



Agenda  
for  
**154<sup>th</sup> PCC Meeting**

**Date:20.01.2026**  
**Eastern Regional Power Committee**  
**14, Golf Club Road, Tollygunge**  
**Kolkata: 700 033**

# EASTERN REGIONAL POWER COMMITTEE

## AGENDA FOR 154<sup>th</sup> PROTECTION COORDINATION SUB-COMMITTEE MEETING TO BE HELD ON 20<sup>TH</sup> JAN 2026 AT 10:30 HRS THROUGH MS TEAMS

### PART – A

**ITEM NO. A.1: Confirmation of Minutes of 153<sup>rd</sup> Protection Coordination sub-Committee Meeting held on 29<sup>th</sup> Oct 2025 through MS Teams.**

The minutes of 153<sup>rd</sup> Protection Coordination sub-Committee meeting held on 28.11.2025 was circulated vide letter dated 9<sup>th</sup> Dec 2025.

**Members may confirm the minutes of the Meeting.**

### PART – B

**ITEM NO. B.1: Submission of Protection Audit Plan & Audit Reports**

The Clause (5) of Regulation 15 of IEGC Regulations, 2023 envisages as below:

Quote

*(3) 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). .....*

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

.....

*(5) 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.*

Unquote

#### **A. Internal Audit**

Sl No.	Utility Name	Audit Plan for FY 2024-25	Audit Report for FY 2024-25	Audit Plan for FY 2025-26	Audit Plan for FY 2026-27
1	PG-ER-1 & PMTL				
2	PG-ER-2				
3	PG-Odisha				
4	WBSETCL				

5	BSPTCL	Received	Not Received	Not Received	Not Received
6	OPTCL	Received	Not Received	Not Received	Not Received
7	DVC	Received	Not Received	Received	Not Received
8	JUSNL	Received	Received	Received	Not Received
9	OPGC	Not Received	Not Received	Not Received	Not Received
10	OHPC	Not Received	Not Received	Not Received	Not Received
11	CESC	Received	Received	Received	Received
12	NHPC	Received	Not Received	Received	Not Received
13	DMTCL	Received	Received	Received	Not Received
14	NTPC ER-I	Received	Not Received	Not Received	Not Received
15	NTPC ER-II	Received	Not Received	Not Received	Not Received
16	Tashiding HEP	Received	Received	Received	Received
17	Jorethang HEP	Received	Received	Received	Received
18	MPL	Not Received	Not Received	Not Received	Not Received
19	JITPL	Not Received	Not Received	Not Received	Not Received
20	GMR	Not Received	Not Received	Not Received	Not Received
21	Adhunik	Not Received	Not Received	Not Received	Not Received
22	IBEUL	Not Received	Not Received	Received	Not Received

 Received,  Not Received

Members may update.

### B. Third Party Audit

Third party Protection Audit has been completed, and report has been received for 220 kV Tashidinh HEP & Jorethang HEP. Audit plan has been received from DMTCL, Dikchu HEP, IBEUL. Apart from this ERPC secretariat has conducted third party audit of seven nos. of critical substations in FY 2025-26.

PG ER-1 representative informed that protection audit plan for FY 2025-26 and reports for FY 2024-25 will be shared to ERPC within a week. Regarding third party protection audit, he updated that audit for 7 numbers of substations has been planned in phase 1 for which contract has been awarded. The phase wise plan for third party audit will be shared to ERPC within a week.

BSPTCL representative stated that SAS upgradation work is in progress at various 220 kV Substations therefore it is quite difficult to carry out protection audit at this stage. PCC advised that internal audit may be planned for the remaining substations where SAS work is not going on. Further audit plan for FY 2026-27 may be submitted.

JUSNL representative submitted that plan for FY 2025-26 will be shared to ERPC at the earliest.

MPL representative said that they had conducted third party protection audit & the report will be shared to ERPC.

PG ER-1 vide email dated 5<sup>th</sup> Nov 2025 and JUSNL vide email dated 17<sup>th</sup> Nov 2025 had shared internal and third party protection audit plan for 2025-26 to ERPC. PG ER-2 vide email dated 24<sup>th</sup> Nov 2025 had shared protection audit plan for FY 2026-27.

In 153<sup>rd</sup> PCC Meeting, BSPTCL representative said that SAS upgradation work is in progress at various 220 k V Substations therefore it is quite difficult to carry out protection audit at this stage. BSPTCL representative said that list will be provided to ERPC/ERLDC.

WBSETCL representative informed that internal audit schedule for FY 2026-27 is shared to ERPC.

JUSNL representative informed that third party protection audit is already in progress at various S/s.

PG Odisha has shared third party protection audit plan for FY 2025-26 vide email dated 16<sup>th</sup> Dec 2025.

**Members may update.**

**ITEM NO. B.2: Total Power Failure at 220 kV Rengali S/s on 12<sup>th</sup> Dec 2025 at 19:06 Hrs**

On 12.12.2025 at 19:06 Hrs, Y phase Bus-1 post insulator of 220 kV Bus coupler at Rengali S/s got snapped and created Y phase bus fault. Fault was sensed in zone -4 protection by all emanating lines and got tripped after 250 msec in Z-4 protection as Bus bar protection was not in service. subsequently 220kV Rengali S/s became dead. Further, Rengali HEP unit -1 & 2 also tripped at the same time.

Detailed report from ERLDC is attached at **Annexure B.2.**

**Load Loss: 13 MW, Gen. Loss: 100 MW**

**Outage Duration: 04:58 Hrs**

**OHPC& OPTCL may explain.**

**ITEM NO. B.3: Total Power Failure at 400 kV TISCO S/s on 5<sup>th</sup> Dec 2025 at 19:21 Hrs**

400kV TISCO S/s is connected through 400kV TISCO Baripada S/C and 400kV TISCO Jamshedpur S/C lines. Prior to the disturbance 400kV TISCO- Baripada S/C was under planned shutdown and TISCO was drawing power through Jamshedpur radially. During charging attempt of Baripada line from TISCO end, Y-Phase LA at Baripada got burst and created Y phase fault. Fault was sensed by 400kV Jamshedpur- TISCO and 400kV Baripada-Jamshedpur line in Z-3 protection and both lines got tripped after 800 msec from Jamshedpur and Baripada end respectively subsequently 400kV TISCO S/s became dead.

Detailed report from ERLDC is attached at **Annexure B.3.**

**Load Loss: 94 MW**

**Outage Duration: 01:13Hrs**

**DVC may explain.**

**ITEM NO. B.4: Total Power Failure at 400 kV PVUNL S/s on 20<sup>th</sup> Dec 2025 at 11:23 Hrs**

On 20/12/2025 at 11:06 Hrs, 400 kV New Ranchi-Patratu-1 line got tripped due to conductor snapping and 400 kV New Ranchi-Patratu-2 was under planned shutdown. After tripping of 400 kV Patratu- New Ranchi-1 Line, 400 kV PVUNL-Tenughat Line got tripped on SPS operation.

Subsequently, PVUNL generation of around 665 MW was evacuated through 400 kV PVUNL-Patratu D/C and 400/220 kV ICTs at Patratu. At 11:23 Hrs, during charging attempt of 400kV Ranchi-Patratu-1 line from Patratu end, faulty line got tripped on SOTF and at the same time bus bar/LBB protection operated at 400kV Patratu S/s subsequently 400kV Patratu-PVUNL D/C got tripped and 400kV PVUNL became dead.

Detailed report from ERLDC is attached at **Annexure B.4.**

**Gen. Loss: 665 MW**

**Outage Duration: 01:12 Hrs**

**JUSNL may explain.**

**ITEM NO. B.5: Total Power Failure at 220 kV Garhwa (JUSNL) S/s on 5<sup>th</sup> Nov 2025 at 02:05 Hrs**

On 5<sup>th</sup> Nov 2025, due to heavy lightning and rain, 33 kV SST got burst and all associated 132 kV lines got tripped. At 02:05 Hrs, all 220kV feeders at Garhwa were hand tripped for safety reason consequently 220kV Garhwa S/s became dead.

Detailed report from ERLDC is attached at **Annexure B.5.**

**Load Loss: 30 MW**

**Outage Duration: 01:40 Hrs**

**JUSNL may explain.**

**ITEM NO. B.6: Tripping of 400 kV Bus at Patna Substation on 12/12/2025**

At 10:50 Hrs on 12.12.25, all main CBs connected to 400 kV Main Bus-2 at Patna SS got tripped due to Bus Bar protection operation. The fault was caused by the de-capping of polymer insulator in B-Phase of 400kV main bay of ICT-3, as intimated.

Following elements got tripped with 400kV Main bus 2:

1. 400 kV Barh -Patna ckt-3
2. 400 kV Barh -Patna ckt-4
3. 400 kV Patna Bakhtiyarpur ckt-1&2
4. 400/220 kV ICT 3 at Patna

Following issues associated with protection were observed in the event.

1. Unwanted tripping of 400kV-Patna-Barh-4 in Z-3 protection ( $I_r=I_c=4$  kA). ERLDC has already communicated this issue via email dated 16<sup>th</sup> Dec'25 NTPC Barh advising review and resolution to prevent re-occurrence.
2. 400kV-Barh-Bakhtiharpur D/C line got tripped on Z-1 distance protection from Bakhtiyarpur end. ERLDC has communicated this issue via email dated 16<sup>th</sup> and 20<sup>th</sup> Dec'25, suggesting verification of relay setting data and carrying out DR Transplay test to analyze the relay response and resolve the issue.
3. DT signal received was recorded at Bakhtiyarpur end, which normally should not have been transmitted as the Tie CB at Patna was in close condition.

**NTPC Barh, PG ER-1 and BSPTCL may explain.**

**ITEM NO. B.7: Third Party Protection audit of Sub stations for the Year 2026-27**

As per IEGC 2023 Clause 15.2, “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.”

Further IEGC 2023 Clause 15.3 states that “After analysis of any event, each RPC shall identify a list of substations / and generating stations where third-party protection audit is required to be carried out and accordingly advise the respective users to complete third party audit within three months.”

ERPC Secretariat conducted protection audit for seven substations in 2025 with assistance from a third-party agency.

In 55<sup>th</sup> TCC & ERPC Meeting held in Dec-25, ERPC approved the proposal for carrying out audit for 15 nos. of substations in ER in FY 2026-27.

Accordingly, a list of S/s has been proposed below for third part protection audit in FY 2026-27.

400/220 kV Mendhasal S/s(OPTCL)	220 kV Subhasgram S/s(WBSETCL)
220 kV Indravati HEP(OHPC)	400/220 kV Mejia S/s(DVC)
220 kV Jaynagar S/s(OPTCL)	220 kV CTPS B S/s (DVC)
220 kV Budhipadar S/s(OPTCL)	220 kV Kalyansweri S/s(DVC)
220 kV Rengali S/s(OPTCL)	220 kV Hazipur S/s(BSPTCL)
400/220 kV Arambag S/s(WBSETCL)	220 kV Begusarai S/s(BSPTCL)
400/220 kV Gokarna S/s(WBSETCL)	220 kV Darbhanga S/s(BSPTCL)
400/220 kV Bidhannagar S/s(WBSETCL)	

**Members may discuss.**

**ITEM NO. B.8: Status of carrier communication for 220 kV Biharsharif–TTPS transmission line**

As per discussions held in 150<sup>th</sup> PCC Meeting, BSPTCL representative informed that the PLCC equipment on the BSPTCL side is ready for 220 kV Biharsharif–TTPS line and commissioning of the PLCC system would be taken up once the PLCC equipment at the TTPS end is ready.

In this connection, it is updated by BSPTCL that all associated works related to the commissioning of the PLCC panel at GSS Biharsharif have been completed, including laying of cables, LMU erection, and other allied works. Local testing of the PLCC panel was successfully carried out by the Mobile Team, Patna on 07.11.2025 at GSS Biharsharif. Further, commissioning of PLCC panels at Biharsharif will be done as soon as PLCC erection work is completed at TTPS end.

**TVNL may update the present status at their end.**

**ITEM NO. B.9: Tripping of ICTs during the month of November & December 25**

Sl. No	Name of the Element	Trip Date/Time	Reason of tripping	Utility
1	220KV/132KV, 160 MVA ICT 1 AT BARIPADA.	04-11-2025 10:14	ICT tripped due to the operation of group relays.	PG ODISHA

2	400KV/11KV, 80 MVA ICT 1 AT ACPP II	08-11-2025 19:32	Due to LV side REF protection.	JSPL/OPTCL
3	400KV/220KV, 315 MVA ICT 2 AT ARAMBAGH	10-11-2025 03:42	Tripped on differential protection.	WBSETCL
4	400KV/220KV, 315 MVA ICT 2 AT BINAGURI	18-11-2025 14:22	Tripped on differential protection due to LV side B-phase LA failed.	PG ER-II
5	400KV/11KV, 110 MVA ICT 2 AT BUXAR TPP	05-12-2025 05:53	Buchholz Relay protection operated.	SJVN/BSPTCL
6	220KV/132KV, 50 MVA ICT 1 AT MALDA	06-12-2025 10:20	Tripped due to LV side O/C E/F relay operation.	PG ER-II
7	400KV/220KV, 500 MVA ICT 1 AT BUXAR TPP	23-12-2025 14:13	Tripped on PRV protection	SJVN/BSPTCL
8	400KV/220KV, 315 MVA ICT 4 AT ARAMBAGH	31-12-2025 08:43	Tripped From HV Side On Pole Discrepancy.	WBSETCL

Concerned utilities may explain.

**ITEM NO. B.10: Tripping of Buses during the month of November & December 25**

Sl. No	Name of the Element	Trip Date	Trip Time	Reason of tripping	Utility
1	220kV Main Bus-1 at Budhipadar SS	17-12-2025	15:37	All emanating line from main bus #1 tripped on Z-4 protection due to bus fault at Budhipadar (one of the pilot insulators connected to bus-1 failed)	OPTCL
2	400KV MAIN BUS - 1 AT MOTIHARI SS	02-11-2025	21:35	BB Relay Maloperation.	DMTCL

Concerned utilities may explain.

**ITEM NO. B.11: Repeated tripping of transmission lines during the month of November & December 25**

Sl.No.	Name of the Element	No. of times Tripped	Reason of tripping	Utility
1	132KV-BANKA (PG)-SULTANGANJ-1	9	Tripped in R-Earth fault in 3 instances and Y-Earth in 6 instances. Fault distance was around 25-30 km from Sultanganj end.	BSPTCL

2	132KV-SULTANGANJ-DEOGHAR-1	9	Tripped in R-Earth fault in 3 instances and B-Earth in 3 instances.	BSPTCL & JUSNL
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**Concerned utilities may explain.**

**ITEM NO. B.12: Single Line Tripping Incidences in month of November 2025 and December 2025**

Single line tripping incidents in the month of November 2025 and December 2025 which needs explanation from constituents of either end is attached at **Annexure B.12.**

**Members may discuss.**

**PART- C: OTHER ITEMS**

**ITEM NO. C.1: Collection Protection Settings data from the newly commissioned Substations**

As part of the support service of Protection Database Project, M/s PRDC will collect relay settings data of the newly commissioned substations and update the data in the ER Protection Database.

The data collection for the following substations have been planned by M/S PRDC in Jan-26.

1. 400 kV Aditya Aluminum
2. 400 kV JSPL-ACPP-II
3. 220 kV Turumunga (OPTCL)

The utilities concerned are requested to facilitate the visit of the PRDC Personnel for collection of the protection settings data.

**Members may note.**

**ITEM NO. C.2: Submission of protection performance indices on monthly basis by users to RPC and RLDC for 220 kV and above lines**

As per IEGC 2023 Clause 15(6), 15(7) all users shall submit protection performance indices of previous month by 10<sup>th</sup> of every month to ERPC and ERLDC along with reasons for performance indices less than unity of individual element wise protection system to the respective RPC and action plan for corrective measures.

Protection Performance Indices for Nov 2025 and Dec 2025 is attached at **Annexure C.2.**

Following table shows the status of PP Indices received for last five months.

Sl.no	Utility Name	August 2025	September 2025	October 2025	November 2025	December 2025
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1	PG-ER-1	Yes (08.09.2025)	Yes (22.10.2025)	Yes (26.11.2025)	Yes (10.12.2025)	
2	PG-ER-2	Yes	Yes (17.10.2025)	Yes (21.11.2025)	Yes (31.12.2025)	Yes (12.01.2026)
3	PG-Odisha	Yes (03.09.2025)	Yes (06.10.2025)			Yes (05.01.2026)
4	WBSETCL/ WBPDC	Yes (04.09.2025)	Yes (08.10.2025)	Yes (07.11.2025)	Yes (04.12.2025)	Yes (05.01.2026)
5	BSPTCL/ BGCL		Yes (21.10.2025)	Yes (24.11.2025)	Yes (19.12.2025)	
6	OPTCL/ OHPC	Yes	Yes (27.10.2025)	Yes (24.11.2025)	Yes (18.12.2025)	
7	DVC		Yes (20.11.2025)	Yes (20.11.2025)		
8	JUSNL	Yes (06.09.2025)	Yes (17.10.2025)	Yes (17.12.2025)	Yes (17.12.2025)	
9	Sikkim					
10	OPGC					
11	PMTL					
12	NTPC- KHSTPP	Yes	Yes (10.10.2025)		Yes (30.12.2025)	
13	NTPC- FSTPP		Yes (10.10.2025)			
14	NTPC- BARH	Yes (04.09.2025)	Yes (06.10.2025)	Yes (01.11.2025)	Yes (01.12.2025)	Yes (05.01.2026)
15	NTPC- TSTPP					
16	NTPC- KBUNL		Yes (10.10.2025)			
17	NPGC					
18	BRBCL					
19	NTPC- DARILAPLI	Yes (01.09.2025)	Yes (01.10.2025)	Yes (03.11.2025)	Yes (01.12.2025)	Yes (01.01.2026)
20	NTPC- NORTH KARNPUA RA					

21	ATL					
22	APNRL	Yes (07.09.2025)	Yes (17.10.2025)		Yes (09.12.2025)	
23	CBPTCL					
24	DMTCL	Yes (04.09.2025)	Yes (04.10.2025)	Yes (04.11.2025)	Yes (03.12.2025)	Yes (02.01.2026)
25	ENICL	Yes (09.09.2025)	Yes (05.10.2025)	Yes (06.11.2025)	Yes (06.12.2025)	
26	Chuzachen HEP					
27	Jorethang HEP	Yes (01.09.2025)	Yes (01.10.2025)	Yes (01.11.2025)	Yes (01.12.2025)	Yes (01.01.2026)
28	Tashiding Hep	Yes (01.09.2025)	Yes (01.10.2025)	Yes (01.11.2025)	Yes (01.12.2025)	Yes (02.01.2026)
29	GMR					
30	IBEUL					
31	JITPL					
32	MPL					
33	NKTL					
34	OGPTL	Yes (09.09.2025)	Yes (05.10.2025)	Yes (06.11.2025)	Yes (06.12.2025)	
35	PMJTL					
36	Powerlink					
37	PKTCL	Yes (09.09.2025)	Yes (05.10.2025)	Yes (06.11.2025)	Yes (06.12.2025)	
38	CESC					
39	Rongnichu HEP					
40	TVNL	Yes (04.09.2025)	Yes (03.10.2025)	Yes (01.11.2025)		

**Members may discuss.**

**ITEM NO. C.3: Follow-up of Decisions of the Previous Protection Sub-Committee Meeting(s)**

The decisions of previous PCC meetings are attached at **Annexure C.3.**

**Members may update.**


**ग्रिड-इंडिया**  
**GRID-INDIA**

**ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड**  
 (भारत सरकार का उद्यम)  
**GRID CONTROLLER OF INDIA LIMITED**  
 (A Government of India Enterprise)  
 [formerly Power System Operation Corporation Limited (POSOCO)]

**पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / Eastern Regional Load Despatch Centre**

कार्यालय : 14, गोल्फ क्लब रोड, टॉलिंगुंज, कोलकाता - 700033  
 Office : 14, Golf Club Road, Tollygunge, Kolkata - 700033  
 CIN : U40105DL2009GOI188682, Website : www.erfdc.in, E-mail : erfdinfo@grid-india.in, Tel.: 033 23890060/0061

**Detailed Report of grid event at 220/132 kV Rengali S/s of Eastern Region**  
**(To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f))**

(आई ई जी सी 37.2 (एफ) के अनुपालन में)

Date(दिनांक): 29-12-2025

**1. Event Summary (घटना का सारांश):**

At 19:06 Hrs on 12.12.2025, Y phase Bus-1 post insulator of 220 kV Bus coupler bay at Rengali S/s snapped and created Y-Earth bus fault. The fault was sensed in zone-4 protection by 220kV Rengali PH #2 line, Z-2 protection from Tarkera end and OC protection by Rengali PG#2 line, leading to tripping of line. Consequently, the 220kV Rengali S/s became dead. Simultaneously, Rengali HEP unit -1 & 2 also tripped due to GT REF protection operation. As a result, a total load loss of 49 MW at Rengali S/s and 100 MW generation loss at Rengali HEP occurred.

**2. Time and Date of the Event (घटना का समय और दिनांक):** 19:06 hrs of 12.12.2025.

**3. Event Category (ग्रिड घटना का प्रकार):** Grid Disturbance (GD)-1

**4. Location/Control Area (स्थान/नियंत्रण क्षेत्र):** Odisha

**5. Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency in (Hz)	Regional Generation in (MW)	Regional Demand in (MW)	State Generation (MW)	State Demand (MW)
				Odisha	Odisha
<b>Pre-Event (घटना पूर्व)</b>	50.02	32286	22775	2435	5965
<b>Post Event (घटना के बाद)</b>	50.02	32186	22726	2335	5916

**\*Pre and post data of 1 minute before and after the event**

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विद्युत उत्पादन इकाइयां जो बंद हैं)	220 kV Rengali-Rengali (PG)-1, 220 kV Rengali-Rengali (PH)-1 was in idle charged condition from Rengali (OPTCL) end. 220kV Main Bus #2 was under out of service condition.
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Weather Condition (मौसम स्थिति)

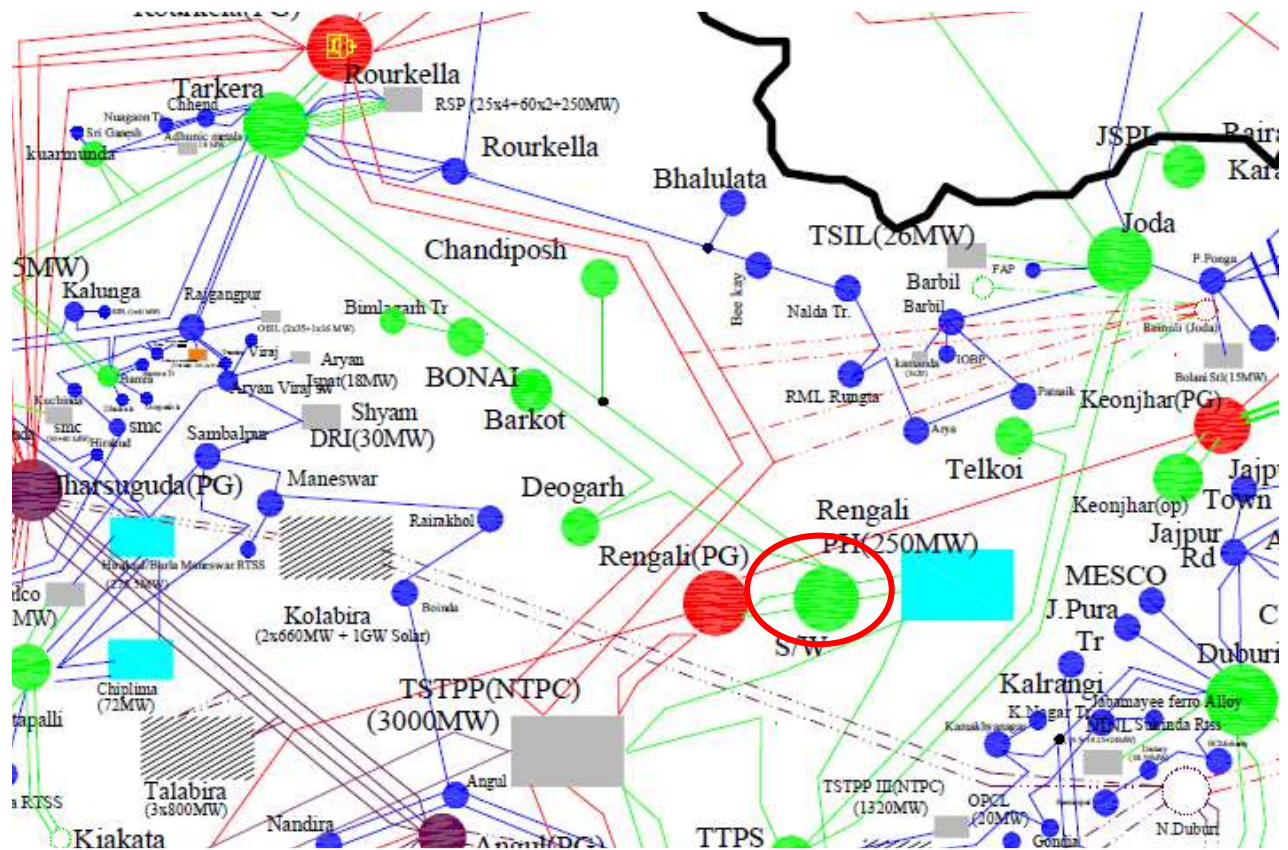
Normal.

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Approximate load loss of 49 MW at Rengali and 100 MW Generation loss at Rengali PH.

7. **Duration of interruption (रुकावट की अवधि):** 04:58 Hrs.

8. **Network across the affected area (प्रभावित क्षेत्र का नक्शा):**

9. **Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण):** Y-Ph Bus-1 Post Insulator of Rengali B/C bay



**Figure 1: Network across the affected area**

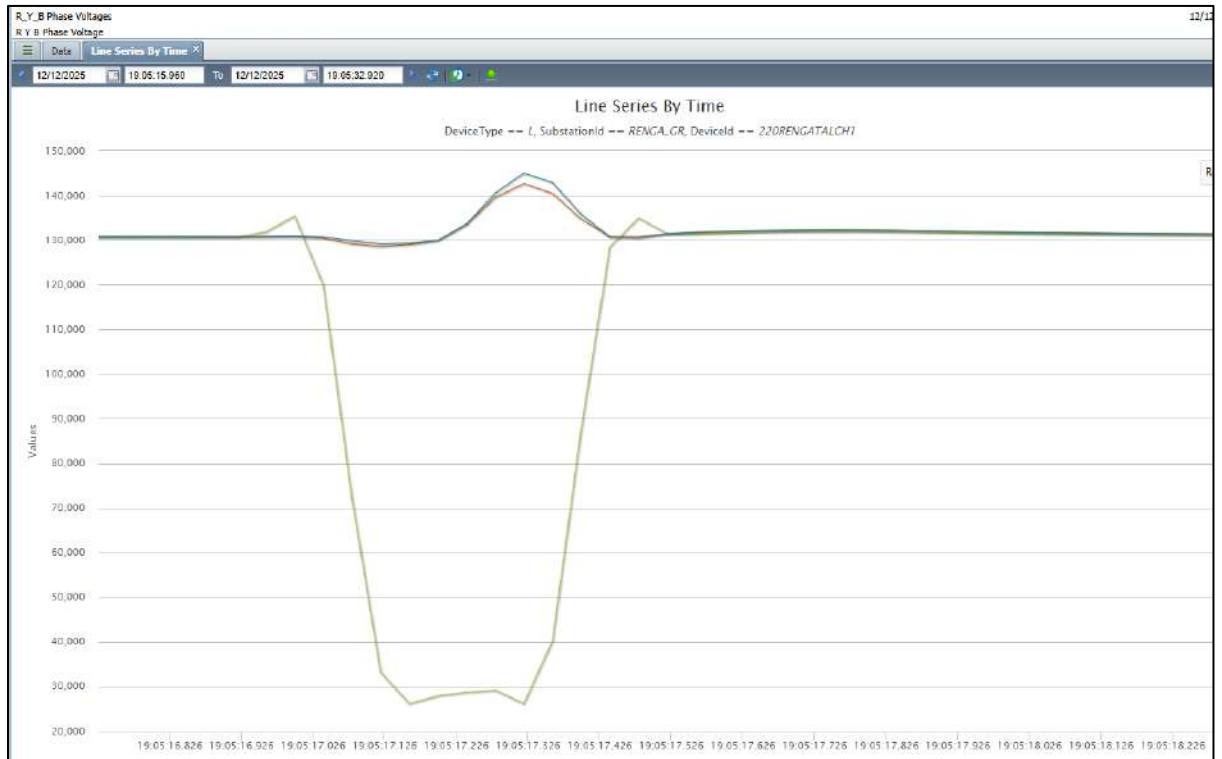
### 10. Major Elements Tripped (प्रमुख ट्रिपिंग):

क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time (Hrs)
1	220KV-Rengali-Rengali (PG)-2	19:05:17	Rengali: Y_N, O/c e/f, Iy12.89 kA;	Didn't trip.	00:24 (13.12.25)
2	220KV-Rengali-Rengali PH-2		Z-4, Y-Earth, FC-15.2 kA	-	00:40 (13.12.25)
3	220 kV Rengali-Deogarh		Not Tripped		00:04 (13.12.25)
4	220 kV Rengali-Tarkera		-	Z-2, FC-1.5kA, Y-Earth	00:09 (13.12.25)
5	U#1, U#2 at Rengali PH (50 MW each)		GT REF operated during disturbance at Rengali S/s		19:28/19:31
6	220KV-Rengali-Rengali (PG)-1		Idle charged from Rengali end.		
7	220KV-Rengali-Rengali PH-1				

### 11. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):

- Prior to the disturbance, 220kV Main bus #2 was under S/D condition and 220kV Rengali PH #2 and 220kV Rengali PG #2 was in idle charged condition from Rengali S/s.
- At 19:05:17 Hrs, Y phase Bus-1 side post insulator of 220 kV Bus coupler bay at Rengali S/s snapped, resulting in a Y-Earth bus fault at Rengali S/s.
- The 220kV Rengali PG #2 line tripped on O/C Earth fault Stg-2 protection after 100 msec.
- The 220kV Tarkera feeder tripped from Tarkera end on Z-2 protection.
- The 220kV Rengali PH #2 line sensed the fault in Z-4 protection and tripped after 250 msec. (Bus bar protection was not in service at the time of event).
- Simultaneously, Rengali PH unit 1 & 2 got tripped due to REF operation of GT.
- Due to tripping of all emanating lines, the 220kV Rengali S/s became dead.
- Total load loss of 49 MW reported at Rengali S/s.

- Generation loss of 100 MW occurred at Rengali PH S/s.



**PMU of Rengali voltage**

## 12. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

- All Protection operated as per existing protection scheme at 220kV Rengali S/s.
- During bus fault, 220kV Rengali-Rengali PH #2 line tripped in Z-4 protection and simultaneously Rengali PH Unit 1 & 2 tripped due to unwanted GT REF protection operation. Reason of REF protection operation for line fault may be explain.
- DR of 220kV Rengali-Tarkera line at Tarkera S/s is not time synchronised. DR channel recording length needs to be increased to 3 sec as per ERPC guidelines.
- Non segregation of feeders between two main buses in the absence of feeder-wise voltage selection relay and BB protection has significantly reduces the reliability of Rengali SS. Uniform distribution of feeders on both buses is recommended to effectively utilise the double main bus scheme to enhance reliability. Further, installation of BB protection is required in accordance with Schedule-V, Section-4 of the CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022.
- As intimated only B/U protection is presently available for the 220 kV Rengali-Rengali PG lines. Line differential Protection needs to be provided, as the line length is less than 10 Kms, in compliance with CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022.

