Agenda
for
147th PCC Meeting

Date:28.05.2025
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

AGENDA FOR 147TH PROTECTION COORDINATION SUB-COMMITTEE MEETING TO BE HELD ON 28th MAY 2025 AT 10:30 HRS THROUGH MS TEAMS

PART – A

ITEM NO. A.1: Confirmation of Minutes of 146th Protection Coordination sub-Committee Meeting held on 23rd April 2025 through MS Teams.

The minutes of 146th Protection Coordination sub-Committee meeting held on 23.04.2025 was circulated vide letter dated 08.05.2025.

Members may confirm the minutes of the Meeting.

PART – B

ITEM NO. B.1: Repeated disturbance at 400 kV PVUNL S/s

a) Disturbance at 400 kV PVUNL S/s on 5th April 2025 at 14:45 Hrs

On 05.04.2025 at 14:45 Hrs, 400kV Tenughat-PVUNL got tripped on phase to ground fault. At present PVUNL is drawing start up power radially through this line. As the line tripped, 400 kV PVUNL S/s became dead which led to load loss of 4 MW.

Further,400kV-TENUGHAT-PVUNL-1 line was charged successfully at 15:33 Hrs.

Load Loss: 4 MW
Outage Duration: 00:48 Hrs

b) Disturbance at 400 kV PVUNL S/s on 10th April 2025 at 15:45 Hrs

On 10.04.2025 at 15:45 Hrs, 400KV Tenughat-PVUNL got tripped on phase to ground fault. At present PVUNL is drawing start up power radially through this line. As the line tripped, 400 kV PVUNL S/s became dead which led to load loss of 4 MW.

Further, 400kV-TENUGHAT-PVUNL-1 line charged successfully at 18:45 Hrs.

Load Loss: 4 MW
Outage Duration: 03:00 Hrs

Detailed report from ERLDC is attached at **Annexure B.1.**

PVUNL may explain.

ITEM NO. B.2: Disturbance at 220/132 kV Fatuha (BSPTCL) S/s on 9th April 2025 at 16:20 Hrs

On 9th April 2025 at 16:05 Hrs, 132 KV Fatuha-Katra got tripped on B phase fault. While charging attempt of said line at 16:20 Hrs, line didn't hold and 132 KV Y-ph and B-ph CT at Fatuha GSS got brust and fire was observed in control cable of 220/132kV ICTs 1 & 2. Further,220/132kV ICTs at Fatuha got tripped and later all emanating lines from Fatuha were hand tripped for safety purpose. Thus, 220/132kV Fatuha S/s became dead.

Power was restored at 16:45 Hrs from 220 kV Fatuha-Sipara line.

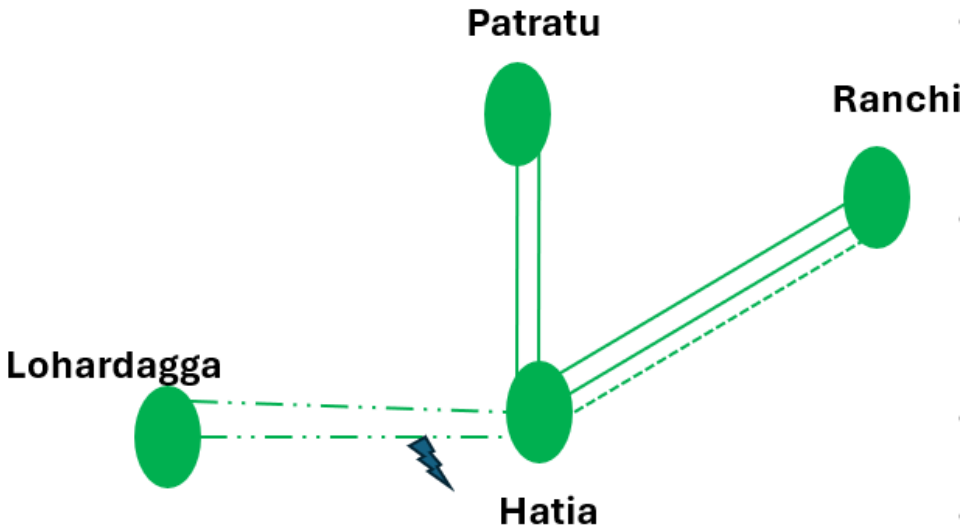
Detailed report from ERLDC is attached at **Annexure B.2.**

Load Loss: 100 MW
Outage Duration: 00:25 Hrs

BSPTCL may explain.

