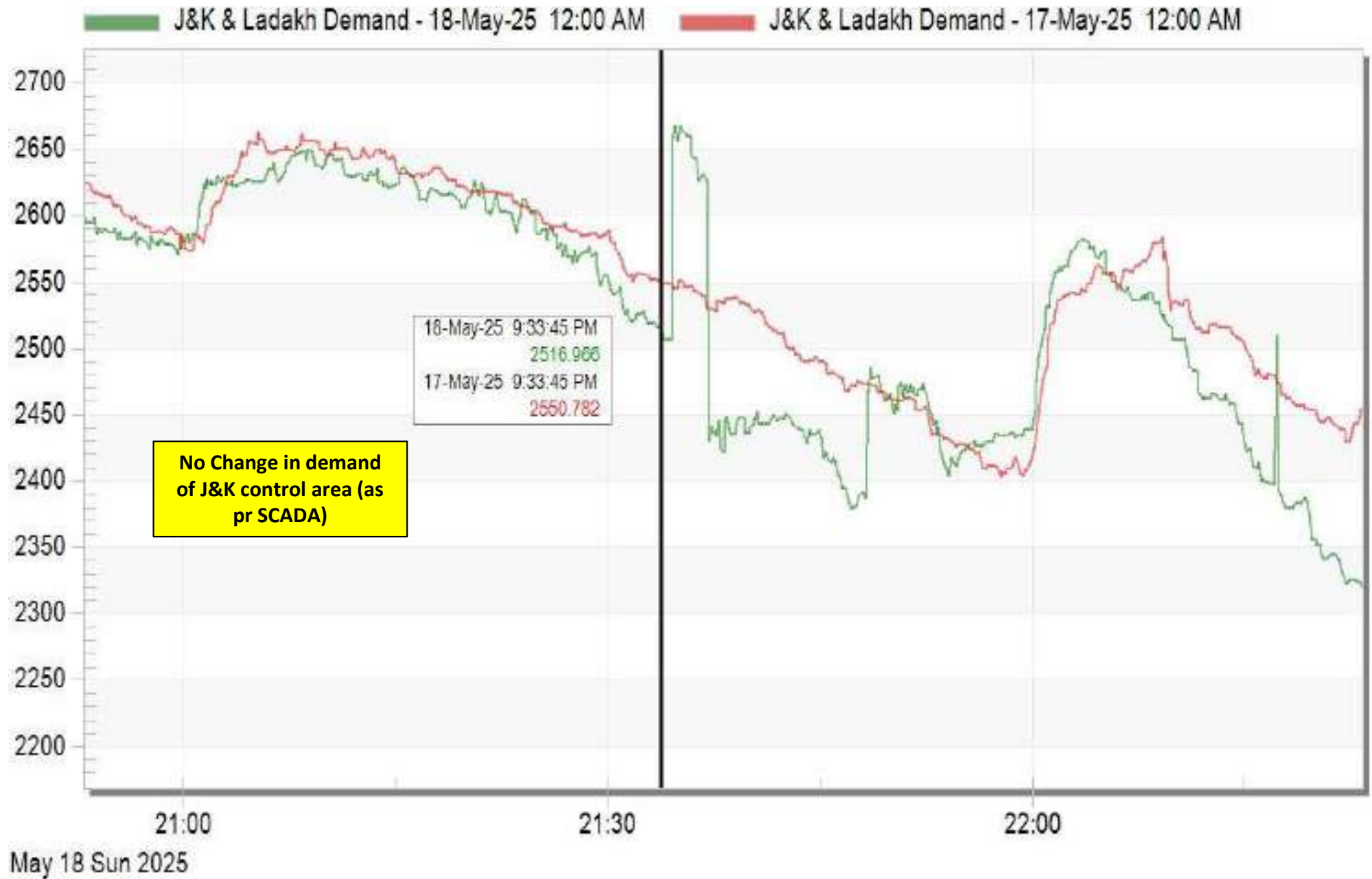
Network of J&K valley before the event



Network of J&K valley after the event



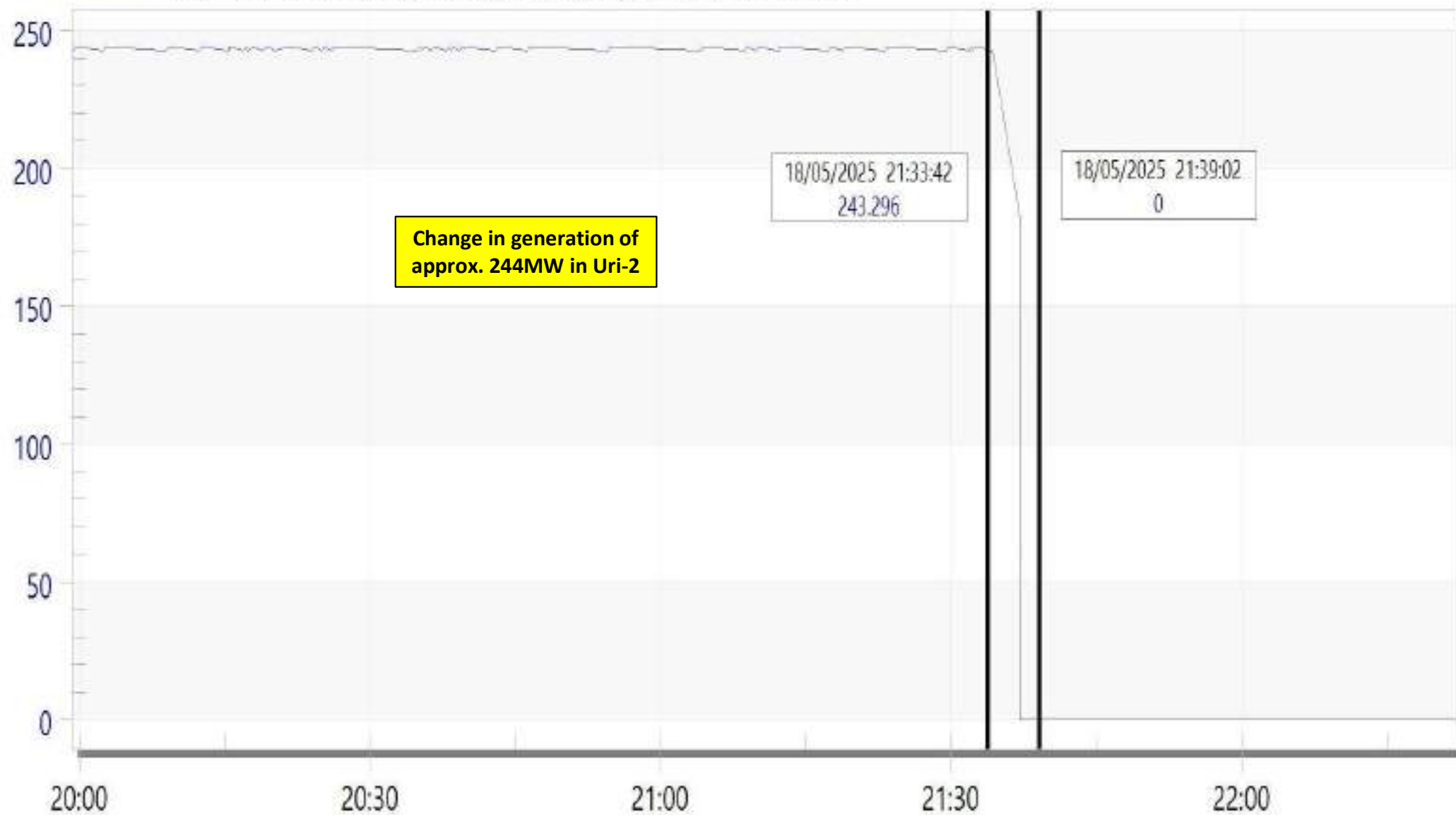
J&K demand during the event



URI-1 generation during the event

New Graph

MNRL.SCADA02.PGCIL/NRLDC_PG/PL/URI_2_NH/P/MvMoment



Change in generation of approx. 244MW in Uri-2

May Sun 18 2025

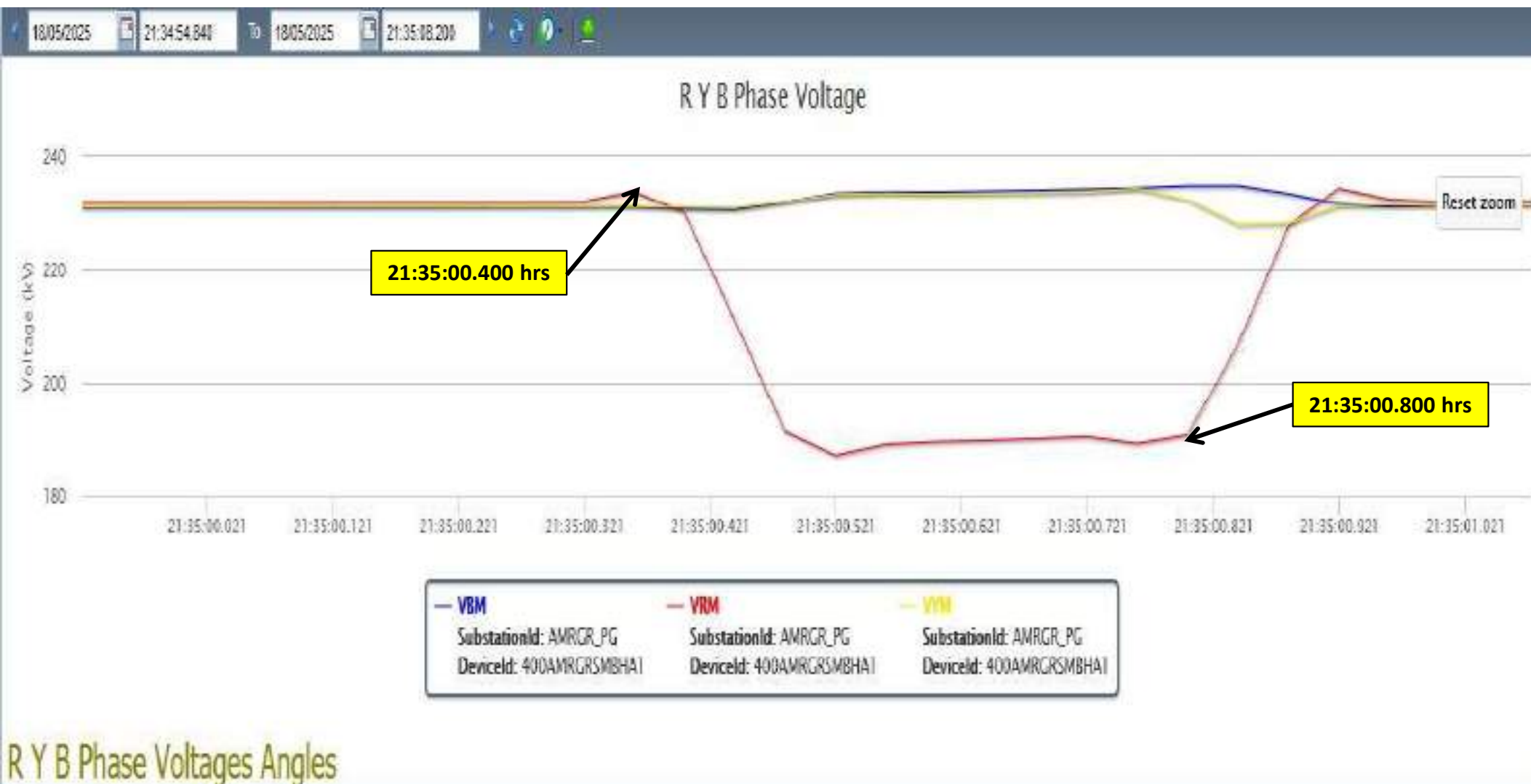
PMU Plot of frequency at Amargarh(INDIGRID)

21:35hrs/18-May-25

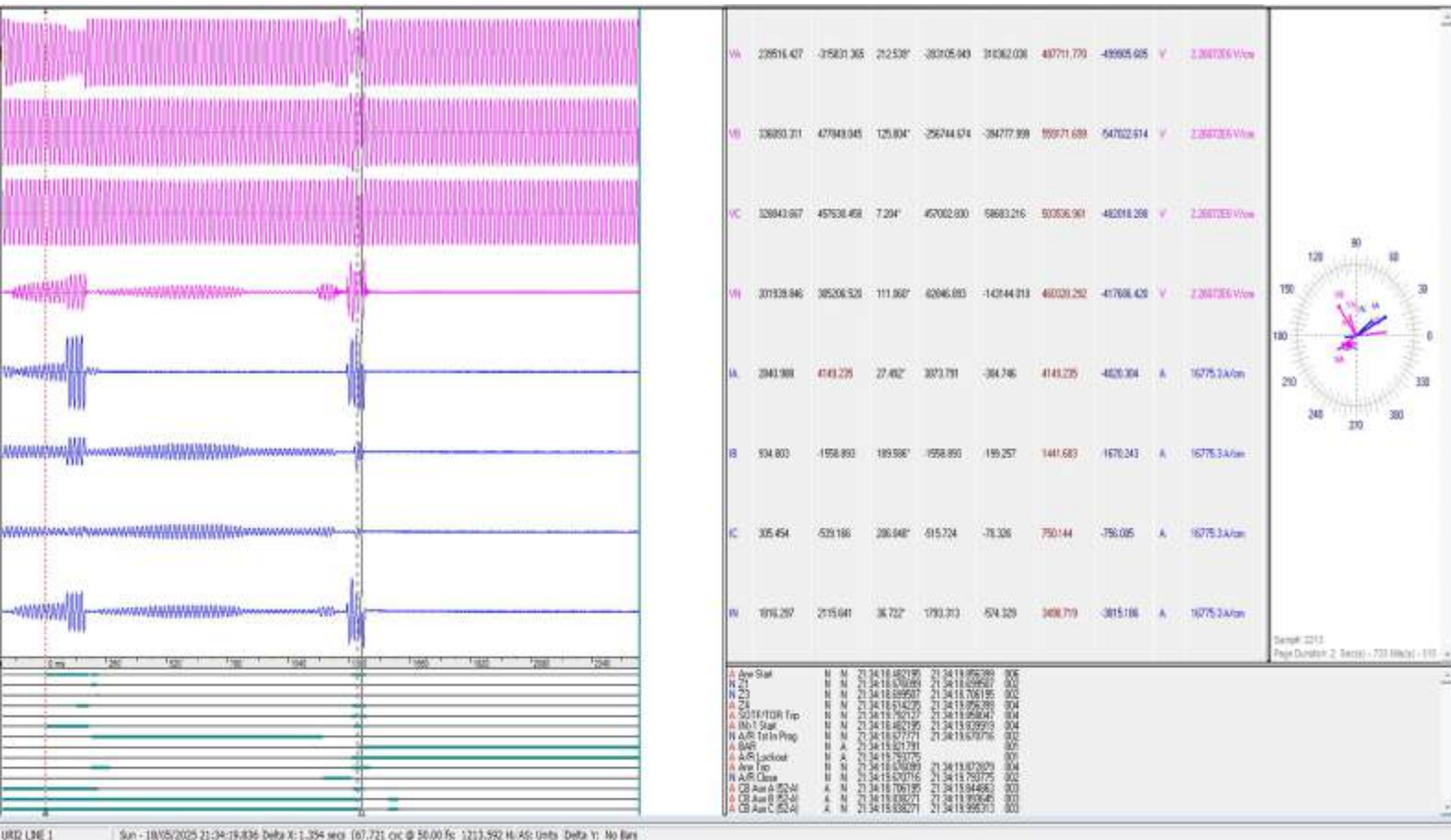


PMU Plot of phase voltage magnitude at Amargarh(INDIGRID)

21:35hrs/18-May-25

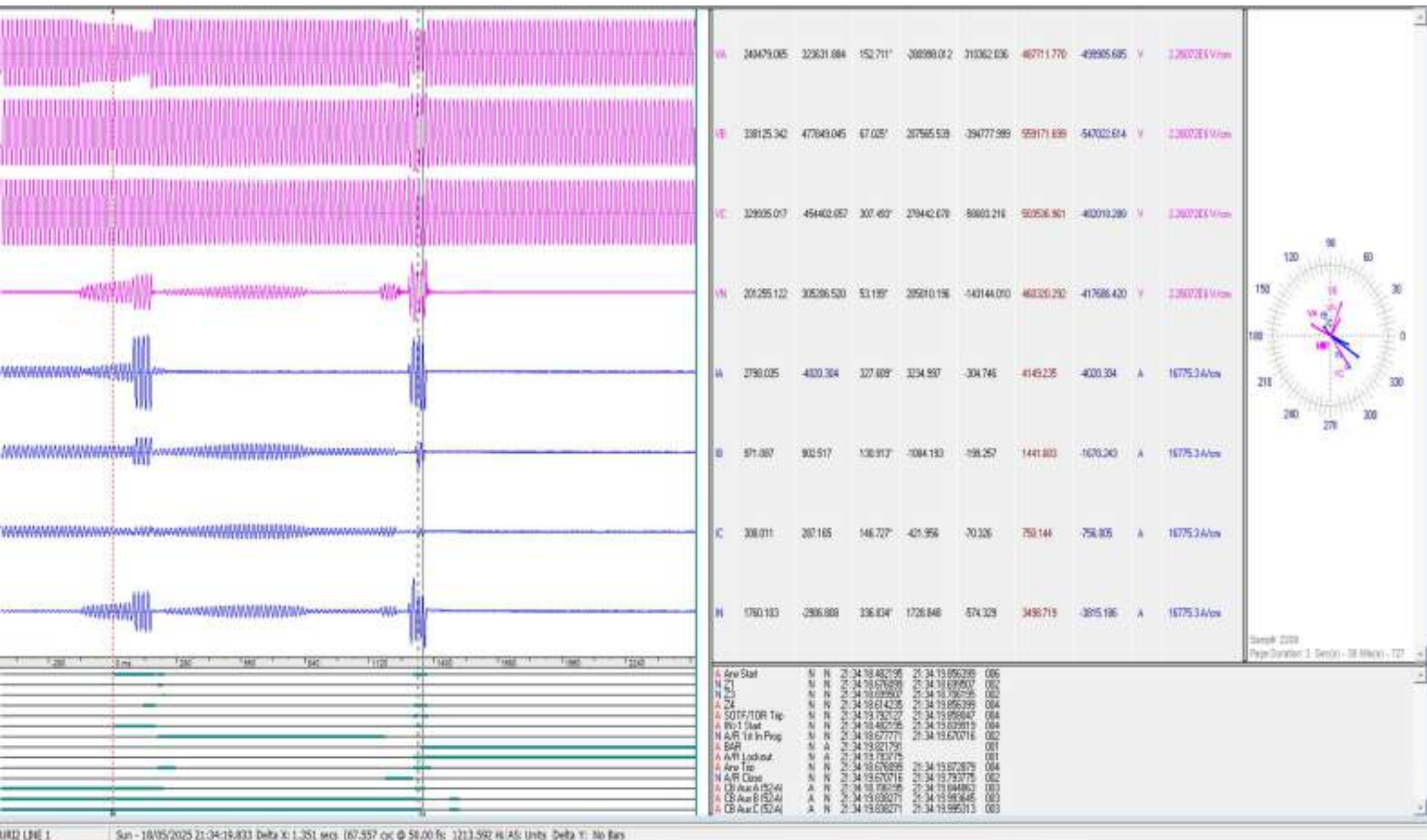


DR of 400 KV Uri_2(NH)(end)-Uri_1(NH) (PG) Ckt-1



- ✓ R-N phase to earth fault. Ir= 3.8KA, Z-1 distance protection operated.
- ✓ A/R successful at Uri_2 end but line tripped at SOTF fault.

DR of 400 KV Uri_2(NH)(end)-Wagoora(PG) (PG) Ckt-1



- ✓ R-N phase to earth fault. $I_r = 2.8\text{KA}$, Z-1 distance protection operated.
- ✓ A/R successful at Uri_2 end but line tripped at SOTF fault.

SCADA SOE

TIME	STATION NAME	Voltage	Element Name	Element Type	Element Status	Remarks
21:34:15,846	URI	400kV	03G3	Circuit Breaker	Open	Tripping of Main CB of 60 MW URI-II HPS - UNIT 3
21:34:15	URI	400kV	01G1	Circuit Breaker	Open	Tripping of Main CB of 60 MW URI-II HPS - UNIT 1
21:34:15	URI	400kV	02G2	Circuit Breaker	Open	Tripping of Main CB of 60 MW URI-II HPS - UNIT 2
21:34:15	URI	400kV	04G4	Circuit Breaker	Open	Tripping of Main CB of 60 MW URI-II HPS - UNIT 4
21:34:16	URI	400kV	11SRING1	Circuit Breaker	Open	Tripping of 400KV Main CB of 400 KV URI_2(NH)-WAGOORA(PG) (PG) CKT-1 at Uri_2
21:34:16	URI	400kV	12URI1	Circuit Breaker	Open	Tripping of 400KV Main CB of 400 KV URI_2(NH)-URI_1(NH) (PG) CKT-1 at Uri_2

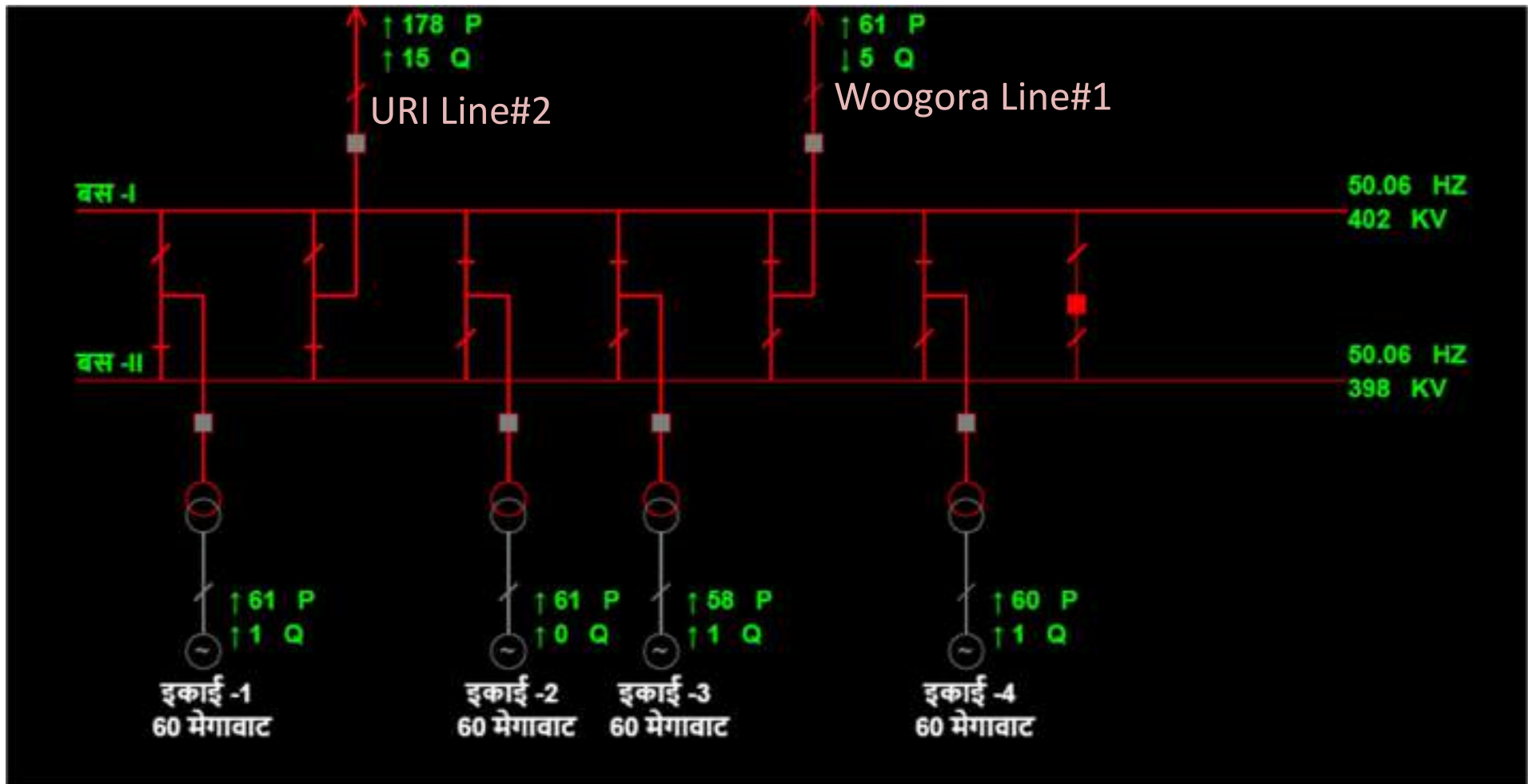
Points for Discussion

- i) Reason and location of fault need to be shared.
- ii) DR, EL & tripping report need to be shared from both the ends.
- iii) Reason for delayed fault clearance needs to be shared.
- iv) Remedial action taken report to be shared.

Agenda Point No.6

- Complete outage of Uri-II Power Station(NHPC) at 21:35 hrs on 18-May-25

SLD of Uri-II



Elements Tripped on 16/04/2025

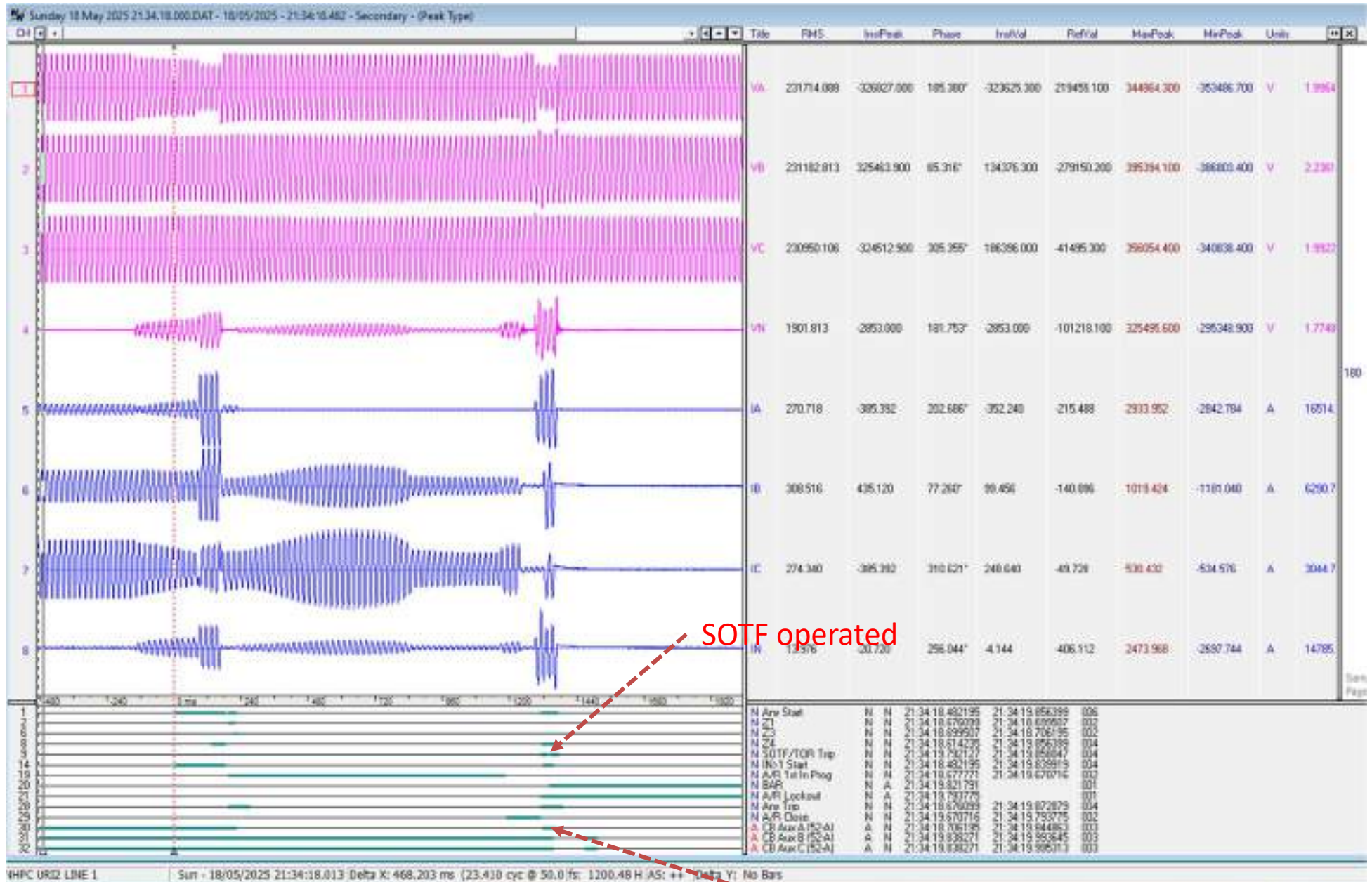
क्रम सं	यूनिट / लाइन नाम	से		तक		कुल आउटेज समय	आउटेज के कारण	ऊर्जा नुकसान (मेगावाट)
		तारीख	समय	तारीख	समय			
1	400 KV Uri-II-Woogora Line#1	18-May-25	21:34:00	19-Jun-25	11:50:00	758:16	Distance Protection relay operated in R-N Phase Fault	0
2	400 KV Uri-II-Uri Line#2	18-May-25	21:34:00	18-May-25	22:59:00	1:25	Distance Protection relay operated in R-N Phase Fault	0
3	Unit#1	18-May-25	21:34:00	18-May-25	23:00:00	1:26	Over Speed protection operated	60
4	Unit#2	18-May-25	21:34:00	18-May-25	23:09:00	1:35	Over Speed protection operated	60
5	Unit#3	18-May-25	21:34:00	18-May-25	23:10:00	1:36	Over Speed protection operated	60
6	Unit#4	18-May-25	21:34:00	18-May-25	23:02:00	1:28	Over Speed protection operated	60

Detail Analysis

400 KV Uri-II-Woogora Line#1:-

- i. It is evident from the DR of distance protection relay of Uri-II-Woogora Line#1 installed at Uri-II end that the R-Phase voltage reduced to 174.5 KV and R-Phase current increased to 1864 A. Accordingly relay sense the fault in Z1 at 21:34:18.677 Hrs in R-N Phase fault and auto reclose operation started followed by opening of R-Phase Pole. The R-Phase CB was successfully reclosed from Uri end after dead time i.e. 21:34:19.677 Hrs.
- ii. However due to persistence of fault within reclaim time, SOTF/TOR protection operated at 21:34:19.793 Hrs and finally three phase tripping occurred from Uri-II end.

Uri-WoogoraLine DR



SOTF operated

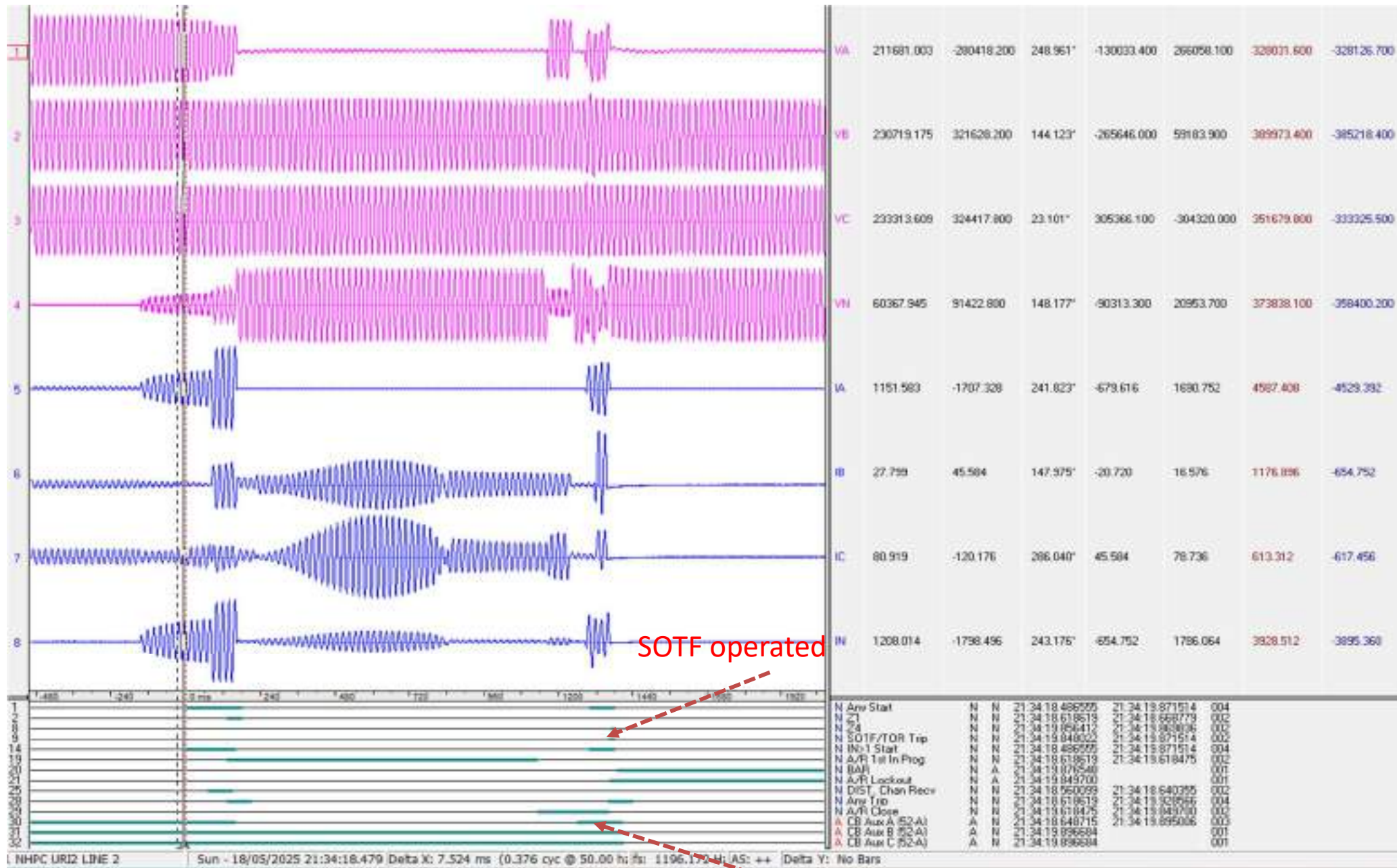
AR in R-Phase

Detail Analysis

400 KV Uri-II-Uri Line#2:-

- i. It is evident from the DR of distance protection relay of Uri-II-Woogora Line#1 installed at Uri-II end that the R-Phase voltage reduced to 174.5 KV and R-Phase current increased to 1864 A. Accordingly relay sense the fault in Z1 at 21:34:18.677 Hrs in R-N Phase fault and auto reclose operation started followed by opening of R-Phase Pole. The R-Phase CB was successfully reclosed from Uri end after dead time i.e. 21:34:19.677 Hrs.
- ii. However due to persistence of fault within reclaim time, SOTF/TOR protection operated at 21:34:19.793 Hrs and finally three phase tripping occurred from Uri-II end.

Uri-Uri-II Line DR



AR in R-Phase

Unit Tripping

Due to unavailability of power evacuation path, all the **four running units** got tripped due to sudden load throw off.

Multiple Element Tripping Event at 800KV HVDC Kurukshetra(PG)

At 22:50 hrs on 21.05.2025

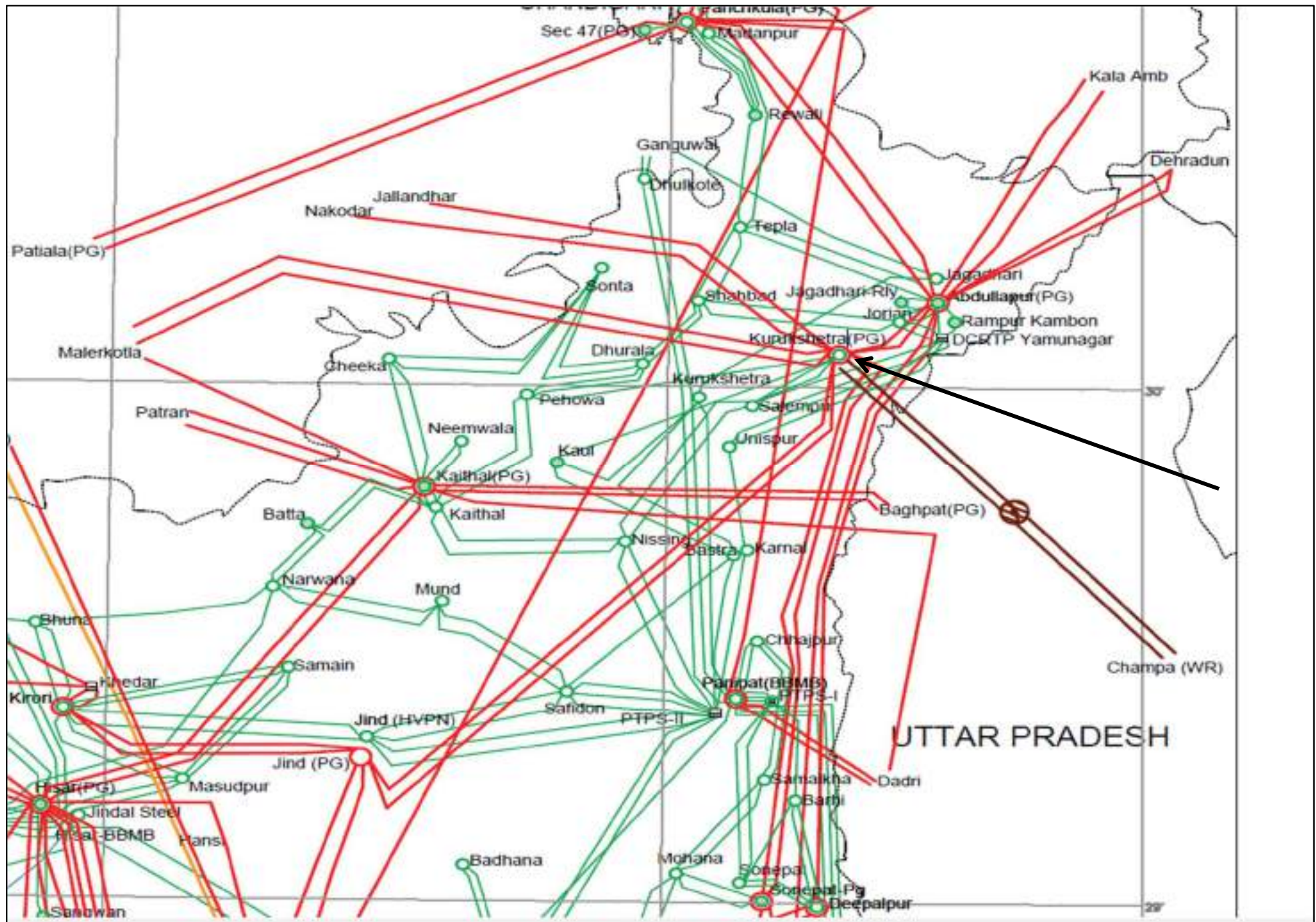
Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	800 kV HVDC Kurukshetra (PG) Pole-02	22:50 hrs	02:26 hrs 22.05.25	Earth fault . Tripped due to DC line fault during windstorm.
2.	800 kV HVDC Kurukshetra (PG) Pole-04		01:42 hrs 22.05.25	Transient fault. Tripped due to DC line fault during heavy wind storm.

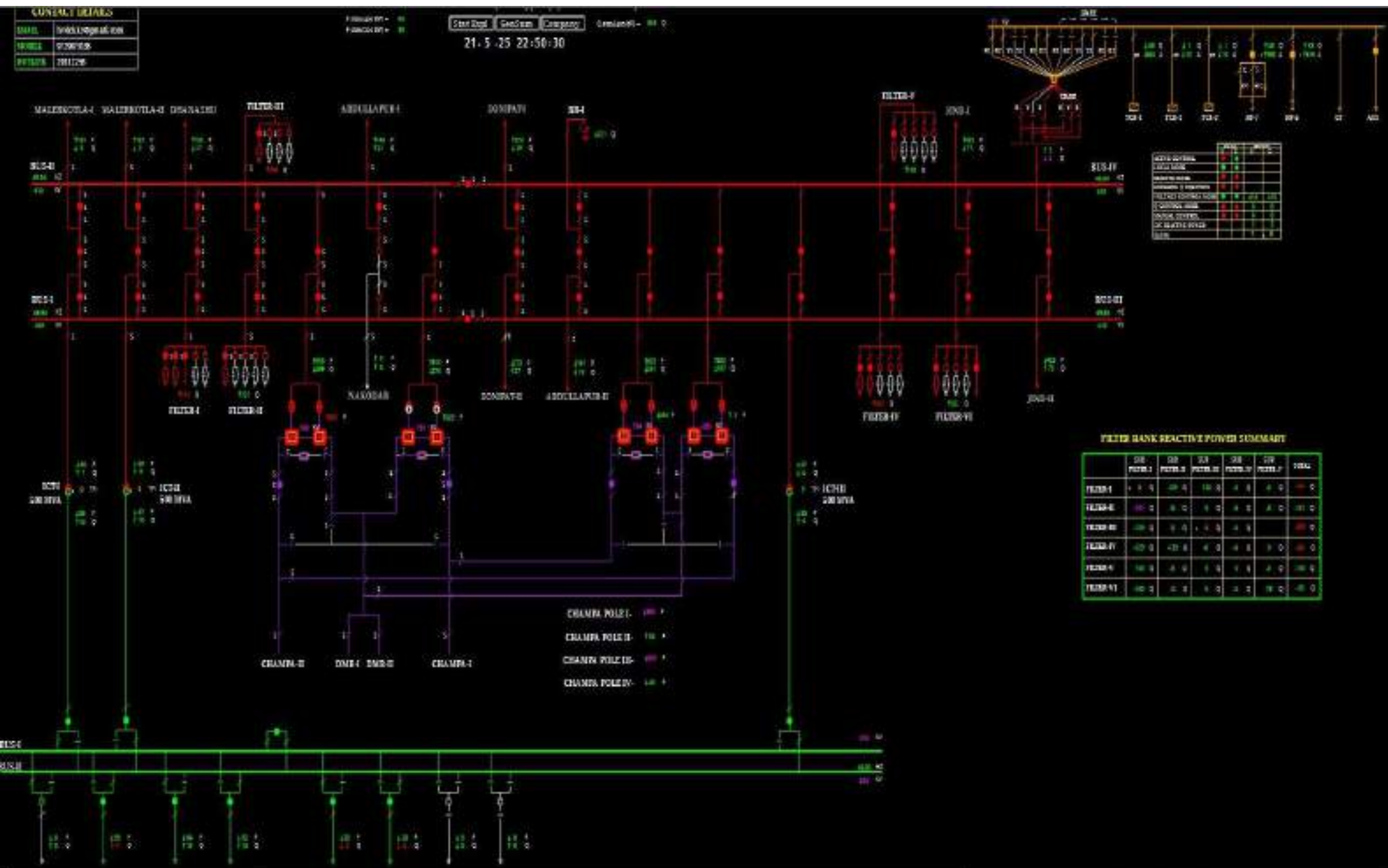
Brief details of the event

- i) During antecedent condition, 800kV HVDC Champa-Kurukshetra was carrying total 3000MW power from Champa to Kurukshetra (Pole-1=958MW, Pole-2=613MW, Pole-3=603MW & Pole-4= 283MW). The weather condition at the time of incident was very worse accompanying thunderstorms & very heavy lightning along with wind was prevailing at Kurukshetra.
- ii) As reported, at 22:50 hrs, 800 kV HVDC Kurukshetra (PG) Pole-02 and Pole 4 tripped due to transient earth fault. The fault distance was 438.1KM from Kurukshetra end and 849.21KM from Champa end.
- iii) As per details received from POWERGRID sequence of event was as follows:
 - a. At 22:50:20:517 hrs, DC line fault sequence started in Pole-2 and Pole-4. Again, at 22:50:25:130 hrs another DC line fault sequence started in Pole-2 and Pole-4.
 - b. Following this at 22:50:25:169 hrs, an attempt was made to run Pole-2 and Pole-4 in reduced voltage mode.
 - c. At 22:50:25:229 hrs, Pole 2 was blocked from Champa end due to subsequent DC line fault.
 - d. At 22:50:26:055 hrs, Pole-4 was blocked due to CAT-B protection operation in Pole-2.
- i) The power order reduced from total ~2450MW to ~1300MW. Pole-1 = 657MW and Pole-3=660MW.
- ii) As per PMU at Kurukshetra(PG), fluctuation in voltage was observed.
- iii) As per SCADA, no change in demand is observed in Haryana control area.

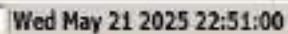
Network Diagram



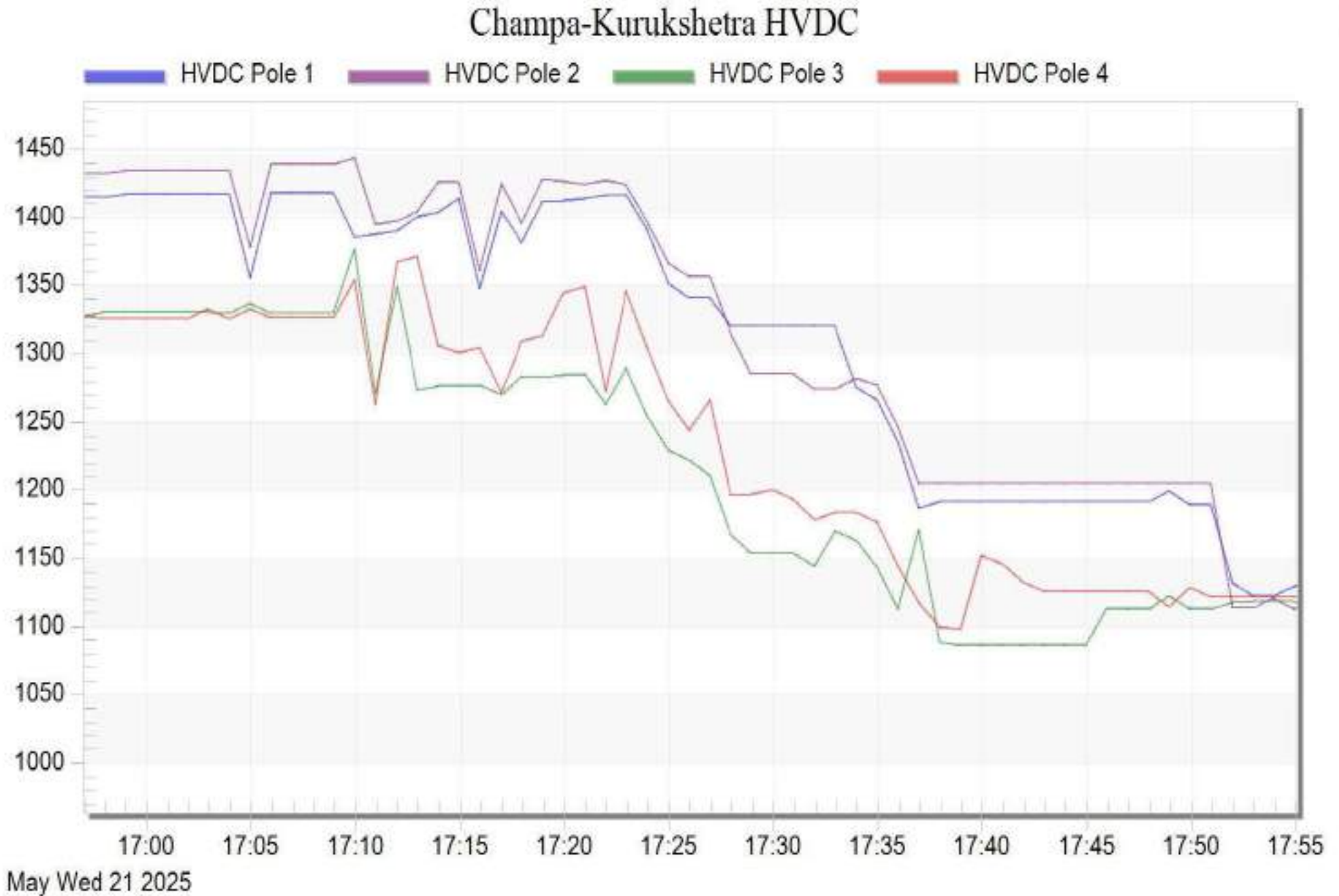
SLD of Kurukshetra (HVDC) before the event



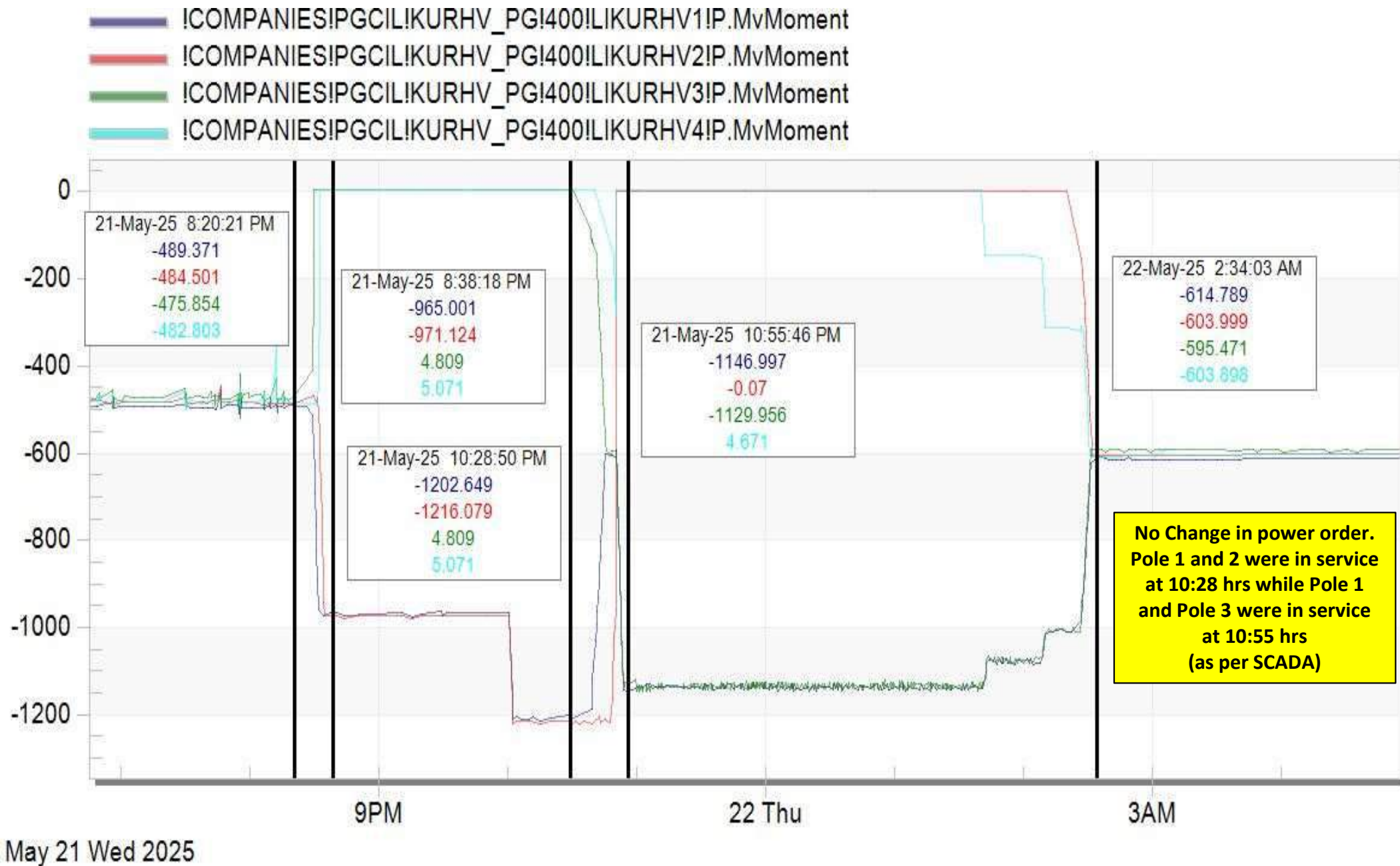
SLD of Kurukshetra (HVDC) after the event



HVDC Kurukshetra Power Flow during 17:00-18:00 hrs

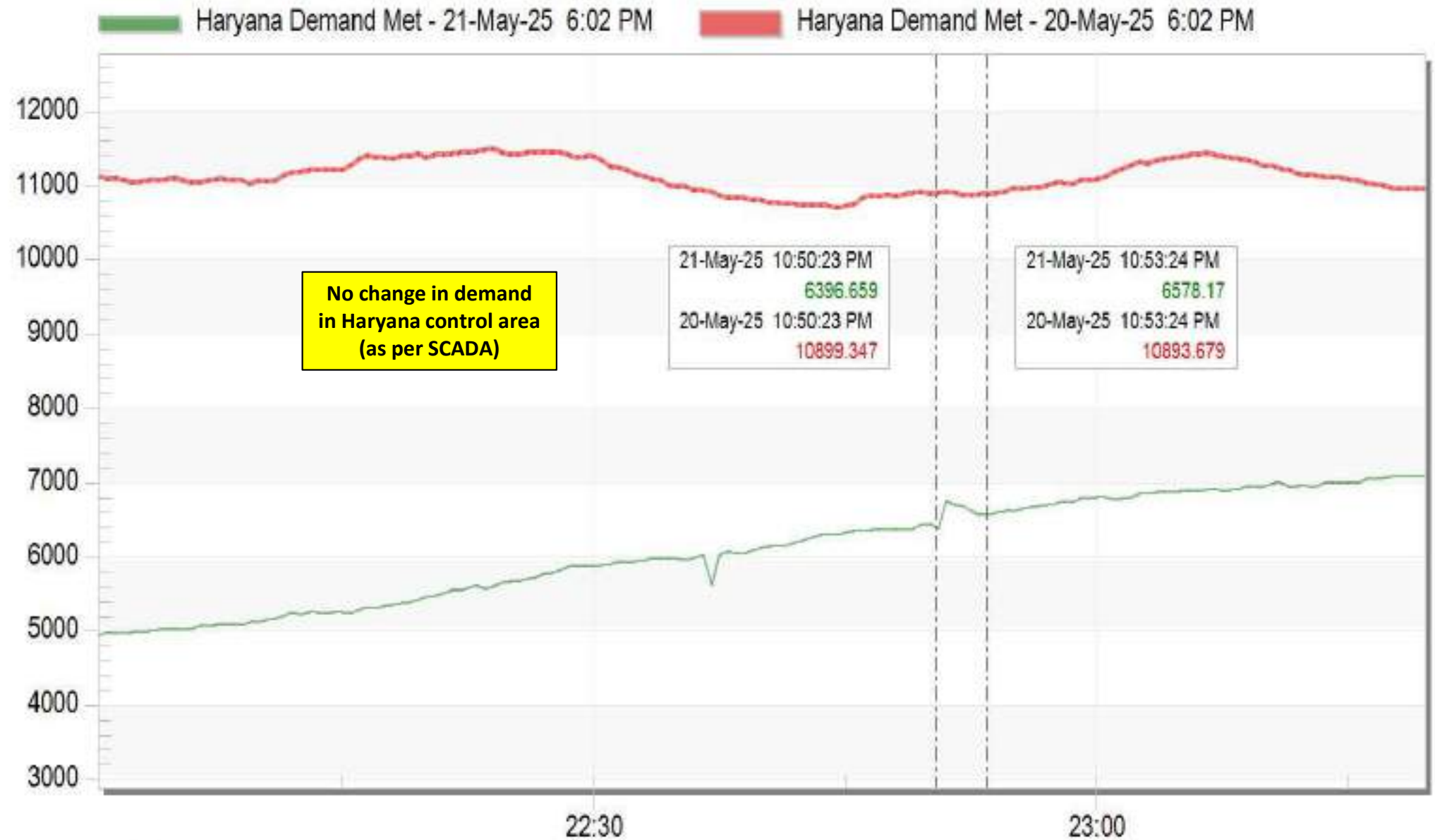


HVDC Kurukshetra Power Flow during the event



Haryana Demand during the event

Haryana Demand Met



Details shared by POWERGRID

Sequence of Events:

22:50:20:517 - DC Line Fault Restart Sequence Started in Pole-2 and Pole-4.

22:50:25:130 - Another DC Line Fault Restart Sequence in Pole-2 and Pole-4.

22:50:25:169 - Pole-2 and Pole-4 in Reduced Voltage Mode

22:50:25:229 - Pole-2 blocked from Champa due to DC Line Fault

22:50:26:055 - Pole-4 blocked due to CAT-B Protection in Pole-2.

- Event logs of Pole-2 and Pole-4 are attached in Figure 1 and Figure 2 respectively.
- TFR of the first DC Line Fault is attached below in Figure 3. First restart after DC line fault can be seen in the graph.
- TFR showing second and third restart can be seen in Figure 4Figure 4.

Details shared by POWERGRID

date	time	severity	message text	status	class	applied	message
21/05/2025	22:50:42.944	1	B P2 L2 Standing Block Sequence Alarm	Cleared	0		BTPC2_PSQ_AYS001
21/05/2025	22:50:34.245	1	B MC Deficit Level 3	Present	1		BTOAL_DEF_AYS005
21/05/2025	22:50:28.940	1	B P2 CAT B From OtherEnd	Cleared	0		BTPC2_PP_AYS011
21/05/2025	22:50:28.230	2	B MC2 Power Control EAPRActiv_ProfBlock	Cleared	0		BTMC2_MPC_AYS001
21/05/2025	22:50:27.529	1	B B1 Filter Control Incorrect Element Energised	Cleared	0		BTMM_FCV_AYS012
21/05/2025	22:50:27.306	1	B P1 L1 Control CLD DMR2 Fault Initiate Protective Sequence	Present	1		BTPRT_ALM_AYS712
21/05/2025	22:50:27.246	1	B P1 L1 Control CLD DMR2 Minor Fail	Present	1		BTPRT_ALM_AYS743
21/05/2025	22:50:27.208	2	A P2 Block From Champs	Cleared	0		BTOTH_OSS_AYS000
21/05/2025	22:50:25.183	1	B P2 Reduced DC Voltage Operation Mode Changed Due To Protection	Cleared	0		BTPC2_RVS_AYS000
21/05/2025	22:50:26.053	1	B P2 CAT B From OtherEnd	Present	1		BTPC2_PP_AYS013
21/05/2025	22:50:25.498	1	B P2 L1 Standing Block Sequence Alarm	Present	1		BTPC2_PSQ_AYS001
21/05/2025	22:50:25.401	1	B P2 L2 Standing Block Sequence Alarm	Present	1		BTPC2_PSQ_AYS002
21/05/2025	22:50:25.276	1	B P2 L1 Control CLD HV Cable Minor Fail	Cleared	0		BTPRT_ALM_AYS301
21/05/2025	22:50:25.267	1	B B1 Filter Control Incorrect Element Energised	Present	1		BTMM_FCV_AYS012
21/05/2025	22:50:25.229	2	B MC2 Power Control EAPRActiv_ProfBlock	Present	1		BTMC2_MPC_AYS001
21/05/2025	22:50:25.229	2	A P2 Block From Champs	Present	1		BTOTH_OSS_AYS000
21/05/2025	22:50:25.222	2	B P2 L2 Main 2 DC Line Fault Restart Sequence Started	Cleared	0		BTPRT_ALM_AYS531
21/05/2025	22:50:25.222	2	B P2 L2 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		BTPRT_ALM_AYS537
21/05/2025	22:50:25.218	2	B P2 L1 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		BTPRT_ALM_AYS535
21/05/2025	22:50:25.193	1	B P2 L1 Control CLD HV Cable Minor Fail	Present	1		BTPRT_ALM_AYS301
21/05/2025	22:50:25.169	1	B P2 Reduced DC Voltage Operation Mode Changed Due To Protection	Present	1		BTPC2_RVS_AYS000
21/05/2025	22:50:25.121	2	B P2 L1 Main 1 DC Line Fault Restart Sequence Started	Present	1		BTPRT_ALM_AYS525
21/05/2025	22:50:25.130	2	B P2 L2 Main 2 DC Line Fault Restart Sequence Started	Present	1		BTPRT_ALM_AYS531
21/05/2025	22:50:25.130	2	B P2 L2 Main 1 DC Line Fault Restart Sequence Started	Present	1		BTPRT_ALM_AYS527
21/05/2025	22:50:25.886	2	B P2 L1 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		BTPRT_ALM_AYS535
21/05/2025	22:50:25.886	2	B P2 L1 Main 2 DC Line Fault Restart Sequence Started	Cleared	0		BTPRT_ALM_AYS529
21/05/2025	22:50:25.886	2	B P2 L2 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		BTPRT_ALM_AYS527
21/05/2025	22:50:25.886	2	B P2 L2 Main 2 DC Line Fault Restart Sequence Started	Cleared	0		BTPRT_ALM_AYS531
21/05/2025	22:50:20.917	2	B P2 L1 Main 2 DC Line Fault Restart Sequence Started	Present	1		BTPRT_ALM_AYS529
21/05/2025	22:50:20.917	2	B P2 L1 Main 1 DC Line Fault Restart Sequence Started	Present	1		BTPRT_ALM_AYS525
21/05/2025	22:50:20.917	2	B P2 L2 Main 2 DC Line Fault Restart Sequence Started	Present	1		BTPRT_ALM_AYS531
21/05/2025	22:50:20.917	2	B P2 L2 Main 1 DC Line Fault Restart Sequence Started	Present	1		BTPRT_ALM_AYS527

Figure 1: Pole-2 Events

Details shared by POWERGRID

Date	Time	Severity	Message Text	Status	Value	Operator	Mnemonic
21/05/2025	22:50:44.247	1	B MC Deficit Level 3	Cleared	0		BTOAL_DEF_AYS008
21/05/2025	22:50:43.262	1	B P4 L2 Standing Block Sequence Alarm	Cleared	0		BTPC4_PSQ_AYS002
21/05/2025	22:50:43.126	1	B P4 L1 Standing Block Sequence Alarm	Cleared	0		BTPC4_PSQ_AYS001
21/05/2025	22:50:34.245	1	B MC Deficit Level 3	Present	1		BTOAL_DEF_AYS008
21/05/2025	22:50:31.134	1	B B2 LFL Operated	Cleared	0		BTOAL_LFL_AYS003
21/05/2025	22:50:30.726	1	B B2 LFL Operated	Present	1		BTOAL_LFL_AYS003
21/05/2025	22:50:28.790	1	B B2 LFL Operated	Cleared	0		BTOAL_LFL_AYS003
21/05/2025	22:50:28.963	2	B P4 CAT B Init at PPOLE	Cleared	0		BTPC4_PP_AYS010
21/05/2025	22:50:28.378	1	B B2 LFL Operated	Present	1		BTOAL_LFL_AYS003
21/05/2025	22:50:28.230	2	B MC2 Power Control EAPRActive_FaultBlock	Cleared	0		BTOAL_MPC_AYS001
21/05/2025	22:50:27.726	1	B P4 L2 Standing Block Sequence Alarm	Present	1		BTPC4_PSQ_AYS002
21/05/2025	22:50:27.587	1	B P4 L2 Control CLD HV Cable Minor Fail	Cleared	0		BTPRT_ALM_AYS009
21/05/2025	22:50:27.557	1	B P4 L1 Control CLD HV Cable Minor Fail	Cleared	0		BTPRT_ALM_AYS007
21/05/2025	22:50:26.776	1	B P4 L1 Standing Block Sequence Alarm	Present	1		BTPC4_PSQ_AYS001
21/05/2025	22:50:26.095	2	B P4 CAT B Init at PPOLE	Present	1		BTPC4_PP_AYS010
21/05/2025	22:50:25.603	1	B P4 L2 Control CLD HV Cable Minor Fail	Present	1		BTPRT_ALM_AYS009
21/05/2025	22:50:25.229	2	B MC2 Power Control EAPRActive_FaultBlock	Present	1		BTOAL_MPC_AYS001
21/05/2025	22:50:25.226	2	B P4 L2 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		BTPRT_ALM_AYS027
21/05/2025	22:50:25.226	2	B P4 L1 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		BTPRT_ALM_AYS026
21/05/2025	22:50:25.224	2	B P4 L1 Main 2 DC Line Fault Restart Sequence Started	Cleared	0		BTPRT_ALM_AYS029
21/05/2025	22:50:25.224	2	B P4 L2 Main 2 DC Line Fault Restart Sequence Started	Cleared	0		BTPRT_ALM_AYS031
21/05/2025	22:50:25.188	1	B P4 L1 Control CLD HV Cable Minor Fail	Present	1		BTPRT_ALM_AYS007
21/05/2025	22:50:25.130	2	B P4 L1 Main 2 DC Line Fault Restart Sequence Started	Present	1		BTPRT_ALM_AYS029
21/05/2025	22:50:25.130	2	B P4 L1 Main 1 DC Line Fault Restart Sequence Started	Present	1		BTPRT_ALM_AYS026
21/05/2025	22:50:25.130	2	B P4 L2 Main 2 DC Line Fault Restart Sequence Started	Present	1		BTPRT_ALM_AYS031
21/05/2025	22:50:25.130	2	B P4 L2 Main 1 DC Line Fault Restart Sequence Started	Present	1		BTPRT_ALM_AYS027
21/05/2025	22:50:22.209	1	B B2 LFL Operated	Cleared	0		BTOAL_LFL_AYS003
21/05/2025	22:50:22.855	1	B B2 LFL Operated	Present	1		BTOAL_LFL_AYS003
21/05/2025	22:50:20.888	2	B P4 L2 Main 2 DC Line Fault Restart Sequence Started	Cleared	0		BTPRT_ALM_AYS031
21/05/2025	22:50:20.888	2	B P4 L1 Main 2 DC Line Fault Restart Sequence Started	Cleared	0		BTPRT_ALM_AYS029
21/05/2025	22:50:20.888	2	B P4 L1 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		BTPRT_ALM_AYS026
21/05/2025	22:50:20.888	2	B P4 L2 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		BTPRT_ALM_AYS027
21/05/2025	22:50:20.606	1	B P4 L1 Control CLD HV Cable Minor Fail	Cleared	0		BTPRT_ALM_AYS007
21/05/2025	22:50:20.578	1	B P4 L1 Control CLD HV Cable Minor Fail	Present	1		BTPRT_ALM_AYS007
21/05/2025	22:50:20.517	2	B P4 L2 Main 2 DC Line Fault Restart Sequence Started	Present	1		BTPRT_ALM_AYS031
21/05/2025	22:50:20.517	2	B P4 L2 Main 1 DC Line Fault Restart Sequence Started	Present	1		BTPRT_ALM_AYS027
21/05/2025	22:50:20.516	2	B P4 L1 Main 1 DC Line Fault Restart Sequence Started	Present	1		BTPRT_ALM_AYS026
21/05/2025	22:50:20.516	2	B P4 L1 Main 2 DC Line Fault Restart Sequence Started	Present	1		BTPRT_ALM_AYS029

Figure 2: Pole-4 Events

Details shared by POWERGRID

Line Fault Location:

LFL displayed fault location at 438.100 km from Kurukshetra and 849.21 km from Champa and Tower No. 2278. This tower is located in Auraiya in NR-3 Region.