- Similarly for short 220 kV Rengali–Rengali PH line ((Less than 10 Kms), line differential protection relay needs to be installed as per the applicable CEA standards.
- Report received from SLDC is attached in Annexure.

**13. Action Taken/Remedial Measures (सुधारात्मक उपाय):**

**14. Key Lessons Learnt (प्रमुख अधिगम बिंदु):**

**Annexure:**

**Annexure-3: Report received from OPTCL**

**Flash Report by SLDC/GENERATOR/ISTS/USER/UTILITY**

(As per IEGC section 5.9.5, 5.9.6 (a), (b) & (c))

1. Name of the reporting entity: 220/33kV Grid S/S, Rengali OPTCL
2. Date and time of the Incident: 12.12.2025 ,19:06Hrs
3. Antecedent Conditions (Just Prior to Event):
  - a. Frequency:50Hz
  - b. Demand/Generation Met: 220kV Main BUS I & II was on shutdown from 09:02 Hr to 18:25 Hr for annual maintenance work of 220/33KV GSS Rengali, OPTCL
  - c. Lines/units/elements under shutdown: Nil
4. Details of tripping (Along with cause of the event and relay flag, whatever available):

Sl. No.	Area/ Region	Loss of Load(MW)	Loss of Generation(MW)
1	220KV Load loss	36 MW	
	33KV Load loss	12.8 MW	

Transmission/Generation Elements tripped during event:

Sl. No.	Name of the Element	Tripping Time	Restoration Time	Relay Indication (if available)	Extra Info
1	220kV Rengali S/Y-Rengali PH ckt II	19:06Hrs, Dt.12.12.20 25	00:24Hrs, Dt.13.12.20 25	Dist pick up, Zone - 4, Dist : 0.00km, Trip time: 247 ms, PU time: 322 ms, Ia: 0.23 kA, Ib: 7.15 kA, Ic: 0.33 kA	At 19:06Hr, 220/33kV GSS Rengali blacked out. Fault Details: 220kV Bus Coupler feeder , Y-Phase Main Bus A Insulator PI snapped at Rengali GSS, OPTCL, 220kV Bus coupler CB was open condition before fault.
2	220kV Rengali S/Y-PGCIL ckt II	19:06Hrs, Dt.12.12.20 25	00:40Hrs, Dt.13.12.20 25	Trip phase B N, Over current, Earth Fault, Fault Duration : 179.0 ms, CB Operation time: 64.00ms, IED trip time : 110.0ms, Ia : 1.814 kA, Ib : 12.89 kA, Ic : 1.738 kA	
3	220kV Rengali S/Y-Deogarh ckt	19:06Hrs, Dt.12.12.20 25	00:04Hrs, Dt.13.12.20 25		Tripped at Deogarh End.
4	220kV Rengali S/Y-Tarkera ckt	19:06Hrs, Dt.12.12.20 25	00:09Hrs, Dt.13.12.20 25		Tripped at Tarkera End.
5	220kV Rengali S/Y-PGCIL ckt I	Did not Trip			Idle charge from Rengali end before black out. At PGCIL end while charging the CB, feeder tripped on PD at PGCIL end Only.

6	220kV Rengali S/Y-Rengali PH ckt I	Did not Trip			Feeder was Idle charged since Dt.20.11.2025, 19:37 Hr from Rengali end due to CB problem at RPH end.
---	------------------------------------	--------------	--	--	--

1. **Action Taken/Remedial measures taken:-** 220kV Rengali S/Y – Tarkera RTSS Chandipsoh ckt charged from Tarkera End. RTSS Chandiposh is availing power from Tarkera end. All 220kV Feeders H/T to replace 220kV Bus Coupler Y-Phase Main Bus A Insulator PI snapped at Rengali GSS, OPTCL

2. **Restoration details:** After replacement of Y-Phase Main Bus A Insulator PI of 220kV Bus Coupler at Rengali GSS, OPTCL. All 220kV feeders charged through 220kV Main Bus A.








3. **Duration of the disturbance:** 19:06 Hr, Dt.12.12.2025 to 00:40 Hr, Dt.13.12.2025

**Shift I/C**

**Sri Jitendra Majhi**  
**Assistant Manager (Elect)**  
**9438908492**

Events Report  
Substation: 220kv ohpc  
File: 2026-01-05 11.46.50.evt  
Model Number: P64292TD6S0910P

Printed on: 07/01/2026 12:12:52

- ..... 7 Input L8 : OFF
- ..... 8 Input L9 : OFF
- ..... 9 Input L10 : OFF
- ..... 10 Input L11 : OFF
- ..... 11 Input L12 : OFF
- ..... Evt Unique Id : 9207
- .....  Friday 12 December 2025 19:12:22.213: Indication Reset
  - ..... Description: GT-1
  - ..... Plant reference: GT-1
  - ..... Model number: P64292TD6S0910P
  - ..... Address: 001 Column: 01 Row: FF
  - ..... Event type: Fault Record
  - ..... Category: 0
  - ..... Event Value : 7
  - ..... Evt Unique Id : 9206
- .....  Friday 12 December 2025 19:10:15.253: Logic Inputs 1
  - ..... Description: GT-1
  - ..... Plant reference: GT-1
  - ..... Model number: P64292TD6S0910P
  - ..... Address: 001 Column: 00 Row: 20
  - ..... Event type: Logic Input Changed State
  - ..... Category: 0
  - .....  Event Value : 0000000000000000
    - ..... 0 1-86 TRIP : OFF
    - ..... 1 2 96 INNI : OFF
    - ..... 2 Input L3 : OFF
    - ..... 3 Input L4 : OFF
    - ..... 4 Input L5 : OFF
    - ..... 5 Input L6 : OFF
    - ..... 6 Input L7 : OFF
    - ..... 7 Input L8 : OFF
    - ..... 8 Input L9 : OFF
    - ..... 9 Input L10 : OFF
    - ..... 10 Input L11 : OFF
    - ..... 11 Input L12 : OFF
  - ..... Evt Unique Id : 9205
- .....  Friday 12 December 2025 19:02:41.561: Output Contacts1
  - ..... Description: GT-1
  - ..... Plant reference: GT-1
  - ..... Model number: P64292TD6S0910P
  - ..... Address: 001 Column: 00 Row: 21
  - ..... Event type: Relay Output Changed State
  - ..... Category: 0
  - .....  Event Value : 0000000000000000
    - ..... 0 R1 TO 86K TRIP : OFF
    - ..... 1 R2 TO DIFF ANN : OFF
    - ..... 2 R3 TO O/C TRP AN: OFF
    - ..... 3 R4 REF TRP ANN : OFF
    - ..... 4 R5 TO LBB ANN : OFF
    - ..... 5 R6 V/F TRIP ANN : OFF
    - ..... 6 R7 BUS DIFF ANN : OFF
    - ..... 7 R8 V/F ALARM ANN: OFF
    - ..... 8 R9 99/51 OP 86L : OFF
    - ..... 9 R10 LBB TRIP -VE: OFF
    - ..... 10 R11 LBB TRIP +VE: OFF
    - ..... 11 Output R12 : OFF
  - ..... Evt Unique Id : 9204
- .....  Friday 12 December 2025 19:02:41.532: Fault Recorded
  - ..... Description: GT-1
  - ..... Plant reference: GT-1
  - ..... Model number: P64292TD6S0910P
  - ..... Address: 001 Column: 01 Row: 00
  - ..... Event type: Fault Record
  - ..... Category: 0
  - ..... Event Value : 0
  - .....  Faulted Phase : 00000110





Events Report  
Substation: 220kv ohpc  
File: 2026-01-05 11.46.50.evt  
Model Number: P64292TD6S0910P