ITEM NO. B.3: Disturbance at 220 kV Hatia (JUSNL) S/s on 15th April 2025 at 18:36 Hrs

Prior to the disturbance 220kV Hatia-Ranchi-2 was under plan shutdown. On 15th April 2025 at 18:36 Hrs R phase fault occurred in 220kV-Hatia- Lohardaga -2(220kV Hatia- Lohardaga D/C were kept idle charged from Hatia end) which was sensed by Hatia end in reverse zone-4 instead of forward zone-1 due to reverse polarity of CT at Hatia end. Subsequently all emanating lines from Hatia tripped in Z-2 protection from remote end and 220kV Hatia S/s became dead.



In 146th PCC Meeting, ERLDC representative informed that on 15th April 2025, 220 kV Ranchi-Hatia-1 was under planned shutdown. Further, 220 kV Hatia-Lohardaga line 1 and 2 were idle charged from Hatia end. At 18:36 Hrs, fault was developed in 220 kV Hatia-Lohardaga line 2 subsequently 220 kV Hatia-Lohardaga 1 and 2, 220 kV Ranchi-Hatia 2 & 3 and 220 kV Hatia-Patratu New D/C tripped which led to total power failure at Hatia S/s.

He further added that fault was in zone 1 of idle charged Lohardagga line but as CT polarity was reversed it sensed the forward fault of line in Zone -4. Since Zone-4 time is 500 mses so fault persisted till 500 msec and all lines from remote end tripped in Zone-2 time resulting to Load loss.

Further, Busbar protection is also unhealthy at Hatia end else only one bus had tripped and remaining feeders can be saved from tripping.

JUSNL representative informed that bus bar protection is available however due to non-availability of isolator status in particular bay it got blocked during the incident. On investigation issues was found with auxiliary contacts of isolator.

Member Secretary, ERPC advised JUSNL representative to monitor healthiness of protection equipment on periodic basis at all concerned substations so that such type of incidents can be avoided.

He further advised ERPC representative to share communication to concerned official of JUSNL regarding periodic monitoring of healthiness of protection equipment.

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

Load Loss: 150 MW
Outage Duration: 00:50 Hrs

JUSNL may update.

ITEM NO. B.4: Disturbance at 220 kV Begusarai (BSPTCL) S/s on 20th April 2025 at 10:00 hrs and Disturbance at 220 k V BTPS on 20th April 2025 at 12:43 hrs

In 146th PCC Meeting, ERLDC representative informed that on 20th April 2025 at 10:00 Hrs, Y phase Bus PT of 132 kV Bus at Begusarai got burst which further evolved to 3 phase fault. Further, 2*220/132 kV ICTs at Begusarai got tripped immediately, however Y phase pole of another remaining 220/132 kV ICT got remained stuck. Due to non-availability of 220 and 132 kV bus bar protection at Begusarai S/s bus bar protection and LBB didn't operate and fault was ultimately cleared in Zone-3 from remote ends.
He informed that, 220 kV Begusarai-Barauni-2 was under shutdown prior to the disturbance. During the disturbance 220 kV Barauni-Begusarai-1 was feeding around 3 kA therefore Induced current of around 400 A was observed in 220 kV Begusarai-Barauni-2 as it has CT on the line side subsequently distance protection operated in zone 1 for this line. Since breaker was already open, LBB got operated and 220 kV Bus-1 at Barauni got tripped which led to tripping of One unit at Barauni,220 kV Barauni-Hazipur-2 and 220 kV Barauni-Mokma-2.

He further said that at 12:43 Hr on the same day, 220 kV Barauni-Hazipur-1 had tripped due to phase-to-phase fault leading to island formation with one unit of Barauni and radial load of Mokama, which didn't survive.