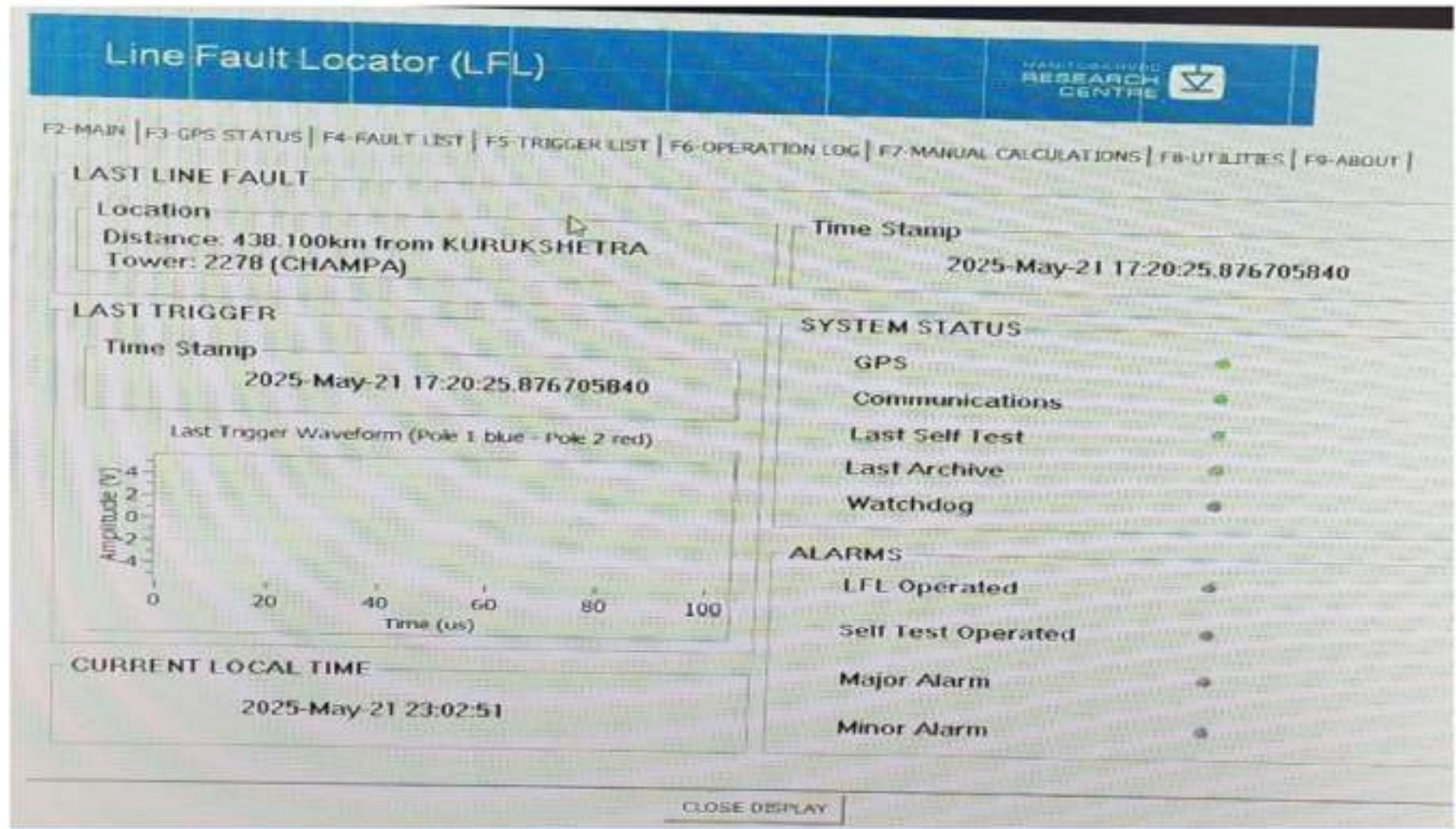
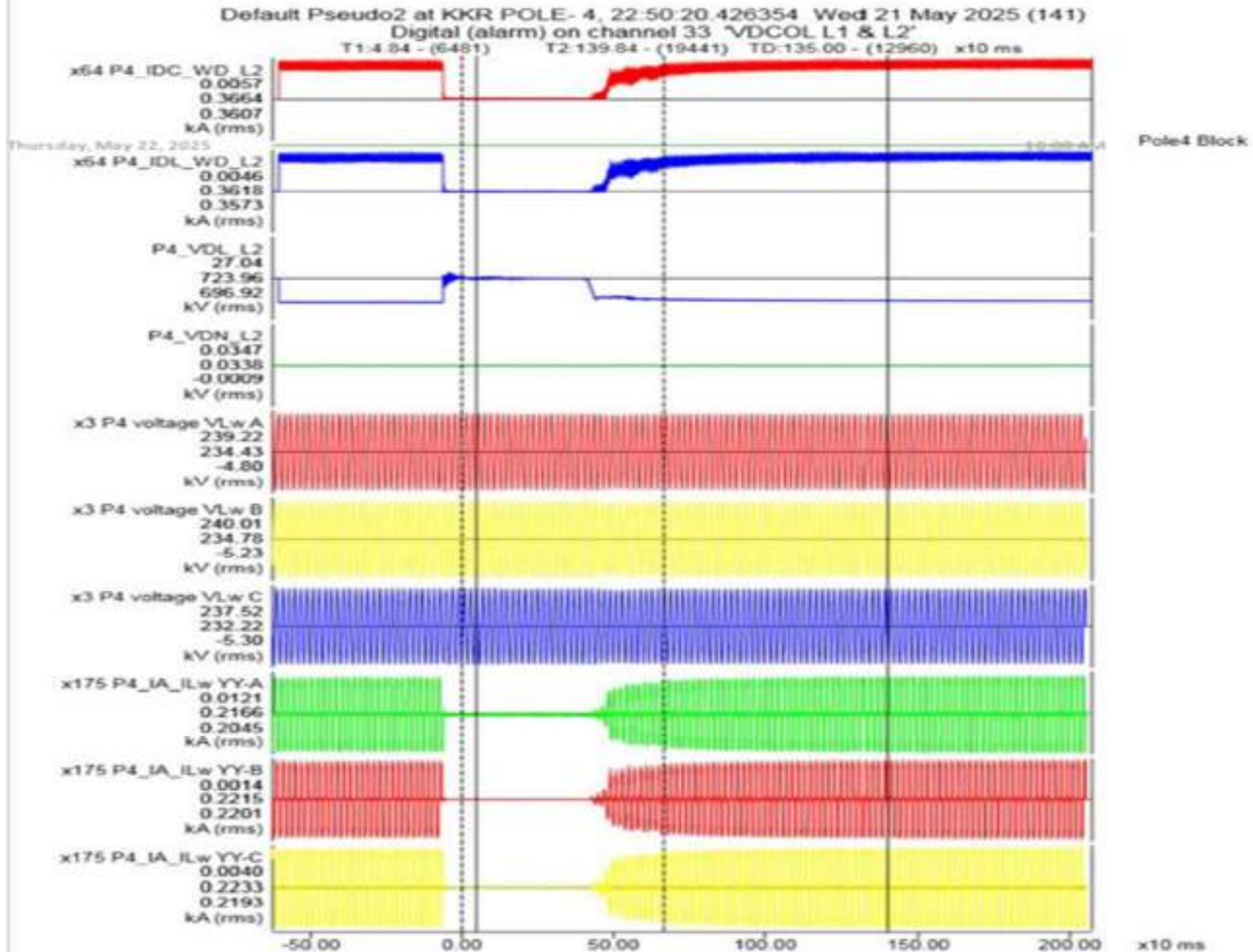
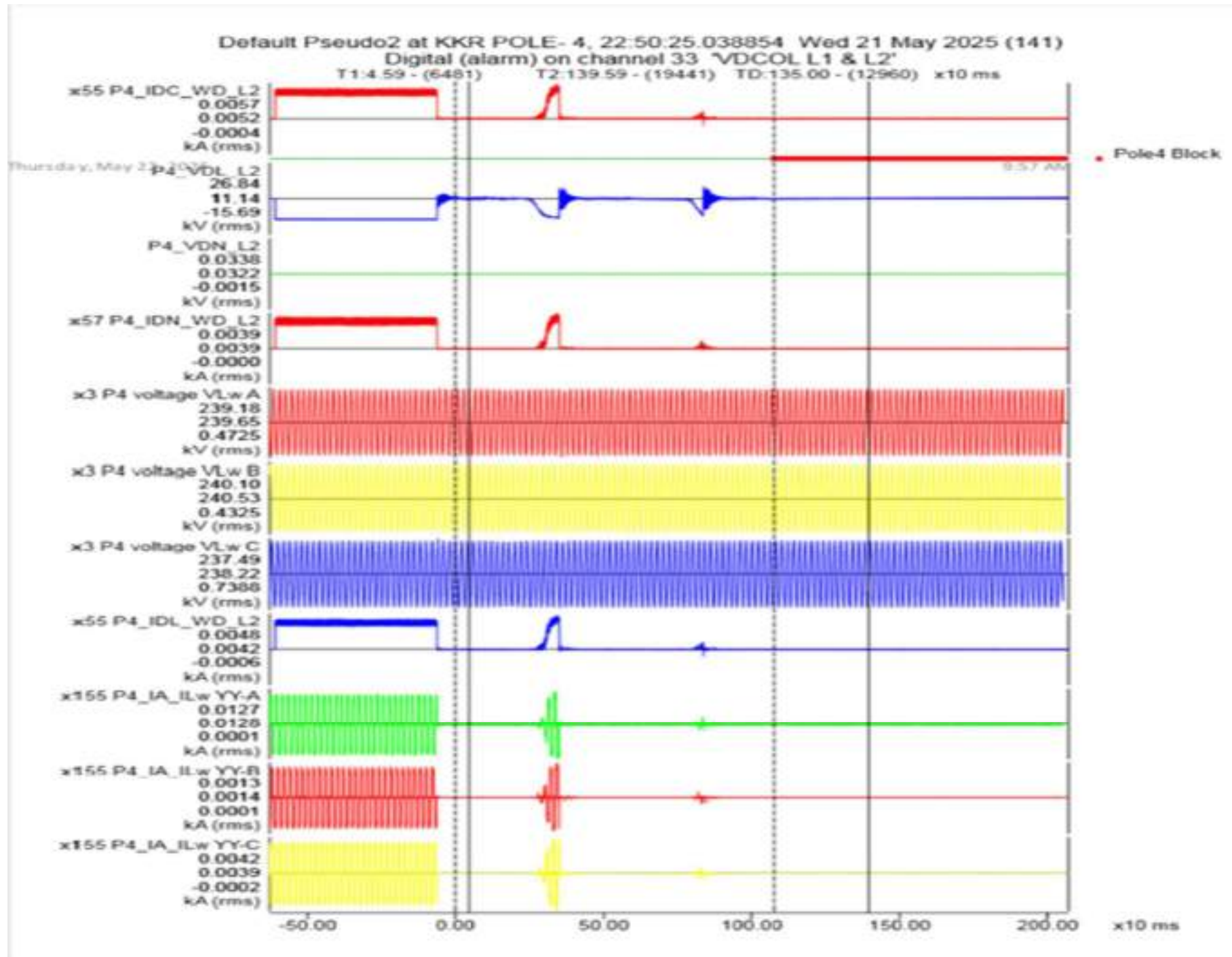


Figure 5: LFL at Kurukshetra

DR of 800 kV HVDC Kurukshetra (PG) Pole-04



DR of 800 kV HVDC Kurukshetra (PG) Pole-04 (2 Restart Attempt)



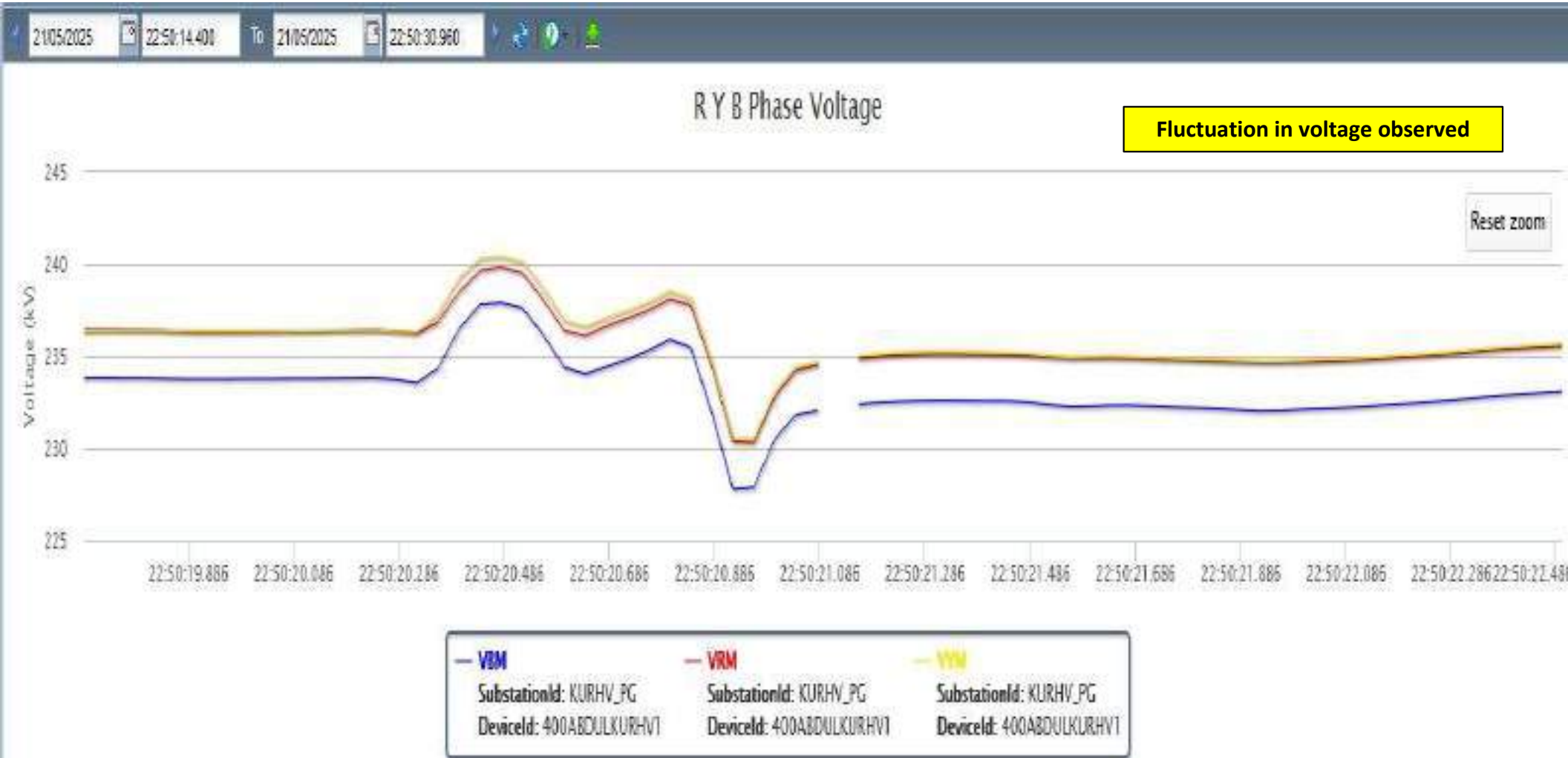
PMU Plot of frequency at Kurukshetra(PG)

22:50 hrs/21-May-25



PMU Plot of phase voltage magnitude at Kurukshetra(PG)

22:50 hrs/21-May-25



R Y B Phase Voltages Angles

SCADA SOE

Time	Station Name	Voltage(kV)	Element Name	Element Type	Element Status
22:27:58,477	KURHV_P	400	BKC2_4	Circuit Breaker	Open
22:28:53,785	KURHV_P	400	BKC4_1	Circuit Breaker	Close
22:34:16,459	KURHV_P	800	808_B	Circuit Breaker	disturbe
22:34:16,479	KURHV_P	800	808_B	Circuit Breaker	Close
22:42:04,379	KURHV_P	400	BKC4_2	Circuit Breaker	Close
22:43:00,961	KURHV_P	400	BKC5_1	Circuit Breaker	Close
22:48:05,407	KURHV_P	400	BKC6_1	Circuit Breaker	Close
22:50:27,410	KURHV_P	400	BKC3_3	Circuit Breaker	Open
22:51:50,508	KURHV_P	400	BKC2_2	Circuit Breaker	Close
22:51:59,338	KURHV_P	400	BKC5_2	Circuit Breaker	Close
22:53:00,395	KURHV_P	400	BKC3_2	Circuit Breaker	Close
22:53:05,923	KURHV_P	400	BKC6_2	Circuit Breaker	Close
22:59:54,368	KURHV_P	400	16NKDR1	Circuit Breaker	Close

Points for Discussion

- i) DR, EL & tripping report need to be shared from both the ends.
- ii) Details of protection operation and sequence of the tripping need to be shared.
- iii) Remedial action taken report to be shared.



पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

FAULT OCCURANCE/ANALYSIS REPORT HVDC KURUKSHETRA

Event:

Pole-2 and Pole-4 blocked due to DC Line Fault in Negative HV Line Conductor.

Date & Time of Blocking:

21.05.2025, 22:50:25:229 Hrs : Pole-2 Blocked

21.05.2025, 22:50:26:055 Hrs : Pole-4 Blocked

Date & Time of Restoration:

22.05.2025, 01:42 Hrs : Pole-4 Deblocked

22.05.2025, 02:26 Hrs : Pole-2 Deblocked

Antecedent Conditions:

Pole in Service : Pole-1, Pole-2, Pole 3 & Pole 4 in service

Operation mode : DMR1||DMR2, Master Control Mode

Power Level : 2500 MW

St. Master Control : Champa

Lane in control	:	Bipole2	-	Lane-1 active
	:	Bipole1	-	Lane-1 active
	:	Pole1	-	Lane-1 active
	:	Pole2	-	Lane-1 active
	:	Pole3	-	Lane-2 active
	:	Pole4	-	Lane-1 active
Telecom	:	Available		
Bay in Service	:	All converter bays & all ACF bays in service at Kurukshetra		
Weather Conditions	:	Stormy Weather in Haryana and Nearby States		

Sequence of Events:

22:50:20:517 - DC Line Fault Restart Sequence Started in Pole-2 and Pole-4.

22:50:25:130 - Another DC Line Fault Restart Sequence in Pole-2 and Pole-4.

22:50:25:169 - Pole-2 and Pole-4 in Reduced Voltage Mode

22:50:25:229 - Pole-2 blocked from Champa due to DC Line Fault

22:50:26:055 - Pole-4 blocked due to CAT-B Protection in Pole-2.

- Event logs of Pole-2 and Pole-4 are attached in Figure 1 and Figure 2 respectively.
- TFR of the first DC Line Fault is attached below in Figure 3. First restart after DC line fault can be seen in the graph.
- TFR showing second and third restart can be seen in Figure 4Figure 4.

21/09/2020	22:00:40.894	0	B P2 L2 Standing Block Sequence Alarm	Cleared	0		ETPCA_P5Q_AY3000
21/09/2020	22:00:34.140	1	B MC Default Level 3	Present	1		ETDGL_DEF_AY3000
21/09/2020	22:00:28.180	1	B P2 CAT B Fuse Overload	Cleared	0		ETPCA_FP_AY3011
21/09/2020	22:00:28.120	0	B MCB Power Control EAFRAlarm_PredBlock	Cleared	0		ETMCC_BPG_AY3004
21/09/2020	22:00:27.529	1	B B1 Filter Control Inverted Current Emergent	Cleared	0		ETMNB_AY_AY3012
21/09/2020	22:00:27.109	1	B P1 L1 Control CLD DMR2 Fault Initiate Protective Sequence	Present	1		ETPRT_ALM_AY3012
21/09/2020	22:00:27.140	1	B P1 L1 Control CLD DMR2 Minor Fail	Present	1		ETPRT_ALM_AY3048
21/09/2020	22:00:27.100	0	A P3 Break Free Closure	Cleared	0		ETDTH_OSG_AY3009
21/09/2020	22:00:25.180	1	B P2 Reduced DC Voltage Operation Mode Changed Due To Protection	Cleared	0		ETPCA_RHS_AY3000
21/09/2020	22:00:25.080	1	B P2 CAT B Fuse Overload	Present	1		ETPCA_FP_AY3011
21/09/2020	22:00:25.480	1	B P2 L1 Standing Block Sequence Alarm	Present	1		ETPCA_P5Q_AY3001
21/09/2020	22:00:25.481	1	B P2 L2 Standing Block Sequence Alarm	Present	1		ETPCA_P5Q_AY3002
21/09/2020	22:00:25.370	1	B P2 L1 Control CLD HV Cable Minor Fail	Cleared	0		ETPRT_ALM_AY3001
21/09/2020	22:00:25.187	1	B B1 Filter Control Inverted Current Emergent	Present	1		ETMNB_AY_AY3012
21/09/2020	22:00:25.120	0	B MCB Power Control EAFRAlarm_PredBlock	Cleared	0		ETMCC_BPG_AY3004
21/09/2020	22:00:25.120	0	A P3 Break Free Closure	Cleared	0		ETDTH_OSG_AY3009
21/09/2020	22:00:25.120	0	B P2 L2 Main 2 DC Line Fault Restart Sequence Started	Cleared	0		ETPRT_ALM_AY3001
21/09/2020	22:00:25.120	0	B P2 L2 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		ETPRT_ALM_AY3007
21/09/2020	22:00:25.120	0	B P2 L1 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		ETPRT_ALM_AY3008
21/09/2020	22:00:25.100	1	B P2 L1 Control CLD HV Cable Minor Fail	Present	1		ETPRT_ALM_AY3001
21/09/2020	22:00:25.100	1	B P2 Reduced DC Voltage Operation Mode Changed Due To Protection	Present	1		ETPCA_RHS_AY3000
21/09/2020	22:00:25.100	0	B P2 L1 Main 1 DC Line Fault Restart Sequence Started	Present	1		ETPRT_ALM_AY3008
21/09/2020	22:00:25.100	0	B P2 L2 Main 1 DC Line Fault Restart Sequence Started	Present	1		ETPRT_ALM_AY3007
21/09/2020	22:00:25.100	0	B P2 L2 Main 1 DC Line Fault Restart Sequence Started	Present	1		ETPRT_ALM_AY3002
21/09/2020	22:00:25.080	0	B P2 L1 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		ETPRT_ALM_AY3008
21/09/2020	22:00:25.080	0	B P2 L2 Main 2 DC Line Fault Restart Sequence Started	Cleared	0		ETPRT_ALM_AY3001
21/09/2020	22:00:25.080	0	B P2 L2 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		ETPRT_ALM_AY3007
21/09/2020	22:00:25.080	0	B P2 L2 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		ETPRT_ALM_AY3002
21/09/2020	22:00:25.017	0	B P2 L1 Main 2 DC Line Fault Restart Sequence Started	Present	1		ETPRT_ALM_AY3008
21/09/2020	22:00:25.017	0	B P2 L1 Main 1 DC Line Fault Restart Sequence Started	Present	1		ETPRT_ALM_AY3008
21/09/2020	22:00:25.017	0	B P2 L2 Main 2 DC Line Fault Restart Sequence Started	Present	1		ETPRT_ALM_AY3001
21/09/2020	22:00:25.017	0	B P2 L2 Main 1 DC Line Fault Restart Sequence Started	Present	1		ETPRT_ALM_AY3007

Figure 1: Pole-2 Events

Date	Time	Severity	Message Text	Status	Value	Operator	Message
21/09/2020	22:00:40.894	0	B MC Default Level 3	Cleared	0		ETDGL_DEF_AY3000
21/09/2020	22:00:40.200	1	B P4 L2 Standing Block Sequence Alarm	Cleared	0		ETPCA_P5Q_AY3000
21/09/2020	22:00:34.420	1	B P4 L1 Standing Block Sequence Alarm	Cleared	0		ETPCA_P5Q_AY3001
21/09/2020	22:00:34.040	1	B MC Default Level 3	Present	1		ETDGL_DEF_AY3000
21/09/2020	22:00:31.130	1	B B2 LPL Overload	Cleared	0		ETDGL_LPL_AY3000
21/09/2020	22:00:26.730	1	B B2 LPL Overload	Present	1		ETDGL_LPL_AY3000
21/09/2020	22:00:26.730	1	B B2 LPL Overload	Cleared	0		ETDGL_LPL_AY3000
21/09/2020	22:00:26.730	1	B P4 CAT B Fuse at PPOLE2	Cleared	0		ETPCA_FP_AY3011
21/09/2020	22:00:26.370	1	B B2 LPL Overload	Present	1		ETDGL_LPL_AY3000
21/09/2020	22:00:26.200	0	B MCB Power Control EAFRAlarm_PredBlock	Cleared	0		ETMCC_BPG_AY3004
21/09/2020	22:00:26.730	1	B P4 L1 Standing Block Sequence Alarm	Present	1		ETPCA_P5Q_AY3000
21/09/2020	22:00:26.367	1	B P4 L2 Control CLD HV Cable Minor Fail	Cleared	0		ETPRT_ALM_AY3000
21/09/2020	22:00:26.367	1	B P4 L1 Control CLD HV Cable Minor Fail	Cleared	0		ETPRT_ALM_AY3007
21/09/2020	22:00:26.730	1	B P4 L1 Standing Block Sequence Alarm	Present	1		ETPCA_P5Q_AY3001
21/09/2020	22:00:26.690	0	B P4 CAT B Fuse at PPOLE2	Present	1		ETPCA_FP_AY3011
21/09/2020	22:00:26.690	1	B P4 L2 Control CLD HV Cable Minor Fail	Present	1		ETPRT_ALM_AY3000
21/09/2020	22:00:26.230	0	B P4 L2 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		ETPRT_ALM_AY3007
21/09/2020	22:00:26.230	0	B P4 L1 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		ETPRT_ALM_AY3008
21/09/2020	22:00:26.230	0	B P4 L2 Main 2 DC Line Fault Restart Sequence Started	Cleared	0		ETPRT_ALM_AY3001
21/09/2020	22:00:26.230	0	B P4 L2 Main 2 DC Line Fault Restart Sequence Started	Cleared	0		ETPRT_ALM_AY3001
21/09/2020	22:00:26.100	1	B P4 L1 Control CLD HV Cable Minor Fail	Present	1		ETPRT_ALM_AY3001
21/09/2020	22:00:26.100	0	B P4 L1 Main 2 DC Line Fault Restart Sequence Started	Present	1		ETPRT_ALM_AY3008
21/09/2020	22:00:26.100	0	B P4 L1 Main 1 DC Line Fault Restart Sequence Started	Present	1		ETPRT_ALM_AY3008
21/09/2020	22:00:26.100	0	B P4 L2 Main 2 DC Line Fault Restart Sequence Started	Present	1		ETPRT_ALM_AY3001
21/09/2020	22:00:26.100	0	B P4 L2 Main 1 DC Line Fault Restart Sequence Started	Present	1		ETPRT_ALM_AY3007
21/09/2020	22:00:26.090	1	B B2 LPL Overload	Cleared	0		ETDGL_LPL_AY3000
21/09/2020	22:00:26.840	1	B B2 LPL Overload	Present	1		ETDGL_LPL_AY3000
21/09/2020	22:00:26.080	0	B P4 L2 Main 2 DC Line Fault Restart Sequence Started	Cleared	0		ETPRT_ALM_AY3001
21/09/2020	22:00:26.080	0	B P4 L1 Main 2 DC Line Fault Restart Sequence Started	Cleared	0		ETPRT_ALM_AY3008
21/09/2020	22:00:26.080	0	B P4 L1 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		ETPRT_ALM_AY3008
21/09/2020	22:00:26.080	0	B P4 L2 Main 1 DC Line Fault Restart Sequence Started	Cleared	0		ETPRT_ALM_AY3007
21/09/2020	22:00:26.080	1	B P4 L1 Control CLD HV Cable Minor Fail	Cleared	0		ETPRT_ALM_AY3001
21/09/2020	22:00:26.570	1	B P4 L1 Control CLD HV Cable Minor Fail	Present	1		ETPRT_ALM_AY3001
21/09/2020	22:00:26.017	0	B P4 L2 Main 2 DC Line Fault Restart Sequence Started	Present	1		ETPRT_ALM_AY3001
21/09/2020	22:00:26.017	0	B P4 L2 Main 1 DC Line Fault Restart Sequence Started	Present	1		ETPRT_ALM_AY3007
21/09/2020	22:00:26.010	0	B P4 L1 Main 1 DC Line Fault Restart Sequence Started	Present	1		ETPRT_ALM_AY3008
21/09/2020	22:00:26.010	0	B P4 L1 Main 2 DC Line Fault Restart Sequence Started	Present	1		ETPRT_ALM_AY3008

Figure 2: Pole-4 Events

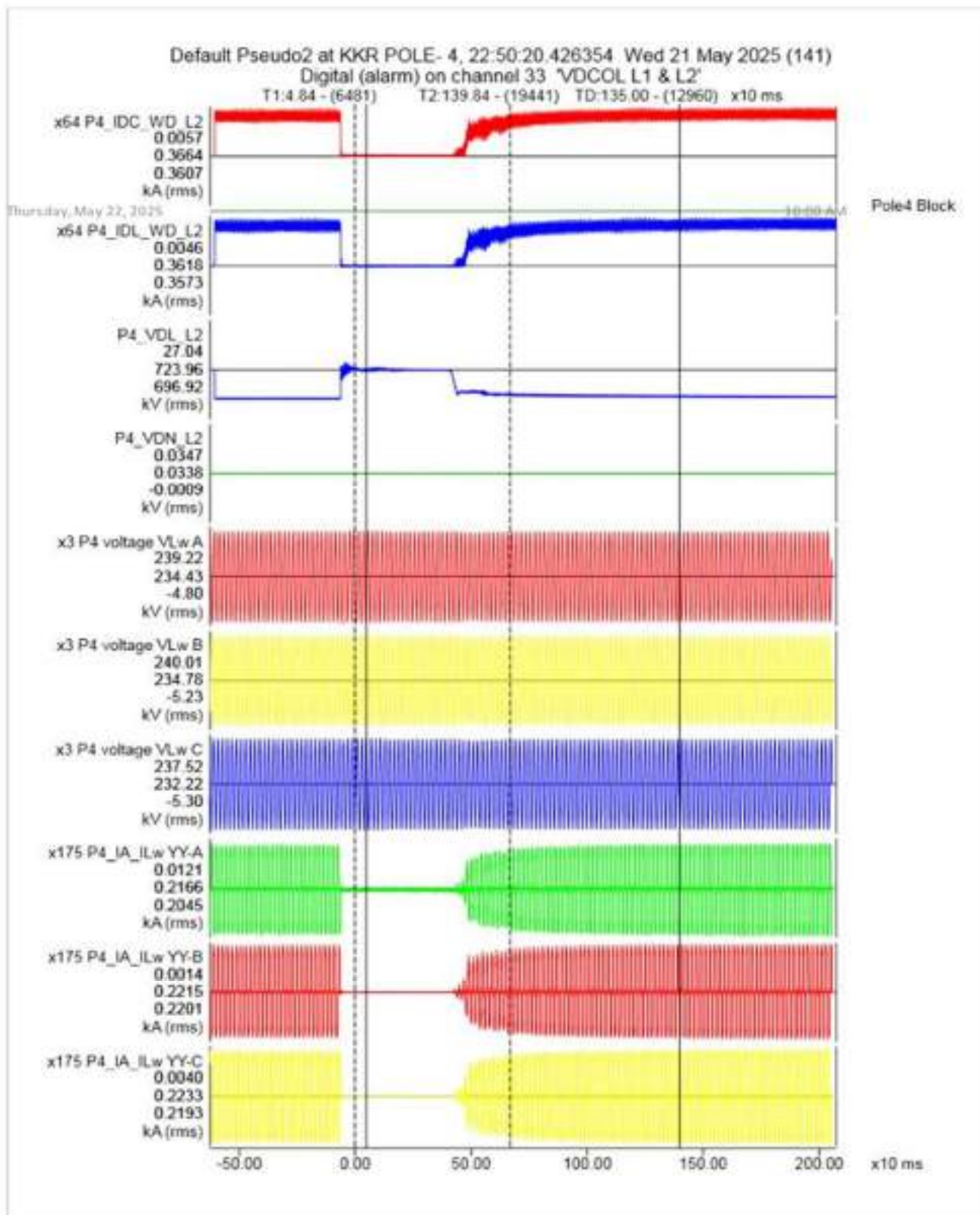


Figure 3: First Restart After DC Line Fault

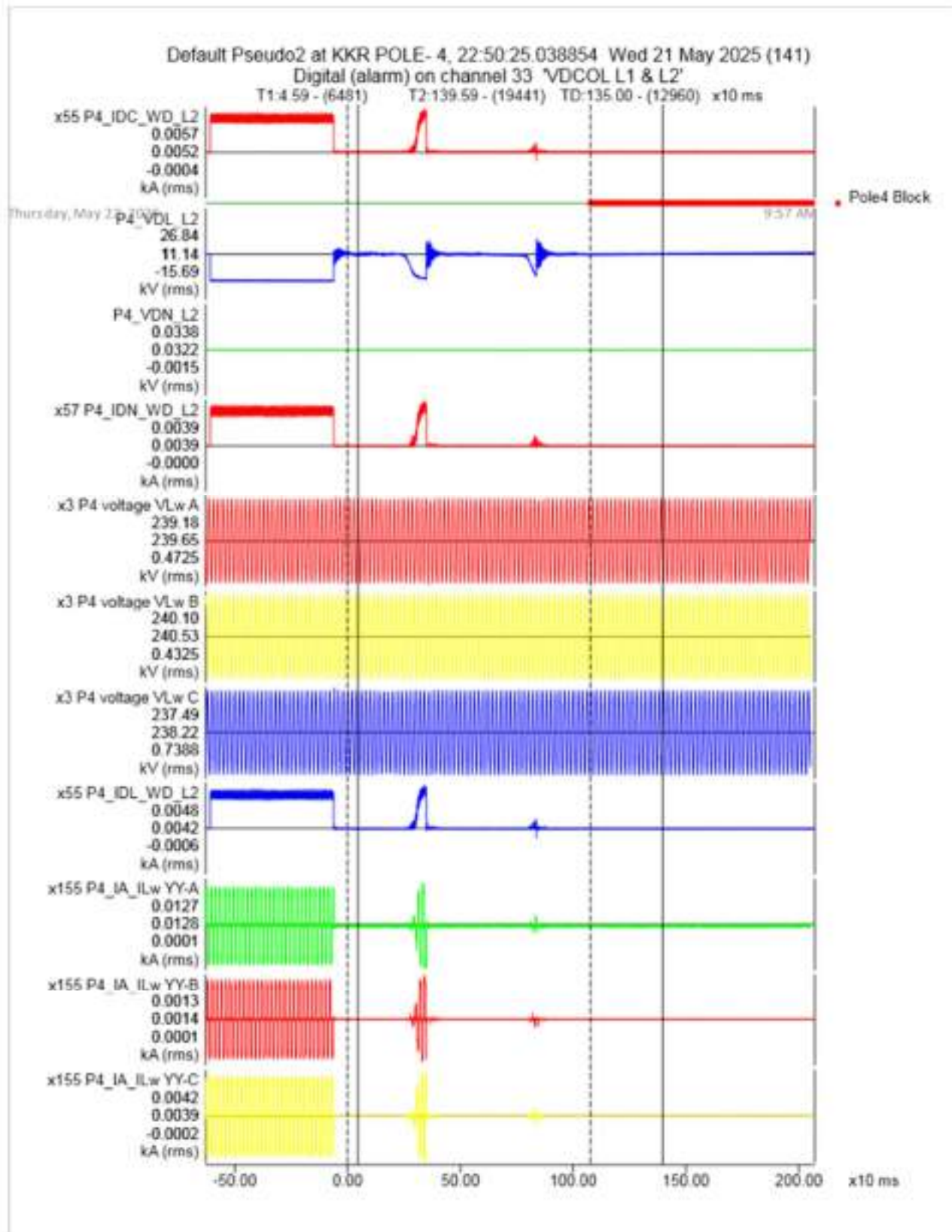


Figure 4: Pole Block After Two More Restart Attempts

Line Fault Location:

LFL displayed fault location at 438.100 km from Kurukshetra and 849.21 km from Champa and Tower No. 2278. This tower is located in Auraiya in NR-3 Region.

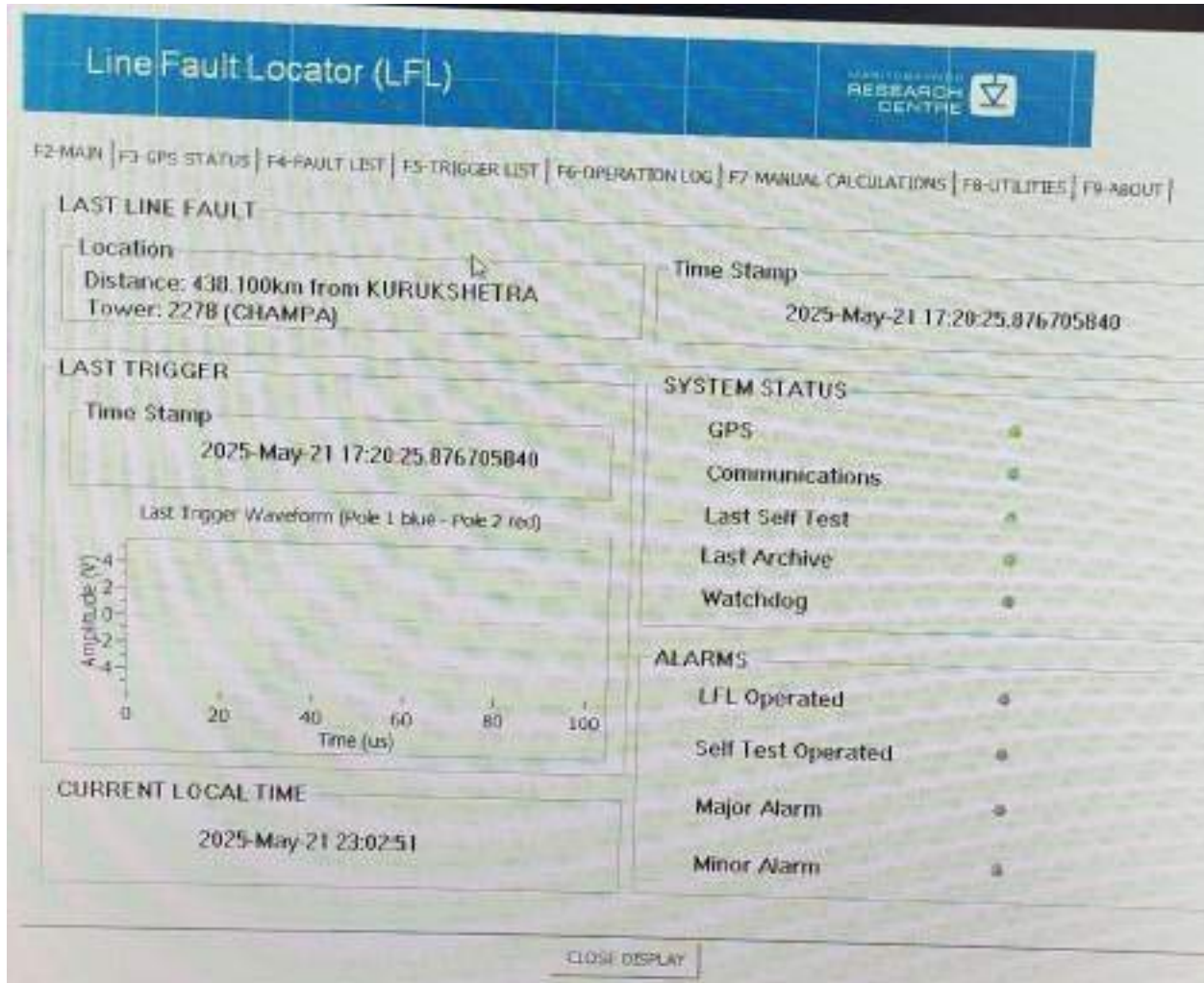


Figure 5: LFL at Kurukshetra

Action Taken:

RTAMC NR-3 was informed about the fault location after the incident and after clearance from RTAMC NR-3, Pole-2 and Pole-4 were restored.

Multiple Element Tripping Event at 400KV Dadri(NTPC) and 500KV HVDC Dadri (PG)

At 20:00 hrs and 20:21 hrs on 21.05.2025

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	400 KV Dadri(NT)-Loni Harsh Vihar(DV) (NT) Ckt-1	20:00 hrs	Yet to be revived	R-N fault, Z-1, Dist. 15.3km from Loni Harsh Vihar. Tower collapse at loc no 24
2.	210 MW Unit-1 at Dadri-I TPS			Due to Loss of Evacuation Path.
3.	210 MW Unit-2 at Dadri-I TPS		15:23 hrs 22.05.25	
4.	210 MW Unit-3 at Dadri-I TPS		20:19 hrs 22.05.25	
5.	210 MW Unit-4 at Dadri-I TPS		07:59 hrs 22.05.25	
6.	400 KV Mandola(PG)-Dadri (PG) (DTL) Ckt-2	20:21 hrs	04:58 hrs 22.05.25	R-N fault
7.	490 MW Unit-1 at Dadri-II TPS		07:35 hrs 22.05.25	Loss of evacuation Path
8.	500 kV HVDC <u>Rihand-Dadri (PG) Ckt-1</u>		02:06 hrs 22.05.25	Pole-1 trip on commutation failure
9.	500 kV HVDC <u>Rihand-Dadri (PG) Ckt-2</u>		22:43 hrs	Pole-2 trip on commutation failure

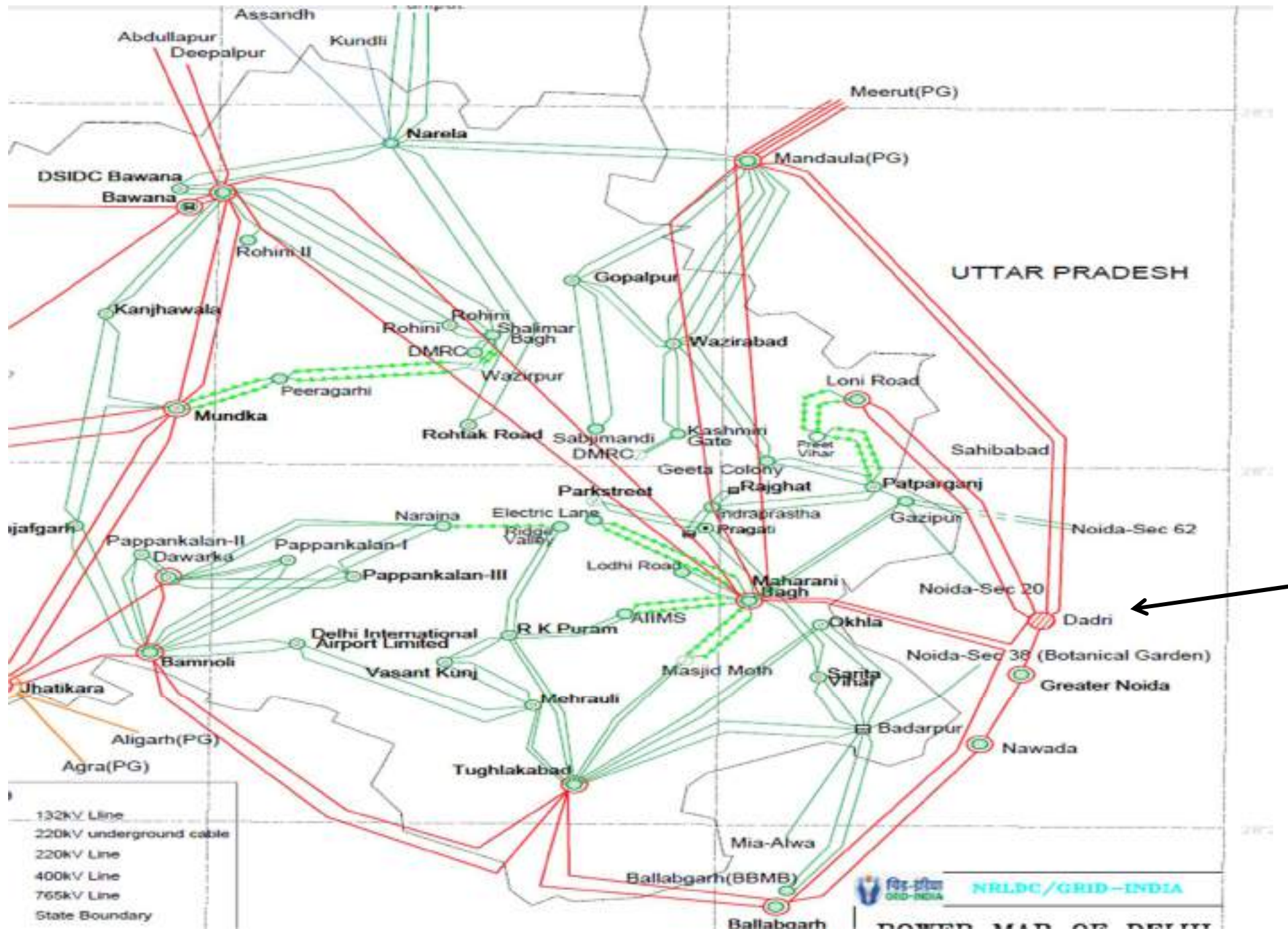
Brief details of the event

- ✓ 400/220kV Dadri Stage I has one and half breaker scheme in 400KV and Double main transfer system in 220KV system. 400KV Dadri stage 2 has one and half breaker scheme. Stage 1 has 4 X 210 Generating units while Stage 2 has 2 X 490 MW Generating units.
- ✓ During antecedent condition, Unit 1,2,3 and 4 of Stage 1 Dadri was generating 131MW, 121 MW, 117MW and 109MW respectively. While Unit 1 of Dadri Stage 2 was generating 264MW while Unit 2 already tripped at 20:17 hrs.
- ✓ The lines 400KV Dadri – Muradnagar, 400KV Dadri – Panipat Ckt -1 & 2 were already tripped during to inclement weather conditions. Whole power of Dadri Stage-1 (~475 MW was evacuating through 400kV Dadri-Harshvihar ckt-1. The Dadri Stage 1 and Stage 2 were running in split bus arrangement.
- ✓ As reported, at 20:00 hrs, 400 KV Dadri(NT)-Loni Harsh Vihar(DV) (NT) Ckt-1 tripped on R-N phase to earth fault. Z-1 distance protection operated; fault distance was 15.3 KM from Harsh Vihar end. During patrolling the tower at location no. 24 found collapsed.
- ✓ As per PMU at Dadri TPS, R-N phase to earth fault cleared within 100msec is observed.
- ✓ Following the tripping of 400 KV Dadri(NT)-Loni Harsh Vihar(DV) (NT) Ckt-1, all the 4 generating units and 3X 210MW ICT 1,2 & 5 tripped due to loss of evacuation path.
- ✓ Again at 20:20 hrs, only 490 MW Unit-1 at Dadri-II TPS was running and 400KV Dadri – Mandaula Ckt-2 was the only operational ckt in Dadri Stage 2. 400KV Dadri- Kaithal Ckt, 400KV Dadri – Gr. Noida, 400KV Dadri – Harsh Vihar Ckt-2, 400KV Dadri – Mandaula Ckt-1 were already under tripped condition on line faults during inclement weather conditions.

Brief details of the event

- ✓ As reported at 20:21 hrs, 400 KV Mandola(PG)- Dadri (PG)(DTL) Ckt-2 tripped during power swing.
- ✓ At the same time, 490 MW Unit-1 at Dadri-II TPS along with 2X500 MVA ICT 3 and 4 tripped due to loss of evacuation path. This led to complete blackout of 400KV Dadri Substation.
- ✓ As per PMU at Dadri TPS, R-N phase to earth fault cleared within 100msec followed by fluctuation in voltage is observed.
- ✓ At the same time, 500 kV HVDC Rihand-Dadri (PG) Ckt-1 and Ckt-2 tripped due to commutation failure. At the time of tripping 500 kV HVDC Rihand-Dadri (PG) Ckt-1 and Ckt-2 were carrying total ~1150 MW. As a result of tripping of both the ckt, SPS condition 2 operated.
- ✓ As per details received from POWERGRID, as per logic if commutation failure persists for more than 2600 ms then the Protection shall issue a Y Trip to the converters. Since starting from 20:20:58:2785 Hrs. 12 successive commutation failures were detected at a gap of less than 500ms, at 20:21:00:8782 both Poles of the Rihand Dadri HVDC Link tripped on Commutation failure protection from HVDC Dadri S/s.
- ✓ As per SPS case-2 operation, there should load shed in load group-A, B, C & D and generation back down of total ~500 MW at Rihand & Singrauli TPS.
- ✓ As per SCADA data, generation backdown of ~335MW is observed in Rihand Stage I and Stage II. However, However, there wasn't any significant generation back down (only ~30MW) in Singrauli observed.
- ✓ As per SCADA, generation loss of total ~975 MW is observed at Dadri TPS, ~475 MW at 20:00 hrs at Dadri Stage-1 TPS and ~254 MW at 20:17 hrs due to tripping of Unit-2 at Dadri stage-II TPS and ~240 MW at 20:21 hrs due to tripping of Unit-1 at Dadri stage-II TPS.

Network Diagram



SLD of Dadri(NTPC) STG-1 before the event @20:00 hrs

CONTACT DETAILS	
EMAIL	seemaladri@gmail.com
MOBILE	903951407
BOOKING	2012265

DADRI(TH)

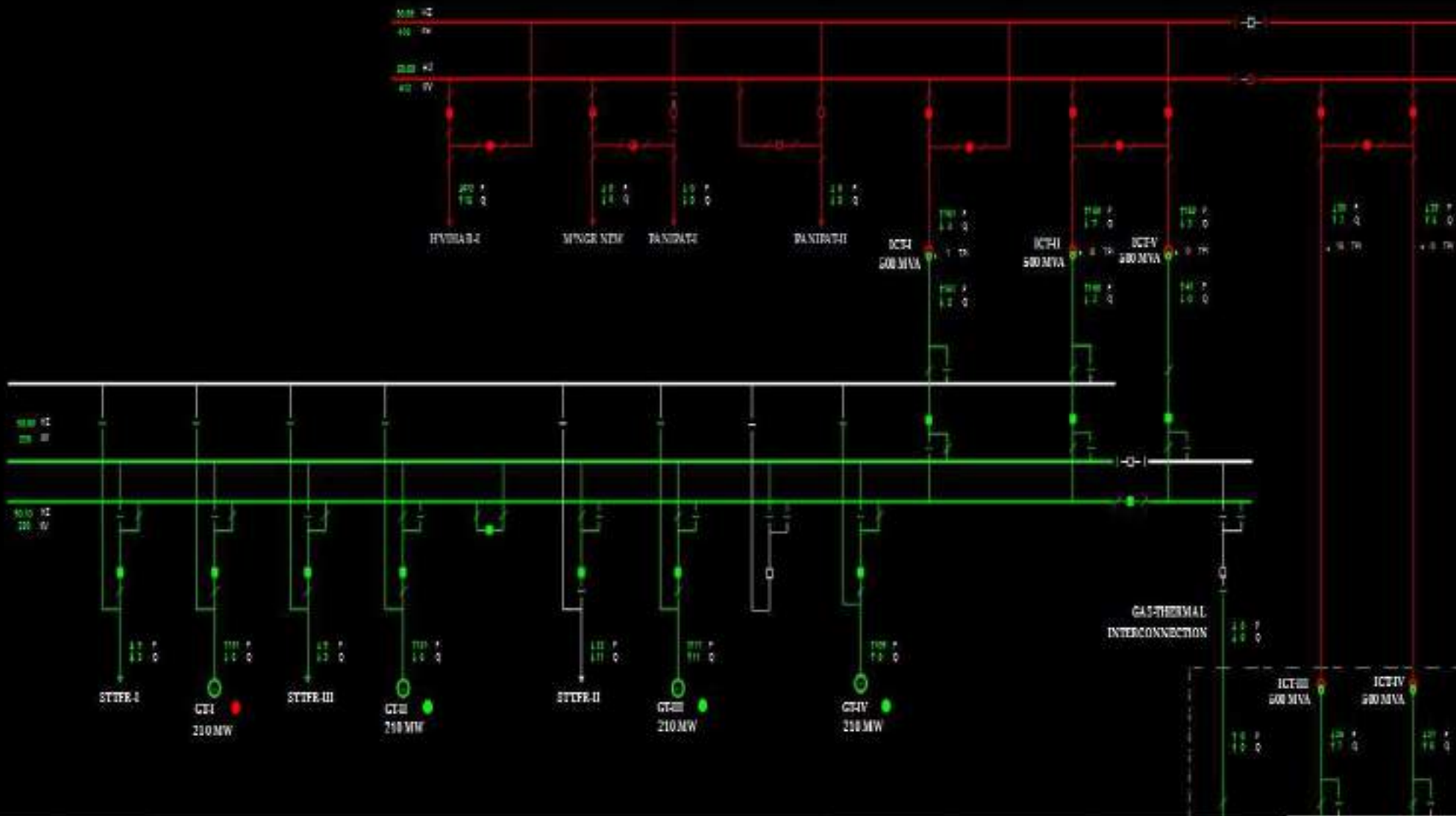
P max (per MT) = 0
P min (per MT) = 0

Stat Expl GenSum Company

21.5.25 20:0:30

Q max (per MT) = 0
Q min (per MT) = 0

PL = 47.8
Q max = 300



SLD of Dadri(NTPC) STG-1 after the event @20:01hrs

CONTACT DETAILS	
EMAIL:	soo.ensai@deutscheslug.de
MOBILE:	900990457
WHATSAPP:	20812626

DADRI(TH)

$\hat{\sigma}^2_{\text{error}}(\text{posterior}) = 1$
 $\hat{\sigma}^2_{\text{error}}(\text{score}) = 10$

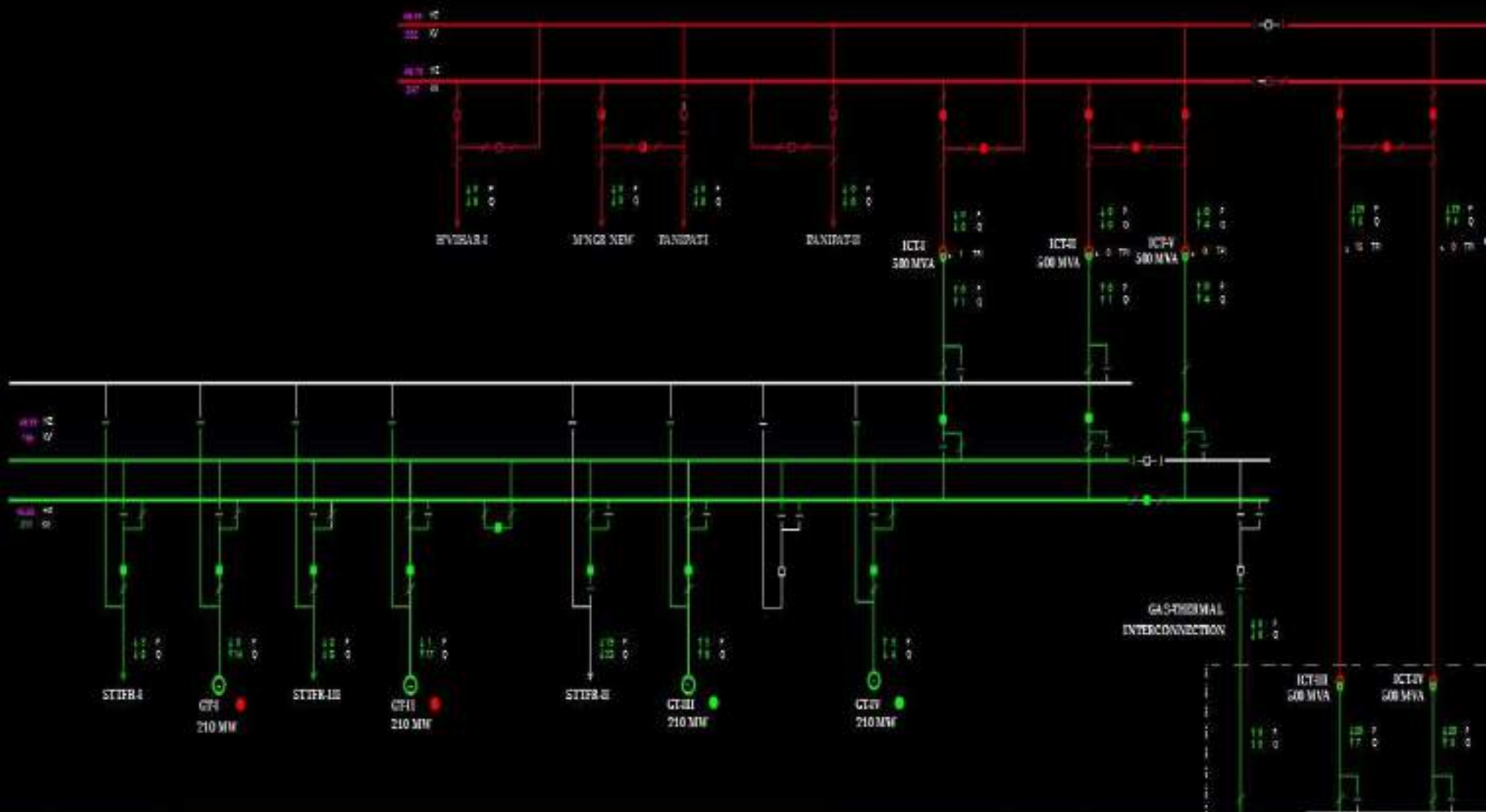
Start Expl

GenSum

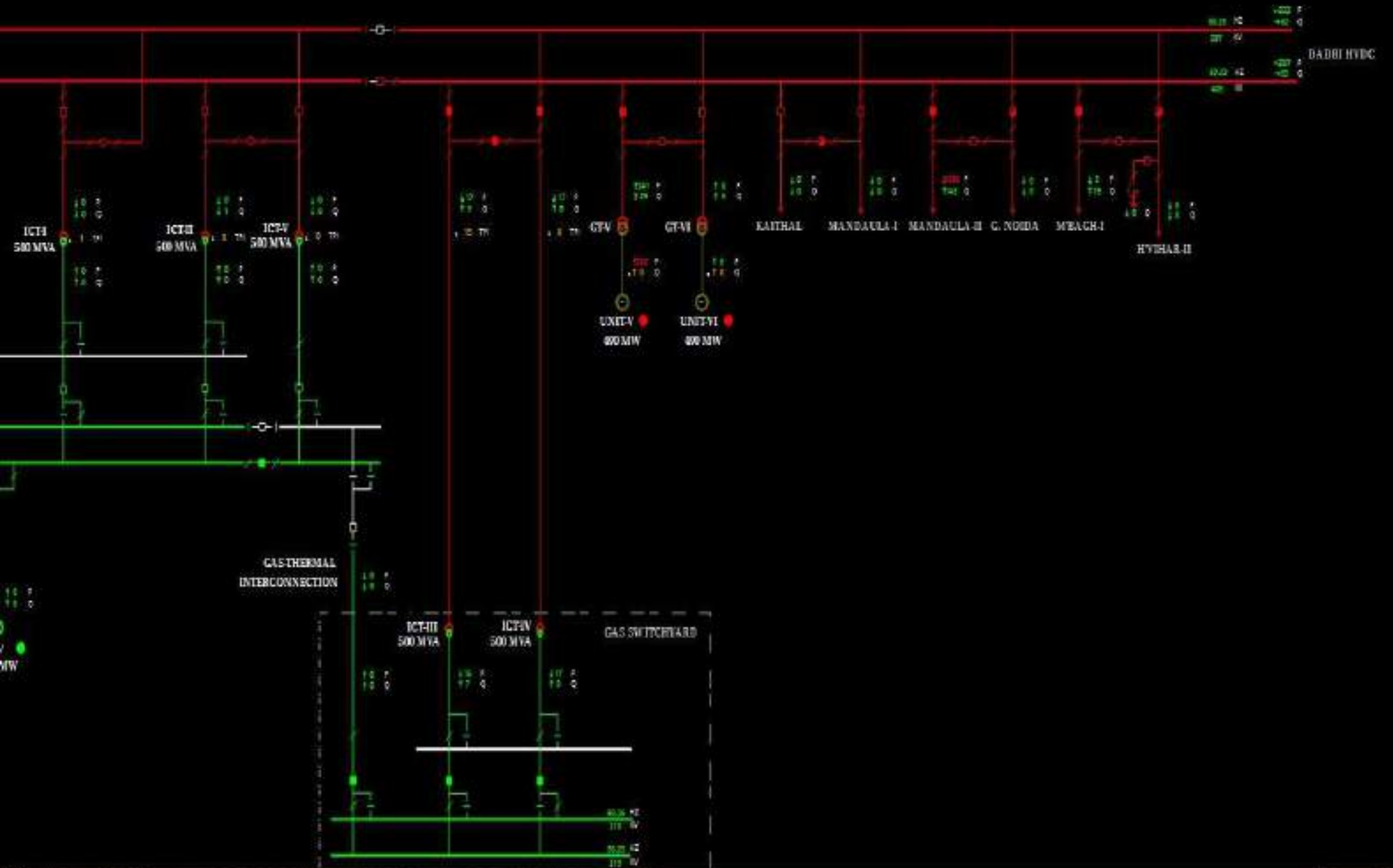
Company

Q sum(100 BT) = 8 FL = 6 B 100
Q sum(100 BT) = 10 SMT = 107

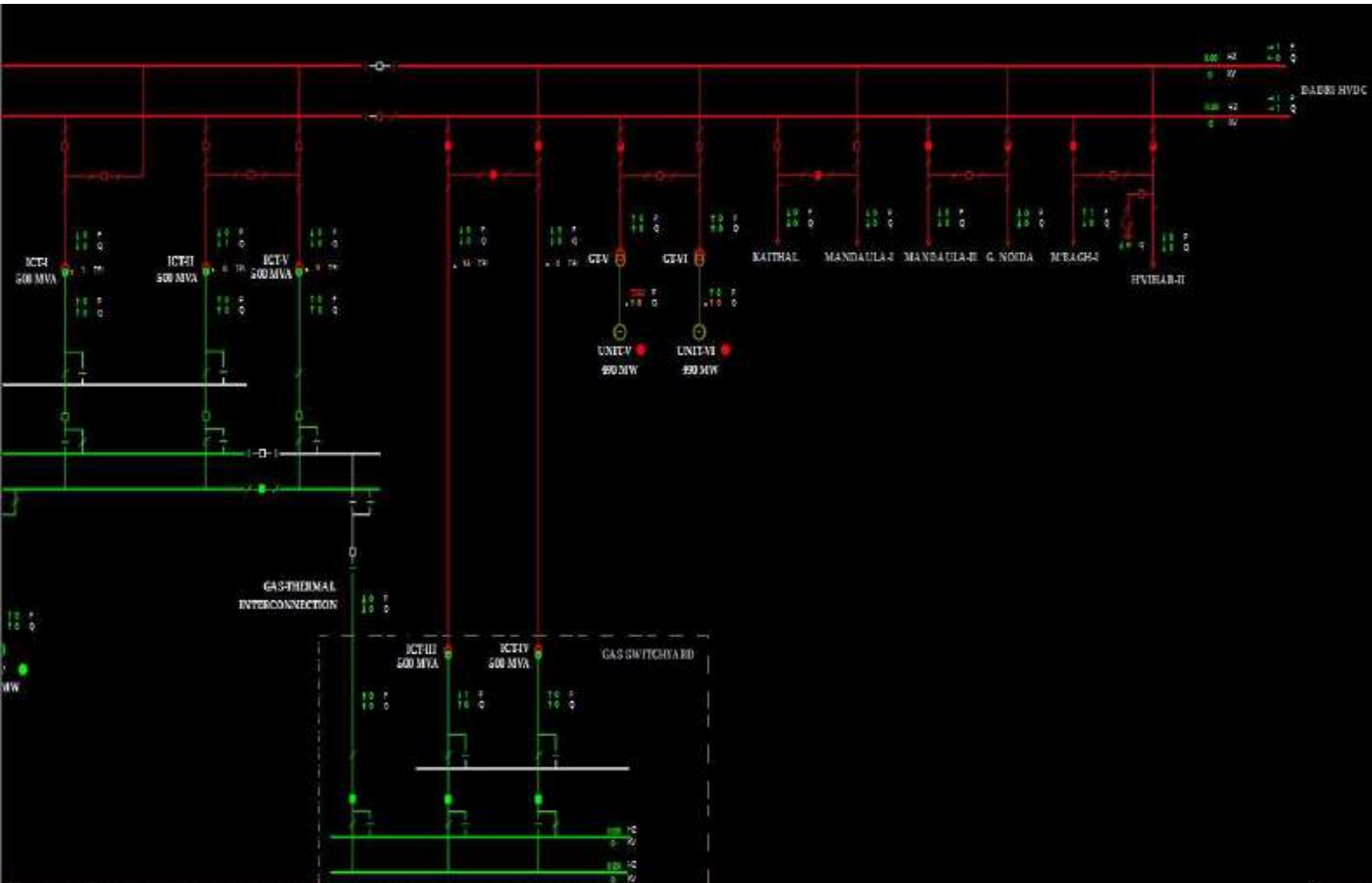
21.5 .25 20:1 :30



SLD of Dadri(NTPC) STG-2 before the event @20:20 hrs



SLD of Dadri(NTPC) STG-2 after the event @20:20 hrs



SLD of HVDC Rihand-Dadri(end) before the event @20:20 hrs

CONTACT DETAILS

EMAIL	hvdcdadri@powergrid.co.in
MOBILE	9560688319
HOTLINE	20112625

DADRI HVDC

Phase (point) = -

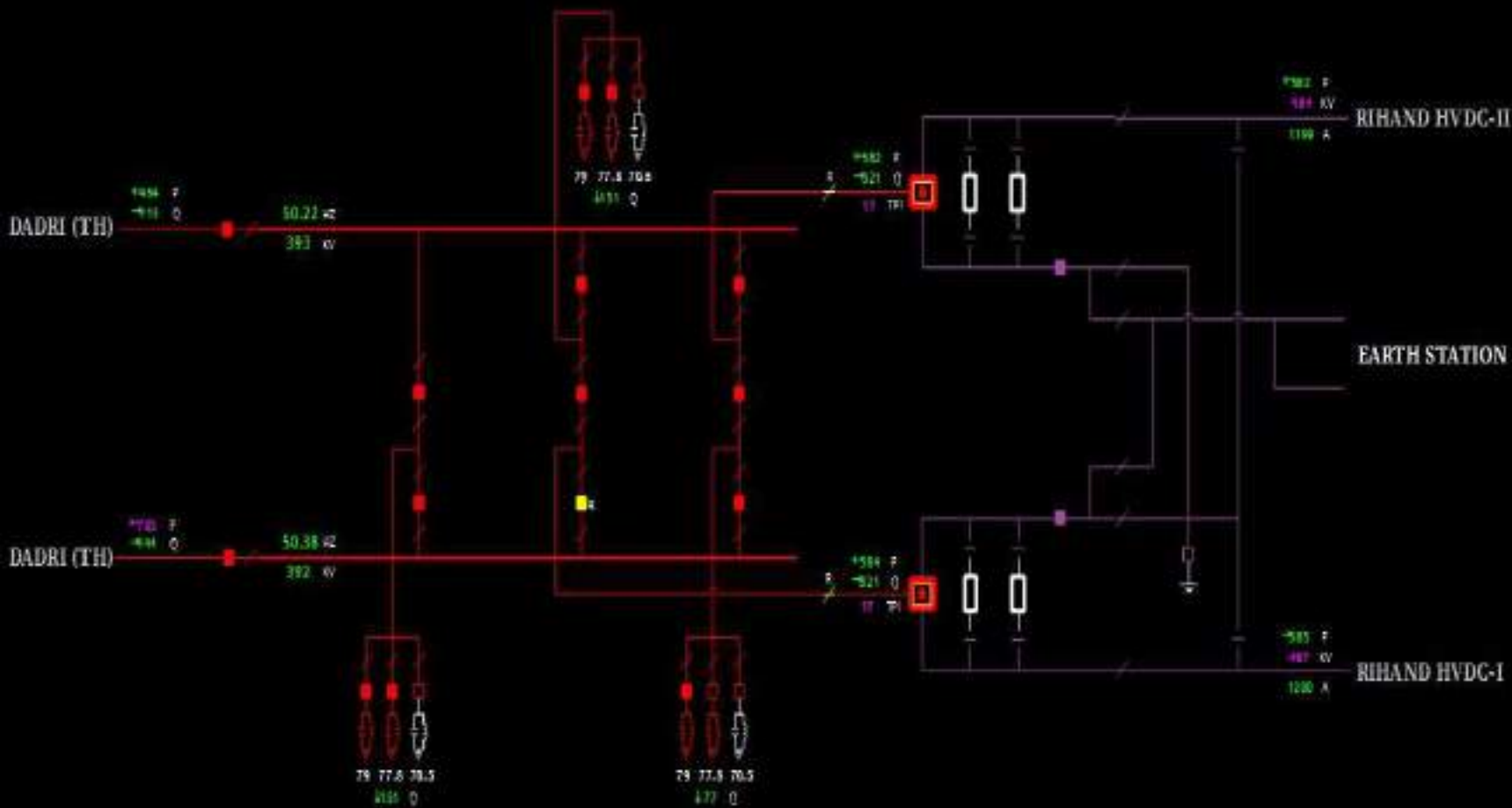
Stat Expl

GenSum

Company

Q number (B) =

21.5 .25 20:20:30



	POLE1	POLE2
GROUND RETURN	●	●
METALLIC RETURN	●	●
DCG ACTIVATED	●	●
DC LINE TRANSFER FAST	●	●
EMERGENCY STOP PROTECTION	●	●
NO CURE	●	●
AUTO RESUME	●	●
FINCHLAND-ALFA	144 A	144 A
CONDUCTOR RATING - CATHODE	18 A	18 A
CONDUCTOR DETECTION	1200 A	1200 A
DC SHORT	●	●
ARMED STOP	●	●
TOO LONG	●	●
OVERCURRENT PROTECTION	1200 A	1200 A

SLD of HVDC Rihand-Dadri(end) before the event @20:20 hrs

CONTACT DETAILS

EMAIL	hvdc.dadri@powergrid.co.in
MOBILE	9560888319
HOTLINE	20112625

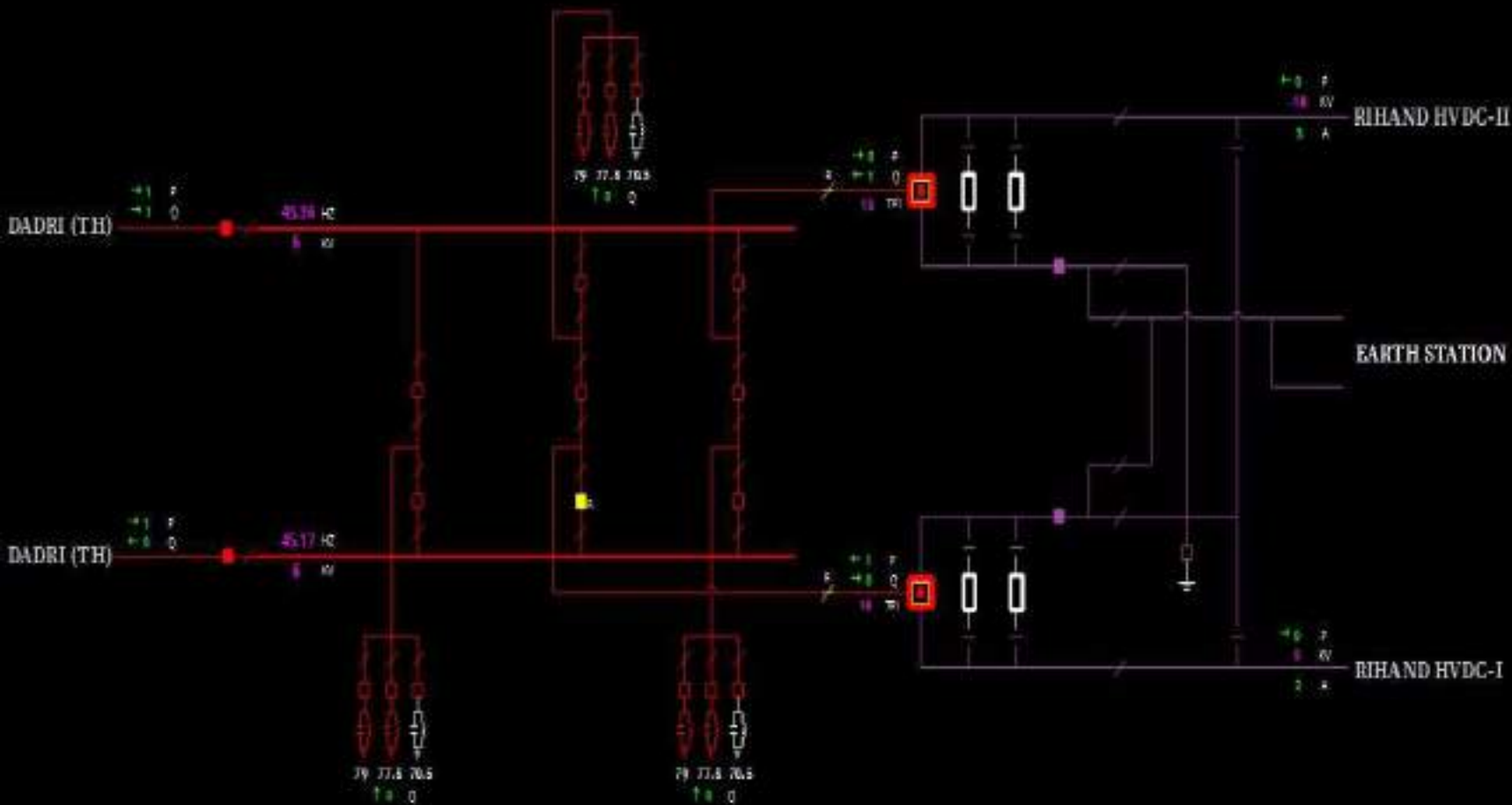
DADRI HVDC

Final Load MW = -3

Start Expl GenSum Company

Q max(Load MW) = -4

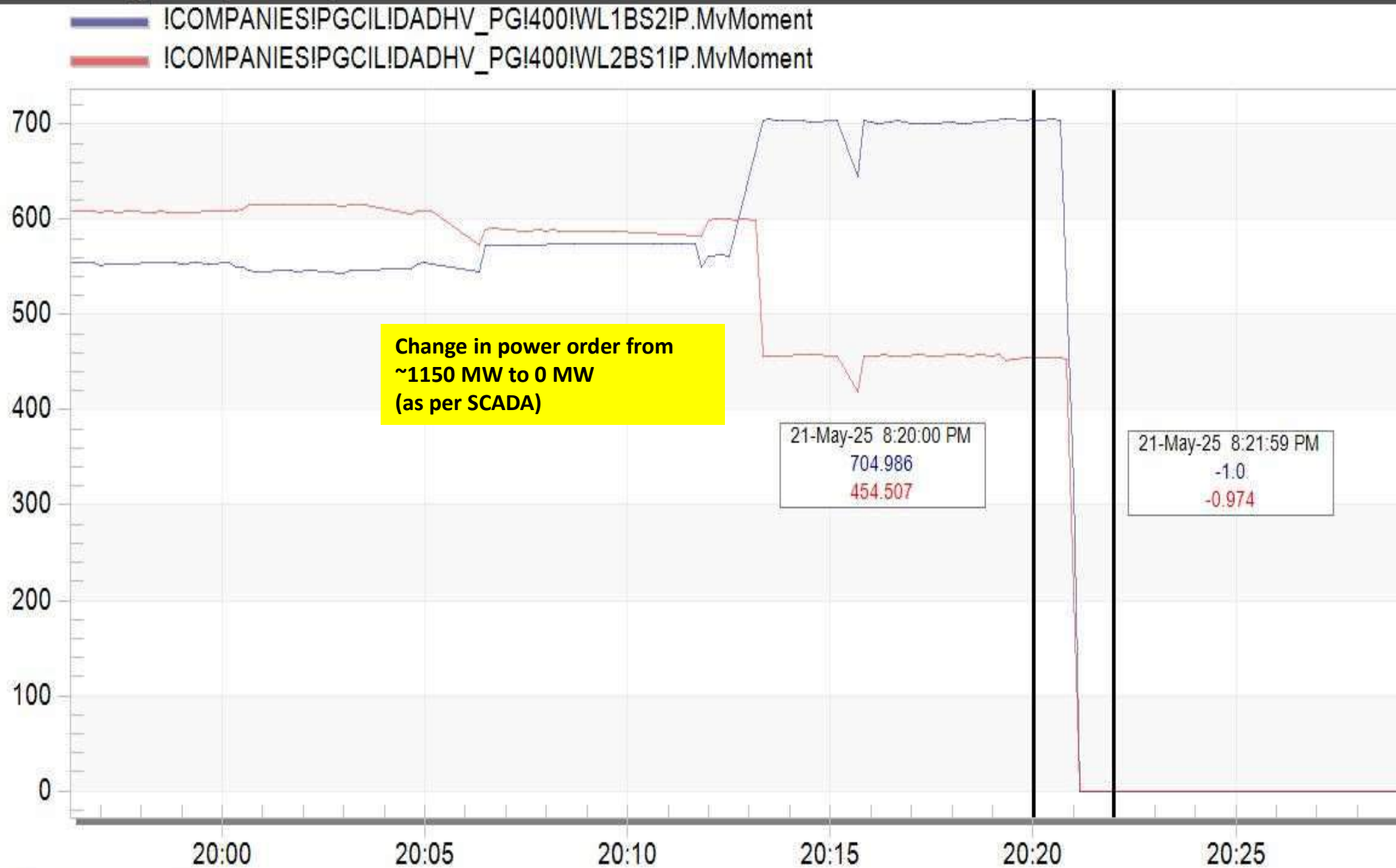
21.5 .25 20:21:30



	VOLTY	NO DC
GROUND RETURN	●	●
METALLIC RETURN	●	●
CODE ACTIVATED	●	●
DC LINE TRANSFER MODE	●	●
TRANSFERRED TO DC MODE	●	●
POD CIRCUIT	●	●
AUTO START	●	●
TRANSFERRED-ALPHA	0 A	0 A
EXTENDED-ALPHA-DRAMA	0 A	0 A
DC LINE SET POINT	150 A	150 A
DC SWIFT	●	●
TRAP SWIFT	●	●
POD SWIFT	●	●
SWITCHING POINT	1000 F	1000 F

HVDC Rihand Dadri Power Flow during the event

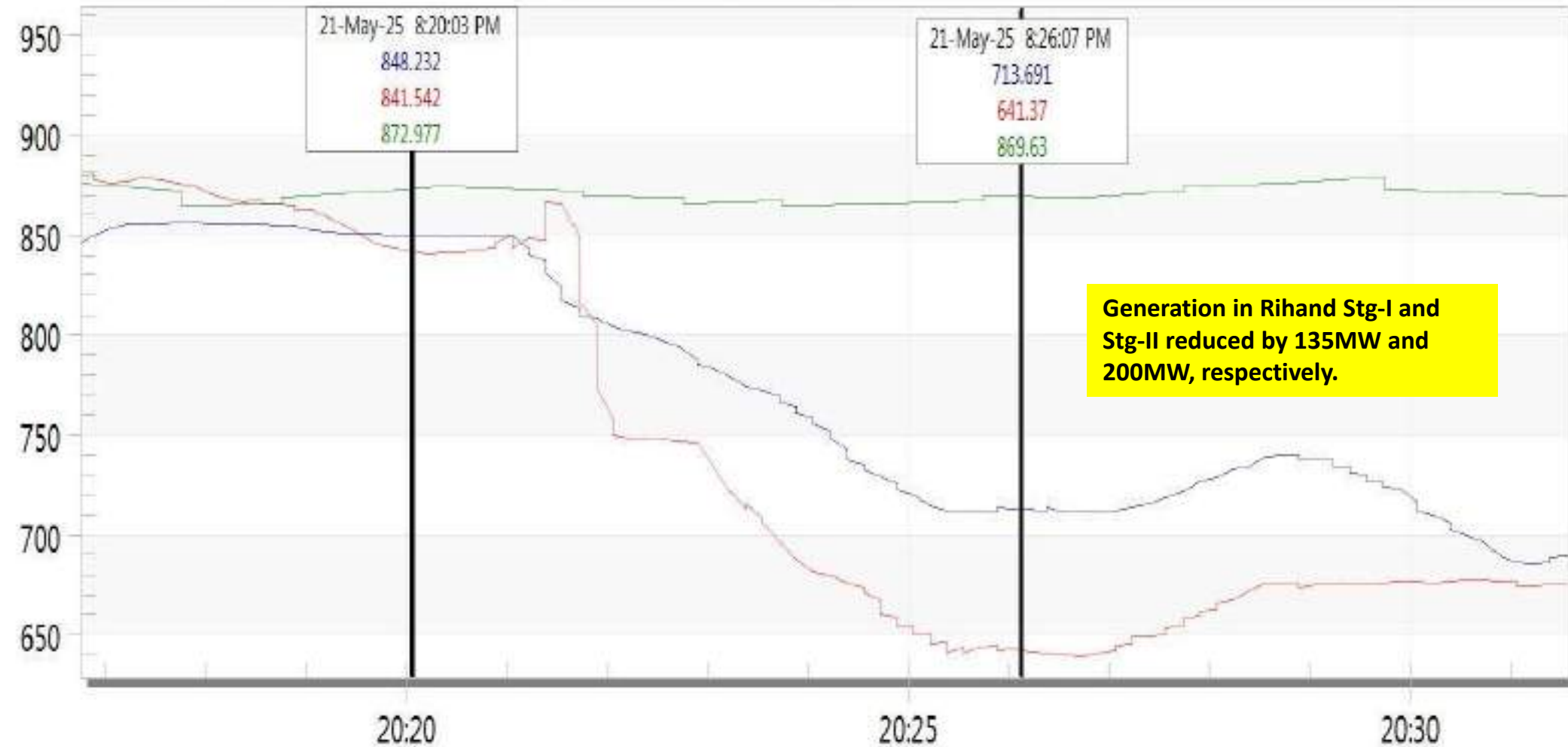
Rihand dadri flow (Updated By: SPCAdmin)