Printed on: 07/01/2026 12:12:53

```

..... 3 CB2 BkTrip 3ph : OFF
..... 4 CB3 ReTrip 3ph : OFF
..... 5 CB3 BkTrip 3ph : OFF
..... 6 CB4 ReTrip 3ph : OFF
..... 7 CB4 BkTrip 3ph : OFF
..... 8 CB5 ReTrip 3ph : OFF
..... 9 CB5 BkTrip 3ph : OFF
..... 10 VTS      : OFF
..... 11 CTS      : OFF
..... 12 W1 V/Hz> Alarm : OFF
..... 13 Alarm RTD 1  : OFF
..... 14 Alarm RTD 2  : OFF
..... 15 Alarm RTD 3  : OFF
..... 16 Alarm RTD 4  : OFF
..... 17 Alarm RTD 5  : OFF
..... 18 Alarm RTD 6  : OFF
..... 19 Alarm RTD 7  : OFF
..... 20 Alarm RTD 8  : OFF
..... 21 Alarm RTD 9  : OFF
..... 22 Alarm RTD 10 : OFF
..... 23 Alarm CL Input 1: OFF
..... 24 Alarm CL Input 2: OFF
..... 25 Alarm CL Input 3: OFF
..... 26 Alarm CL Input 4: OFF
..... 27 W2 V/Hz> Alarm : OFF
..... Fault Time   : Friday 12 December 2025 19:02:41.452
..... Fault Type   :
..... Active Group : 1
..... System Frequency : 50.03 Hz
..... IA-1 Magnitude : 136.9 A
..... IB-1 Magnitude : 616.0 A
..... IC-1 Magnitude : 363.6 A
..... IA-2 Magnitude : 2.790kA
..... IB-2 Magnitude : 6.135kA
..... IC-2 Magnitude : 3.778kA
..... IA-HV Magnitude : 136.9 A
..... IB-HV Magnitude : 616.0 A
..... IC-HV Magnitude : 363.6 A
..... IA-LV Magnitude : 2.790kA
..... IB-LV Magnitude : 6.135kA
..... IC-LV Magnitude : 3.778kA
..... I2-HV Magnitude : 116.7 A
..... I2-LV Magnitude : 2.428kA
..... IN-HV Measd Mag : 3.769 A
..... IN-LV Measd Mag : 4.683mA
..... V1 Magnitude   : 3.326kV
..... V2 Magnitude   : 3.326kV
..... VAB Magnitude  : 0.000 V
..... VBC Magnitude  : 9.974kV
..... VCA Magnitude  : 9.975kV
..... IADiff         : 36.19mPU
..... IBDiff         : 33.15mPU
..... ICDiff         : 3.163mPU
..... IABias         : 1.547 PU
..... IBBias         : 1.728 PU
..... ICBias         : 439.2mPU
..... REF HV LoZ Diff : 1.084kA
..... REF HV LoZ Bias : 309.9 A
..... 1ph VperHz     : 906.8mPU
..... Evt Unique Id  : 9203

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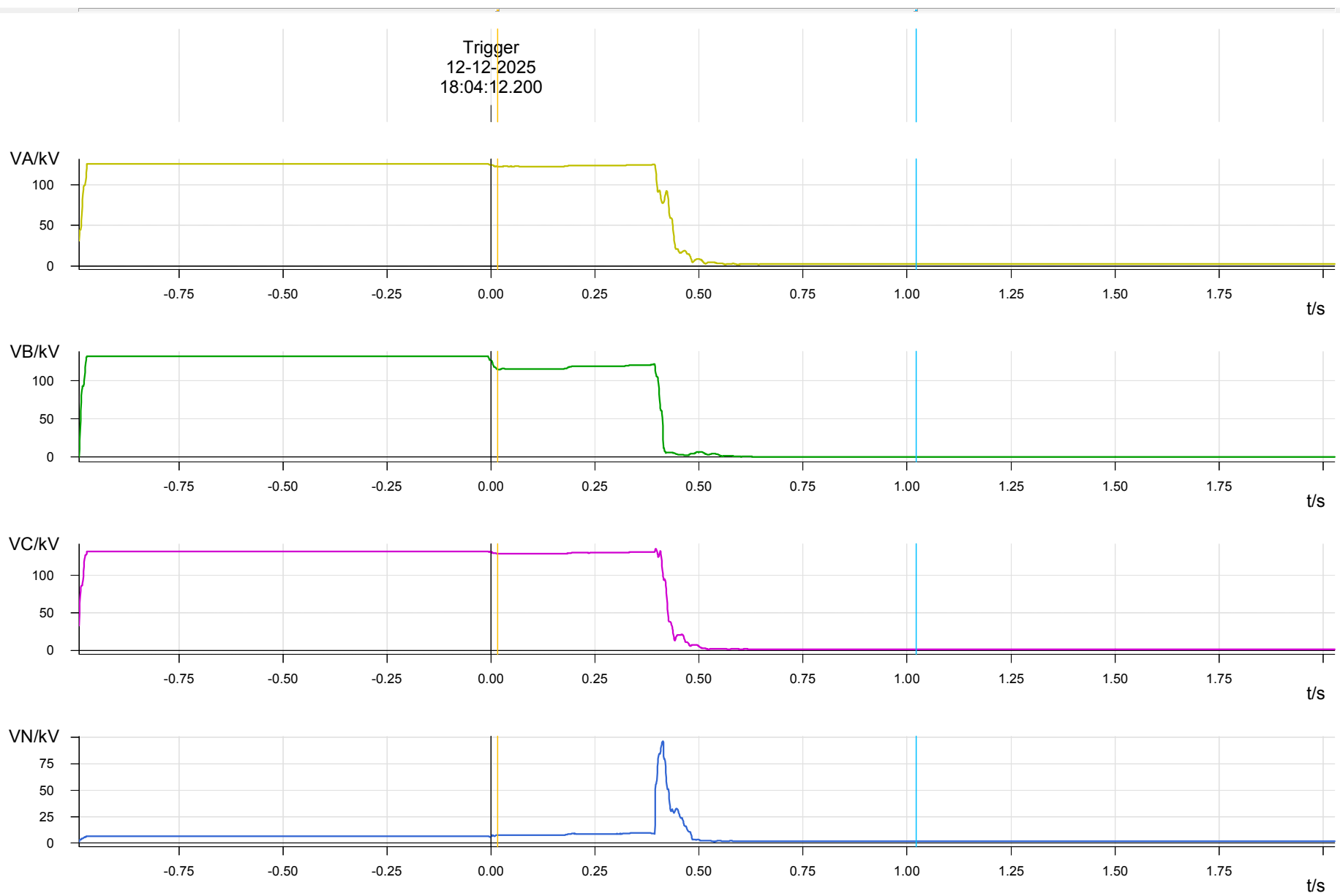
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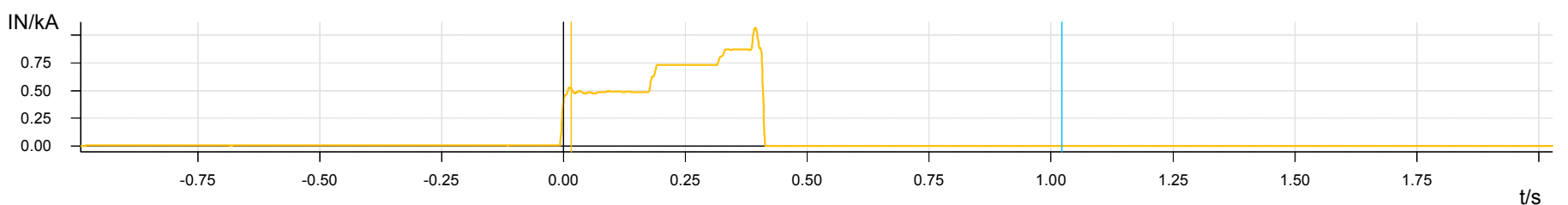
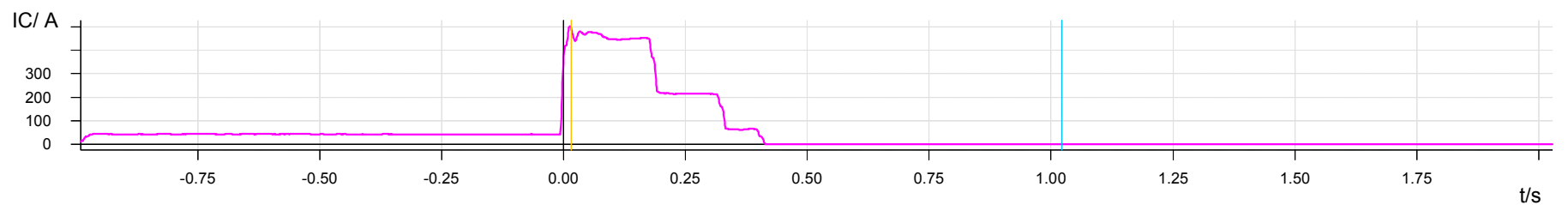
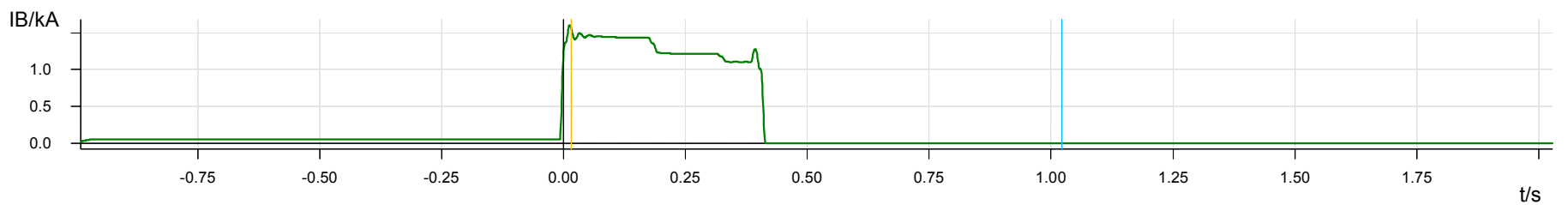
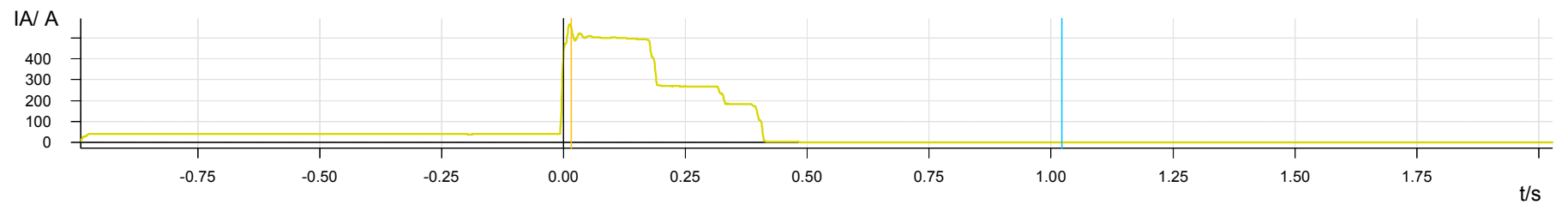
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..... Plant reference: GT-1
..... Model number: P64292TD6S0910P
..... Address: 001 Column: 00 Row: 21
..... Event type: Relay Output Changed State

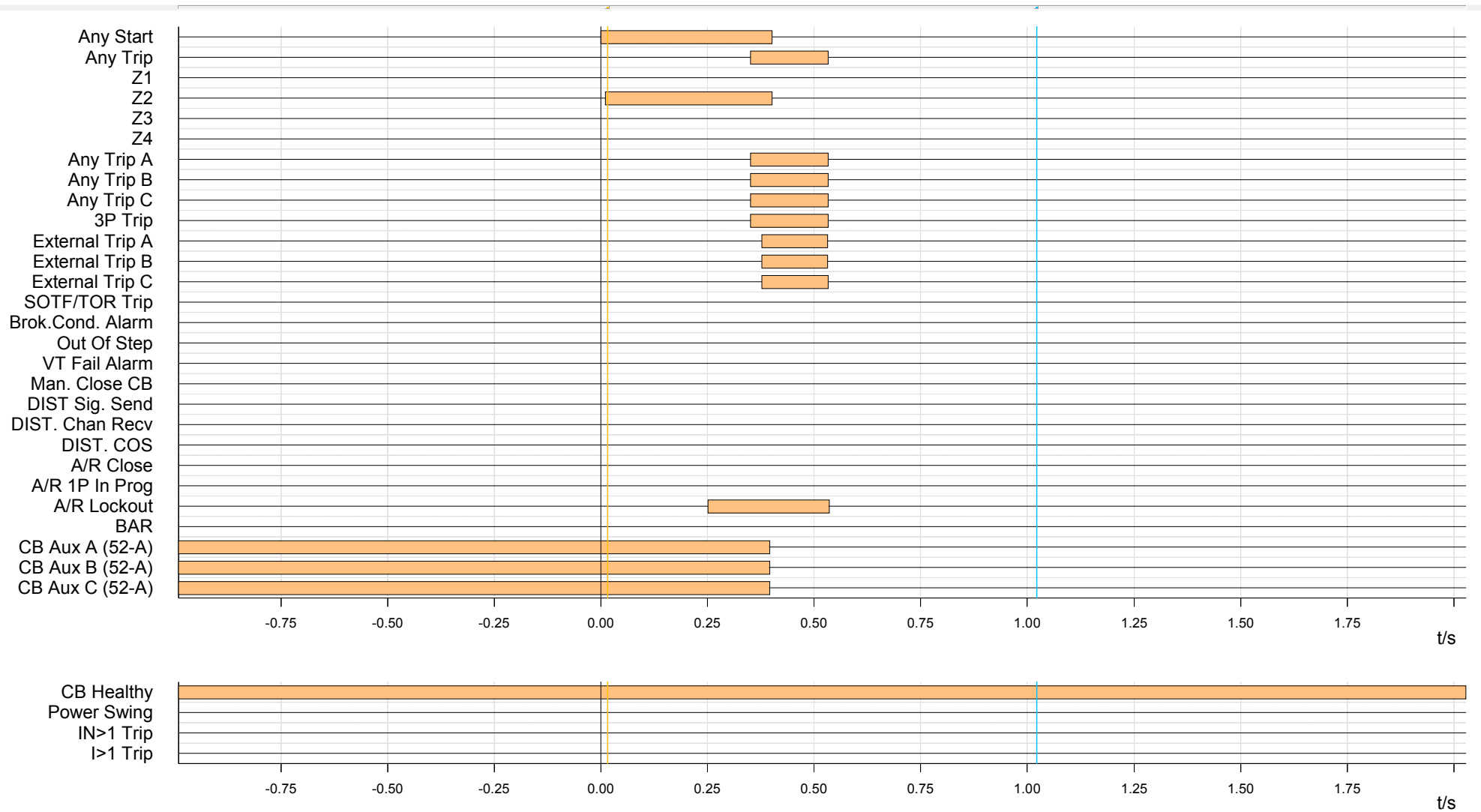
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**TARKERA**

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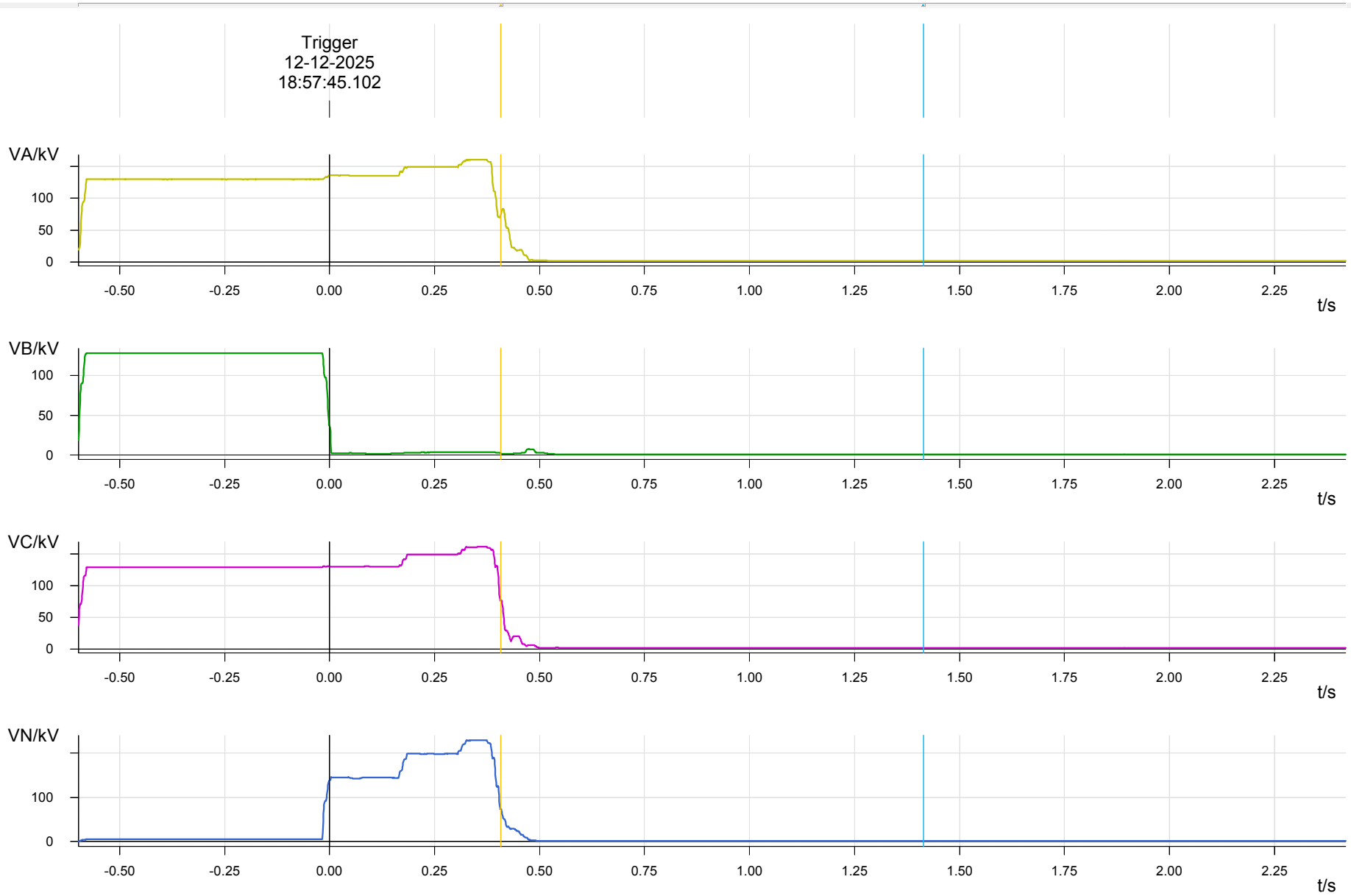


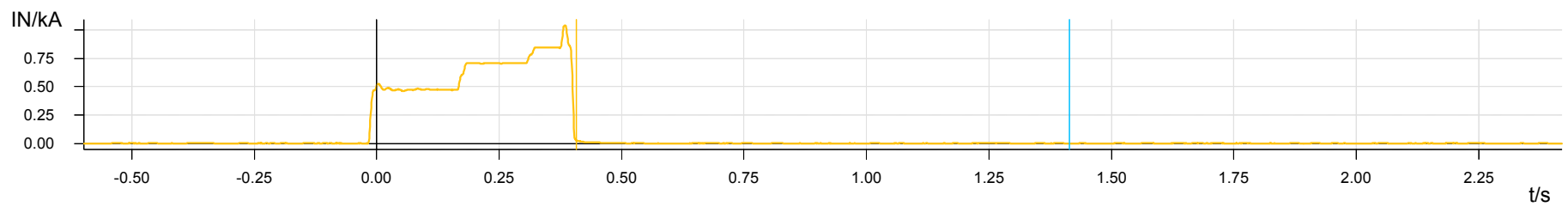
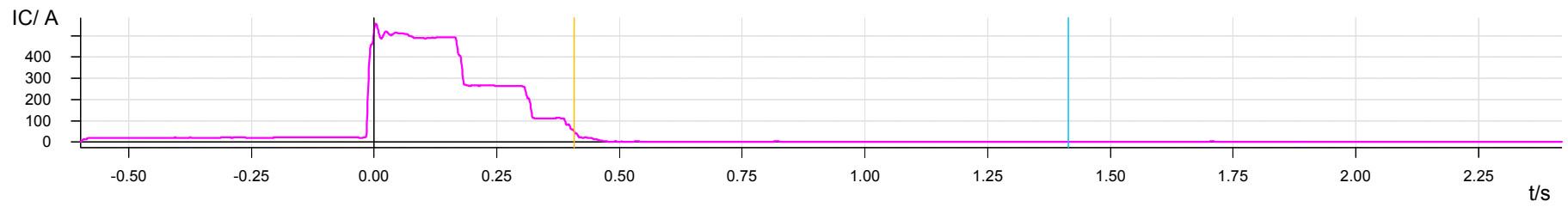
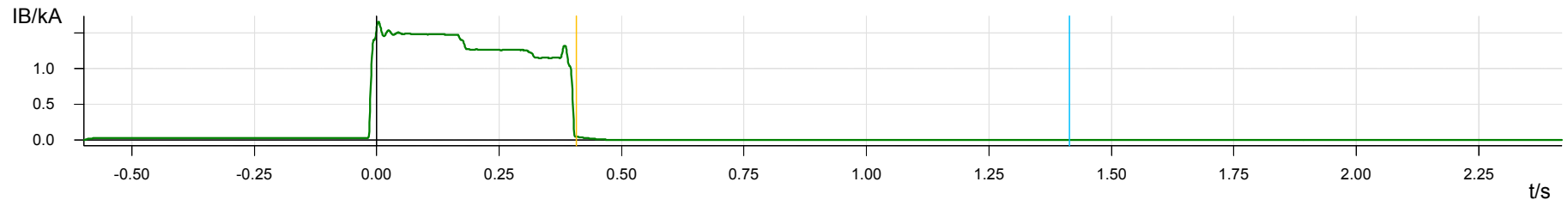
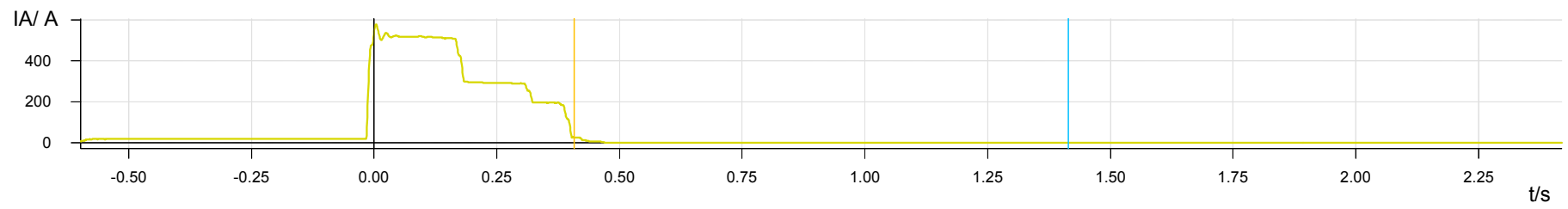


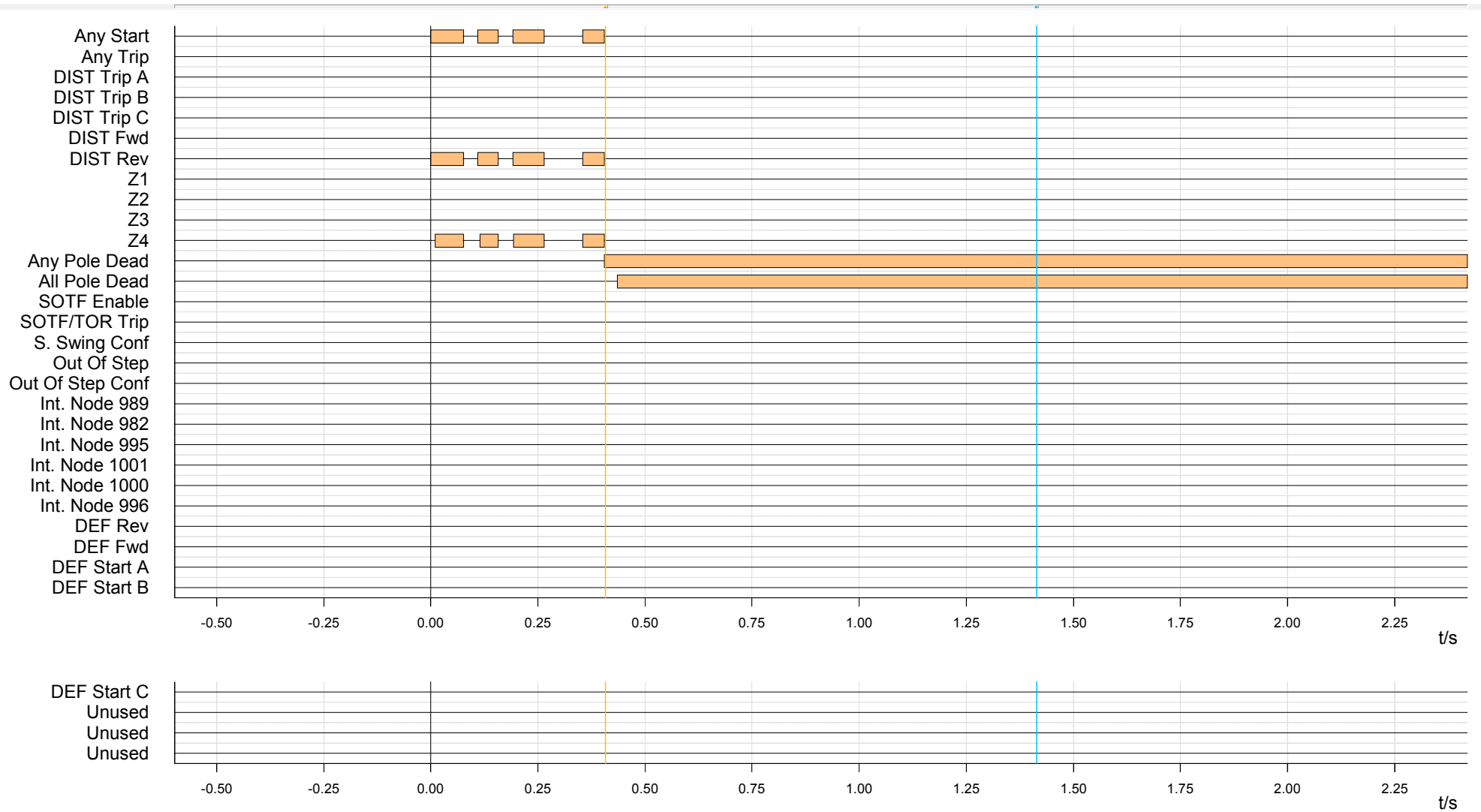


**NiCOM**

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Meramund 22 4 17 / SIEMENS / Rengali 220KV 7SA522 V4.6 Var RPH2

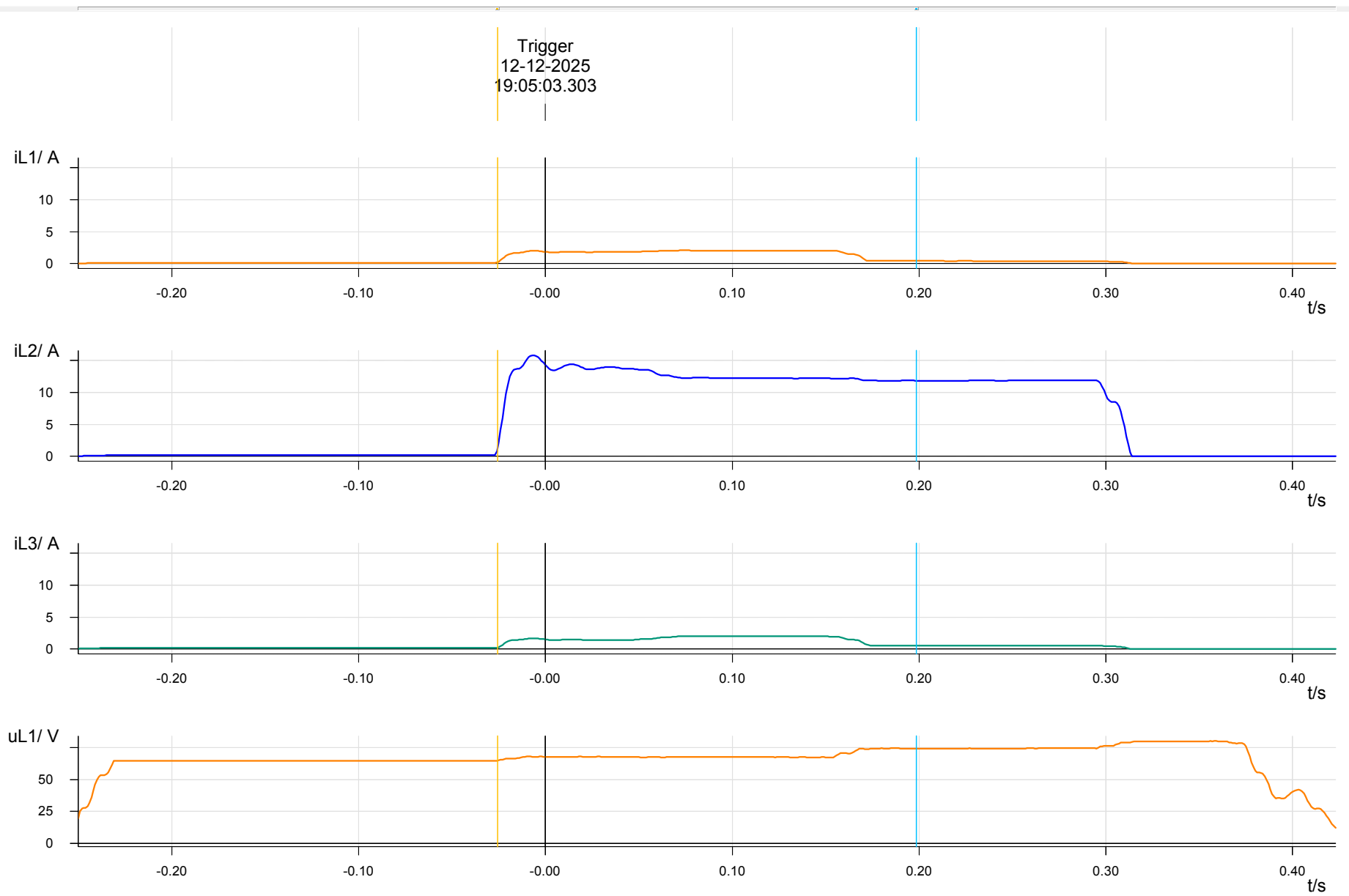
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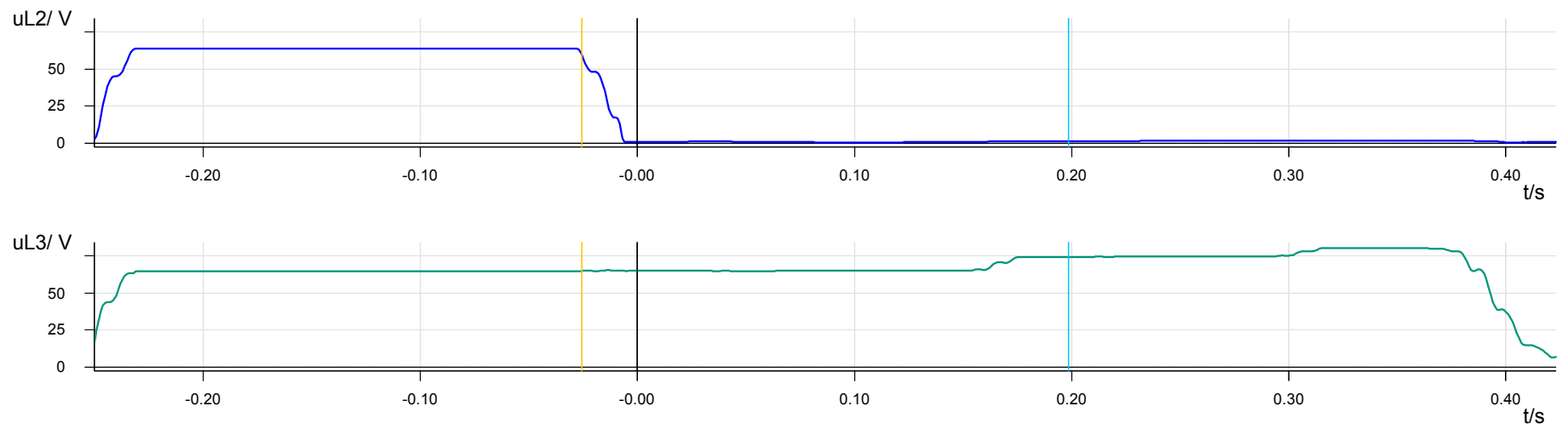
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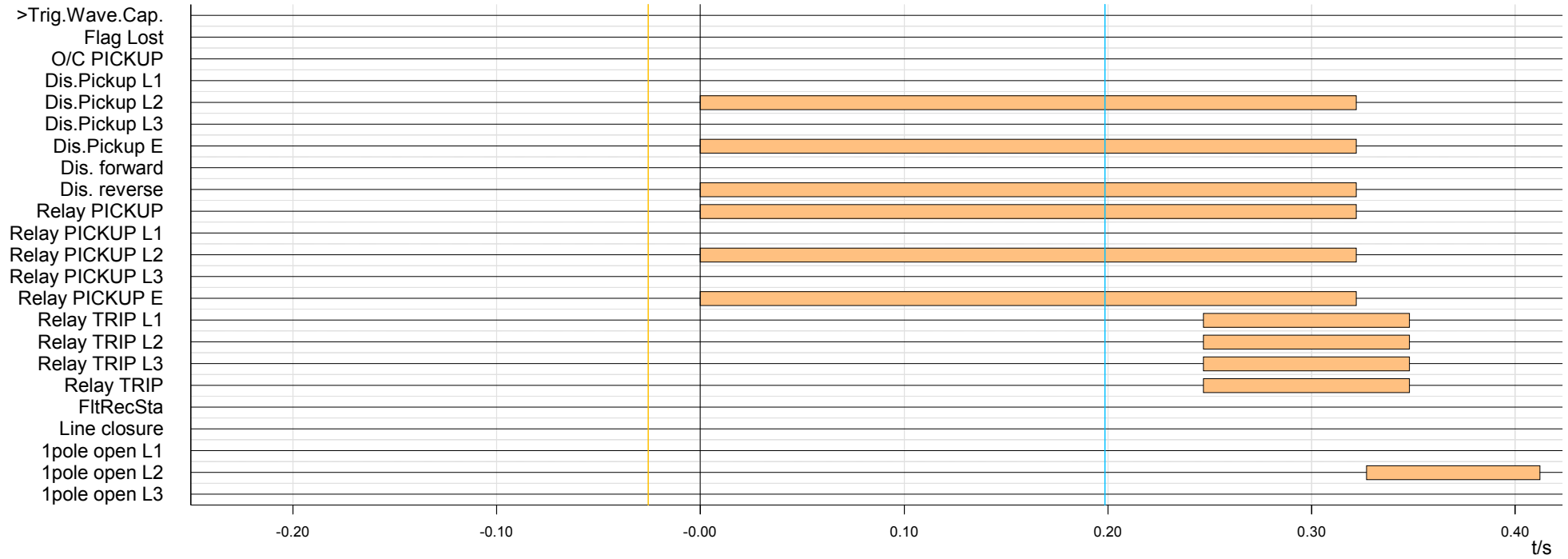
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RENGALI

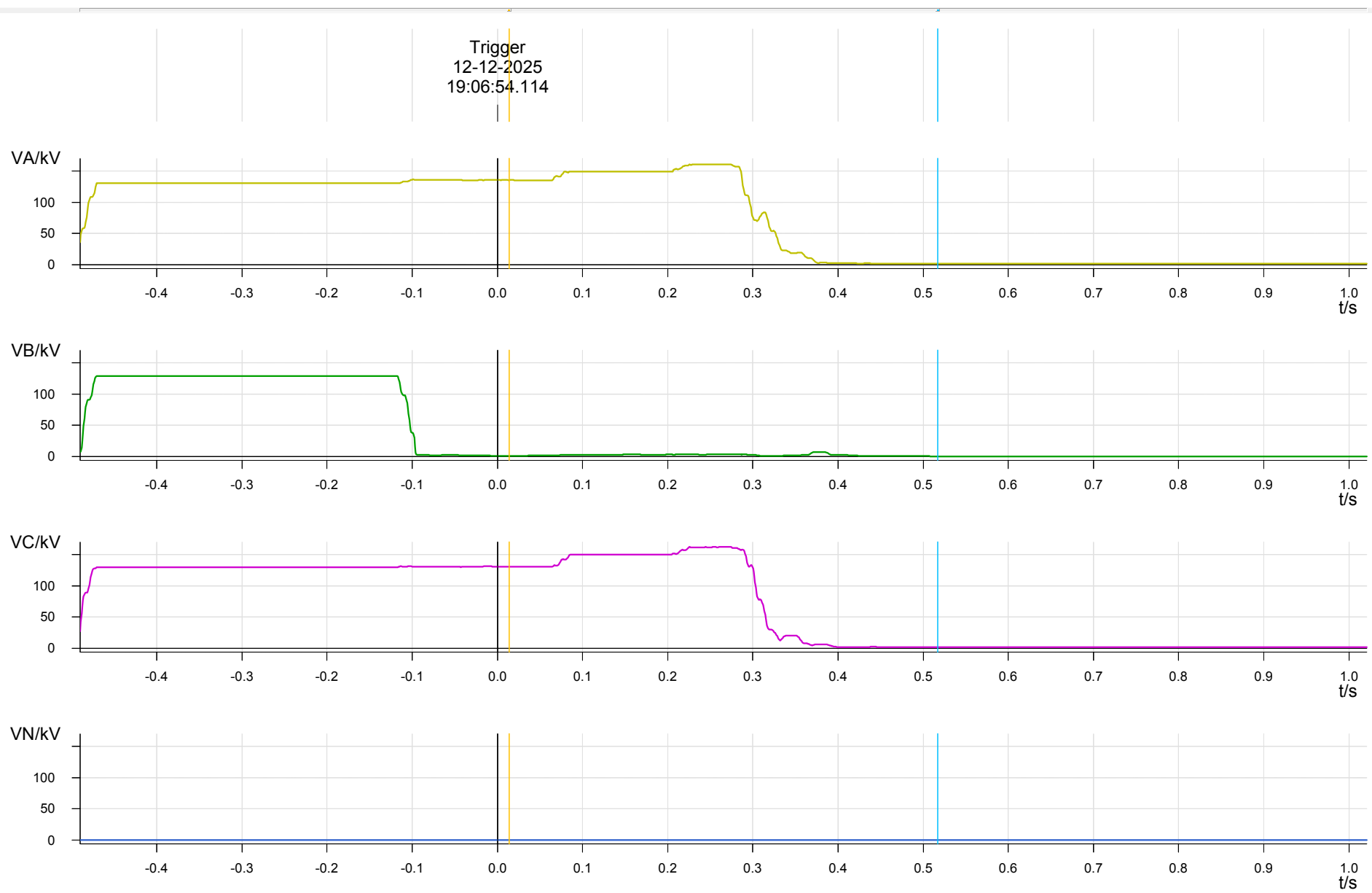
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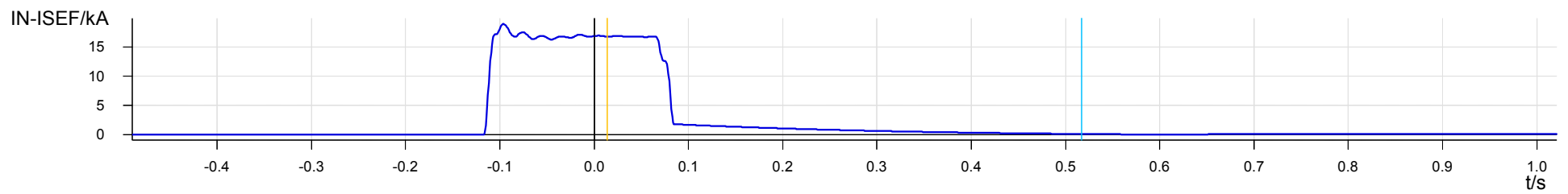
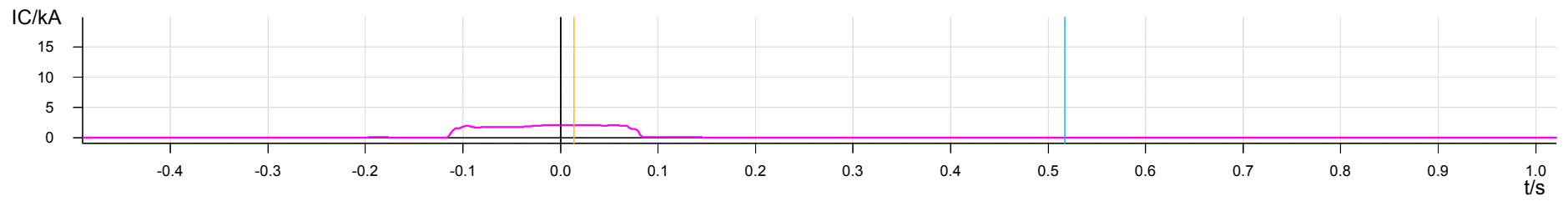
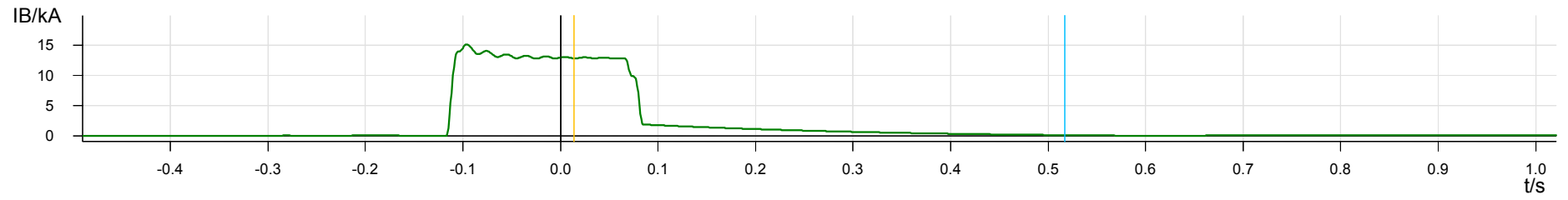
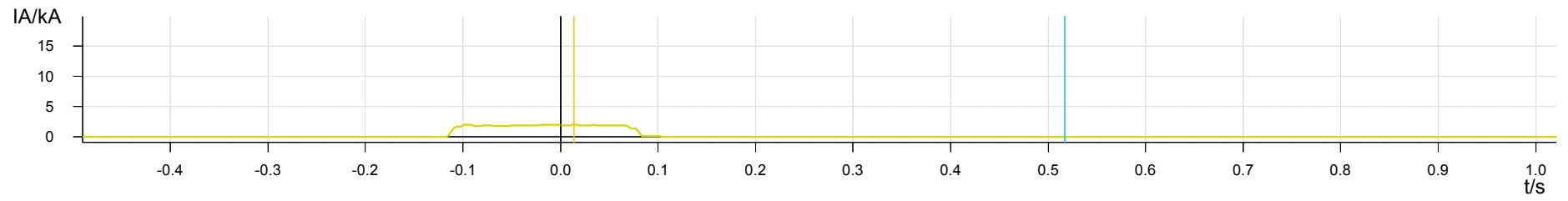
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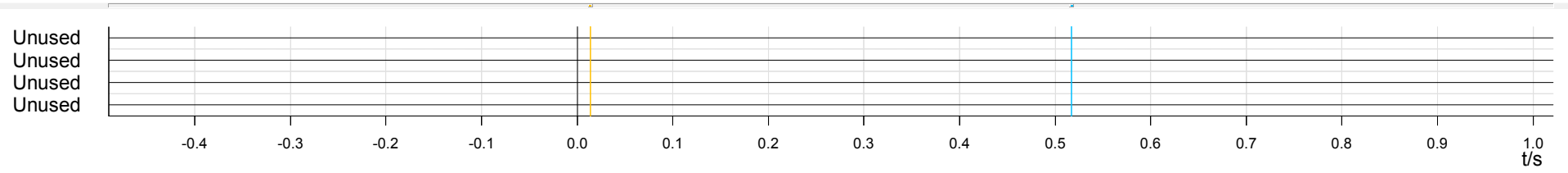
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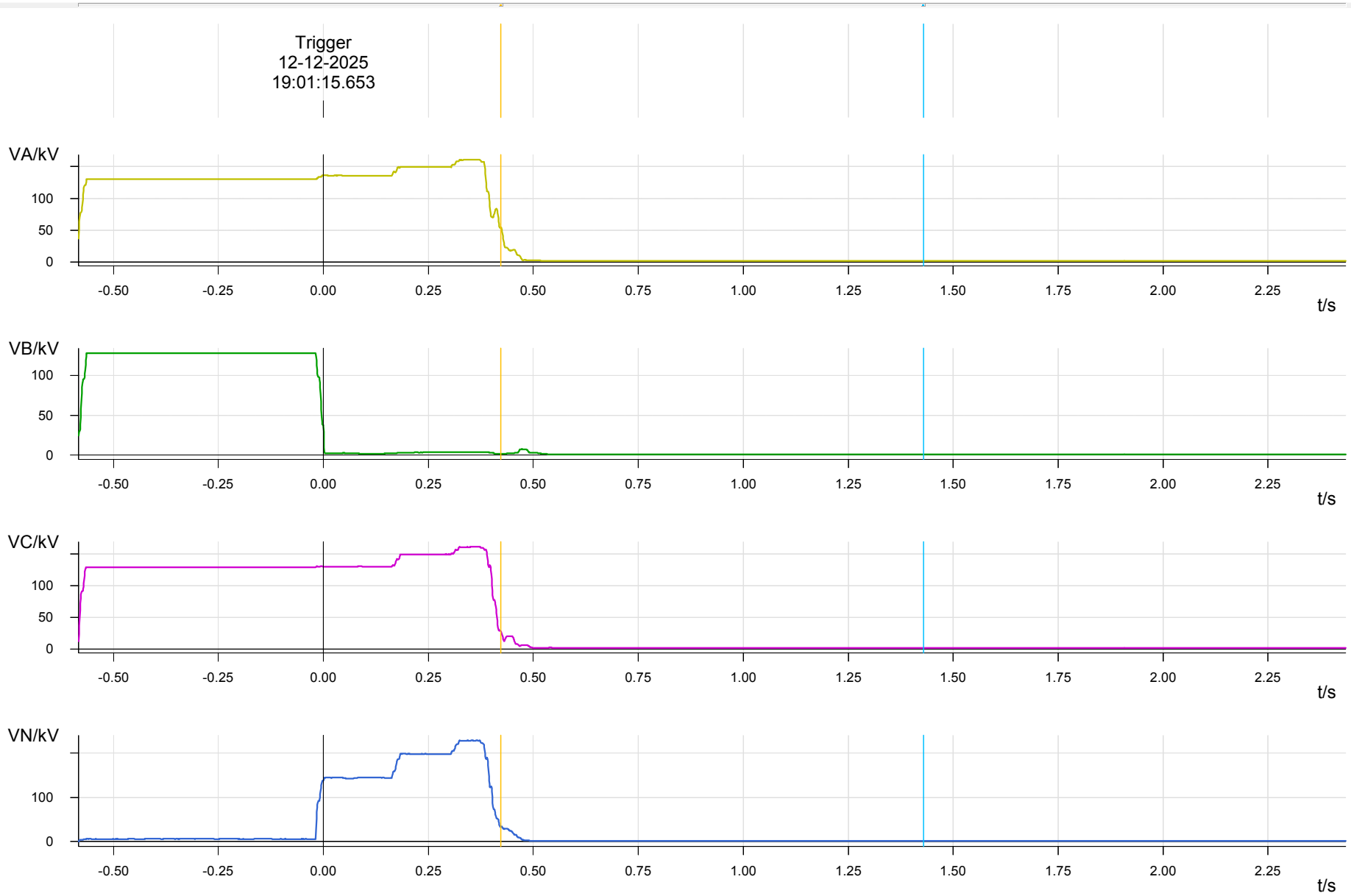


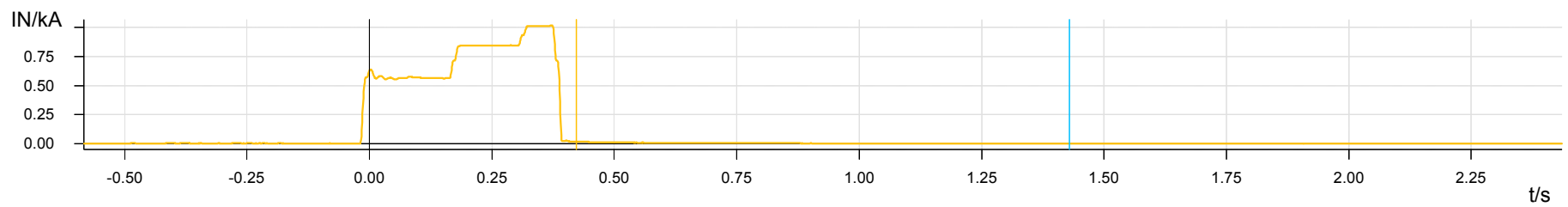
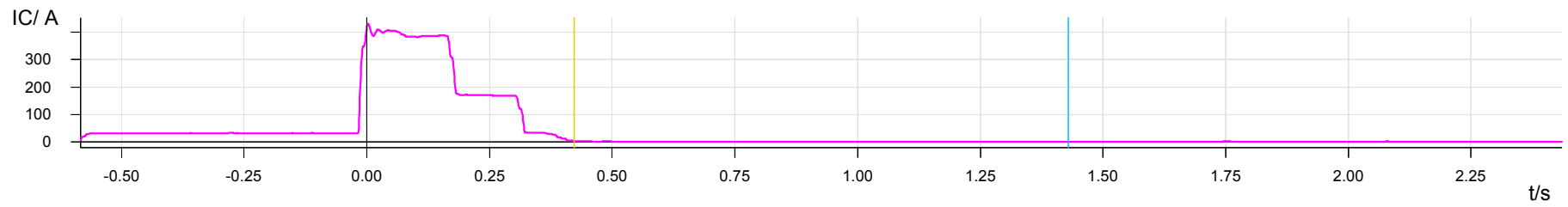
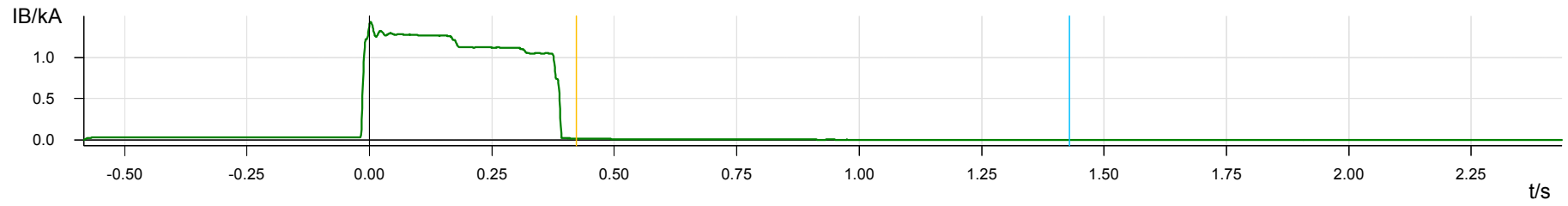
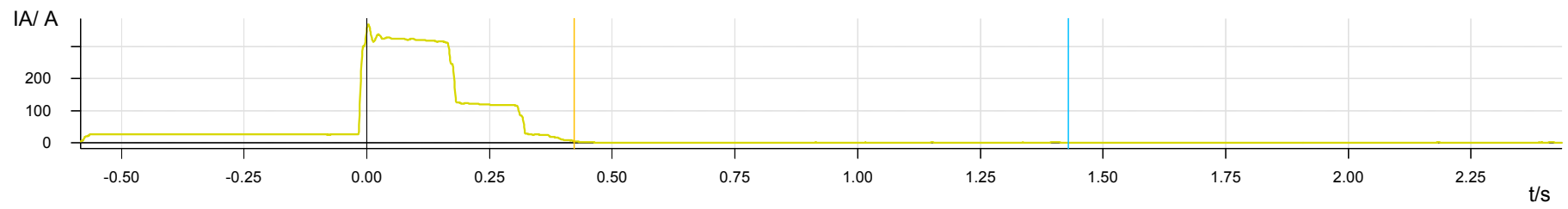


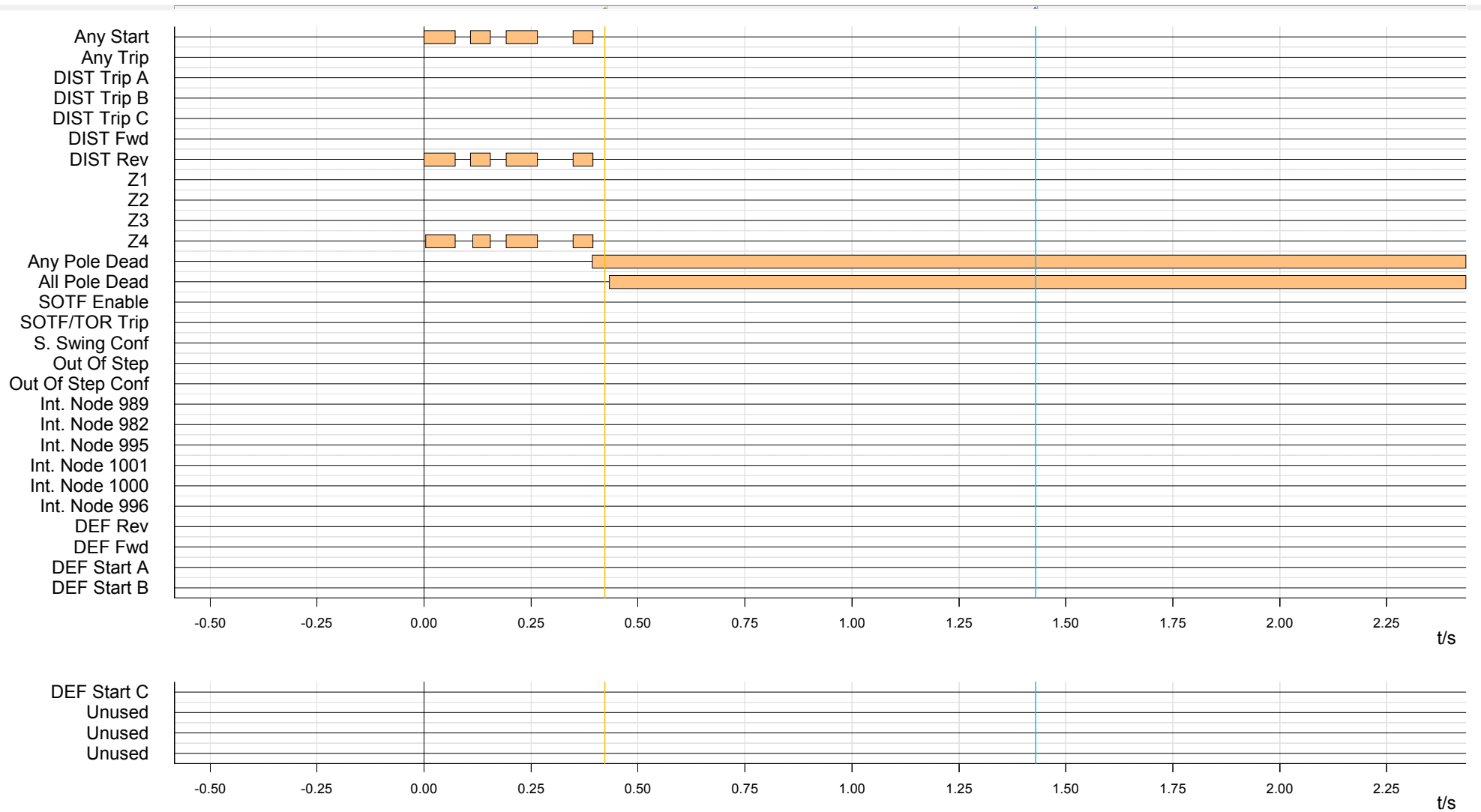


**MiCOM**

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**ग्रिड-इंडिया**  
GRID-INDIA

**ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड**  
(भारत सरकार का उद्यम)  
**GRID CONTROLLER OF INDIA LIMITED**  
(A Government of India Enterprise)  
[formerly Power System Operation Corporation Limited (POSOCO)]

**पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / Eastern Regional Load Despatch Centre**

कार्यालय : 14, गोल्फ क्लब रोड, टॉलिंगंज, कोलकाता - 700033  
Office : 14, Golf Club Road, Tollygunge, Kolkata - 700033  
CIN : U40105DL2009GOI188682, Website : www.erfdc.in, E-mail : erfdinfo@grid-india.in, Tel. : 033 23890060/0061




**पूर्वी क्षेत्र के 400 केवी टिस्को उप-केन्द्र में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event at 400 kV-TISCO Station of Eastern Region**

**(To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f))**  
(आई ई जी सी 37.2 (एफ) के अनुपालन में)

**Date(दिनांक):02-01-2026**

• **Event Summary (घटना का सारांश):**

400kV TISCO S/s is connected to Grid through 400kV TISCO Baripada S/C and 400kV TISCO Jamshedpur S/C lines. Prior to the disturbance 400kV TISCO- Baripada S/C was under planned shutdown and TISCO draw power radially through Jamshedpur.

At 19:21 Hrs, during charging attempt of 400 kV TISCO Baripada S/C from TISCO end, Y-Phase LA at Baripada got burst and created Y-Earth fault. Fault was sensed by 400kV Jamshedpur- TISCO and 400kV Baripada-Jamshedpur line in Z-3 protection and after 1200 msec both lines got tripped from Jamshedpur and Baripada end respectively. 400kV TISCO S/s became dead and 94 MW load loss reported at TISCO S/s.

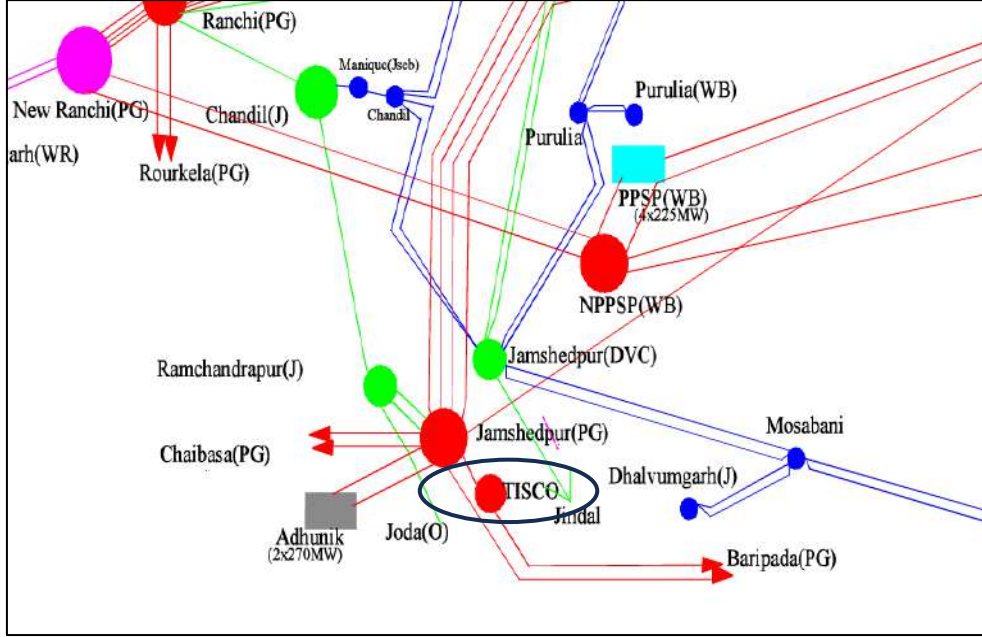
- **Time and Date of the Event (घटना का समय और दिनांक):** At 19:21 Hrs on 05/12/2025.
- **Event Category (ग्रिड घटना का प्रकार):** Grid Disturbance (GD)-1
- **Location/Control Area (स्थान/नियंत्रण क्षेत्र):** DVC/ TISCO
- **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency in Hz	Regional Generation in MW	Regional Demand in MW
<b>Pre-Event (घटना पूर्व)</b>	49.99	31791	21829
<b>Post Event (घटना के बाद)</b>	50.00	31791	21735

*\*Pre and post data of 1 minute before and after the event*

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विद्युत उत्पादन इकाइयां जो बंद है)	400 kV TISCO- BARIPADA S/C was under planned shutdown.
Weather Condition (मौसम स्थिति)	Normal.

- **Load and Generation loss (लोड और जेनरेशन हानि):**
  - **Load loss: 94 MW.**
- **Duration of interruption (रुकावट की अवधि): 01:13 Hrs.**
- **Network across the affected area (प्रभावित क्षेत्र का नक्शा)**

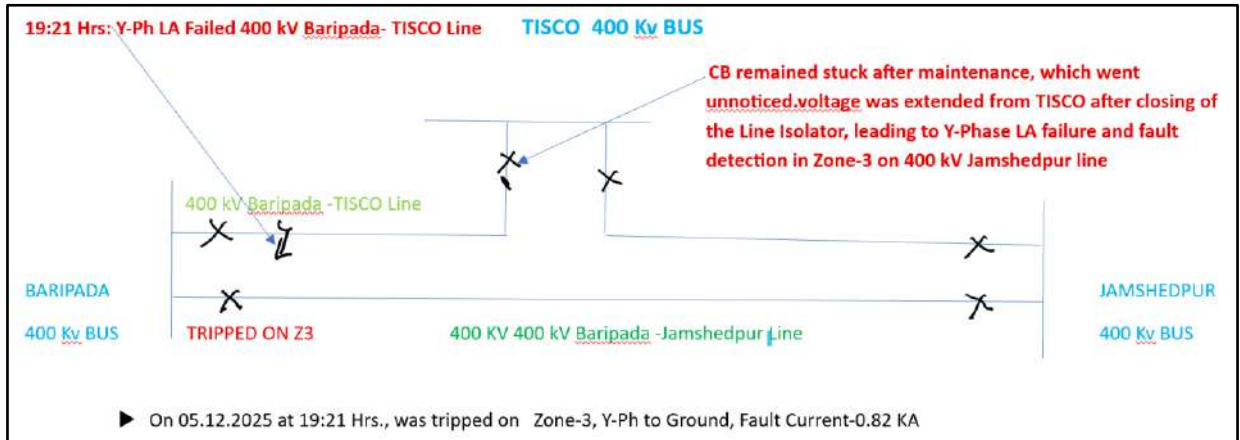


**Figure 1: Network across the affected area**

- **Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): Y-Phase LA of 400kV TISCO-Baripada line at Baripada end.**
- **Major Elements Tripped (प्रमुख ट्रिपिंग):**

क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time (Hrs)
1	400 kV TISCO-Jamshedpur-S/C	19:21	-	Y-E fault, Z-3, FC-2.84 kA FD- 186.2 km	20:34
2	400KV-JAMSHEDPUR-BARIPADA-S/C	19:21	-	Y-E fault, Z-3, FC-0.82 kA	20:23

- **Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):**



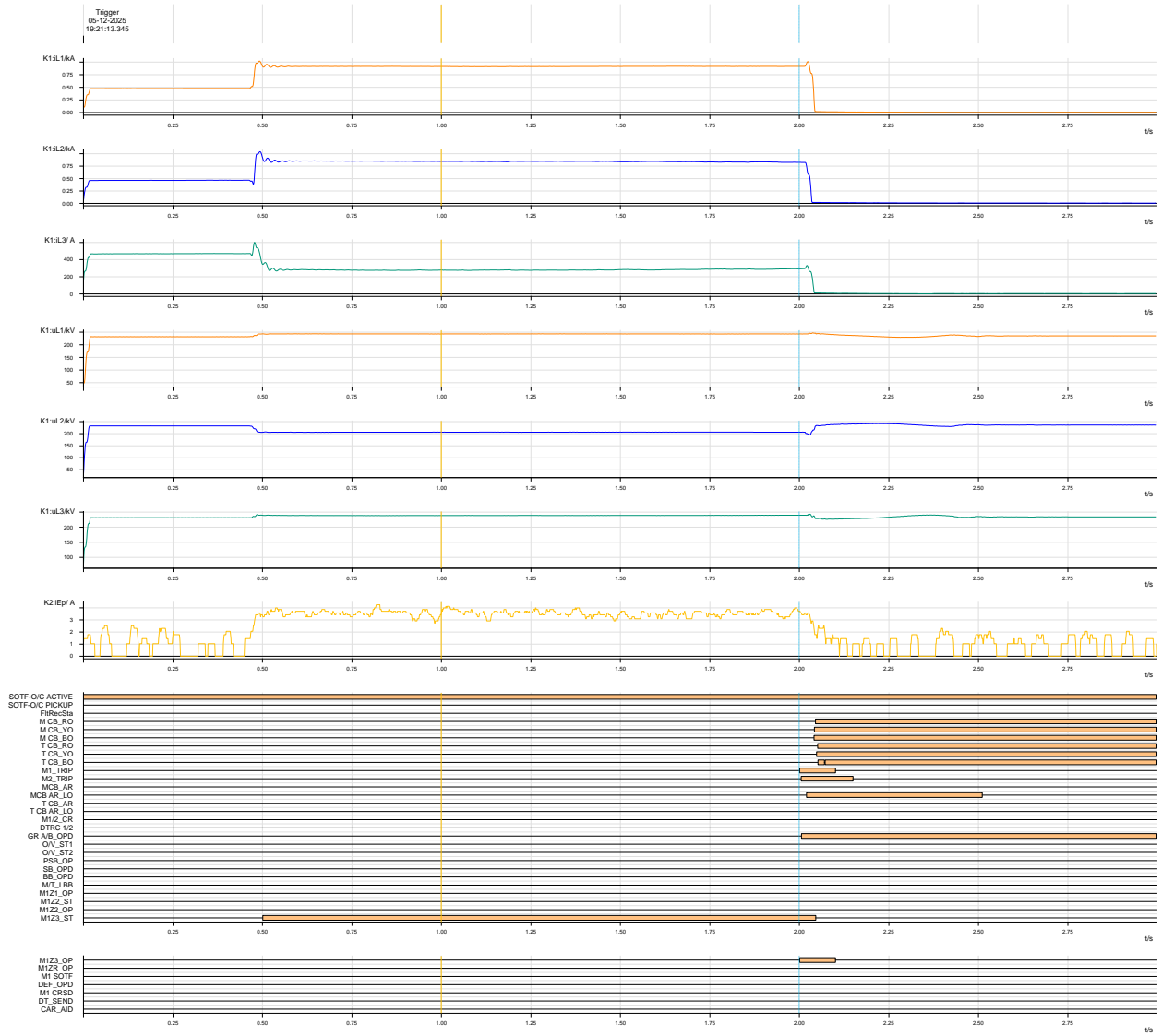
- Prior to the disturbance, TISCO Plant was radially connected through 400kV TISCO Jamshedpur line (400kV TISCO-Baripada line was under planned S/D)
- At 19:21:15 Hrs, during charging of 400kV TISCO-Baripada line from TISCO end, line got charged, while closing of line side isolator (*Tie CB at TISCO in stuck condition due to suspected control circuit issue at TISCO end*).
- Following the closing of line isolator at TISCO end, line got extended from TISCO end, during which Y-phase LA at Baripada burst. This creates Y-Earth fault in 400 kV TISCO-Baripada S/C. Protection system at TISCO failed to clear the fault, resulting clearance of fault by tripping of healthy 400kV Jamshedpur-Baripada line and 400kV Jamshedpur-Tisco line from Baripada and Jamshedpur end on Z-3 protection respectively.
- 400kV TISCO S/s became dead and 94 MW load loss reported at TISCO S/s.
- **Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):**
  - Non-operation of protection at TISCO end: The protection system for Baripada line at TISCO end did not operate. The reason for the same may be shared.
  - Z-III Coordination (Encroaching ROT) issue- The Z-III setting of 400 kV Baripada – Jamshedpur Line at Baripada appears to be overlapping with the Z-III of 400 kV Jamshedpur – TISCO Line. PG Odisha is requested to review the setting to ensure proper selectivity.
  - Line isolator interlock circuit (Electrical /mechanical) seems to be bypassed at TISCO for 400 kV Baripada Line. The reason for the same may be updated.
  - Report received from PG Odisha is attached in annexure.
- **Non-compliance observed (विनियमन का गैर-अनुपालन):**

S.No.	Issues	Regulation Non-Compliance	Remark
1	Flash Report received within 8hrs?	IEGC section 37.2 (b)	Submitted
2	Whether DR/EL provided within 24 Hours?	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	Submitted
3	Detailed Report received within 7 days?	IEGC section 37.2 (e)	Submitted
4	Protection system not operated correctly	CEA Technical Standard for Construction of Electrical Plants and Electric Lines: 48 (1) a. CEA (Technical standards for connectivity to the Grid) Regulation, 2007: Schedule Part 1. (6.1, 6.2, 6.3)	NA

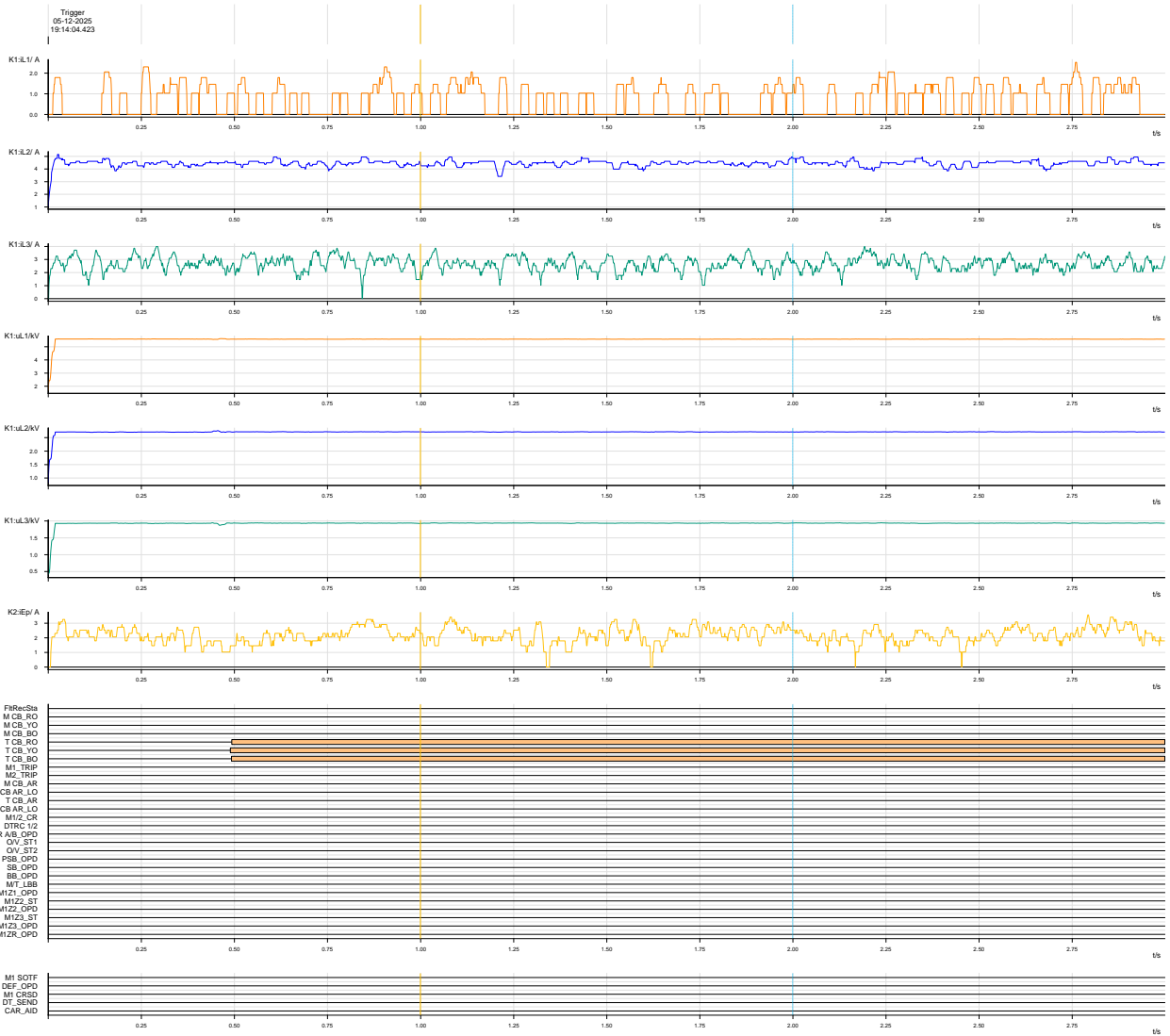
- **Key Lessons Learnt** (प्रमुख अधिगम बिंदु):

# Annexure:

## DR of Baripada-Jamshedpur line at Baripada end:



# DR of Baripada-TISCO at Baripada end:





**ग्रिड-इंडिया**  
GRID-INDIA

**ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड**  
(भारत सरकार का उद्यम)  
**GRID CONTROLLER OF INDIA LIMITED**  
(A Government of India Enterprise)  
[formerly Power System Operation Corporation Limited (POSOCO)]

**पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / Eastern Regional Load Despatch Centre**

कार्यालय : 14, गोल्फ क्लब रोड, टॉलिंगंज, कोलकाता - 700033  
Office : 14, Golf Club Road, Tollygunge, Kolkata - 700033  
CIN : U40105DL2009GOI188682, Website : www.erfdc.in, E-mail : erfdinfo@grid-india.in, Tel. : 033 23890060/0061




पूर्वी क्षेत्र के 400 केवी पी.वी.यू.एन.एल. उप-केन्द्र में ग्रिड घटना पर विस्तृत रिपोर्ट / **Detailed Report of grid event at 400 kV-PVUNL Station of Eastern Region**  
(To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f))  
(आई ई जी सी 37.2 (एफ) के अनुपालन में)

Date(दिनांक):02-01-2026

• **Event Summary** (घटना का सारांश):

At 11:06 Hrs on 20/12/2025, 400 kV New Ranchi-Patratu-1 line tripped due to conductor snapping, while the 400 kV New Ranchi-Patratu-2 line was under planned shutdown. Following tripping of 400 kV Patratu- New Ranchi-1 Line, 400 kV PVUNL-Tenughat Line tripped on SPS operation. Subsequently, PVUNL generation around 665 MW was evacuated through 400 kV PVUNL-Patratu D/C and 400/220 kV ICTs at Patratu.

At 11:23 Hrs, during charging attempt of 400kV Ranchi-Patratu-1 line from Patratu end, faulty line tripped on SOTF. Simultaneously, bus bar/LBB protection operated at 400kV Patratu S/s, resulted in tripping of 400kV Patratu-PVUNL D/C Lines. Consequently, 400kV PVUNL bus became dead. Total 665 MW generation loss reported at PVUNL due to loss of evacuation path.

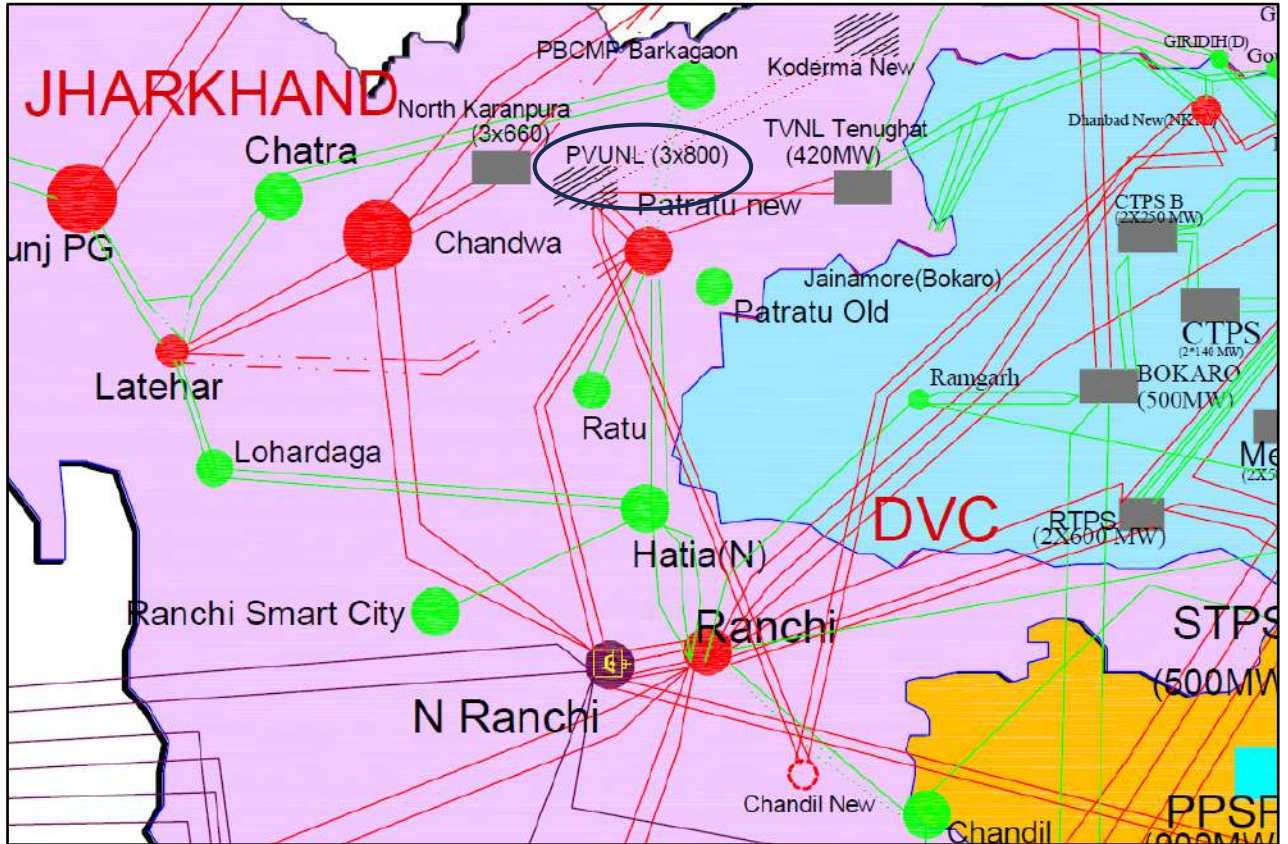
- **Time and Date of the Event** (घटना का समय और दिनांक): At 11:23 Hrs on 20/12/2025.
- **Event Category** (ग्रिड घटना का प्रकार): **Grid Disturbance (GD)-1**
- **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Jharkhand / 400kV-PVUNL
- **Antecedent Conditions** (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation in MW	Regional Demand in MW
<b>Pre-Event</b> (घटना पूर्व)	49.953	29925	22933
<b>Post Event</b> (घटना के बाद)	49.901	29260	22933

\*Pre and post data of 1 minute before and after the event

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विद्युत उत्पादन इकाइयां जो बंद हैं)	400 kV New Ranchi- Patratu-2 line was under planned S/D.
Weather Condition (मौसम स्थिति)	Normal.

- **Load and Generation loss (लोड और जेनरेशन हानि):**
  - **Generation loss: 665 MW.**
- **Duration of interruption (रूकावट की अवधि): 01:12 Hrs.**
- **Network across the affected area (प्रभावित क्षेत्र का नक्शा)**



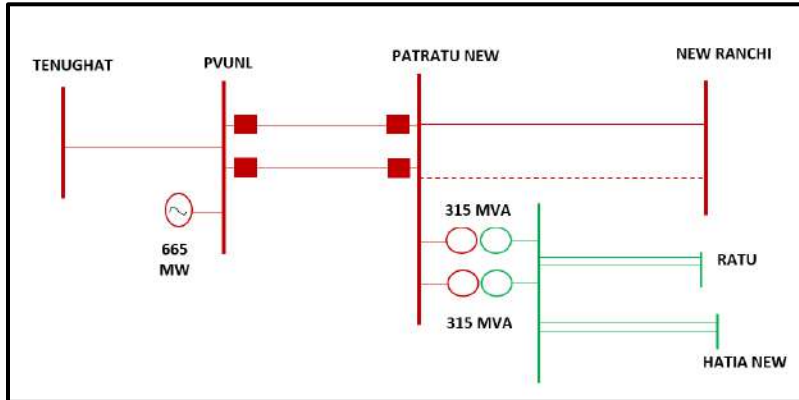
**Figure 1: Network across the affected area**

- **Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NA**

• **Major Elements Tripped (प्रमुख ट्रिपिंग):**

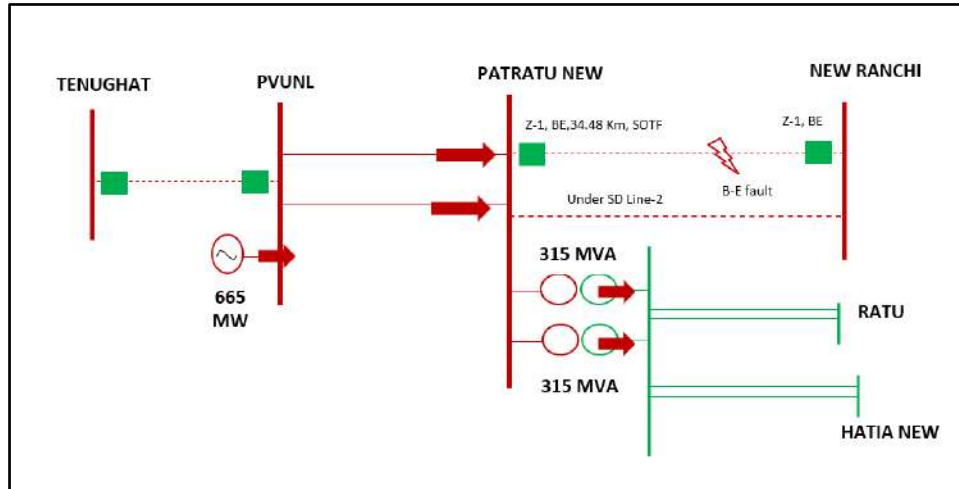
क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिसे संकेत	उप केंद्र 2 रिसे संकेत	Restoration time (Hrs)
1	<b>400 kV Patratu- New Ranchi -1 line</b>	11:06:24	Z-1, B-E, FC-4.99 kA	B- E, FD: 10.4 km, FC- 15.3 kA	21/12/2025_16:45 Hrs
2	<b>400 kV PVUNL- Tenughat line</b>	11:06:30	SPS O/C Operated as per scheme.	DT received as per scheme.	21:03 Hrs
3	<b>400 kV PVUNL- Patratu-1 line</b>	11:23:28	Bus bar protection operated at Patratu end and DT received at PVUNL end		14:50 Hrs
4	<b>400 kV PVUNL- Patratu-2 line</b>	11:23:28			12:58 Hrs

• **Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):**

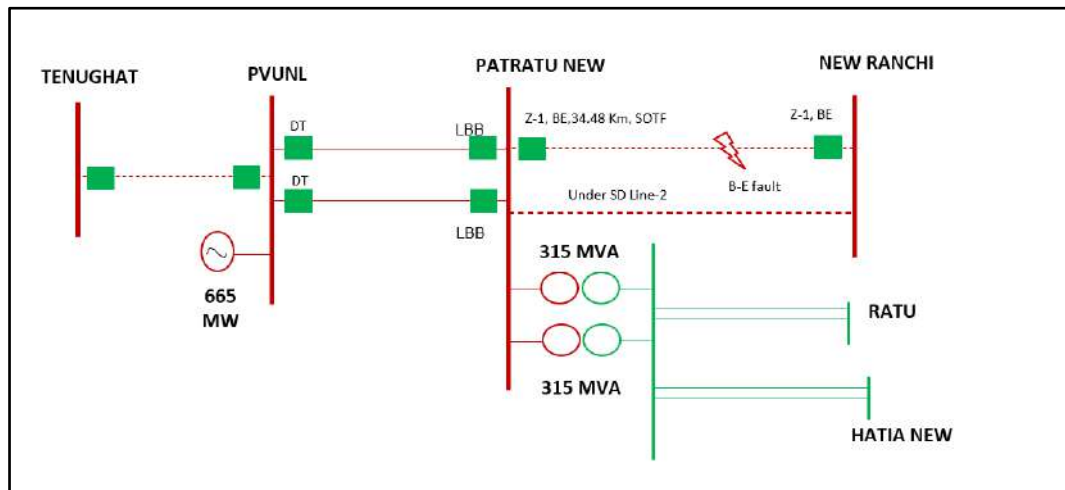


- Prior to event, PVUNL generation of around 665 MW was being evacuated through 400kV PVUNL-Patratu D/C and 400kV PVUNL-Tenughat line.
- 400kV New Ranchi-Patratu -2 line was under planned shutdown.
- At 11:06:15 Hrs on 20/12/25, B-E fault occurred on 400 kV Patratu- New Ranchi-1 Line due to snapping of conductor in between Loc No 27-28. A/R was attempted through Tie CB, but it was unsuccessful due to persistent fault after dead time of 1 sec.

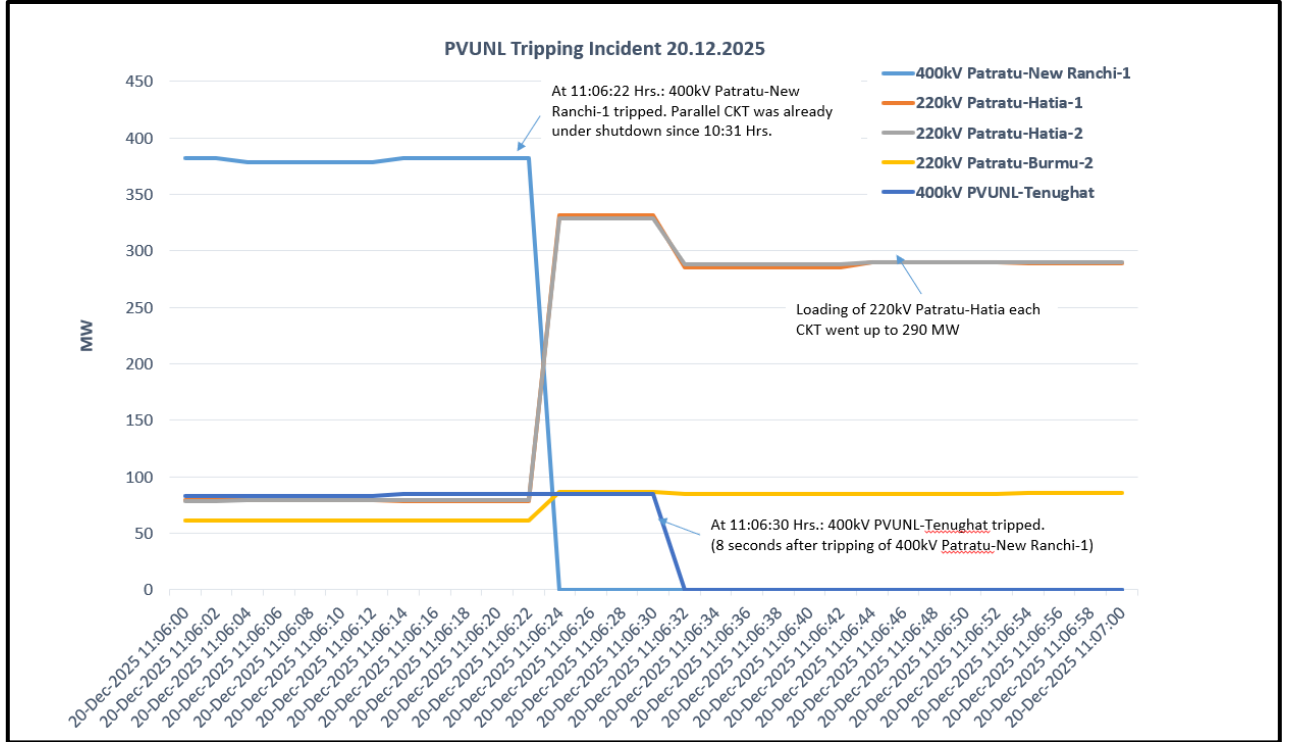
- Following tripping of 400 kV Patratu- New Ranchi-1 Line, 400 kV PVUNL-Tenughat Line tripped on SPS operation as per scheme (324 A). Subsequently, PVUNL generation was evacuated through 400 kV PVUNL-Patratu D/C and 400/220 kV ICTs at Patratu.



- At 11:23:28 Hrs, during charging attempt of the 400 kV Patratu-New Ranchi-1 from Patratu end, line tripped on SOTF due to permanent fault. Simultaneously, busbar/LBB protection operated at 400 kV Patratu substation, resulting in tripping of both 400 kV PVUNL-Patratu D/C lines on LBB/BB and DT receipt at PVUNL.