Following operational issues are observed related to this disturbance –

- 220 kV Biharsharif-Mokama D/c was kept open to control loading of 220 kV Barauni-Begusarai D/c which is already reconductored with HTLS (as deliberated in 115th PCC Meeting)
- First event occurred at 10:00 Hrs however lines from Barauni were not charged for more than two and half hours.

Therefore event at 12:43 Hrst could have been avoided if 220 kV Biharsharif-Mokama D/c was kept closed and 220 kV Barauni-Begusarai-1 or 220 kV Barauni-Hazipur-2 was charged in time.

MS, ERPC opined that event had occurred very recently so he advised ERLDC representative to place this agenda in next meeting along with detailed report received from concerned utility for fruitful discussion.

He further advised ERPC/ERLDC representative to share communication to BSPTCL for following operational practices as per deliberations in earlier PCC/OCC meetings.

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

BTPS and BSPTCL may update.

ITEM NO. B.5: Disturbance at 220 kV Bodhgaya (BSPTCL) S/s on 21st April 2025 at 19:42 Hrs

On 21st April 2025, prior to the disturbance, 220kV Gaya – Bodhgaya D/C got tripped at 19:30 Hrs from Bodhgaya end on over current protection. As per SCADA 202 MW power flow was observed in each circuit. At 19:42 Hrs 220 kV Khizersarai-Bodhgaya D/C got tripped from Bodhgaya end due to snapping of R-phase conductor and 220kV Bodhgaya S/s became dead.

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

Load Loss: 310 MW
Outage Duration: 00:24 Hrs

BSPTCL may explain.

ITEM NO. B.6: Disturbance at 220 kV Chatra (JUSNL) S/s on 27th April 2025 at 19:08 Hrs

220kV Chatra S/s is connected from Daltongunj S/s & Latehar S/s through single circuit. On 27th April 2025, at 19:08 Hrs, 220 kV Daltongunj- Chatra line got tripped from Daltonganj end in Z-3 distance protaction and simultaneously, 220 kV Latehar–Chatra line also tripped from Latehar end in Z-3 distance protection. Thus, 220kV Chatra S/s became dead.

Detailed report from ERLDC is attached at **Annexure B.6.**

Load Loss: 20 MW
Outage Duration: 02:34 Hrs

JUSNL may explain.

ITEM NO. B.7: Disturbance at 400 kV Dikchu HEP on 30th April 2025 at 20:34 Hrs

On 30th April 2025 at 20:34 Hrs, 400 kV Rangpo-Dikchu got tripped on Y phase fault in Zone 2 protection from Dikchu end only. As Dikchu is connected radially through Rangpo, Due to loss of evacuation path, both units of Dikchu got tripped.

Detailed report from ERLDC is attached at **Annexure B.7.**

Gen. Loss: 96 MW
Outage Duration: 00:52 Hrs

Dikchu HEP may explain.

ITEM NO. B.8: Tripping of ICTs during the month of April 25

Sl. No	Name of the Element	Trip Date	Trip Time	Remarks	Utility
1	400KV/220KV 315 MVA ICT 1 AT LATEHAR(JUSNL)	22-04-2025	20:10	R phase LA of 400/220/33 KV ICT - I burst	JUSNL

2	400KV/220KV 315 MVA ICT 2 AT LATEHAR(JUSNL)	16-04-2025	19:35	REF protection operated	JUSNL
3	400KV/220KV 315 MVA ICT 3 AT BIHARSARIFF	14-04-2025	17:51	Master trip 86 due to Back up E/F relay operated due to fault in 132 kV feeder.	PG-ER 1
4	400KV/220KV 315 MVA ICT 3 AT BIHARSARIFF	10-04-2025	16:05	Master trip 86 and inter-trip operated.	PG-ER 1
5	400KV/220KV 500 MVA ICT 2 AT BUXAR TPP	06-04-2025	11:52	REF protection operated	SJVN Thermal Private ltd

Concerned utilities may explain.