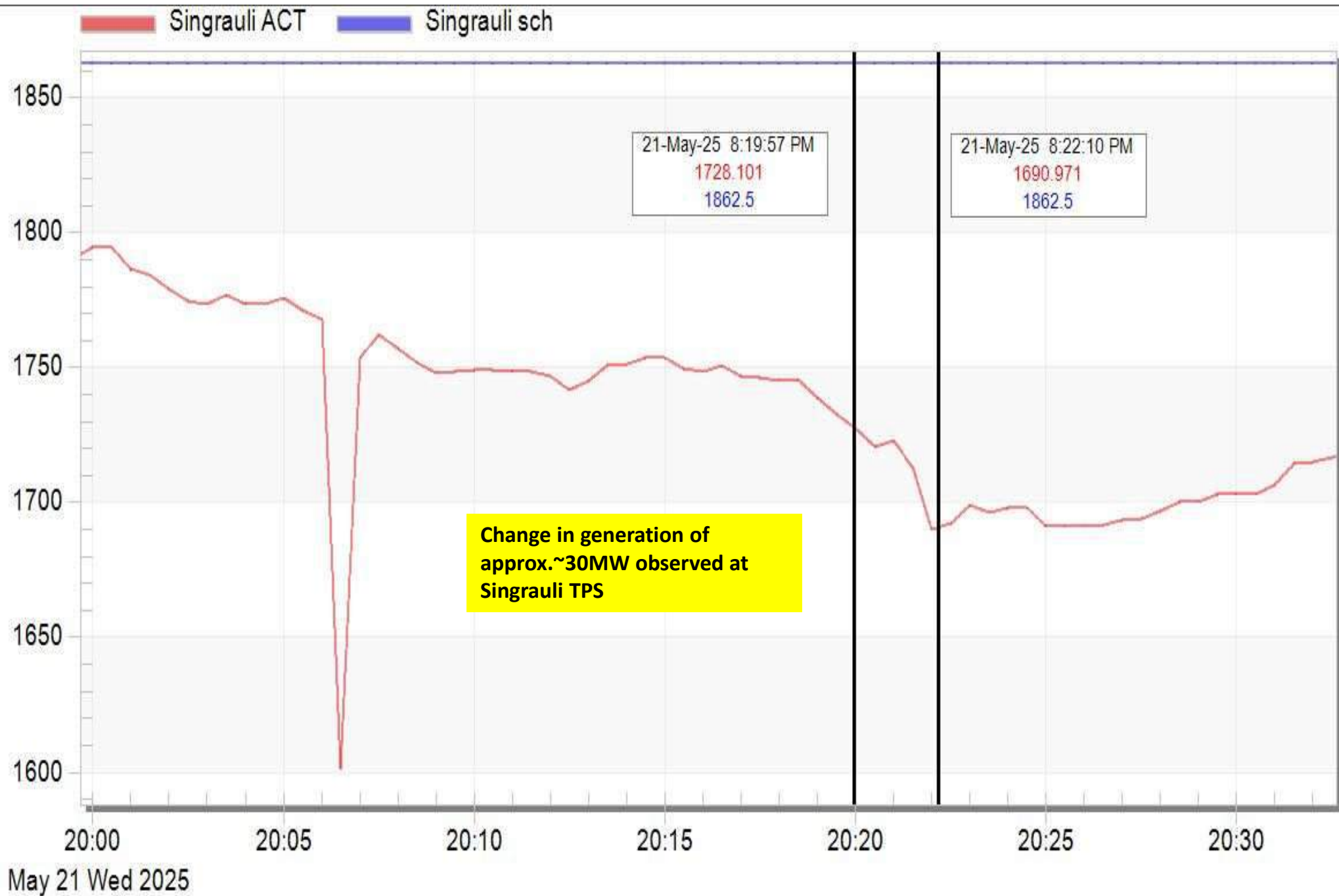
Rihand (NTPC) Generation during the event

New Graph

- !COMPANIES!PGCIL!NRLDC_PG!PLIRIHN1_NT!P.MvMoment
- !COMPANIES!PGCIL!NRLDC_PG!PLIRIHN2_NT!P.MvMoment
- !COMPANIES!PGCIL!NRLDC_PG!PLIRIHN3_NT!P.MvMoment



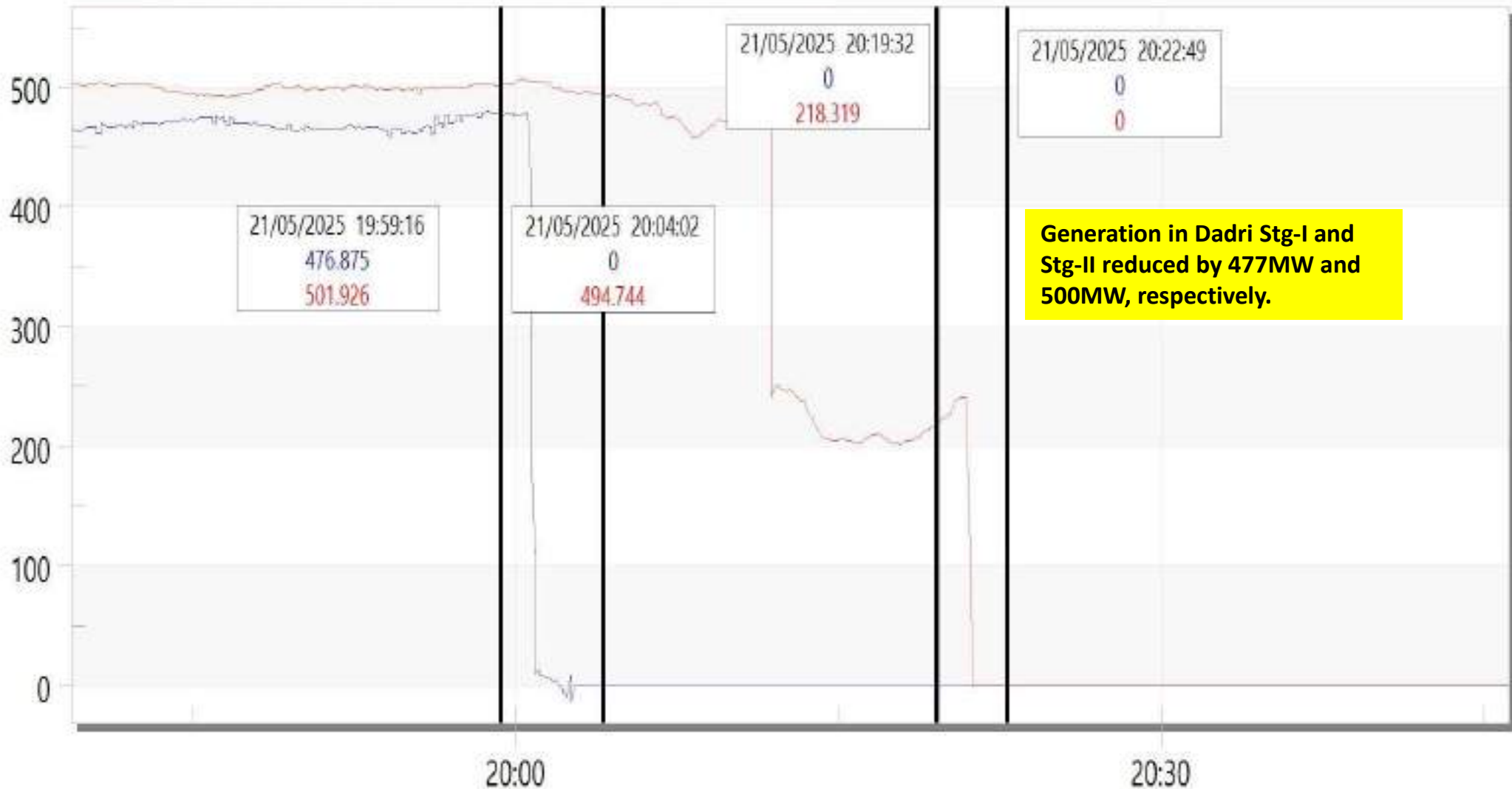
Singrauli (NTPC) Generation during the event



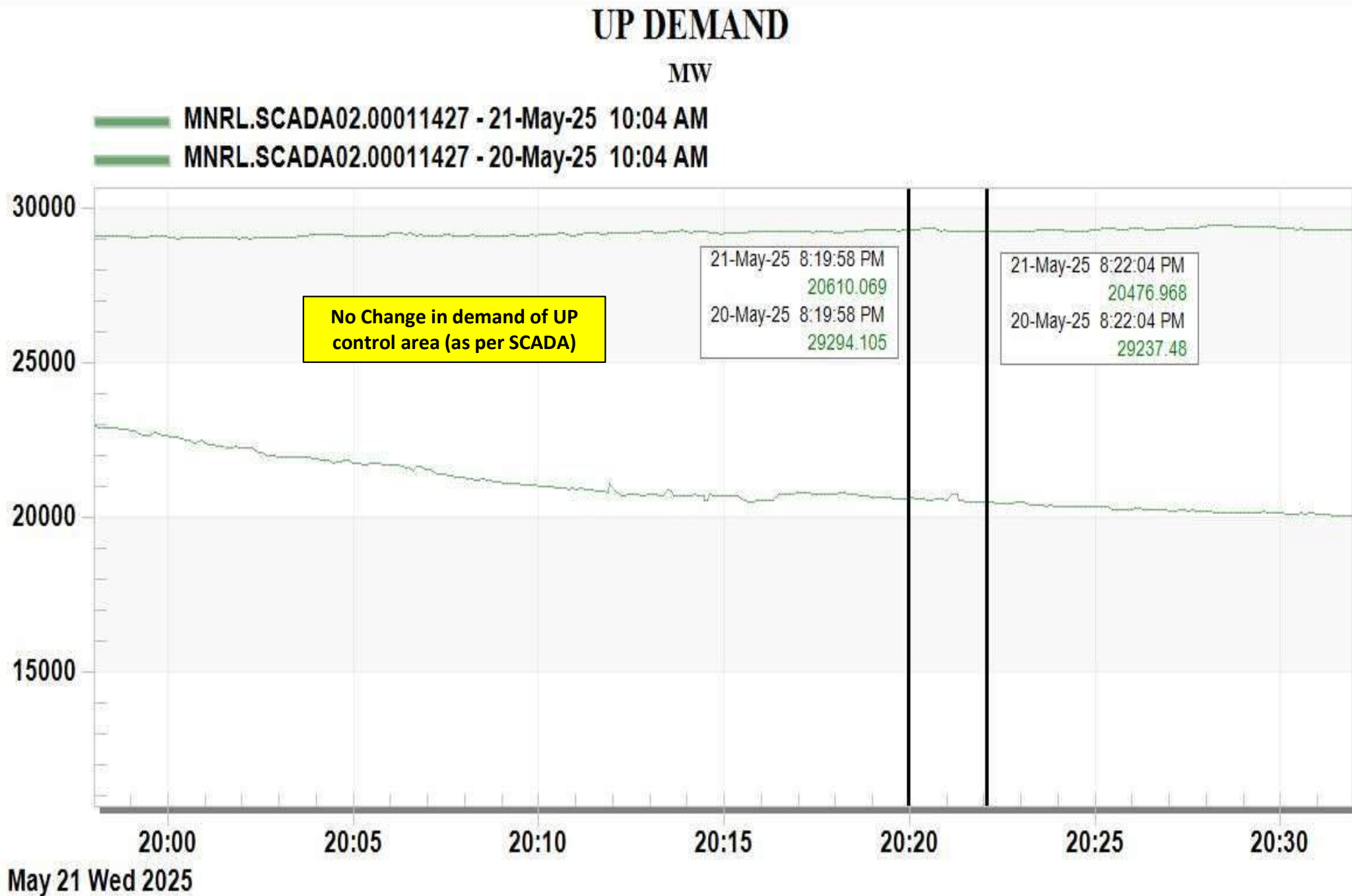
Dadri (NTPC) Generation during the event

Dadri Thermal

!COMPANIES!PGCIL!NRLDC_PG!PL!D_THM_1!P.MvMoment
!COMPANIES!PGCIL!NRLDC_PG!PL!D_THM_2!P.MvMoment



Uttar Pradesh Demand during the event



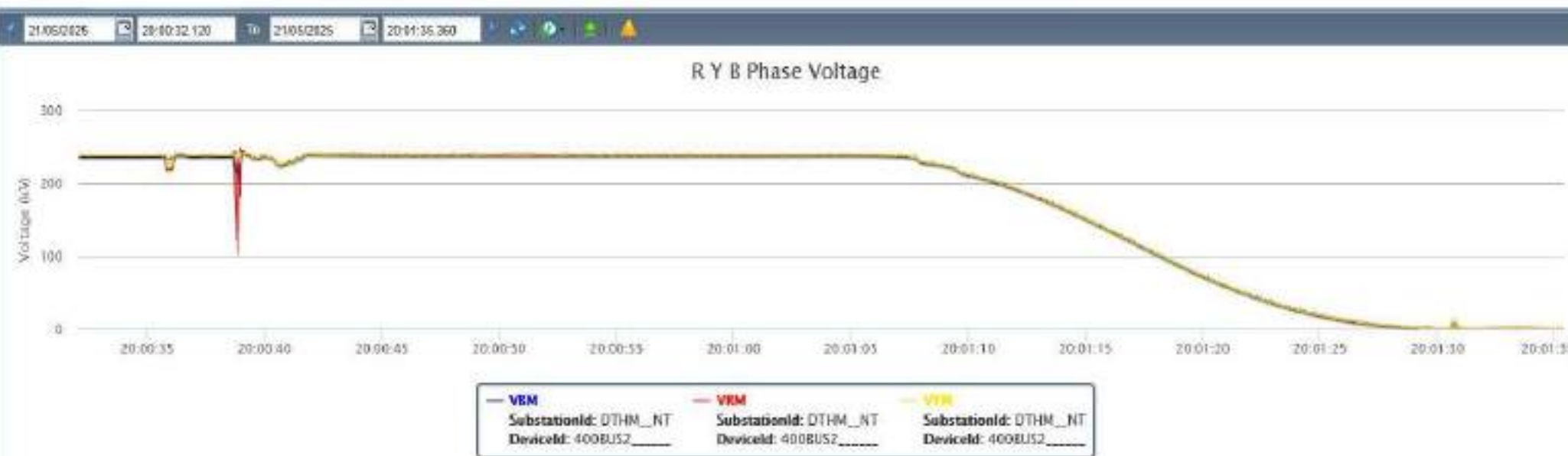
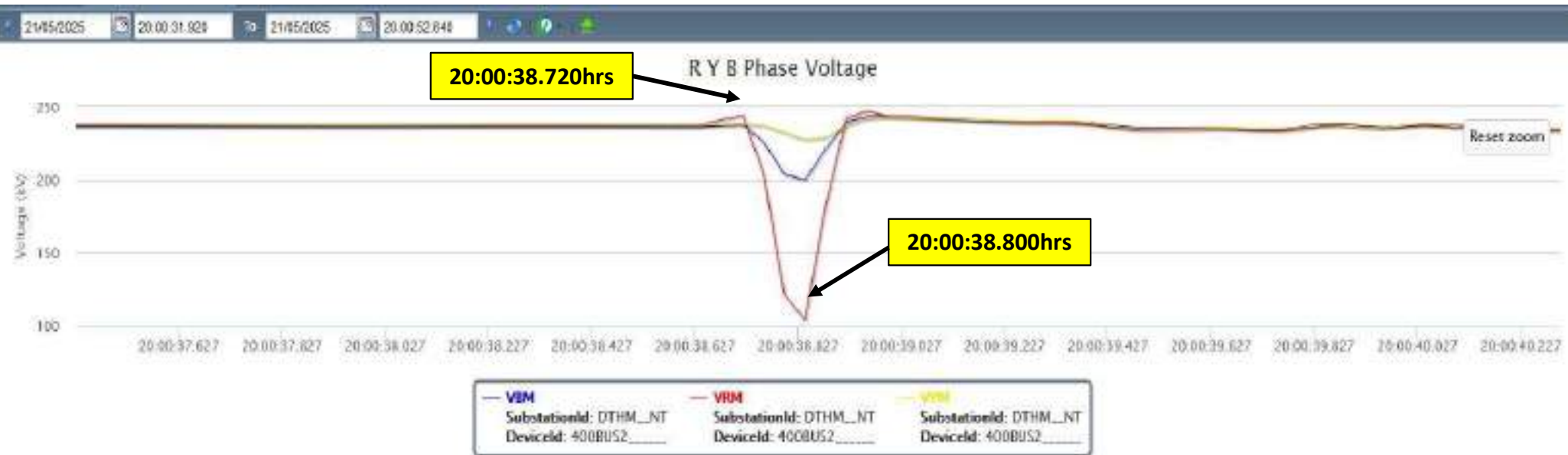
PMU Plot of frequency at Singrauli(NTPC)

20:20 hrs/21-May-25



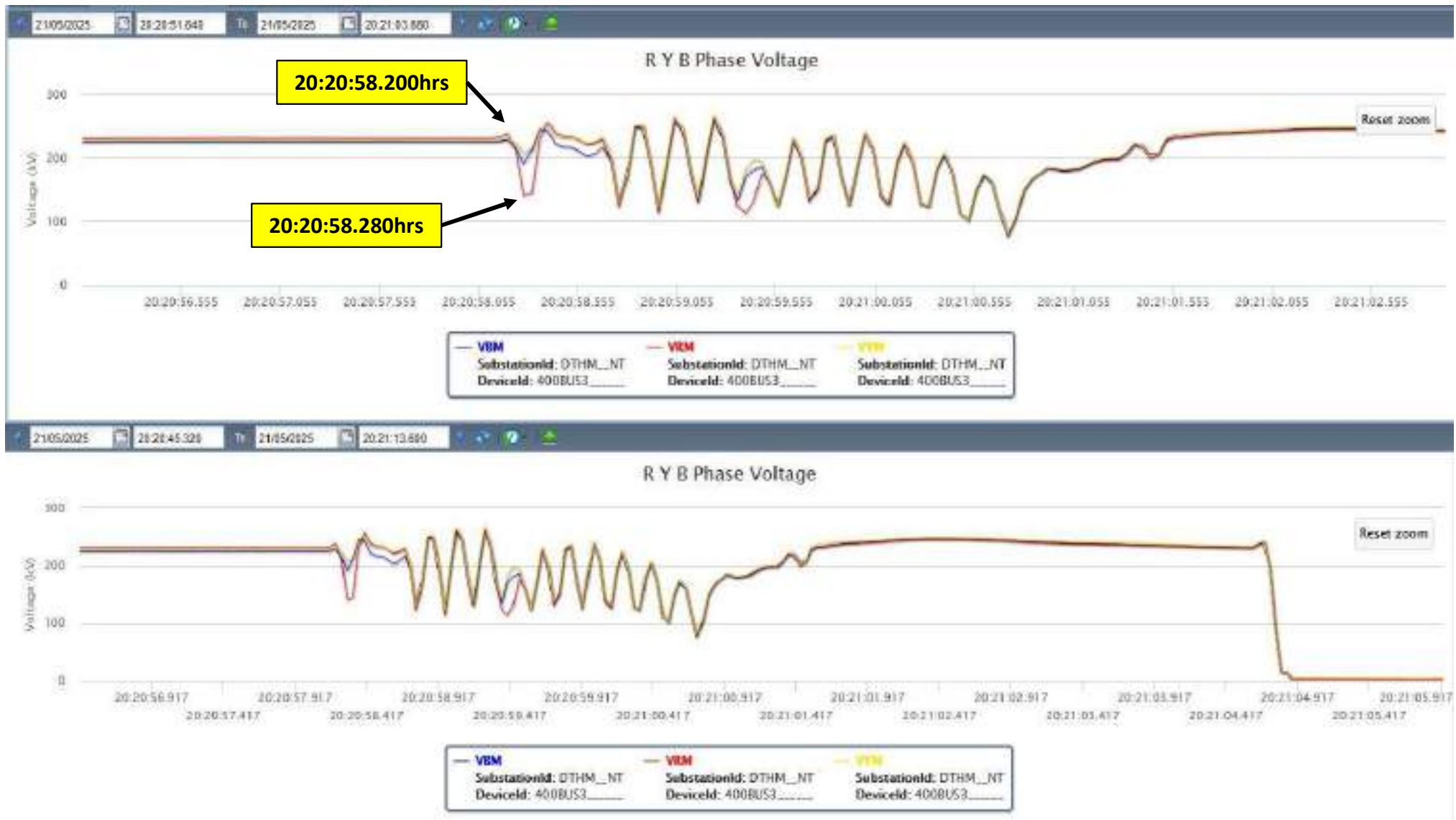
PMU Plot of phase voltage magnitude at Dadri TPS(NTPC)

20:00 hrs/21-May-25



PMU Plot of phase voltage magnitude at Dadri TPS(NTPC)

20:21 hrs/21-May-25



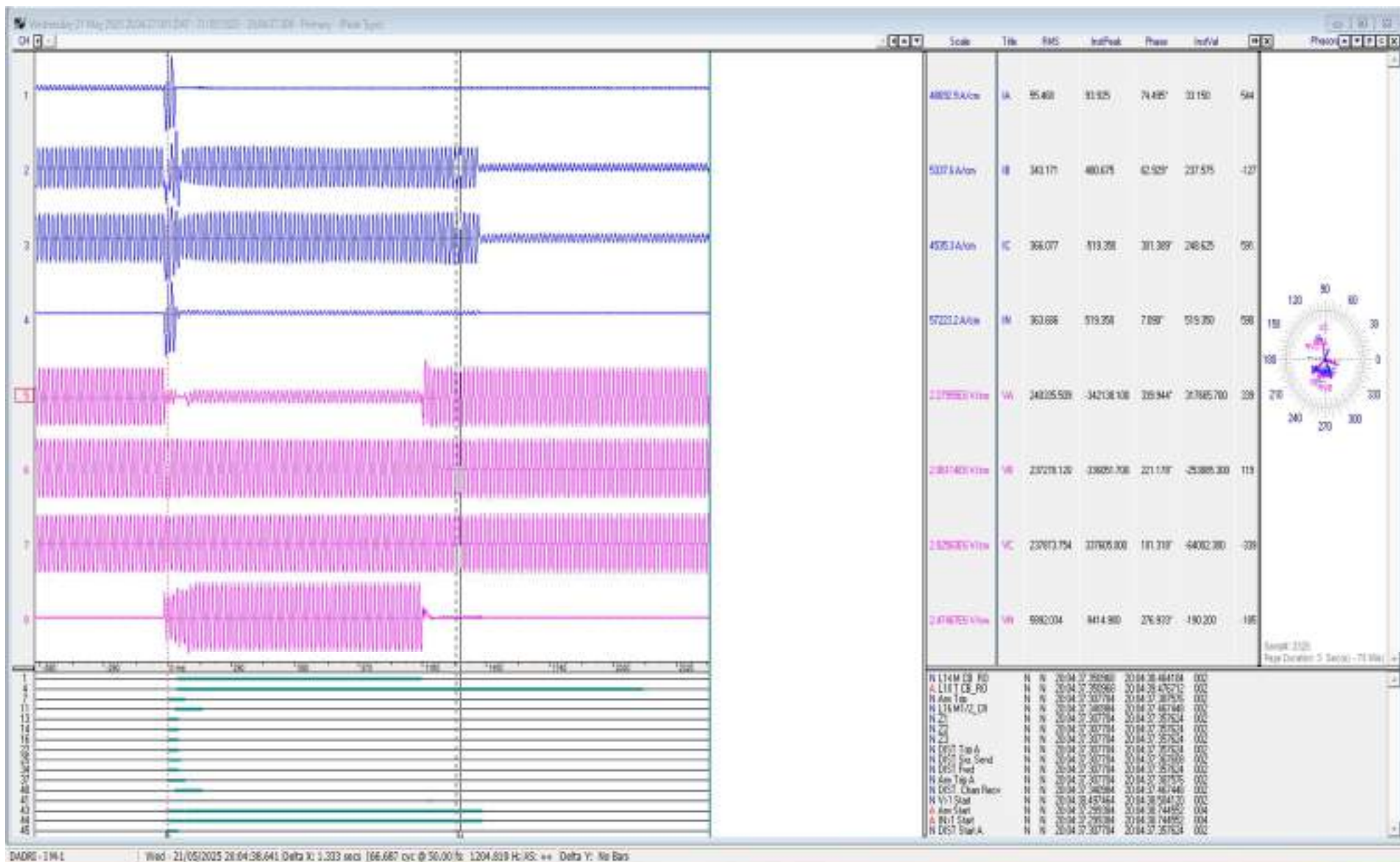
PMU Plot of phase voltage magnitude at Singrauli(NTPC)

20:20 hrs/21-May-25



R Y B Phase Voltages Angles

DR of 400kV Dadri-Mandola(end) ckt-1



- ✓ R-N fault with successful A/R operation at Mandola end is observed. Line tripped from Dadri end.

DR of 400kV Dadri(end)-Mandola ckt-2

File: 201728.DAT - 21/05/2025 - 20:17:28.184 - Secondary - (Peak Type)

Page: 1

* File Information: *

Station: MANDULA2 Folder mandaula#2_With Reactor
Device: 000329
File Name: C:\USERS\SWYD\DESKTOP\210525\MANDAULA-2\SIEMENS\201728.DAT
File Size: 65546 Bytes
Prefault Time: 21/05/2025 20:17:28.135000
Fault Time: 21/05/2025 20:17:28.184000
Save Time: 05-22-2025 00:48:30
Process Time: 05-29-2025 15:49:36
Start Date & Time: 21/05/2025 20:17:28.135000
End Date & Time: 21/05/2025 20:17:28.525000
File Duration: 390 Mils(s)
Sampling Frequency: 1000.000000, 1000.000 Microsecond Rate
Line Frequency: 50.000000

* Maximum/Minimum Analog Summary: *

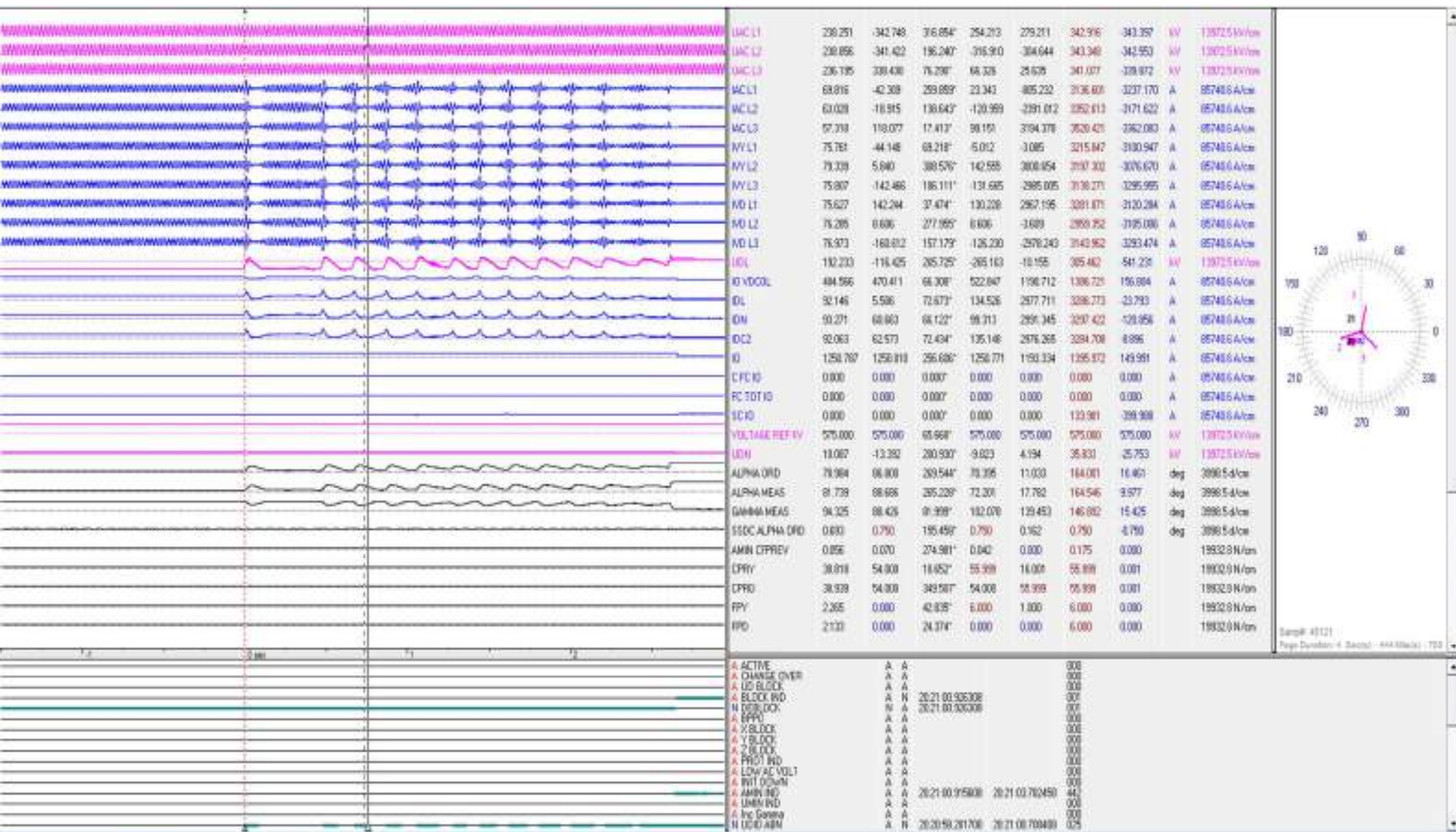
> Max-Inst	Min-Inst	Max-RMS	Min-RMS	One-Bit	Inst-Diff	RMS-Diff	pUnits	Description
0.834	-1.332	0.619	0.256	0.0046	0.498	0.364	A	1-IL1 1
0.862	-0.917	0.656	0.226	0.0046	0.055	0.430	A	2-IL2 2
0.977	-0.940	0.701	0.221	0.0046	0.037	0.480	A	3-IL3 3
103.095	-101.991	72.144	21.028	0.0094	1.104	51.117	V	4-uL1 5
104.632	-105.491	77.989	26.210	0.0094	0.858	51.779	V	5-uL2 6
106.689	-104.680	90.538	12.191	0.0094	2.009	78.347	V	6-uL3 7

* Events/Sensors Activity Summary: *

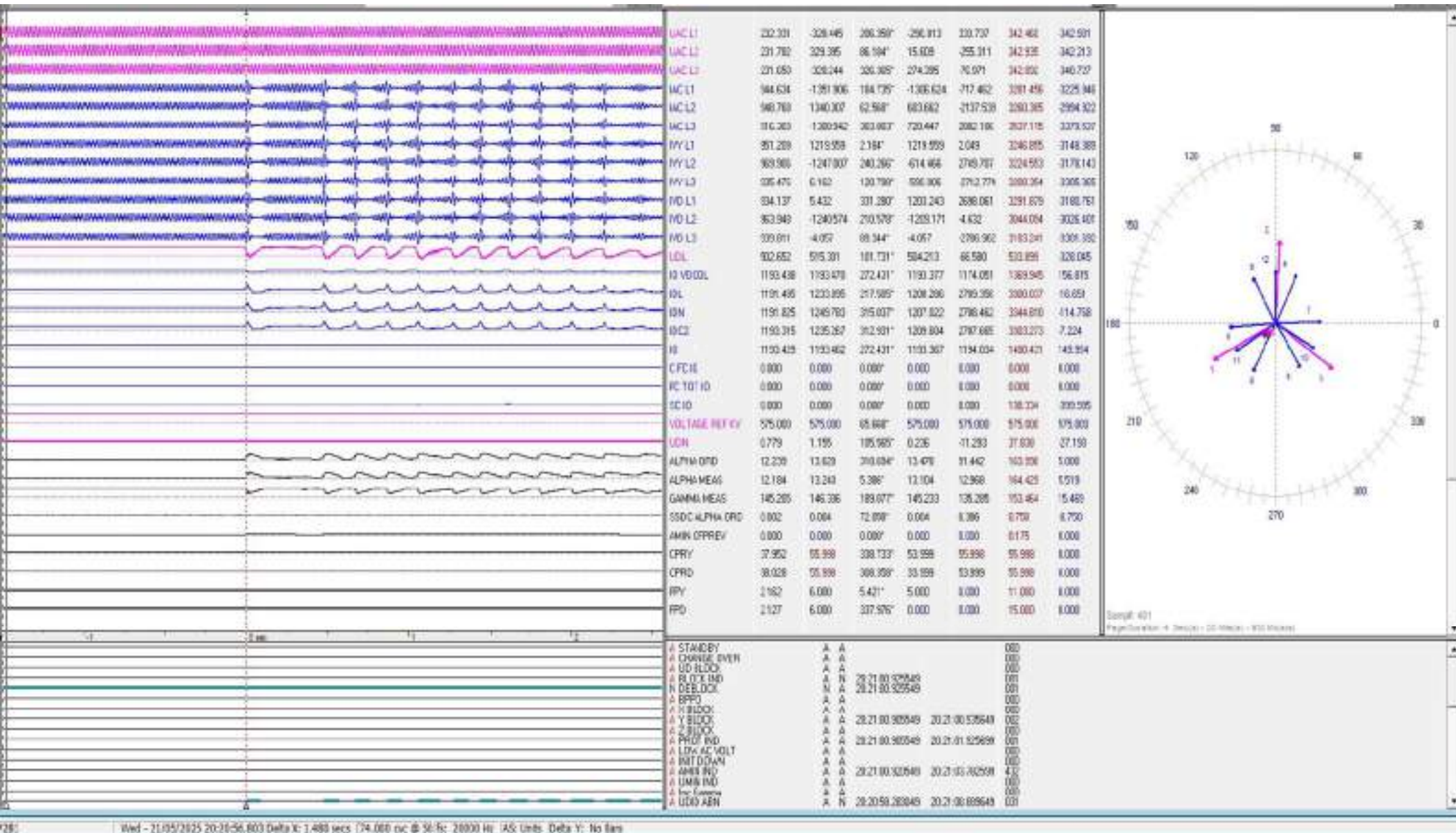
>Fst	Lst	Fst-Change	Lst-Change	Changes	Description
N	N	20:17:28.184000	20:17:28.424000	004	26-Relay PICKUP 501
N	N	20:17:28.184000	20:17:28.424000	004	27-Relay PICKUP L1 503
N	N	20:17:28.184000	20:17:28.424000	004	28-Relay PICKUP L2 504
N	N	20:17:28.204000	20:17:28.424000	004	29-Relay PICKUP L3 505
A	A	XX:XX:XX.XXXXXX	XX:XX:XX.XXXXXX	000	40-Pow. Swing L1 4167
A	A	XX:XX:XX.XXXXXX	XX:XX:XX.XXXXXX	000	41-Pow. Swing L2 4168
A	A	XX:XX:XX.XXXXXX	XX:XX:XX.XXXXXX	000	42-Pow. Swing L3 4169
A	A	XX:XX:XX.XXXXXX	XX:XX:XX.XXXXXX	000	57-LINE IS CL 65532

✓ Line tripped from Dadri end only during power swing.

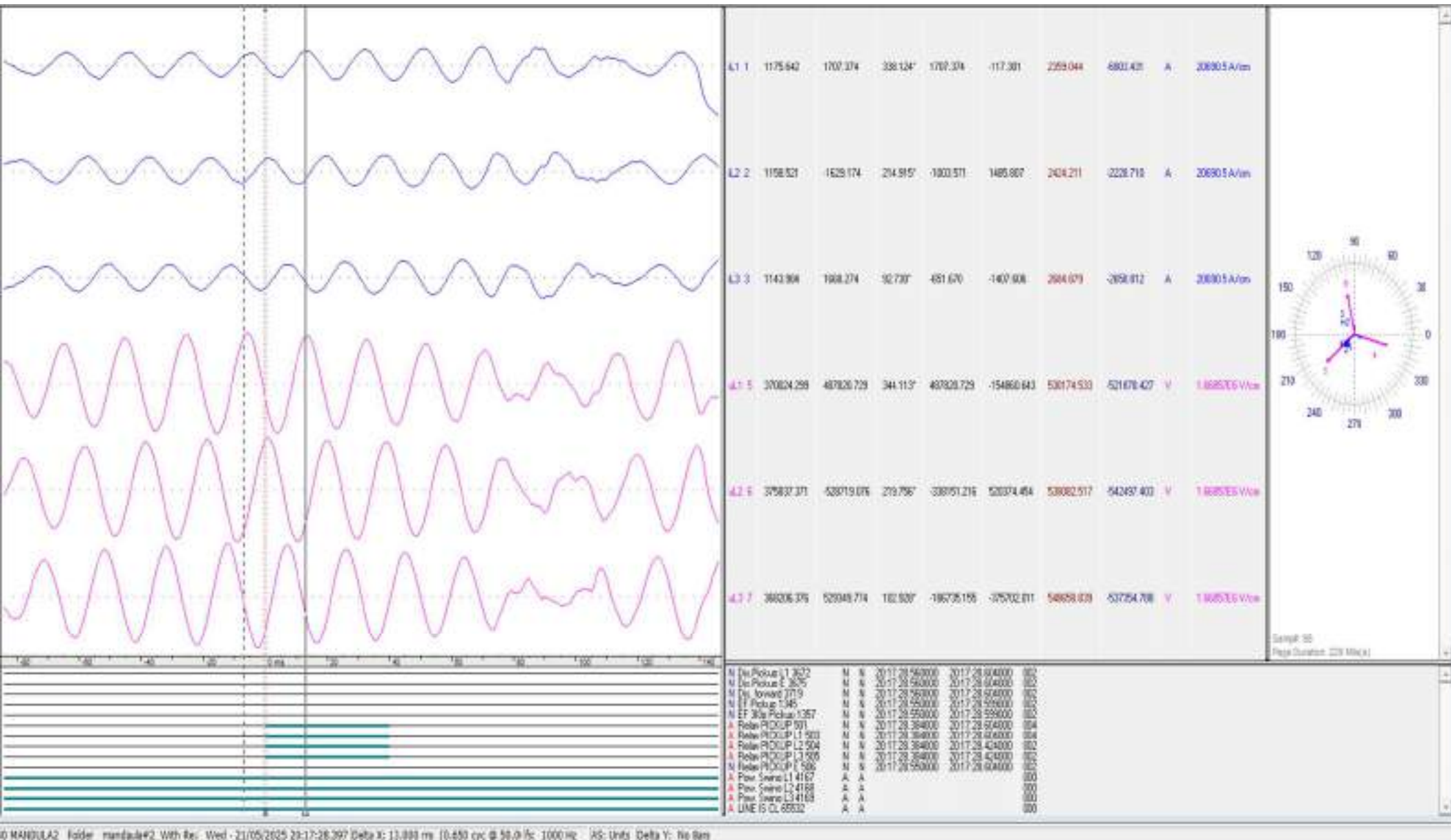
DR of 500 kV HVDC Rihand(end)-Dadri (PG) Ckt-1



DR of 500 kV HVDC Rihand(end)-Dadri (PG) Ckt-2



DR of 400KV Mandola(end)-Dadri (PG) Ckt-2



✓ Power Swing Detected.

SCADA SOE

Time	Station Name	Voltage(KV)	Element Name	Element Type	Element Status	Remarks
20:00:38,755	HARSH VIHAR	400kV	F_02(D_THM-1)	Circuit Breaker	Open	Tripping of 400KV Main CB of 400 KV Dadri(NT)-Loni Harsh Vihar(DV) (NT) Ckt-1 at Harshvihar
20:06:18,378	HARSH VIHAR	400kV	F_06(D_THM-1)	Circuit Breaker	Open	
20:12:30,563	DADRI_HVDC	400	Z12	Circuit Breaker	Open	Tripping of 400KV Filters at Dadri_HVDC
20:21:00,980	DADRI_HVDC	400	12RHNHV2	Circuit Breaker	Open	
20:21:00,980	DADRI_HVDC	400	13TIE	Circuit Breaker	Open	
20:21:01,087	DADRI_HVDC	400	22CPBK2	Circuit Breaker	Open	
20:21:01,087	DADRI_HVDC	400	Z22	Circuit Breaker	Open	Tripping of 400KV Filters at Dadri_HVDC
20:21:01,087	DADRI_HVDC	400	Z21	Circuit Breaker	Open	Tripping of 400KV Filters at Dadri_HVDC
20:21:01,190	DADRI_HVDC	400	23TIE	Circuit Breaker	Open	
20:21:01,213	DADRI_HVDC	400	11CPBK1	Circuit Breaker	Open	Tripping of 400KV main CB of 500 kV HVDC Rihand-Dadri (PG) Ckt-1 at Dadri
20:21:01,213	DADRI_HVDC	400	Z11	Circuit Breaker	Open	Tripping of 400KV Filters at Dadri_HVDC
20:21:01,241	DADRI_HVDC	400	31CPBK3	Circuit Breaker	Open	Tripping of 400KV main CB of 500 kV HVDC Rihand-Dadri (PG) Ckt-2 at Dadri
20:21:01,241	DADRI_HVDC	400	Z32	Circuit Breaker	Open	Tripping of 400KV Filters at Dadri_HVDC
20:21:01,241	DADRI_HVDC	400	33TIE	Circuit Breaker	Open	
20:21:01,241	DADRI_HVDC	400	Z31	Circuit Breaker	Open	Tripping of 400KV Filters at Dadri_HVDC
20:21:01,256	RIHND_HVDC	400kV	11CPBK1	Circuit Breaker	Open	Tripping of 400KV main CB of 500 kV HVDC Rihand-Dadri (PG) Ckt-1 at Rihand
20:21:01,256	RIHND_HVDC	400kV	Z12	Circuit Breaker	Open	Tripping of 400KV Filters at Rihand_HVDC
20:21:01,282	RIHND_HVDC	400kV	23TIE	Circuit Breaker	Open	
20:21:01,303	RIHND_HVDC	400kV	31CPBK3	Circuit Breaker	Open	Tripping of 400KV main CB of 500 kV HVDC Rihand-Dadri (PG) Ckt-2 at Rihand
20:21:01,303	RIHND_HVDC	400kV	Z32	Circuit Breaker	Open	Tripping of 400KV Filters at Rihand_HVDC
20:21:01,303	RIHND_HVDC	400kV	Z31	Circuit Breaker	Open	Tripping of 400KV Filters at Rihand_HVDC
20:21:01,303	RIHND_HVDC	400kV	33TIE	Circuit Breaker	Open	

Points for Discussion

- i) Reason of tripping of 490 MW unit-2 at Dadri Stage-II at 20:17 hrs need to be shared.
- ii) DR, EL & tripping report need to be shared from both the ends.
- iii) As per DR of 400kV Dadri-Mandola ckt-1, line tripped at 20:04 hrs from Dadri end only. Line successfully autoreclosed from Mandola end. Details w.r.t. the tripping need to be shared.
- iv) As reported, 400kV Dadri-Mandola ckt-2 tripped during power swing from Dadri end only. DR(.dat/.cfg) file of the tripping need to be shared.
- v) Remedial action taken report to be shared.

PG MAHARANIBAGH 400 kV BUS

MANDOLA-MEERUT CKT 1

MANDOLA-MEERUT CKT 2

MANDOLA-MEERUT CKT 3

MANDOLA-MEERUT CKT 4

MANDOLA-DADRI CKT 1

MANDOLA-DADRI CKT 2

PG MANDOLA 400 kV BUS

DTL MANDOLA 220 kV BUS

WAZIRABAD 1

WAZIRABAD 2

WAZIRABAD 3

NAERLA 1, 2

GOPALPUR 1, 2

GEN -1 & 2

GEN -3 & 4

GEN -5 & 6

GAS PP

NTPC DADRI 400 kV BUS

Gr Noida (UPPCL)

KAITHAL

BALLABGARH

HARSH VIHAR

HVDC POLE-1

HVDC POLE-2

PG MEERUT 220 kV BUS

PG MEERUT 400 kV BUS

MUZAFFARNAGAR

BAREILY 1 (*)

BAREILY 2 (*)

BAGPAT 1

BAGPAT 2

MODIPURAM-1

MODIPURAM-2

SIMBHAWALI

SHATABDINAGAR

GAJRAULA

NEHTAUR

CHARLA

JAGRITI VIHAR

PG MEERUT 765 kV BUS

PG KOTESHWAR 765 kV BUS

To PG BHIWANI

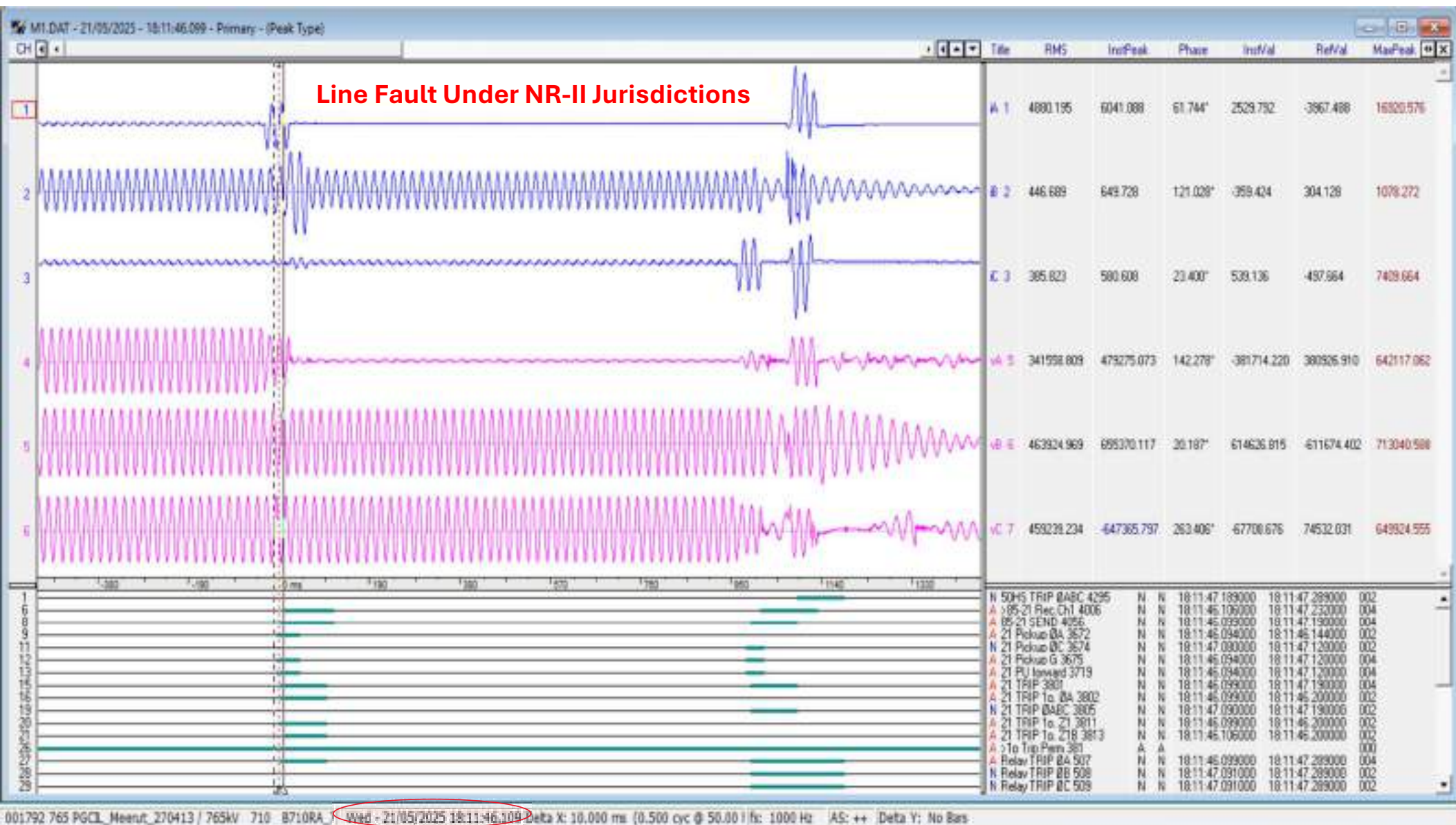
To WUPTCL Gr. Noida

To PG Moga

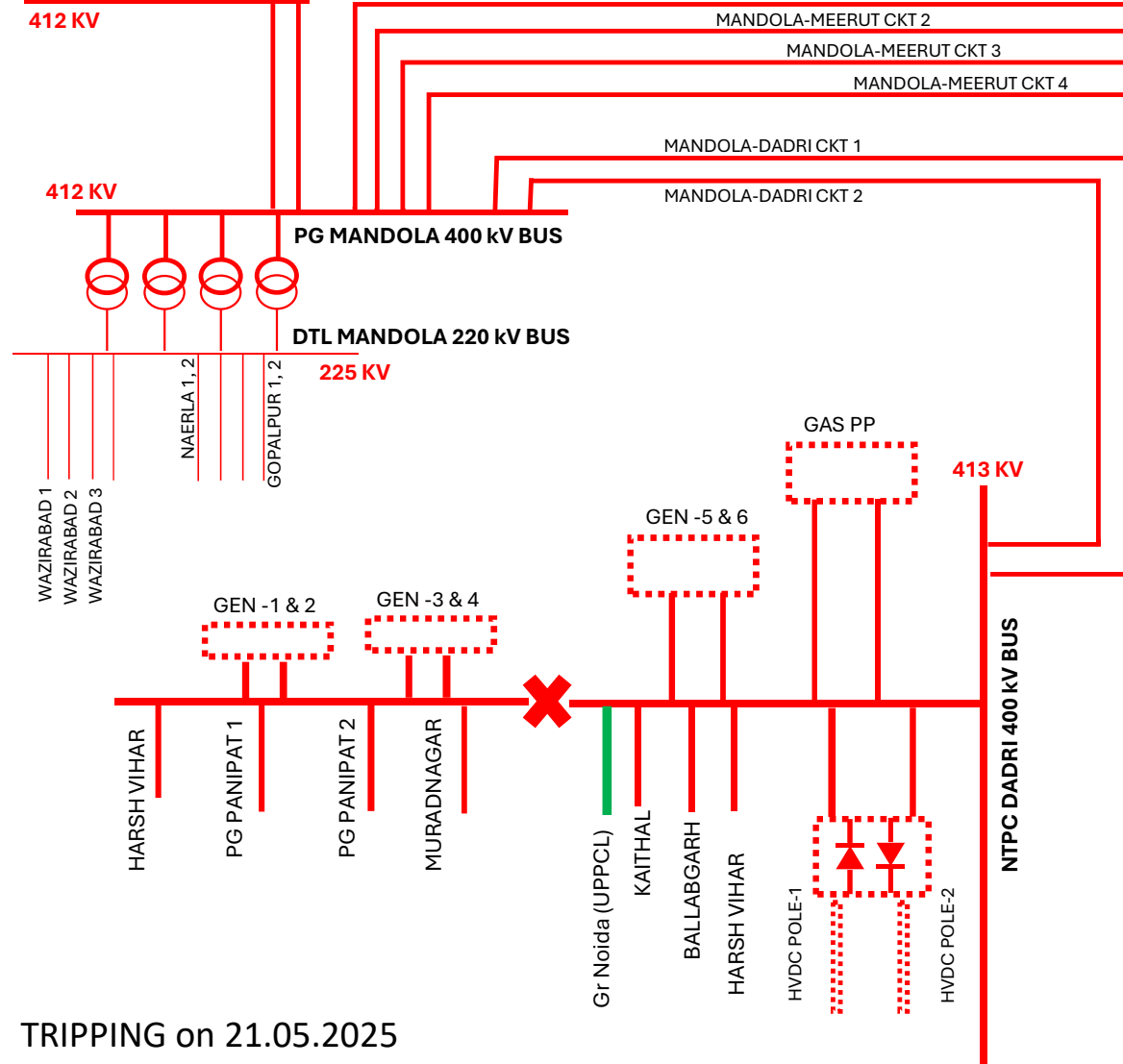
TRIPPING on 21.05.2025

* 400 kV Meerut-Bareilly 400 kV Overcrossing
765 kV Koteswar Meerut Ckt 1 & 2

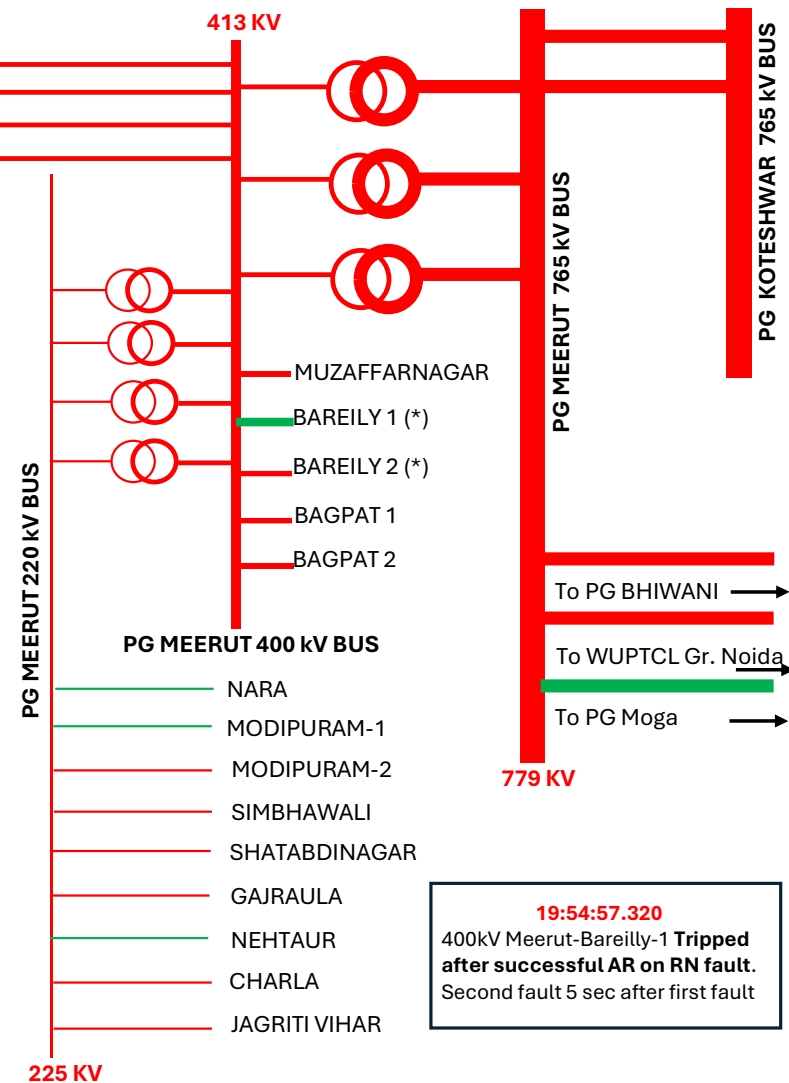




PG MAHARANIBAGH 400 kV BUS



413 KV



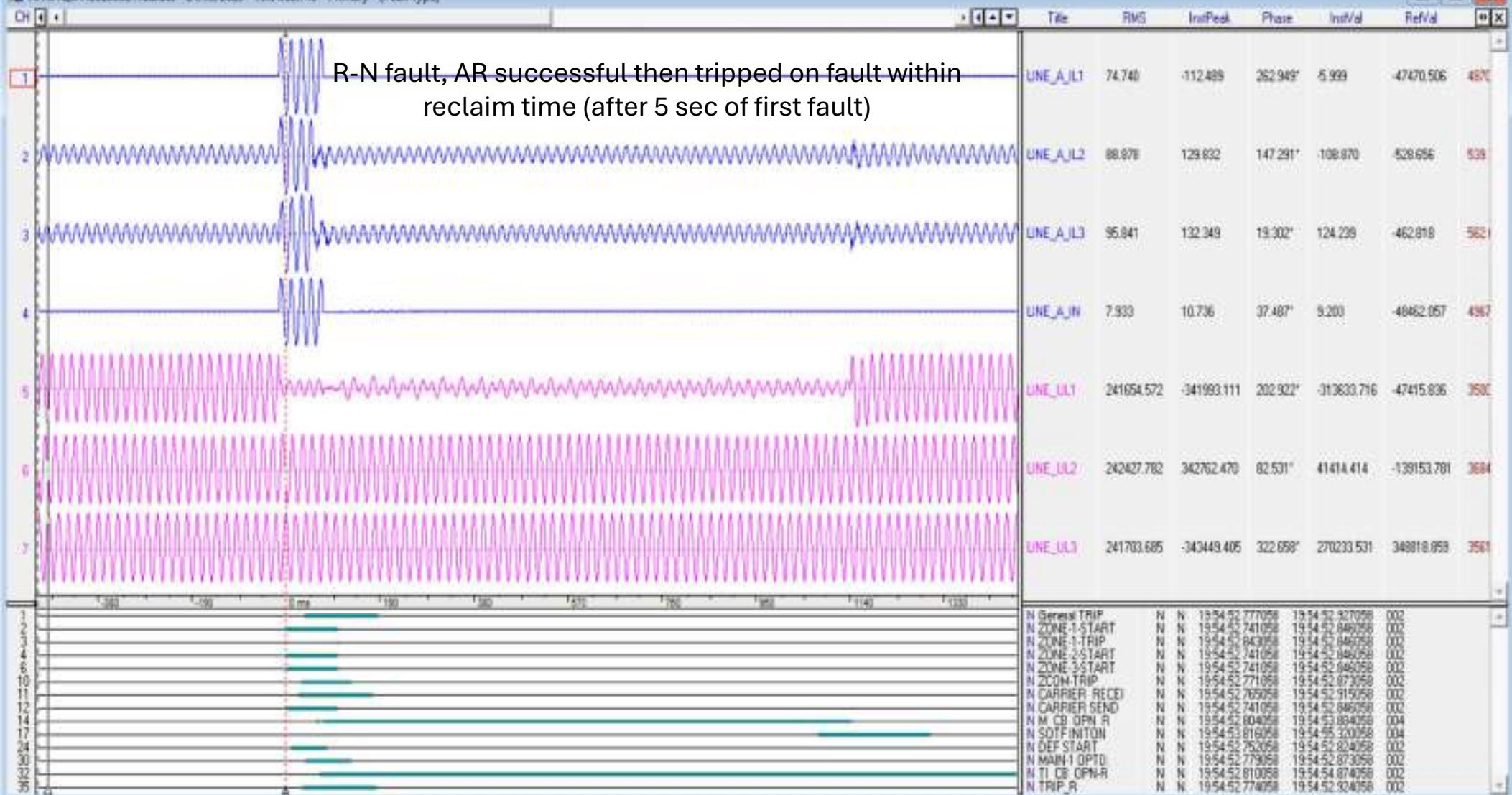
779 KV

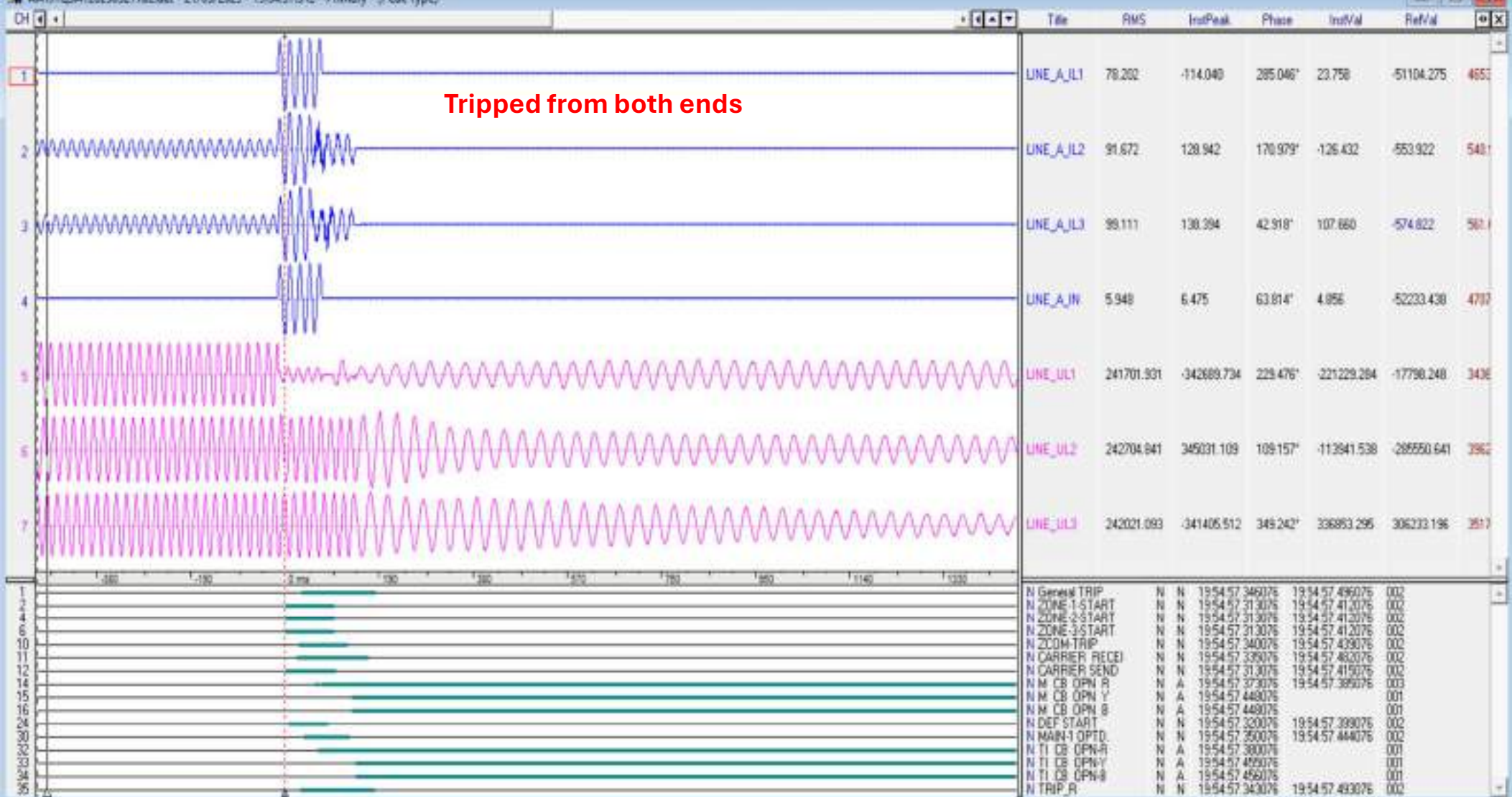
19:54:57.320
400kV Meerut-Bareilly-1 Tripped
after successful AR on RN fault.
Second fault 5 sec after first fault

* 400 kV Meerut-Bareilly 400 kV Overcrossing
765 kV Koteswar Meerut Ckt 1 & 2

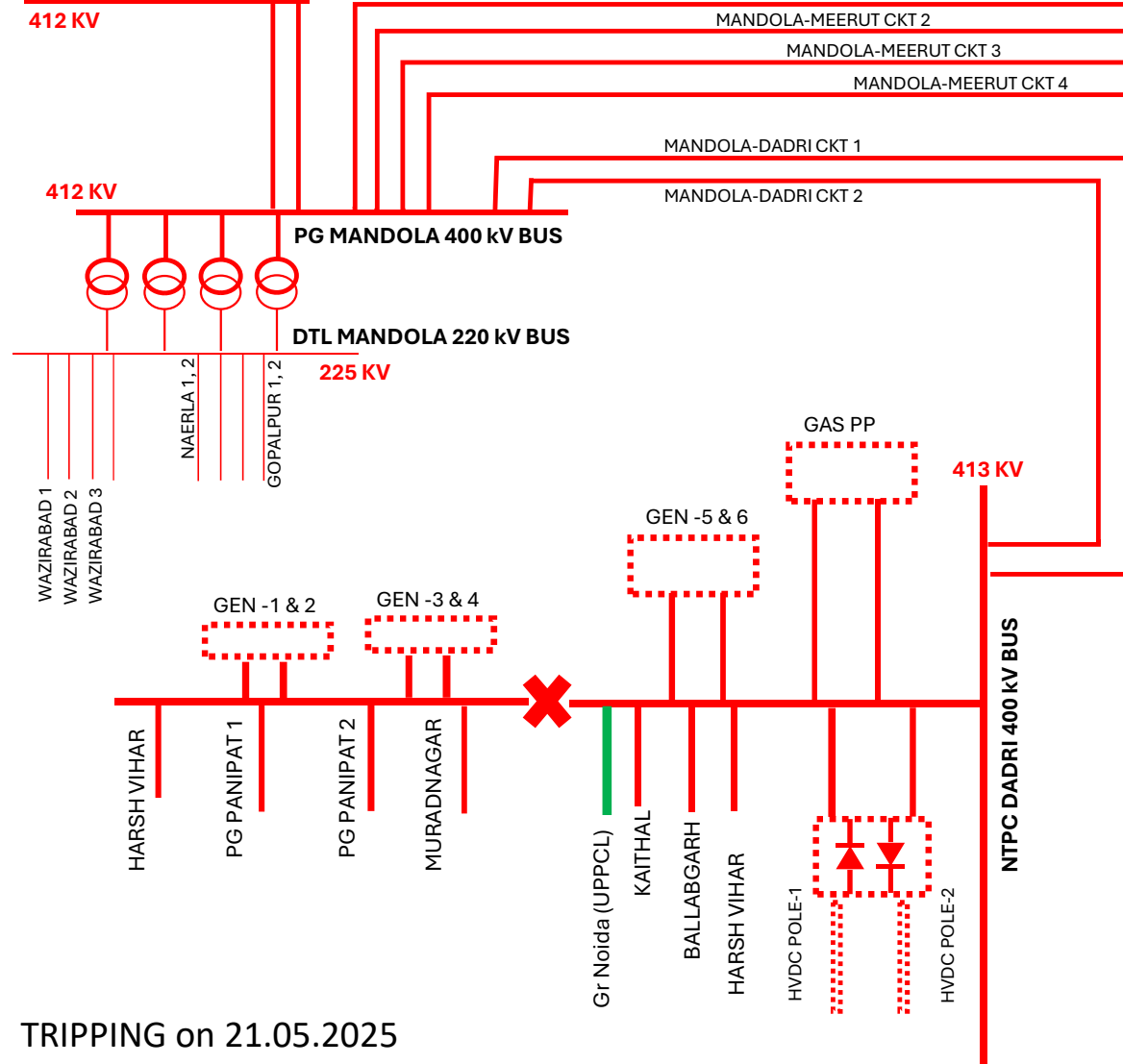


TRIPPING on 21.05.2025

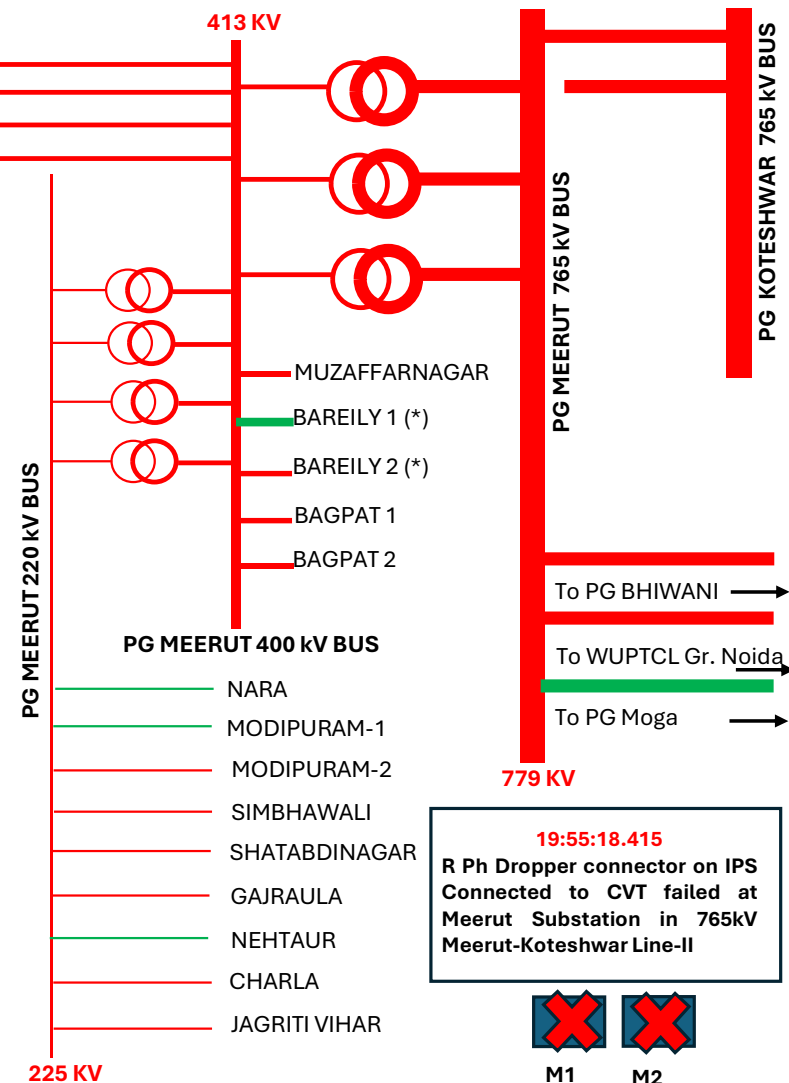




PG MAHARANIBAGH 400 kV BUS



413 KV



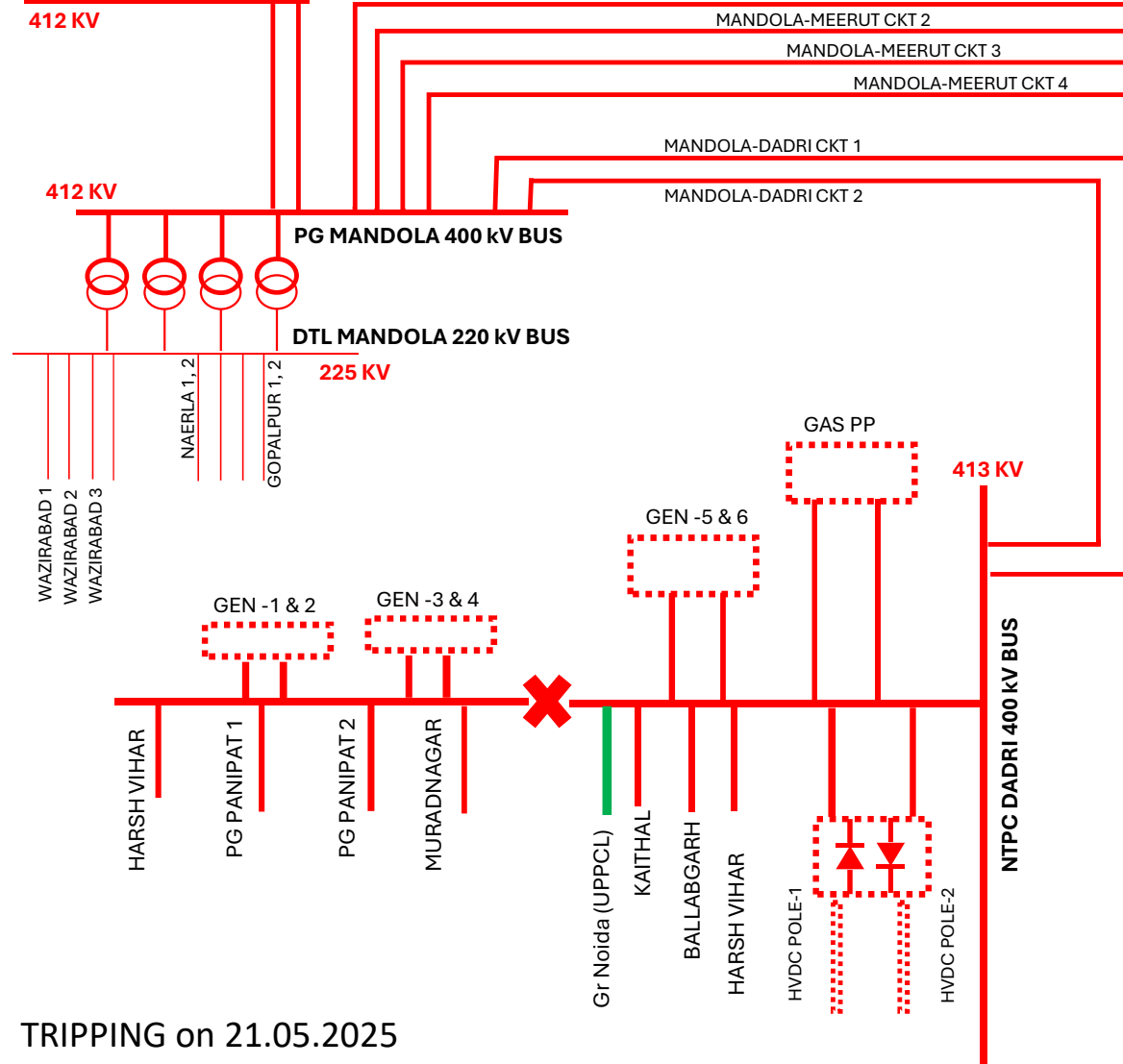
* 400 kV Meerut-Bareilly 400 kV Overcrossing
765 kV Koteshwar Meerut Ckt 1 & 2



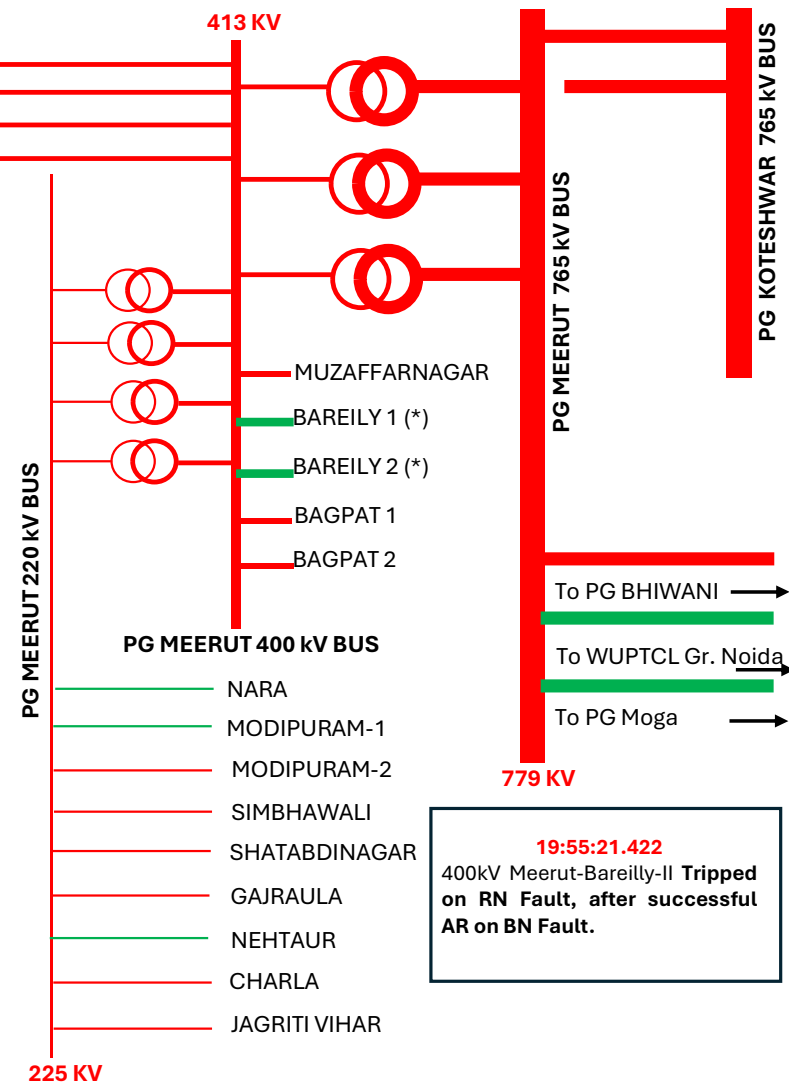
TRIPPING on 21.05.2025



PG MAHARANIBAGH 400 kV BUS



413 KV

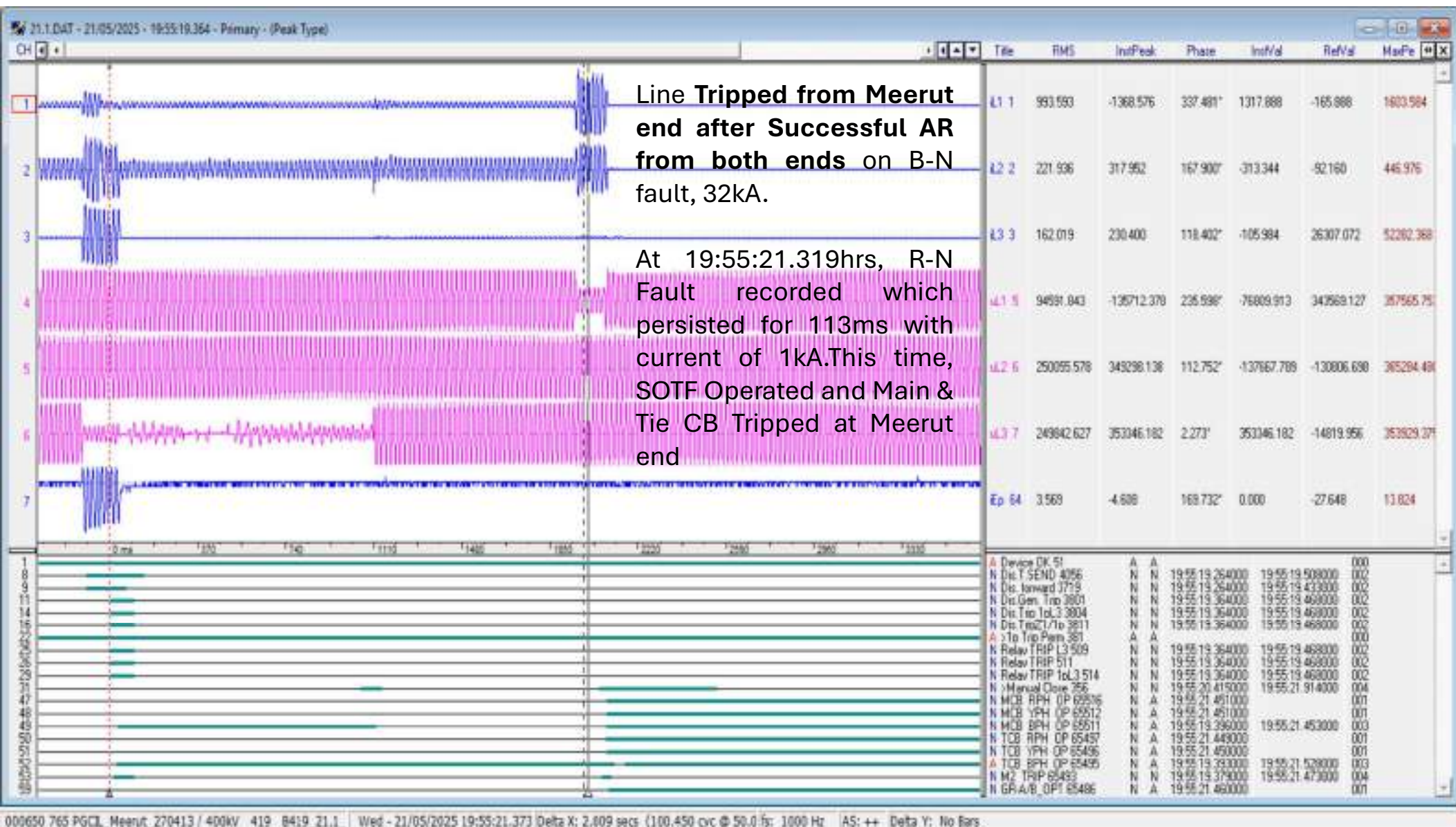


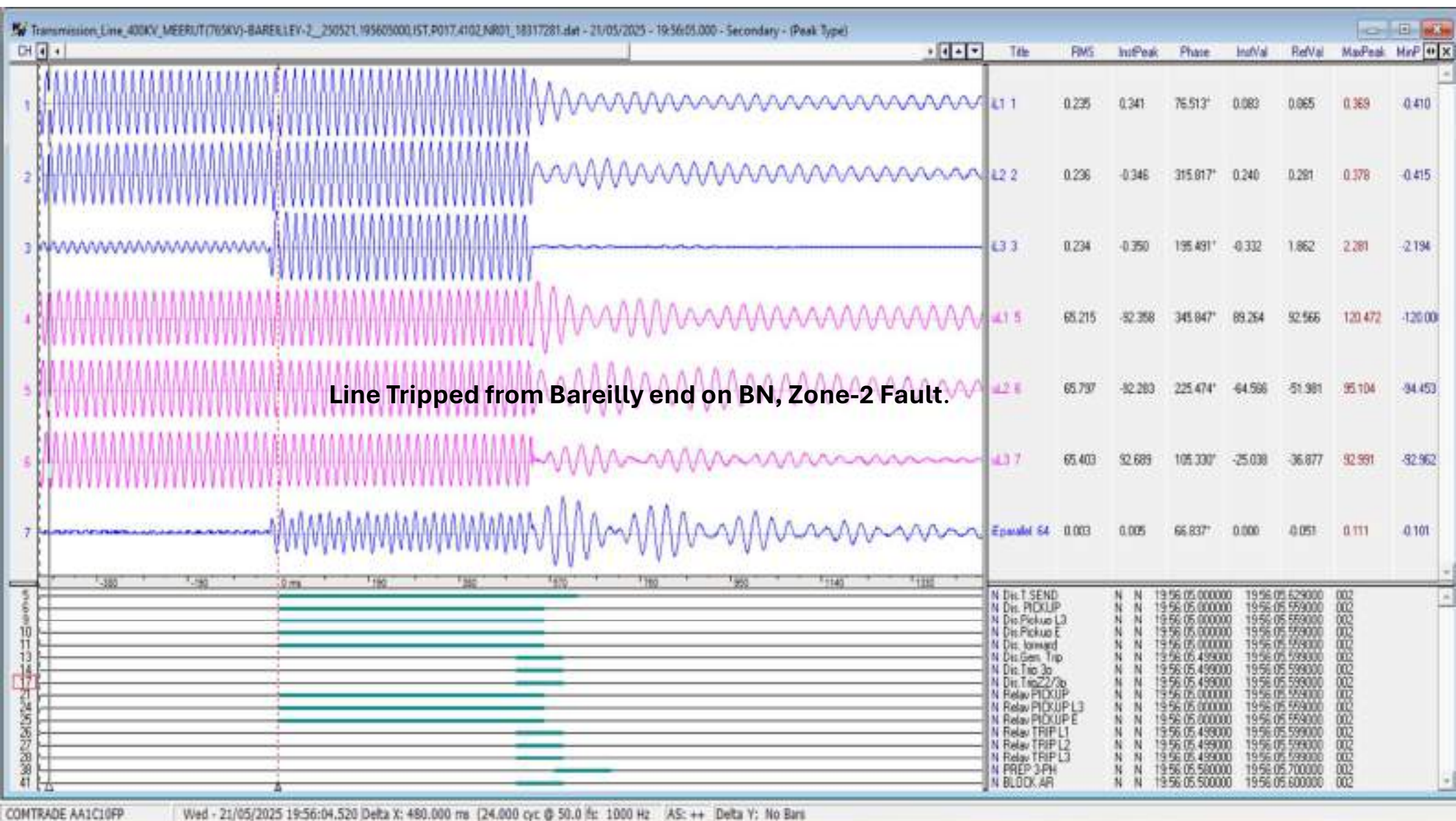
19:55:21.422
400kV Meerut-Bareilly-II Tripped
on RN Fault, after successful
AR on BN Fault.