- This results loss of evacuation path and blackout of PVUNL bus, leading to a generation loss of 665 MW.



● **Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):**

- BB-1 and LBB operation inferred to be un-intended protection operation, which was initiated from 400 kV Patratu – PVUNL - 02 bay. This indicates probable setting, CT polarity/and or wiring issue associated with the LBB/ BB protection scheme of PVUNL bay-2 and Patratu 400 kV Bus-1.
- Complete verification of the entire BB protection wiring is required and issue to be resolved at earliest to prevent re-occurrence. After implementing the necessary corrections, busbar stability test shall be conducted to confirm healthy operation.
- A/R not attempted with Main CB at Patratu for 400 kV New Ranchi-1 Line. Reason for the same need to be investigate.
- MOM which was held on 31/12/2025 is attached in annexure.
- Report received from JUSNL is attached in annexure.

**Action Taken/Remedial Measures (सुधारात्मक उपाय):** A committee will form with representatives from PVUNL, CRITL and JUSNL to review BB/LBB protection scheme at 400 kV Patratu substation and submit committee report within **one week**.

● **Non-compliance observed (विनियमन का गैर-अनुपालन):**

S.No.	Issues	Regulation Non-Compliance	Remark
1	Flash Report received within 8hrs?	IEGC section 37.2 (b)	Not Submitted

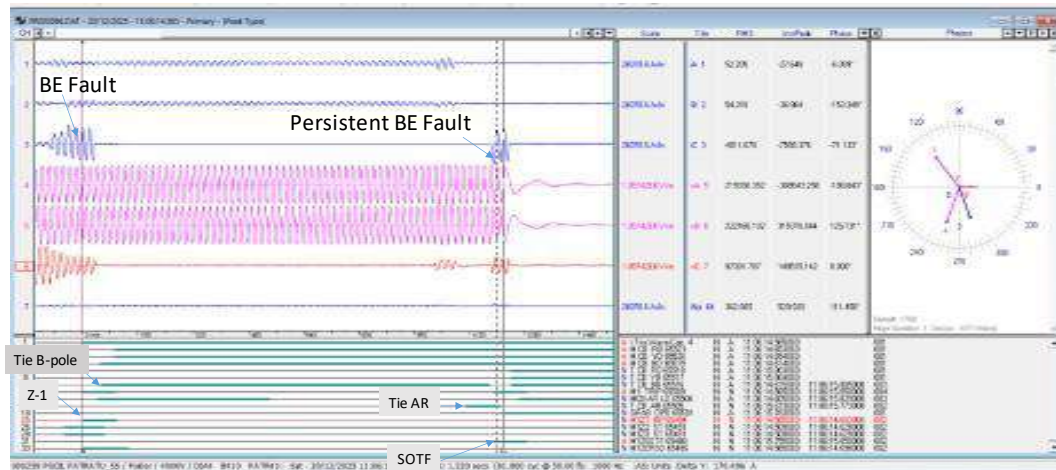
2	<b>Whether DR/EL provided within 24 Hours?</b>	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	Submitted
3	<b>Detailed Report received within 7 days?</b>	IEGC section 37.2 (e)	Submitted
4	<b>Protection system not operated correctly</b>	CEA Technical Standard for Construction of Electrical Plants and Electric Lines: 48 (1) a. CEA (Technical standards for connectivity to the Grid) Regulation, 2007: Schedule Part 1. (6.1, 6.2, 6.3)	<b>Unintended LBB/bus bar protection operated at Patratu S/s.</b>

- **Key Lessons Learnt** (प्रमुख अधिगम बिंदु):

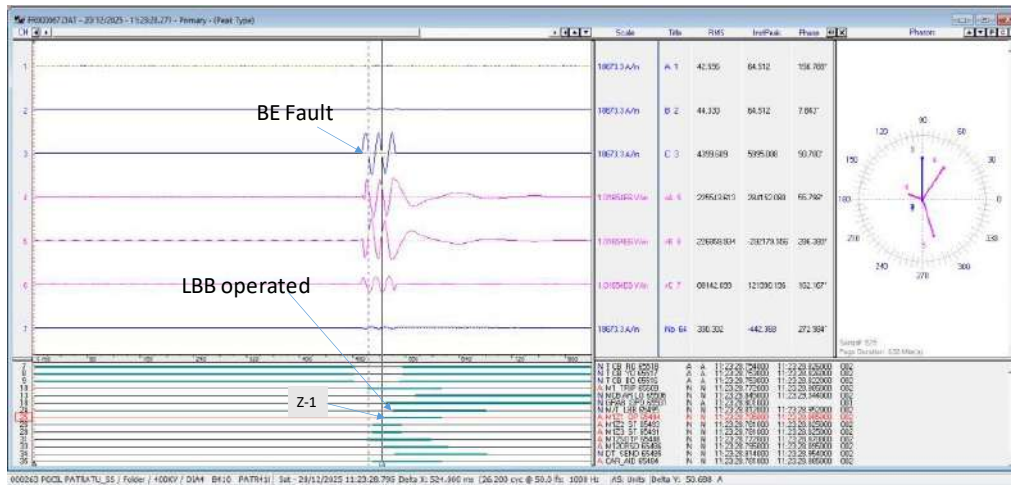
1. Preventive maintenance of the transmission line, including thermos-vision scanning and tightening of all loose joints in accordance with CEA Grid Standard regulation 2010 is essential to prevent incident such as snapping of ACSR twin moose conductor (flow 400 MW). Periodic checking of all protection settings through both internal reviews and Third-party Protection audit as mentioned in the Grid code, is required to avoid un-intended protection operation and to ensure system reliability.

## Annexure 1:

DR from Patratu for New Ranchi-1 at 11:06 Hrs



DR from Patratu for New Ranchi-1 at 11:23 Hrs





## **Recording of Meeting on disturbance at 400 kV PVUNL Generating Station**

An online meeting was held on 31<sup>st</sup> December'25 to discuss the Grid Disturbance at 400 kV PVUNL Generating station that occurred on 20<sup>th</sup> December'25. The meeting was attended by representatives from PVUNL, JUSNL, CRITL Team, ERLDC and ERPC.

Following Key points were deliberated during the meeting-

- ERLDC explained the sequence of events through presentation and highlighted that the unintended LBB/BB protection operation at Patratu S/s, during charging attempt of faulty 400 kV Patratu-New Ranchi-1 Line, resulted PVUNL blackout and led to a generation loss of 665 MW at PVUNL.
- CRITL Team from JUSNL informed that the LBB initiation originated from Main Bay of 400 kV PVUNL-2, following which BB protection operated. Due to wiring/circuitry issue in LBB/BB protection, all tie CBs along with Main CBs connected to 400 kV Bus-1 tripped at 400 kV Patratu, resulting loss of evacuation of PVUNL and generation loss.
- It was agreed that CRITL will form a committee in presence of PVUNL representative to review the LBB and bus bar protection scheme and submit the findings along with root cause and remedial measures of this event within one week. JUSNL agreed.
- As an interim measure to prevent recurrence, Bus bar protection at Patratu S/s has been kept out of service and zone-4-time delay of all lines has been reduced to 250 msec. The BB protection may be taken in to service after reviewing bus bar scheme and successful BB stability test.
- ERLDC pointed that for availing any line shutdown at PVUNL or Patratu, PVUNL generation must be restricted to ensure N-1 compliance in 220kV network to avoid overloading in 220kV Patratu-Hatia D/C and 315 MVA ICTs at Patratu S/s.
- ERLDC highlighted that the 400kV Patratu-New Ranchi-1 line got tripped due to snapping of conductor in between Loc No 27-28 with loading of around 400 MW only. JUSNL is requested to carry out the proper maintenance of the line, in line with CEA grid standard regulation 2010 to avoid such breakdown in future. JUSNL agreed the same.
- ERLDC also raised concern about repeated (Three times) Grid disturbance at PVUNL in 2025 due to unwanted protection operation at Patratu S/s and sought an update on the status of internal protection audit for compliance of IEGC 2023. CRITL team

informed that the internal protection audit was conducted in December'25 and they will submit report within one month.

- PVUNL representative raised the concern about repeated unwanted disturbance at PVUNL due to protection issue at Patratu S/s, which adversely affecting generator stability and resulting in financial loss.

Finally it was decided that a committee will form with member from PVUNL, CRITL and JUSNL to review BB/LBB protection scheme and submit committee report within one week.

*\*\*\*Meeting concluded with a Vote of Thanks. \*\*\**

**Members Present-**

- K Suresh kumar, AGM(PVUNL)
- S Md Rasool, DGM(PVUNL)
- Rakesh Kumar, Senior Manager (PVUNL)
- R. L. Paswan, GM, Transmission Zone-V, Hazaribagh
- Pravin Ram, DGM (in-charge), Hazaribagh
- Vikash Kumar, Sr. Manager, 400/220kV Patratu S/s.
- Chandra Shekhar Kumar, Sr. Manager, CRIL
- Dharm Das Murmu, Jr. Manager, CRITL
- Raju Kachhap, Sr. Manager, SLDC
- Kumar Satyam, ERPC
- Manas Das, DGM, ERLDC
- Bilash Achari, DGM, ERLDC
- Bimal Swargiary, DGM, ERLDC
- Rakesh Kumar Pradhan, Chief Manager, ERLDC
- Alok Pratap Singh, Chief Manager, ERLDC
- Gitesh Patel, Deputy Manager, ERLDC

## **Grid Disturbance at 400/220 kV Patratu GSS on 20.12.2025**

### **At 11.23 Hrs Event :-**

At 11:23 hrs during trial operation of 400 kV Patratu - New Ranchi-1 Line, the line was tripped on SOTF, Z1 and same time BB1 protection operated which is incorrectly initiated from 400 kV PVUNL – 02 bay, simultaneously 400 kV PVNL D/C, 400 kV Latehar D/C main CB and concern Tie CB operated due which total power failure occurred at Patratu s/s.

Again, at 12.21 hrs total power failure occurred while closing of CB of 400 kV Patratu – PVUNL- 01 from PVUNL and this time also LBB protection operated which is incorrectly initiated from 400 kV PVUNL – 02 bay.

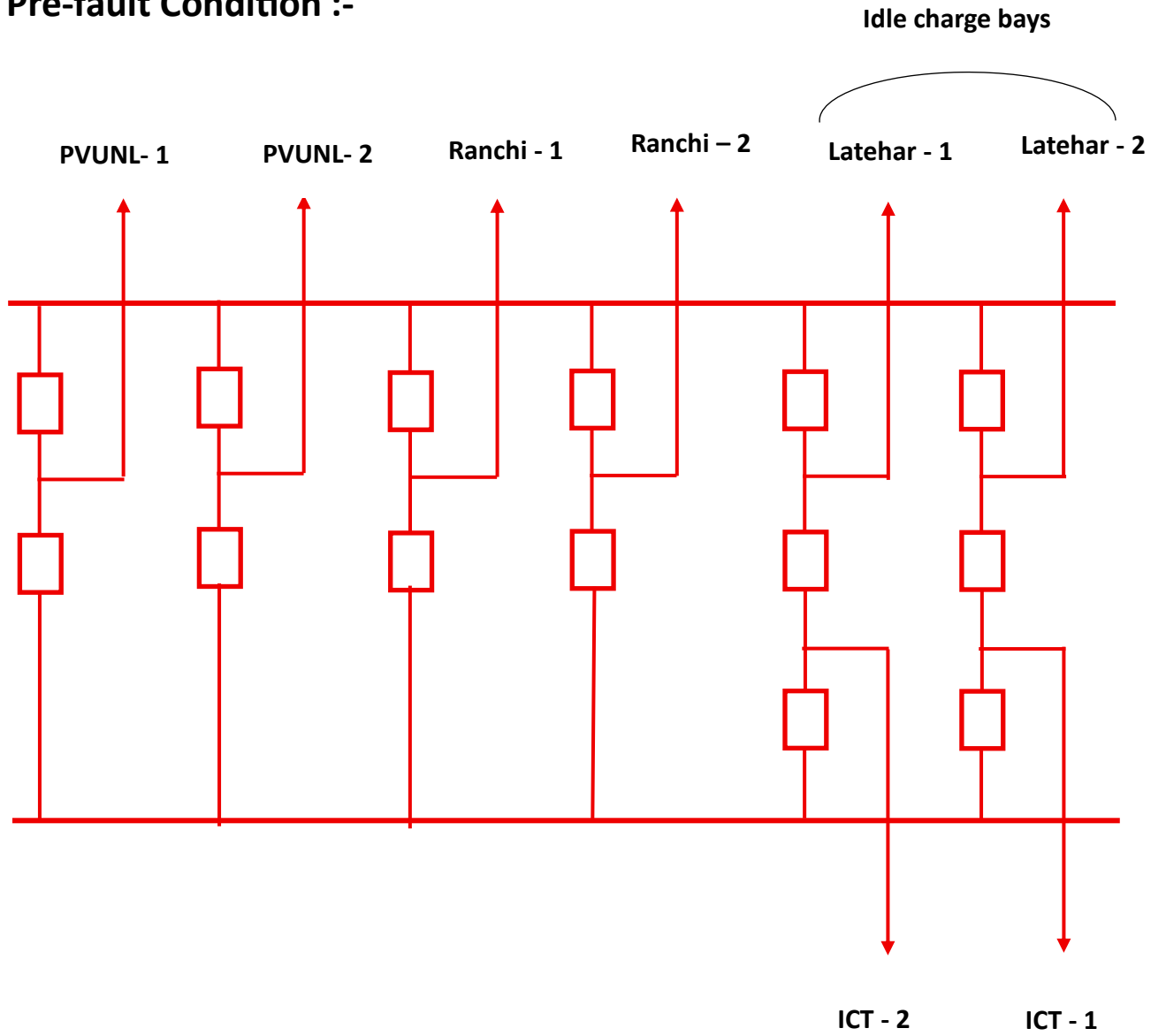
**Weather condtion** : - Normal

**Generation Load Loss** :- 665 MW

**Elements under shutdown** :- 400 kV Patratu – New Ranchi – 02  
(shutdown taken at 10:30 Hrs)

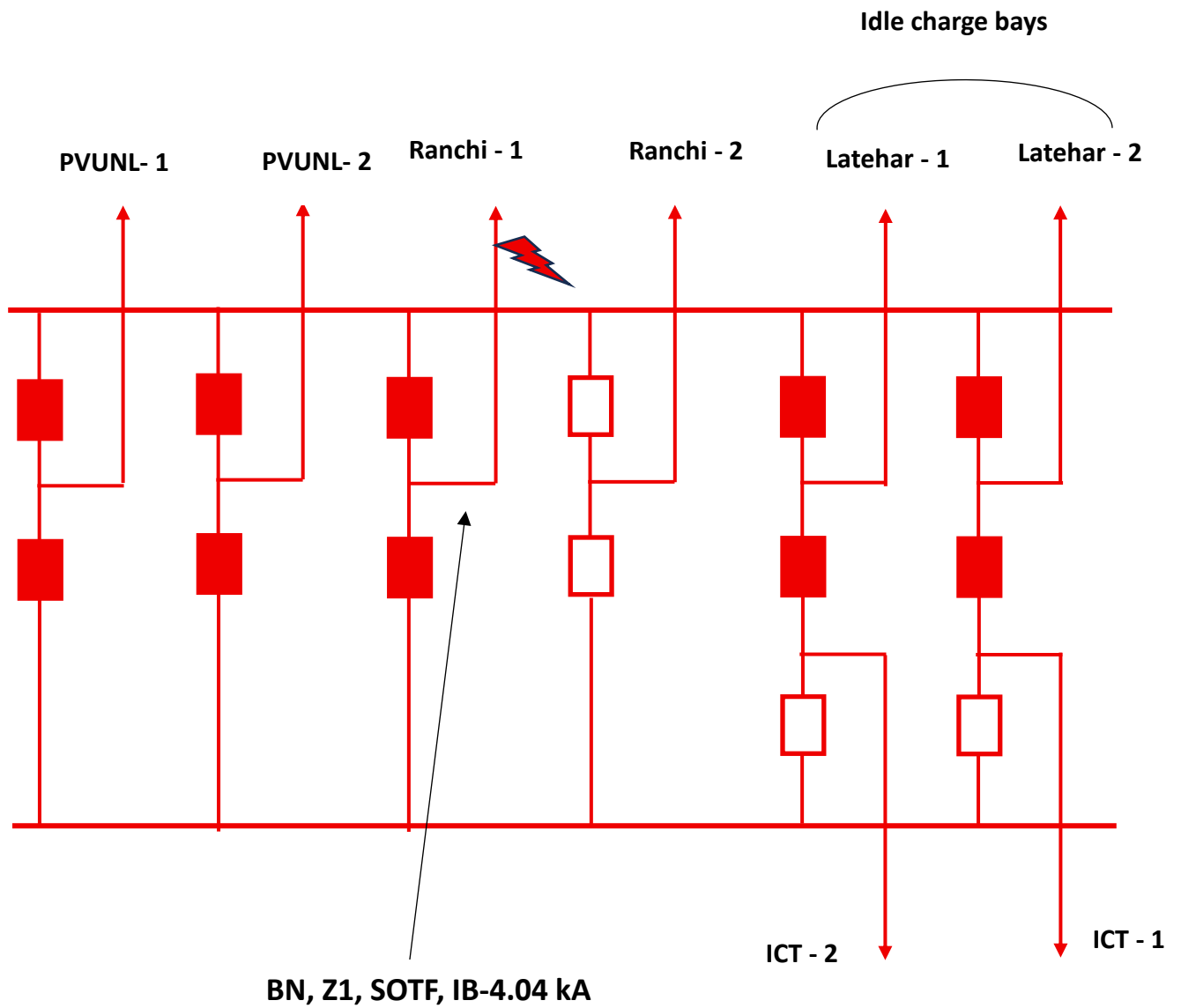
**Element's tripped** :- 400 kV Patratu - New Ranchi-1, 400 kV Patratu – PVUNL D/C, 400 kV Patratu – Latehar D/C (idle charge bay)

# Pre-fault Condition :-



- 400 kV Patratu – New Ranchi was under planned shutdown.

## 20.12.25, 11.23 Hrs Event :-

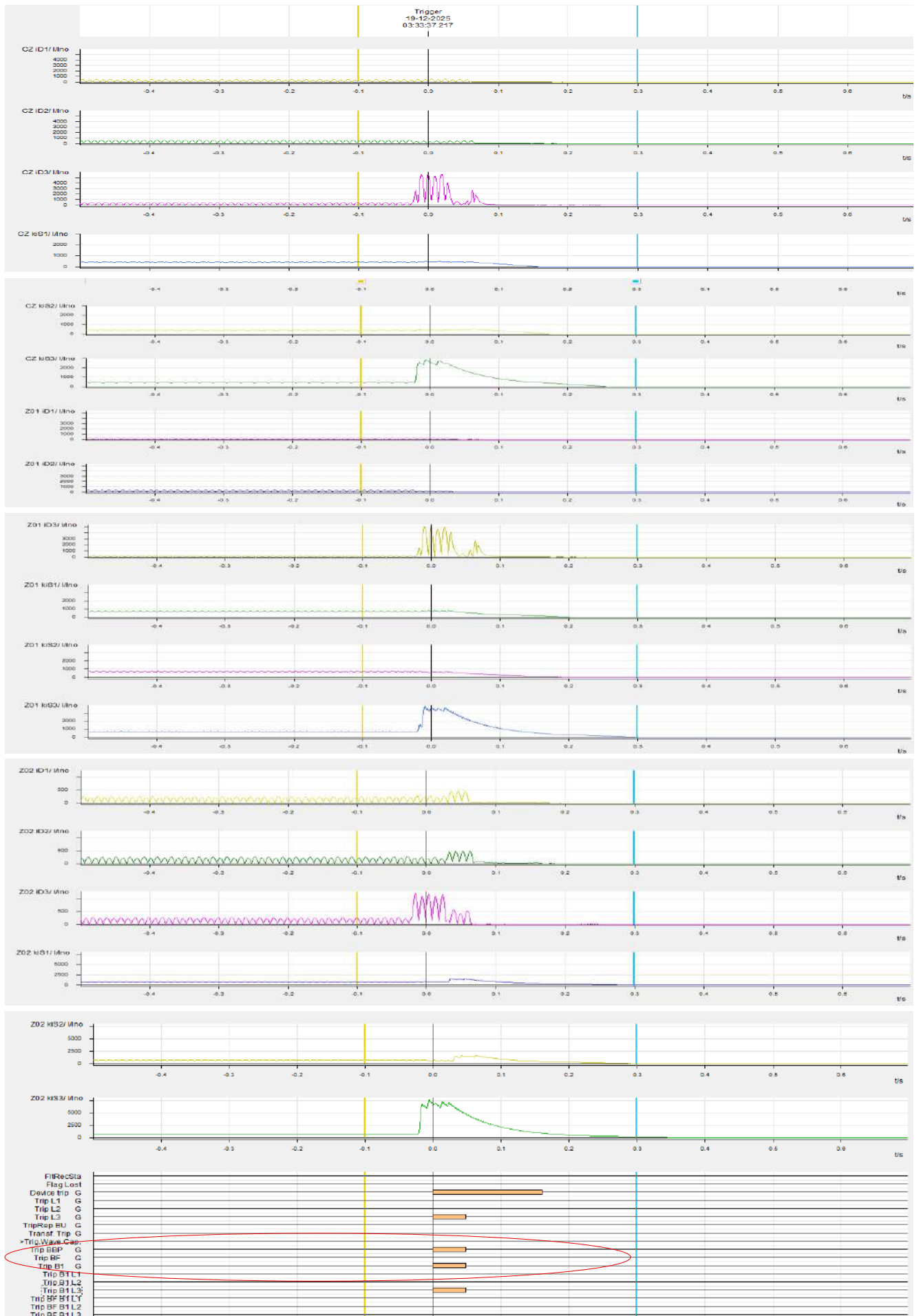


- With the tripping of 400 kV Patratu – New Ranchi – 01, Bus Bar – 1 operated.
- And all Main CB and Tie CB of 400 kV Line feeders operated.

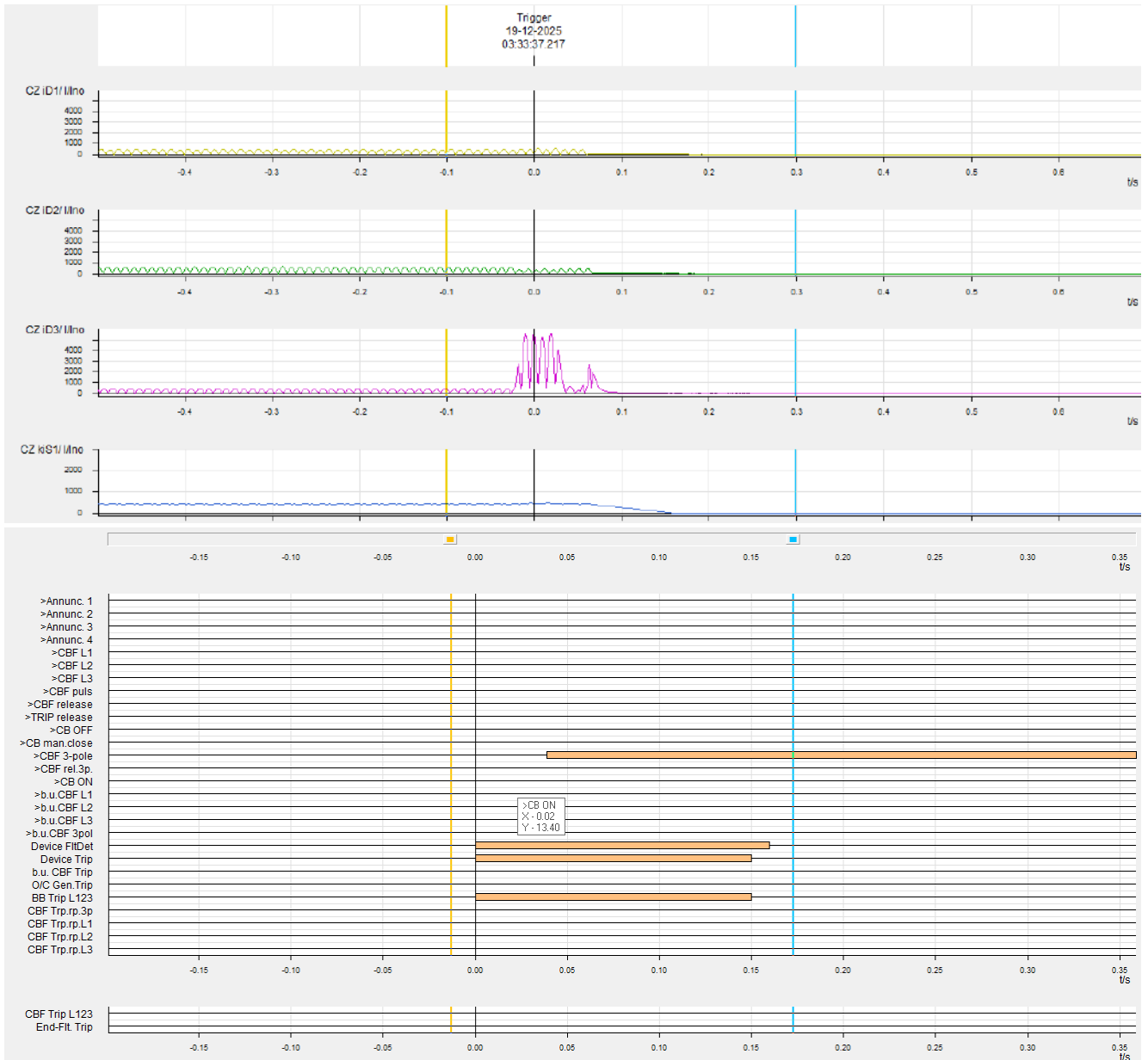
## **Fault Analysis :-**

- BN fault occurred at 11:06 Hrs on 400 kV Patratu- New Ranchi-1 Line with Z1, 4.99 kA. The fault was due to snapping of conductor in between Loc No 27-28 as intimated. A/R was attempted through Tie CB, but it was unsuccessful due to persistent fault after 1 sec.
- After tripping of 400 kV Patratu- New Ranchi-1 Line, 400 kV PVUNL-Tenughat Line tripped on SPS operation. Subsequently, PVUNL generation was evacuated through 400 kV PVUNL-Patratu D/C and 400/220 kV ICTs at Patratu.
- At 11:23:28 Hrs, during charging attempt, the 400 kV Patratu-New Ranchi-1 tripped again due to permanent fault on Z-1 operation. Within 17 msec from Z-1 operation, Bus Bar-1 operated. Simultaneously, all Main CB and Tie CB of 400 kV line feeders tripped.
- This results loss of evacuation path and blackout of PVUNL bus, leading to a generation loss of 665 MW.
- It seems that Bus bar protection is operated incorrectly.

# Indication of BB\_CU2 :-



# Indication of BB2 PU of 400 kV Patraru -2 Bay



## 1 Indications

### 1.1 Trip Log - 000002 / 19-12-2025 03:33:37.217 - PAT\_231225 / Folder / PATR400BBM2/7SS522

Trip Log - 000002 / 19-12-2025 03:33:37.217 - PAT\_231225 / Folder / PATR400BBM2/7SS522

Number	Indication	Value	Date and time	Cause	State
00301	Power System fault	2 - ON	19.12.2025 03:33:37.217		
00302	Fault Event	2 - ON	19.12.2025 03:33:37.217		
177.1344.01	Trip command for B1 L3	ON	0 ms		

## **20.12.25, 12.21 Hrs Event :-**

Again, at 12.21 hrs total power failure occurred while closing of CB of 400 kV Patrattu – PVUNL- 01 from PVUNL end and LBB protection operated which is incorrectly initiated from 400 kV PVUNL – 02 bay.

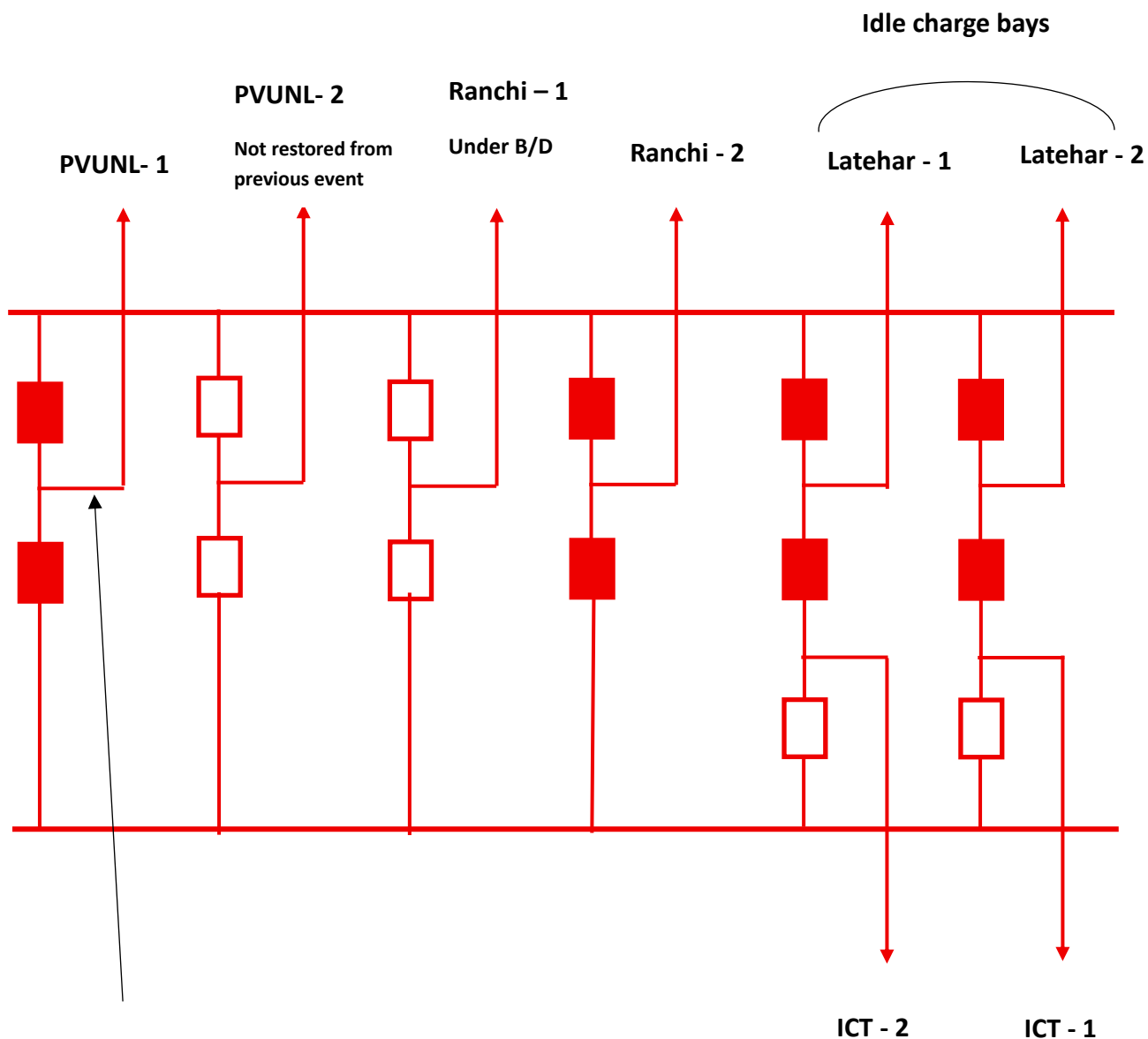
**Weather condtion** : - Normal

**Generation Load Loss** :-

**Elements under outage**:- 400 kV Patrattu – New Ranchi – 01  
(under breakdown due to snapping of conductor in between Loc No 27-28)

**Element's tripped** :- 400 kV Patrattu - New Ranchi-2, 400 kV Patrattu – PVUNL- 01, 400 kV Patrattu – Latehar D/C (idle charge bay)

## 20.12.25, 12.21 Hrs Event :-



LBB operated while closing of CB of 400 kV  
Patratu – PVUNL- 01 from PVUNL end.

- LBB operated which is incorrectly initiated from 400 kV PVUNL – 02 bay which is not in charged condition at the time of event.

# Relay Indication –

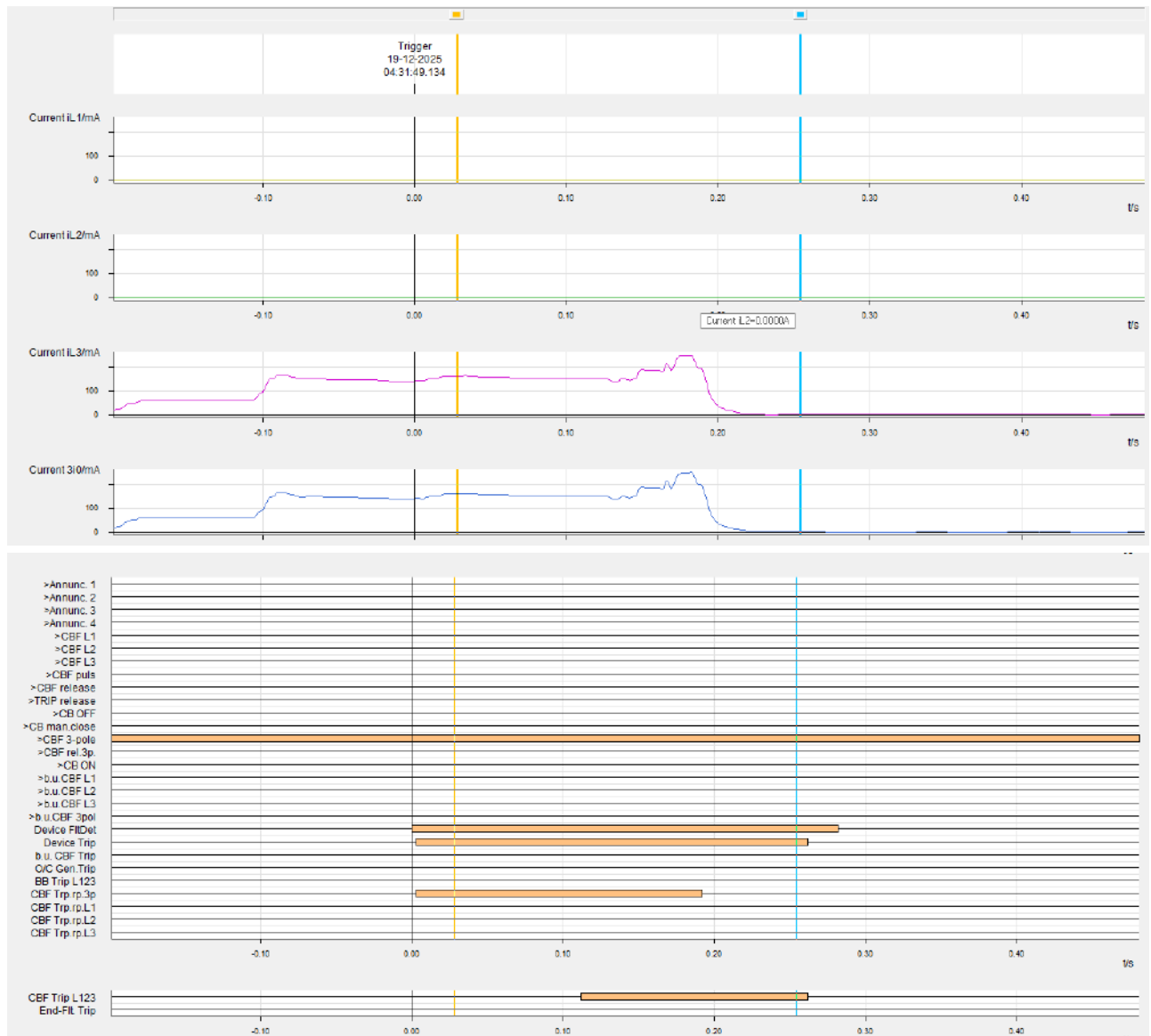
## Bus Bar CU2 :-

1	Indications
1.1	Trip Log - 000003 / 19-12-2025 04:31:49.135 - PAT_231225 / Folder / PATR400BBM2/7SS522

Trip Log - 000003 / 19-12-2025 04:31:49.135 - PAT\_231225 / Folder / PATR400BBM2/7SS522

Number	Indication	Value	Date and time	Cause	State																							
00301	Power System fault	3 - ON	19.12.2025 04:31:49.135																									
00302	Fault Event	3 - ON	19.12.2025 04:31:49.135																									
176.1071.09	Trip repeat Bay Unit @09 phase L1	ON	3 ms																									
176.1072.09	Trip repeat Bay Unit @09 phase L2	ON	3 ms																									
176.1073.09	Trip repeat Bay Unit @09 phase L3	ON <td 3 ms			177.1352.01	Trip command BF for B1 phase L1	ON	102 ms			177.1353.01	Trip command BF for B1 phase L2	ON	102 ms			177.1354.01	Trip command BF for B1 phase L3	ON	102 ms			176.1082.09	Breaker fail/Transfer trip Bay Unit @09	ON	124 ms		
177.1352.01	Trip command BF for B1 phase L1	ON	102 ms																									
177.1353.01	Trip command BF for B1 phase L2	ON	102 ms																									
177.1354.01	Trip command BF for B1 phase L3	ON	102 ms																									
176.1082.09	Breaker fail/Transfer trip Bay Unit @09	ON	124 ms																									

## BB bay unit-2 of 400 kV PVUNL-2



## **Observations/ Protection Issues-**

1. Bus Bar -1 and LBB operation seems un-intended protection operation which was initiated from 400 kV Patratu – PVUNL - 02 bay.
2. It seems that there was some wiring issue for LBB/ BB protection in PVUNL bay-2.

## **Operational Issues-**

- Since A/R was unsuccessful due to persistent fault on 400 kV Patratu- New Ranchi-1 Line, charging attempt should be under taken only after thorough patrolling and confirmation of fault clearance by Line maintenance crew.


**ग्रिड-इंडिया**  
**GRID-INDIA**

**ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड**  
 (भारत सरकार का उद्यम)  
**GRID CONTROLLER OF INDIA LIMITED**  
 (A Government of India Enterprise)  
 [formerly Power System Operation Corporation Limited (POSOCO)]

**पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / Eastern Regional Load Despatch Centre**

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कार्यालय : 14, गोल्फ क्लब रोड, टॉलिंगंज, कोलकाता - 700033  
 Office : 14, Golf Club Road, Tollygunge, Kolkata - 700033  
 CIN : U40105DL2009GOI188682, Website : www.erfdc.in, E-mail : erfdcinfo@grid-india.in, Tel.: 033 23890060/0061

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**Detailed Report of grid event at 220kV Garhwa S/s of Eastern Region**  
**(To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f))**

(आई ई जी सी 37.2 (एफ) के अनुपालन में)

Date(दिनांक): 25-11-2025

**1. Event Summary (घटना का सारांश):**

At 02:05 Hrs, an RYB fault occurred in 33 kV bus side (an SST supply bay) due to bird strike. Consequently, 220/132 kV ICTs tripped in O/C earth fault. Following this incident, all 220kV feeders at Garhwa were manually hand tripped for safety reason, leading to complete outage of 220kV Garhwa S/s. Total load loss of 30 MW reported at Garhwa S/s of Jharkhand Power System.

**2. Time and Date of the Event (घटना का समय और दिनांक): At 02:05 Hrs on 05/11/2025:**

**3. Event Category (ग्रिड घटना का प्रकार): Grid Disturbance (GD)-1**

**4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Garhwa, Jharkhand**

**5. Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency in Hz	Regional Generation in MW	Regional Demand in MW	State Generation in MW	State Demand in MW
				Jharkhand	Jharkhand
Pre-Event (घटना पूर्व)	50.024	28142	18601	332	1137
Post Event (घटना के बाद)	50.024	28142	18571	332	1107

**\*Pre and post data of 1 minute before and after the event**

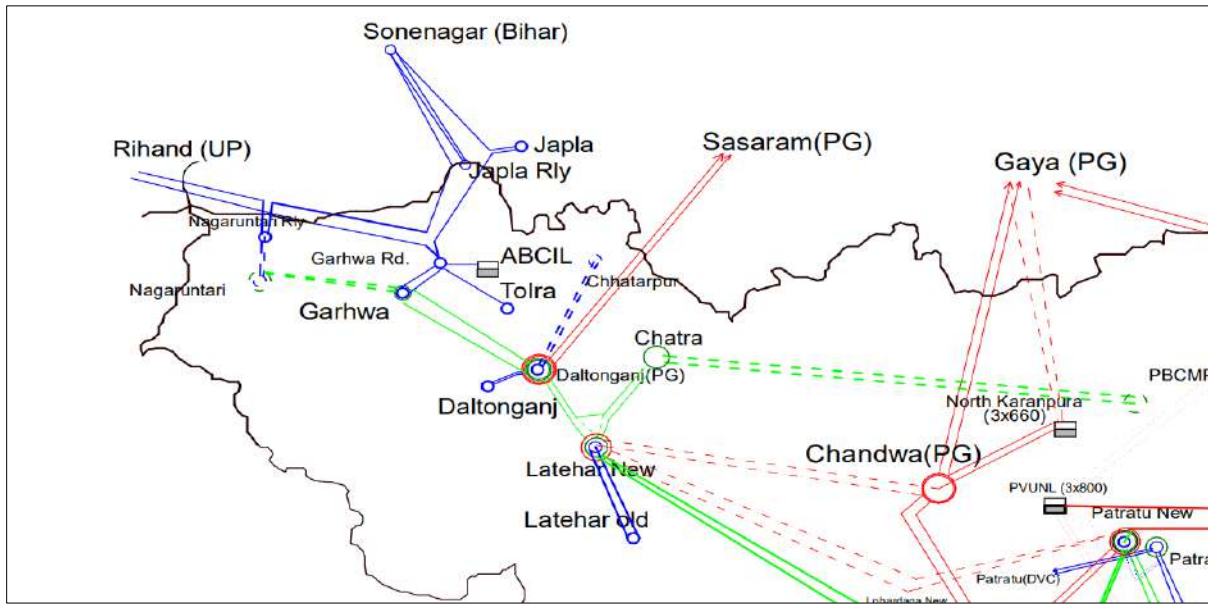
Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विद्युत उत्पादन इकाइयां)	NIL
---	-----

जो बंद है)	
Weather Condition (मौसम स्थिति)	Inclement weather at Garwah S/S.

1. **Load and Generation loss (लोड और जेनरेशन हानि):** Approximate load loss of 30 MW at Garhwa (JH) area of Jharkhand Power System.

6. **Duration of interruption (रुकावट की अवधि):** 1 Hours and 40 minutes

7. **Network across the affected area (प्रभावित क्षेत्र का नक्शा):**