ITEM NO. B.9: Tripping of Buses during the month of April 25

Sl. No	Name of the Element	Trip Date	Trip Time	Remarks	Utility
1	400 kV BIHARSARIFF(PG) Bus 3	10-04-2025	15:55	Bus bar protection operated	PG-ER 1

Powergrid may explain.

ITEM NO. B.10: Repeated tripping of transmission lines during the month of April 25

Sl.No.	Name of the Element	No. of times Tripped	Remarks	Utility
1	400KV-FSTPP-KHSTPP-1	5	Tripped on Y-Earth fault in 4 instances and R-Earth fault in 1 instance.	NTPC & PG-ER 1
2	400KV-KHSTPP-BARH-2	5	Tripped due to tripping of KHSTPP-Farakka #1(In same dia with Barh #2) in 3 instances and on R-Earth fault in 2 instances.	NTPC & PG-ER 1
3	400KV-MEERAMUNDALI-TSTPP-1	3	Tripped due to DT send by Meramundali end in 2 instances and tripped from Talcher end on transient fault in 1 instance.	NTPC Talcher & OPTCL
4	400KV-PPSP-BIDHANNAGAR-2	3	Tripped on B-Earth fault in 2 instances and R-Earth fault in 1 instance.	WB
5	220KV-SAHARSA(PMTL)-BEGUSARAI-2	4	Tripped on B-Earth fault in 3 instances and fault distance was around 94 Km in 2 instances.	PMTL & BSPTCL

6	220KV-TENUGHAT-BIHARSARIFF-1	3	Tripped on R-Earth fault in 3 instances	JUSNL & BSPTCL
7	220KV-PUSAULI-NADHOKAR-1	3	Tripped on B-Earth in Z-3 from Pusauli end in 2 instances and R-Earth fault in 1 instance.	PG-ER 1 & BSPTCL
8	220KV-PATNA-KHAGAUL-1	3	Tripped on B-Earth fault in 2 instances and Y-B fault in 1 instance.	PG-ER 1 & BSPTCL

Concerned utilities may explain.

ITEM NO. B.11: 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 10th 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. For the month of April'25, detailed list is attached as **Annexure B.11.**

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

Sl.no	Utility Name	December	January	February	March 2025	April 2025
1	PG-ER-1	Yes (13.02.2025)	Yes (13.02.2025)			Yes (23.02.2025)
2	PG-ER-2	Yes (16.01.2025)	Yes	Yes	Yes (19.04.2025)	
3	PG-Odisha	Yes (02.01.2025)	Yes (07.02.2025)	Yes (06.03.2025)	Yes (21.4.2025)	Yes (12.05.2025)
4	WBSETCL/ WBPDCL	Yes (07.01.2025)	Yes (11/02/2025)	Yes (06.03.2025)	Yes (08.04.2025)	Yes (07.05.2025)
5	BSPTCL/ BGCL	Yes (13.01.2025)	Yes (10.02.2025)	Yes (10.03.2025)	Yes (11.04.2025)	Yes (13.05.2025)
6	OPTCL/ OHPC	Yes (15.01.2025)	Yes (10.02.2025)	Yes (17.03.2025)	Yes (15.04.2025)	Yes (15.05.2025)
7	DVC	Yes				Yes (12.05.2025)
8	JUSNL	Yes (07.01.2025)	Yes (13.02.2025)	Yes (05/03/2025)	Yes (23.04.2025)	Yes (21.05.2025)
9	Sikkim					