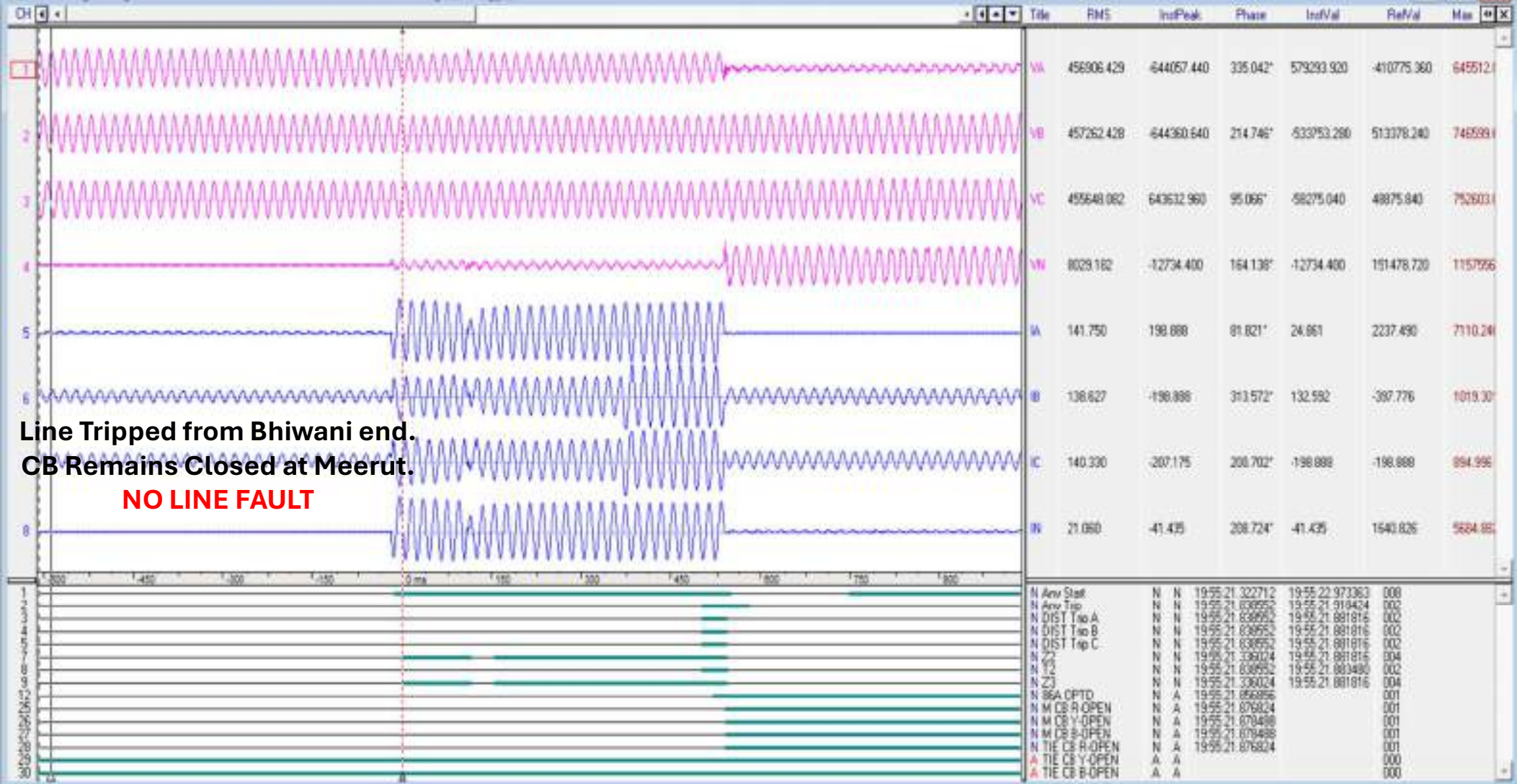
* 400 kV Meerut-Bareilly 400 kV Overcrossing
765 kV Koteswar Meerut Ckt 1 & 2



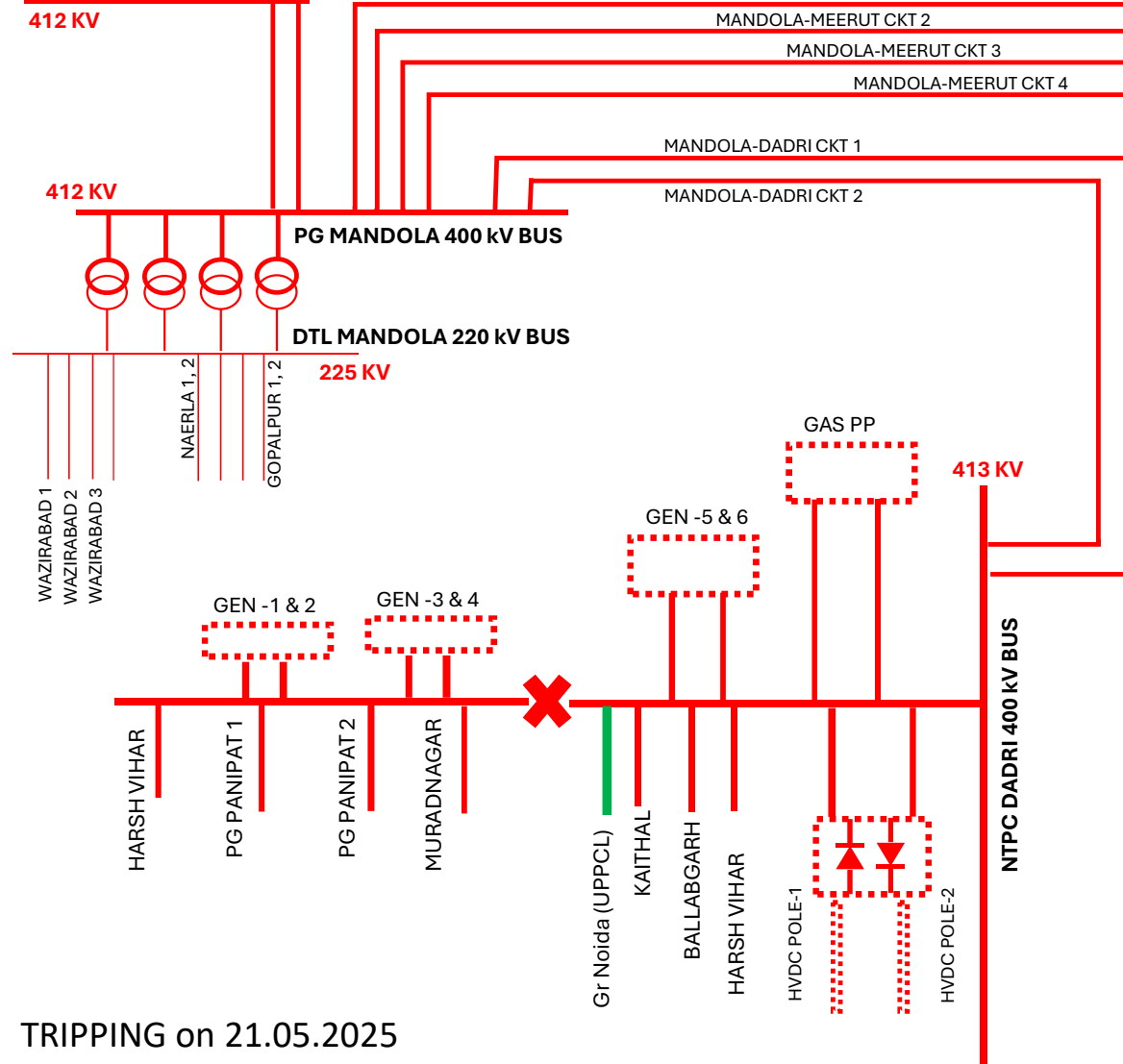
TRIPPING on 21.05.2025



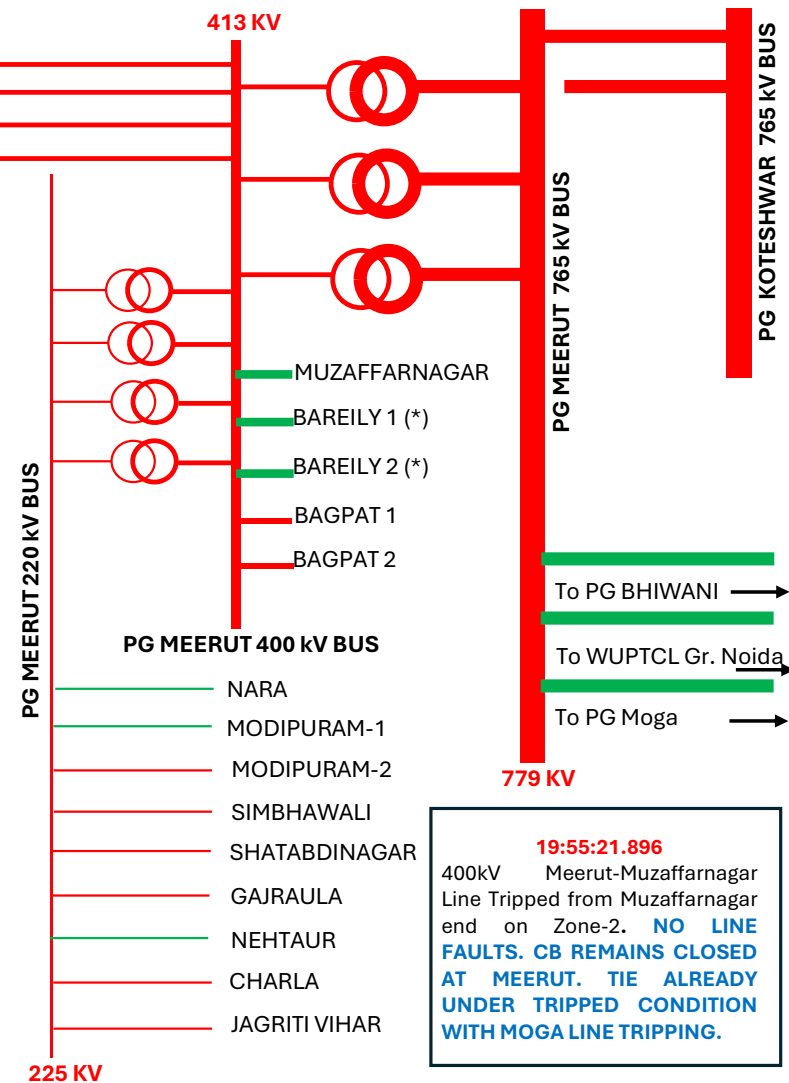




PG MAHARANIBAGH 400 kV BUS



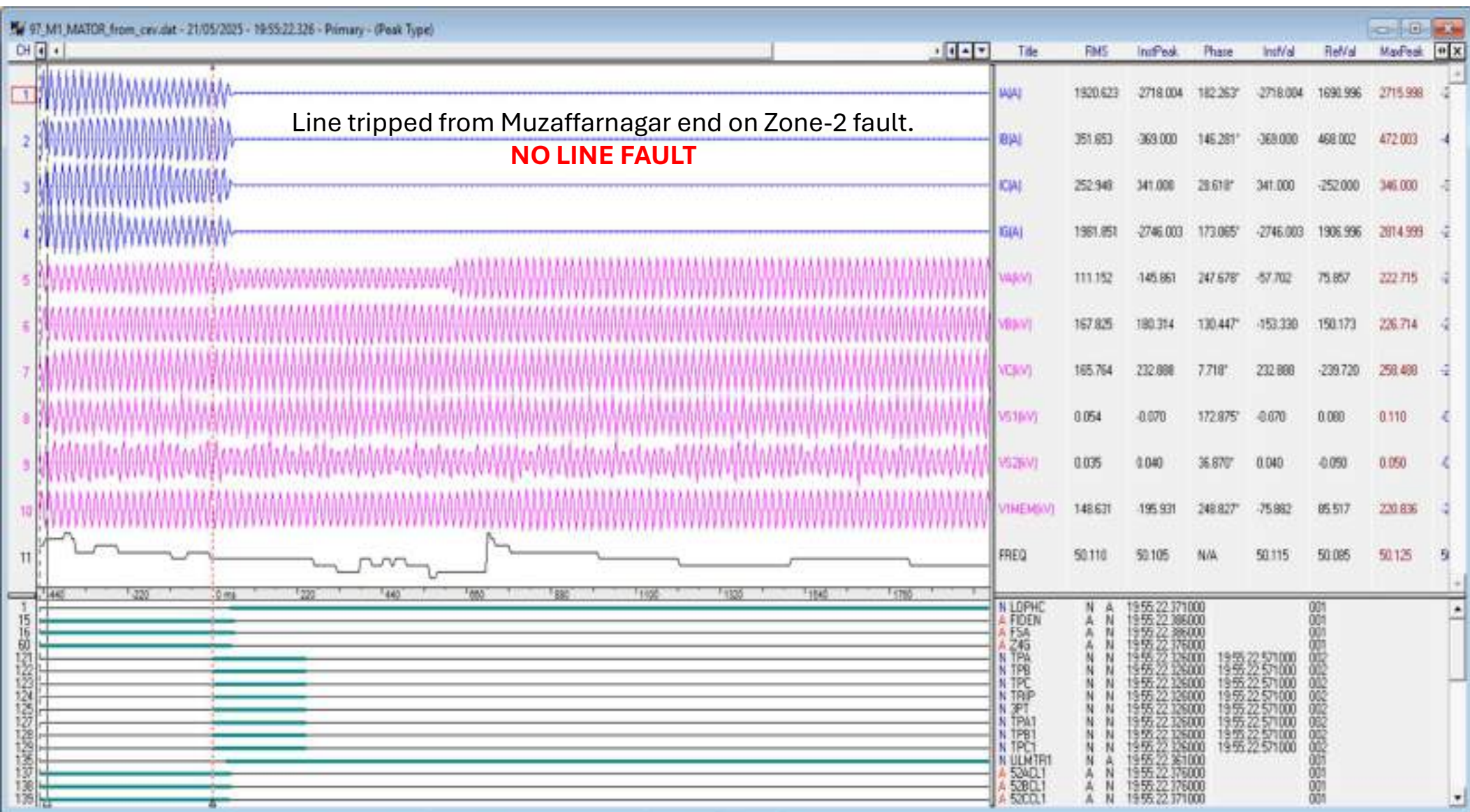
413 KV



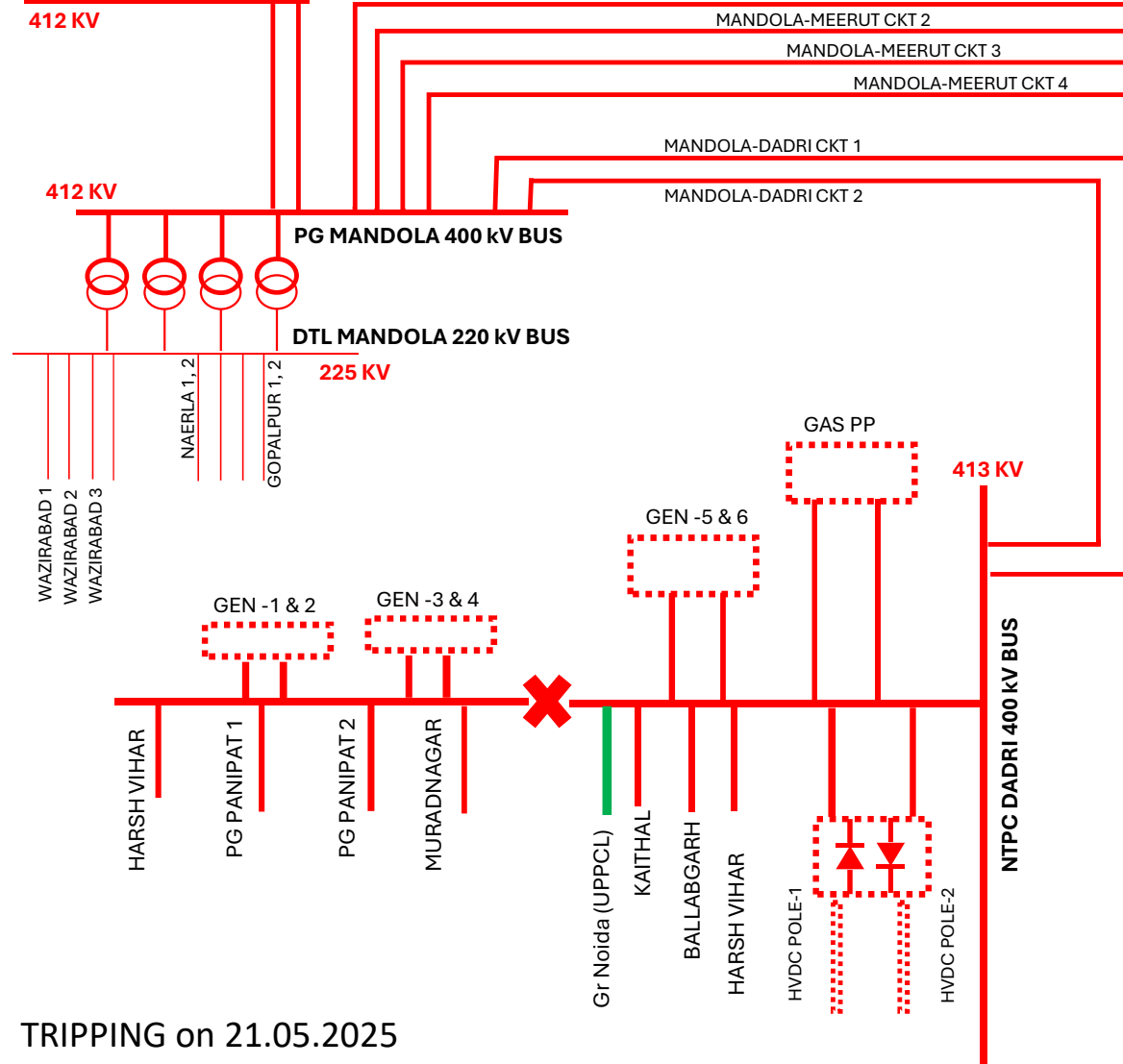
* 400 kV Meerut-Bareilly 400 kV Overcrossing 765 kV Koteswar Meerut Ckt 1 & 2



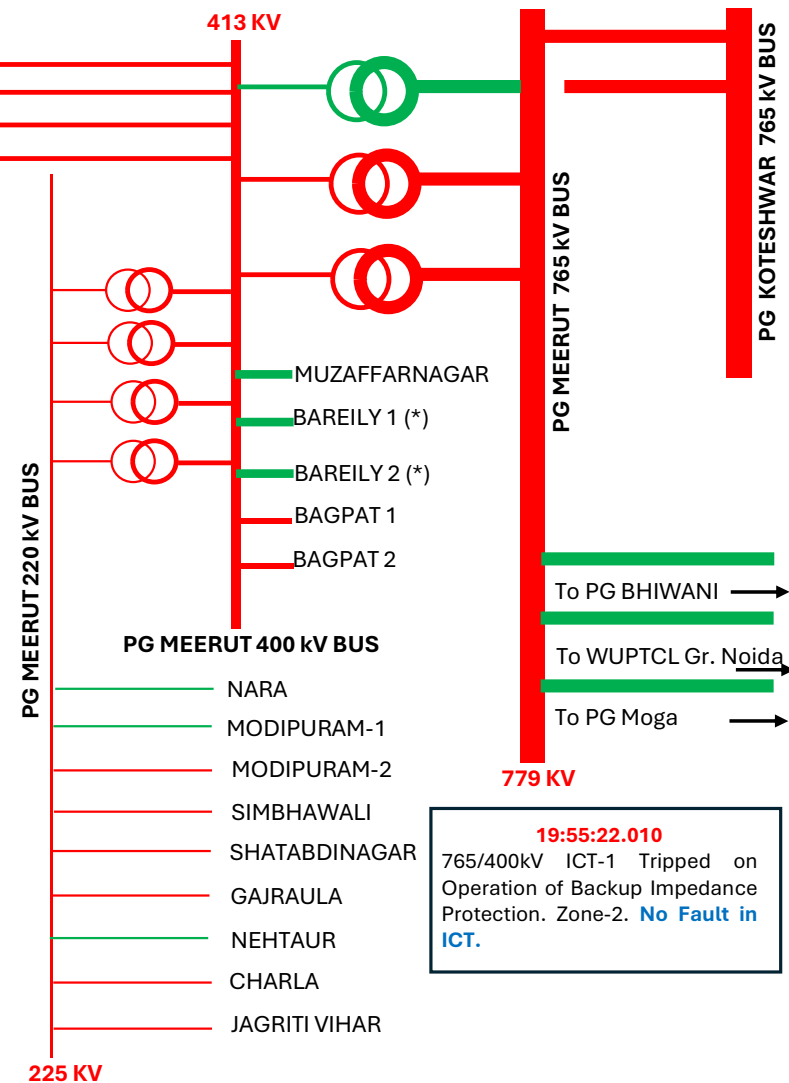
TRIPPING on 21.05.2025



PG MAHARANIBAGH 400 kV BUS



413 KV

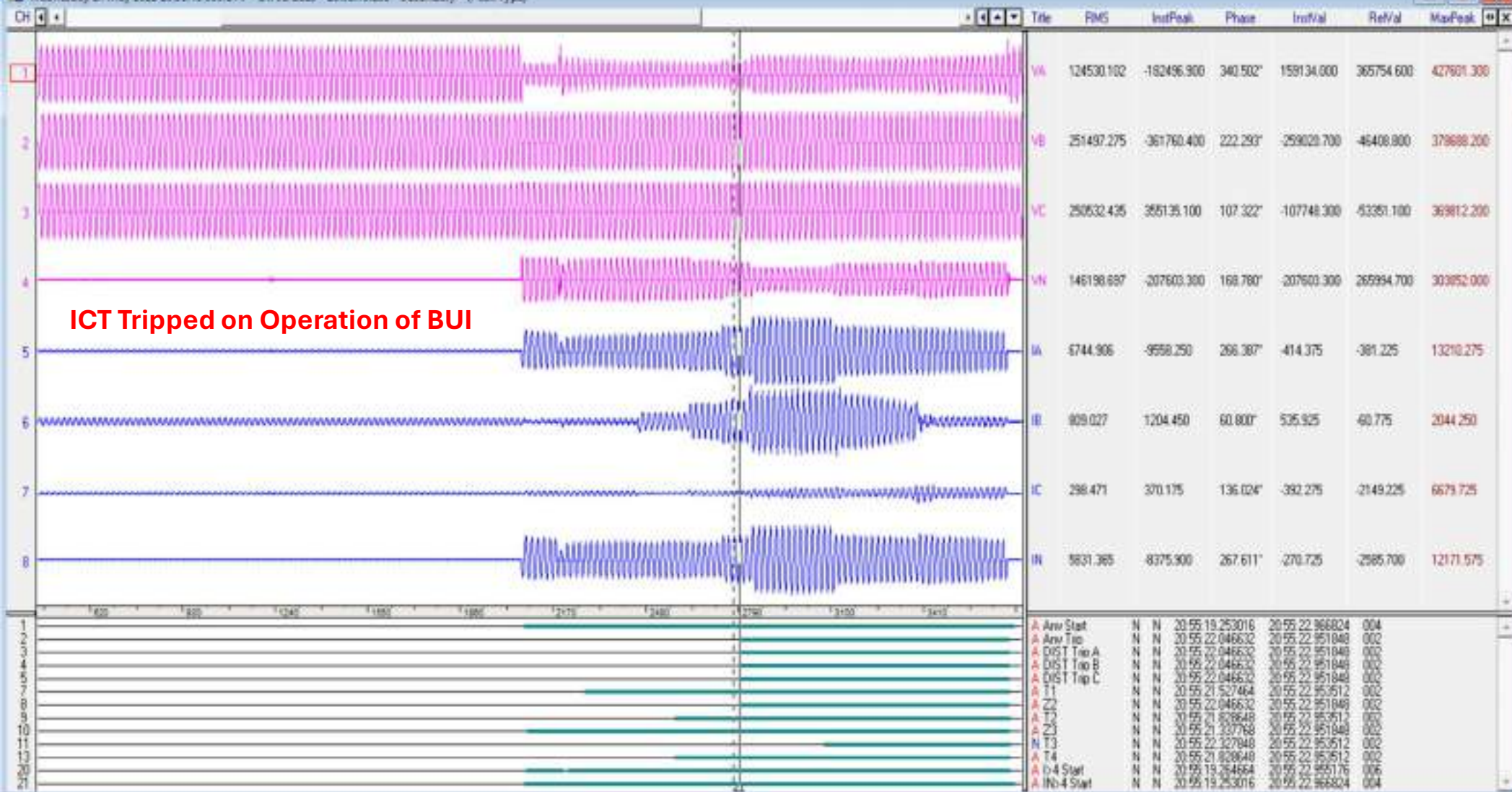


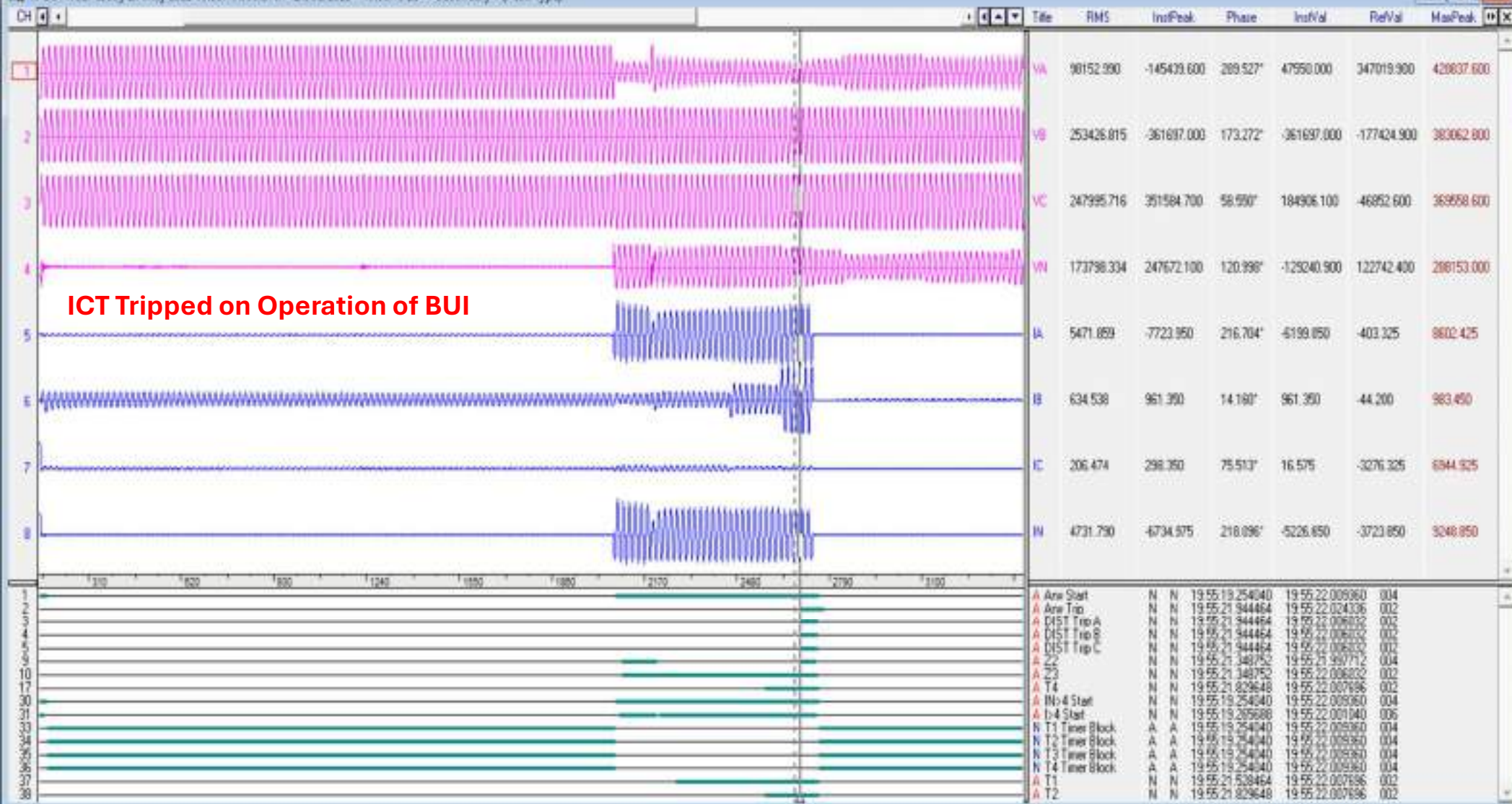
19:55:22.010
765/400kV ICT-1 Tripped on
Operation of Backup Impedance
Protection. Zone-2. No Fault in
ICT.

* 400 kV Meerut-Bareilly 400 kV Overcrossing
765 kV Koteswar Meerut Ckt 1 & 2

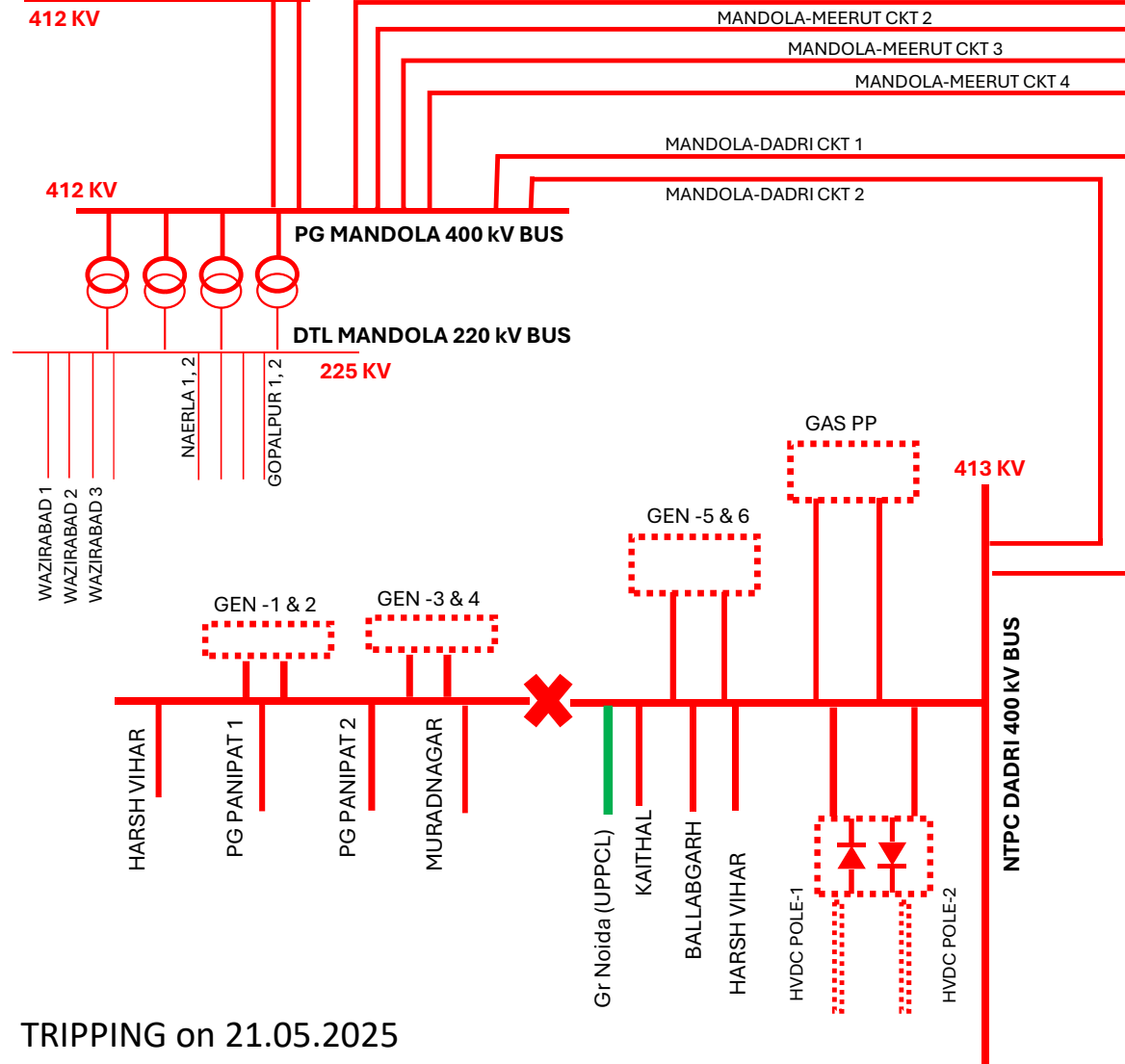


TRIPPING on 21.05.2025

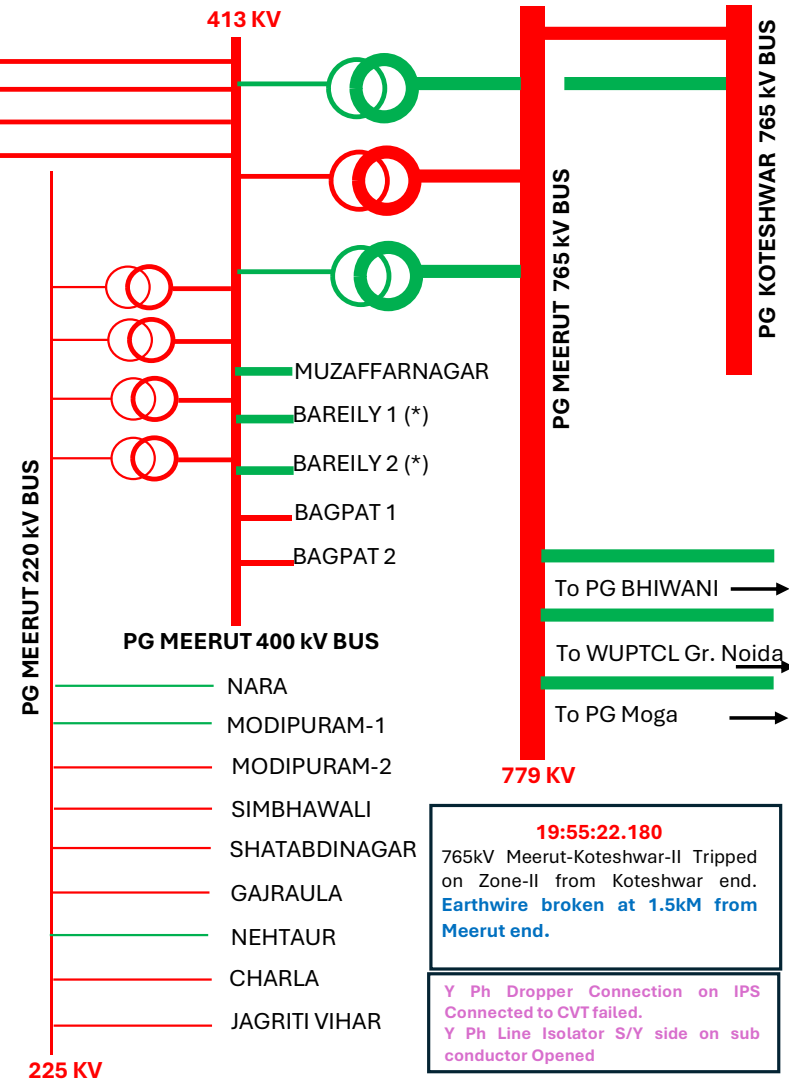




PG MAHARANIBAGH 400 kV BUS



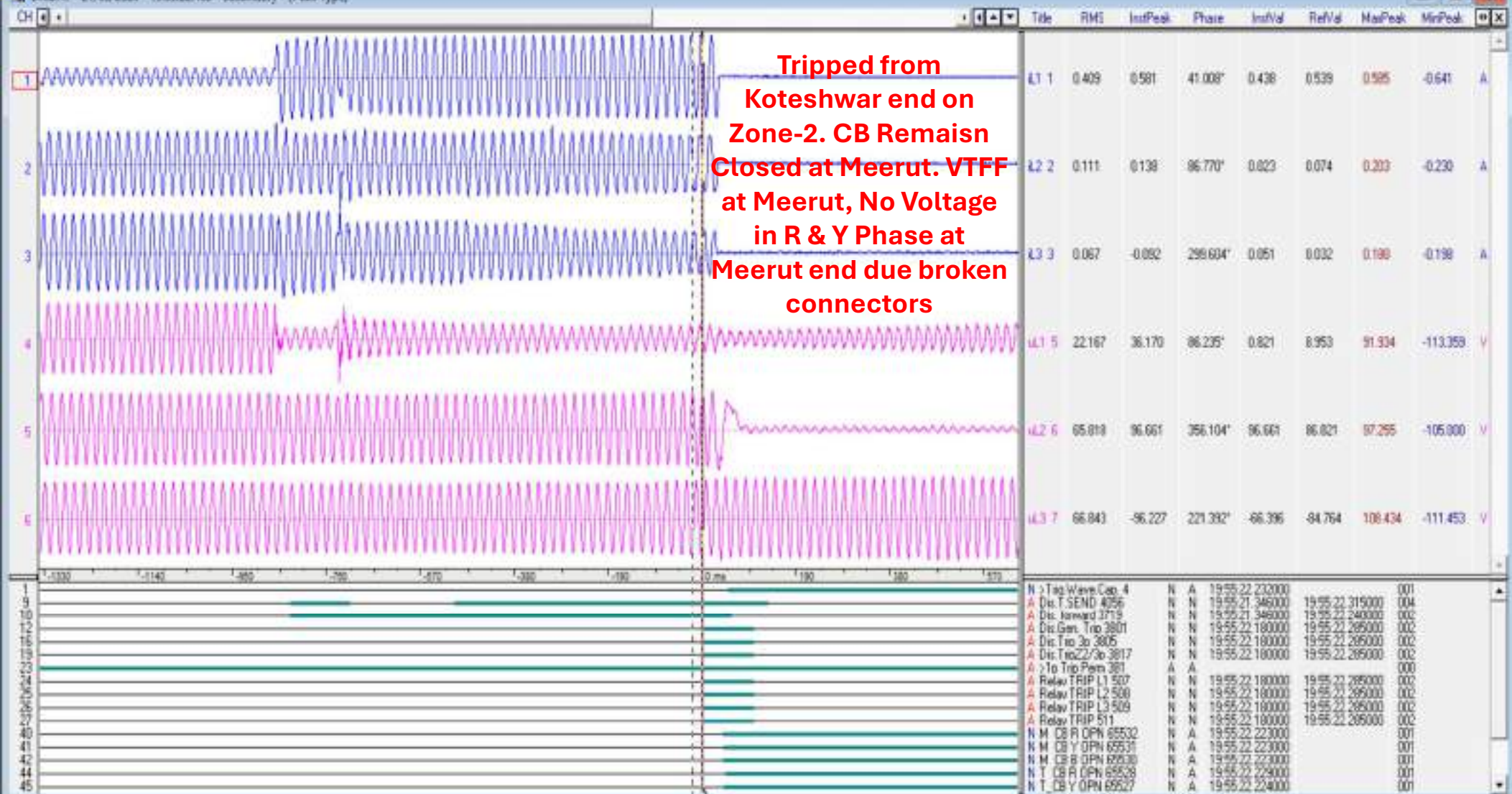
413 KV



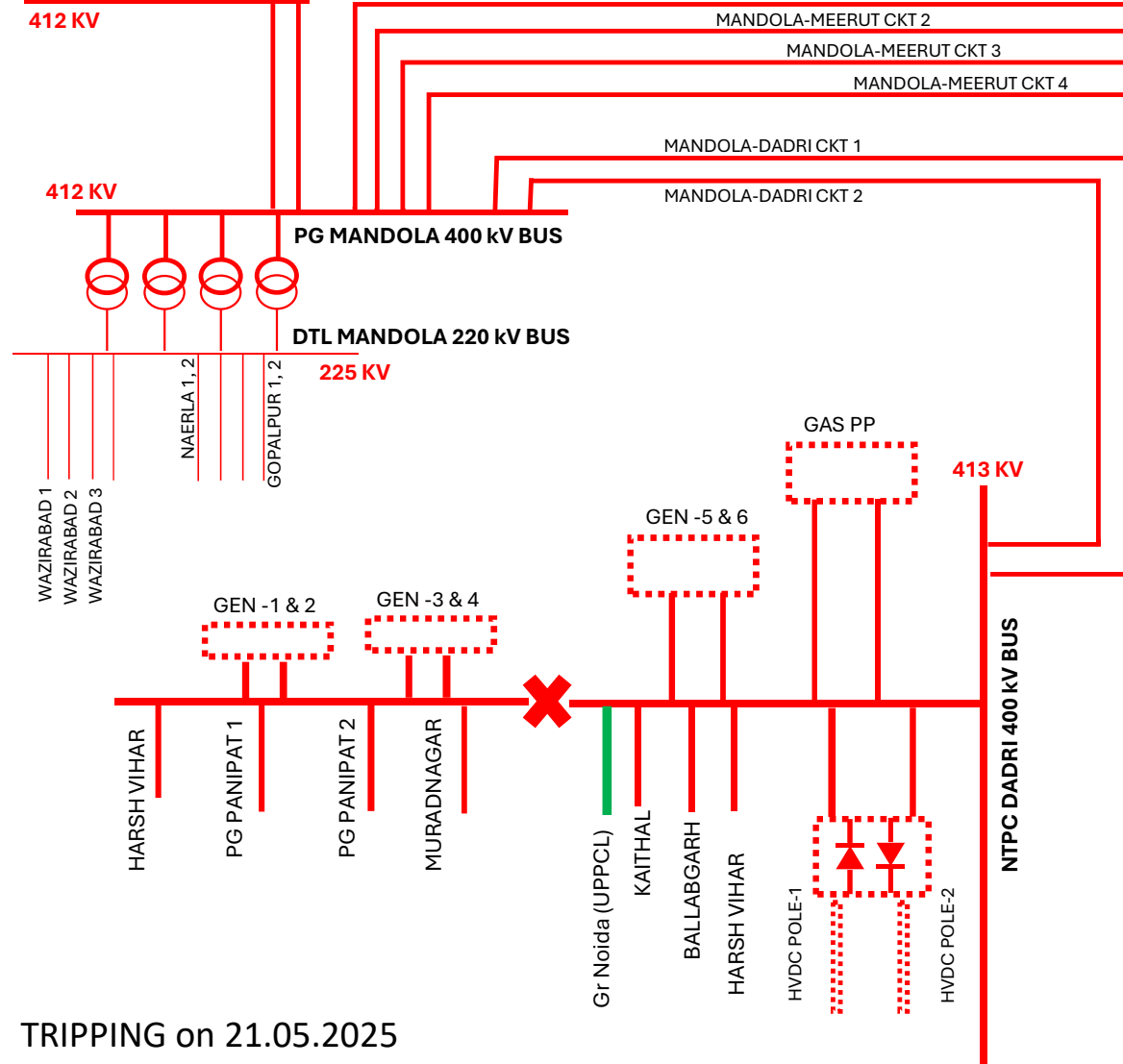
* 400 kV Meerut-Bareilly 400 kV Overcrossing
765 kV Koteswar Meerut Ckt 1 & 2



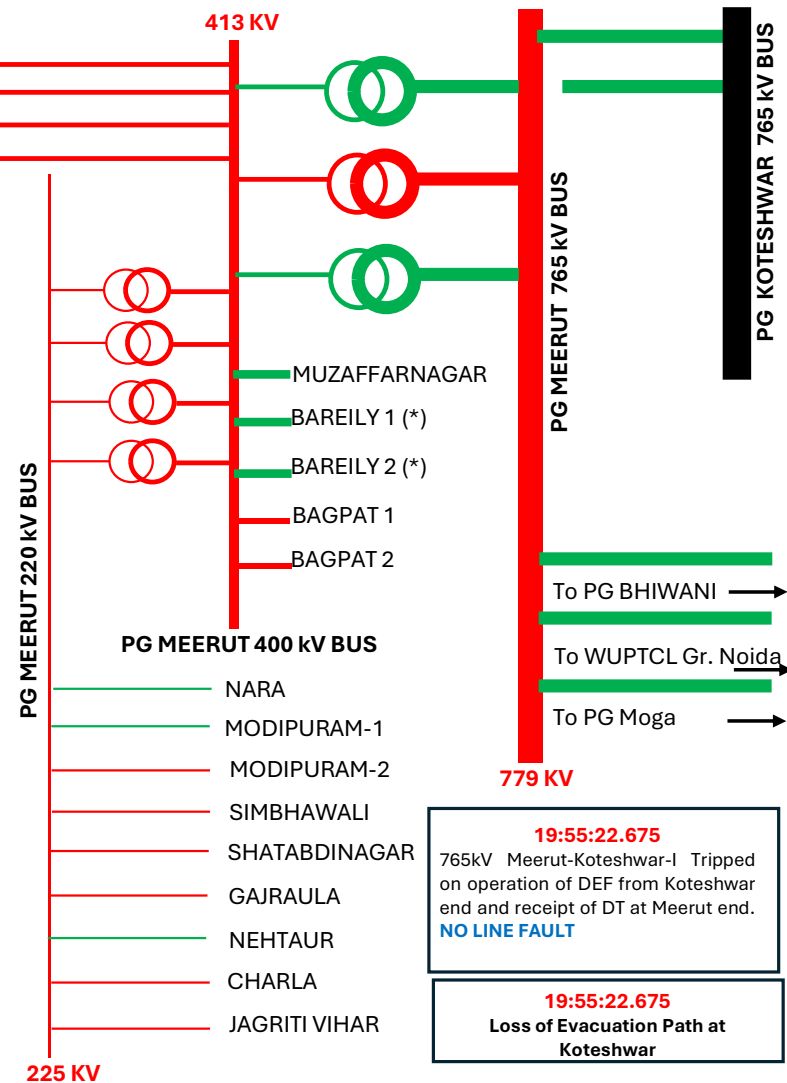
TRIPPING on 21.05.2025



PG MAHARANIBAGH 400 kV BUS



413 KV



225 KV

779 KV

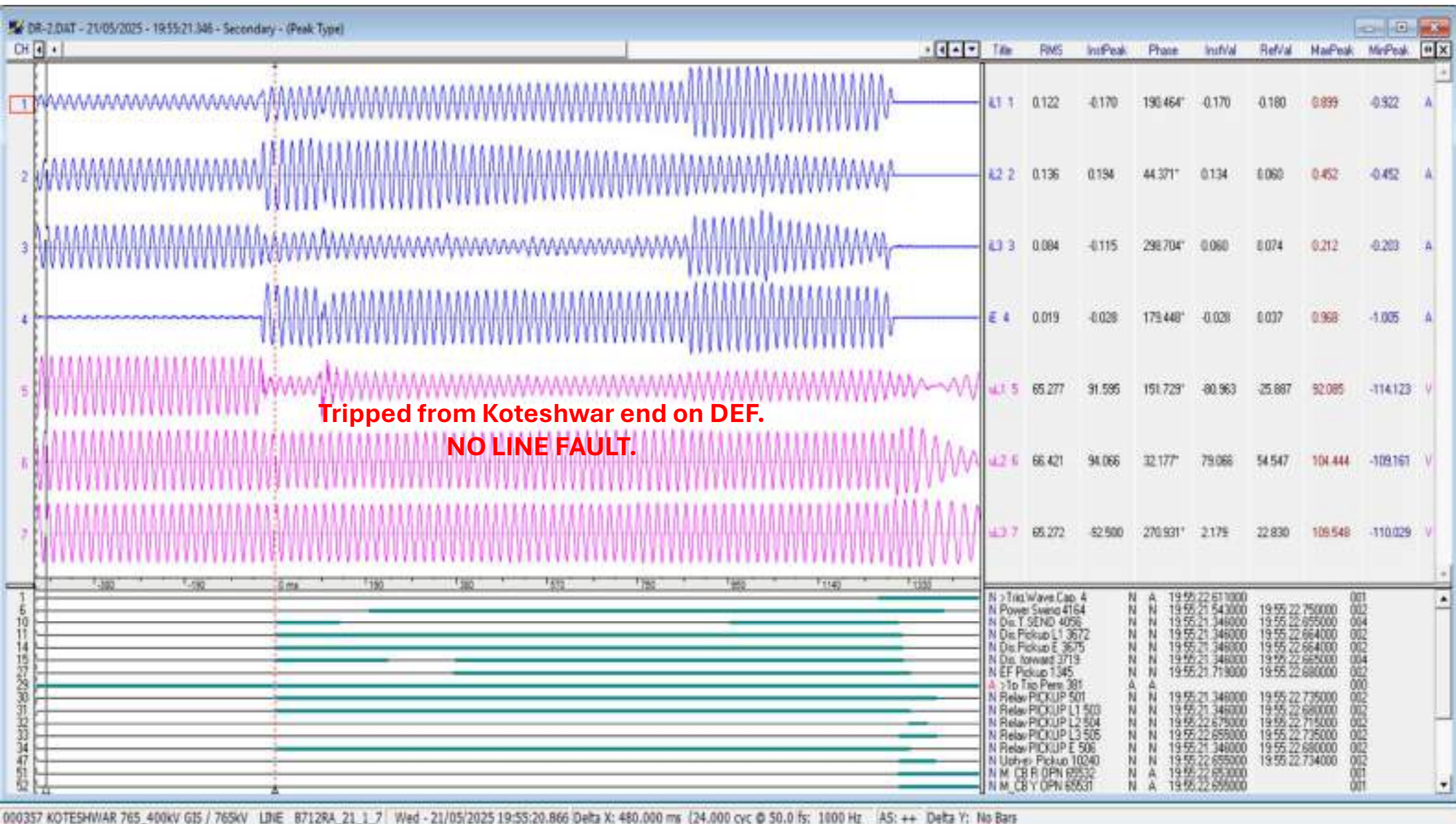
19:55:22.675
765kV Meerut-Koteswar-I Tripped
on operation of DEF from Koteswar
end and receipt of DT at Meerut end.
NO LINE FAULT

19:55:22.675
**Loss of Evacuation Path at
Koteswar**

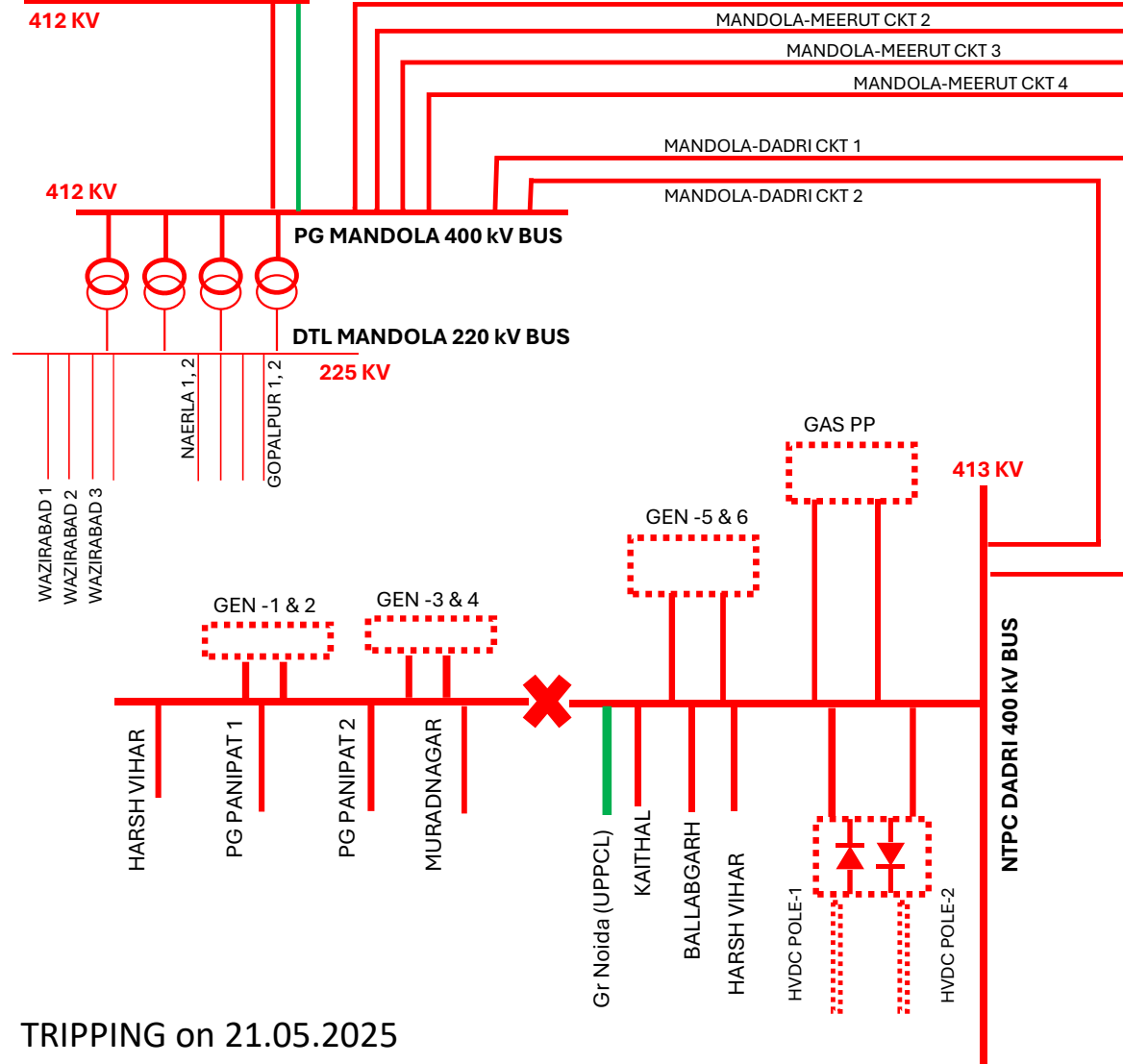
* 400 kV Meerut-Bareilly 400 kV Overcrossing
765 kV Koteswar Meerut Ckt 1 & 2



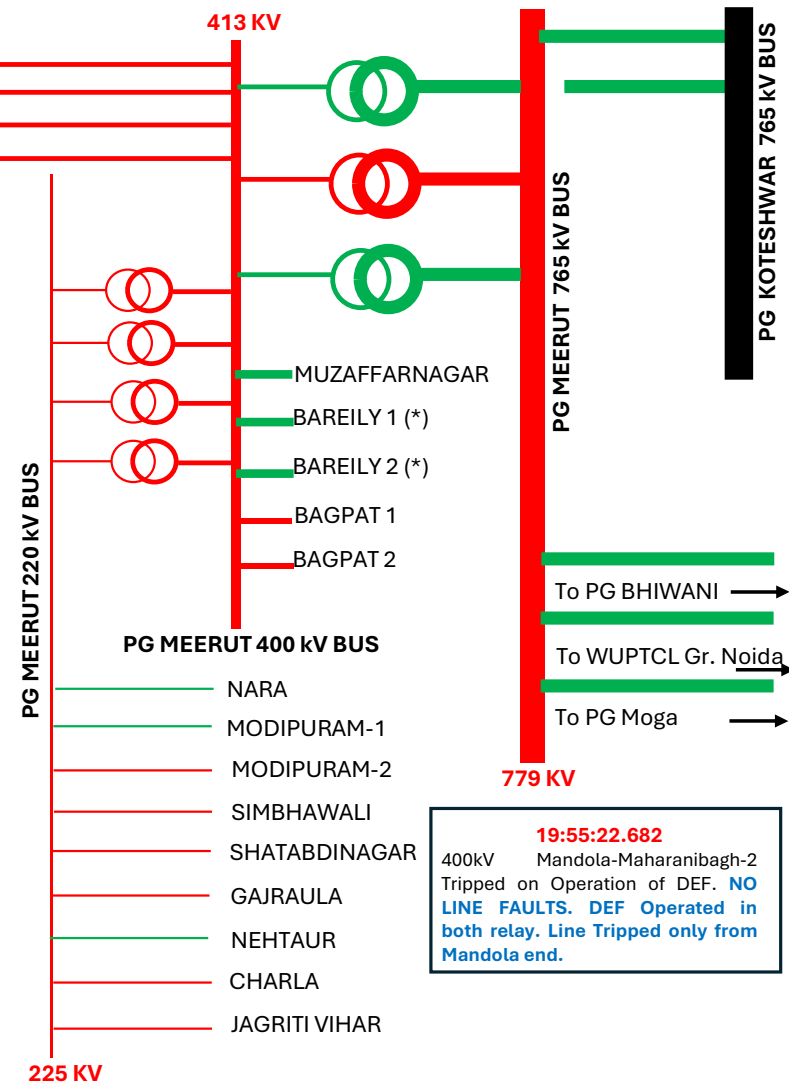
TRIPPING on 21.05.2025



PG MAHARANIBAGH 400 kV BUS



413 KV



19:55:22.682

400kV Mandola-Maharanibagh-2

Tripped on Operation of DEF. **NO**

LINE FAULTS. DEF Operated in

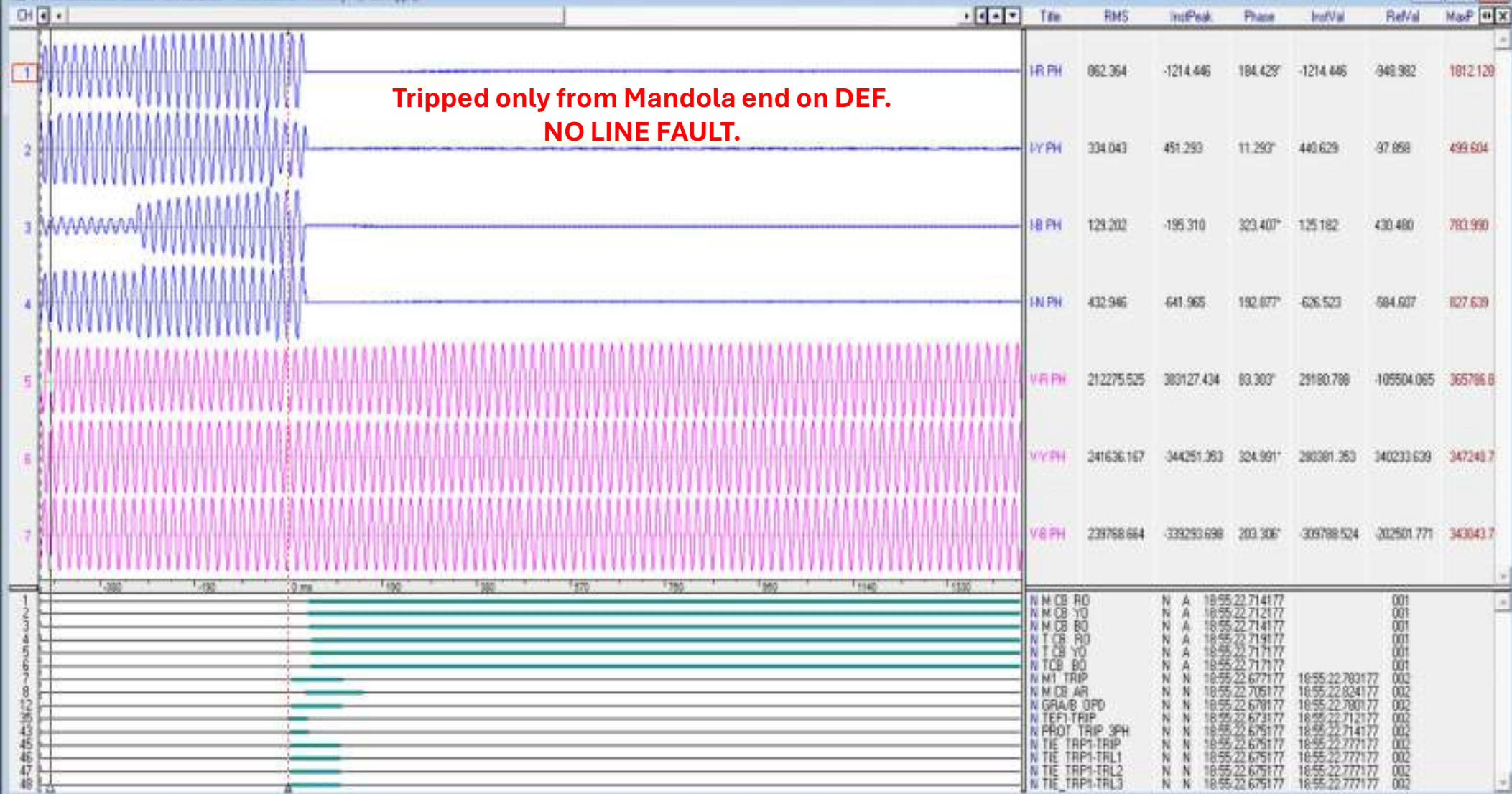
both relay. Line Tripped only from

Mandola end.