**Figure 1: Network across the affected area**

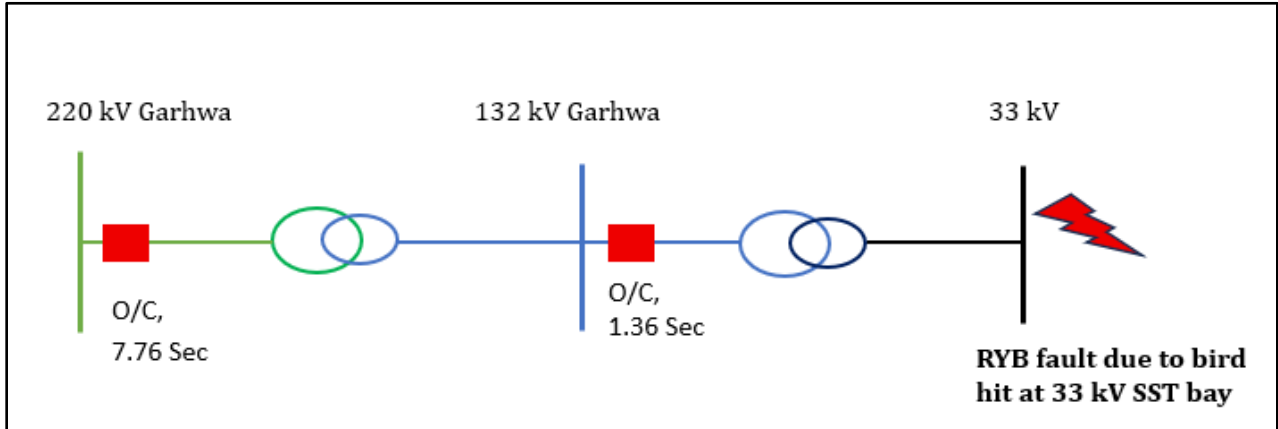
8. **Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण):** NA

9. **Major Elements Tripped (प्रमुख ट्रिपिंग):**

क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220 KV Daltonganj (PG) – Garhwa ckt -1	02:05	Manually Hand Tripped		03:46
2	220 KV Daltonganj (PG) – Garhwa ckt -2	02:05	Manually Hand Tripped		03:47
3	220/132kV ICT -1	02:04:10	O/C Earth fault		-

4	220/132kV ICT- 2	02:04:10	O/C Earth fault	-
5	132/33kV ICT -1	02:04:04	O/C Earth fault	-

**10. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):**



- 220kV Garhwa S/s is connected with Grid through 220kV-Daltongunj-Garhwa D/C.
- At 02:04:04 Hrs, a three phase fault occurred due to bird strike on 33kV bus side.
- Fault was partially cleared by 132/33kV ICT-1 on O/C earth fault after 1.36 sec.
- Due to reversed polarity issue of 132/33kV ICT-2, fault was not picked up and after 7.7 sec, both 220/132kV ICTs got tripped on O/C earth fault.
- Meanwhile for safety purpose, 220kV both feeders manually hand tripped.
- As a result 220kV Garhwa S/s became dead.
- Total load loss of 30 MW reported at Garhwa S/s.



**Figure 2: PMU plot at 400KV Daltonganj Sasaram line#1 Voltage during tripping of 132 kV system**

#### 11. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):

- Fault was occurred in 33kV bus side, which was partially cleared by 132/33kV ICT -1 but same fault was not sensed by 132/33kV ICT-2. As per report received from SLDC, Backup core CT polarity of 132 kV side of ICT-2 was found reversed. Issue resolved on 11/11/2025.
- Fault was occurred in 33kV network which was delayed cleared by 132/33kV ICT-1 and 220/132kV ICTs in 1.7 sec and 7.7 sec respectively. O/C earth fault setting of 220/132kV ICTs and 132/33kV ICTs may be coordinated.
- DR is not time synchronised.
- Detail Report received from SLDC is attached in Annexure.

#### 12. Action Taken/Remedial Measures (सुधारात्मक उपाय):

The Back -up core CT polarity issue of 132 kV side of 132/33 kV Power Transformer-02 was rectified on 11.11.2025.

**13. Non-compliance observed (विनियमन का गैर-अनुपालन):**

S.No.	Issues	Regulation Non-Compliance	Utilities
1.	DR/EL submitted within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	YES
2	Detailed report not submitted within 7 days	IEGC section 37.2 (e)	YES

**14. Key Lessons Learnt (प्रमुख अधिगम बिंदु):**

Periodic internal protection audit should be carried out as mandated by Grid code once in a year to identify this type of CT polarity errors and protection Setting coordination, issues, thereby preventing un-intended protection operation .

**Annexure 1:**

## **Grid Disturbance at 220 kV Garhwa Substation on 05.11.2025 at 02:05 Hrs**

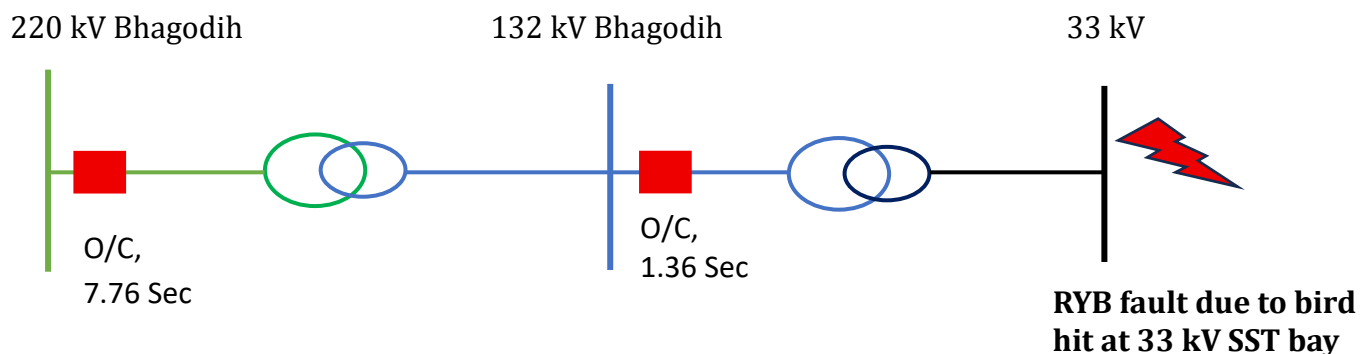
At 02:05 Hrs, an **RYB fault** occurred at 33 kV Bus side (at SST supply bay) due to bird hit and the fault was partially cleared within 1360 msec due to the tripping of one 132/33 kV Power Transformer-01. Due to none tripping of other 132/33 kV Power Transformer-02, the fault was completely cleared within 7760 msec by 220/132 kV ICTs with delayed fault clearance.

Weather condition – Normal

Element under outage prior to event – Nill

Element tripped – 132/33 kV Power Transformer-01, 220/132 kV ICTs.

Load Loss – 30 MW



**Note :-** 132/33 kV Power Transformer-02 didn't tripped due to incorrect CT polarity of Back-up core of 132 kV side.

### **Fault Analysis :-**

- RYB fault occurred at 33 kV bus side due to bird hit at 33 kV SST bay and the fault was partially cleared within 1360 msec due to the tripping of one 132/33 kV Power Transformer-01.
- Due to none tripping of other 132/33 kV Power Transformer-02, the fault was completely cleared within 7760 msec by 220/132 kV ICTs with delayed fault clearance as the fault current seen by ICTs are of low magnitude.

### **Protection Issue :-**

- The Back -up core CT polarity of 132 kV side of 132/33 kV Power Transformer-02 was found reverse (incorrect).

The issue was rectified on 11.11.2025.

- 220/132 kV ICTs and 132/33 kV Power Transformers back up setting weren't coordinated properly. The back settings are revised as follows –

### OVER CURRENT PROTECTION

Function	150MVA ICTS				50MVA Power Transformer			
	HV (800/1)		LV (1200/1)		HV (300/1)		LV (1200/1)	
	Previous	Revised	Previous	Revised	Previous	Revised	Previous	Revised
<b>IDMT Setting</b>								
<b>Pick up (A)</b>	0.49 A	<b>0.49 A</b>	0.49 A	<b>0.55 A</b>	0.8 A	<b>0.8 A</b>	0.8 A	<b>0.8 A</b>
<b>TMS (S)</b>	0.25 A	<b>0.25 A</b>	0.25 A	<b>0.22 A</b>	0.260 A	<b>0.200 A</b>	0.19 A	<b>0.19 A</b>
<b>Direction</b>	Non-dir	<b>Forward</b>	Non-dir	Non-dir	Forward	<b>Forward</b>	Forward	<b>Non-Dir</b>
<b>High Set Definite Time</b>								
<b>Pick Up (A)</b>	4.0A	<b>3.0 A</b>	4.0 A	<b>3.3 A</b>	7.29 A	<b>4.37 A</b>	7.29 A	<b>4.37 A</b>
<b>Time Dely (S)</b>	0 S	<b>0.1 S</b>	0 s	<b>0.1 S</b>	0.2 S	<b>0.1 S</b>	0.15 S	<b>0.1 S</b>
<b>Direction</b>	Non-dir	<b>Non-dir</b>	Non-dir	<b>Non-dir</b>	Non-dir	<b>Non-dir</b>	Non-dir	<b>Non-dir</b>

### EARTH FAULT PROTECTION

Function	150MVA ICTS				50MVA Power Transformer			
	HV (800/1)		LV (1200/1)		HV (300/1)		LV (1200/1)	
	Previous	Revised	Previous	Revised	Previous	Revised	Previous	Revised
<b>IDMT Setting</b>								
<b>Pick up (A)</b>	0.20 A	<b>0.15 A</b>	0.20 A	<b>0.15 A</b>	0.15 A	<b>0.15 A</b>	0.15 A	0.15 A
<b>TMS (S)</b>	0.25 A	<b>0.35 S</b>	0.25 S	<b>0.32 S</b>	0.355 S	<b>0.30 S</b>	0.27 S	0.27 S
<b>Direction</b>	Non-dir	<b>Forward</b>	Non-dir	<b>Non-dir</b>	Forward	<b>Forward</b>	Forward	Non-Dir
<b>High Set Definite Time</b>								
<b>Pick Up (A)</b>	2.5 A	<b>2.4 A</b>	2.5 A	<b>2.6 A</b>	5.47 A	<b>3.5 A</b>	5.47 A	<b>3.5 A</b>
<b>Time Dely (S)</b>	0 S	<b>0.1 S</b>	0	<b>0.1 S</b>	0.2 S	<b>0.1 S</b>	0.15 S	<b>0.1 S</b>
<b>Direction</b>	Non-dir	Non-dir	Non-dir	Non-dir	Non-dir	<b>Non-dir</b>	Non-dir	<b>Non-dir</b>

## Relay Indication of 220/132 kV ICT-1 HV Side

S	Fault start	Trip comm...	End of fault	Fault type
#	11/05/2025 03:17:41.716	03:17:49.352	03:17:49.436	*****

11/05/2025	03:17:41.716	03:17:49.352	03:17:49.436
Pickup		Trip	End
Fault type *****		Trip type *****	
<b>Units</b>			
	Pickup		Trip
Phase A Instantaneous Unit 1	Pick Up		Phase A Instantaneous Unit 1 Trip
Phase B Instantaneous Unit 1	Pick Up		Phase B Instantaneous Unit 1 Trip
Phase C Instantaneous Unit 1	Pick Up		Phase C Instantaneous Unit 1 Trip
Phase A Instantaneous Unit 2	Pick Up		Phase A Instantaneous Unit 2 Trip
Phase B Instantaneous Unit 2	Pick Up		Phase B Instantaneous Unit 2 Trip
Phase C Instantaneous Unit 2	Pick Up		Phase C Instantaneous Unit 2 Trip
Phase A Instantaneous Unit 3	Pick Up		Phase A Instantaneous Unit 3 Trip
Phase B Instantaneous Unit 3	Pick Up		Phase B Instantaneous Unit 3 Trip
Phase C Instantaneous Unit 3	Pick Up		Phase C Instantaneous Unit 3 Trip
Phase A Time Overcurrent Unit 1	Pick Up		Phase A Time Overcurrent Unit 1 Trip
Phase B Time Overcurrent Unit 1	Pick Up		Phase B Time Overcurrent Unit 1 Trip
Phase C Time Overcurrent Unit 1	Pick Up		Phase C Time Overcurrent Unit 1 Trip
Phase A Time Overcurrent Unit 2	Pick Up		Phase A Time Overcurrent Unit 2 Trip
Phase B Time Overcurrent Unit 2	Pick Up		Phase B Time Overcurrent Unit 2 Trip
Phase C Time Overcurrent Unit 2	Pick Up		Phase C Time Overcurrent Unit 2 Trip

### Magnitudes

	Pre-Fault	Fault
IA	0.086 A	0.119 A
ANG IA	0.0 °	352.8 °
IB	0.123 A	0.879 A
ANG IB	211.5 °	201.7 °
IC	0.052 A	0.700 A
ANG IC	115.8 °	28.1 °
IG	3d37b396 *	3da8db05 *
ANG IG	434ab73e *	433a8cc0 *
IN	0.045 A	0.083 A
ANG IN	202.9 °	186.7 °
IPOL	0.000 A	0.000 A
ANG IPOL	***** °	***** °
ZSC	0.015 A	0.028 A
NSC	0.032 A	0.424 A
PSC	0.085 A	0.495 A
FREQ	50.000 Hz	50.000 Hz
IGN	0.000 A	0.000 A

### General

ACTGRP	1
THERMAL IMG	0 %

## Relay Indication of 220/132 kV ICT-1 LV Side

S	Fault start	Trip comm...	End of fault	Fault type
#	11/05/2025 02:55:57.388	02:56:05.016	03:14:52.934	BC

11/05/2025  
02:55:57.388 02:56:05.016 03:14:52.934

Pickup Trip End  
Fault type BC Trip type \*\*\*\*\*

### Units

Units	Pickup	Trip
Phase A Instantaneous Unit 1	Pick Up	Trip
Phase B Instantaneous Unit 1	Pick Up	Trip
Phase C Instantaneous Unit 1	Pick Up	Trip
Phase A Instantaneous Unit 2	Pick Up	Trip
Phase B Instantaneous Unit 2	Pick Up	Trip
Phase C Instantaneous Unit 2	Pick Up	Trip
Phase A Instantaneous Unit 3	Pick Up	Trip
Phase B Instantaneous Unit 3	Pick Up	Trip
Phase C Instantaneous Unit 3	Pick Up	Trip
Phase A Time Overcurrent Unit 1	Pick Up	Trip
Phase B Time Overcurrent Unit 1	Pick Up	Trip
Phase C Time Overcurrent Unit 1	Pick Up	Trip
Phase A Time Overcurrent Unit 2	Pick Up	Trip
Phase B Time Overcurrent Unit 2	Pick Up	Trip
Phase C Time Overcurrent Unit 2	Pick Up	Trip

### Magnitudes

	Pre-Fault	Fault
VA	64.333 V	62.660 V
ANG VA	0.0 °	359.3 °
VB	63.619 V	41.529 V
ANG VB	240.8 °	218.2 °
VC	64.725 V	43.573 V
ANG VC	121.9 °	138.7 °
IA	0.087 A	0.118 A
ANG IA	166.1 °	158.6 °
IB	0.118 A	0.878 A
ANG IB	18.4 °	7.3 °
IC	0.052 A	0.700 A
ANG IC	281.5 °	193.7 °
IG	38627e0f *	38ef1349 *
ANG IG	42c42f86 *	43528d98 *
IN	0.039 A	0.082 A
ANG IN	10.5 °	351.8 °
IPOL	0.000 A	0.000 A
ANG IPOL	***** °	***** °
VN	1.020 V	3.592 V
ANG VN	215.0 °	139.6 °
VSYNC	64.241 V	63.445 V

## Relay Indication of 220/132 kV ICT-2 HV Side

Emulation

S	Fault start	Trip comm...	End of fault	Fault type
#	08/08/2022 22:48:21.956	22:48:26.840	22:48:26.928	*****

08/08/2022

22:48:21.956 22:48:26.840 22:48:26.928

Pickup Trip End

Fault type \*\*\*\*\* Trip type \*\*\*\*\*

**Units**

	Pickup	Trip
Phase A Instantaneous Unit 1 Pick Up	●	Phase A Instantaneous Unit 1 Trip ●
Phase B Instantaneous Unit 1 Pick Up	●	Phase B Instantaneous Unit 1 Trip ●
Phase C Instantaneous Unit 1 Pick Up	●	Phase C Instantaneous Unit 1 Trip ●
Phase A Instantaneous Unit 2 Pick Up	●	Phase A Instantaneous Unit 2 Trip ●
Phase B Instantaneous Unit 2 Pick Up	●	Phase B Instantaneous Unit 2 Trip ●
Phase C Instantaneous Unit 2 Pick Up	●	Phase C Instantaneous Unit 2 Trip ●
Phase A Instantaneous Unit 3 Pick Up	●	Phase A Instantaneous Unit 3 Trip ●
Phase B Instantaneous Unit 3 Pick Up	●	Phase B Instantaneous Unit 3 Trip ●
Phase C Instantaneous Unit 3 Pick Up	●	Phase C Instantaneous Unit 3 Trip ●
Phase A Time Overcurrent Unit 1 Pick Up	●	Phase A Time Overcurrent Unit 1 Trip ●
Phase B Time Overcurrent Unit 1 Pick Up	●	Phase B Time Overcurrent Unit 1 Trip ●
Phase C Time Overcurrent Unit 1 Pick Up	●	Phase C Time Overcurrent Unit 1 Trip ●
Phase A Time Overcurrent Unit 2 Pick Up	●	Phase A Time Overcurrent Unit 2 Trip ●
Phase B Time Overcurrent Unit 2 Pick Up	●	Phase B Time Overcurrent Unit 2 Trip ●
Phase C Time Overcurrent Unit 2 Pick Up	●	Phase C Time Overcurrent Unit 2 Trip ●

**Magnitudes**

	Pre-Fault	Fault
IA	0.409 A	0.376 A
ANG IA	360.0 °	333.9 °
IB	0.342 A	0.726 A
ANG IB	184.0 °	202.5 °
IC	0.072 A	0.552 A
ANG IC	153.4 °	53.5 °
IG	3c175afb *	3b950fc7 *
ANG IG	4290e630 *	432da438 *
IN	0.009 A	0.005 A
ANG IN	70.5 °	170.9 °
IPOL	0.000 A	0.000 A
ANG IPOL	***** °	***** °
ZSC	0.003 A	0.002 A
NSC	0.204 A	0.209 A
PSC	0.235 A	0.530 A
FREQ	50.000 Hz	50.000 Hz
IGN	0.000 A	0.000 A

**General**

ACTGRP	1
THERMAL IMG	0 %

## Relay Indication of 220/132 kV ICT-2 LV Side

S	Fault start	Trip comm...	End of fault	Fault type
#	11/05/2025 03:00:50.946	03:00:58.474	03:18:23.724	BC

11/05/2025

03:00:50.946

03:00:58.474

03:18:23.724

Pickup

Trip

End

Fault type BC

Trip type \*\*\*\*\*

Units

Pickup

Trip

Phase A Instantaneous Unit 1 Pick Up ●	Phase A Instantaneous Unit 1 Trip ●
Phase B Instantaneous Unit 1 Pick Up ●	Phase B Instantaneous Unit 1 Trip ●
Phase C Instantaneous Unit 1 Pick Up ●	Phase C Instantaneous Unit 1 Trip ●
Phase A Instantaneous Unit 2 Pick Up ●	Phase A Instantaneous Unit 2 Trip ●
Phase B Instantaneous Unit 2 Pick Up ●	Phase B Instantaneous Unit 2 Trip ●
Phase C Instantaneous Unit 2 Pick Up ●	Phase C Instantaneous Unit 2 Trip ●
Phase A Instantaneous Unit 3 Pick Up ●	Phase A Instantaneous Unit 3 Trip ●
Phase B Instantaneous Unit 3 Pick Up ●	Phase B Instantaneous Unit 3 Trip ●
Phase C Instantaneous Unit 3 Pick Up ●	Phase C Instantaneous Unit 3 Trip ●
Phase A Time Overcurrent Unit 1 Pick Up ●	Phase A Time Overcurrent Unit 1 Trip ●
Phase B Time Overcurrent Unit 1 Pick Up ●	Phase B Time Overcurrent Unit 1 Trip ●
Phase C Time Overcurrent Unit 1 Pick Up ●	Phase C Time Overcurrent Unit 1 Trip ●
Phase A Time Overcurrent Unit 2 Pick Up ●	Phase A Time Overcurrent Unit 2 Trip ●
Phase B Time Overcurrent Unit 2 Pick Up ●	Phase B Time Overcurrent Unit 2 Trip ●
Phase C Time Overcurrent Unit 2 Pick Up ●	Phase C Time Overcurrent Unit 2 Trip ●

Magnitudes

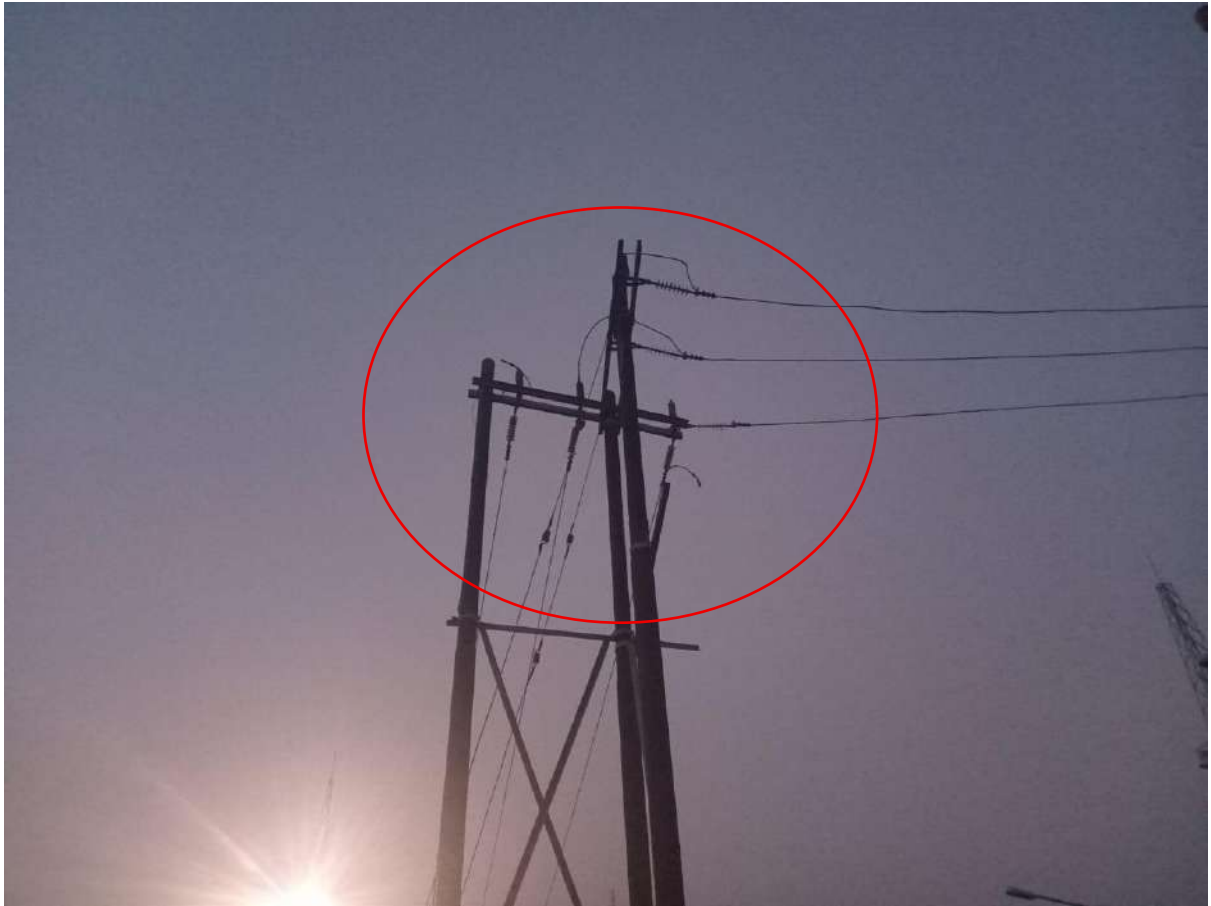
Pre-Fault

Fault

VA	64.696 V	63.502 V
ANG VA	0.0 °	359.2 °
VB	63.894 V	40.941 V
ANG VB	240.5 °	218.6 °
VC	65.443 V	42.234 V
ANG VC	120.3 °	137.1 °
IA	0.090 A	0.115 A
ANG IA	166.3 °	156.3 °
IB	0.090 A	0.868 A
ANG IB	18.8 °	6.7 °
IC	0.052 A	0.703 A
ANG IC	281.2 °	193.4 °
IG	3c00b242 *	3d994d0e *
ANG IG	43b07650 *	43ae30f2 *
IN	0.008 A	0.075 A
ANG IN	353.7 °	348.5 °
IPOL	0.000 A	0.000 A
ANG IPOL	***** °	***** °
VN	0.883 V	2.302 V
ANG VN	79.6 °	76.1 °
VSYNC	64.257 V	63.465 V

## Relay Indication of 132 kV Power Transformer - 01 HV Side

Parameter	Value
Thursday 13 April 2000 17:19:50.229	User Logged In On UI Level 3
Thursday 13 April 2000 11:16:13.807	Fault Recorded
Description	P141 67HV
Plant reference	MiCOM
Model number	P141916N6M0610P
Address	001 Column: 01 Row: 00
Event type	Fault Record
Category	0
Event Value	0
Faulted Phase	00100111
Start Elements 1	00000000000000000000000000000000
Start Elements 2	00000000000000000000000000000000
Start Elements 3	00000000000000000000000000000000
Trip Elements 1	00000000000000000000000000000000
Trip Elements 2	00000000000000000000000000000000
Trip Elements 3	00000000000000000000000000000000
Trip Elements 4	00000000000000000000000000000000
Fault Alarms	00000000
Fault Time	Thursday 13 April 2000 11:16:13.807
Active Group	1
System Frequency	50.04 Hz
Fault Duration	1.252 s
CB Operate Time	55.00ms
Relay Trip Time	1.192 s
IA	45.80 A
IB	988.9 A
IC	851.1 A
VAB	117.0kV