10	OPGC					
11	PMTL					
12	NTPC-KHSTPP	Yes	Yes	Yes	Yes	Yes (23.05.25)
13	NTPC-FSTPP					
14	NTPC-BARH	Yes (10.01.2025)		Yes (07.03.2025)	Yes (15.04.2025)	Yes (09.05.2025)
15	NTPC-TSTPP					
16	NTPC-KBUNL					
17	NPGC					
18	BRBCL					
19	NTPC-DARILAPLI	Yes (04.01.2025)	Yes (12/02/2025)	Yes (01/03/2025)	Yes (02.04.2025)	Yes (02.04.2025)
	NTPC-NORTH KARNPUARA	Yes (01/03/2025)	Yes (01/03/2025)	Yes (01/03/2025)		
21	ATL					
22	APNRL					
23	CBPTCL					
24	DMTCL	Yes (02.01.2025)	Yes (03/02/2025)	Yes (03/04/2025)	Yes (02/04/2025)	Yes (03.05.2025)
25	ENICL	Yes (03.01.2025)	Yes (12.02.2025)	Yes		Yes (13.05.2025)
26	Chuzachen HEP					
27	Jorethang HEP	YES (02.01.2024)	Yes (01/02/2025)	Yes (01/03/2025)	Yes (02.04.2025)	Yes (02.05.2025)
28	Tashiding Hep	YES (02.01.2024)	Yes (01/02/2025	Yes (02/03/2025)	Yes (01.04.2025)	Yes (03.05.2025)
29	GMR					
30	IBEUL					
31	JITPL					
32	MPL					
33	NKTL					

34	OGPTL	Yes (03.01.2025)	Yes (12.02.2025)	Yes		Yes (13.05.2025)
35	PMJTL					
36	Powerlink					
37	PKTCL	Yes (03.01.2025)	Yes (12.02.2025)	Yes		Yes (13.05.2025)
38	CESC	Yes (17.02.2025)	Yes (17.02.2025)			
39	Rongnichu HEP					
40	SPTL					
41	TVNL	Yes (08.01.2025)	Yes (04.02.2025)	Yes (05.03.2025)	Yes (01.04.2025)	Yes (03.05.2025)

Members may discuss.

ITEM NO. B.12: Protection System Analysis Group of Eastern Region

A Uniform Protection protocol has been developed by NPC in line with IEGC 2023. The protocol envisages formation of a Protection System Analysis Group (PSAG) loads in each region with members from RPC, NLDC, RLDC, PGCIL, a Protection Expert from the region along with the entity under whose jurisdiction GD/GI occurred to analyze the GD/GI for analysis of Grid Disturbances/incidents at major/critical S/s and at substations that affected critical/essential/strategic in detail by visiting the respective substation/substations physically and conducting the meetings. The progress of implementation of the PSAG shall be followed up in the monthly PCC Meeting.

Status of nominations received from utilities are as follows-

S. No.	Utility	Status
1	NLDC	Not received
2	ERLDC	Received
3	Powergrid	Received
4	BSPTCL	Received
5	JUSNL	Received
6	OPTCL	Received
7	WBSETCL	Not received
8	DVC	Not received
9	CESC	Not received
10	NTPC	Not received

Members may update.

ITEM NO. B.13: Single Line Tripping Incidences in month of April 2025

Single line tripping incidents in the month of April 2025 which needs explanation from constituents of either end is attached at **Annexure B.13.**

Members may discuss.

PART- C: OTHER ITEMS

ITEM NO. C.1: Third Party Protection audit of Critical Sub stations by ERPC

In 145th PCC Meeting, ERPC representative informed that it is planned to carry out protection audit for few critical substations by last week of April 2025 (2025-26).

List of Critical Substations for which third party protection audit will be carried out by ERPC is as follows –

1. 400/220 kV Tenughat (TVNL)S/s
2. 400 kV Kahalgaon (NTPC) S/s
3. 400/220 kV Jeerat (WBSETCL) S/s
4. 400/220 kV Lapanga (OPTCL) S/s
5. 220/132 kV Biharsharif (BH) S/s
6. 400/220 kV Meeramundali (OPTCL)S/s
7. 220/132 kV Ramchnadrapur (JUSNL) S/s

The audit of 400/220 kV Jeerat S/s will be carried out in the 1st week of June-25. For remaining substations, it will be completed by 2nd week of July-25.

Draft Protection audit format for carrying out third party protection audit is attached at **Annexure C.1**. **Observations, if any on the format may be submitted to ERPC Secretariat.**

Members may note.

ITEM NO. C.2: Internal Protection Audit Plan of Sub stations for the Year 2025-26

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

Quote
(1) *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). .....*

(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

All utilities are requested to submit the annual audit plan for the substations 220kV and above voltage level for FY 2025-26 to ERPC by 31.10.2024. Annual audit plans for internal audit of their protection systems and third-party protection audit shall be furnished separately.