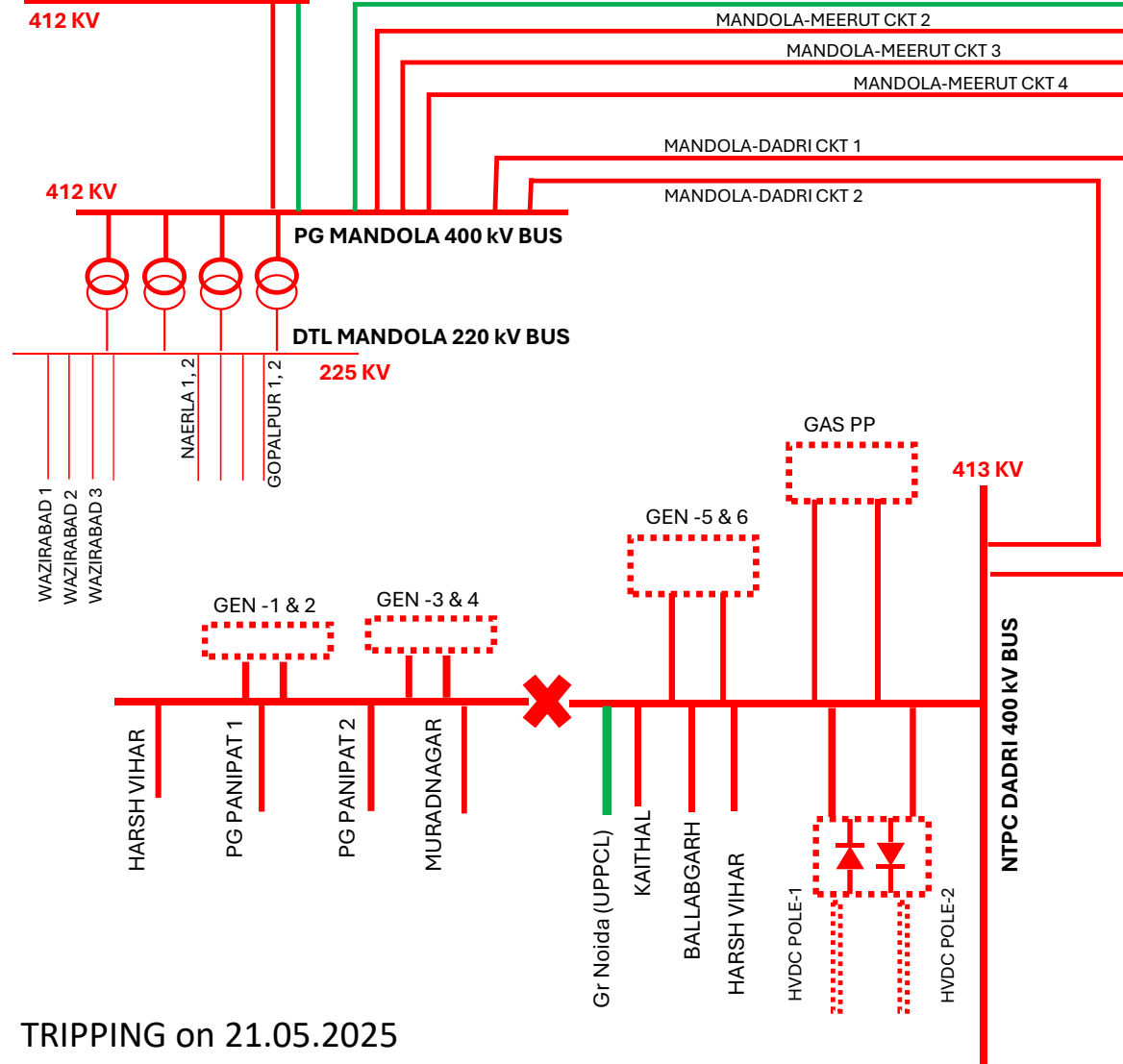
* 400 kV Meerut-Bareilly 400 kV Overcrossing
765 kV Koteswar Meerut Ckt 1 & 2



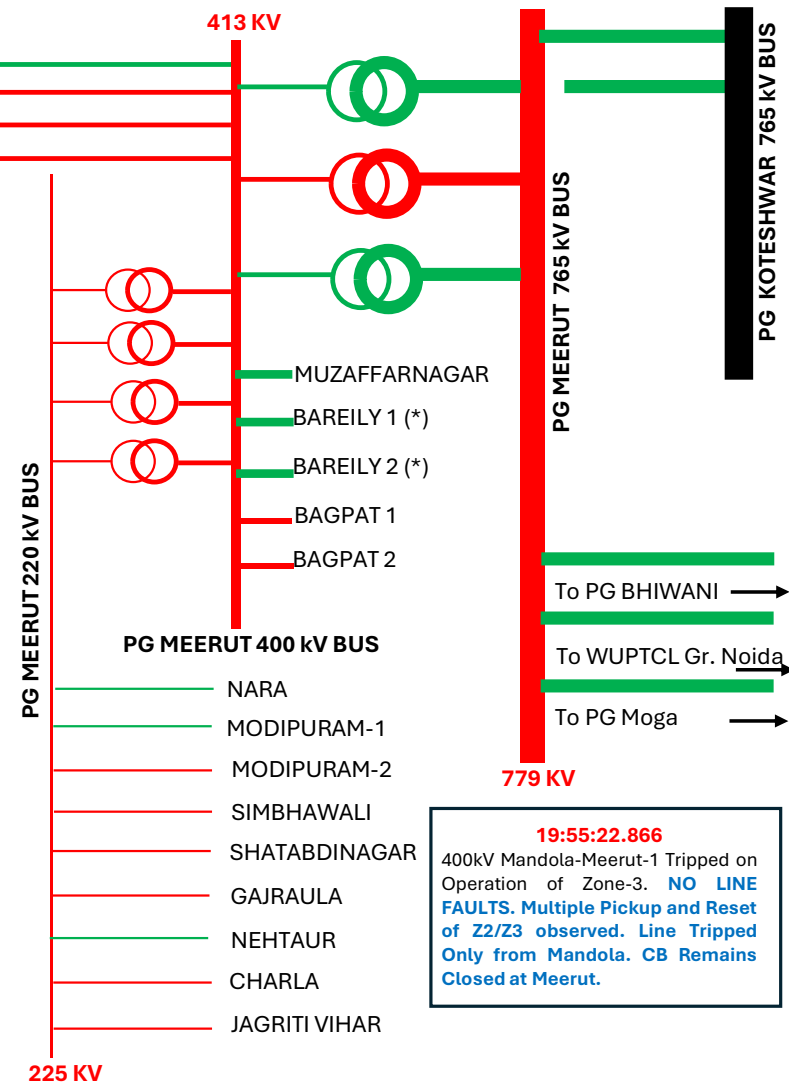
TRIPPING on 21.05.2025



PG MAHARANIBAGH 400 kV BUS



413 KV



19:55:22.866

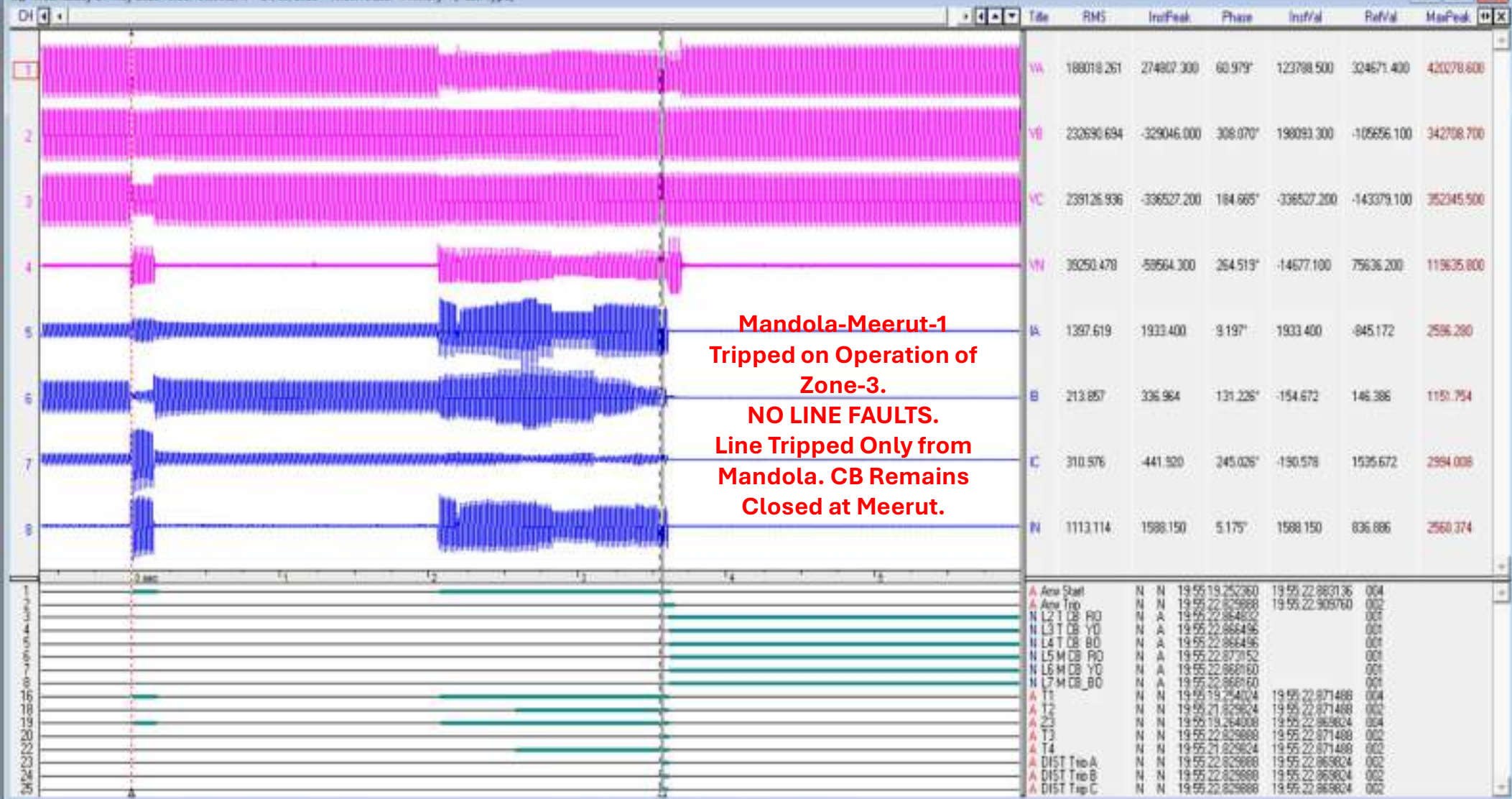
400kV Mandola-Meerut-1 Tripped on Operation of Zone-3. **NO LINE FAULTS. Multiple Pickup and Reset of Z2/Z3 observed. Line Tripped Only from Mandola. CB Remains Closed at Meerut.**

* 400 kV Meerut-Bareilly 400 kV Overcrossing 765 kV Koteshwar Meerut Ckt 1 & 2

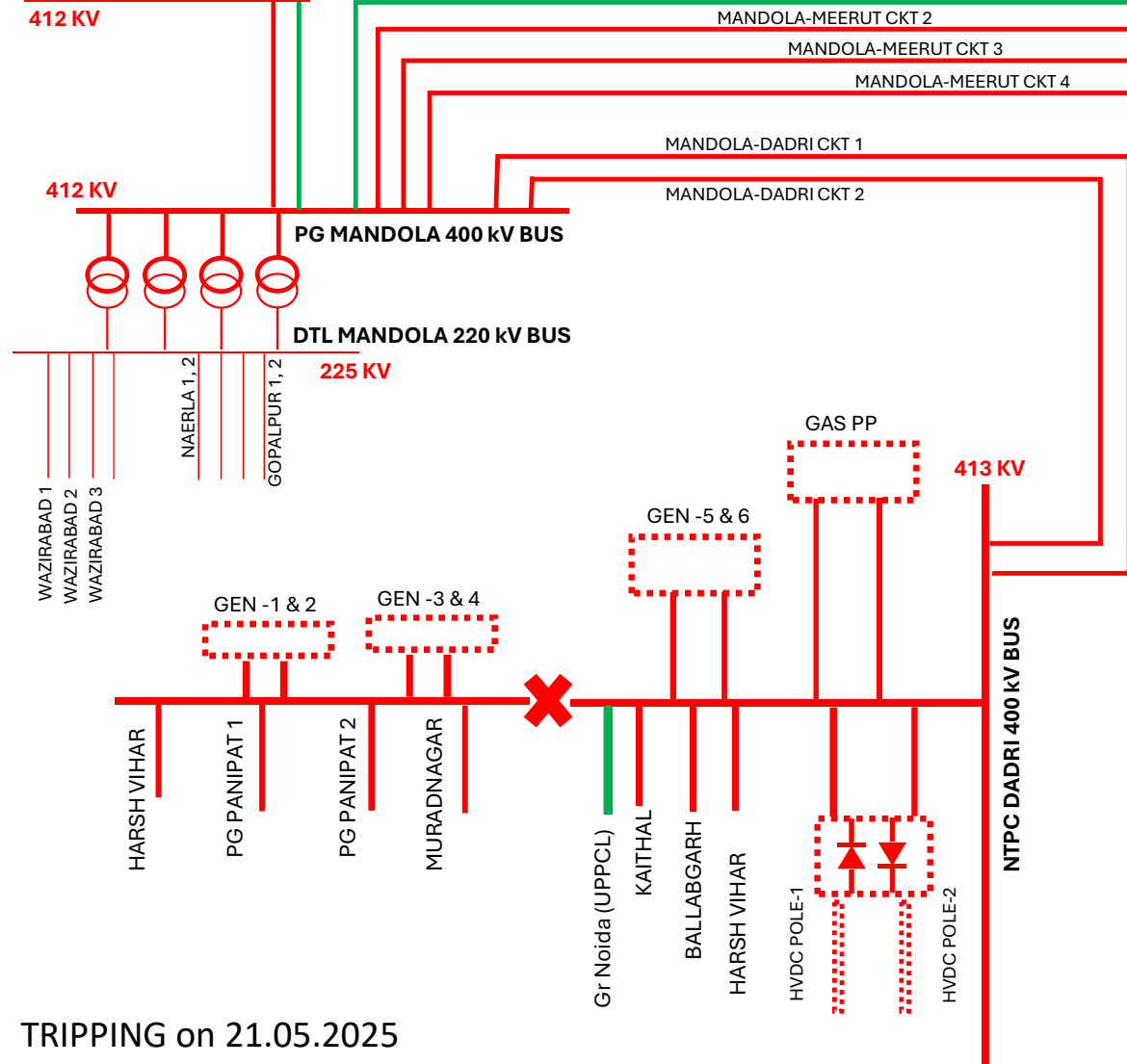


TRIPPING on 21.05.2025

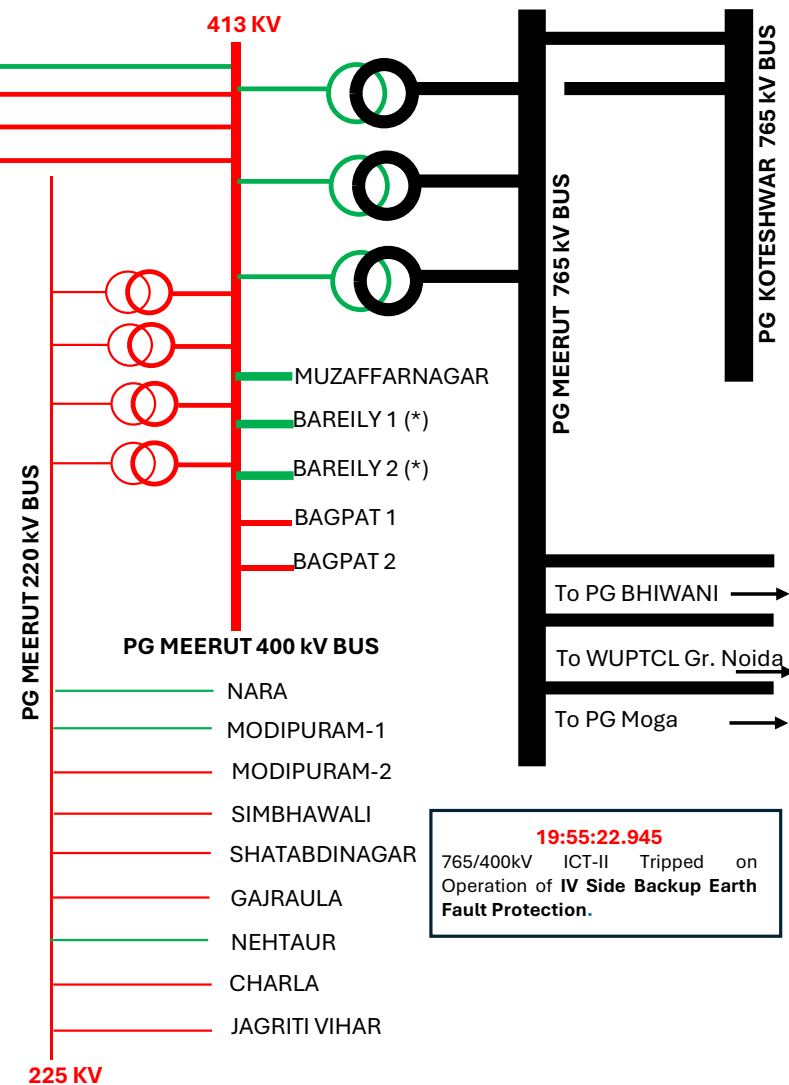
Wednesday 21 May 2025 19:55:19.000 DAT - 21/05/2025 - 19:55:19.252 - Primary - (Peak Type)



PG MAHARANIBAGH 400 kV BUS



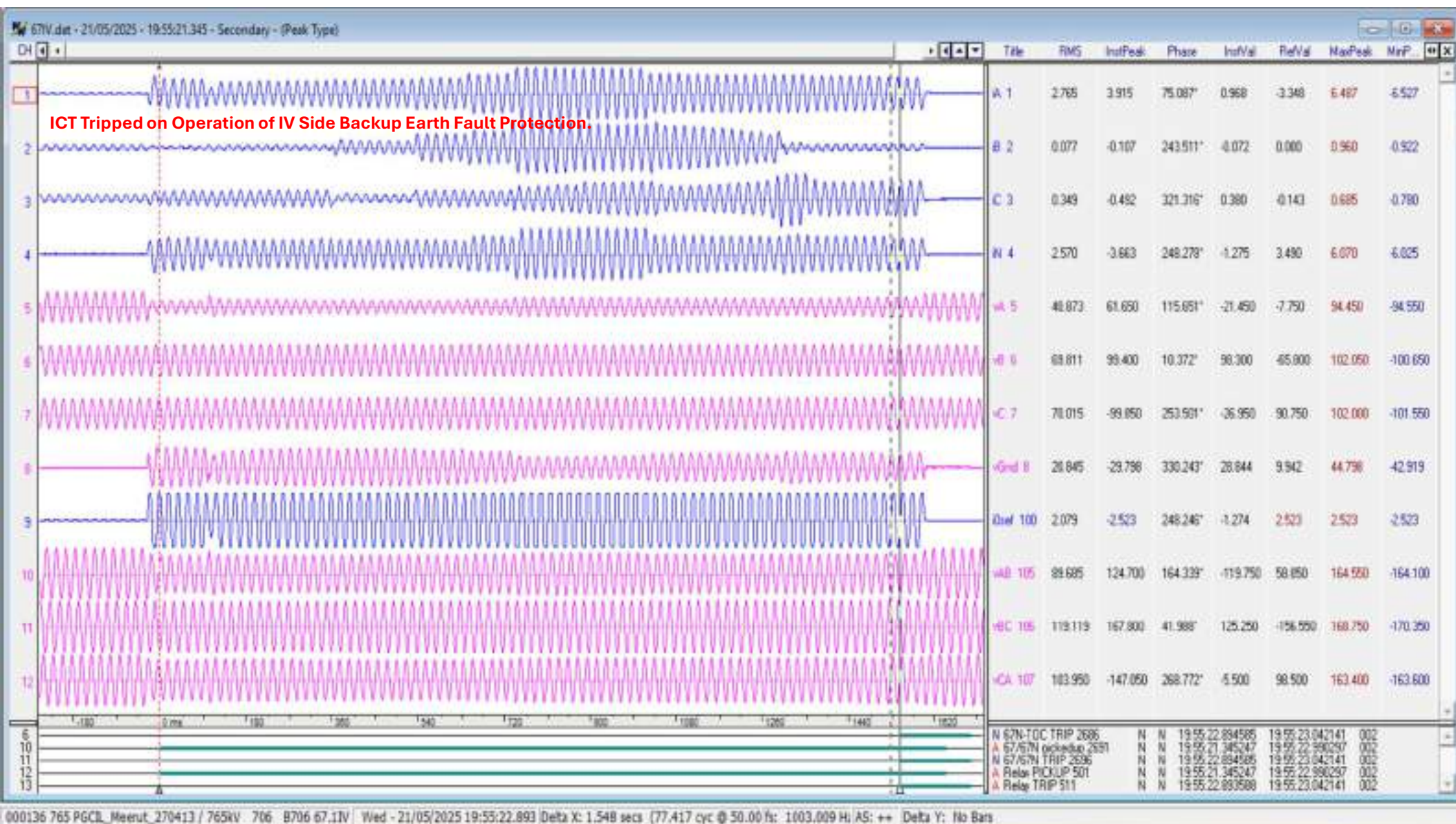
413 KV

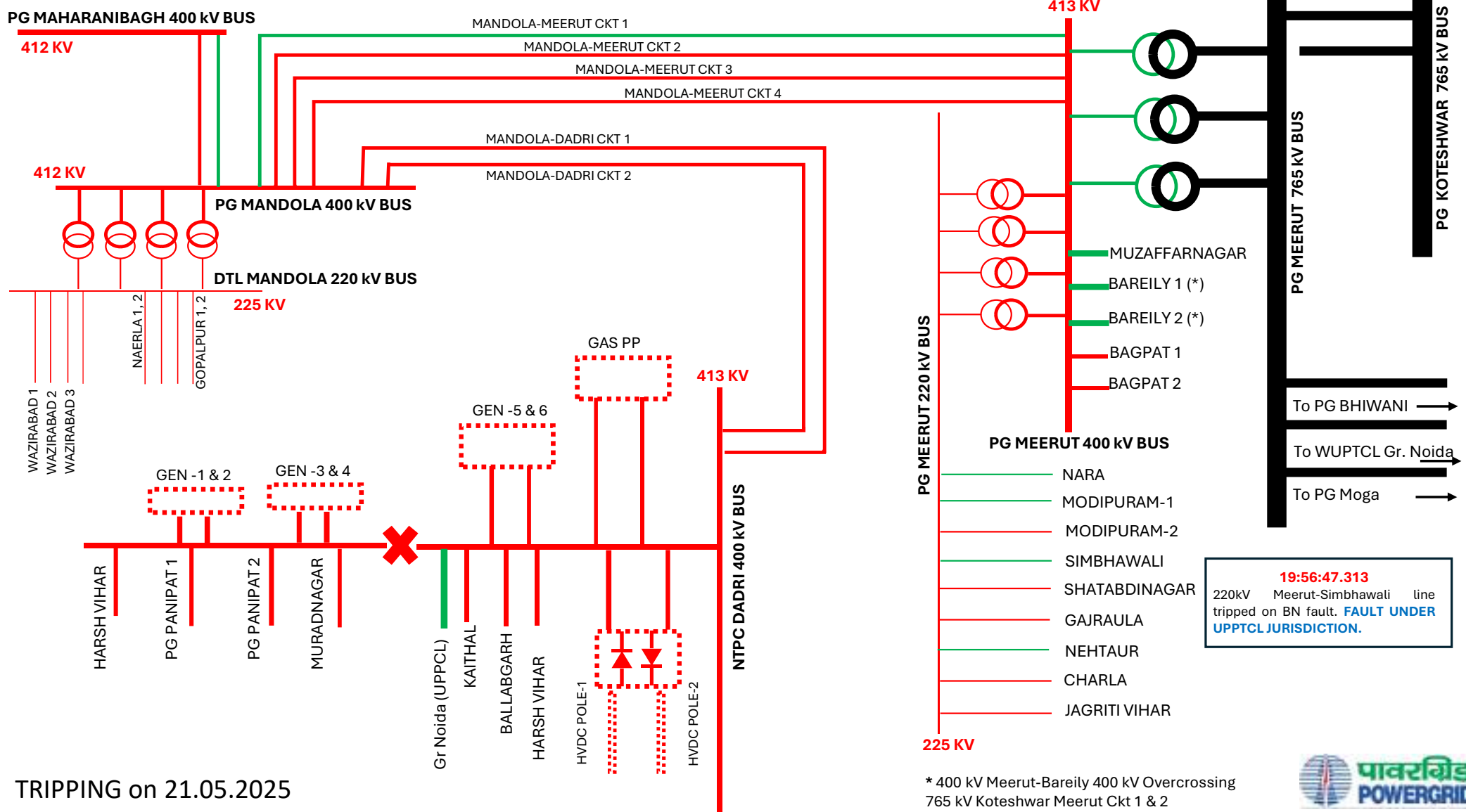


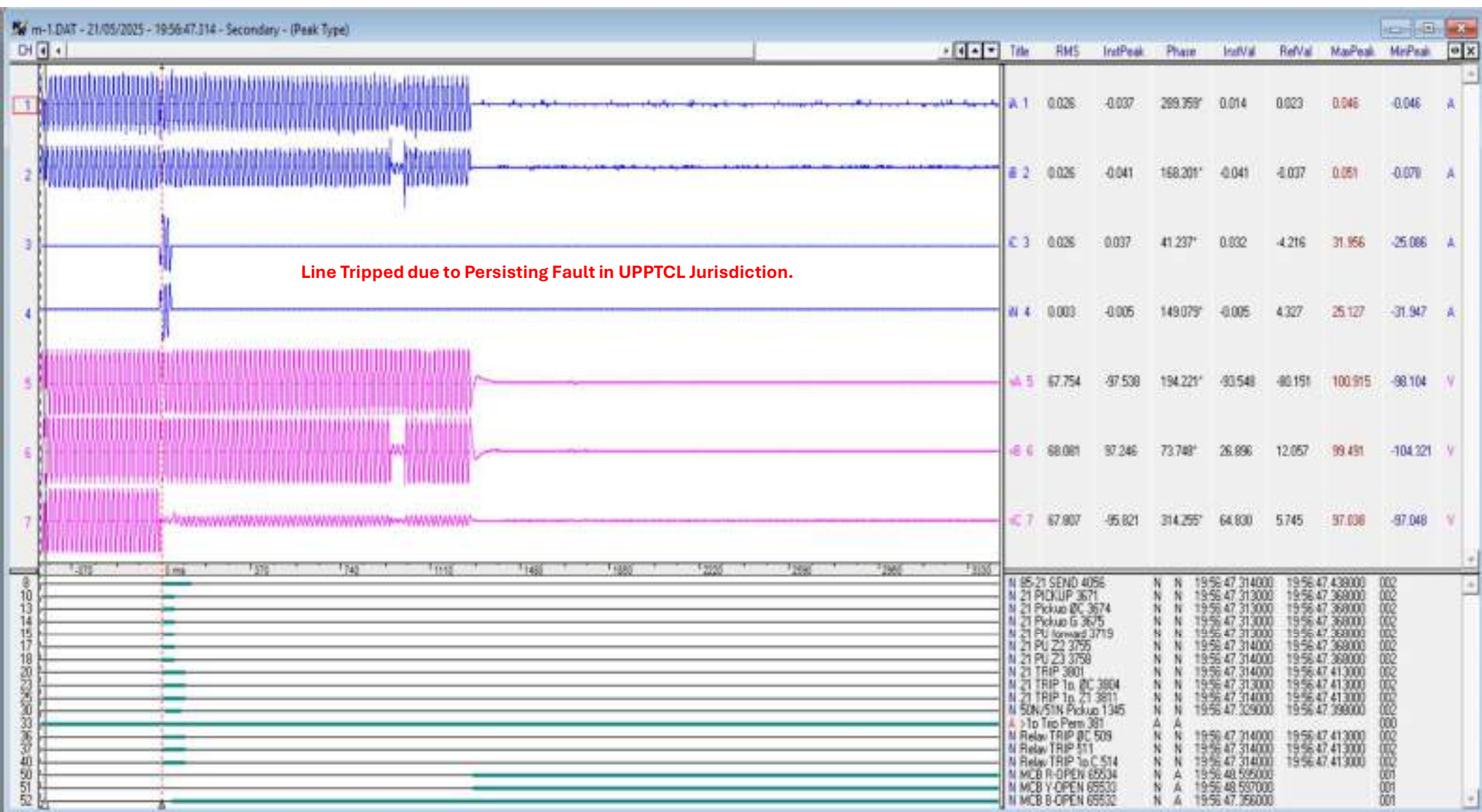
* 400 kV Meerut-Bareilly 400 kV Overcrossing
765 kV Koteswar Meerut Ckt 1 & 2



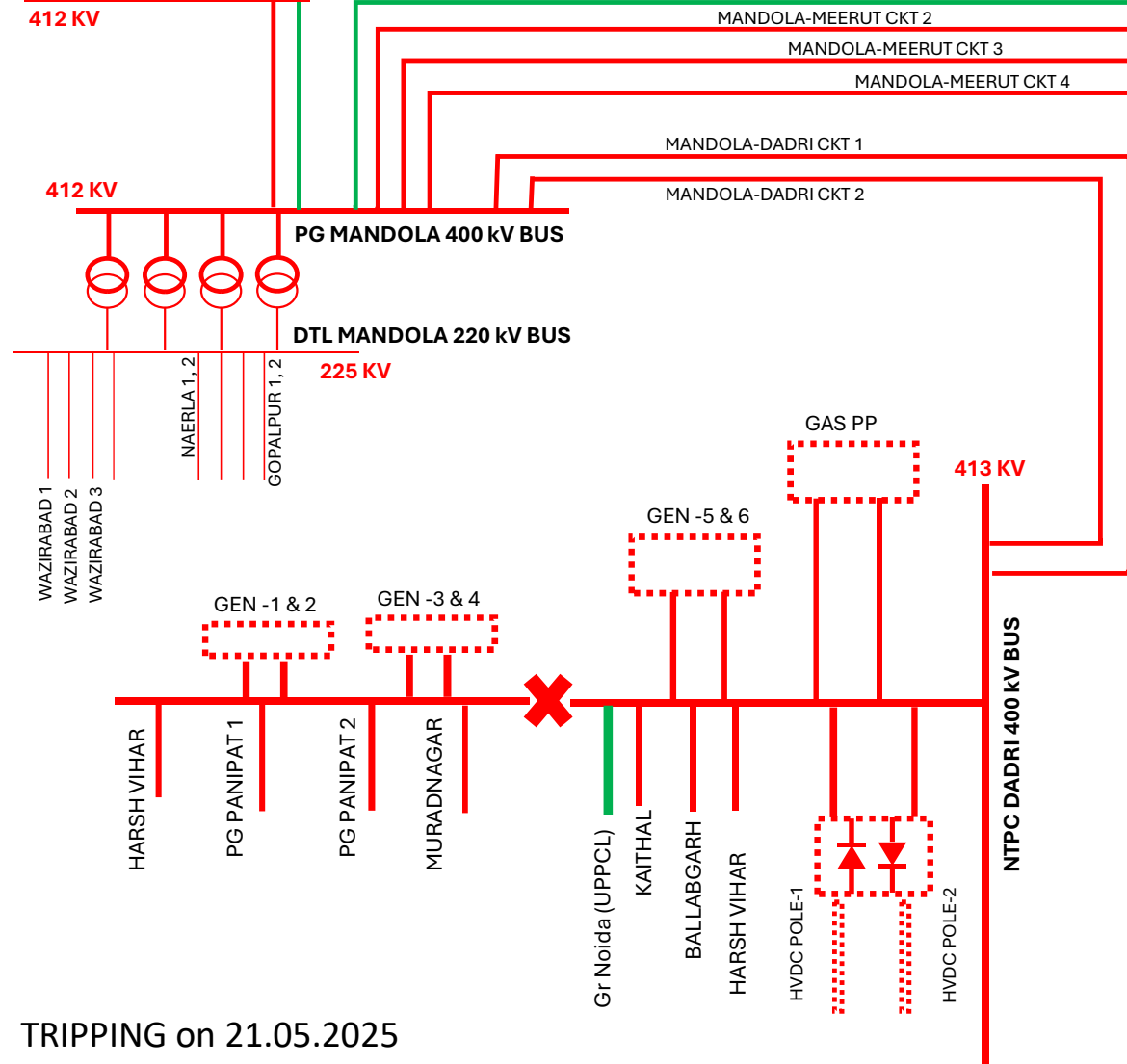
TRIPPING on 21.05.2025



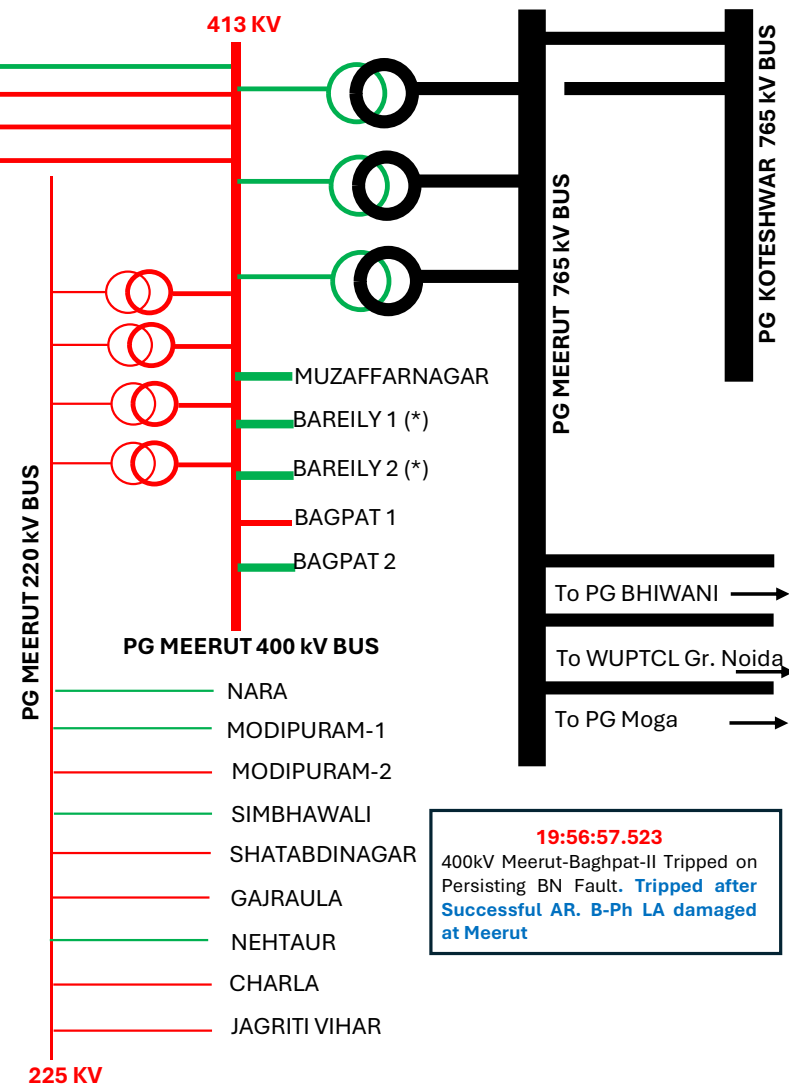




PG MAHARANIBAGH 400 kV BUS



413 KV

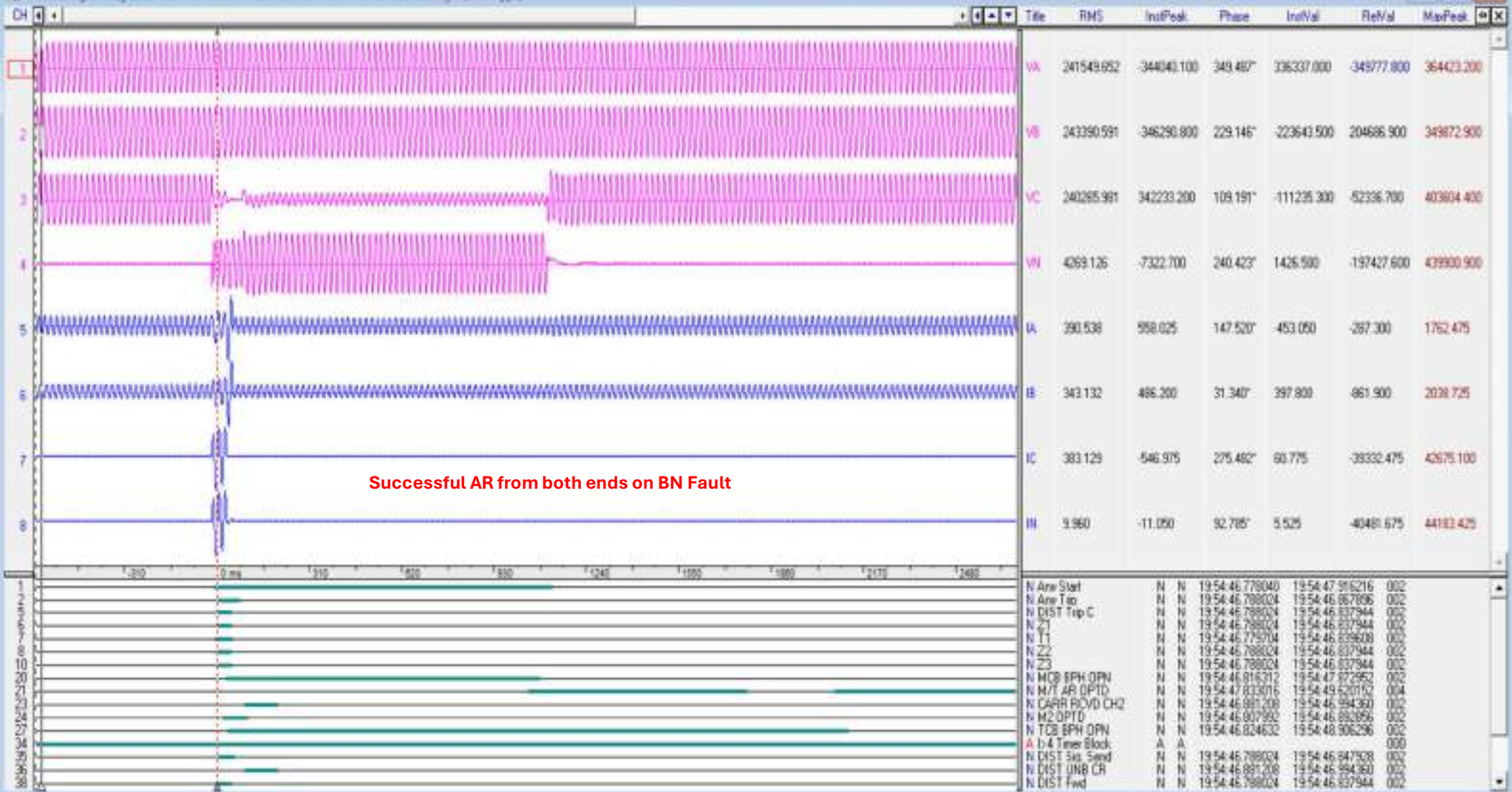


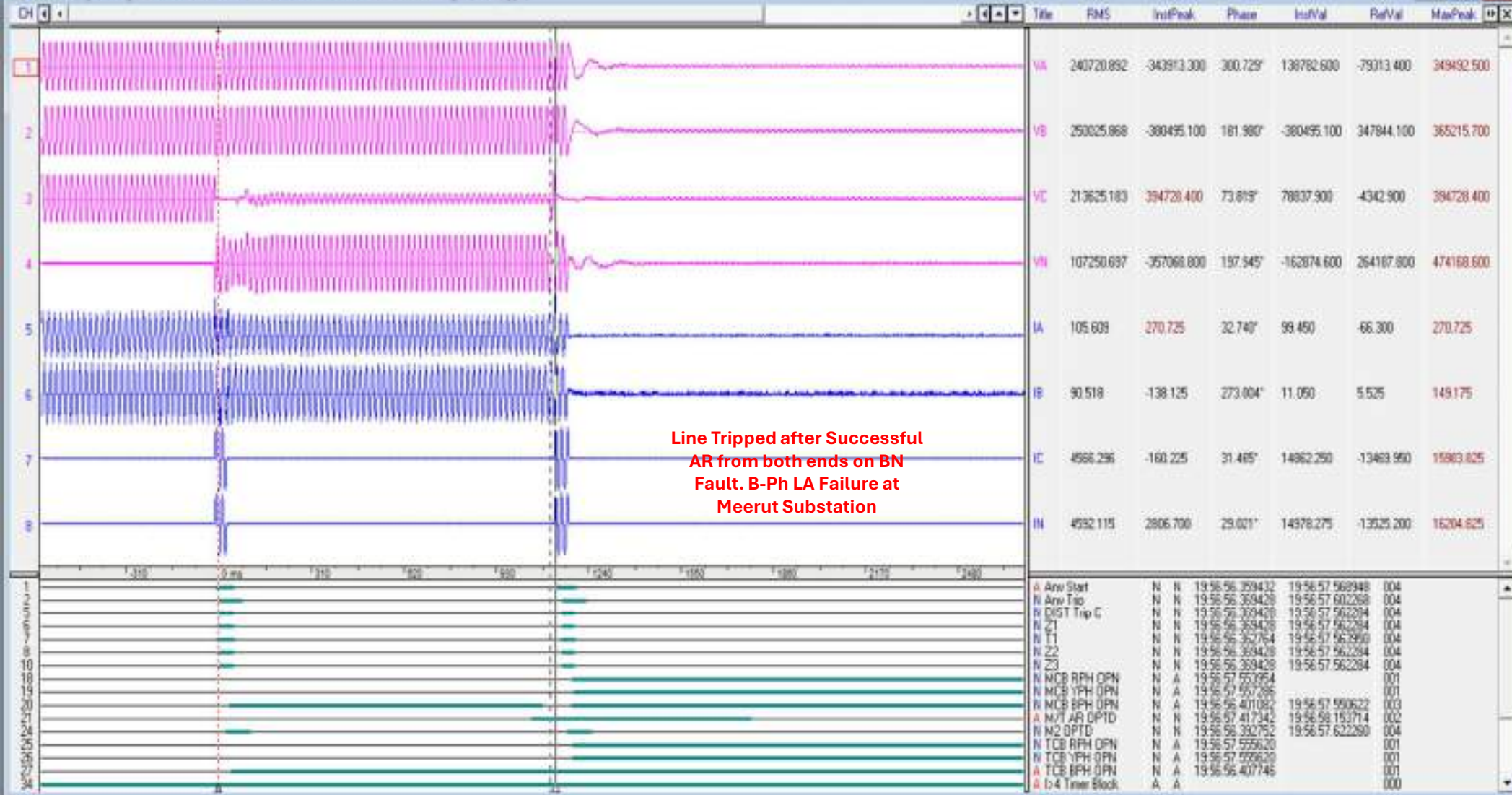
19:56:57.523
400kV Meerut-Baghpatt-II Tripped on
Persisting BN Fault. Tripped after
Successful AR. B-Ph LA damaged
at Meerut

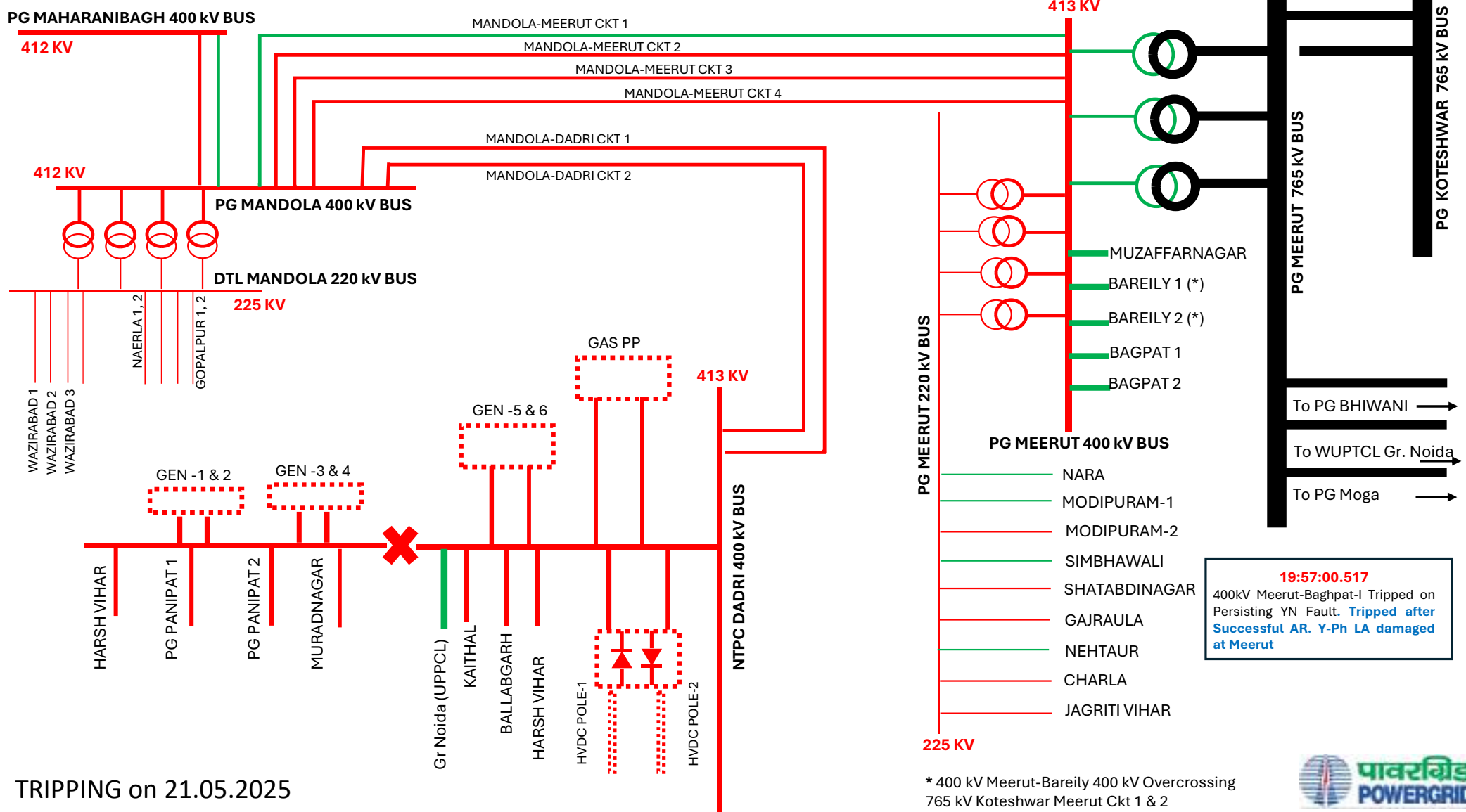
* 400 kV Meerut-Bareilly 400 kV Overcrossing
765 kV Koteswar Meerut Ckt 1 & 2

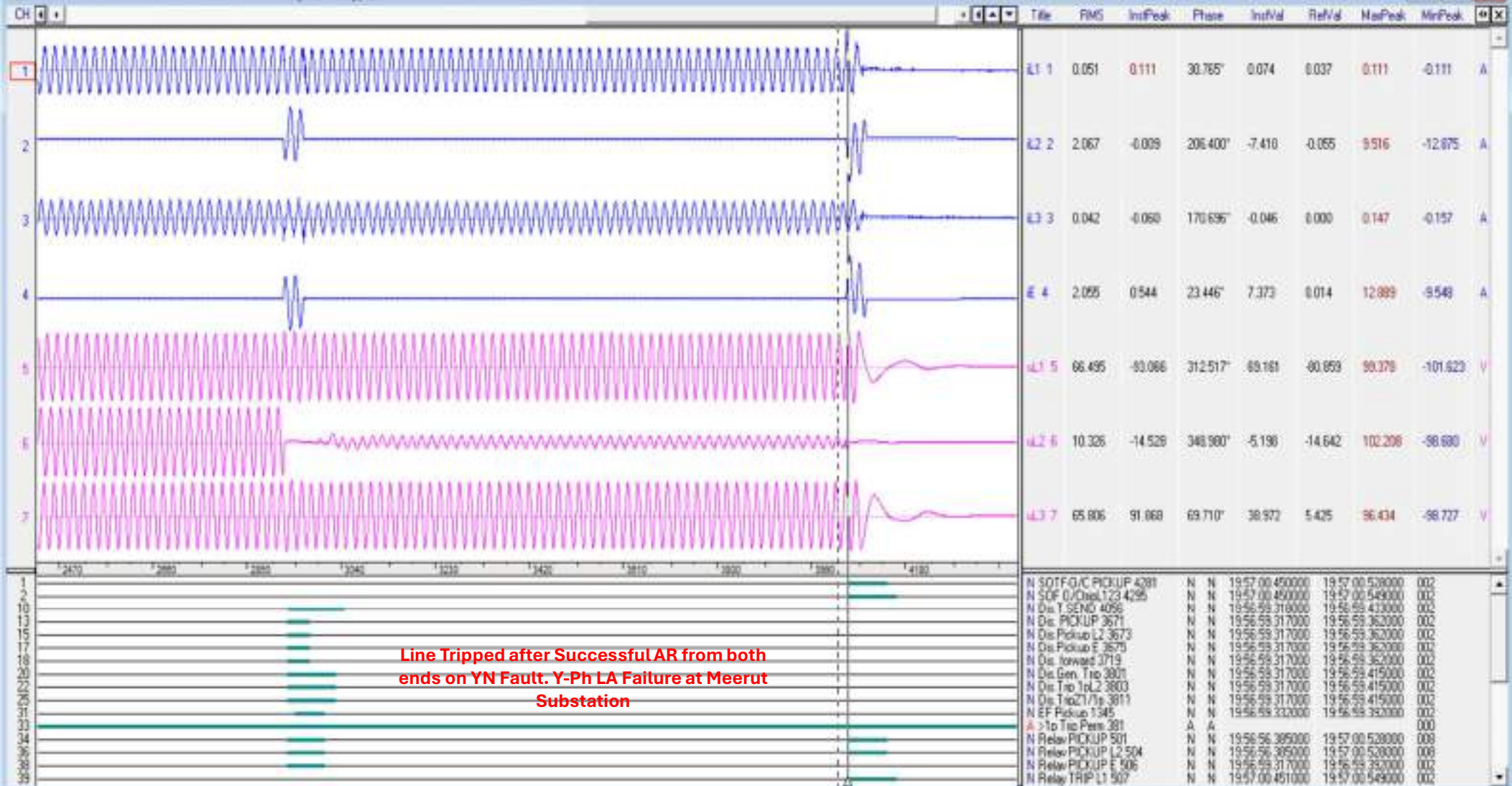


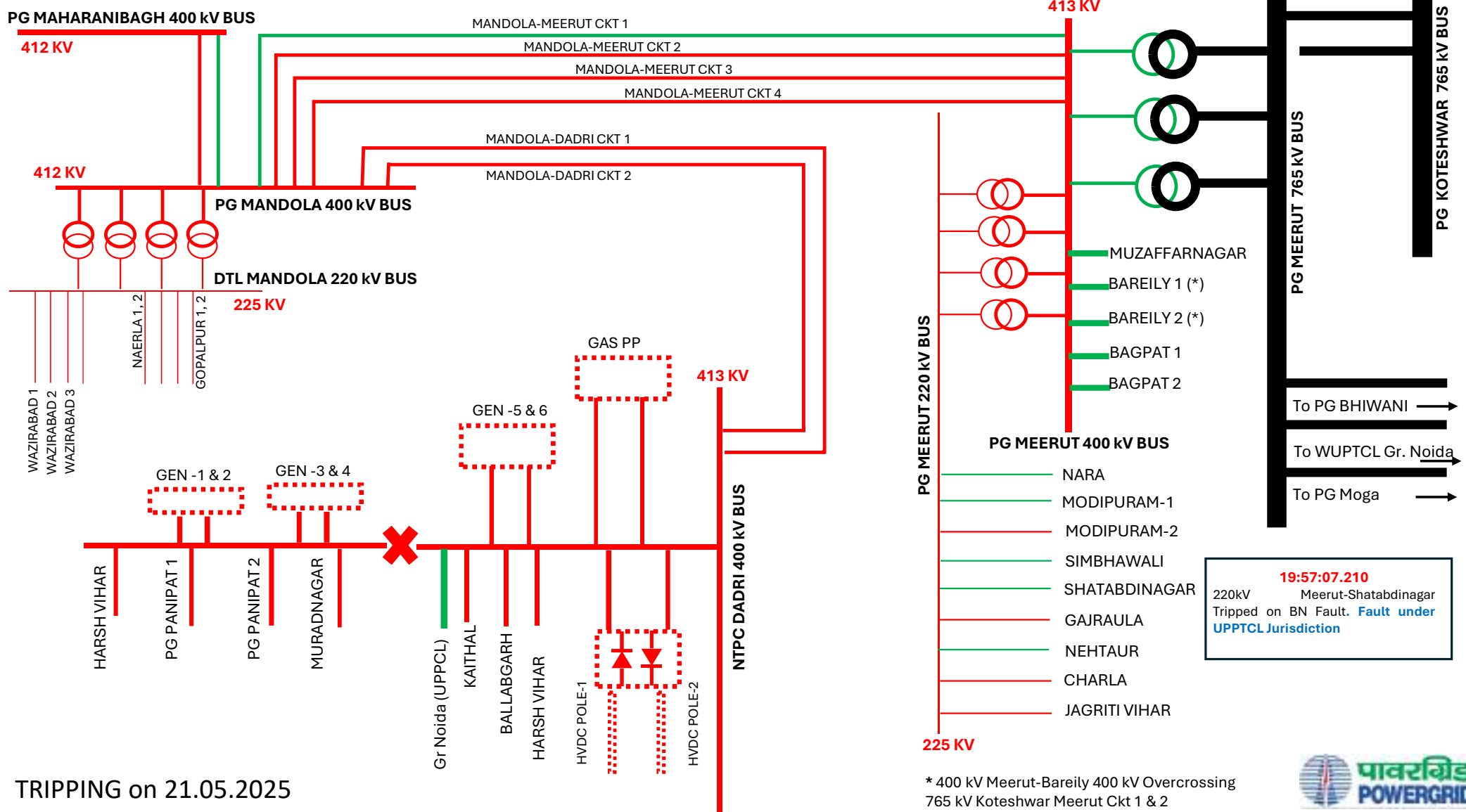
TRIPPING on 21.05.2025

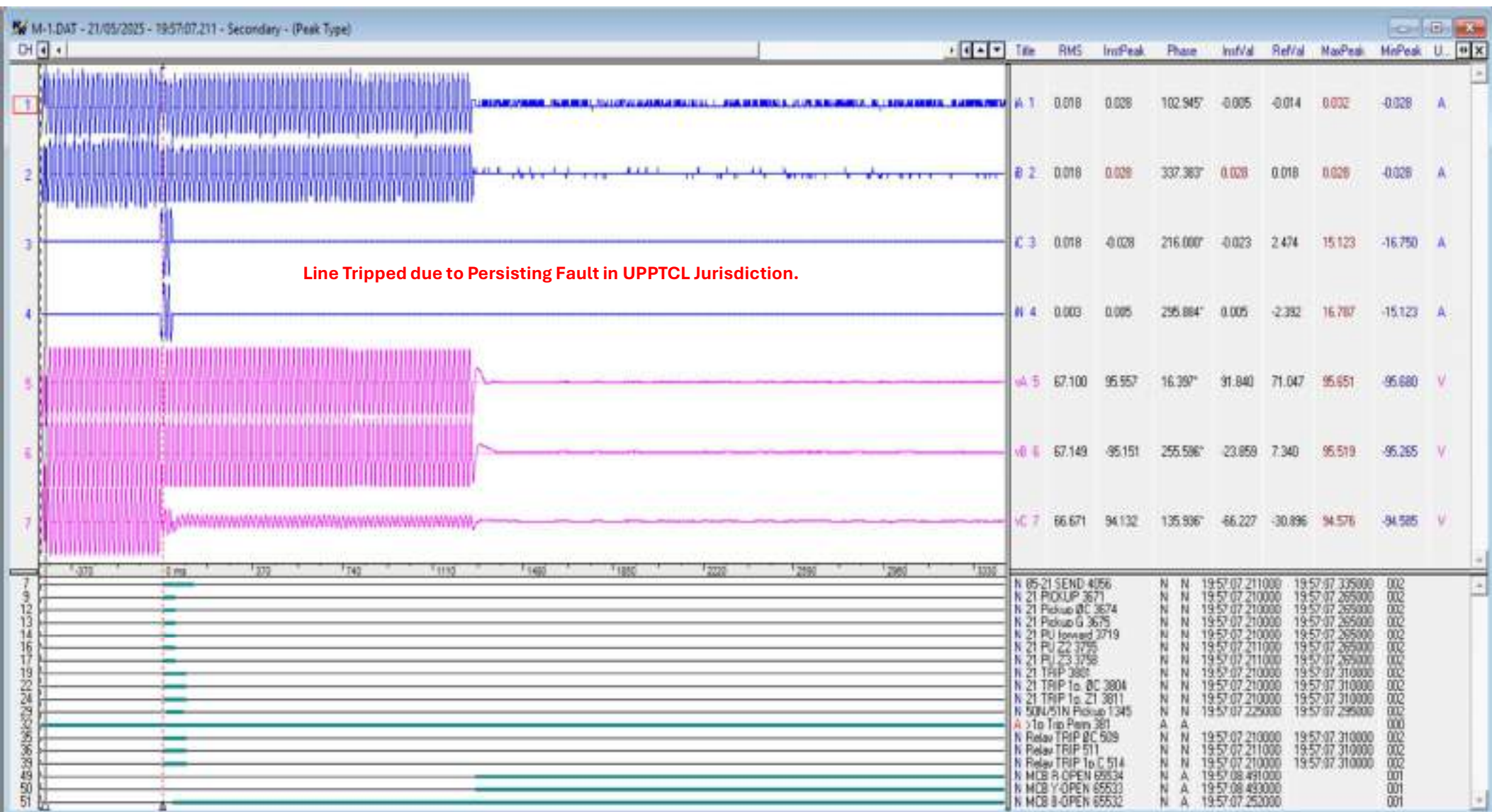












PG MAHARANIBAGH 400 kV BUS

412 KV

MANDOLA-MEERUT CKT 1

MANDOLA-MEERUT CKT 2

MANDOLA-MEERUT CKT 3

MANDOLA-MEERUT CKT 4

MANDOLA-DADRI CKT 1

MANDOLA-DADRI CKT 2

PG MANDOLA 400 kV BUS

DTL MANDOLA 220 kV BUS

225 KV

WAZIRABAD 1

WAZIRABAD 2

WAZIRABAD 3

NAERLA 1, 2

GOPALPUR 1, 2

GEN -1 & 2

GEN -3 & 4

GEN -5 & 6

GAS PP

413 KV

NTPC DADRI 400 kV BUS

Gr Noida (UPPCL)

KAITHAL

BALLABGARH

HARSH VIHAR

HVDC POLE-1

HVDC POLE-2

413 KV

MUZAFFARNAGAR

BAREILY 1 (*)

BAREILY 2 (*)

BAGPAT 1

BAGPAT 2

PG MEERUT 400 kV BUS

NARA

MODIPURAM-1

MODIPURAM-2

SIMBHAWALI

SHATABDINAGAR

GAJRAULA

NEHTAUR

CHARLA

JAGRITI VIHAR

PG MEERUT 220 kV BUS

225 KV

PG MEERUT 765 kV BUS

PG KOTESHWAR 765 kV BUS

To PG BHIWANI

To WUPTCL Gr. Noida

To PG Moga

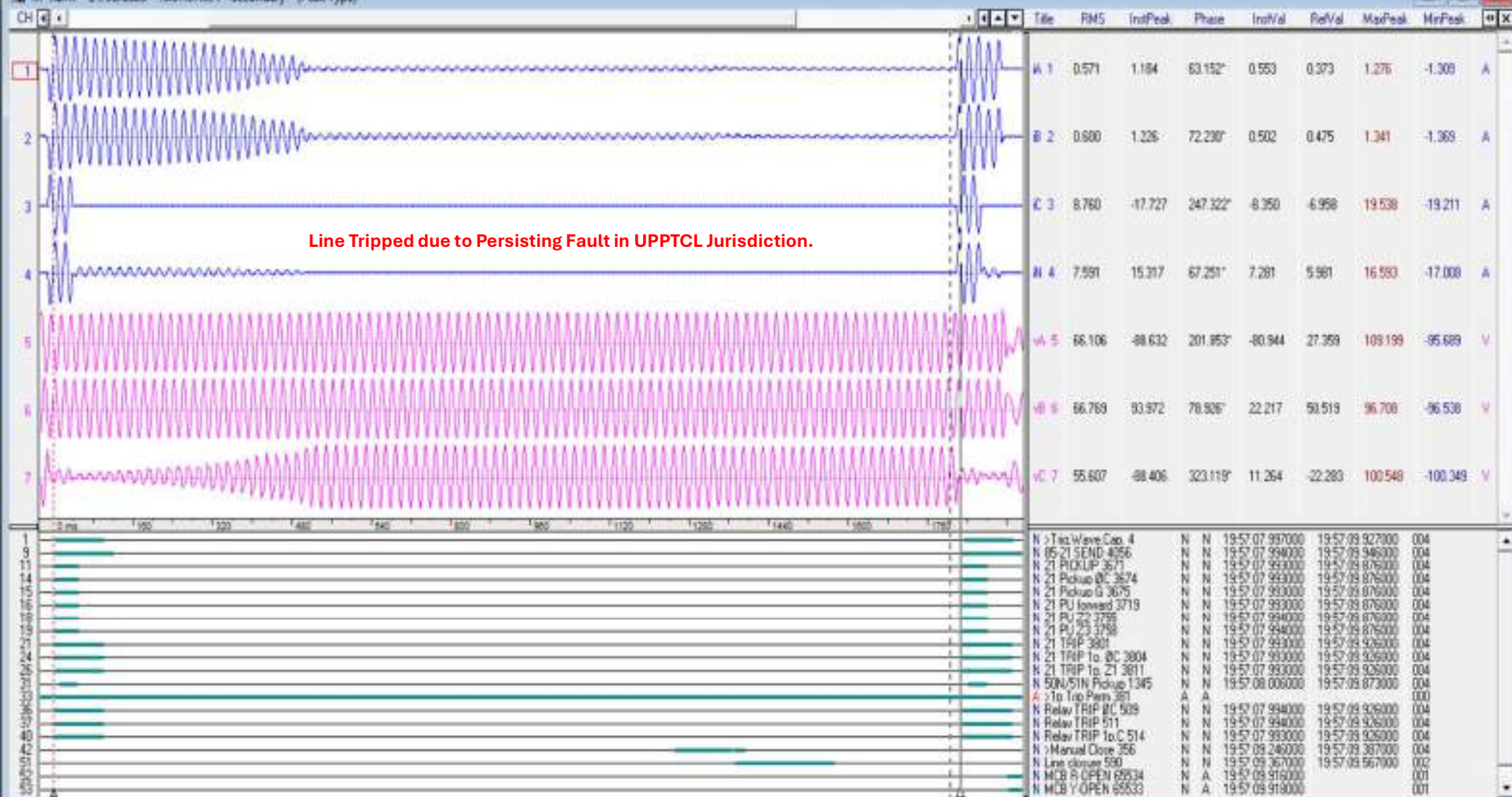
19:57:09.823

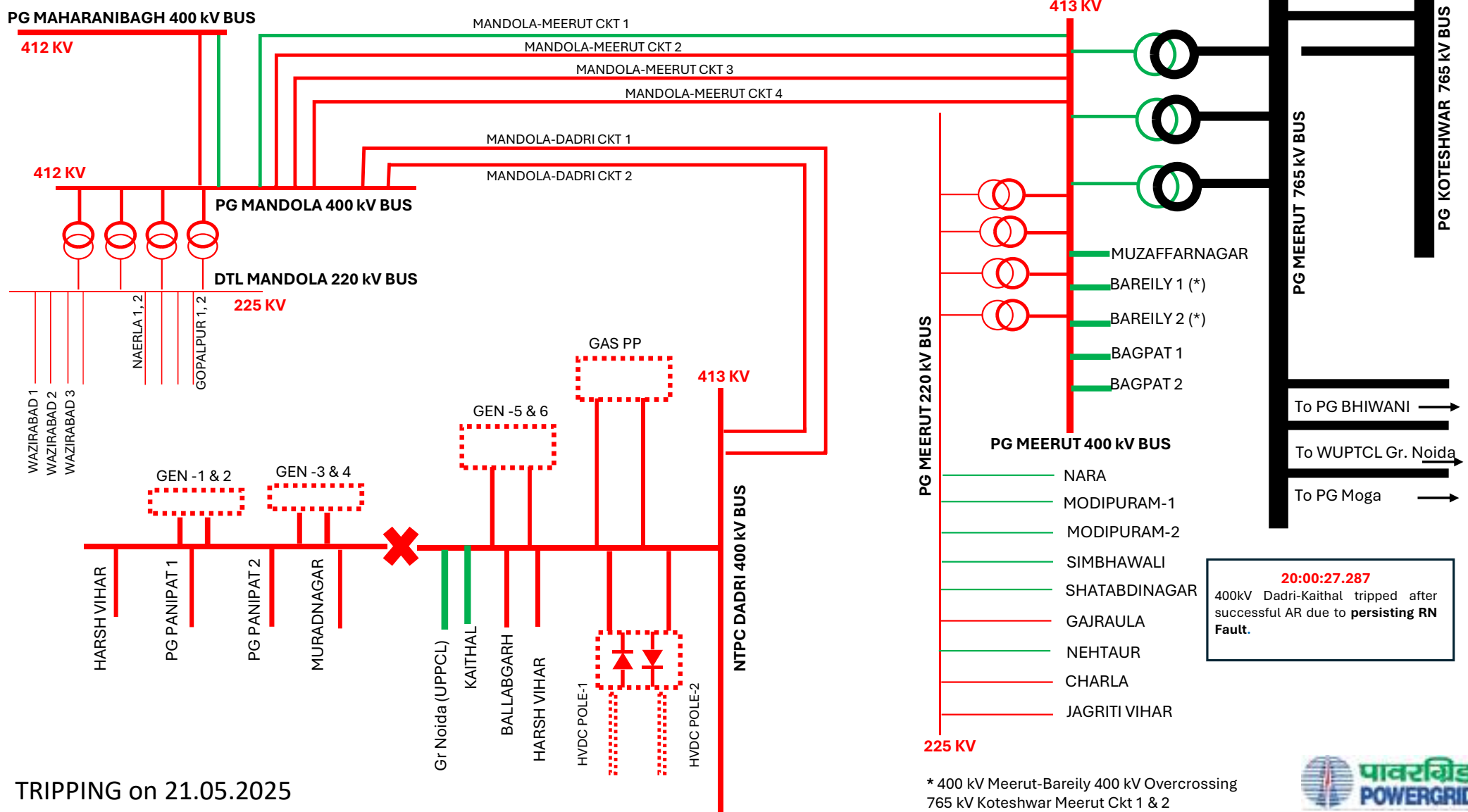
220kV Meerut-Modipuram-II Tripped
on BN Fault. **Fault under UPPTCL
Jurisdiction**

* 400 kV Meerut-Bareilly 400 kV Overcrossing
765 kV Koteswar Meerut Ckt 1 & 2

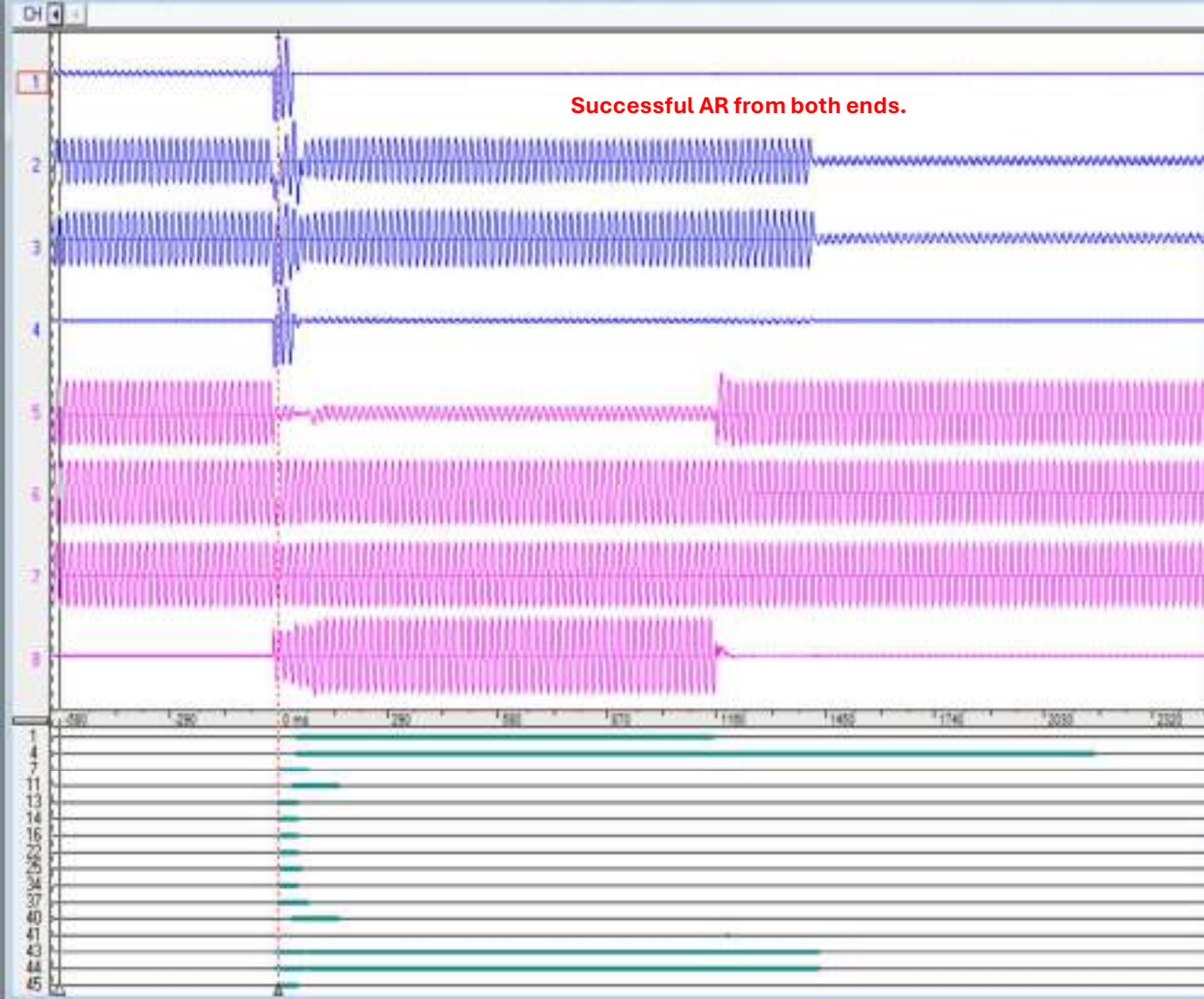


TRIPPING on 21.05.2025



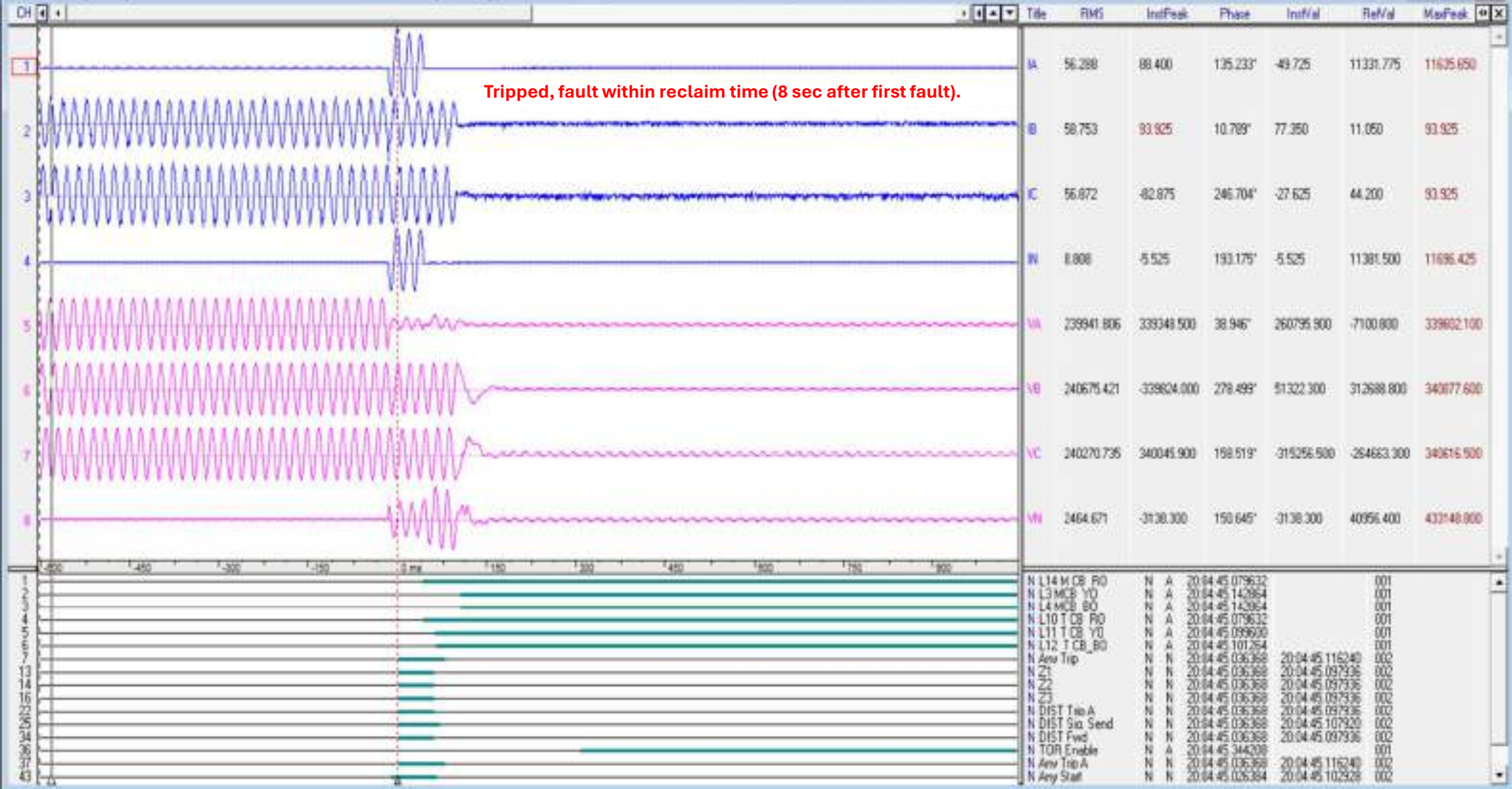






Title	RMS	InstPeak	Phase	InstVal	RefVal	MaxPeak
1A	354.450	502.775	225.805°	-359.125	5442.125	6862.050
1B	351.784	486.200	103.062°	-110.900	-127.875	867.425
1C	351.087	508.300	344.524°	475.150	591.175	646.425
1N	14.574	5.525	340.169°	11.050	5906.225	8077.550
VA	236798.343	335956.608	24.901°	-302418.000	33982.400	418376.600
VB	237719.726	-336590.600	264.449°	-29607.800	119921.100	345276.400
VC	236574.525	334573.900	144.456°	-271764.100	-339221.700	341828.600
VN	1956.004	-1172.900	137.749°	1046.100	-185318.200	401322.000

N L14 M CB_RD	N	N	20:04:37.350968	20:04:38.464184	002
N L10 T CB_RD	N	N	20:04:37.350968	20:04:39.476712	002
N Ans Trip	N	N	20:04:37.307704	20:04:37.387576	002
N L16 M1/2_CR	N	N	20:04:37.340984	20:04:37.467448	002
N Z1	N	N	20:04:37.307704	20:04:37.357624	002
N Z2	N	N	20:04:37.307704	20:04:37.357624	002
N Z3	N	N	20:04:37.307704	20:04:37.357624	002
N DIST Trip A	N	N	20:04:37.307704	20:04:37.357624	002
N DIST Sig_Send	N	N	20:04:37.307704	20:04:37.367608	002
N DIST Fwd	N	N	20:04:37.307704	20:04:37.357624	002
N Ans Trip A	N	N	20:04:37.307704	20:04:37.387576	002
N DIST Chan Recv	N	N	20:04:37.340984	20:04:37.467448	002
N Vv1 Start	N	N	20:04:38.457464	20:04:38.504120	002
N Ans Start	N	N	20:04:37.259384	20:04:38.744552	004
N Rn1 Start	N	N	20:04:37.259384	20:04:38.744552	004
N DIST Start A	N	N	20:04:37.307704	20:04:37.357624	002



PG MAHARANIBAGH 400 kV BUS

412 KV

MANDOLA-MEERUT CKT 1

MANDOLA-MEERUT CKT 2

MANDOLA-MEERUT CKT 3

MANDOLA-MEERUT CKT 4

MANDOLA-DADRI CKT 1

MANDOLA-DADRI CKT 2

PG MANDOLA 400 kV BUS

DTL MANDOLA 220 kV BUS

225 KV

WAZIRABAD 1

WAZIRABAD 2

WAZIRABAD 3

NAERLA 1, 2

GOPALPUR 1, 2

GEN -1 & 2

GEN -3 & 4

GEN -5 & 6

GAS PP

413 KV

NTPC DADRI 400 kV BUS

Gr Noida (UPPCL)

KAITHAL

BALLABGARH

HARSH VIHAR

HVDC POLE-1

HVDC POLE-2

413 KV

PG MEERUT 220 kV BUS

PG MEERUT 400 kV BUS

MUZAFFARNAGAR

BAREILY 1 (*)

BAREILY 2 (*)

BAGPAT 1

BAGPAT 2

NARA

MODIPURAM-1

MODIPURAM-2

SIMBHAWALI

SHATABDINAGAR

GAJRAULA

NEHTAUR

CHARLA

JAGRITI VIHAR

225 KV

PG MEERUT 765 kV BUS

PG KOTESHWAR 765 kV BUS

To PG BHIWANI

To WUPTCL Gr. Noida

To PG Moga

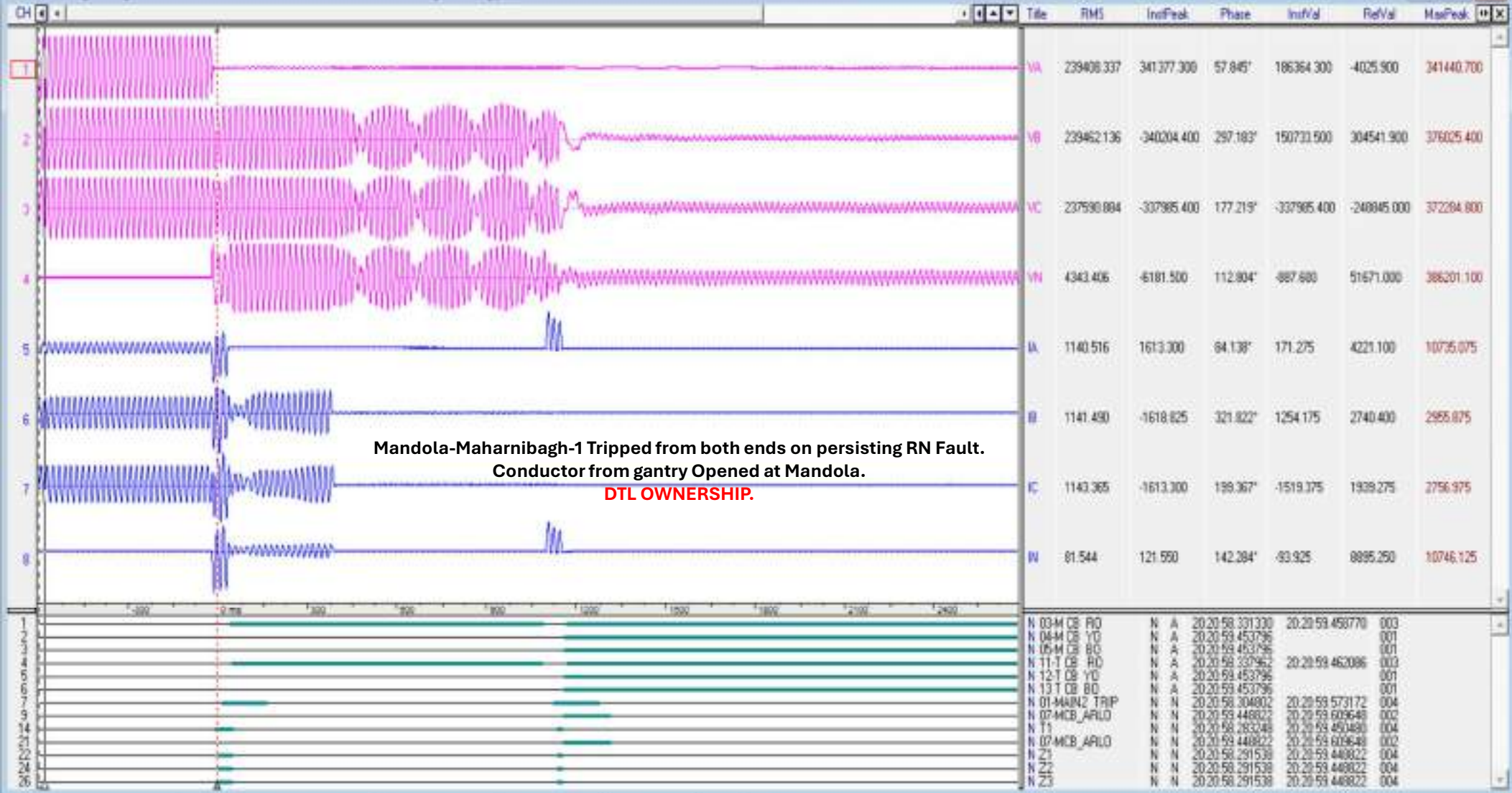
20:20:59.448

400kV Mandola-Maharnibagh-1 on
persisting RN Fault. Conductor from
gantry Opened at Mandola. DTL
OWNERSHIP.