VBC	64.48kV
VCA	117.6kV
IN Measured	101.8 A
IN Derived	100.0 A
IN Sensitive	0.000 A
VAN	74.67kV
VBN	49.10kV
VCN	50.74kV
VN Derived	3.003kV
Evt Unique Id	18868
Thursday 13 April 2000 11:16:13.804	Output Contacts1
Thursday 13 April 2000 11:16:13.803	l> BlockStart OFF
Thursday 13 April 2000 11:16:13.803	Trip Command In OFF
Thursday 13 April 2000 11:16:13.803	l>1 Trip OFF
Thursday 13 April 2000 11:16:13.803	Any Start OFF
Thursday 13 April 2000 11:16:13.803	l>1 Start OFF
Thursday 13 April 2000 11:16:13.803	l>1 Start B OFF
Thursday 13 April 2000 11:16:13.803	l>1 Trip B OFF
Thursday 13 April 2000 11:16:13.803	l>1 Start A OFF
Thursday 13 April 2000 11:16:13.792	l>1 Start C OFF
Thursday 13 April 2000 11:16:13.733	Output Contacts1
Thursday 13 April 2000 11:16:13.732	Trip Command In ON
Thursday 13 April 2000 11:16:13.732	l>1 Trip ON
Thursday 13 April 2000 11:16:13.732	l>1 Trip B ON
Thursday 13 April 2000 11:16:12.801	l>1 Start A ON
Thursday 13 April 2000 11:16:12.541	l> BlockStart ON
Thursday 13 April 2000 11:16:12.541	Any Start ON
Thursday 13 April 2000 11:16:12.541	l>1 Start ON
Thursday 13 April 2000 11:16:12.541	l>1 Start C ON
Thursday 13 April 2000 11:16:12.541	l>1 Start B ON
Thursday 13 April 2000 07:20:22.890	Fault Recorded



### List of important transmission lines in ER which tripped in November-2025

Sl. No.	LINE NAME	TRIP DATE	TRIP TIME	RESTORATION DATE	RESTORATION TIME	Relay Indication LOCAL END	Relay Indication REMOTE END	Reason	Fault Clearance time in msec	Remarks	DR Configuration Discrepancy (Local End)	DR Configuration Discrepancy (Remote End)	DR/EL RECEIVED FROM LOCAL END	DR/EL RECEIVED FROM REMOTE END	LOCAL END UTILITY	REMOTE END UTILITY
1	400KV-ALIPURDUAR (PG)-BONGAIGAO N-1	26-11-2025	12:53	26-11-2025	15:32	Alipurduar: R-B-E fault, 8.08 kA, 8.1 kA, 37.5 km	Bongaigaon End: RBE fault, 6 kA, 6 kA, 57.5 km.	R-B-Earth	100 msec	Line tripped in phase to phase to earth fault.			YES	NO	PG ER-II	PG NER
2	400KV-CHANDWA-NORTH KARANPURA-2	26-11-2025	09:29	26-11-2025	09:35	DT received at chandwa		No Fault	NA	DT send from North Karanpura end during availing shutdown of Tie CB of Gaya line 2 at NKSTPP			YES	NO	PG ER-I	NTPC
3	220KV-BIRPARA-MALBASE-1	25-11-2025	15:35	25-11-2025	21:01	Auto recloser successful at Birpara end: Relay BN fault, 3.6 kA, 40 km.		B-Earth	100 msec	A/r successful from Birpara end and line tripped from Bhutan end only.			YES	YES	PG ER-II	BHUTAN
4	220KV-PANDIABILI-PRATAPSASAN-1	24-11-2025	14:56	24-11-2025	19:53	Tripped with 86 master trip relay from Pratapsasan end only, and no other relay indication		No Fault	NA	Master trip relay operated at Pratapsasan end. OPTCL may explain.			NA	NO	PG ODISHA	OPTCL
5	400KV-KHSTPP-BARH-2	23-11-2025	21:08	24-11-2025	00:55	KHSTPP :Z2, R PH, FC-2.94 KA, FD-182 KM ,	A/r successful in second attempt.	R-Earth	80 msec	R phase to ground fault occurred in Kahalgaon Barh line 2 and from Kahalgaon end three phase tripping and from Barh end A/r successful in second attempt.			NO	YES	NTPC	NTPC
6	400KV-FSTPP-KHSTPP-1	23-11-2025	21:08	24-11-2025	01:00	Not Tripped	Main Bay was under S/D	No Fault	NA	Line tripped due to tripping of Barh line 2 at Kahalgaon end(Main bay of Farakka line 1 was under S/D at Kahalgaon end)			NA	NO	NTPC	NTPC

7	400KV- MEDINIPUR- KHARAGPUR- 1	22-11-2025	14:58	23-11-2025	02:21	Medinipur end: Y-N , fd-20.15 km, fe-6.815 kA		Y-Earth	100 msec	Three phase tripping for multiple phase to ground fault within 500 msec.			YES	YES	PMTL	WBSE TCL
8	220KV- CHUKHA- BIRPARA-1	20-11-2025	12:25	20-11-2025	13:01	Chukha: R-N , Zone- 2 , FD- 70.2km, Ir= 1.054.6 kA	A/r successful from Birpara end. R-Earth, FC-11.4 kA	R-Earth	350 msec	Line tripped in Z-2 protection from Chukha end only and A/r successful from Birpara end.			YES	YES	BHUT AN	PG ER- II
9	400KV- BINAGURI- MALBASE-1	19-11-2025	10:43	19-11-2025	12:16	Binaguri end: Z-3, BN fault, 2.07 kA, 100 % distance,		B-Earth	800 msec	Line tripped from PG end in Z-3 protection due to fault in Bhutan Network which was not cleared from Bhutan end.			YES	NO	PG ER- II	BHUT AN
10	220KV- BIRPARA- MALBASE-1	19-11-2025	10:43	19-11-2025	12:22	Birpara end: BN fault, Z-3, 99.06 km, 1.3 kA,		B-Earth	800 msec					YES	NO	PG ER- II
11	400KV- KODERMA- BOKARO-1	18-11-2025	12:02	18-11-2025	13:52	-	Bokaro: B-Phase to Earth fault, Zone1, Fault Location- 45.58km.	B-Earth	100 msec	Three phase tripping for phase to ground .(A/r was under Off condition)			NO	NO	DVC	DVC
12	400KV- PATNA- BAKHTIYAR- UR(BH)-2	14-11-2025	11:37	14-11-2025	12:44	Did not trip	DT received in channel-2	No Fault	NA	Spurious tripping due to DT received at Bihar end. BSPTCL may explain.			YES	NO	PG ER- I	BSPT CL
13	220KV- BUDHIPADA R-KORBA-3	13-11-2025	12:59	13-11-2025	20:52	DT Received at Budhipadar end	-	No Fault	NA	Line tripped due to DT received at Budhipadar end			NO	NO	OPTCL	PG WR
14	220KV- CHANDIL- STPS(WBPDC L)-1	13-11-2025	11:51	13-11-2025	12:49	Spurious DT Recieved		No Fault	NA	Line tripped due to spurious DT received. WBPDC and JUSNL may explain.			NO	NO	JUSNL	WBPDC CL

15	220KV- BUDHIPADA R-KORBA-2	13-11-2025	00:06	13-11-2025	04:15	Bus bar protection Operated at Budhipadar end				Restored. Bus bar operated during charging attempt of 220 kV Budhipadar- SMC linewhich was under faulty condition. After patrolling charging					OPTCL	PG WR
16	400KV- JEERAT- BAKRESWAR- 1	11-11-2025	10:18	11-11-2025	10:51	At Jeerat end only with R/I DT Received, 86	Not Tripped	No Fault	NA	Line tripped on DT received at Jeerat end. WBPDCCL may explain.			YES	NO	WBSE TCL	WBPDC CL
17	400KV- KISHANGANJ- RANGPO-2	08-11-2025	14:16	08-11-2025	17:40	Kishangang13.971k m, Y-11.98, B-11.82	Rangpo:Y-B Fault , Rangpo: 154.14 KM , 3.68 KA ..	Y-B	100 msec	Line tripped in phase to phase fault.			YES	YES	PG ER- I	PG ER- II
18	400KV- BIHARSARIFF (PG)- BANKA(PG)-1	07-11-2025	10:56	07-11-2025	11:33	R/I at Banka: B-N. Fault distance- 44.69km f current- 6.05kA	Biharsariff: B_N, F dist 157.6 km, F Current 2.34 kA	B-Earth	100 msec	A/r failed after 1 sec.			YES	YES	PG ER- I	PG ER- I
19	400KV-PPSP- BIDHANNAG AR-1	07-11-2025	00:30	07-11-2025	06:43	Dgp 400 KV SS:- Y Ph, Z 1, 121.9 KM, 2.75 KA.	PPSP :- Z1, Y Ph, 55.7 KM	Y-Earth	100 msec	Three phase tripping for phase to ground fault.			NO	YES	WBSE DCL	WBSE TCL
20	400KV- BINAGURI- TALA-2	06-11-2025	20:52	06-11-2025	21:50	DT Received at Binaguri end.	Not Tripped	No Fault	NA	DT received at Binaguri end.			YES	NO	PG ER- II	BHUT AN
21	765KV- JHARSUGUD A- DHARAMJAI GARH-4	03-11-2025	13:15	03-11-2025	17:51	Jharsuguda: Y-N fault, FC-9.03 kA, FD- 68.8km;	Dharamjaygarh: Y- N, FD – 82.6 km, FC – 9.3 kA	Y-Earth	100 msec	A/r failed after 1 sec.			NO	NO	PG ODISH A	PG WR

22	400KV-MOTIHARI-BARH-2	03-11-2025	10:26	03-11-2025	11:55	Spurious Tripping during Bus bar testing at DMTCL end.	DT received at NTPC Barh	No Fault	NA	400KV Tie breaker tripped at DMTCL end and DT send to Barh end during the protection check of 400KV Busbar relay at DMTCL end. DMTCL may explain.			YES	YES	DMTCL	NTPC
23	220KV-PATNA-FATUHA-1	03-11-2025	08:05	03-11-2025	10:03	R-Y-B-Earth, Z-2	Zone 4, 1.644km, 4.825kA, R-Y-B-Earth	R-Y-B-Earth	350 msec	Line tripped in Z-2 protection from Patna end and in Z-4 protection from Fatuha end due to B phase CT Of 220kv side of 100 MVA ICT-3 bursted at GSS fatuha.			YES	YES	PG ER-I	BSPTCL
24	220KV-NEW PURNEA-MADHEPURA-2	03-11-2025	04:57	03-11-2025	16:08	New Purnea: Y_B , Y - 4.1 KA , B - 3.97 KA , 52 KM	Y-B, Z-1	Y-B	100 msec	Line tripped in phase to phase fault.	DR Length needs to be increased to 3 sec.		YES	NO	PG ER-I	BSPTCL
25	220KV-MAITHON(PG)-DUMKA-1	02-11-2025	10:27	02-11-2025	10:54	Tripped from Maithon end only:B-N fault, 61.84km, 2.87 kA.	A/r successful from Dumka end.	B-Earth	350 msec	A/r successful from Dumka end and three phase tripping from Maithon end in Z-2 protection. PG ER-2 and JUSNL may explain.			NO	YES	PG ER-II	JUSNL

## List of important transmission lines in ER which tripped in December-2025

Sl. No.	LINE NAME	TRIP DATE	TRIP TIME	RESTORATION DATE	RESTORATION TIME	Relay Indication  LOCAL END	Relay Indication  REMOTE END	Reason	Fault Clearance time in msec	Remarks	DR Configuration Discrepancy (Local End)	DR Configuration Discrepancy (Remote End)	DR/EL RECEIVED FROM LOCAL END	DR/EL RECEIVED FROM REMOTE END	LOCAL END UTILITY	REMOTE END UTILITY
1	400KV-FSTPP-KHSTPP-2	30-12-2025	22:49	31-12-2025	00:51	Tripped from Farakka end only. Relay details : BN fault, 237 km, 2 kA,	Not Tripped	No Fault	NA	As per PMU no fault was observed. Line tripped from Farakka end only. NTPC Farakka may explain.			NO	NO	NTPC	NTPC
2	400KV-JEERAT-BAKRESWAR-1	30-12-2025	13:12	30-12-2025	18:15	Jeerat:- Y Ph, Z-1, Dist:- 90.70 KM, Ib:- 4.27 KA	Bakreswar:- Y Ph, Z-1, Dist:- 66.8 KM, Ib:- 3.312 KA.	Y-Earth	100 msec	A/r failed after 1 sec.			YES	YES	WBSETCL	WSETCL
3	220KV-KHAGARIA-NEW PURNEA-1	29-12-2025	13:07	29-12-2025	13:42	Purnea end relay: RY fault, Ir-4.84 kA, Iy 4.94 kA, 38.6 km.	Khagria end relay: R ph Y ph, Zone-1, Distance - 59.1km, Ir-3.104kA, Iy-3.014kA	R-Y	100 msec	Line tripped on phase to phase fault.			YES	NO	BSPTCL	PGER-I
4	400KV-BINAGURI-TALA-2	29-12-2025	11:07	29-12-2025	13:11	Not Tripped	Tripped from Tala end only	No Fault	NA	As per PMU no fault was observed and line tripped from Bhutan end only.			YES	NO	PGER-II	BHUTAN

5	220KV-CHAIBASA(PG)-CHAIBASA(JUSNL)-1	29-12-2025	10:42	29-12-2025	11:43	DT received at PG end.	Chaibase (JUSNL) :E/F Operated, DT send,	No Fault	NA	As per PMU no fault was observed and line tripped from JUSNL end due to E/F operation and DT send to PG end.			YES	NO	PG ER-I	JUSNL
6	220KV-MUZAFFARPUR-HAJIPUR-2	28-12-2025	14:10	30-12-2025	18:02	Hajipur: R-Y, IR-8.6kA, IY-8.8kA, 4km	Muzaffarpur : 45.02 KM , IR-3.94 KA IY-3.95 KA	R-Y	100 msec	Line tripped on phase to phase fault.			YES	YES	PG ER-I	BSPTCL
7	400KV-BARH-MOTIHARI-1	27-12-2025	19:13	28-12-2025	14:09	BARH end relay: Z-1, R-ph,23.38kA, 7.68kM,SOTF.	Motihari end relay: RB fault, 1.82 kA, 208.9 km	R-B	100 msec	Line tripped on phase to phase fault from Motihari end and from Barh end only R pole got tripped, further after 1 sec, A/r failed and three phase got tripped.			YES	YES	NTPC	DMTCL
8	220KV-SAHARSA(PMTL)-BEGUSARAI-1	27-12-2025	18:06	27-12-2025	21:58	Tripped in Z-3 from Saharsa end	-	R-Earth	800 msec	220KV-SAHARSA(PMTL)-BEGUSARAI-1 & 2 tripped from Saharsa end in Z-3 protection due to fault conductor snapped in 132 kV Samastipur line which was not cleared from remote end. BSPTCL may explain.			YES	NA	PMTL	BSPTCL
9	220KV-SAHARSA(PMTL)-BEGUSARAI-2	27-12-2025	18:06	27-12-2025	21:59	Tripped in Z-3 from Saharsa end	-	R-Earth							YES	NA
10	220KV-DALKHOLA (WB)-DALKHOLA (PG)-1	26-12-2025	18:42	26-12-2025	19:23	Tripped from Dalkhola (WB) end only	-	B-Earth	100 msec	As per PMU B-Earth fault observed and three phase tripping from WB end. WB may explain.	DR length needs to be increased to 3 sec.		YES	NO	WBSETCL	PG ER-II

11	400KV-PPSP-BIDHANNAGAR-1	25-12-2025	00:59	25-12-2025	17:32	Z-1, Y-Earth,	Z-1, Y-Earth, FC-14.4 kA	Y-Earth	100 msec	Three phase tripping for phase to ground fault.			NO	YES	WBSEDC L	WBS ETCL
12	400KV-BIHARSARIFF(PG)-BALIA-2	23-12-2025	02:02	23-12-2025	06:41	BH: R-N, FC-2.59KA.,FD-175KM	-	R-Earth	100 msec	A/r failed after 1 sec.			YES	NO	PG ER-I	PG NR
13	765KV-GAYA-BALIA-1	23-12-2025	02:01	23-12-2025	03:24	Gaya: R-Ph, 128.019km,4.96 kA ;	Balia end relay details: FD- 103.8 Km, FC- 5.5 kA, Z-1, R-G fault	R-Earth	100 msec	Line tripped in reclaim time.			YES	NO	PG ER-I	PG NR
14	220KV-BINAGURI-BIRPARA-2	18-12-2025	15:22	19-12-2025	05:02	Binaguri end: R N fault, 5.17 kA, 29.7 km	Birpara: R-N fault3.24 kA, 47.7 km.	R-Earth	100 msec	A/r failed after 1 sec.			YES	YES	PG ER-II	PG ER-II
15	400KV-BARH-PATNA-3	18-12-2025	07:09	18-12-2025	20:41	Barh : Y-N-29kA, B-N-1.74kA, 2.85 KM	Patna : M1: FD-68.18KM, FC-8.7KA	Y-Earth	100 msec	A/r failed after 1 sec from Patna end and no A/r attempted from Barh after dead time , further after 2.5 sec line tripped			YES	NO	NTPC	PG ER-I
16	400KV-PUSAULI(PG)-DALTONGANJ-2	18-12-2025	04:55	18-12-2025	16:30	Sasaram: 24.4 KM 8.2KA Y ph.	Daltonganj: Y Phase to Ground, Fault FAULT CURRENT: 1.878 kA,	Y-Earth	100 msec	As per PMU A/r failed after 1 sec.			NO	NO	PG ER-I	PG ER-I
17	400KV-PUSAULI(PG)-ALLAHABAD-1	18-12-2025	00:31	19-12-2025	11:02	Sasaram- Y-N ,FD- 12.84KM, FC- 2.81KA,	-	Y-Earth	100 msec	As per PMU A/r failed after 1 sec.			NO	NO	PG ER-I	PG NR

18	400KV-BIHARSARIF(PG)-SAHUPURI(CHANDLAUL)-1	17-12-2025	23:11	18-12-2025	01:58	Bliharsarif end R ph to ground, FD-226.2km , FC-1.932KA. A/R Successfull	Sahupuri end: R- N ,FD 1.50KM IR 12.66KA	R-Earth	100 msec	A/r successful from Biharsariff end and three phase tripping from Sahupuri end.			YES	NO	PG ER-I	NR
19	220KV-BUDHIPADAR-KORBA-3	17-12-2025	15:38	17-12-2025	17:23	Budhipadar: B_N, Zone-4, -2.714 km, 1.233 kA	-	B-Earth	250 msec	Line tripped in Z-4 protection due to bus fault at Budhipadar S/s.			NO	NO	OPTCL	WR
20	220KV-MAITHON-DHANBAD-2	17-12-2025	10:42	17-12-2025	11:23	R/I at Dhanbad: B ph Z1, Fault dist - 4.5km, Fault current : 6.15 kA	Maithon end: A/R successfully operated, B_N, Fault Current 1.994kA, FD	B-Earth	100 msec	A/r successful from Maithon end and three phase tripping from Dhanbad end. DVC may explain.			YES	NO	PG ER-I	DVC
21	400KV-DURGAPUR-KAHALGAON-1	17-12-2025	09:08	17-12-2025	11:45	Tripped from Durgapur end only due to DT received.	Not Tripped	No Fault	NA	As per PMU no fault was observed. Line tripped from Durgapur end due to DT received. PG ER-2 and NTPC Kahalgaon may			NO	NO	PG ER-II	NTPC
22	220KV-CHANDIL-STPS(WBPDCL)-1	17-12-2025	00:38	17-12-2025	01:05	Chandil: R-N , Ir 1.95kA, Z 1, Distance 76.5km	Santaldih : A/R successful	R-Earth	280 msec	A/r successful from Santaldih end and line tripped from Chandil end. JUSNL may explain.			NO	NO	JUSNL	WBP DCL
23	220KV-BINAGURI-BIRPARA-2	16-12-2025	10:03	16-12-2025	21:37	Binaguri end Y_N FC= NA, FD=18.90KM,	R/I at Birpara end Y_N, FC= 2.02KA, FD=60.2KM	Y-Earth	100 msec	A/r failed after 1 sec.			YES	YES	PG ER-II	PG ER-II