* 400 kV Meerut-Bareilly 400 kV Overcrossing
765 kV Koteswar Meerut Ckt 1 & 2



TRIPPING on 21.05.2025

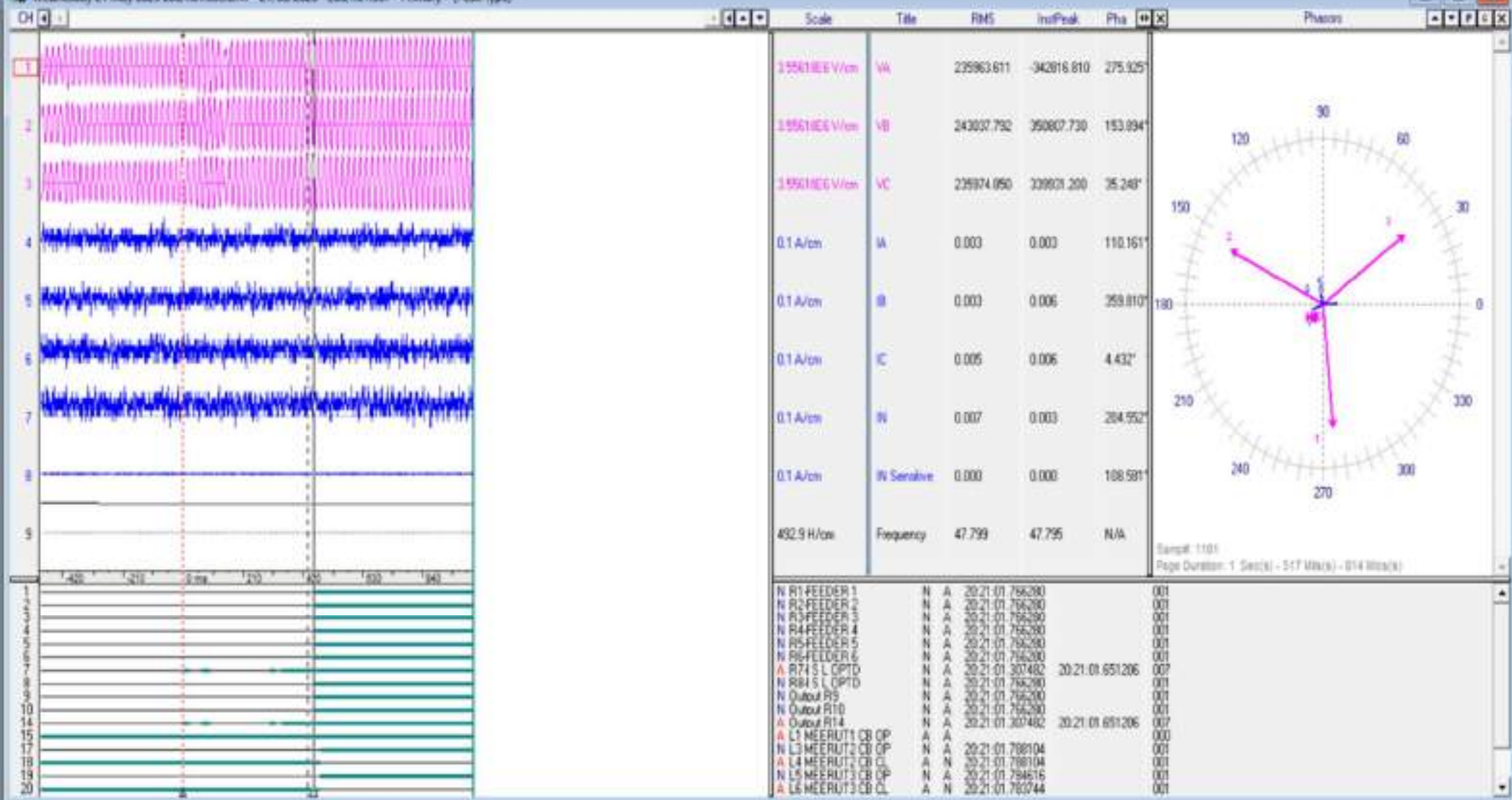




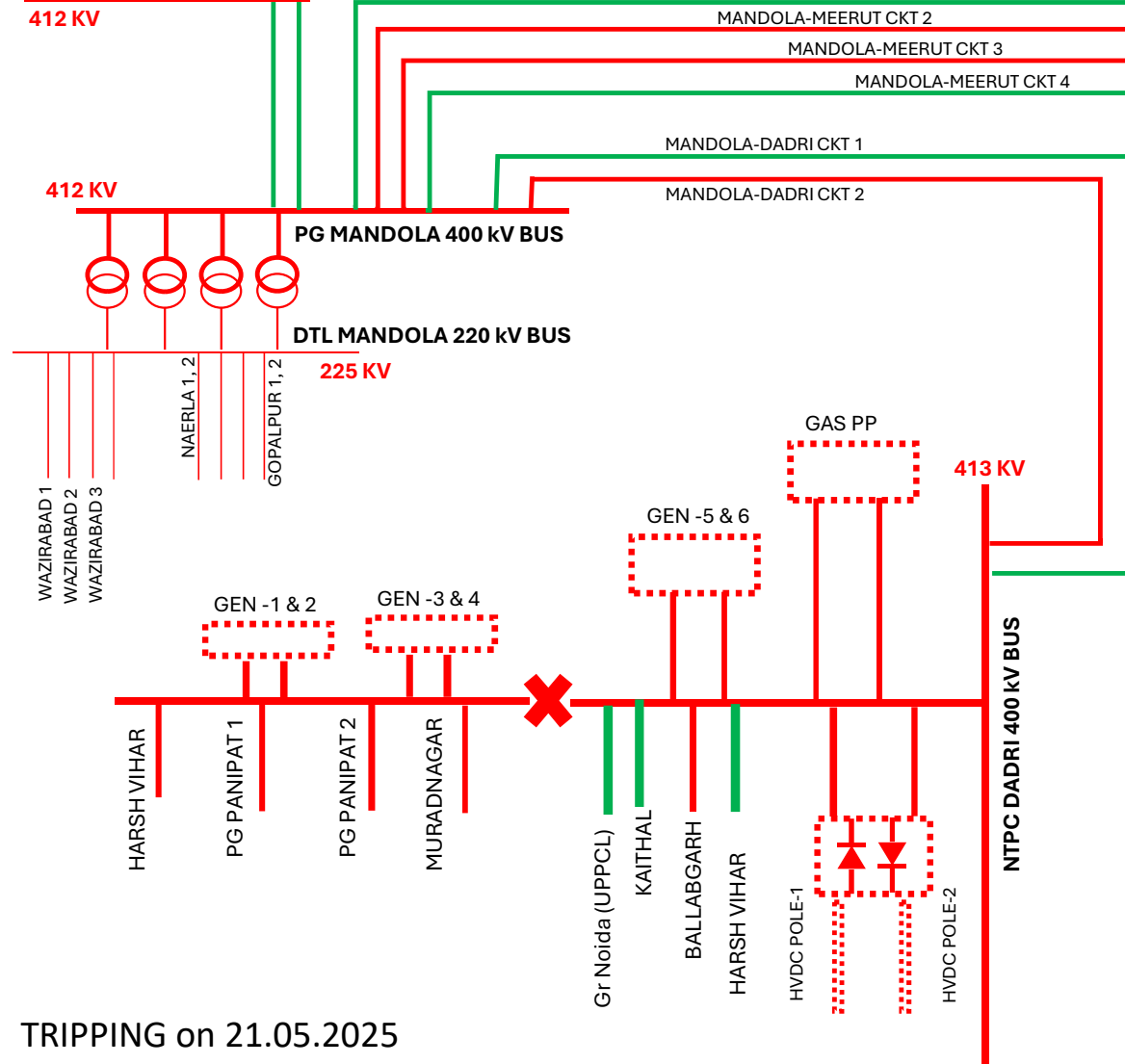
Large power swing was observed on the Mandola-Dadri Line-2 and the frequency at the Mandola Substation began to drop rapidly.

Due to the frequency decline, the under-frequency islanding scheme at Mandola Substation was triggered at **20:21:01.784 Hrs.**

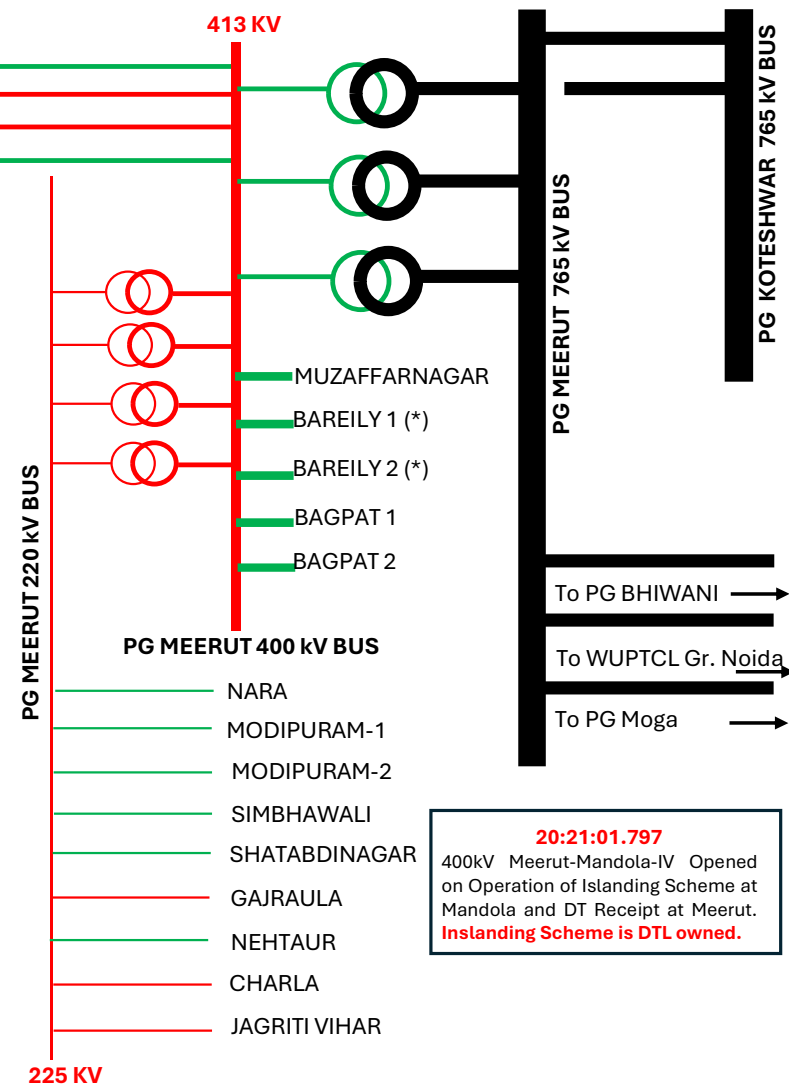
Islanding Scheme at Mandola is owned by DTL and the operating threshold is 47.9 HZ, instantaneous.



PG MAHARANIBAGH 400 kV BUS



413 KV



20:21:01.797

400kV Meerut-Mandola-IV Opened on Operation of Islanding Scheme at Mandola and DT Receipt at Meerut.

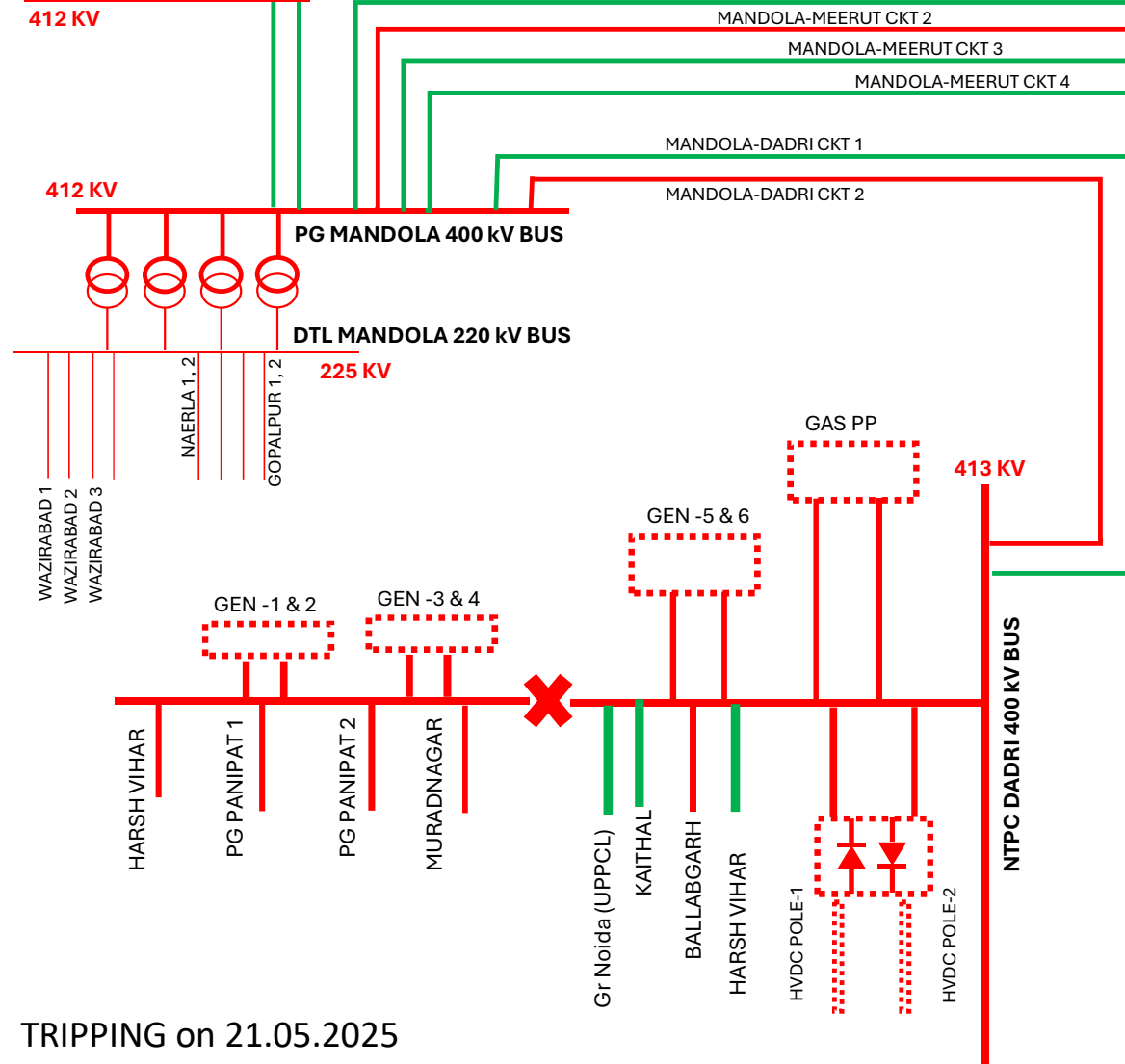
Islanding Scheme is DTL owned.

* 400 kV Meerut-Bareilly 400 kV Overcrossing 765 kV Koteswar Meerut Ckt 1 & 2

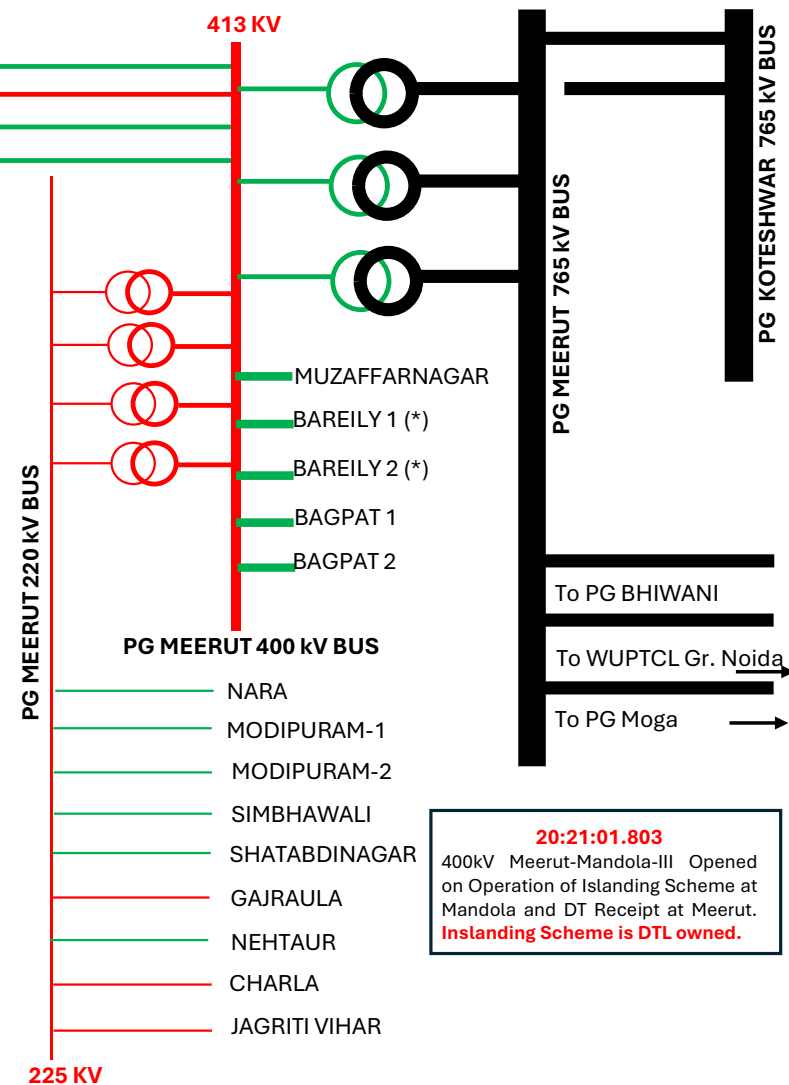


TRIPPING on 21.05.2025

PG MAHARANIBAGH 400 kV BUS



413 KV



20:21:01.803
400kV Meerut-Mandola-III Opened
on Operation of Islanding Scheme at
Mandola and DT Receipt at Meerut.
Islanding Scheme is DTL owned.

* 400 kV Meerut-Bareilly 400 kV Overcrossing
765 kV Koteswar Meerut Ckt 1 & 2



TRIPPING on 21.05.2025

PG MAHARANIBAGH 400 kV BUS

412 KV

MANDOLA-MEERUT CKT 1

MANDOLA-MEERUT CKT 2

MANDOLA-MEERUT CKT 3

MANDOLA-MEERUT CKT 4

MANDOLA-DADRI CKT 1

MANDOLA-DADRI CKT 2

PG MANDOLA 400 kV BUS

DTL MANDOLA 220 kV BUS

225 KV

WAZIRABAD 1

WAZIRABAD 2

WAZIRABAD 3

NAERLA 1, 2

GOPALPUR 1, 2

GEN -1 & 2

GEN -3 & 4

GEN -5 & 6

GAS PP

413 KV

NTPC DADRI 400 kV BUS

HARSH VIHAR

PG PANIPAT 1

PG PANIPAT 2

MURADNAGAR

Gr Noida (UPPCL)

KAITHAL

BALLABGARH

HARSH VIHAR

HVDC POLE-1

HVDC POLE-2

PG MEERUT 220 kV BUS

PG MEERUT 400 kV BUS

NARA

MODIPURAM-1

MODIPURAM-2

SIMBHAWALI

SHATABDINAGAR

GAJRAULA

NEHTAUR

CHARLA

JAGRITI VIHAR

MUZAFFARNAGAR

BAREILY 1 (*)

BAREILY 2 (*)

BAGPAT 1

BAGPAT 2

PG MEERUT 765 kV BUS

PG KOTESHWAR 765 kV BUS

To PG BHIWANI

To WUPTCL Gr. Noida

To PG Moga

20:21:01.808

400kV Meerut-Mandola-II Opened on
Operation of Islanding Scheme at
Mandola and DT Receipt at Meerut.
Inslanding Scheme is DTL owned.

* 400 kV Meerut-Bareilly 400 kV Overcrossing
765 kV Koteswar Meerut Ckt 1 & 2



TRIPPING on 21.05.2025

20:20:58:2785 Hrs.: - Commutation failure detected in Pole 1 & Pole 2

20:20:58:7536 Hrs.: - Commutation failure detected in Pole 1 & Pole 2

20:20:58:9485 Hrs.: - Commutation failure detected in Pole 1 & Pole 2

20:20:59:1420 Hrs.: - Commutation failure detected in Pole 1 & Pole 2

20:20:59:2538 Hrs.: - Commutation failure detected in Pole 1 & Pole 2

20:20:59:5500 Hrs.: - Commutation failure detected in Pole 1 & Pole 2

20:20:59:7130 Hrs.: - Commutation failure detected in Pole 1 & Pole 2

20:20:59:8950 Hrs.: - Commutation failure detected in Pole 1 & Pole 2

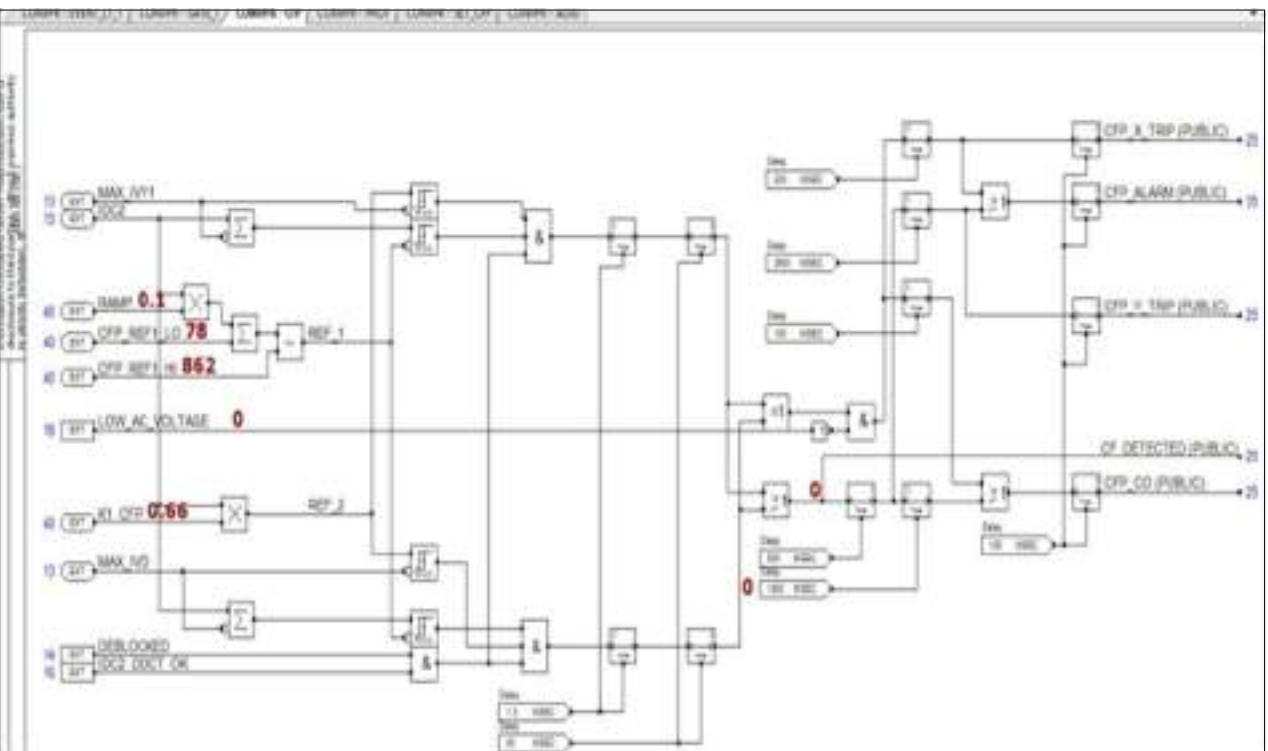
20:21:00:0810 Hrs.: - Commutation failure detected in Pole 1 & Pole 2

20:21:00:2780 Hrs.: - Commutation failure detected in Pole 1 & Pole 2

20:21:00:4865 Hrs.: - Commutation failure detected in Pole 1 & Pole 2

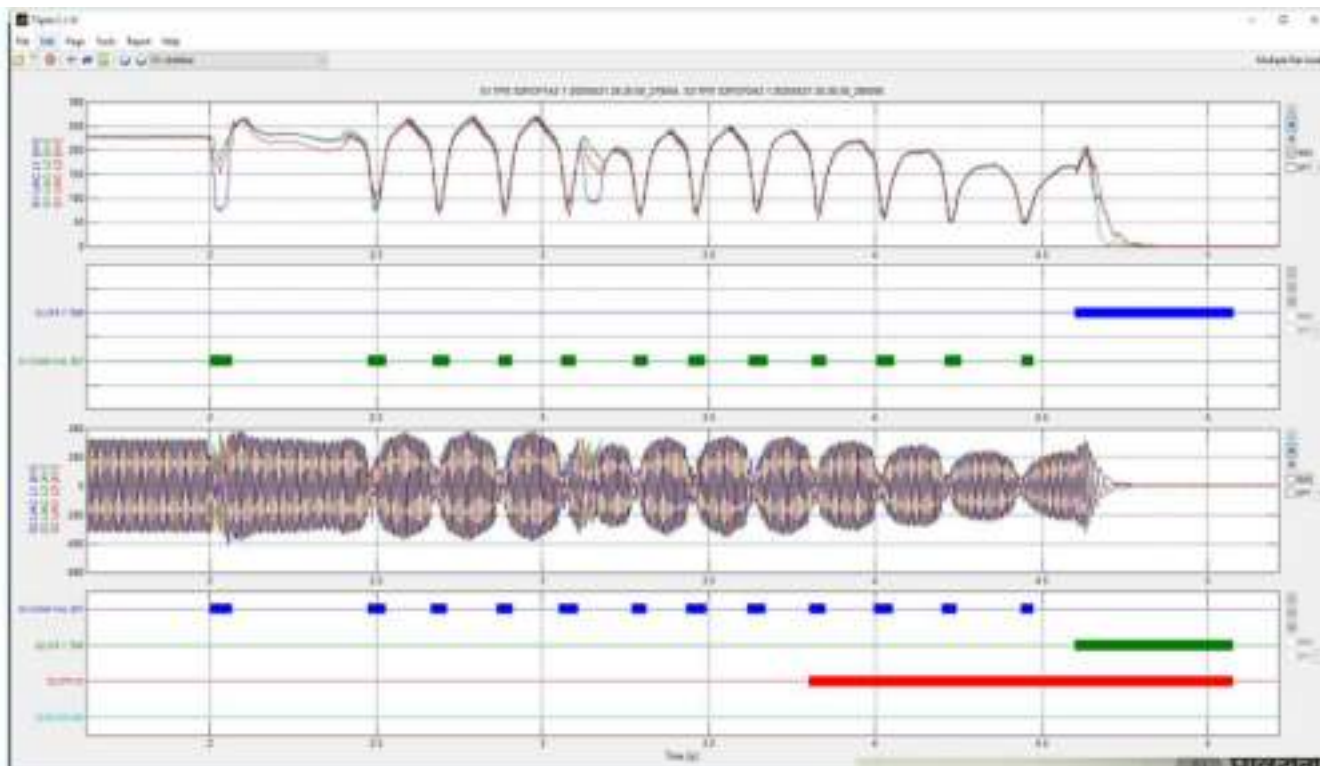
20:21:00:7186 Hrs.: - Commutation failure detected in Pole 1 & Pole 2

20:21:00:8782 Hrs.: - Pole 1 & Pole 2 Tripped on Commutation Failure Protection



As per logic if commutation failure persists for more than 2600 ms then the Protection shall issue a Y Trip to the converters.

Since starting from 20:20:58:2785 Hrs. 12 successive commutation failures were detected and as evident from the Event list these failures were detected at a gap of less than 500ms, at 20:21:00:8782 both Poles of the Rihand Dadri HVDC Link tripped on Commutation failure protection from HVDC Dadri Sub-station.



Rihand-Dadri SPS operated after tripping of Rihand-Ddari-Bi Pole.

This caused the tripping of 220kV Mandola-Narela double-circuit lines and 220kV Mandola-Gopalpur double-circuit lines **from Mandola Sub-station.**

SUBSTATION, MANDOLA								
COUNTER READING OF SPECIAL PROTECTION SCHEME FOR HYDRO BIPOLE								
FEEDER DESIGNATION	GOPALPUR DIRECTION				NARELA DIRECTION			
	CODE A	CODE B	CODE C	CODE D	CODE A	CODE B	CODE C	CODE D
Date	TS	RS	TS	RS	TS	RS	TS	RS
14/5/15	24	19	18	19	24	20	20	20
15/5/15	24	19	18	19	24	20	20	20
16/5/15	24	19	18	19	24	20	20	20
17/5/15	24	19	18	19	24	20	20	20
18/5/15	24	19	18	19	24	20	20	20
19/5/15	24	19	18	19	24	20	20	20
20/5/15	24	19	18	19	24	20	20	20
21/5/15	24	19	18	19	24	20	20	20
22/5/15	24	19	18	19	24	20	20	20

PG MAHARANIBAGH 400 kV BUS

412 KV

MANDOLA-MEERUT CKT 1

MANDOLA-MEERUT CKT 2

MANDOLA-MEERUT CKT 3

MANDOLA-MEERUT CKT 4

MANDOLA-DADRI CKT 1

MANDOLA-DADRI CKT 2

PG MANDOLA 400 kV BUS

DTL MANDOLA 220 kV BUS

225 KV

WAZIRABAD 1

WAZIRABAD 2

WAZIRABAD 3

NAERLA 1, 2

GOPALPUR 1, 2

GEN -1 & 2

GEN -3 & 4

GEN -5 & 6

GAS PP

413 KV

NTPC DADRI 400 kV BUS

Gr Noida (UPPCL)

KAITHAL

BALLABGARH

HARSH VIHAR

HVDC POLE-1

HVDC POLE-2

PG MEERUT 220 kV BUS

PG MEERUT 400 kV BUS

NARA

MODIPURAM-1

MODIPURAM-2

SIMBHAWALI

SHATABDINAGAR

GAJRAULA

NEHTAUR

CHARLA

JAGRITI VIHAR

PG MEERUT 765 kV BUS

PG KOTESHWAR 765 kV BUS

MUZAFFARNAGAR

BAREILY 1 (*)

BAREILY 2 (*)

BAGPAT 1

BAGPAT 2

To PG BHIWANI

To WUPTCL Gr. Noida

To PG Moga

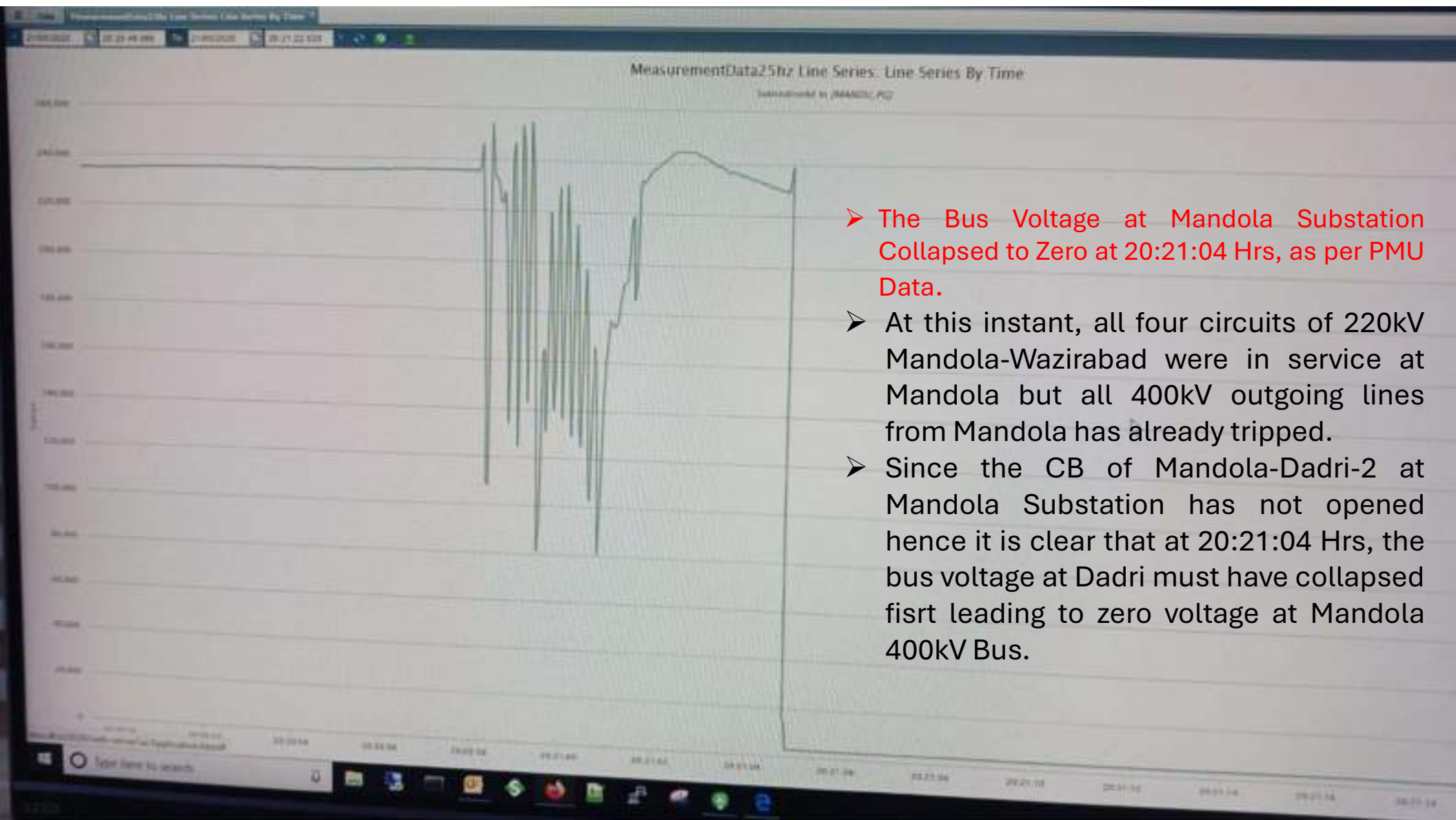
20:21:01.900

220kV Mandola-Narela D/C and
220kV Mandola-Gopalpur D/C lines
tripped on operation of Rihand Dadri
SPS.

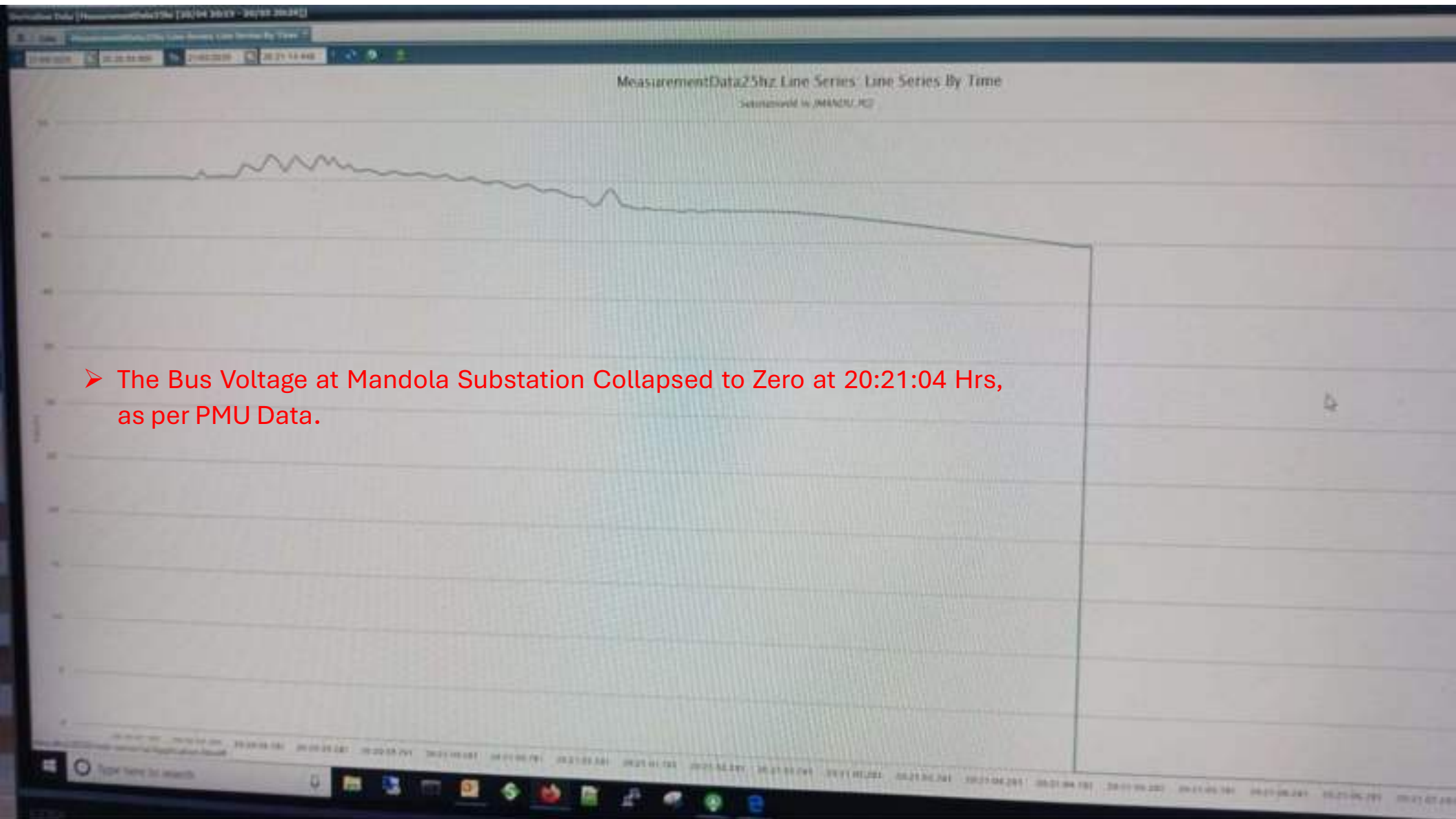
* 400 kV Meerut-Bareilly 400 kV Overcrossing
765 kV Koteswar Meerut Ckt 1 & 2



TRIPPING on 21.05.2025



- The Bus Voltage at Mandola Substation Collapsed to Zero at 20:21:04 Hrs, as per PMU Data.
- At this instant, all four circuits of 220kV Mandola-Wazirabad were in service at Mandola but all 400kV outgoing lines from Mandola has already tripped.
- Since the CB of Mandola-Dadri-2 at Mandola Substation has not opened hence it is clear that at 20:21:04 Hrs, the bus voltage at Dadri must have collapsed first leading to zero voltage at Mandola 400kV Bus.



PG MAHARANIBAGH 400 kV BUS

412 KV

MANDOLA-MEERUT CKT 1

MANDOLA-MEERUT CKT 2

MANDOLA-MEERUT CKT 3

MANDOLA-MEERUT CKT 4

MANDOLA-DADRI CKT 1

MANDOLA-DADRI CKT 2

PG MANDOLA 400 kV BUS

DTL MANDOLA 220 kV BUS

225 KV

WAZIRABAD 1

WAZIRABAD 2

WAZIRABAD 3

NAERLA 1, 2

GOPALPUR 1, 2

GEN -1 & 2

GEN -3 & 4

HARSH VIHAR

PG PANIPAT 1

PG PANIPAT 2

MURADNAGAR

GEN -5 & 6

GAS PP

441 KV

NTPC DADRI 400 kV BUS

Gr Noida (UPPCL)

KAITHAL

BALLABGARH

HARSH VIHAR

HVDC POLE-1

HVDC POLE-2

PG MEERUT 220 kV BUS

PG MEERUT 400 kV BUS

MUZAFFARNAGAR

BAREILY 1 (*)

BAREILY 2 (*)

BAGPAT 1

BAGPAT 2

NARA

MODIPURAM-1

MODIPURAM-2

SIMBHAWALI

SHATABDINAGAR

GAJRAULA

NEHTAUR

CHARLA

JAGRITI VIHAR

PG MEERUT 765 kV BUS

PG KOTESHWAR 765 kV BUS

To PG BHIWANI

To WUPTCL Gr. Noida

To PG Moga

20:21:04.723

400kV Dadri-Ballabgarh (By-Passed at Maharanibagh) tripped on receipt of DT at Ballabgarh end. **Suspected Over-Voltage Operation at Dadri (NTPC). No LINE FAULT.** With This Generators Tripped at Dadri (NTPC)

* 400 kV Meerut-Bareilly 400 kV Overcrossing 765 kV Koteswar Meerut Ckt 1 & 2



TRIPPING on 21.05.2025

PG MAHARANIBAGH 400 kV BUS

412 KV

MANDOLA-MEERUT CKT 1

MANDOLA-MEERUT CKT 2

MANDOLA-MEERUT CKT 3

MANDOLA-MEERUT CKT 4

MANDOLA-DADRI CKT 1

MANDOLA-DADRI CKT 2

PG MANDOLA 400 kV BUS

DTL MANDOLA 220 kV BUS

225 KV

WAZIRABAD 1

WAZIRABAD 2

WAZIRABAD 3

NAERLA 1, 2

GOPALPUR 1, 2

GEN -1 & 2

GEN -3 & 4

HARSH VIHAR

PG PANIPAT 1

PG PANIPAT 2

MURADNAGAR

GEN -5 & 6

GAS PP

Gr Noida (UPPCL)

KAITHAL

BALLABGARH

HARSH VIHAR

HVDC POLE-1

HVDC POLE-2

NTPC DADRI 400 kV BUS

PG MEERUT 220 kV BUS

PG MEERUT 400 kV BUS

MUZAFFARNAGAR

BAREILY 1 (*)

BAREILY 2 (*)

BAGPAT 1

BAGPAT 2

NARA

MODIPURAM-1

MODIPURAM-2

SIMBHAWALI

SHATABDINAGAR

GAJRAULA

NEHTAUR

CHARLA

JAGRITI VIHAR

PG MEERUT 765 kV BUS

PG KOTESHWAR 765 kV BUS

To PG BHIWANI

To WUPTCL Gr. Noida

To PG Moga

20:21:04.723

400kV Dadri-Ballabgarh (By-Passed at Maharanibagh) tripped on receipt of DT at Ballabgarh end. **Suspected Over-Voltage Operation at Dadri (NTPC).** No LINE FAULT. With This Generators Tripped at Dadri (NTPC)

* 400 kV Meerut-Bareilly 400 kV Overcrossing 765 kV Koteswar Meerut Ckt 1 & 2



TRIPPING on 21.05.2025

Multiple Element Tripping Event at 400/220KV Bareilly (UP), 220KV CB Ganj (UP) and 220KV Tanakpur(NH)

At 20:24hrs and 20:51hrs hrs on 31.05.2025

Tripped Elements

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
1.	400/220 kV 315 MVA ICT 3 at Bareilly (UP)	20:24 hrs	20:42 hrs	Tripped due to 220KV Bus-Bar 2 operation
2.	400/220 kV 315 MVA ICT 1 at Bareilly (UP)		21:37 hrs	Hand Tripped
3.	31.42 MW Tanakpur HPS - UNIT 1		20:50 hrs	Tripped due to voltage fluctuation at the same time. Details Awaited
4.	31.42 MW Tanakpur HPS - UNIT 2		21:47 hrs	
5.	220KV Bareilly(UP) – Pant Nagar			Tripped due to 220KV Bus-Bar 2 operation during charging of 400/220 kV 315 MVA ICT 2 at Bareilly (UP)
6.	220KV Bareilly(UP) – <u>Pilibhit Ckt-1</u>			
7.	220KV Bareilly(UP) – <u>Pilibhit Ckt-2</u>			
8.	220KV Bareilly(UP) – Dohna Ckt-2			
9.	220KV Bus-1 at Bareilly (UP)			

S. No	Name of Elements	Outage Time	Revival Time	Reason of tripping
10.	220KV Bareilly – Faridpur Ckt			R-Y phase to phase fault.
11.	400/220 kV 315 MVA ICT 1 at Bareilly (UP)	20:51 hrs	20:56 hrs	Overcurrent protection operated due to Overloading.
12.	220 KV Bus-2 at Bareilly(UP)			Tripped at the same time. Further tripping details awaited
13.	220KV Bareilly(UP) – Dohna Ckt-1			
14.	220KV Bareilly(UP) – CB Ganj2 Ckt-1			
15.	132 KV Mahendra Nagar (PG)-Tanakpur(NH) (PG) Ckt-1		21:50 hrs	Tripped during voltage fluctuation at the same time. Details Awaited
16.	220 KV Tanakpur (NH)-CB Ganj(UP) (PG) Ckt-1		21:57 hrs	
17.	220 KV Tanakpur(NH)-Sitarganj(PG) (PG) Ckt-1		21:43 hrs	
18.	31.42 MW Tanakpur HPS - UNIT 3		21:52 hrs	

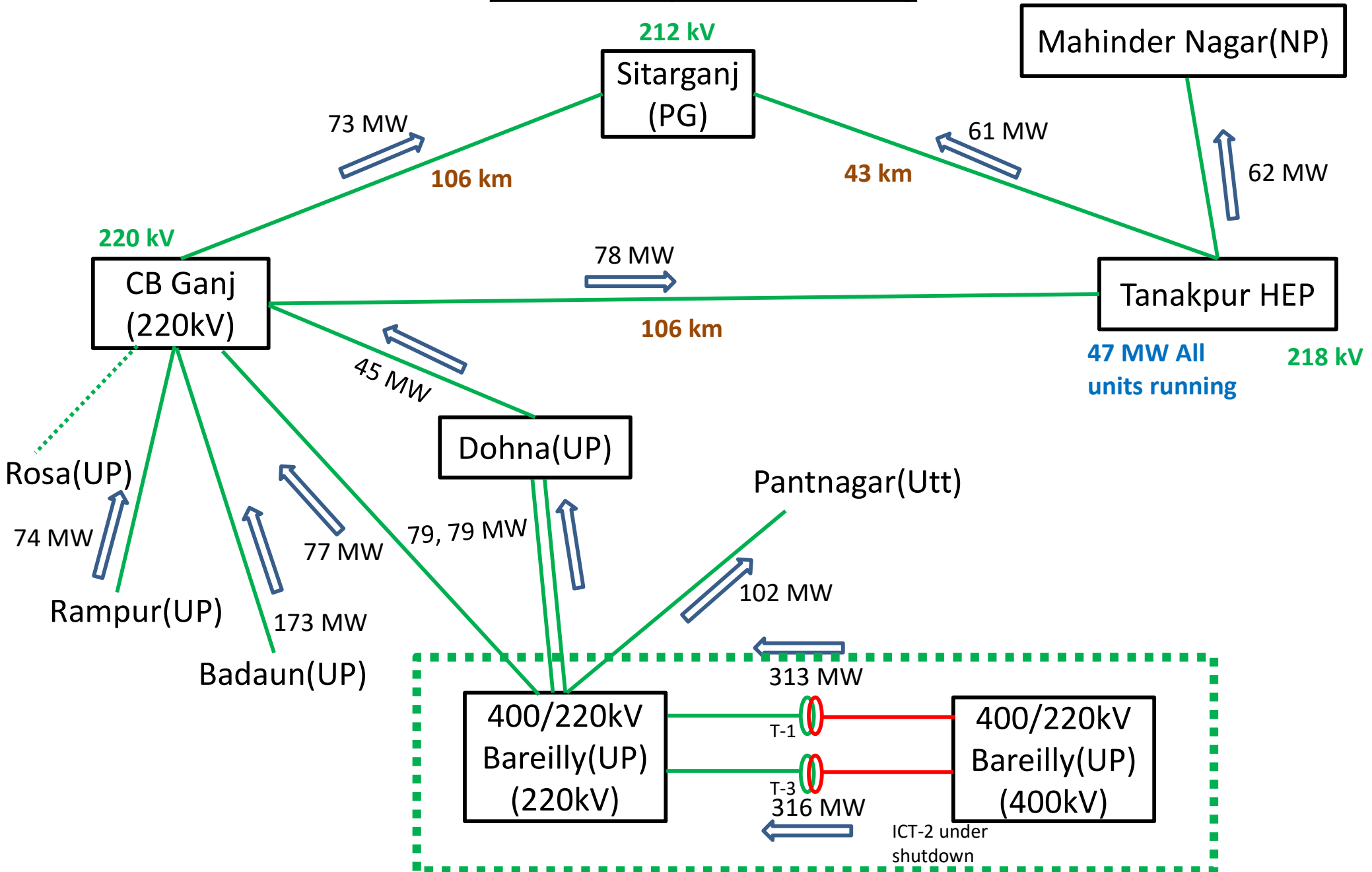
Brief details of the event

- ✓ Total generated power of Tanakpur evacuates through 220 KV Tanakpur (NH)-CBGanj(UP) (PG) Ckt-1, 220 KV Tanakpur(NH)-Sitarganj(PG) (PG) Ckt-1 and 132 KV Mahendra Nagar (PG)-Tanakpur(NH) (PG) Ckt-1. During the antecedent condition, 3X40 MW Tanakpur was generating 46MW.
- ✓ 400/220KV Bareilly(UP) has double main and transfer bus-scheme in both 400KV and 220KV system. 315MVA, 400/220KV ICT 2 was in shutdown condition. The 315MVA, 400/220KV ICT 1 and 3, were loaded 311MW and 315 MW respectively.
- ✓ As reported, at 20:24 hrs, an attempt was made to charge 315MVA, 400/220KV ICT 2. After ~15 sec of ICT charging, 220KV Bus-Bar Zone 2 (Y-ph differential) protection operated. As per PMU, there was no fault in system during bus bar operation. Exact reason of bus bar protection yet to be received.
- ✓ Subsequently 220KV lines to Pantnagar, CB Ganj-II, Dohna-II, Pilibhit-II and ICT-3 tripped due to 220KV Bus-Bar II protection operation at Bareilly. At the same time, 315MVA, 400/220KV ICT 1 was hand-tripped for equipment safety.
- ✓ As per PMU at Bareilly(PG), R-Y phase to phase fault observed was observed with delayed fault clearance of 440msec. As reported, 220kV Bareilly-Faridpur line tripped on fault occurred due to snapping of line side jumper (after CT).
- ✓ After tripping of ICTs at 400/220 kV Bareilly (UP), line loading of 220KV CB Ganj-Sitarganj ckt reached up to the level of 270MW, it leads to voltage oscillation/ fluctuation in the Tanakpur-Sitarganj-Cbganj complex. Voltage fluctuation was in the range of 125kV to 218kV on 220KV bus voltage and at the same time, two units at Tanakpur HEP (Unit-1 and Unit-2) also tripped. As a result, 533 MW load loss was observed in UP and approx. 38 MW of generation loss was observed in Tanakpur HEP.

Brief details of the event

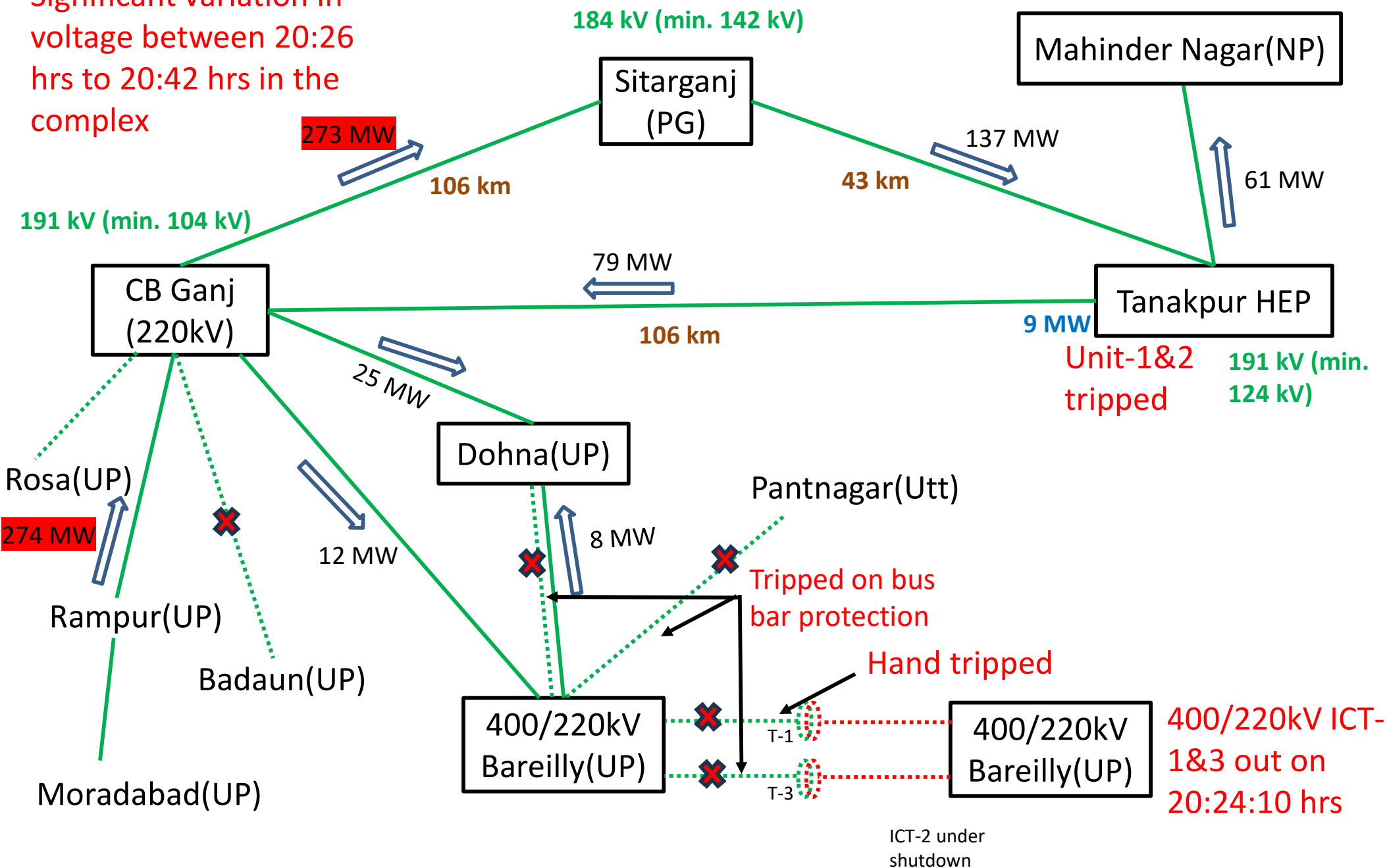
- ✓ At 20:42 hrs, 315MVA, 400/220KV ICT 1 was revived.
- ✓ As reported at 20:51 hrs, 315MVA, 400/220KV ICT 1 loading increase to 347MW. As a result, the ICT tripped on Overcurrent protection. This again led to voltage fluctuations in the Tanakpur-Sitarganj-CBH Ganj complex as a result 220 KV Tanakpur (NH)-CBGanj(UP) (PG) Ckt-1, 220 KV Tanakpur(NH)-Sitarganj(PG) (PG) Ckt-1 and 132 KV Mahendra Nagar (PG)-Tanakpur(NH) (PG) Ckt-1 (Affected the power supply to Nepal) tripped simultaneously, which further led to 138 MW load loss in UP and approx. 31 MW of generation loss in Tanakpur HEP (Unit-3 tripped, Unit-1 and Unit-2 were already out).
- ✓ As per PMU at Barilly(PG), R-Y phase to phase fault was observed at 20:24hrs with delayed fault clearance of 440msec.
- ✓ This led to complete blackout of Tanakpur HEP.
- ✓ As per SCADA, at 20:24 Hrs, as per SCADA approx. 533MW load loss was observed in UP and approx. 38 MW of generation loss was observed at Tanakpur HEP.
- ✓ At 20:51 Hrs, as per SCADA approx. 138MW load loss was observed in UP and approx. 31 MW of generation loss was observed at Tanakpur HEP.

Tanakpur HEP, CB Ganj Complex loading profile during antecedent scenario (at 20:24 hrs)

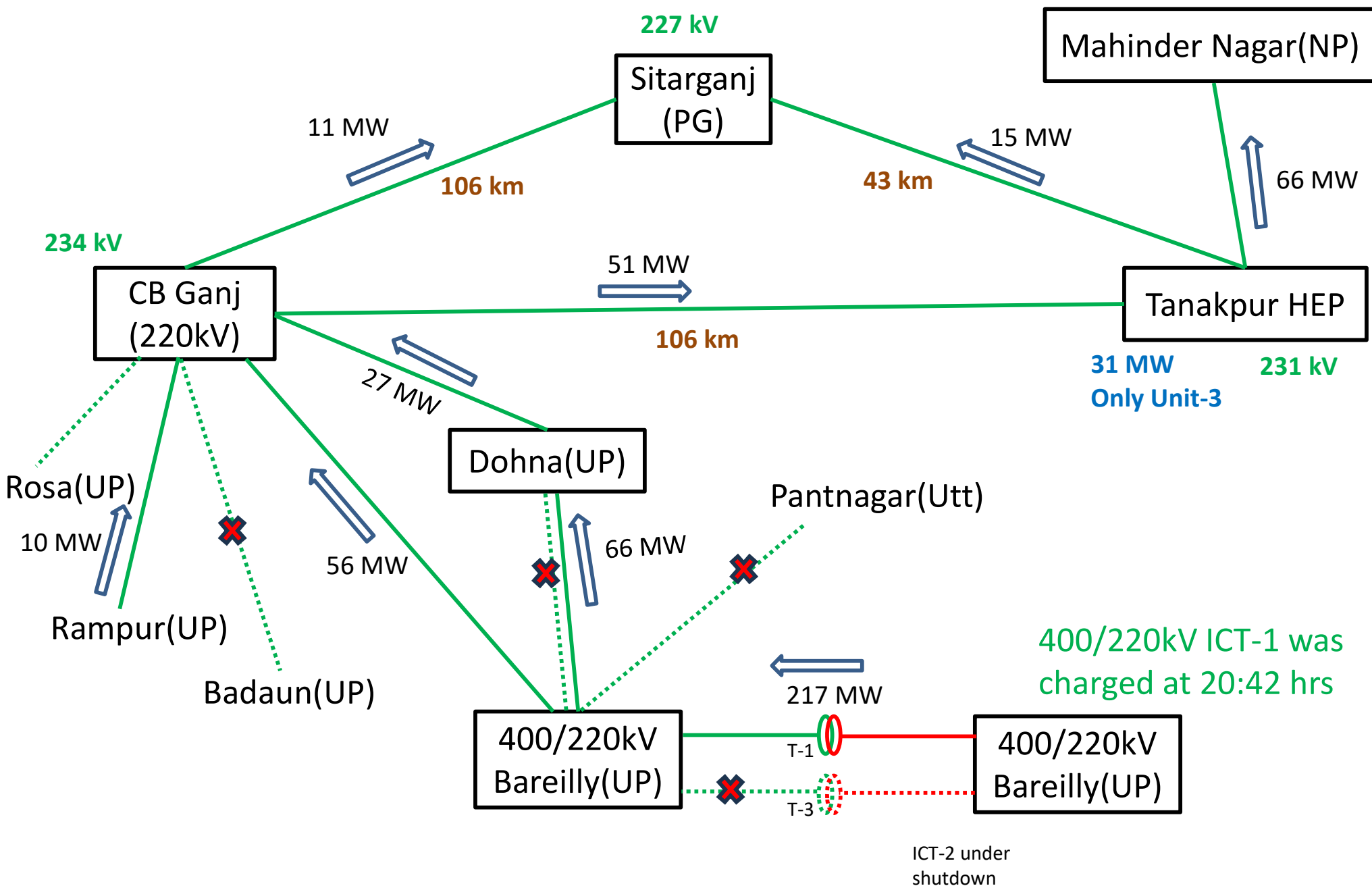


Tanakpur HEP, CB Ganj Complex loading profile at 20:26:20 hrs

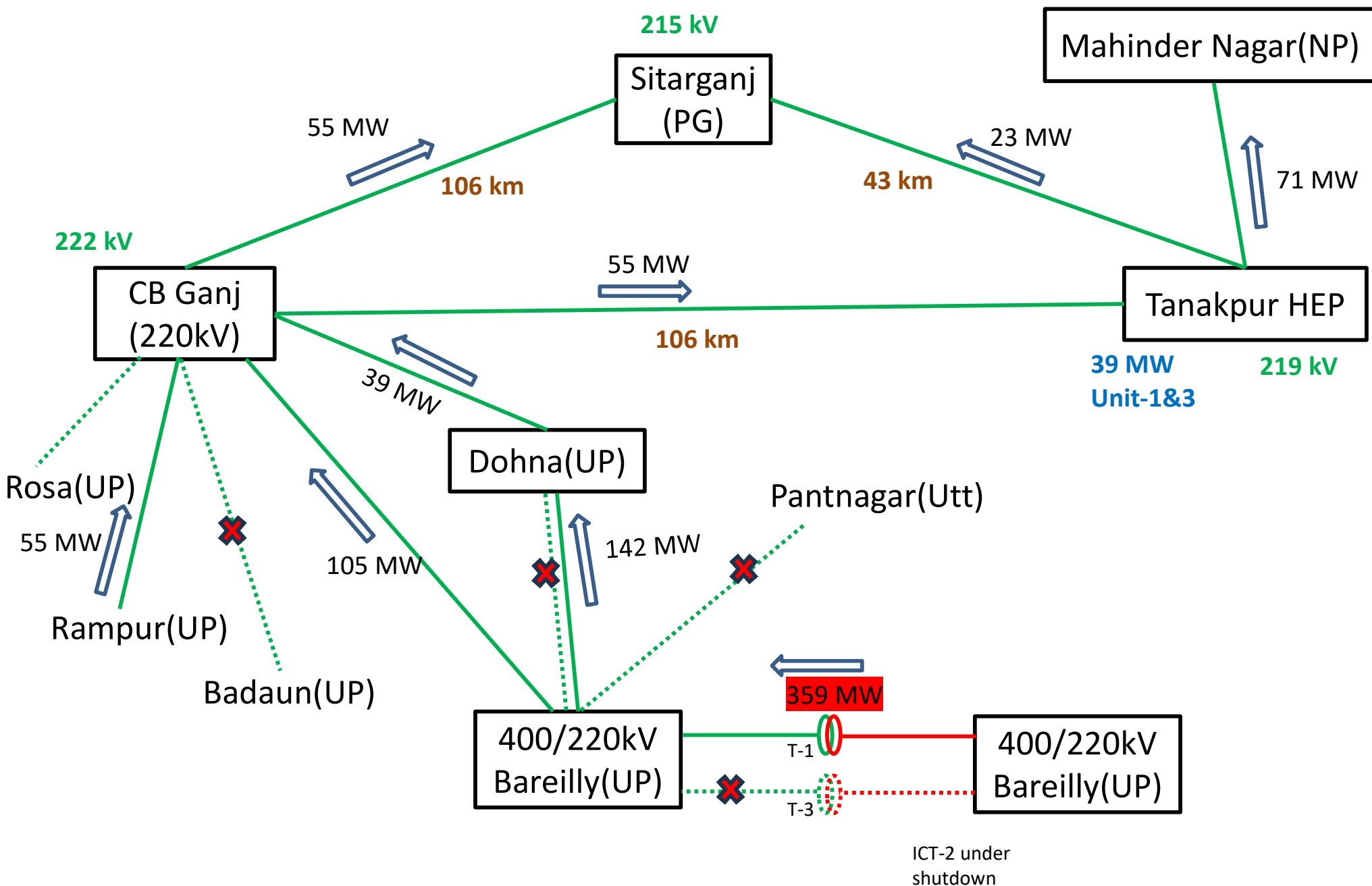
Significant variation in voltage between 20:26 hrs to 20:42 hrs in the complex



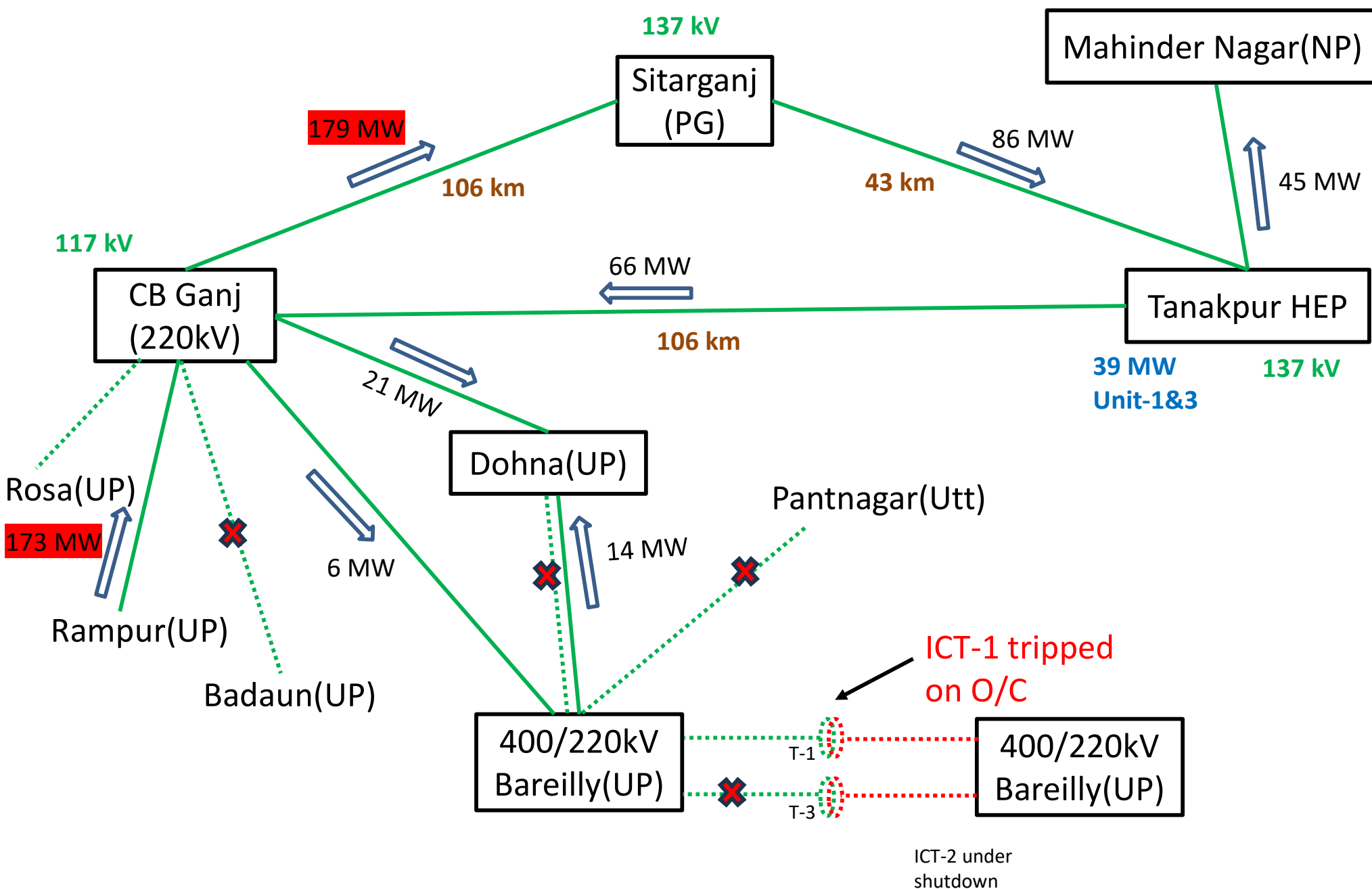
Tanakpur HEP, CB Ganj Complex loading profile at 20:42:20 hrs



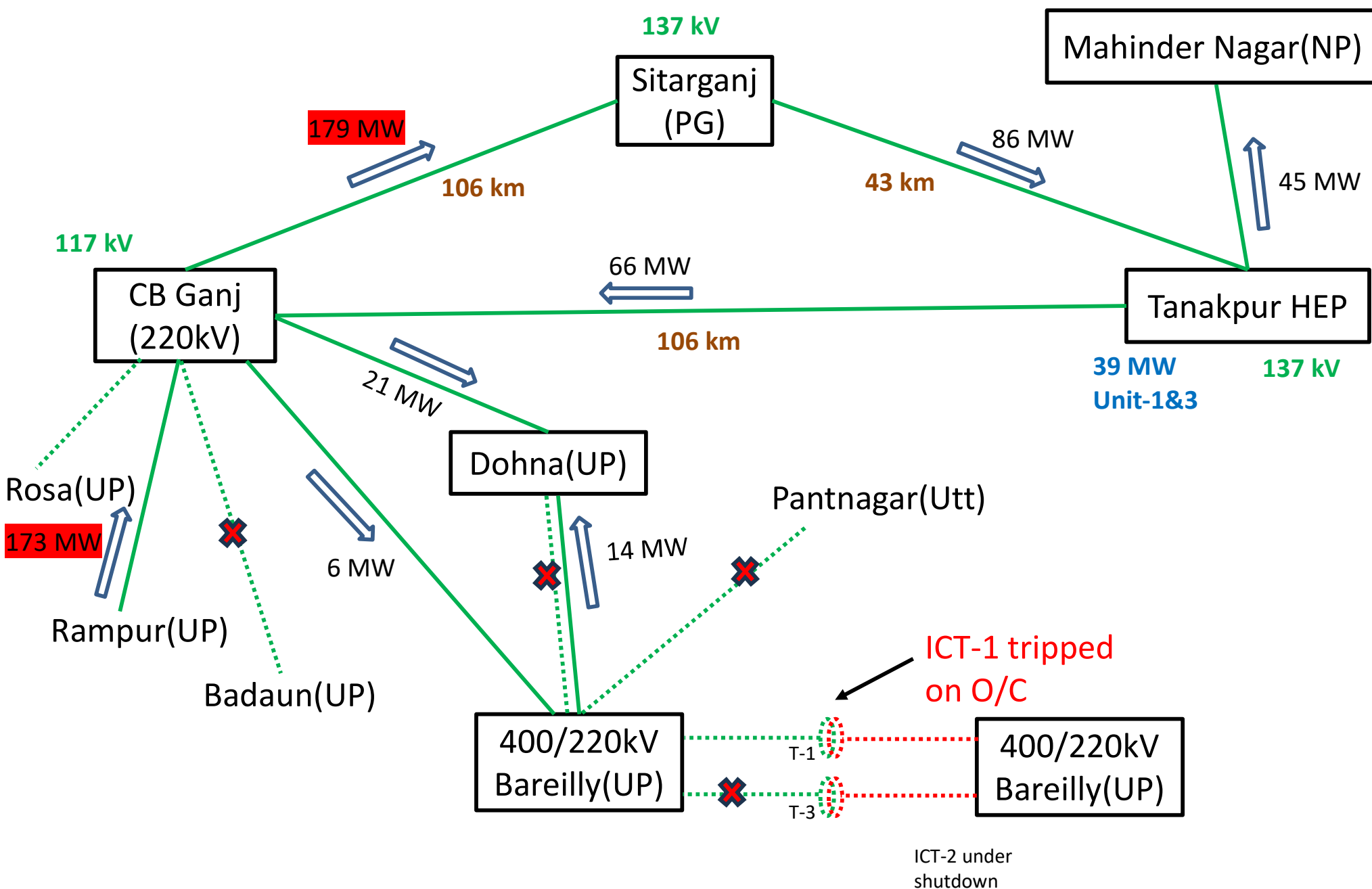
Tanakpur HEP, CB Ganj Complex loading profile at 20:51:50 hrs



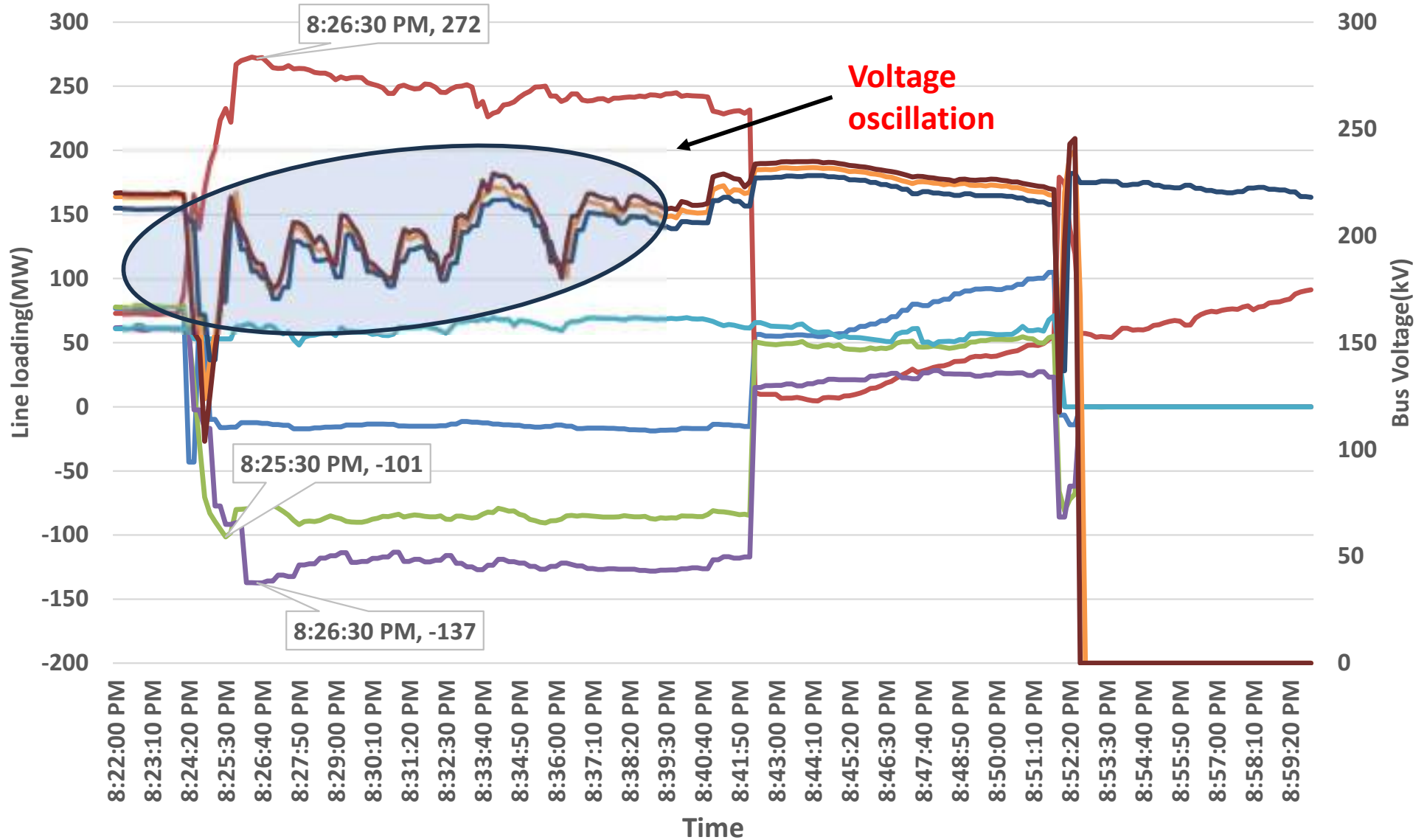
Tanakpur HEP, CB Ganj Complex loading profile at 20:52:00 hrs