24	400KV-DURGAPUR-KHSTPP-2	15-12-2025	11:45	15-12-2025	18:51	DT received at PG end.	Not Tripped	No Fault	NA	DT received at Durgapur end. NTPC Kahalgaon may explain.			NO	NA	PG ER-II	NTPC

25	220KV-KHAGARIA-NEW PURNEA-2	11-12-2025	06:10	11-12-2025	06:55	New purnea: R-Y, IR 2.89 kA IY 2.87 kA, 51 km.	Khagaria: Distance Protection Relay Main-2, R ph Y ph, Zone-1, Distance -	R-Y	100 msec	Line tripped on phase to phase fault.			YES	YES	BSPTCL	PG ER-I
26	400KV-GOKARNA-NEW PURNEA-1	07-12-2025	14:38	07-12-2025	15:40	R/I at Gokarna end: Z2, R_B, Fault Current: Ir: 2.69 kA & Ib : 2.84 kA, Fault location:	Purnea.: R_B, FC Ir 11.66 kA, Ib 11.54 kA, FD 35 km	R-B	100 msec	Line tripped on phase to phase fault.			YES	YES	WBSETCL	PG ER-I
27	400KV-NAUBATPUR(BH)-BALIA-2	06-12-2025	14:54	06-12-2025	16:58	Naubatpur: Did not trip	Balia: R-N fault, M1: FD=57.3 KM, FC=5.8KA, M2:- FD=59km	R-Earth	100 msec	Line tripped from Balia end only.			NO	NO	BGCL	PG NR
28	400KV-PATNA-BALIA-3	06-12-2025	14:53	06-12-2025	17:07	Patna: B_N, FD: 82.1 km, FC: 5.72 kA	-	B-Earth	100 msec	A/r failed after 1 sec.			YES	NO	PG ER-I	PG NR
29	400KV-PUSAULI(PG)-ALLAHABAD-1	05-12-2025	23:49	06-12-2025	03:01	Causing operation of reactor LBB relay	DT received	No Fault	NA	Due to L/R LBB operation and DT send to remote end.			YES	NO	PG ER-I	PG NR
30	220KV-MUZAFFARPUR(PG)-HAZIPUR-2	04-12-2025	12:13	04-12-2025	13:39	-	Relay Details at GSS Hajipur(New) end: RN fault, 4.945 KA, Z-1	R-Earth	100 msec	A/r successful from Hazipur end and line tripped from Muzaffarpur end only. PG ER-I may explain.			NO	YES	PG ER-I	BSPTCL
31	400KV-MAITHON-DURGAPUR-1	04-12-2025	12:13	04-12-2025	13:45	YB 46.9 km, 7.04 kA, 6.95 kA.	YB , 20km, 7.08 kA, 7.18 kA.	Y-B	100 msec	Line tripped on phase to phase fault.			YES	YES	PG ER-II	PG ER-II

32	400KV-NEW PURNEA- MUZAFFARPUR- 1	03-12-2025	12:23	03-12-2025	17:06	R_N Fault; Muzaffarpur: FC-4.6 KA, FD-84.4 KM;	New Purnea: FC-2.12 KA, FD-20.3 KM	R-Earth	100 msec	A/r failed after 1 sec.			YES	YES	PG ER-I	PG ER-I
33	400KV- DURGAPUR- SAGARDIGHI-2	03-12-2025	10:10	04-12-2025	18:59	Tripped on Over voltage	-	No Fault	NA	Line tripped on over voltage. R phase voltage showing abnormally high as compare to other two phase. PG ER-			YES	NA	PG ER-II	WBS ETCL
34	765KV-GAYA- BALIA-1	01-12-2025	14:20	01-12-2025	17:09	Gaya: Y-B, 220km, It 3.93 kA IB 3.65 kA	Balia: M1- FD=14.12k m, FC- Iy=12.14KA ,Ib=12.39K A, M2:- FD=14.1km.	Y-B	100 msec	Line tripped on phase to phase fault.			YES	NO	PG ER-I	PG NR
35	400KV- GORAKHPUR- MOTIHARI-1	01-12-2025	09:21	01-12-2025	15:18	R/I Motihari : R_B, F Current Ir 3.80 kA, Ib 3.93 kA, FD 121.0km		R-B	100 msec	Line tripped on phase to phase fault.			NO	YES	PG NR	DMT CL

Month	Novemeber
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Date	Line tripping	Cause of Tripping	Tripping Analysis	Correct Operations at NTPC Barh (Nc)	Failed operations at NTPC Barh(Nf)	Number of Unwanted Operation (Nu)	Number of incorrect operations (Ni= Nf+Nu)
03.11.2025	400 kV Barh-Motihari Line 2	Direct Trip (DT) signal received from remote end	At NTPC Barh end, 400 kV Barh-Motihari circuit 2 received DT signal from remote (Motihari) end. On communication with Motihari substation, it was known that bus fault had taken place at remote end substation leading to transmission of direct trip signal. At Barh end, both main and tie breakers tripped as per envisaged protection scheme.	1	0	0	0
23.11.2025	400 kV Barh-Kahalgaon Line 2	Single Phase to ground fault (R-N)	400 kV Barh-Kahalgaon Line 2 initially encountered single phase, R-N transient fault. Fault distance: 46.3 kms, Fault current: 10kA as recorded at NTPC Barh event log. At NTPC Barh end , successful auto-reclore took place and line was under idle charged condition.	1	0	0	0

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

*Chatterjee* 11/2/25  
 Signature of Area Engineer

*Kanishka Ranjan*  
 Signature of Area In-charge

पराग चटर्जी/Parag Chatterjee  
 सिनियर प्रबंधक (प्र. एवं अनु./वि.अनु. विभाग)  
 Sr. Manager (O&M/EMD)  
 नैतिक वि. बाह/NTPC Ltd., Barh

कनिष्का रंजन / KANISHKA RANJAN  
 उप महाप्रबंधक (प्र. एवं अनु./विद्युत अनुरक्षण विभाग)  
 Dy. General Manager (O&M/EMD)  
 नैतिक वि. बाह /NTPC Ltd., Barh

Protection Performance Indices for the month-Nov-2025 - NTPC Kahalgaon

SL No.	Name of ELEMENT	Tripping Date	Tripping Time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc		Nu		Nf		Dependability Index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf))	Remark/Reason for performance indices less	Analysis for the event
						End A	End B	End A	End B	End A	End B	End A	End B					
1	Kh- Barh Line - 2 Main & Tie bay (3352, 3252), Kh-Farakka Line - 1	23.11.2025	1:55	24.11.2025	0:55	ZONE - 2		0		1		1		0	0	0		ZONE - 2, R - ph, Fault current 2.94 kA, Distance 182 Km, A/R unsuccessful. Kh-Farakka Line - 1 was charged only through Tie bay, since main bay uprating work is in progress due to tripping of tie bay, Kh Fkk Line - 1 also tripped.

Nc	Number of correct operation at internal power system Faults
Nf	Number of failures to operate at internal power system Faults
Nu	Number of unwanted operations

Prepared By

By

  
**जी. भास्कर / G. BASKAR**  
 अवर मरिटेड (ग्रिडिंग) इंजीनियर / AGM (O&M/E.M.U.)  
 एनटीपीसी लिमिटेड / NTPC Limited  
 कहलगाँव, भागलपुर / Kahalgaon, Bhagalpur

## Performance Indices of Darlipali STPP for Nov'25

Index. No.	Number of correct operations at internal power system faults( Nc)	Number of failures to operate at internal power system faults(Nf)	The Dependability Index( $D=Nc/(Nc+Nf)$ )
1	1	0	1

Index. No.	Number of correct operations at internal power system faults( Nc)	Number of unwanted operations (Nu)	The Security Index( $S=Nc/(Nc+Nu)$ )
2	1	0	1

Index. No.	Number of correct operations at internal power system faults( Nc)	Number of incorrect operations ( $Ni=Nf+Nu$ )	The Reliability Index ( $R=Nc/(Nc+Ni)$ )
3	1	0	1

**NOTE for reference of deciding parameters:**

- 1) Nc = The number of correct operation of switchyard breakers (220kV and above) on protection to be counted i.e if the breaker has operated correctly on internal protection operation**
- 2) Nf = The number of failure of switchyard breaker (220kV and above) to operate on its protection to be counted i.e if the breaker has not operated on internal protection operation (includes LBB operation etc)**
- 3) Nu = The number of unwanted operation of switchyard breaker (220kV and above) without its own protection operation to be counted i.e if the breaker has opened without operation of its protection leading to tripping of other breaker or grid connected equipments**

BSPTCL

Protection Performance Indices for the month of November'25																	
S. No.	Name of the element	Tripping Date	Tripping time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc		Nu		Nf		Dependability index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf))	Remarks (/Rectification)
						End A	End B	End A	End B	End A	End B	End A	End B				
1	400KV-PATNA-BAKHTIYARPUR(BH)-2	14-11-2025	11:37	14-11-2025	12:44		Bakhtiyarpur-DT received in channel-2		0		1		0	0	0	0	Due to issue in PLCC at PG end. Problem attended and resolved by the Telecom Team.
2	220KV-PATNA-FATUHA-1	03-11-2025	08:05	03-11-2025	10:03		Fatuha-Zone 4, 1.644km, 4.825kA, R-Y-B-Earth		1		0		0	1	1	1	
3	220KV-NEW PURNEA-MADHEPURA-2	03-11-2025	04:57	03-11-2025	16:08	New Purnea: Y_B, Y - 4.1 KA, B - 3.97 KA, 52 KM	Madhepura-Y-B, Z-1	1	1	0	0	0	0	1	1	1	

# JUSNL

Protection Performance Indices for the month of November' 25 (In compliance of Clause 15(6) of IEGC 2023)																	
S. No.	Name of the element	Tripping Date	Tripping Time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc		Nu		Nf		Dependability index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf))	Remarks (Reason for performance indices less than 1)
						End A	End B	End A	End B	End A	End B	End A	End B				
1	220 KV DUMKA - MAITHON(PG) - 1	02-11-2025	10:27	02-11-2025	10:54	BN, Z1, IB - 2.20 kA, AR successful		1		0		0		1	1	1	
2	220 KV CHANDIL - STPS (WBPDCL) -1	13-11-2025	11:51	13-11-2025	12:49	Mal operated due to issue in DC supply		1		1		0		1	0.5	0.5	Mal operated due to issue in DC supply
3	220 KV Govindpur-TTPS -2	13-04-2025	10:25	13-04-2025		BN, Z1, 56.85 km, IB - 1.30 kA, 3ph tripping		1		1		0		1	0.5	0.5	DTPC is unhealthy



# OPTCL

PROTECTION PERFORMANCE INDICES AS PER TRIPPING LIST OF 154TH PCC MEETING AGENDA FOR THE MONTH OF NOVEMBER 2025 FOR OPTCL ,SLDC,ODISHA

SL.NO	NAME OF THE ELEMENT	TRIPPING DATE	TRIPPING TIME	RESTORATION DATE	RESTORATION TIME	REASON(RELAX INDICATION)		NC		NU		NF		DEPENDABILITY INDEX (NC/NC+NF)	SECURITY INDEX (NC/NC+NU)	RELIABILITY INDEX(NC/NC+NU+NF)	REMARKS
						END-A	END-B	END-A	END-B	END-A	END-B	END-A	END-B				
1	220KV-PANDIABIL-PRATAPSASAN-1	24-11-2025	14:56	24-11-2025	19:53	NO TRIP	Master trip relay 86 oprated from Pratapsasan end	0	1	0	1	0	1	END A=0 ,END B=1/2	END A=0 ,END B=1/2	END A=1 ,END B=1/3	No Fault Master trip relay 86 oprated from Pratapsasan end
2	220KV-BUDHIPADAR-KORBA-3	13-11-2025	12:59	13-11-2025	20:52	DT Received at Budhipadar	NO TRIP	1	0	1	0	1	0	END A=1/2,END B=0	END A=1/2,END B=0	END A=1/3,END B=0	No Fault.Line tripped due to DT received at Budhipadar end
3	220KV-BUDHIPADAR-KORBA-2	13-11-2025	00:06	13-11-2025	04:15	Bus bar protection Operated at Budhipadar	NO TRIP	1	0	0	0	0	0	END A=1 ,END B=0	END A=1 ,END B=0	END A=1 ,END B=0	Bus bar operated during charging attempt of 220 kV Budhipadar-SMC linewhich was under faulty condition

PG ER-1

Protection Performance Indices for the month of Nov'25 (In compliance of Clause 15(6) of IEGC 2023)																	
S. No.	Name of the element	Tripping Date	Tripping Time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc		Nu		Nf		Dependability index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf))	Remarks (Reason for performance indices less than 1)
						End A	End B	End A	End B	End A	End B						
1	132KVARA-DUMRAON(BSPTCL)-1	17-11-2025	19:18:00	17-11-2025	20:30:00	TRIPPED FROM BOTH ENDS DUE TO Y-N FAULT. ARA(SITE)-FD-11.57KM FC- 4.6kA. FAULT IS UNDER BSPTCL JURISDICTION	Other Utility	1	NA	0	NA	0	NA	1	1	1	
2	132KVARA-DUMRAON(BSPTCL)-1	01-11-2025	05:26:00	01-11-2025	06:25:00	TRIPPED FROM BOTH ENDS DUE TO Y-N FAULT ARA(AFAS):M1-FD-11.723km, FC-4816KA FAULT IS UNDER BSPTCL JURISDICTION	Other Utility	1	NA	0	NA	0	NA	1	1	1	
3	400KV BANKA BIHARSARIF-1	07-11-2025	10:56:00	07-11-2025	11:32:00	TRIPPED FROM BOTH ENDS DUE TO B-N FAULT. BANKA(SITE)-M2: FD-42.2KM FC-5.6KA FAULT OCCURED DUE TO KITE IN THE SECTION BETWEEN TOWER LOCATION NOS 176 AND 177 .		1	1	0	0	0	0	1	1	1	
4	400KV FARAKKA(NTPC)-KAHALGAON(NTPC)-1	23-11-2025	21:08:00	24-11-2025	01:00:00	TRIPPED FROM KAHALGAON END ONLY DUE TO PROBLEM AT NTPC END. FAULT IS UNDER NTPC KAHALGAON JURISDICTION.		NA	NA	NA	NA	NA	NA	NA	NA	NA	
5	400KV KAHALGAON(NTPC)-BANKA-2	01-11-2025	00:00:00	01-11-2025	18:00:00	Other Utility	TRIPPED FROM BOTH ENDS DUE TO DT RECEIVED AT BANKA END. AS REPORTED BY NTPC KAHALGAON, TEED RELAY OPERATED AT KAHALGAON END. FAULT	NA	1	NA	0	NA	0	1	1	1	
6	400KV KAHALGAON(NTPC)-BARH(NTPC)-2	23-11-2025	21:08:00	24-11-2025	00:55:00	A/R SUCCESSFUL FROM BARH END BUT TRIPPED FROM KAHALGAON END DUE TO R-N FAULT DUE TO PROBLEM AT NTPC END. BARH: M1-FD-46.3KM, FC-10KA. FAULT IS UNDER NTPC KAHALGAON JURISDICTION.		NA	NA	NA	NA	NA	NA	NA	NA	NA	
7	400KV KODERMA(DVC)-BOKARO(JBVNL)-1	18-11-2025	12:02:00	18-11-2025	13:52:00	TRIPPED FROM BOTH ENDS DUE TO B-N FAULT DUE TO LOCALIZED CYCLONE AROUND FAULT AREA. KODERMA SITE DETAIL:- M1: FD- 44.90KM, FC- 6.50KA.		NA	NA	NA	NA	NA	NA	NA	NA	NA	
8	400KV MOTIHARI(DMTCL)-GORAKHPUR-1	18-11-2025	17:20:00	18-11-2025	17:20:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO R-N FAULT. LIGHTENING AND THUNDERSTORM REPORTED NEAR FAULT AREA. MOTIHARI(SITE)-FD-136.8KM FC-2.33KA GKP-(SITE)- M1: FD-36.32KA FC-7.29KA M2: FD-35.8KA FC-7.32KA BROKEN INSULATOR AT LOC. 923		NA	NA	NA	NA	NA	NA	NA	NA	NA	
9	400KV MOTIHARI(DMTCL)-GORAKHPUR-2	06-11-2025	13:39:00	06-11-2025	13:39:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO B-N FAULT MOTIHARI:M1-34.4KM, FC-4.93KA. FAULT IS UNDER DMTCL JURISDICTION.		NA	NA	NA	NA	NA	NA	NA	NA	NA	
10	400KV MOTIHARI(DMTCL)-GORAKHPUR-2	06-11-2025	12:33:00	06-11-2025	12:33:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO B-N FAULT MOTIHARI:M2-33.20KM, FC-6.101KA. FAULT IS UNDER DMTCL JURISDICTION.		NA	NA	NA	NA	NA	NA	NA	NA	NA	
11	400KV PATNA-BAKHTIYARPUR-2	14-11-2025	11:37:00	14-11-2025	12:44:00	TRIPPED ONLY FROM BAKHTIYARPUR END DUE TO MALFUNCTION OF PLCC AT BAKHTIYARPUR END. FAULT IS UNDER BSPTCL JURISDICTION.	Other Utility	1	NA	0	NA	0	NA	1	1	1	

PG ER-2

List of important transmission lines in ER which tripped in November-2025					END-A						END-B					
Sl. No.	LINE NAME	TRIP DATE	TRIP TIME	UTILITY RESPONSE	Nc	Nu	Nf	Dependability Index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf))	Nc	Nu	Nf	Dependability Index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf))
1	400KV-ALIPURDUAR (PG)-BONGAAGAON-1	26-11-2025	12:53	Ph-Ph fault occurred in line. Hence, 3 phase trip happened. Protection operated properly at PG ER-II end.	1			1	1	1	NA					
2	220KV-BIRPARA-MALBASE-1	25-11-2025	15:35	Protection system operated properly at PG ER-II end.	1			1	1	1	NA					
3	220KV-CHUKHA-BIRPARA-1	20-11-2025	12:25	Protection system operated properly at PG ER-II end.	NA						1			1	1	1
4	400KV-BINAGURI-MALBASE-1	19-11-2025	10:43	Fault was in Bhutan system beyond line length & it was not cleared timely. As a back-up, Z3 operated from Binaguri end. Protection operated properly at PG ER-II end.	1			1	1	1	NA					
5	220KV-BIRPARA-MALBASE-1	19-11-2025	10:43	Fault was in Bhutan system beyond line length & it was not cleared timely. As a back-up, Z3 operated from Birpara end. Protection operated properly at PG ER-II end.	1			1	1	1	NA					
6	400KV-KISHANGANJ-RANGPO-2	08-11-2025	14:16	Ph-Ph fault occurred in line. Hence, 3 phase trip happened. Protection operated properly at PG ER-II end.	NA						1			1	1	1
7	400KV-BINAGURI-TALA-2	06-11-2025	20:52	No fault was observed in line. DT was received at Binaguri end. Hence, 3 phase trip happened. Protection operated properly at PG ER-II end.	1			1	1	1	NA					