Tanakpur HEP, CB Ganj Complex loading profile at 20:52:10 hrs



Loading and voltage profile of Tanakpur, CB Ganj complex

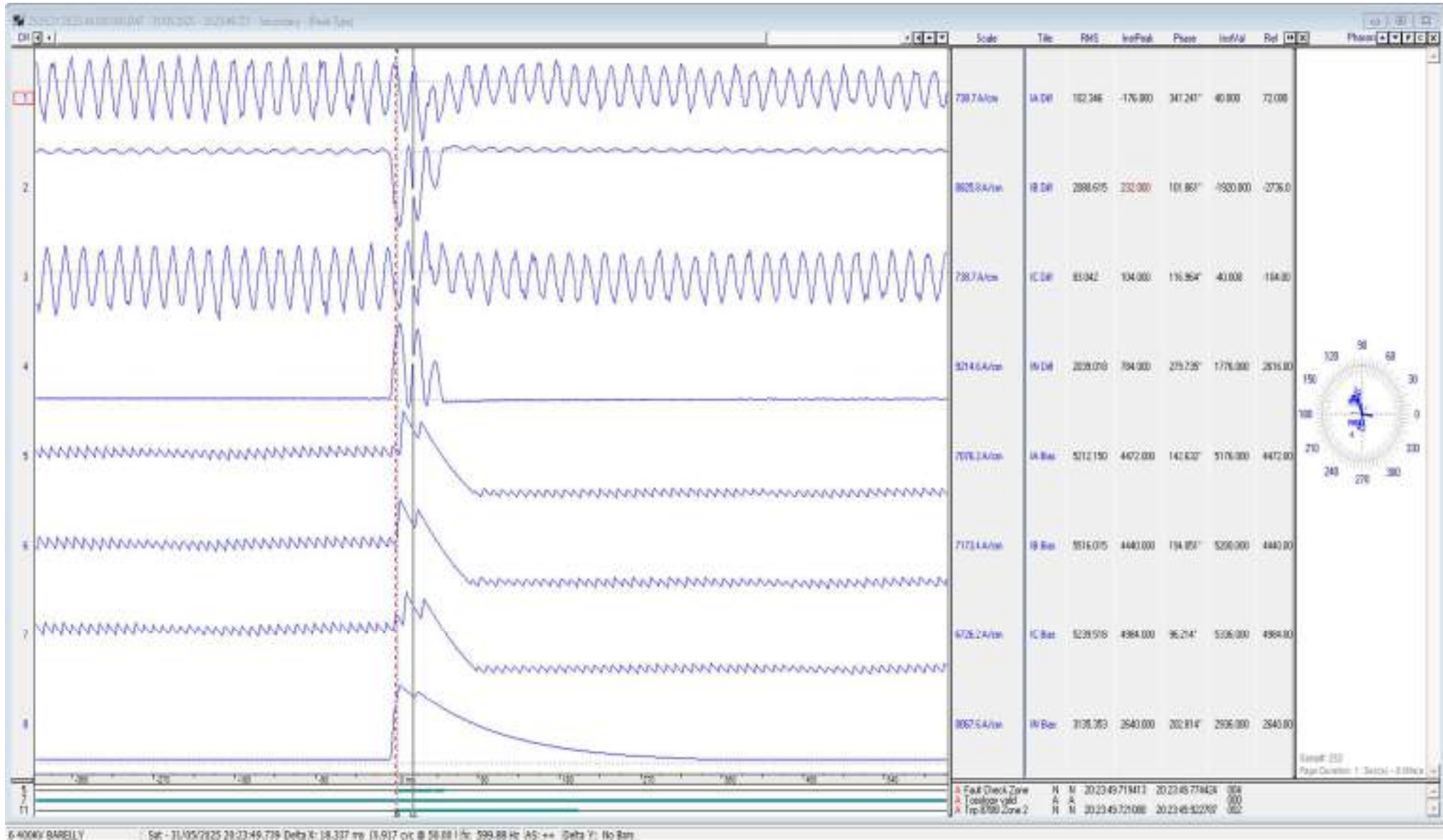


- 220kV Bareilly-CB Ganj Line
- 220kV CB Ganj-Tanakpur Line
- 132kV Tanakpur-Mahindernagar Line
- 220kV Sitarganj Voltage
- 220kV CB Ganj-Sitarganj Line
- 220kV Tanakpur-Sitarganj Line
- 220kV Tanakpur Voltage
- 220kV CB Ganj Voltage

SCADA SOE

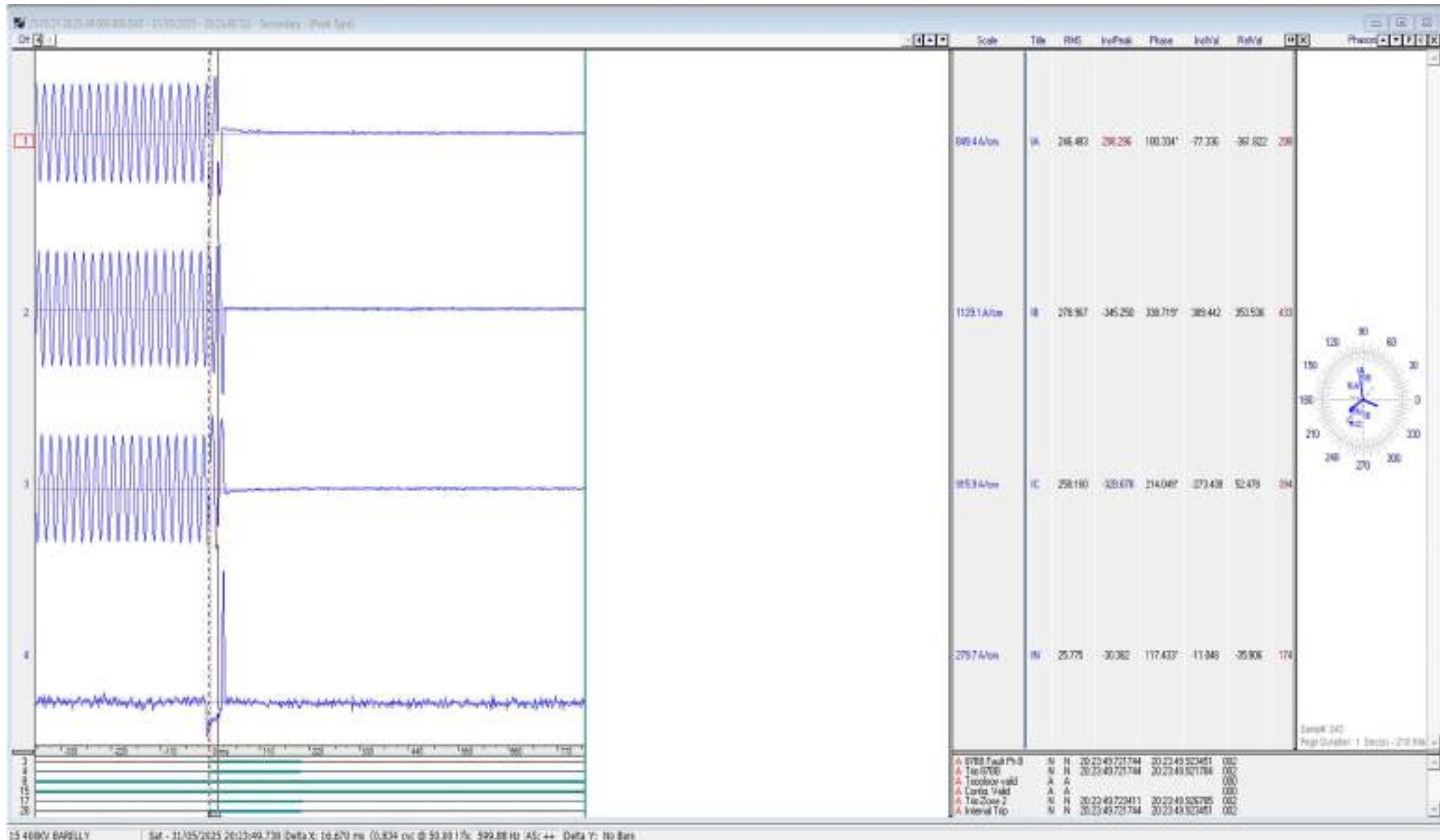
Time	Station Name	Voltage	Element Name	Element Type	Element Status	Remarks
20:23:45,371	CBGA1_UP	400kV	04T2	Circuit Breaker	Close	400/220kV ICT-2 at Bareilly(UP) was charged
20:24:00,087	CBGA1_UP	220kV	07PNTNG	Circuit Breaker	disturbe	Elements i.e., 220kV line to Pantnagar, CB Ganj-II, Dohna-II, Pilibhit-II and ICT-3 tripped on bus bar protection operation of 220kV Bus-2 at Bareilly(UP)
20:24:00,091	CBGA1_UP	220kV	15CBGA22	Circuit Breaker	disturbe	
20:24:00,099	CBGA1_UP	220kV	14DOHNA2	Circuit Breaker	Open	
20:24:00,114	CBGA1_UP	220kV	13PLBT22	Circuit Breaker	Open	
20:24:00,123	CBGA1_UP	220kV	83T3	Circuit Breaker	Open	
20:24:09,214	CBGA1_UP	400kV	01T1	Circuit Breaker	disturbe	400/220kV ICT-1 at Bareilly(UP) was hand tripped
20:24:09,216	CBGA1_UP	220kV	03T1	Circuit Breaker	disturbe	
20:24:20,512	DOHNA_UP	220kV	06ROSA	Circuit Breaker	Open	
20:24:35,480	CBGA1_UP	220kV	08SHJHA1	Circuit Breaker	Open	220kV CB Ganj-Faridpur line tripped
20:24:42,895	CBGA1_UP	400kV	04T2	Circuit Breaker	Open	
20:25:05,918	CBGA1_UP	400kV	83T3	Circuit Breaker	Open	
20:30:25	TANAKPUR	220kV	01G1	Circuit Breaker	disturbe	
20:30:25	TANAKPUR	220kV	02G2	Circuit Breaker	Open	
20:41:23,112	CBGA1_UP	400kV	01T1	Circuit Breaker	Close	400/220kV ICT-1 at Bareilly(UP) was charged
20:42:04,137	CBGA1_UP	220kV	03T1	Circuit Breaker	Close	
20:44:01,680	CBGA1_UP	400kV	04T2	Circuit Breaker	Close	
20:51:49,064	CBGA1_UP	400kV	01T1	Circuit Breaker	disturbe	400/220kV ICT-1 at Bareilly(UP) tripped
20:51:49,067	CBGA1_UP	220kV	03T1	Circuit Breaker	disturbe	
20:53:24,248	DOHNA_UP	132kV	14T2	Circuit Breaker	Open	
20:53:27,008	DOHNA_UP	132kV	13T1	Circuit Breaker	Open	
20:53:29,443	DOHNA_UP	220kV	04T1	Circuit Breaker	Open	
20:53:30,203	DOHNA_UP	220kV	05T2	Circuit Breaker	Close	
20:53:31,217	DOHNA_UP	220kV	05T2	Circuit Breaker	Open	
20:55:46,230	CBGA1_UP	220kV	05DOHNA	Circuit Breaker	Open	
20:55:56,893	CBGA1_UP	220kV	06CBGA21	Circuit Breaker	Open	
20:56:22,898	CBGA2_UP	132kV	07T2	Circuit Breaker	Open	

DR of 220KV Bus-Bar 2 at 400/220KV Bareilly (20:23:49 hrs)



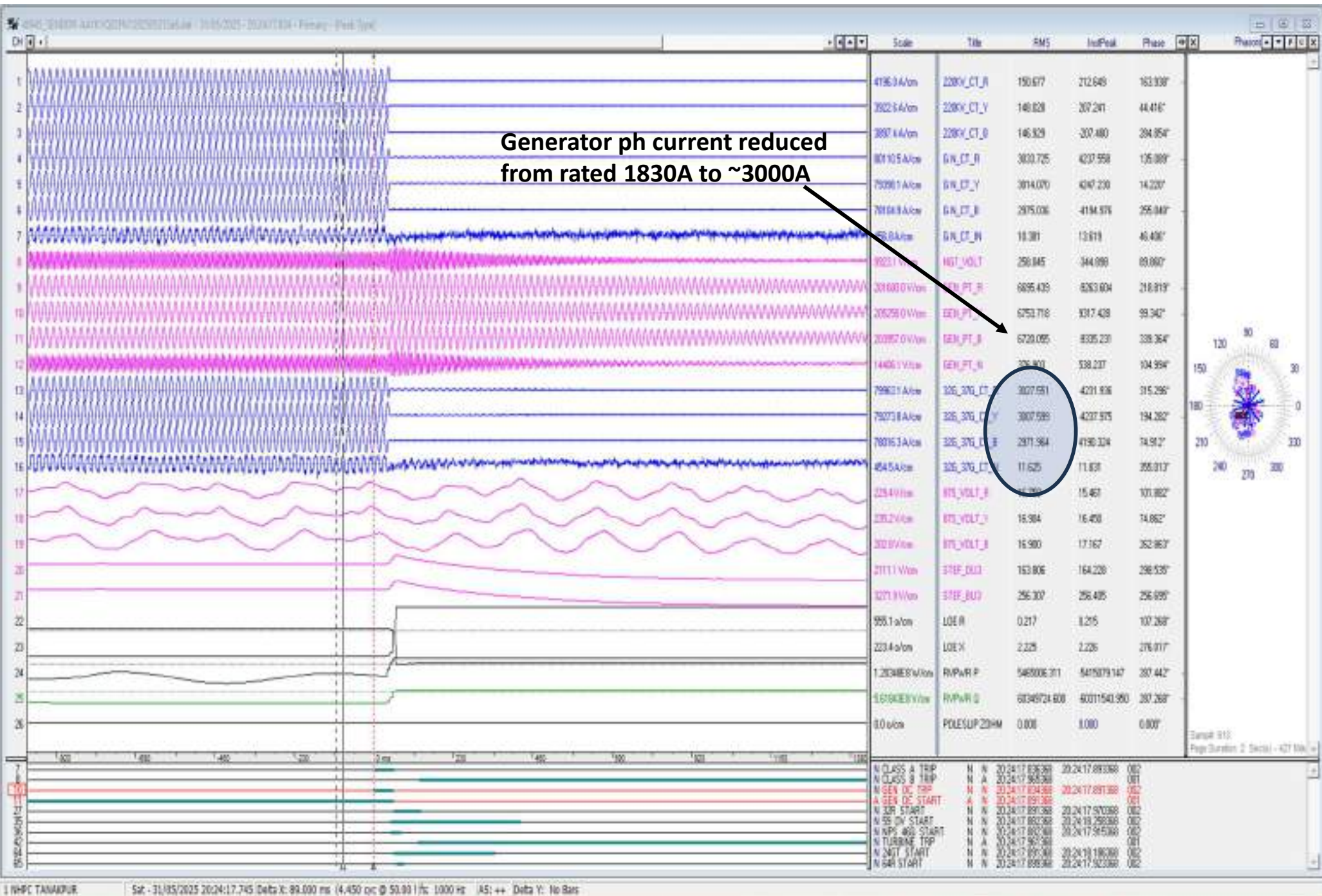
✓ 220KV, Zone-2 Y-phase Bus-Bar protection operated

DR of 220KV Dohna Line (Bus-Bar Relay) at Bareilly (20:23:49 hrs)

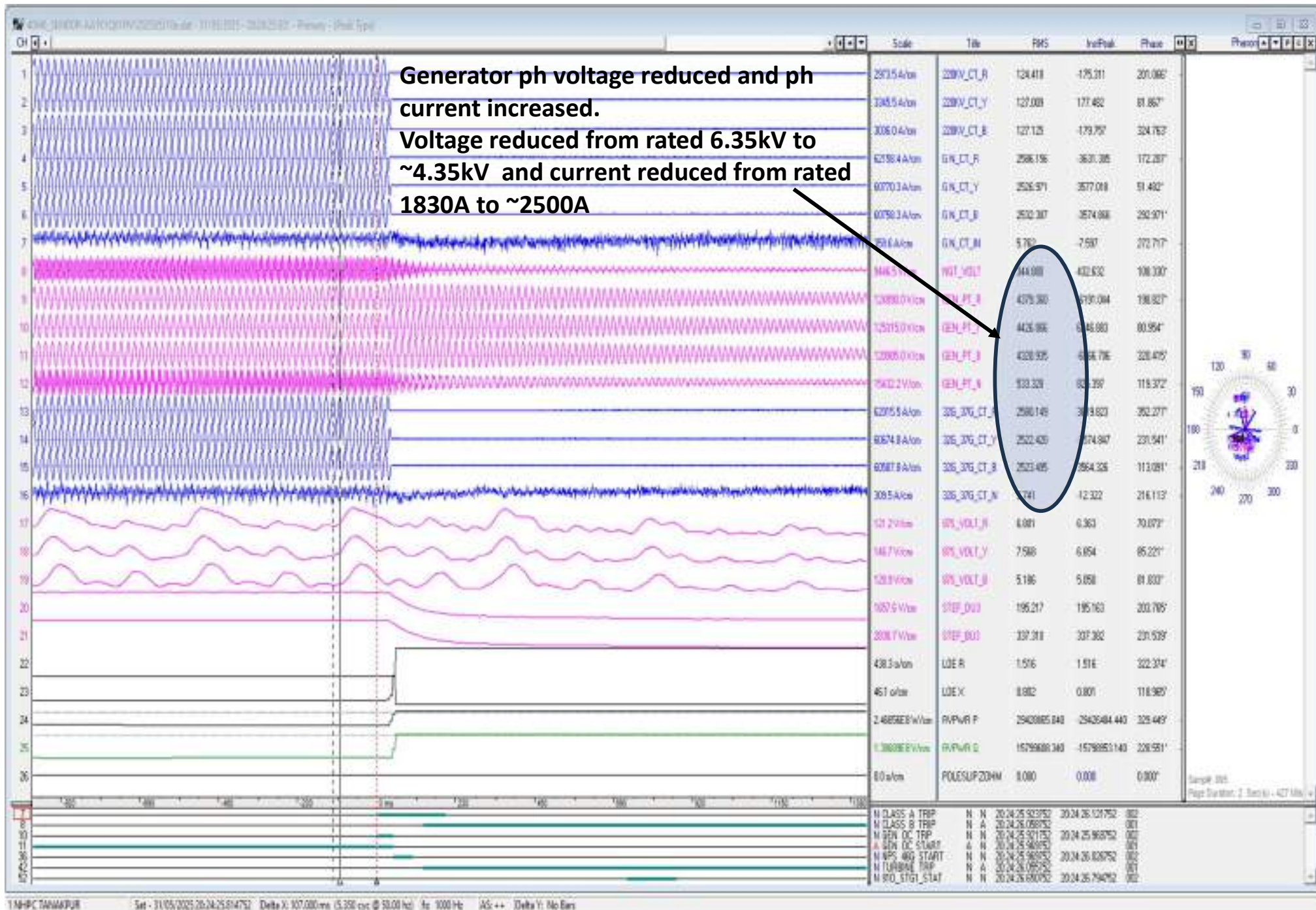


✓ No fault was observed during bus bar protection operation.

DR of Unit-2 at Tanakpur HEP (20:24:17hrs)



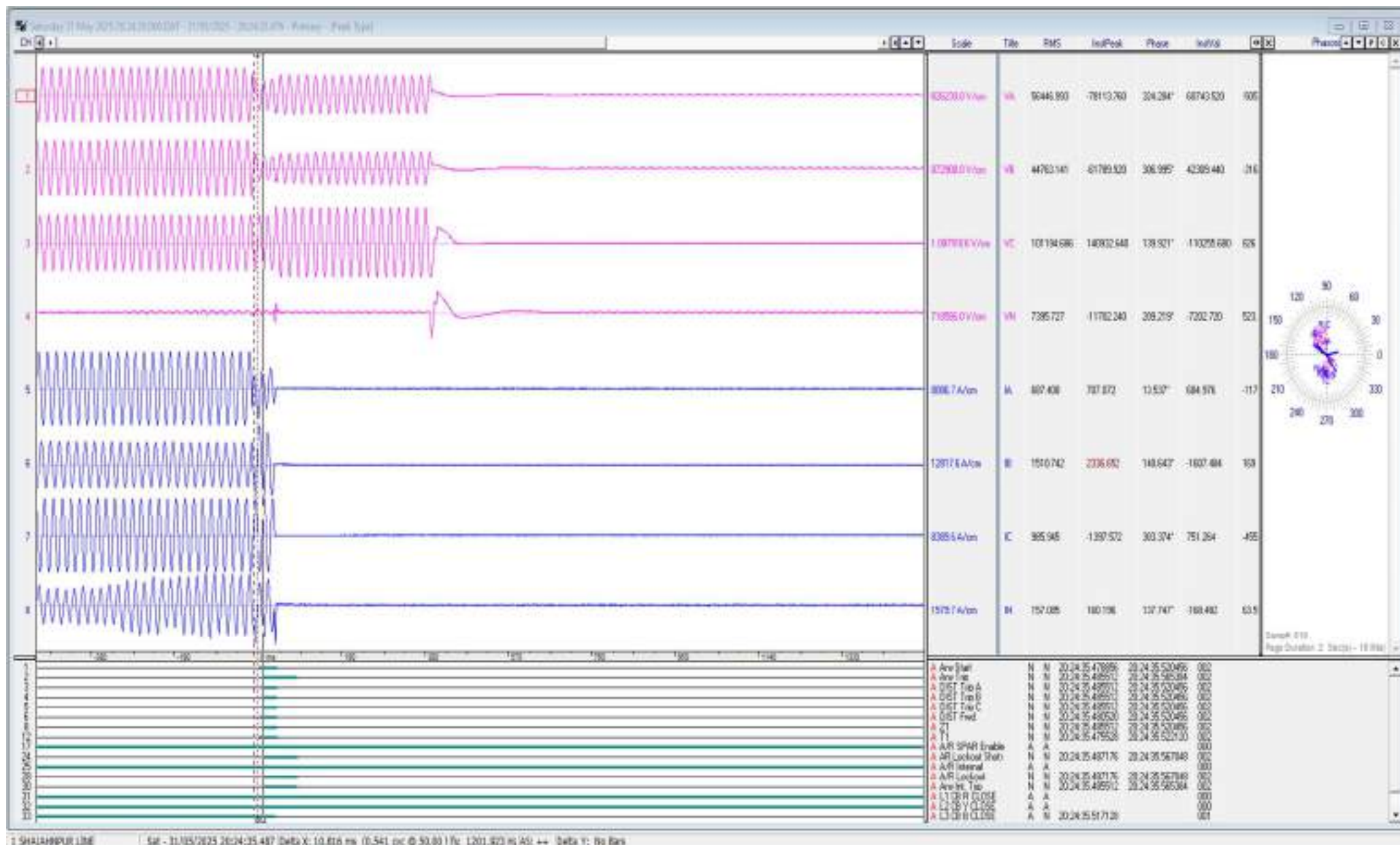
DR of Unit-1 at Tanakpur HEP (20:24:25 hrs)



Event logger of Unit-1 at Tanakpur HEP (20:24:25 hrs)

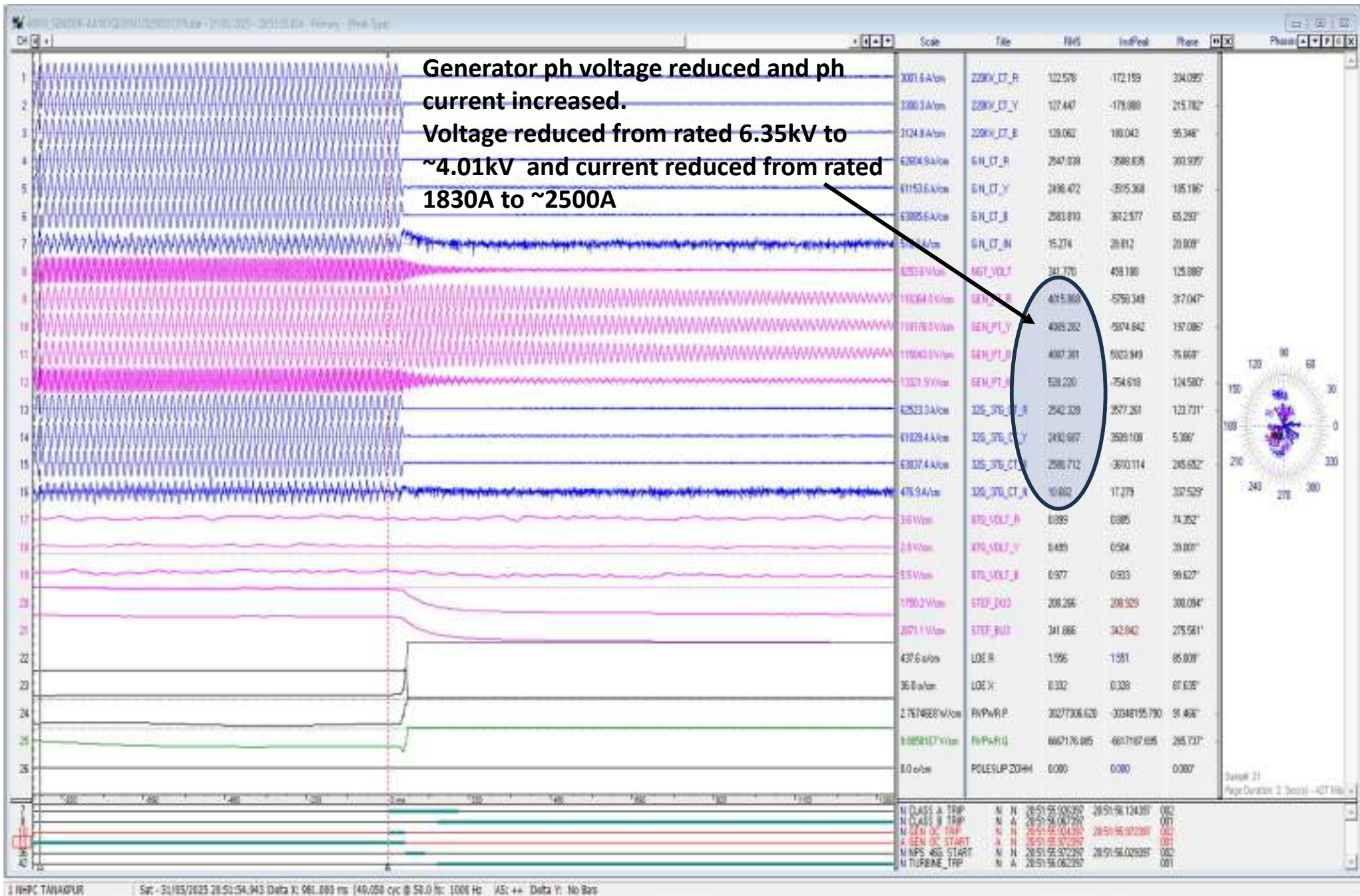
Type	Date & Time	Signal name	Status
P	31-05-2025 20:24:26	TURBINE_TRP	On
P	31-05-2025 20:24:26	NPS_46G_START	Off
P	31-05-2025 20:24:25	NPS_46G_START	On
P	31-05-2025 20:24:25	GEN_OC_TRP	Off
P	31-05-2025 20:24:25	GEN_OC_START	Off
P	31-05-2025 20:24:25	CLASS_A_TRIP	On
P	31-05-2025 20:24:25	GEN_OC_TRP	On
P	31-05-2025 20:24:20	GEN_OC_START	On
P	31-05-2025 20:24:20	NPS_46G_START	Off
P	31-05-2025 20:24:20	GEN_OC_START	Off
P	31-05-2025 20:24:20	GEN_OC_START	On
P	31-05-2025 20:24:20	NPS_46G_START	On
P	31-05-2025 20:24:16	GEN_OC_START	Off
P	31-05-2025 20:24:11	GEN_OC_START	On
P	31-05-2025 14:02:55	NPS_46G_START	Off

DR of 220KV Bareilly(UP)(end) –Faridpur Ckt (20:24:35 hrs)

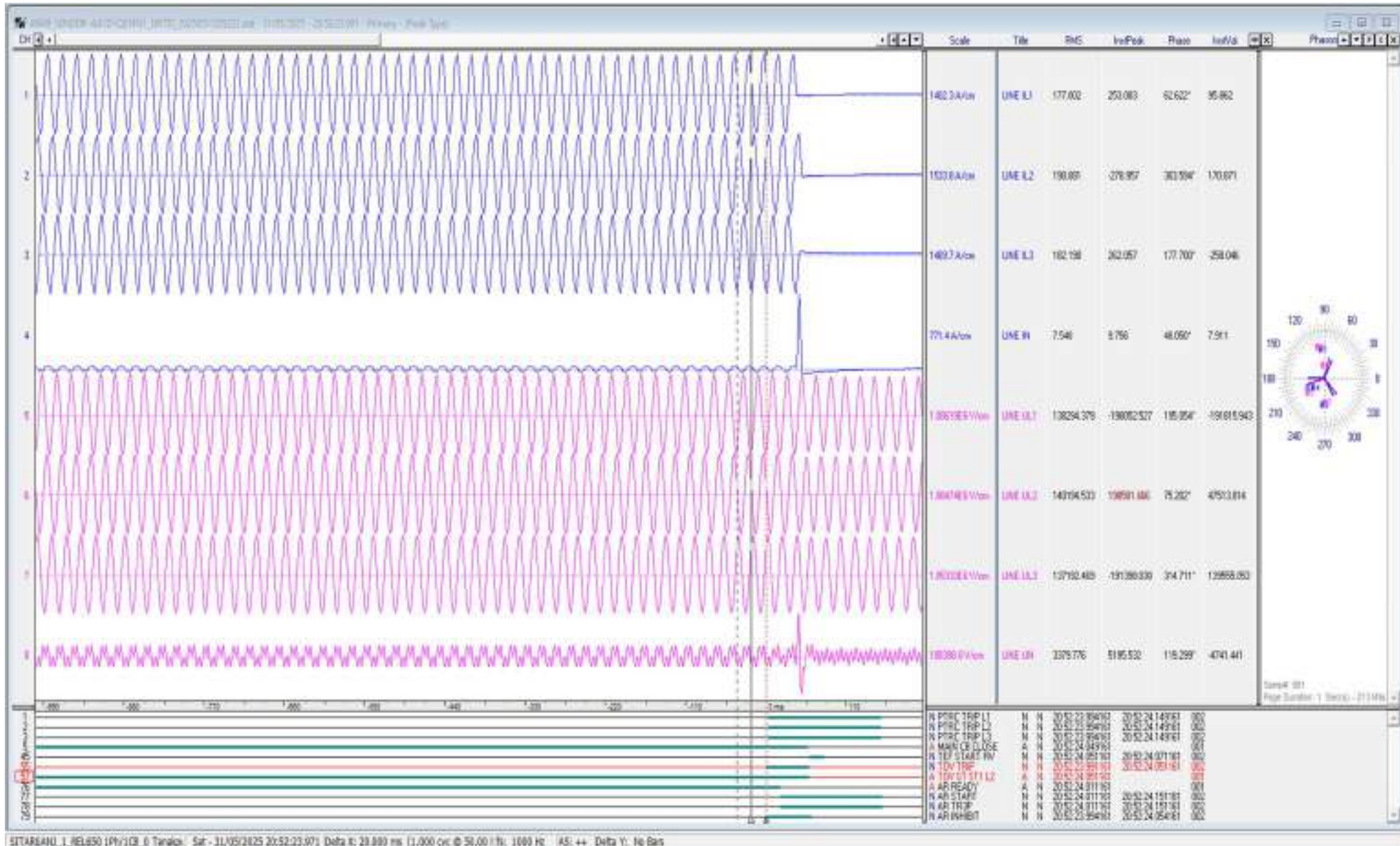


✓ R-Y phase to phase fault observed in Z-1.

DR of Unit-3 at Tanakpur HEP (20:51:55hrs)



DR of 220kV Tanakpur(end)-Sitarganj ckt (20:52:23hrs)

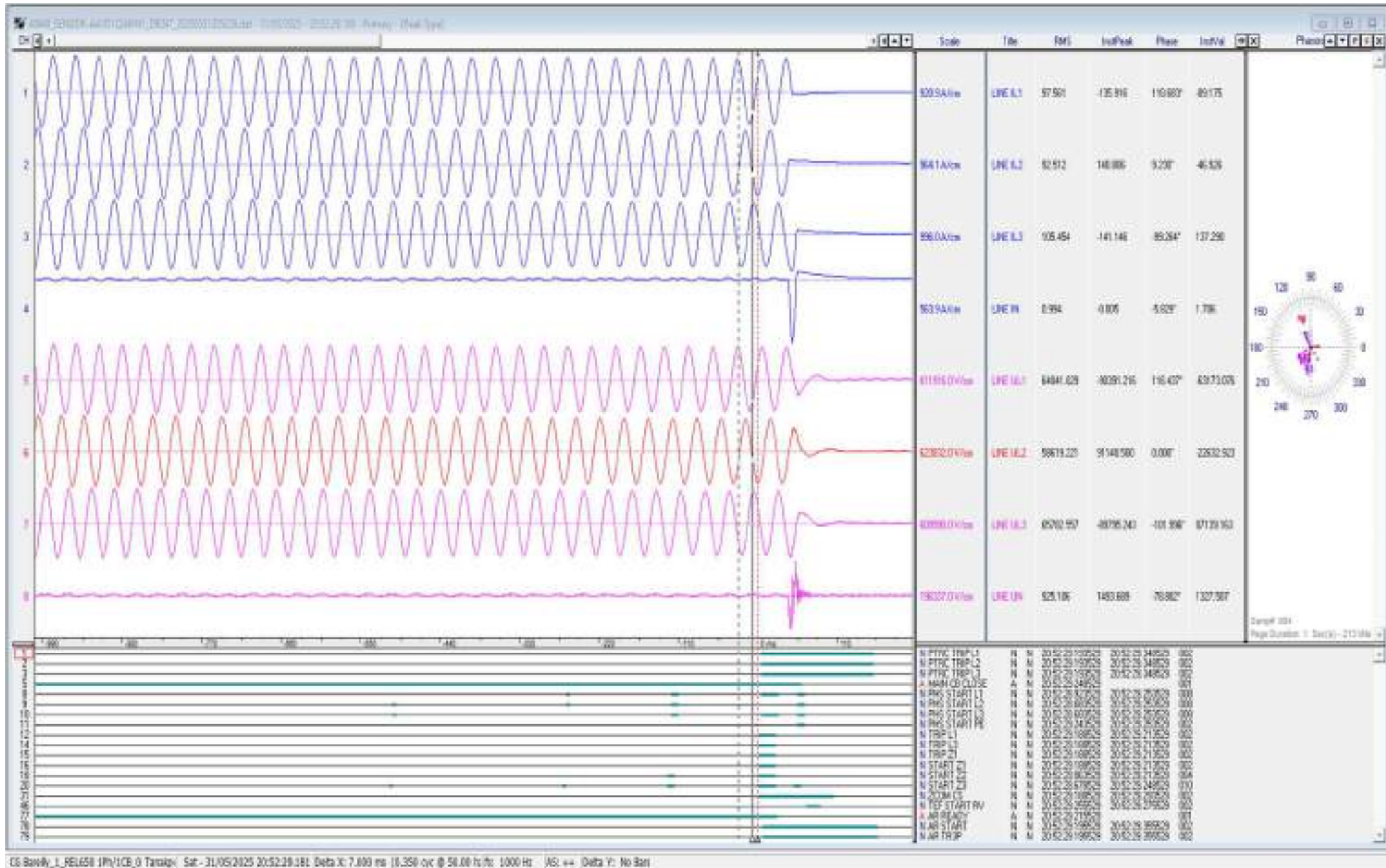


Overvoltage stage-1 protection operated. Phase voltage at Tanakpur ~1.1pu

EL of 220kV Tanakpur(end)-Sitarganj ckt (20:52:23hrs)

31-05-2025 20:52:24	TEF START RV	On
31-05-2025 20:52:24	MAIN CB CLOSE	Off
31-05-2025 20:52:24	AR READY	Off
31-05-2025 20:52:24	AR START	On
31-05-2025 20:52:24	AR TR3P	On
31-05-2025 20:52:23	PTRC TRIP L2	On
31-05-2025 20:52:23	AR INHIBIT	On
31-05-2025 20:52:23	PTRC TRIP L3	On
31-05-2025 20:52:23	PTRC TRIP L1	On
31-05-2025 20:52:23	TOV TRIP	On
31-05-2025 20:52:18	TOV ST ST1 L2	On

DR of 220kV Tanakpur(end)-CB Ganj ckt (20:52:29hrs)

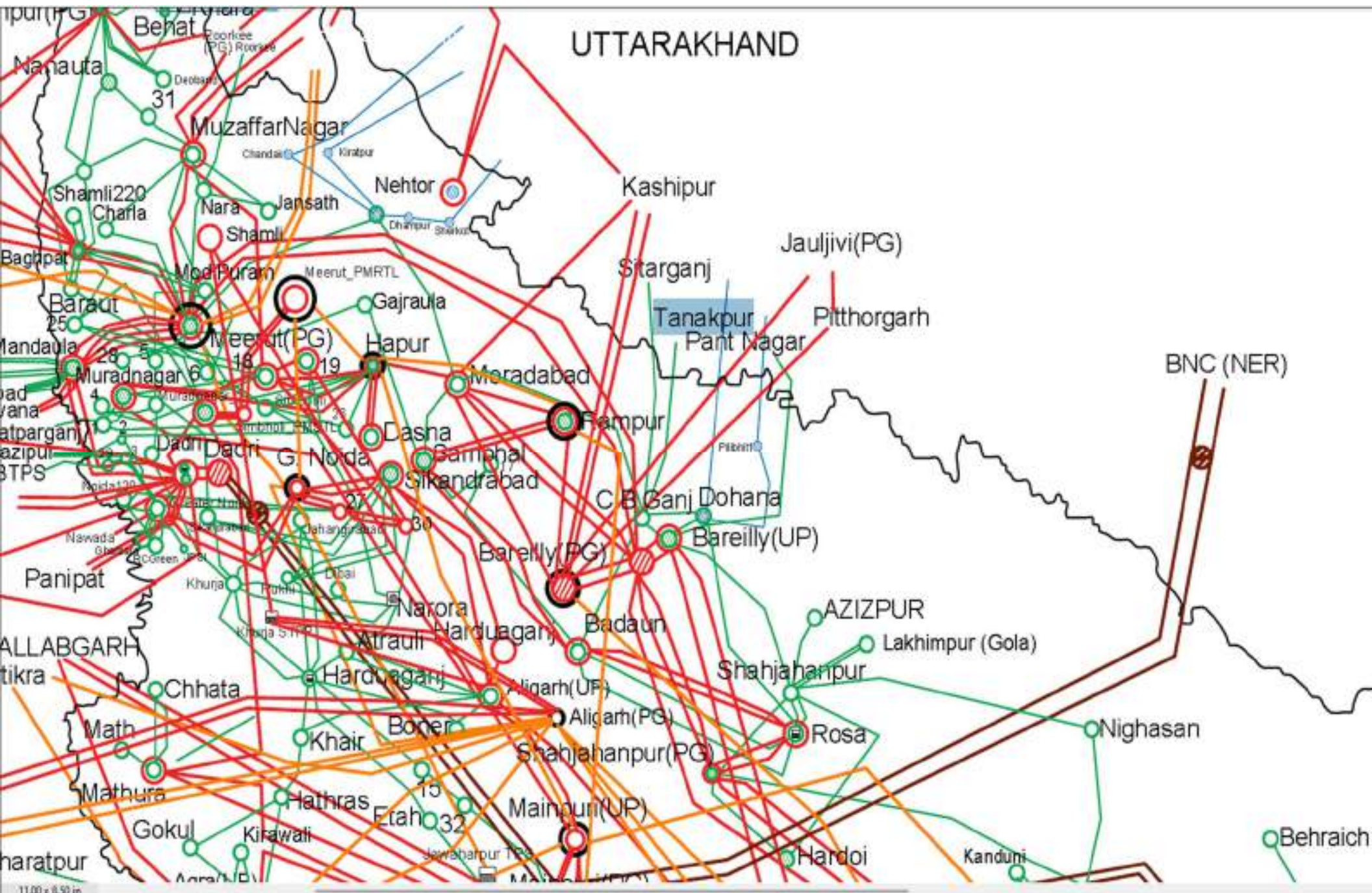


Z-1 distance protection operated. Phase voltage at Tanakpur reduced to ~0.5pu

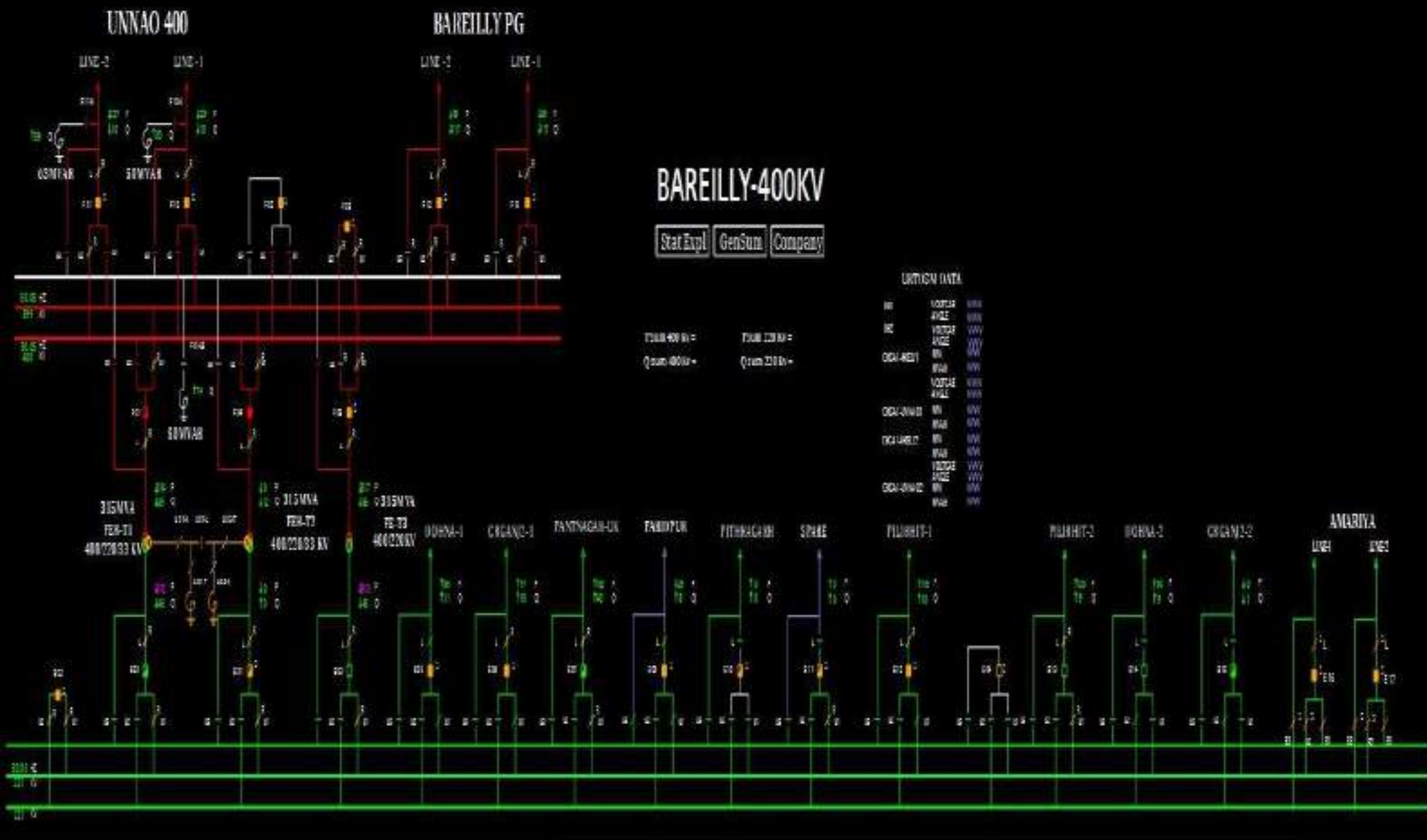
EL of 220kV Tanakpur(end)-CB Ganj ckt (20:52:29hrs)

31-05-2025 20:52:29	TRIP L3	Off
31-05-2025 20:52:29	TRIP Z1	Off
31-05-2025 20:52:29	AR START	On
31-05-2025 20:52:29	AR TR3P	On
31-05-2025 20:52:29	PHS START L1	On
31-05-2025 20:52:29	PHS START L3	On
31-05-2025 20:52:29	PTRC TRIP L1	On
31-05-2025 20:52:29	PTRC TRIP L2	On
31-05-2025 20:52:29	PTRC TRIP L3	On
31-05-2025 20:52:29	START Z1	On
31-05-2025 20:52:29	START Z2	On
31-05-2025 20:52:29	START Z3	On
31-05-2025 20:52:29	TRIP L1	On
31-05-2025 20:52:29	TRIP L3	On
31-05-2025 20:52:29	TRIP Z1	On
31-05-2025 20:52:29	ZCOM CS	On
31-05-2025 20:52:29	PHS START L1	Off
31-05-2025 20:52:29	PHS START L2	Off
31-05-2025 20:52:29	PHS START L3	Off
31-05-2025 20:52:29	START Z2	Off
31-05-2025 20:52:29	START Z3	Off
31-05-2025 20:52:29	PHS START L1	On
31-05-2025 20:52:29	PHS START L2	On
31-05-2025 20:52:29	PHS START L3	On
31-05-2025 20:52:29	START Z2	On
31-05-2025 20:52:29	START Z3	On

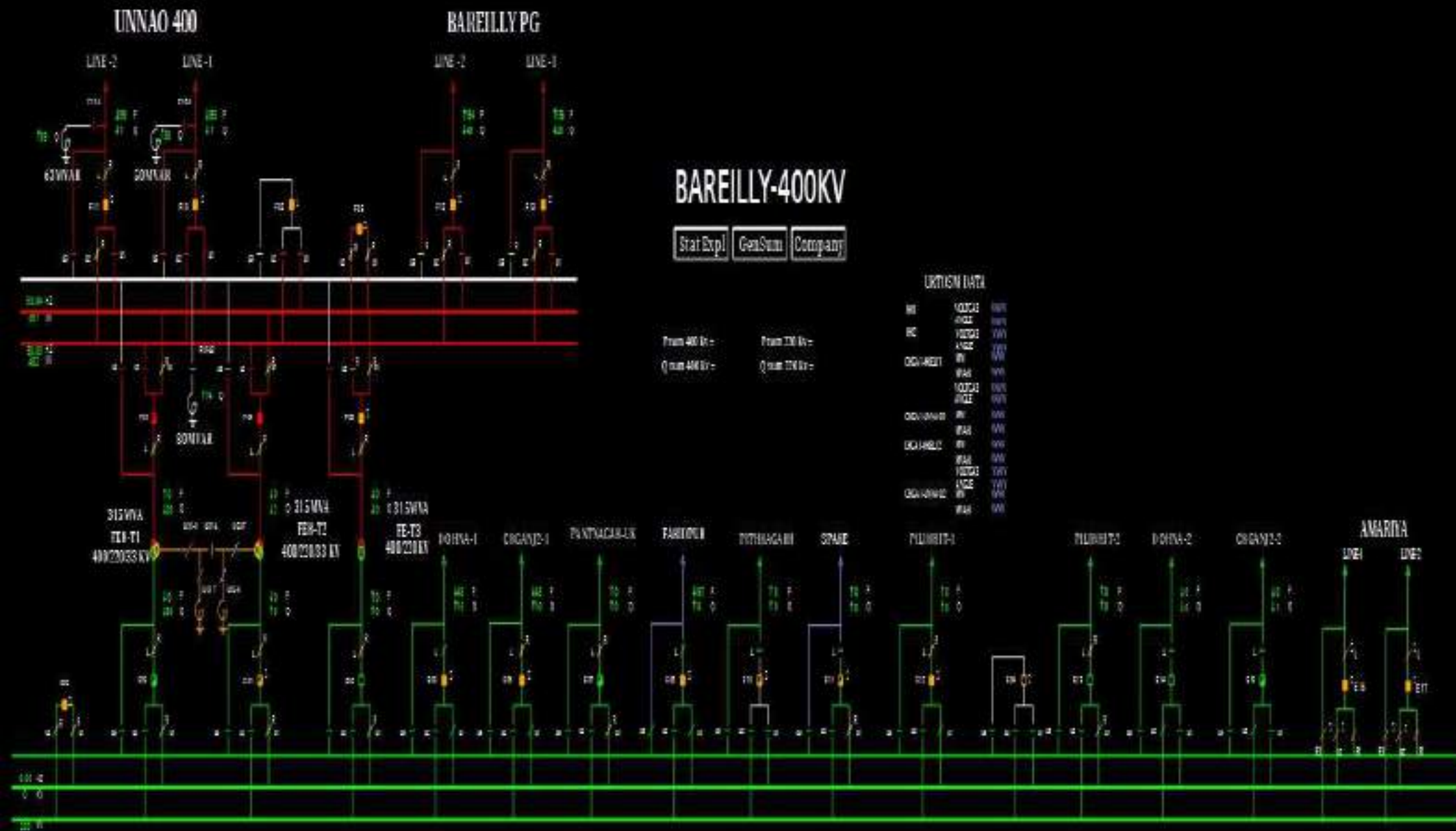
Network Diagram



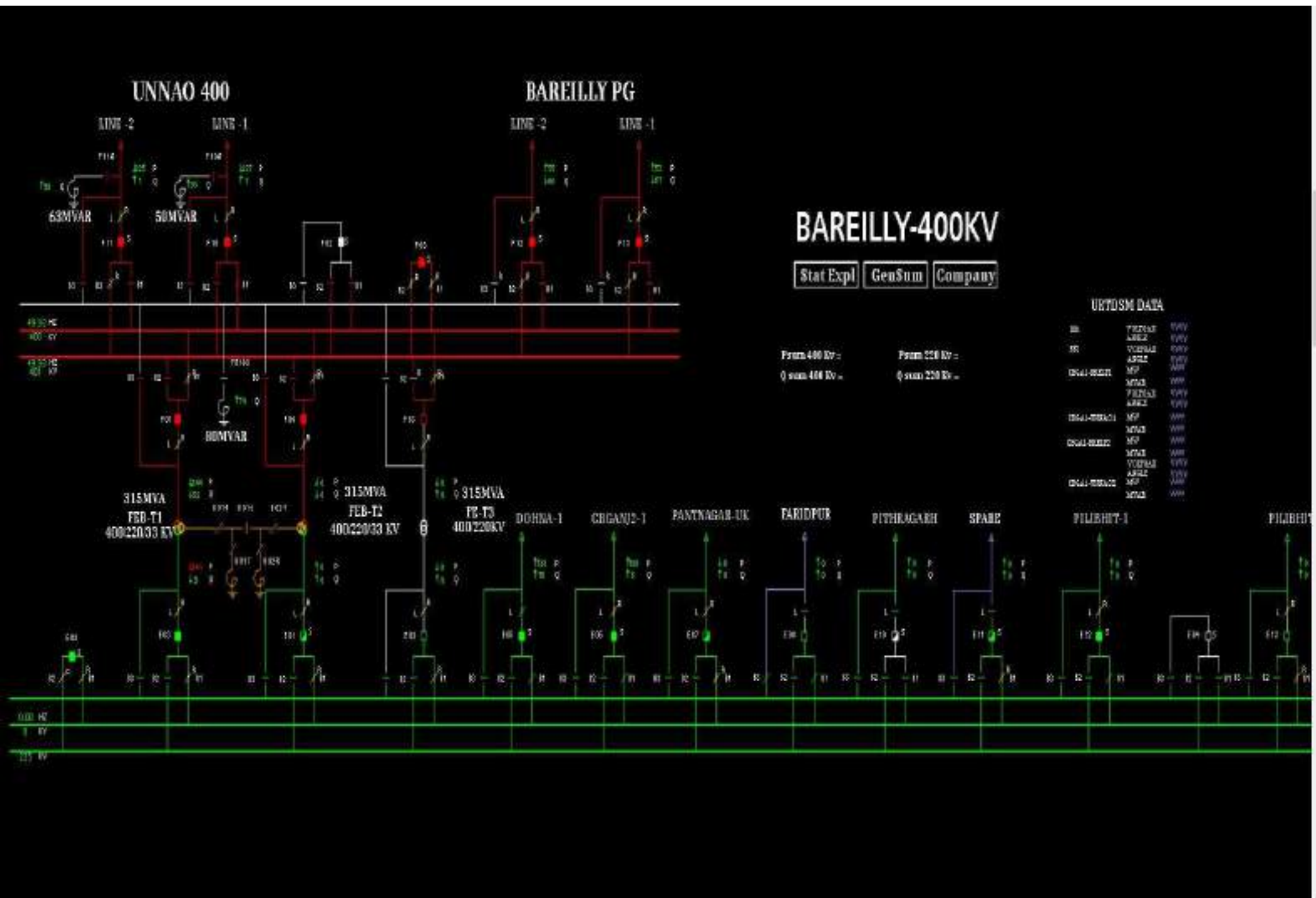
SLD of 400/220KV Bareilly S/s before the event @20:24



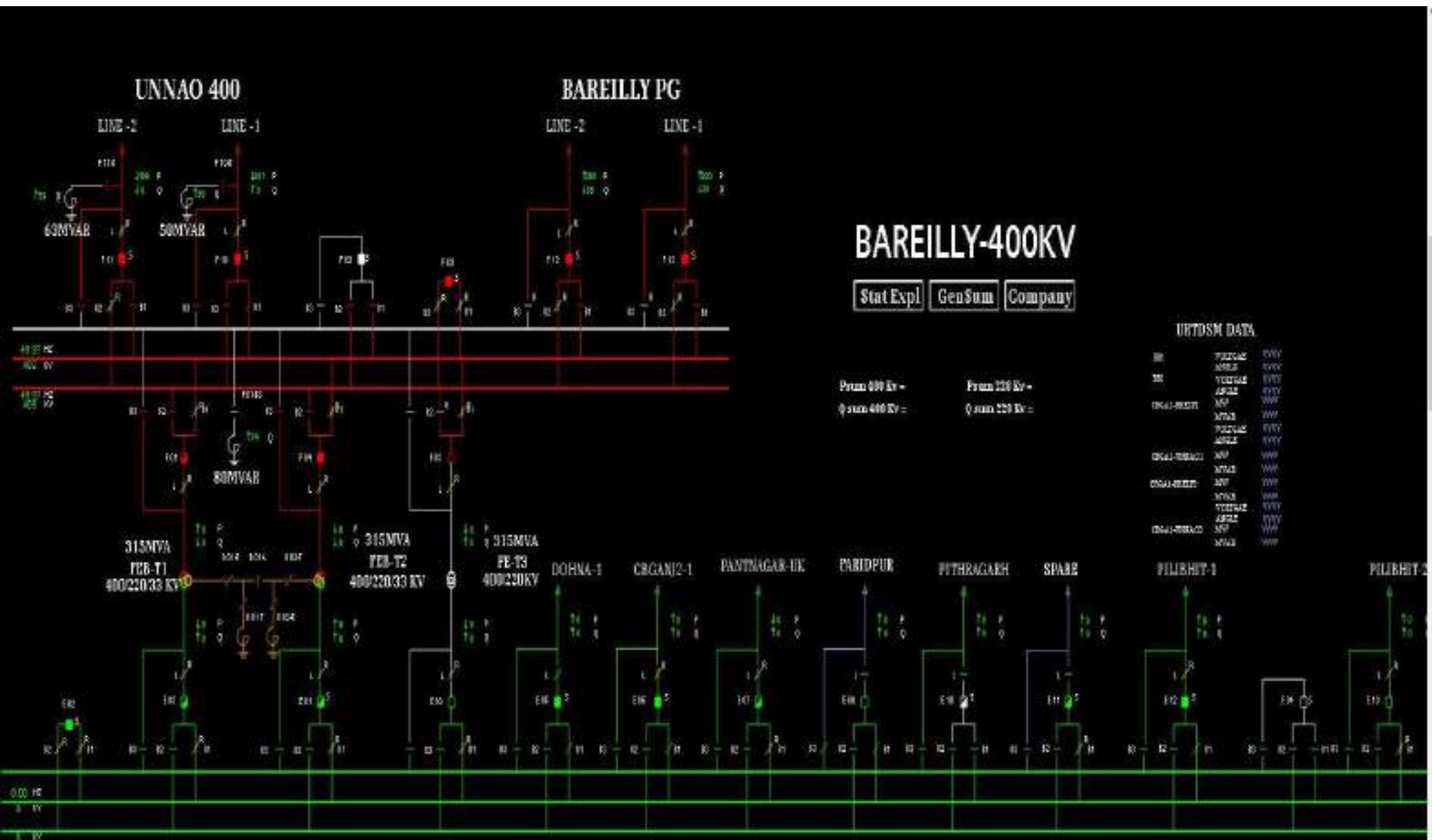
SLD of 400/220KV Bareilly S/s after the event @20:24



SLD of 400/220KV Bareilly S/s before the event @20:50



SLD of 400/220KV Bareilly S/s before the event @20:50



SLD of 220KV Tanakpur S/s before the event @20:24

CONTACT DETAILS	
EMAIL	nhpc_tanakpur@rediffmail.com
MOBILE	9897543001
HOTLINE	20112403 / 20112212

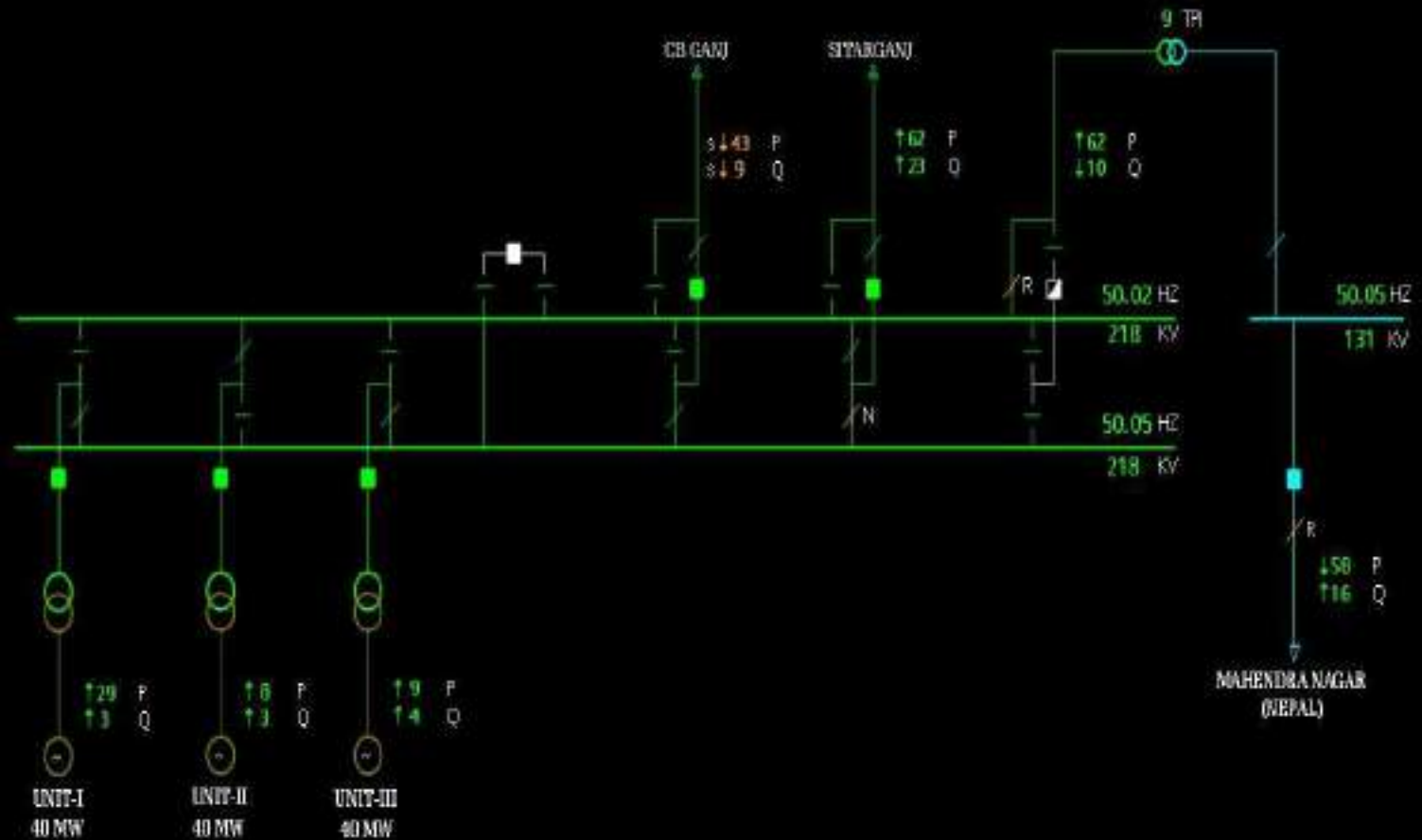
P sum(220 kV) = 34
Q sum(220 kV) = -7

TANAKPUR

Stat Expl GenSum Company

31.5.25 20:23:59

PL = 47
SENT = 82



SLD of 220KV Tanakpur S/s after the event @20:24

CONTACT DETAILS

EMAIL	nhpc_tanakpur@rediffmail.com
MOBILE	9897543001
HOTLINE	20112403 / 20112212

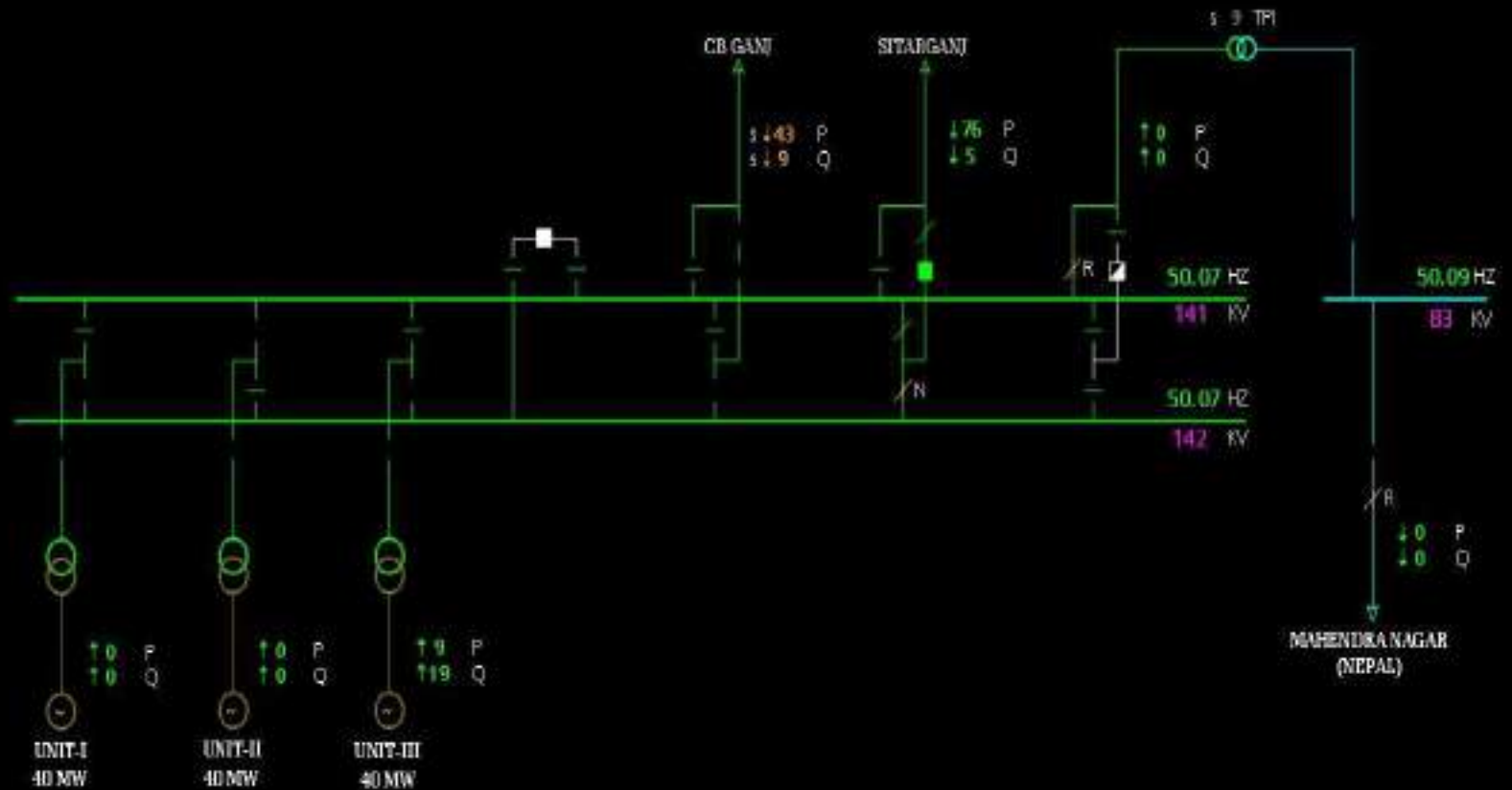
P sum(220kV) = -110
Q sum(220kV) = -46

TANAKPUR

Stat Expl GenSum Company

31.5.25 20:24:59

PL = 10
SENT = -119



SLD of 220KV Tanakpur S/s before the event @20:50

CONTACT DETAILS

EMAIL	nhpc_tanakpur@rediffmail.com
MOBILE	9897543001
HOTLINE	20112403 / 20112212

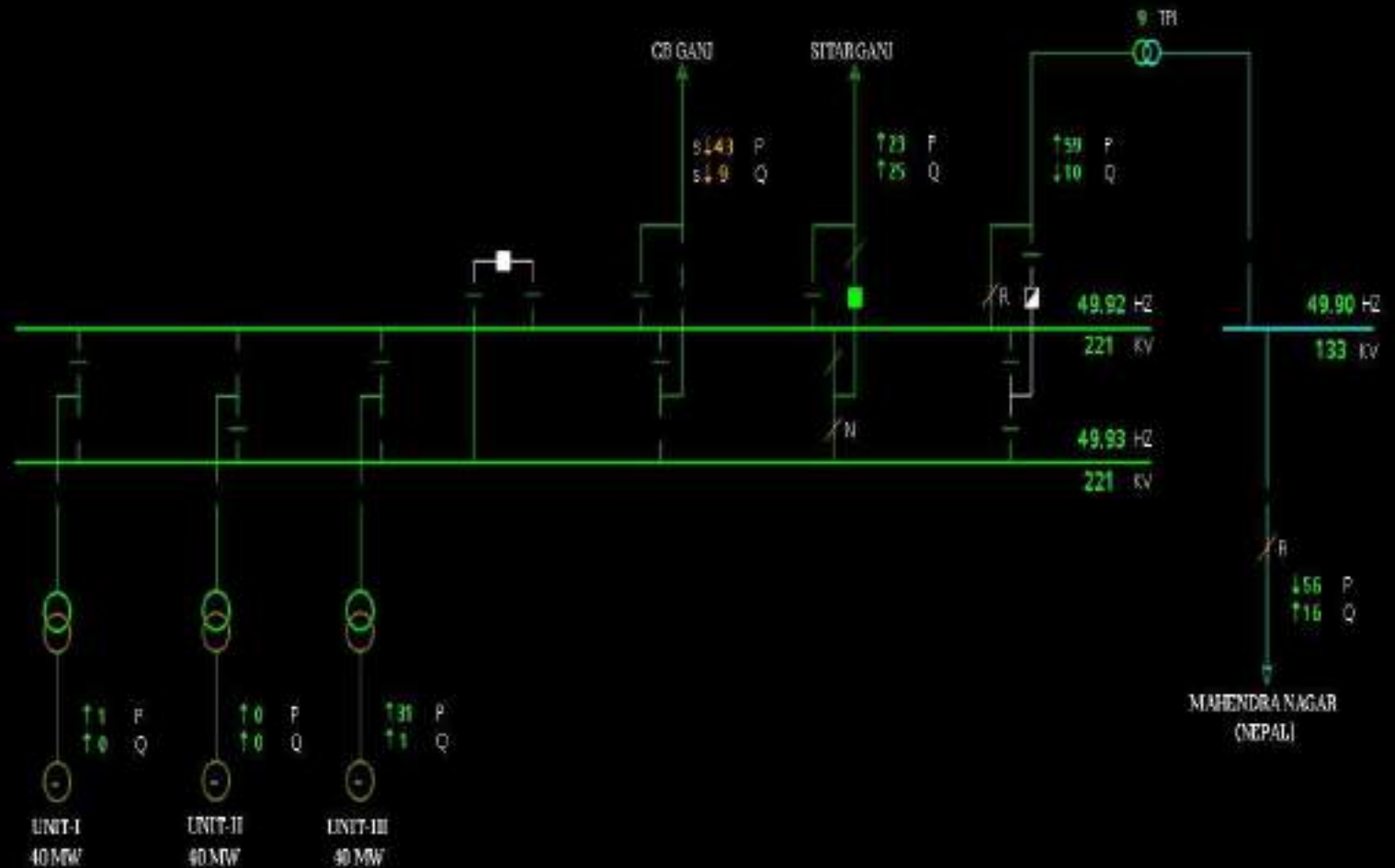
P sum(220 kV) = 5.11
Q sum(220 kV) = 8.4

TANAKPUR

Stat Expl GenSum Company

31.5 25 20:50:59

PL = 32
SENT = 8.40



SLD of 220KV Tanakpur S/s after the event @20:50

CONTACT DETAILS	
EMAIL	nhpe_tanakpur@rediffmail.com
MOBILE	9897543001
HOTLINE	20112403 / 20112212