8	220KV-MATHON(PG)-DUMKA-1	02-11-2025	10:27	Fault was single phase type & detected in Z2 from Mathon end. However, carrier was not received from remote end. Hence, time delayed (at T2) 3 phase trip happened at Mathon SS. PLCC owned by JUSNL. Protection operated properly at PG ER-II end.	1			1	1	1	NA					

# APNRL

ADHUNIK POWER AND NATURAL RESOURCES LIMITED 2 X 270 MW																		
Protection Performance Indices for the November' 2025 (In compliance of Clause 15(6) of IEGC 2023)																		
Sl.No	Name of the element	Tripping Date	Tripping Time	Restoration Date	Restoration on Time	Reason (Relay indication)		Nc		Nu		Nf		Dependability (Nc/(Nc+Nf))	Security Index (Nc/Nc+Nu)	Reliability Index (Nc/Nc+Nu+Nf)	Remarks (Reason for performance indices less than 1)	Analysis of the Event
						End A	End B	End A	End B	End A	End B	End A	End B					
1	--																Adhunik Line-1 & Line-2 not operated.	
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.																		



ENICL, OGPTL, PKTCL

Protection Performance Indices for the month of November-25 (In compliance of Clause 15(6) of IEGC 2023)																		
S. No.	Name of Utility	Name of the element	Tripping Date	Tripping Time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc		Nu		Nf		Dependability Index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf))	Remarks (Reason for performance indices less than 1)
							End A	End B	End A	End B	End A	End B	End A	End B				
1	EAST NORTH INTERCONNECTION LIMITED	400 kv (Quad ) D/C Bongaigaon - Alipurduar line CKT- 1(BNG- ALIP #1)	26-11-2025	12:53:00	26-11-2025	15:32:00	M1-FD-57.52 KM, FC-6 KA M2-FD-58.34 KM, FC-6 KA	M1-FD-37.5 KM, FC-8.08 KA M2-FD-39.2 KM, FC-8.2 KA	1.00	1.00	-	-	-	-	-NA-	1	1	Tripped due to R-phase to B- phase fault
		400 kv (Quad ) D/C Bongaigaon - Alipurduar line CKT- 2(BNG- ALIP #2)								-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of November'25
		400 kv (Quad) D/C Purnia-Biharshrif Line CKT-1 (NPRN-BSF#1)								-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of November'25
		400 kv (Quad) D/C Purnia-Biharshrif Line CKT-2( NPRN- BSF# 2)								-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of November'25
		400 kv (Quad ) D/C Alipurduar - Siliguri line CKT- 1(ALIP- SLG #1)								-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of November'25
		400 kv (Quad ) D/C Alipurduar - Siliguri line CKT- 2(ALIP- SLG #2)								-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of November'25
2	ODISHA GENERATION PHASE - II LIMITED	765kV D/C Jharsuguda(Sundargarh)-Raipur pool CKT-1							-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of November'25	
		765kV D/C Jharsuguda(Sundargarh)-Raipur pool CKT-2							-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of November'25	
		400kV D/C IB-OPGC- Jharsuguda(Sundargarh) Ckt-1							-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of November'25	
		400kV D/C LILO POINT (T. No. - 130) - Sundargarh							-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of November'25	
		400kV D/C OPGC-LILO POINT (T. No. - 130)							-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of November'25	
3	PURULIA KHARAGPUR TRANSMISSION COMPANY LIMITED	400 kv Chaibasa-Kharagpur D/C line CKT- 1							-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of November'25	
		400 kv Chaibasa-Kharagpur D/C line CKT- 2							-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of November'25	
		400 KV,D/C New Ranchi-New Purulia Line: CKT-1							-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of November'25	
		400 KV,D/C New Ranchi-New Purulia Line: CKT-2							-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of November'25	





Month	December
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Date	Line tripping	Cause of Tripping	Tripping Analysis	Correct Operations at NTPC Barh (Nc)	Failed operations at NTPC Barh(Nf)	Number of Unwanted Operation (Nu)	Number of Incorrect operations (Ni= Nf+Nu)
12.12.2025	400 kV Barh-Patna#3	Direct Trip (DT) signal received from remote end	At NTPC Barh end, 400 kV Barh-Patna#3 received DT (Direct Trip) signal from remote (Patna) end. On communication with Patna substation, it was learnt that bus fault had taken place at remote end substation leading to transmission of direct trip signal. At Barh end, both main and tie breakers tripped as per envisaged protection scheme.	1	0	0	0
12.12.2025	400 kV Barh-Patna#4	Breakers at Barh end tripped due to sensing of R-B fault. Line remained idle charged from Patna end	In line with the above incident, distance relay at Barh end sensed phase-phase fault in Zone 3. As per envisaged logic, multiphase fault (2 ph/3 ph) along with any trip has been hooked up for 86 master trip operation. Fault current sensed was 3.9 kA in both R and B phase. I>2 DDB (Digital Data Bus) has been enabled in settings tab for displaying 'Backup overcurrent' alarm in SCADA. I>2 is set at 1.13*I rated (3390Amps). Therefore when fault current breached I>2 limit, 'Any Trip' was triggered along with multiphase fault, which led to 86 master trip operation. Relay operation happened as per logic. However since zone 3 is a time delayed protection (Td- 1 sec), breakers at Barh end should not have opened as fault was transient in nature and decayed within 50 millisecond. Logic has been modified on consultation with NTPC Engg and Grid-India	0	0	1	1
18.12.2025	400 kV Barh-Patna#3	Zone-1 Y phase fault detected. Auto reclosure attempt taken but tripped on persisting fault	Y phase, Zone -1 fault detected at Barh end with a fault current of 30 kA at a distance of 2.85 kms from Barh end. Auto reclosure attempt was taken from Barh end but tripped on persisting fault. After receiving clearance from ERLDC, line was charged from Patna end but tripped again on SOTF protection (Switch on to fault). Line patrolling was done thereafter by Powergrid and fault was rectified.	1	0	0	0
27.12.2025	400 kV Barh-Motihari#1	Zone-1 R phase fault detected. Auto reclosure attempt taken but tripped on persisting fault	R phase, Zone-1 fault detected at a distance of 13 kms from Barh end with a fault current of 23 kA. Auto reclosure attempt taken from Barh end but tripped on SOTF protection. Line patrolling was done thereafter by Powergrid and fault was rectified. After receiving clearance, line was charged from Motihari end and synchronised from Barh end.	1	0	0	0

Dependability Index $D = Nc / (Nc + Nf)$	1
Security Index $S = Nc / (Nc + Nu)$	0.75
Reliability Index $R = Nc / (Nc + Ni)$	0.75

*Chatterjee*  
 31/1/26  
 Signature of Area Engineer  
*Parag Chatterjee*

*K.R.*  
 03/01/26  
 Signature of Area In-charge  
*K. Ranjan*

## Performance Indices of Darlipali STPP for the month Dec'25

Index. No.	Number of correct operations at internal power system faults( Nc)	Number of failures to operate at internal power system faults(Nf)	The Dependability Index( $D=Nc/(Nc+Nf)$ )
1	1	0	1

Index. No.	Number of correct operations at internal power system faults( Nc)	Number of unwanted operations (Nu)	The Security Index( $S=Nc/(Nc+Nu)$ )
2	1	0	1

Index. No.	Number of correct operations at internal power system faults( Nc)	Number of incorrect operations ( $Ni=Nf+Nu$ )	The Reliability Index ( $R=Nc/(Nc+Ni)$ )
3	1	0	1

**NOTE for reference of deciding parameters:**

- 1) Nc = The number of correct operation of switchyard breakers (220kV and above) on protection to be counted i.e if the breaker has operated correctly on internal protection operation**
- 2) Nf = The number of failure of switchyard breaker (220kV and above) to operate on its protection to be counted i.e if the breaker has not operated on internal protection operation (includes LBB operation etc)**
- 3) Nu = The number of unwanted operation of switchyard breaker (220kV and above) without its own protection operation to be counted i.e if the breaker has opened without operation of its protection leading to tripping of other breaker or grid connected equipments**

Protection Performance Indices for the month of DECEMBER '25 (In compliance of Clause 15(6) of IEGC 2023)																		
Sl. No.	Name of the element	Tripping Date	Tripping Time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc		Nu		Nf		Dependability index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf))	Remarks (Reason for performance indices less than 1)	Analysis of the event
						End A	End B	End A	End B	End A	End B	End A	End B					
1	GOKARNA-NEW PURNIA #1	07.12.25	14:38:00	07.12.25	15:40:00	Zone-2,R-B-phase, CS ,CR ,3-phase Trip		1		0		0		1	1	1		
2	DURGAPUR-PPSP # 1	25.12.25	00:59:00	25.12.25	17:32:00	Zone-1,Y-phase, CS ,CR ,3-phase Trip		1		0		0		1	1	1		
3	DALKHOLA-DALKHOLA PG #1	26.12.25	18:42:00	26.12.25	19:23:00	ZCAL-TRWEI Trip		0		1		0		#	#	#	Tripped in weak infeed signal operation	
4	JEERAT-BKTPP	30.12.25	13:12:00	30.12.25	18:15:00	Zone-1,Y-phase, CS ,CR ,A/R close,A/R L/O		1		0		0		1	1	1		
5	ARAMBAG-315 MVA TR #4	31.12.25	08:43:00	31.12.25	13:58:00	Pole Discrepancy operated		0		1		0		#	#	#	CB pole discrepancy relay mal-operated, replaced.	

PG ER-2

List of important transmission lines in ER which tripped in December-2025					END-A						END-B					
Sl. No.	LINE NAME	TRIP DATE	TRIP TIME	UTILITY RESPONSE	Nc	Nu	Nf	Dependability Index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf))	Nc	Nu	Nf	Dependability Index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf))
1	400KV-BINAGURI-TALA-2	29-12-2025	11:07	Line tripped from Tala end only. No trip at Binaguri end. As no was present in line, protection operated properly at PG ER-II end.	1			1	1	1	NA					
2	220KV-DALKHOLA (WB)-DALKHOLA (PG)-1	26-12-2025	18:42	Line tripped only at WB end. No tripping at PG end. As no fault was observed in line, protection operated properly at PG ER-II end.	NA						1			1	1	1
3	220KV-BINAGURI-BIRPARA-2	18-12-2025	15:22	Line tripped due to persisting fault in line. Protection operated properly at PG ER-II end.	1			1	1	1	1			1	1	1
4	400KV-DURGAPUR-KAHALGAON-1	17-12-2025	09:08	No fault was observed in line. DT was received at Durgapur end. Hence, 3 phase trip happened. Protection operated properly at PG ER-II end.	1			1	1	1	NA					
5	220KV-BINAGURI-BIRPARA-2	16-12-2025	10:03	Line tripped due to persisting fault in line. Protection operated properly at PG ER-II end.	1			1	1	1	1			1	1	1
6	400KV-DURGAPUR-KHSTPP-2	15-12-2025	11:45	No fault was observed in line. DT was received at Durgapur end. Hence, 3 phase trip happened. Protection operated properly at PG ER-II end.	1			1	1	1	NA					
7	400KV-MAITHON-DURGAPUR-1	04-12-2025	12:13	Ph-Ph fault occurred in line. Hence, 3ph trip happened. Protection operated properly at PG ER-II end. Protection operated properly at PG ER-II end.	1			1	1	1	1			1	1	1
8	400KV-DURGAPUR-SAGARDIGHI-2	03-12-2025	10:10	There was no system overvoltage. Only M1 relay operated at Durgapur SB. VT cable for M1 relay from switchyard to CRP failed. Therefore, neutral wire got earthed at more than one point due to failure of cable and potential rises in secondary circuit.		1		#DIV/0!	0	0	NA					





# Tashiding HEP

Tashiding Hydro Electric Project 2 X 48.5 MW																		
Protection Performance Indices for the DECEMBER -2025 (In compliance of Clause 15(6) of IEGC 2023)																		
Sl. No.	Name of the element	Tripping Date	Tripping Time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc		Nu		Nf		Dependability index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf))	Remarks (Reason for performance indices less than 1)	Analysis of the event
						End A	End B	End A	End B	End A	End B	End A	End B					
1	220KV Tashiding-Legship Line-1	10-12-2025	08:56	10-12-2025	09:51												Black start testing at THEP End.	
2	220KV Tashiding-Legship Line-1	12-12-2025	11:14	12-12-2025	14:22												Black start testing at Rangpo End.	
3	220KV Tashiding-New Melli Line-2	12-12-2025	11:32	12-12-2025	14:37													
3	220KV Tashiding-Legship Line-1	16-12-2025	09:54	16-12-2025	12:49	--	--	--	--	--	--	--	--	--	--	--	For cutting the Bamboo tree	--
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.																		

SI No.	Name of the incidence	PCC Recommendation	Latest status
<b>153<sup>rd</sup> PCC Meeting</b>			
1.	Total Power Failure at 220 k V IBTPS(OPGC) S/s on 21st Oct 2025 at 17:25 Hrs	PCC advised OPGC representative to increase DR length to 3 sec with pre-fault time of 500 msec and post fault 2500 msec as per ERPC protection philosophy. OPGC was further advised to share settings of bus coupler to ERPC/ERLDC for review.	
<b>152<sup>nd</sup> PCC Meeting</b>			
2.	Total Power Failure at 220 kV Bolangir New (OPTCL) on 6th Sep 2025 at 12:16 Hrs	OPTCL representative was advised to analyze the reason behind non sensing the fault by relay in zone 2 and zone 3.	.
<b>151<sup>st</sup> PCC Meeting</b>			
3.	Disturbance at 220 kV Chatra (JUSNL) S/s on 7th Aug 2025 at 04:43 Hrs	<p>PCC advised that DC leakage issue in the substation shall be promptly addressed and resolved to avoid this type of disturbance in future.</p> <p>Regarding restoration of BCU &amp; PLCC panel, they updated that both BCU &amp; PLCC are of ZIV make and the OEM has been communicated for support. Further the BCU will be replaced with the spare BCU available with them. They added that OPGW in the line is already commissioned. DTPC will be commissioned soon. After commissioning DTPC, the carrier communication issue will be resolved.</p>	JUSNL representative informed that 220 k V Daltongunj Itkhori -1 is charged through bus coupler at present.Regarding BCU rectification, it is expected that rectification work will be started by 2 <sup>nd</sup> Dec 2025 and issue will be resolved by 2 <sup>nd</sup> week of Dec 2025.

4.	Total Power Failure at 220 kV Goraul (BSPTCL) S/s on 7th July 2025 at 14:31 Hrs	BSPTCL was advised to configure the DR time window as per ERPC Guidelines.	BSPTCL representative informed that replacement of BCU will be completed by Dec 2025.
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