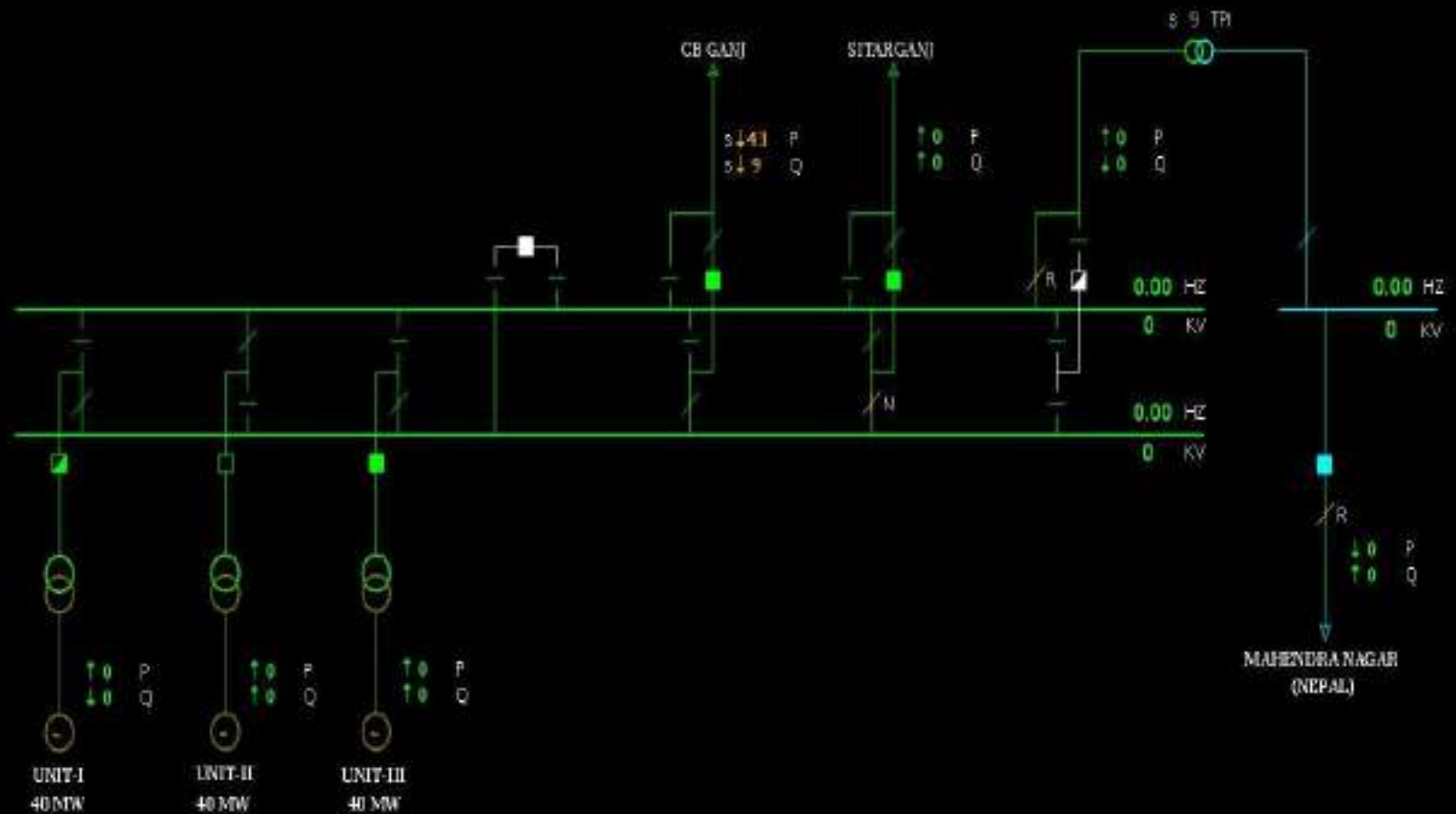
Q sum(220 kV) = 5 -9

TANAKPUR

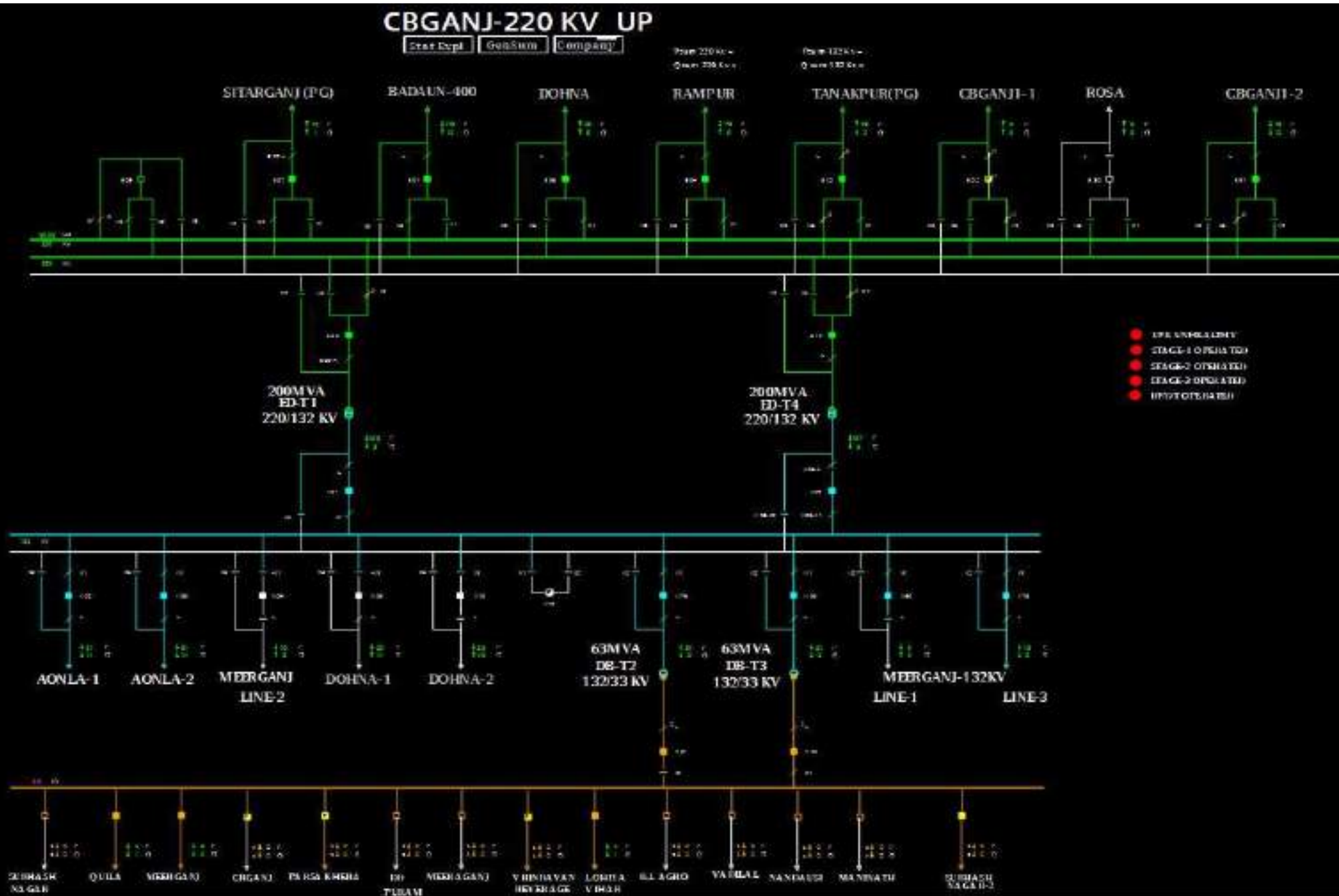
PL = 0
SENT = 5 - 43

Stat Expl GenSum Company

31.5 .25 20:52:59



SLD of 220KV C.B Ganj S/s before the event @20:24



SLD of 220KV C.B Ganj S/s after the event @20:24

CBGANJ-220 KV UP

Start Expl GenSum Compasg

From 220 kv +
To 220 kv -

From 132 kv +
To 132 kv -

SITARGANJ (TG)

BADAUN-400

DOHNA

HAMPUH

TANAKPUR(TG)

CBGANJ1-1

HOSA

CBGANJ1-2

200MVA
ED-T1
220/132 KV

200MVA
ED-T4
220/132 KV

AONLA-1

AONLA-2

MEERGANJ
LINE-2

DOHNA-1

DOHNA-2

63MVA
ED-T2
132/33 KV

63MVA
ED-T3
132/33 KV

MEERGANJ-132KV
LINE-1

LINE-2

OUTRASH
NAGAR

QUILA

MEERGANJ

CIGANJ

TRISHA KHORA

DO

MEERGANJ

VIRINHAVER

LOHIVA

BLAGRO

VADHAL

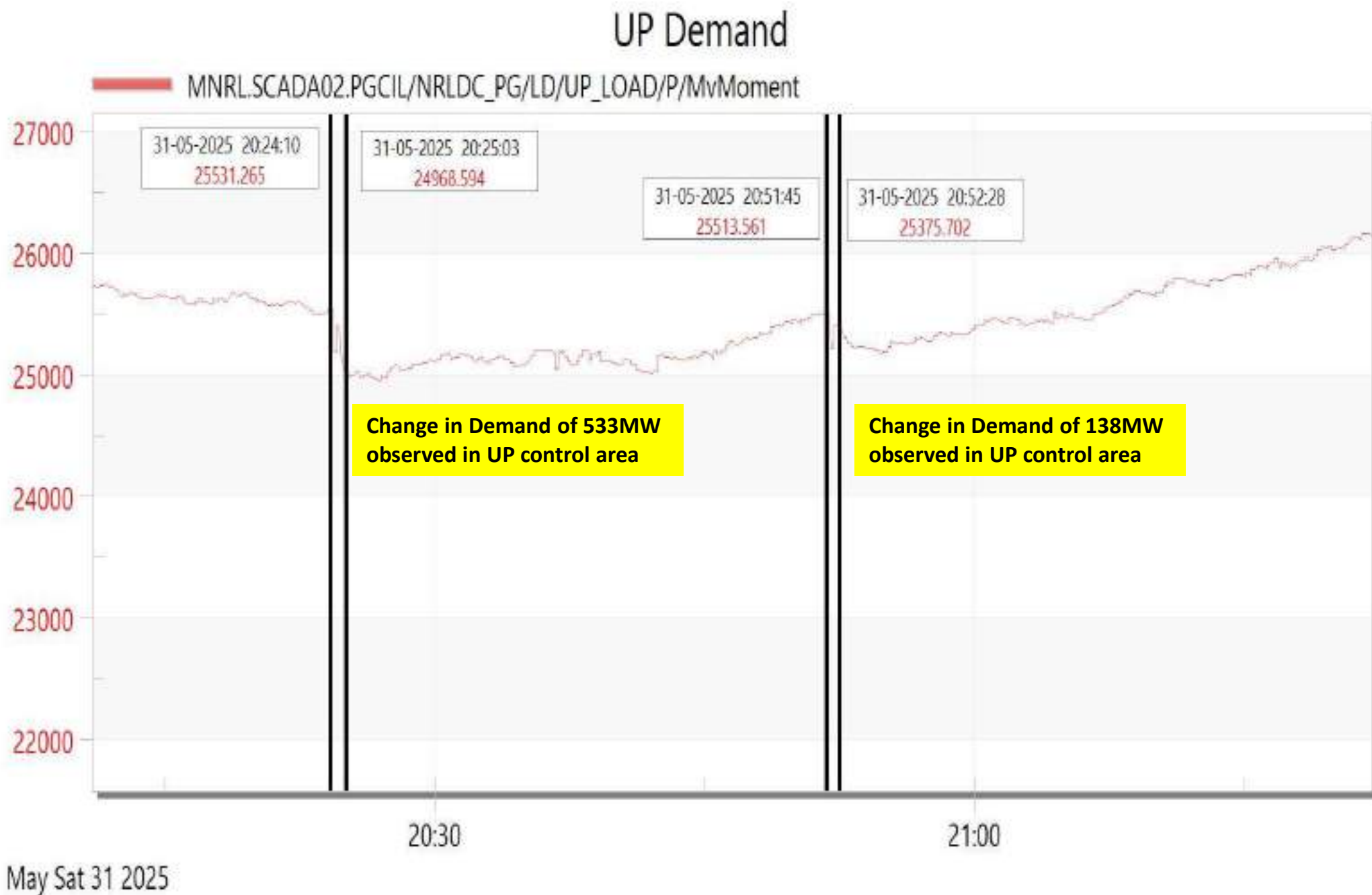
NANDAU

MANVATH

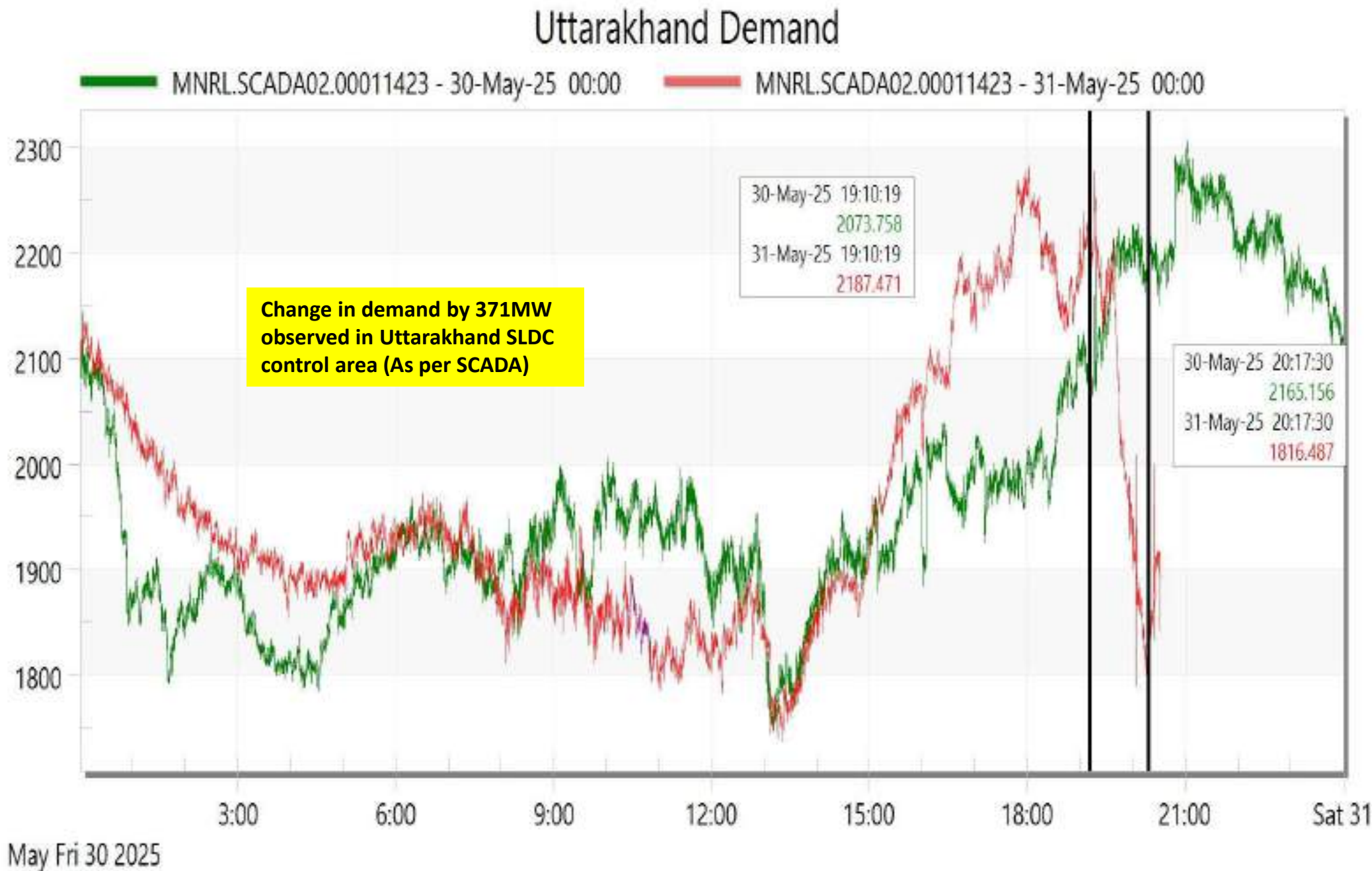
OUTRASH
NAGAR-2

- UPR UNHEALTHY
- STAGE-1 OPERATED
- STAGE-2 OPERATED
- STAGE-3 OPERATED
- WEIGHT OPERATED

Uttar Pradesh demand during the event

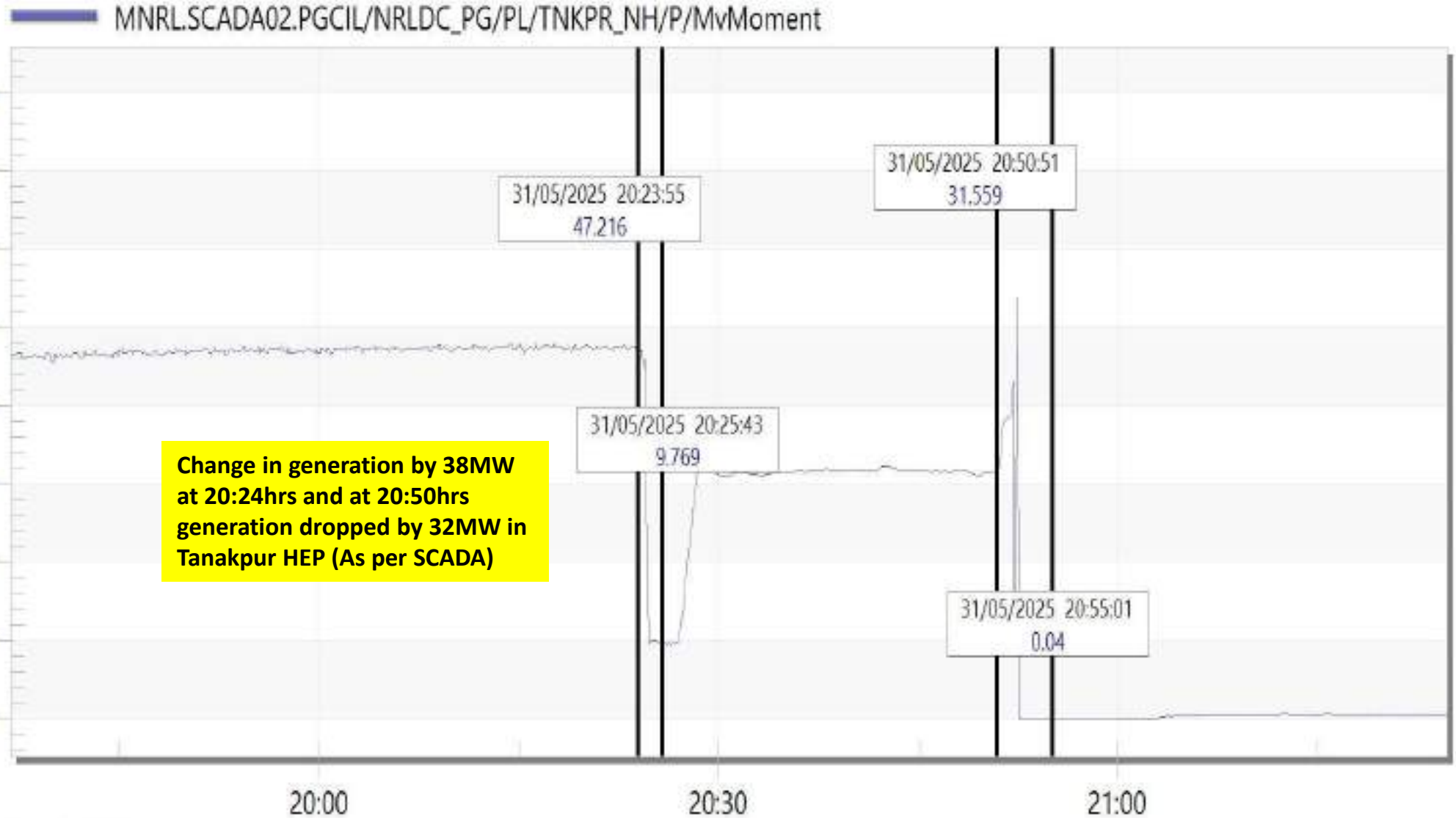


Uttarakhand demand during the event



Tanakpur Generation during the event

New Graph



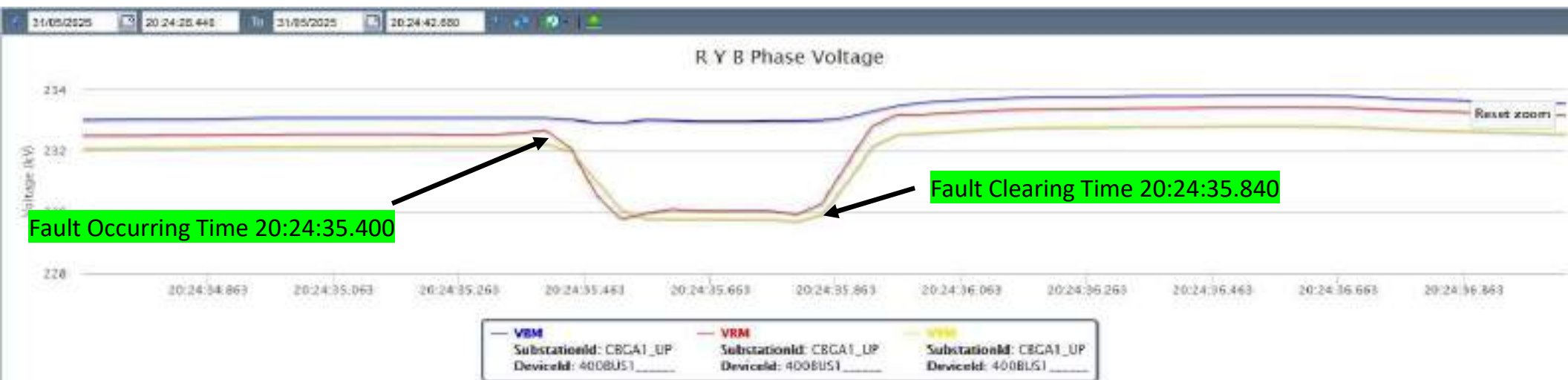
May Sat 31 2025

PMU Plot of frequency at CBGA(UP)

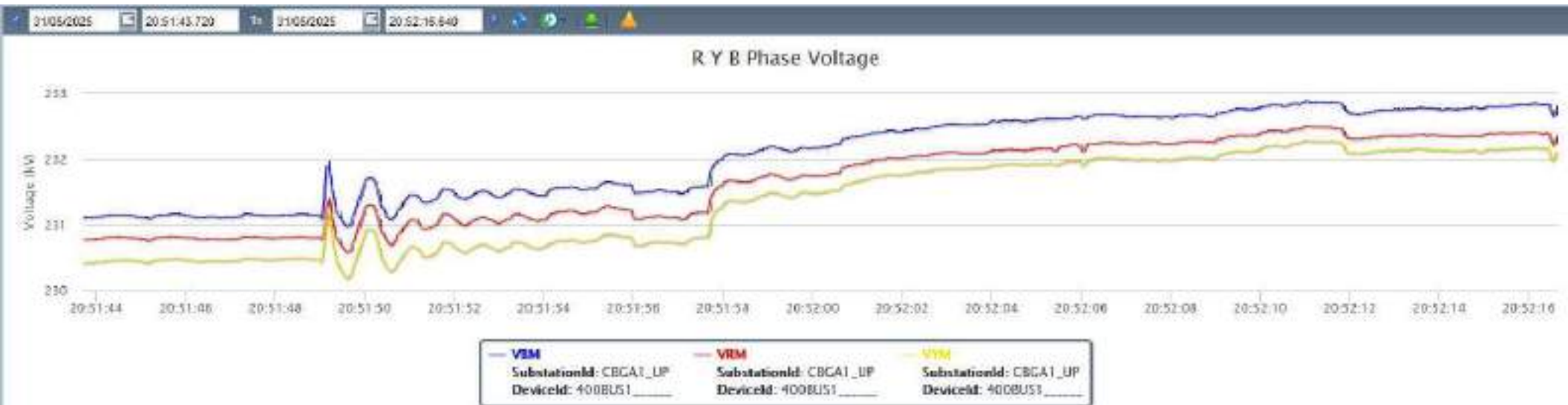
20:50hrs/31-May-25



PMU Plot of phase voltage magnitude at Bareilly(PG)



R Y B Phase Voltages Angles



R Y B Phase Voltages Angles

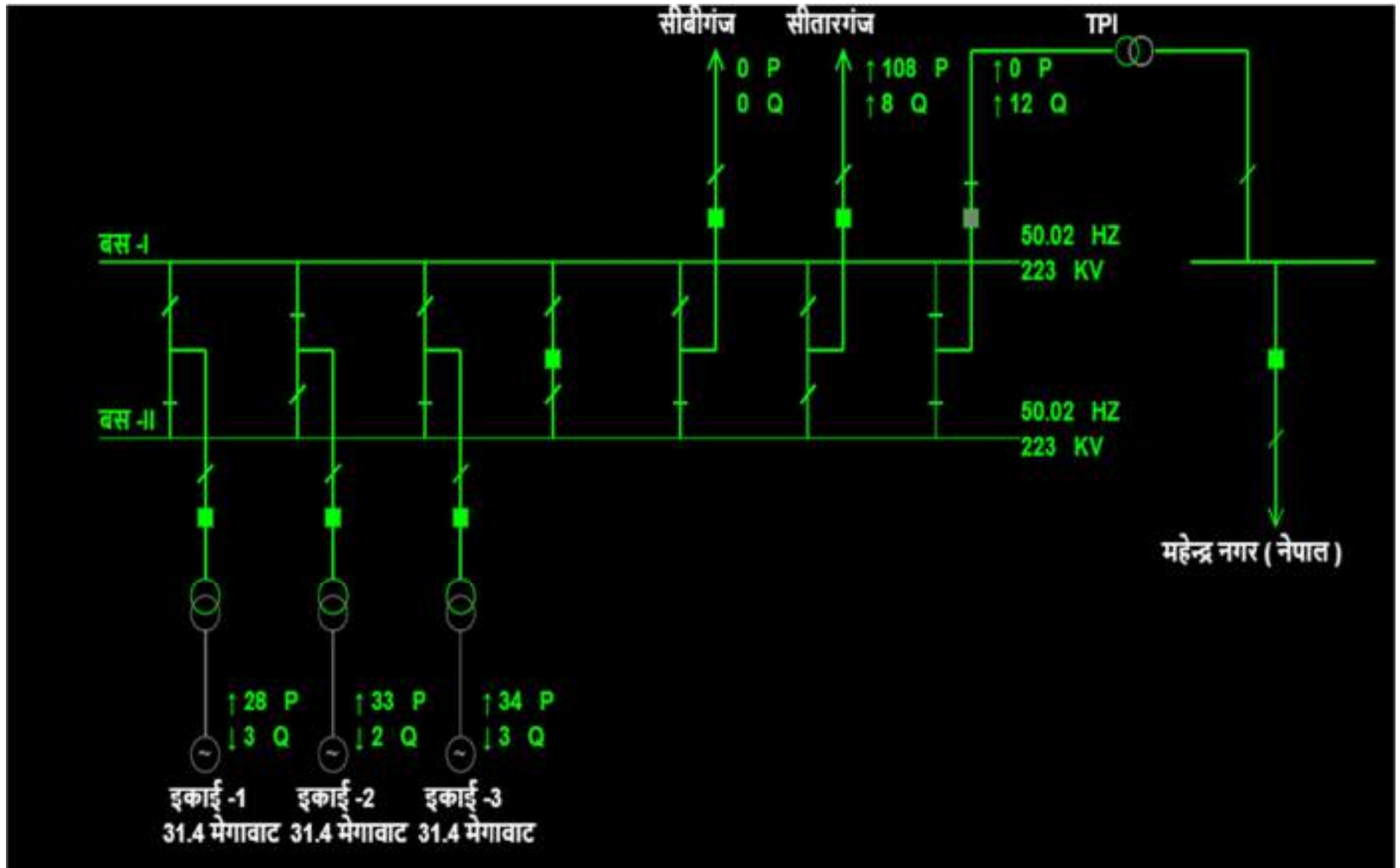
Points for Discussion

- i) Reason of bus bar protection operation at 20:24 hrs at Bareilly (UP) need to be shared.
- ii) DR, EL & tripping report need to be shared from both the ends.
- iii) Details of protection operation and sequence of the tripping need to be shared.
- iv) Remedial action taken report to be shared.

Agenda Point No.9

- Complete outage of Tanakpur Power Station(NHPC) at 20:24 hrs on 23-May-25

SLD of Tanakpur



Elements Tripped on 31/05/2025

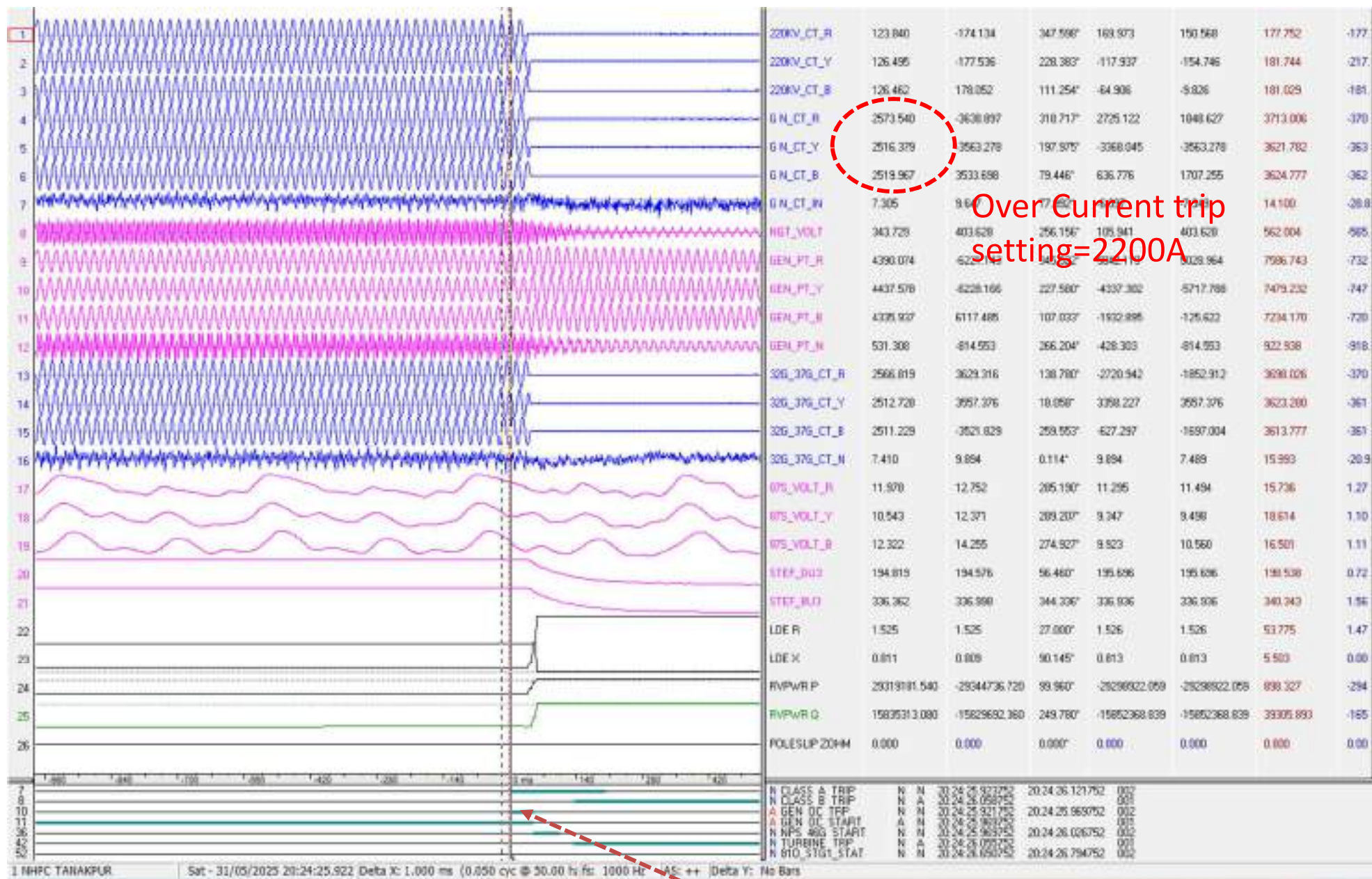
क्रम सं	यूनिट / लाइन नाम	से		तक		कुल आउटेज समय	आउटेज के कारण	ऊर्जा नुकसान (मेगावाट)
		तारीख	समय	तारीख	समय			
1	Unit#1	31-May-25	20:24:00	31-May-25	20:50:00	0:26	Generator Over Current Protection operated	33
2	Unit#2	31-May-25	20:24:00	31-May-25	21:47:00	1:23	Generator Over Current Protection operated	33
3	220 KV Tanakpur-CB Ganj Line#1	31-May-25	20:51:00	31-May-25	21:57:00	1:06	Z1 Protection operated at R-Y-B Phase fault	0
4	Unit#3	31-May-25	20:51:00	31-May-25	21:55:00	1:04	Generator Over Current protection operated	0
5	220 KV Tanakpur-Sitaraganj Line#2	31-May-25	20:52:00	31-May-25	21:44:00	0:52	Over voltage Stage-1 Protection operated in Y-Phase	33
6	Unit#1	31-May-25	20:52:00	31-May-25	21:52:00	1:00	Generator Over voltage Protection operated	33

Detail Analysis

Unit#1:-

During the incidence, there was disturbance in the system. It is evident from the DR of generator protection relay installed at Tanakpur end that the R-Phase, Y-Phase & B-Phase voltages were reduced to 4.38 KV, 4.43 KV & 4.33 KV respectively from the rated voltage of 6.35 KV. Similarly, the R-Phase, Y-Phase & B-Phase currents were increased to 2573 A, 2516 A & 2520 A respectively from rated current of 1831 A. Accordingly generator over current protection started at 20:24:20 Hrs and tripped after time delay i.e. at 20:24:25 Hrs.

Unit#1 DR

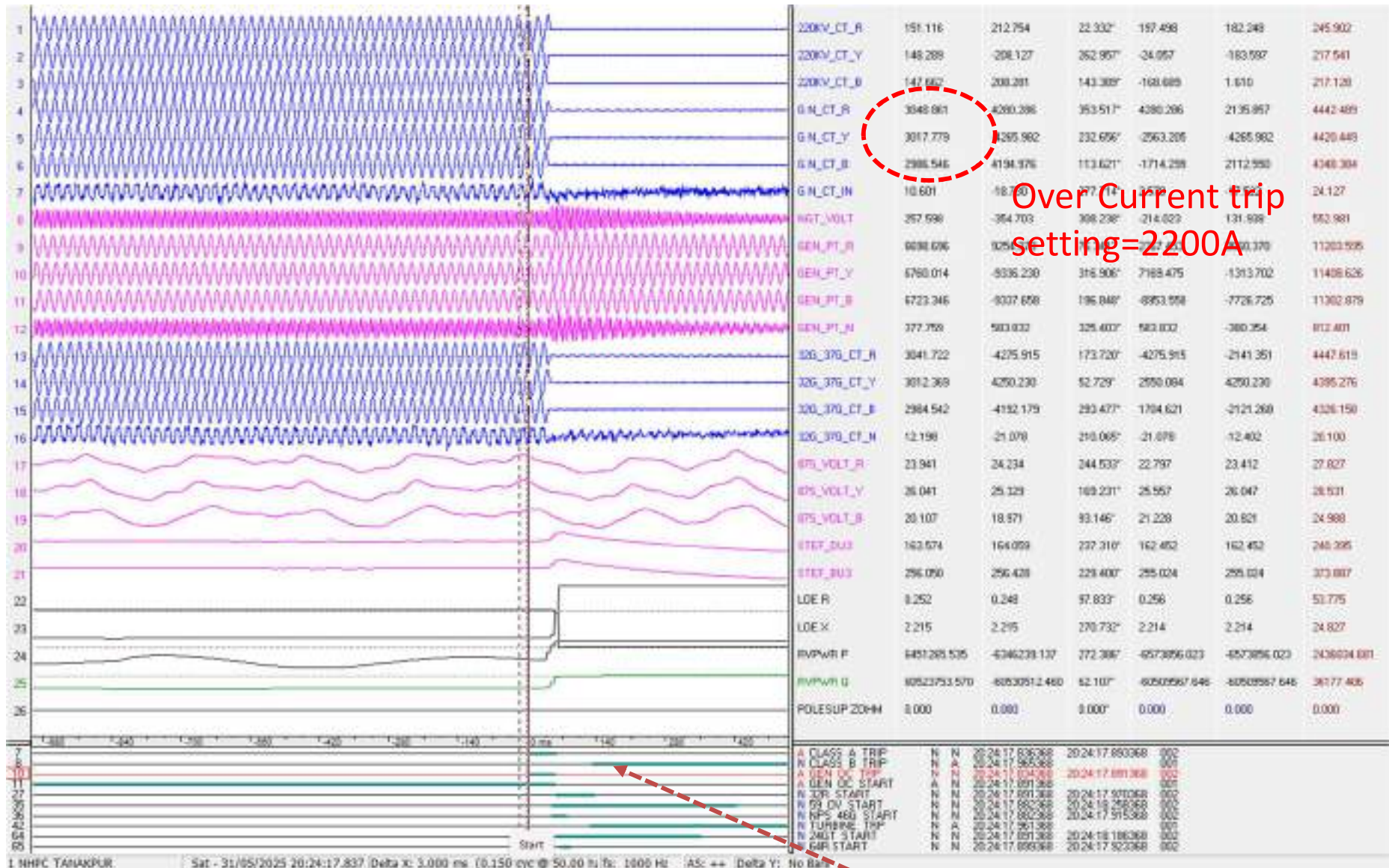


Detail Analysis

Unit#2:-

It is evident from the DR of generator protection relay installed at Tanakpur end that the R-Phase, Y-Phase & B-Phase currents were increased to 3049 A, 3018 A & 2980 A respectively. Accordingly generator over current protection started and tripped after time delay i.e. at 20:24:17.835 Hrs.

Unit#2 DR



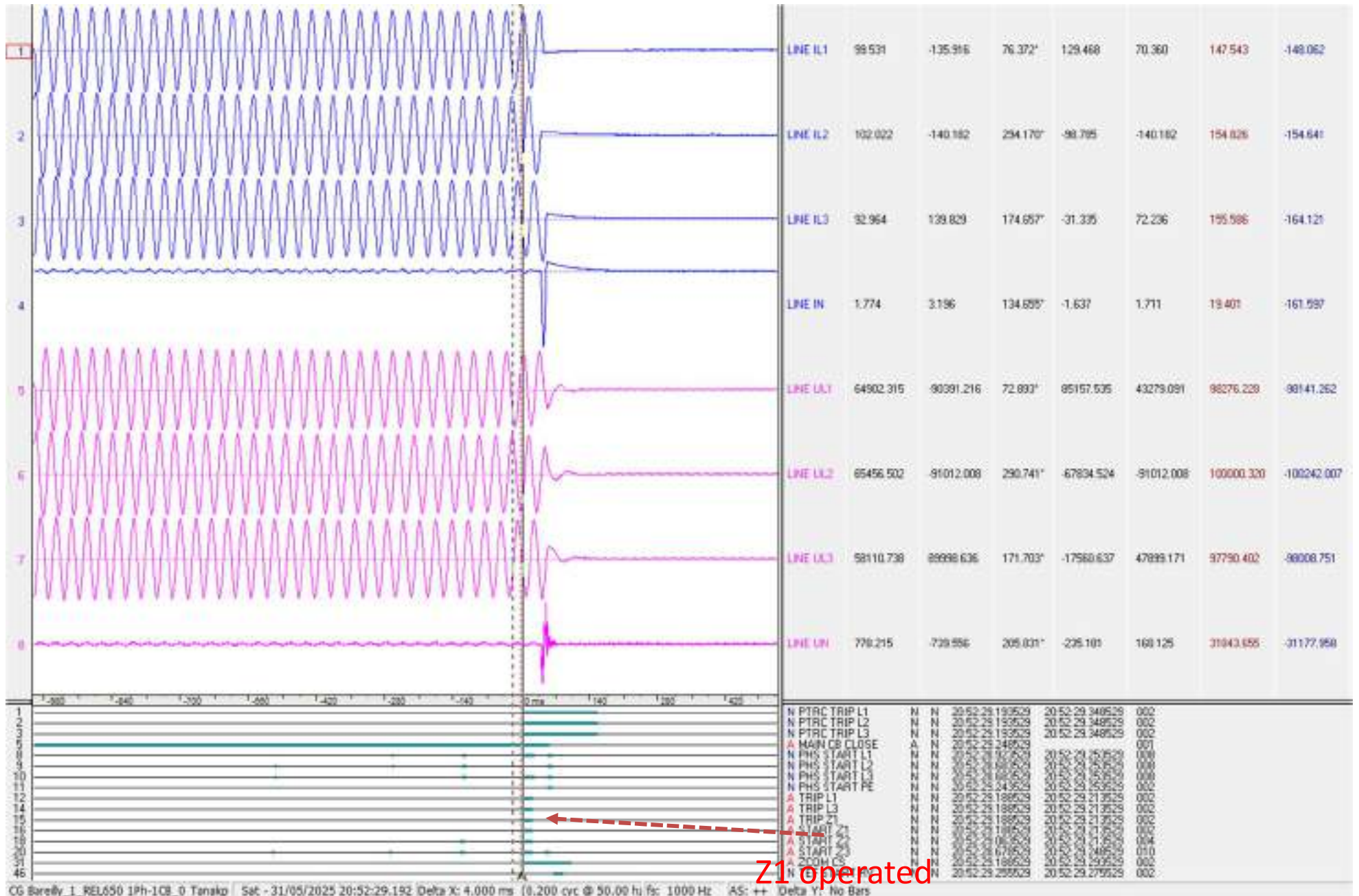
Over Current Trip

Detail Analysis

CB Ganj Line#1-

It is evident from the DR of distance protection relay installed at Tanakpur end that the R-Phase, Y-Phase & B-Phase voltages were reduced to 58.77 KV, 67.60 KV & 62.64 KV respectively. Similarly the R-Phase, Y-Phase & B-Phase currents were in order of 95A, 106 A & 95 A respectively. Accordingly relay sense the fault in Z1 at 20:52:29.188 Hrs in R-Y-B phase fault and three phase tripping occurred from Tanakpur end.

CBGanj Line#1 DR



Detail Analysis

Sitaraganj Line#2

It is evident from the DR of distance protection relay installed at Tanakpur end that the Y-Phase voltages increased to 140.18 KV . Accordingly, over voltage protection started at 20:52:18 Hrs and tripped after time delay of 5 sec i.e. 20:52:23 Hrs.

Sitaraganj Line#2 EL

P	31-05-2025 21:44:27	MAIN CB CLOSE	On
P	31-05-2025 20:52:24	AR START	Off
P	31-05-2025 20:52:24	AR TR3P	Off
P	31-05-2025 20:52:24	PTRC TRIP L3	Off
P	31-05-2025 20:52:24	PTRC TRIP L2	Off
P	31-05-2025 20:52:24	PTRC TRIP L1	Off
P	31-05-2025 20:52:24	TEF START RV	Off
P	31-05-2025 20:52:24	AR INHIBIT	Off
P	31-05-2025 20:52:24	TOV TRIP	Off
P	31-05-2025 20:52:24	TOV ST ST1 L2	Off
P	31-05-2025 20:52:24	TEF START RV	On
P	31-05-2025 20:52:24	MAIN CB CLOSE	Off
P	31-05-2025 20:52:24	AR READY	Off
P	31-05-2025 20:52:24	AR START	On
P	31-05-2025 20:52:24	AR TR3P	On
P	31-05-2025 20:52:23	PTRC TRIP L2	On
P	31-05-2025 20:52:23	AR INHIBIT	On
P	31-05-2025 20:52:23	PTRC TRIP L3	On
P	31-05-2025 20:52:23	PTRC TRIP L1	On
P	31-05-2025 20:52:23	TOV TRIP	On
P	31-05-2025 20:52:18	TOV ST ST1 L2	On
P	31-05-2025 20:51:57	TEF START RV	Off
P	31-05-2025 20:51:57	TEF START RV	On
P	31-05-2025 20:51:55	TEF START RV	Off
P	31-05-2025 20:51:55	TEF START RV	On
P	31-05-2025 20:42:04	TEF START RV	On
P	31-05-2025 20:42:04	TEF START RV	On
P	31-05-2025 20:25:39	TEF START RV	Off
P	31-05-2025 20:25:39	TEF START RV	On
P	31-05-2025 20:24:26	TEF START RV	Off
P	31-05-2025 20:24:25	TEF START RV	On
P	31-05-2025 20:24:20	TEF START RV	Off
P	31-05-2025 20:24:20	TEF START RV	On
P	31-05-2025 08:51:47	TEF START RV	Off
P	31-05-2025 08:51:46	TEF START RV	On

OV Stage-1 operated

Detail Analysis

Unit#1:-

It is evident from the EL of generator protection relay installed at Tanakpur end that the over voltage protection started at 20:52:37 Hrs and tripped after time delay i.e. 20:52:40 Hrs.

Unit#3:-

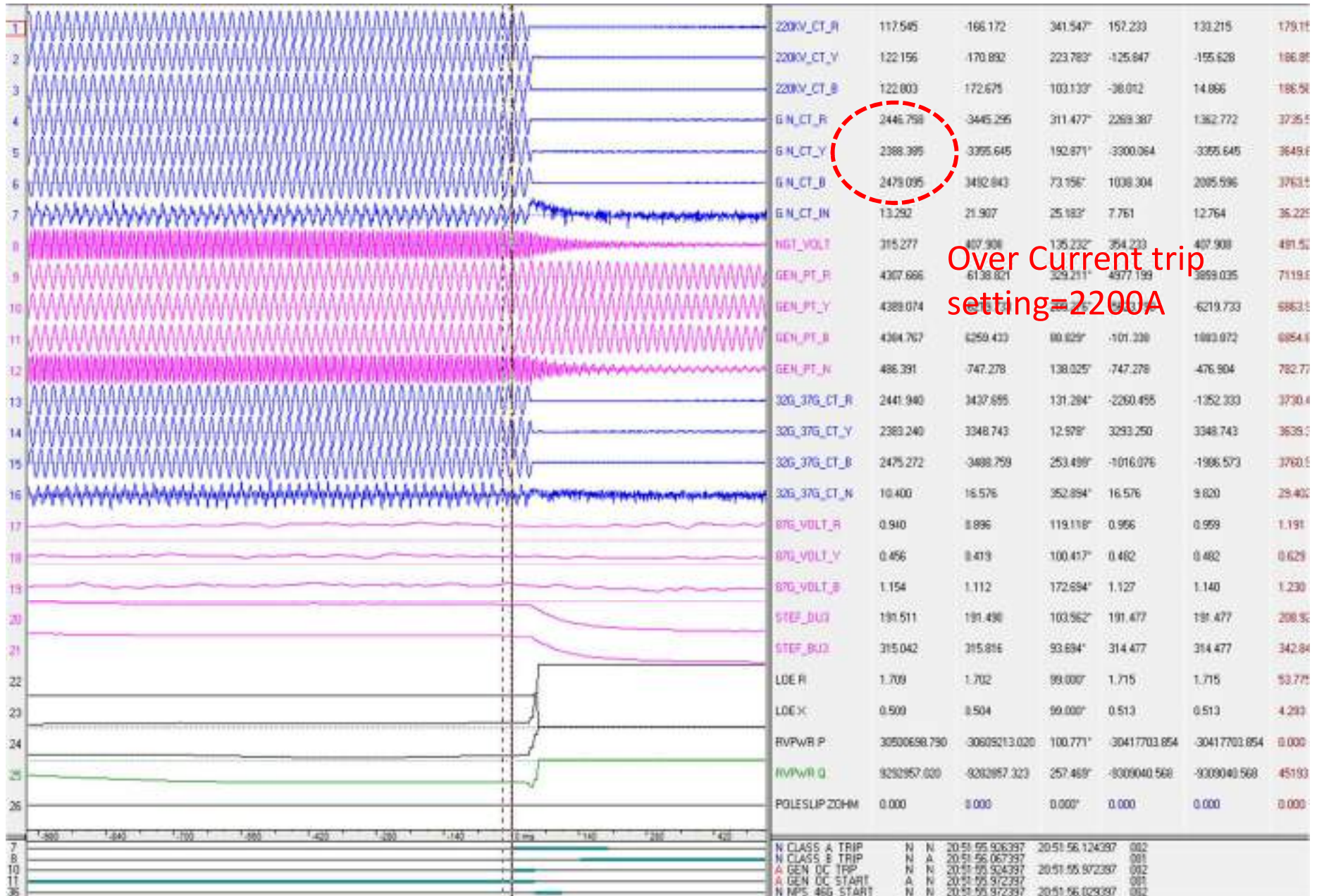
It is evident from the DR of generator protection relay installed at Tanakpur end that the R-Phase, Y-Phase & B-Phase currents were increased to 2450 A, 2390 A & 2477 A respectively. Accordingly generator over current protection started at 20:51:49 Hrs and tripped after time delay i.e. at 20:51:55 Hrs.

Unit#1 EL

Type	Date & Time	Signal name	Status
P	01-06-2025 17:16:41	NPS_46G_START	Off
P	01-06-2025 17:16:41	NPS_46G_START	On
P	31-05-2025 21:55:55	32R_START	Off
P	31-05-2025 21:55:55	32R_START	On
P	31-05-2025 21:55:54	32R_START	Off
P	31-05-2025 21:55:54	32R_START	On
P	31-05-2025 20:52:42	81O_STG1_STAT	Off
P	31-05-2025 20:52:41	CLASS_C_TRIP	Off
P	31-05-2025 20:52:41	59_OV_START	Off
P	31-05-2025 20:52:41	59_OV_TRIP	Off
P	31-05-2025 20:52:40	24GT_ALARM	Off
P	31-05-2025 20:52:40	CLASS_C_TRIP	On
P	31-05-2025 20:52:40	59_OV_TRIP	On
P	31-05-2025 20:52:38	81O_STG1_STAT	On
P	31-05-2025 20:52:38	24GT_ALARM	On
P	31-05-2025 20:52:37	59_OV_START	On
P	31-05-2025 20:52:36	81U_STG1_STAR	Off
P	31-05-2025 20:52:32	81U_STG1_STAR	On
P	31-05-2025 20:52:32	FUSE_FAIL	Off
P	31-05-2025 20:52:32	FUSE_FAIL	On
P	31-05-2025 20:52:32	81U_STG1_STAR	Off
P	31-05-2025 20:52:32	FUSE_FAIL	Off
P	31-05-2025 20:52:32	FUSE_FAIL	On

OV Stage-1 operated

Unit#3 DR





400KV Bareilly Sub-Station, UPPTCL

Tripping report

31.05.2025 20:24

Tripping of 220 KV elements at 400 KV S/S Bareilly

400 KV BAREILLY :TRIPPING OF 220 KV ICTs and 220 KV Feeders at 400 Bareilly 31.05.2025 20:24

- **Date & Time of event:** 31.05.2025 20:24
- **Sub-Station affected:** 400KV BAREILLY
- **Date & Time of restoration:**

220 KV Bus coupler	01.06.2025 14:40
220 KV Dohna Ckt-2	31.05.2025 22:51
315 MVA ICT-1(manually open)	31.05.2025 20:42
315 MVA ICT-2	31.05.2025 21:01
315 MVA ICT-3	31.05.2025 21:37
2220 KV Bareilly-CB Ganj Ckt-2	31.05.2025 21:40
220 KV Bareilly-CB KV pantnagar	31.05.2025 21:20
220 KV Bareilly-CB Amariya -2	31.05.2025 22:30
220 KV Bareilly-CB Pilibhit Ckt-2	31.05.2025 22:09
220 KV Bareilly-CB Faridpur	01.06.2025 13:45

Antecedents condition

- Antecedents condition at 400 KV Bareilly at 220 KV level

Feeders and T/F Bay position with respect to Bus and load on Dated 31/05/2025 20:00Hrs at 400 KV Bareilly					
Sl. No.	Feeder Name	Bus1	Bus2	Transfer bus	Load in MW at 20:00 Hrs
1	220KV DOHNA-1	Y	—	—	84
2	220KV DOHNA-2	—	Y	—	77
3	220KV C.B.GANJ-1	Y	—	—	79
4	220KV C.B.GANJ-2	—	Y	—	0
5	220KV PBT-1	Y	—	—	110
6	220KV PBT-2	—	Y	—	114
7	220KV Faridpur	Y	—	—	26 (import)
8	220KV PANTNGAR	—	Y	—	103
9	Amariya-1	Y	—	—	29
10	Amariya-2	—	Y	—	29
11	315 MVA ICT-1 220 KV side	Y	—	—	305
12	315 MVA ICT-2 220 KV side	—	Y	—	S/D
13	315 MVA ICT-3 220 KV side	—	Y	—	306
14	220Kv Transfer Bus	—	—	—	—
15	220 KV Bus Coupler	Y	Y	—	72A

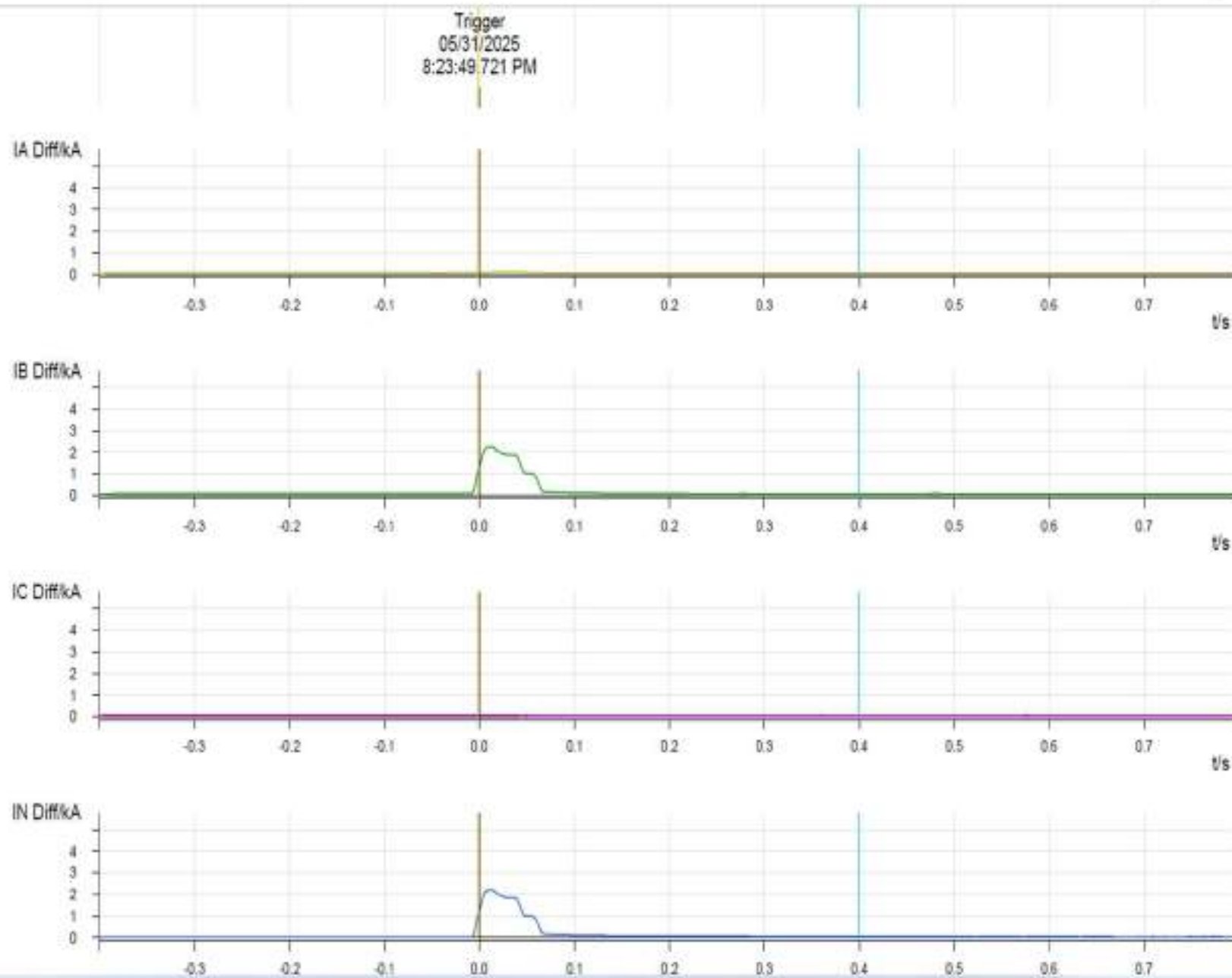
Report

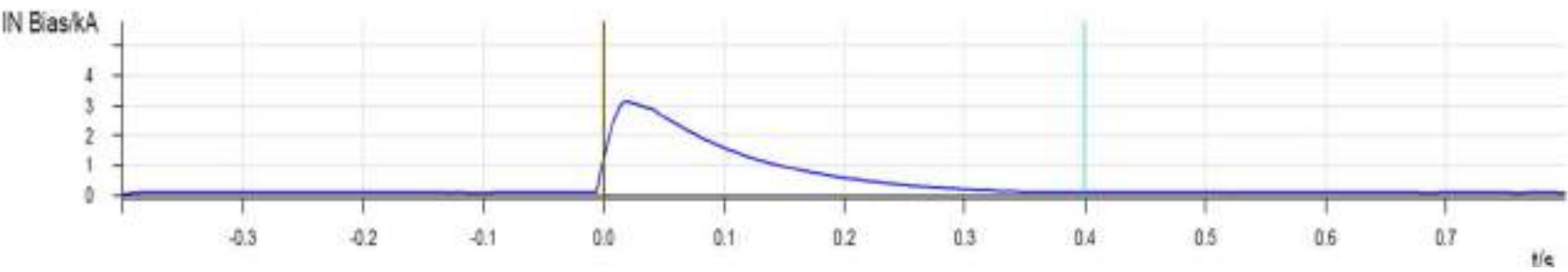
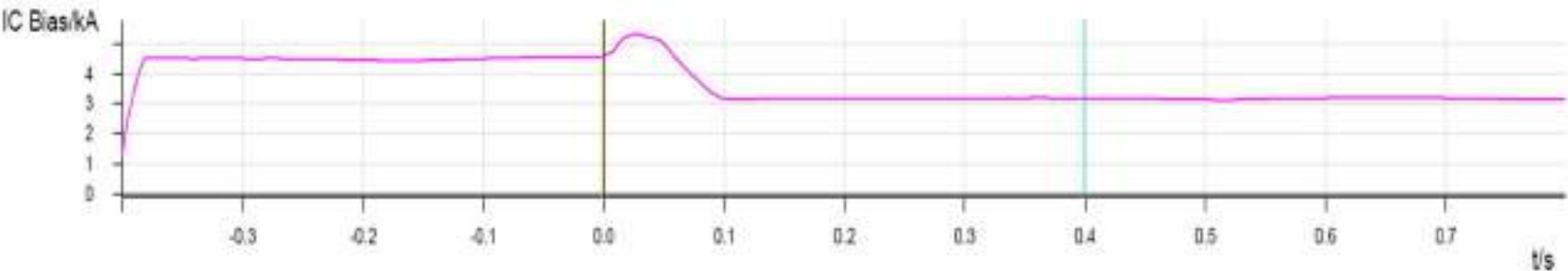
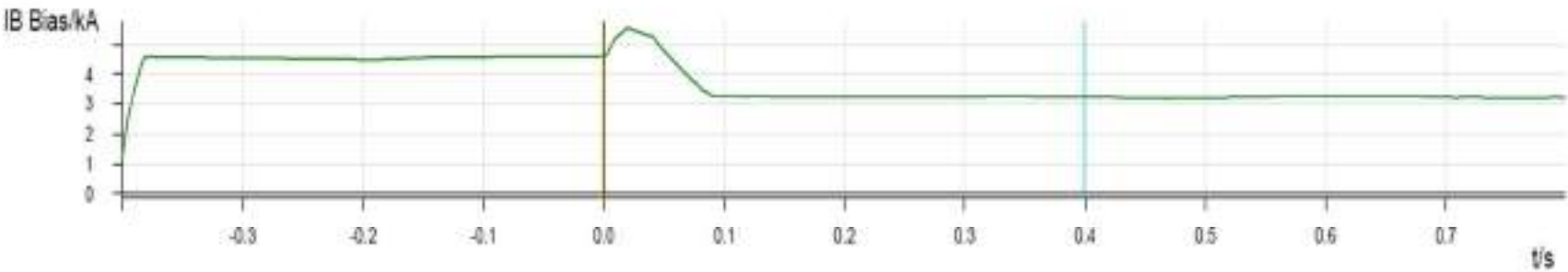
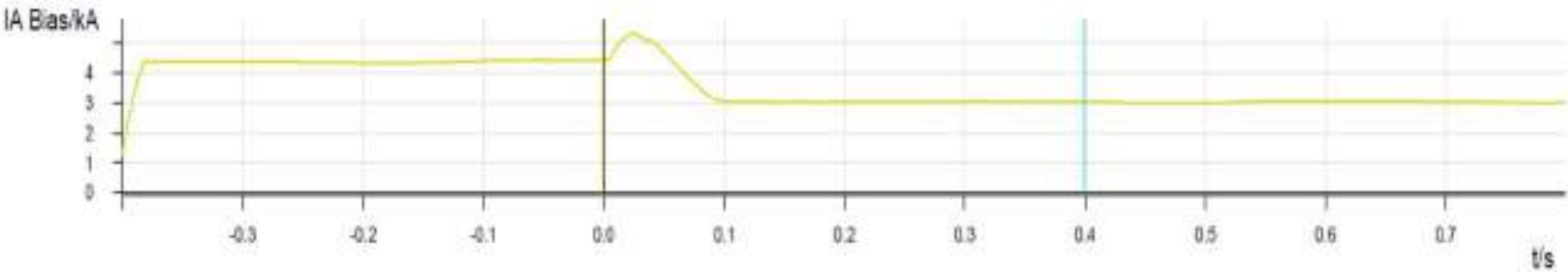
Details of Tripping of feeders under Transmission Central ZONE(TRIPPING DETAILS UNDER TEST & COMMISSIONING DIVISION , BAREILLY) 31.05.2025							
SL. NO.	NAME OF SUB-STATION	TRIPPING DATE/ TIME	CLOSING DATE/ TIME	C.B. NO/ DIRECTION	TYPE OF PROTECTION ON SCHEME	FLAGS OBSERVED	ANALYSIS
						THIS END	
						RELAY FLAGS	
	400 KV Bareilly	31.05.2025 20:24		Bus bar relay	Busbar protection on Micom 741/742	87BB Trip, Z2, Ia=72.49A, Ib=2.733KA, Ic=104.6A, In=2.016KA	87 BB differential Z2 protection operated during charging of ICT-2 after Y phase CT Replacement. As ICT-2 was connected to Bus-2 so all feeders connected to Bus-2 got tripped.
1	400 KV Bareilly	31.05.2025 20:24	01.06.2025 14:40	220 KV Bus coupler		Tripped A,B,C, Trip, 87BB Trip, Z2, Ia=414.1A, Ib=605.5A, Ic=144.5A, In=320.2A	
2	400 KV Bareilly	31.05.2025 20:24	31.05.2025 22:51	220 KV Dohna Ckt-2		Tripped A,B,C, Trip, 87BB Trip, Z2, Ia=207A, Ib=312.5A, Ic=224.6A, In=37.11A	
3	400 KV Bareilly	31.05.2025 20:24	31.05.2025 21:01	315 MVA ICT-2		Tripped A,B,C, Trip, 87BB Trip, Z2, Ia=830.1A, Ib=1.246KA, Ic=236.3A, In=1.938KA	
4	400 KV Bareilly	31.05.2025 20:24	31.05.2025 21:37	315 MVA ICT-3		Tripped A,B,C, Trip, 87BB Trip, Z2, Ia=808.6A, Ib=822.3A, Ic=818.4A, In=183.6A	
5	400 KV Bareilly	31.05.2025 20:24	31.05.2025 21:40	CB Ganj Ckt-2		Tripped A,B,C, Trip, 87BB Trip, Z2, Ia=11.72A, Ib=0A, Ic=11.72A, In=0A	
6	400 KV Bareilly	31.05.2025 20:24	31.05.2025 21:20	220 KV pantnagar		Tripped A,B,C, Trip, 87BB Trip, Z2, Ia=314.51A, Ib=361.3A, Ic=312.55A, In=25.39A	
7	400 KV Bareilly	31.05.2025 20:24	31.05.2025 22:30	220 KV Amariya -2		Tripped A,B,C, Trip, 87BB Trip, Z2, Ia=85.94A, Ib=87.89A, Ic=89.84A, In=13.67A	
8	400 KV Bareilly	31.05.2025 20:24	31.05.2025 22:09	220 KV Pilibhit Ckt-2		Tripped A,B,C, Trip, 87BB Trip, Z2, Ia=304.7A, Ib=330.1A, Ic=304.7A, In=17.58A	
9	400 KV Bareilly	31.05.2025 20:24	01.06.2025 13:45	220 KV Faridpur	MicomP 442/ Rel-650	R, Y, Z1, A/R lockout, 9.714Km, Ia=534.8A, Ib=1.354K, Ic=993.8A, fault duration=41.6ms, fault clearing time=79.88ms,	Due to jumper snapped b/w dead end tower and CT
10	400 KV Bareilly	31.05.2025 20:24	31.05.2025 20:42	315 MVA ICT-1	ABB		Opened manually
11	400 KV Bareilly	31.05.2025 20:52	31.05.2025 20:56	315 MVA ICT-1	ABB	HV side Directional over current protection operated, Gr B3 phase trip unit operated	Due to overloading of ICT

Events Description at 400 KV S/S Bareilly

- On dated 31.05.2025 at 20:24 87 BusB differential Z2 protection operated during charging of 315 MVA ICT-2 after Replacement of 220 KV Y phase CT. Bus bar differential protection operated due to 220 KV Y phase replaced CT polarity reversal. As ICT-2 was connected to Bus-2 so all feeders connected to Bus-2 got tripped.

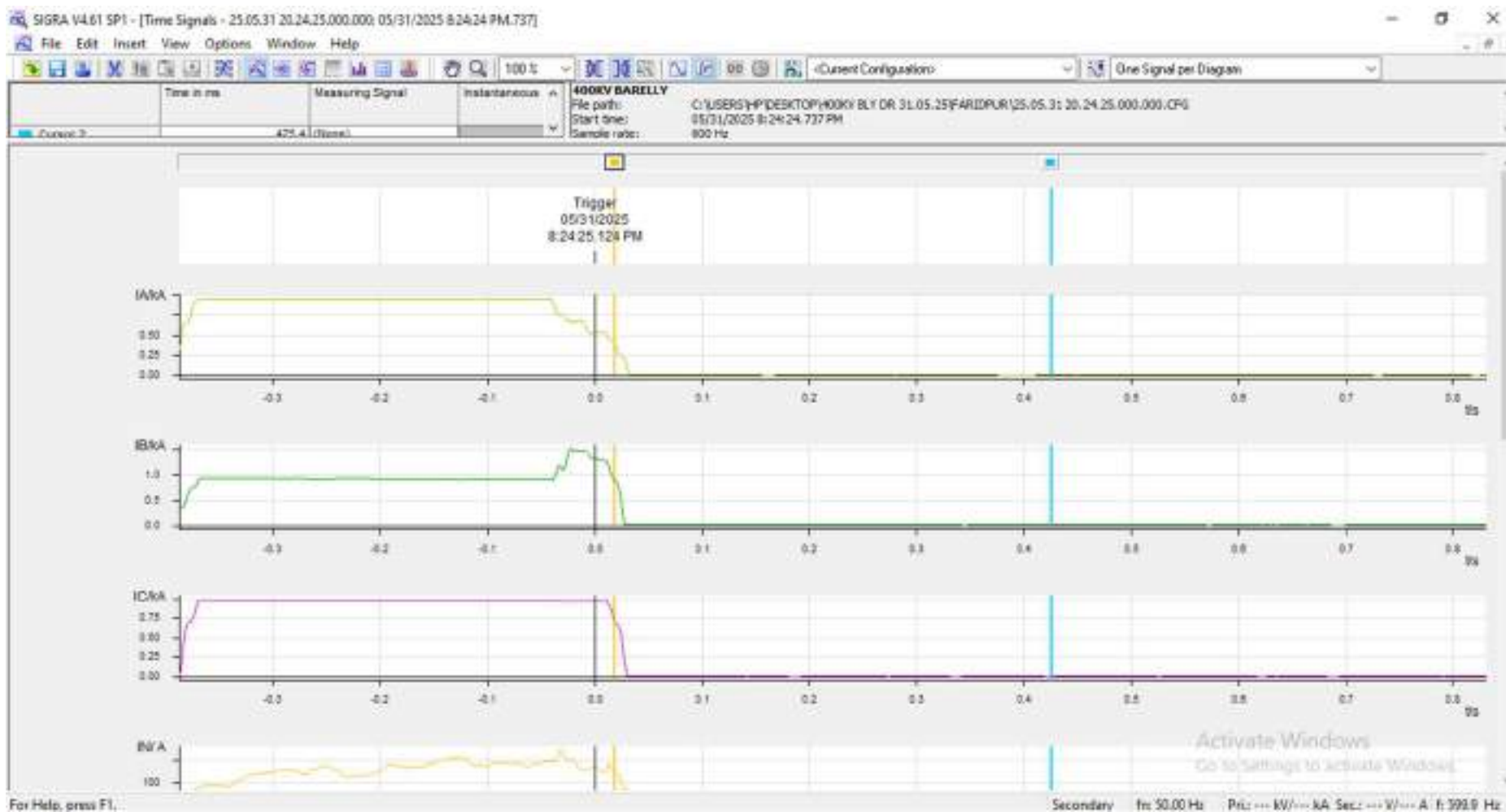
DR of 220 KV Bus Bar relay





- On dated 31.05.2025 at 20:24 220 KV Faridpur line which was connected to 220 KV Bus-1 tripped in Z1 due to jumper snapped from 220 KV CT terminal between dead end tower and CT with following flags R, Y, Z1, A/R lockout, 9.714Km, $I_a=534.8A$, $I_b=1.354K$, $I_c=993.8A$, fault duration=41.6ms, fault clearing time=79.88ms.

DR of 220 KV Faridpur line

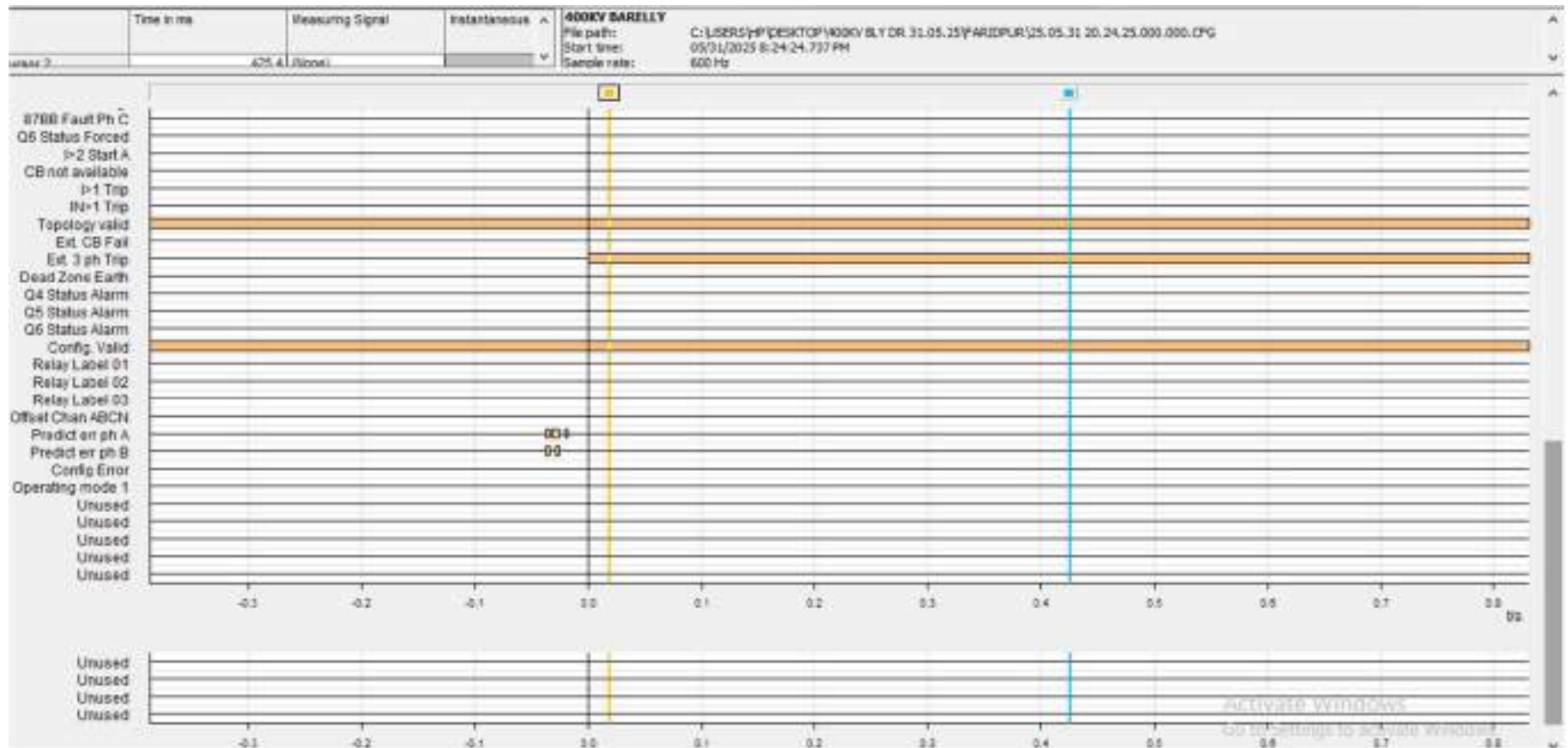


Slide 10

DR1

Divya Ratna Rathore, 21-06-2025

DR of 220 KV Faridpur line

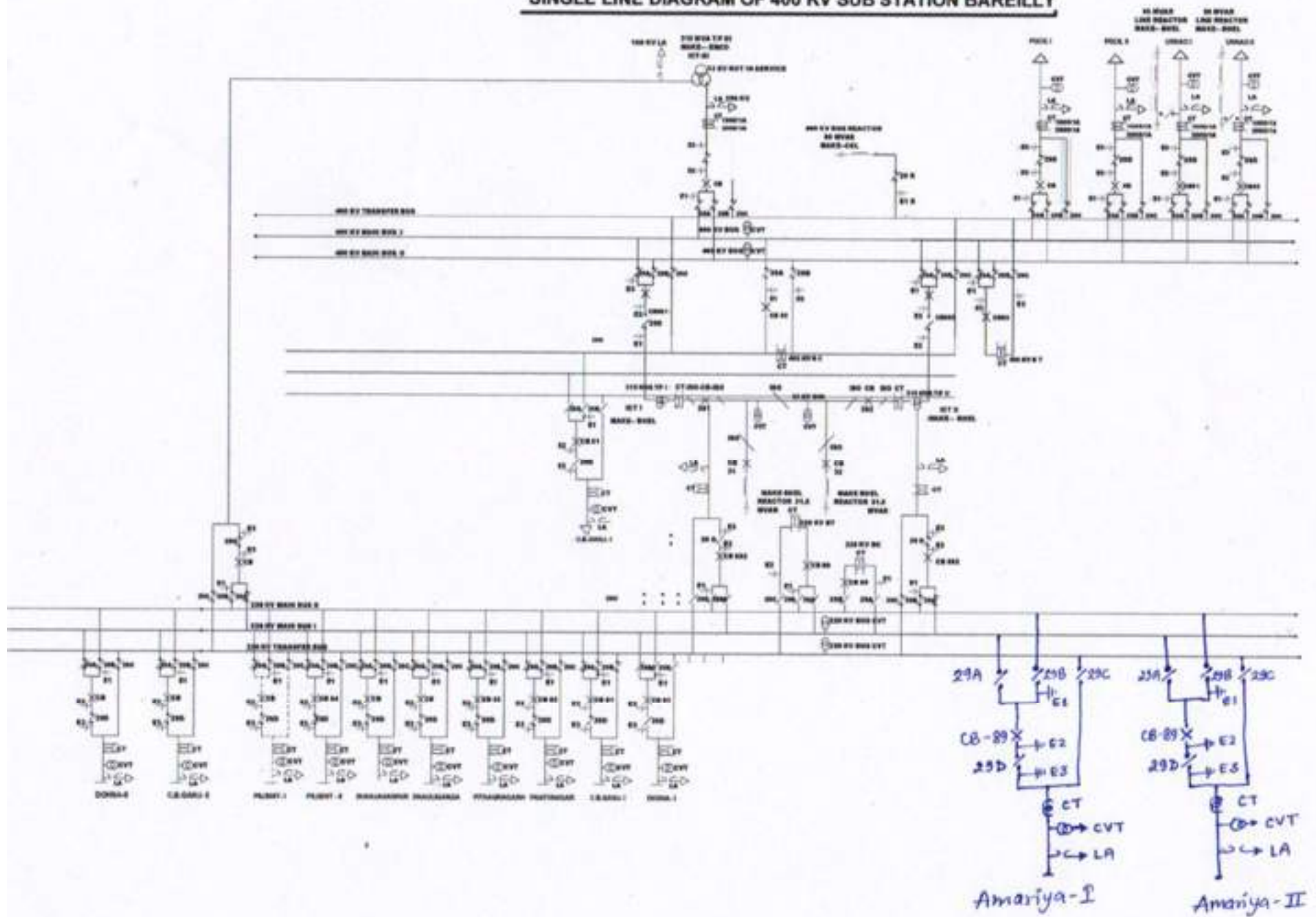
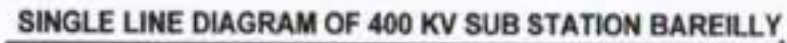


- On dated 31.05.2025 at 20:24hrs 220 KV Faridpur line tripped in Z-1 (at the time of tripping of 220 KV Bus Bar in Z2).
- Seen sparking at 220 KV CT terminal of 220 KV Faridpur line 315 MVA ICT-1 opened manually.
- 315 MVA ICT-1 charged at 20:42 hrs but due to overloading 315 MVA ICT-1 tripped at 20:52 with flags HV Directional Overcurrent and charged at 20:56

REMEDIAL ACTION TAKEN

- CT polarity (Bus Bar protection core) of 220 KV Y Phase CT of 315 MVA ICT-2 corrected on dated 01.06.2025.

SLD



THANK YOU.