In 145th PCC Meeting, PCC advised all utilities to share internal protection audit plan for FY 2025-26 to ERPC at earliest.

Powergrid ER-II had submitted internal protection audit plan for FY 2025-26 to ERPC vide email dated 19 April 2025.

DMTCL had submitted internal protection audit plan for FY 2025-26 to ERPC vide email dated 5 April 2025.

In 146th PCC Meeting, PCC advised concerned utilities to share internal protection audit plan for FY 2025-26 to ERPC at earliest.

Concerned utilities may update.

ITEM NO. C.3: Third Party Protection audit of Sub stations for the Year 2025-26

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."

and as per clause 15.5," 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."

In 145th PCC Meeting, PCC advised all utilities to share third party protection audit plan for FY 2025-26 to ERPC at earliest.

In 146th PCC Meeting, PCC advised all utilities to share third party protection audit plan for FY 2025-26 to ERPC at earliest.

Concerned utilities may update.

ITEM NO. C.4: Follow-up of Decisions of the Previous Protection Sub-Committee Meeting(s)

The decisions of previous PCC meetings are attached at **Annexure C.4.**

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, टालिगंज, कोलकाता - 700033
Office : 14, Golf Club Road, Tollygunge, Kolkata - 700033
CIN : U40105DL2009GOI188682, Website : www.erldc.in, E-mail : erldcinfo@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):02-05-2025

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

Event 1: At 14:45 Hrs on 05/04/2025

At 14:45 Hrs on 05.04.2025, 400KV Tenughat-PVUNL tripped on phase to ground fault. At present PVUNL is drawing start up power radially through this line. As the line tripped, 400 kV PVUNL S/s became dead. Around 4 MW load loss occurred.
400KV-TENUGHAT-PVUNL-1 line charged successfully at 15:33 Hrs.

Event 2: At 15:45 Hrs on 10/04/2025

At 15:45 Hrs on 10.04.2025, 400KV Tenughat-PVUNL tripped on phase to ground fault. At present PVUNL is drawing start up power radially through this line. As the line tripped, 400 kV PVUNL S/s became dead. Around 4 MW load loss occurred.
400KV-TENUGHAT-PVUNL-1 line charged successfully at 18:45 Hrs.

2. **Time and Date of the Event (घटना का समय और दिनांक):**
   - Event 1: At 14:45 Hrs on 05/04/2025
   - Event 2: At 15:45 Hrs on 10/04/2025

3. **Event Category (ग्रिड घटना का प्रकार): Grid Disturbance (GD)-1**
4. **Location/Control Area (स्थान/नियंत्रण क्षेत्र):** Jharkhand / 400kV-PVUNL
5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

- Event 1: At 14:45 Hrs on 05/04/2025

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
				Jharkhand	Jharkhand
Pre-Event (घटना पूर्व)	49.93	23775	25441	317	1591
Post Event (घटना के बाद)	49.93	23775	25437	317	1587

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

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो बंद है)	Nil
Weather Condition (मौसम स्थिति)	Normal.

- Event 2: At 15:45 Hrs on 10/04/2025

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
				Jharkhand	Jharkhand
Pre-Event (घटना पूर्व)	50.04	24088	21147	180	1249
Post Event (घटना के बाद)	50.09	24088	21143	180	1245

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

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो बंद है)	Before tripping, PVUNL - 400KV - Bus 2 was under planned shutdown.
Weather Condition (मौसम स्थिति)	Inclement Weather in Jharkhand

6. Load and Generation loss (लोड और जेनरेशन हानि):

- **Event 1: At 14:45 Hrs on 05/04/2025:** Generation loss: Nil; Load loss: 4 MW.
- **Event 2: At 15:45 Hrs on 10/04/2025:** Generation loss: Nil; Load loss: 4 MW

7. Duration of interruption (रुकावट की अवधि):

- **Event 1: At 14:45 Hrs on 05/04/2025:** 00:48 Hrs
- **Event 2: At 15:45 Hrs on 10/04/2025:** 03:00 Hrs

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

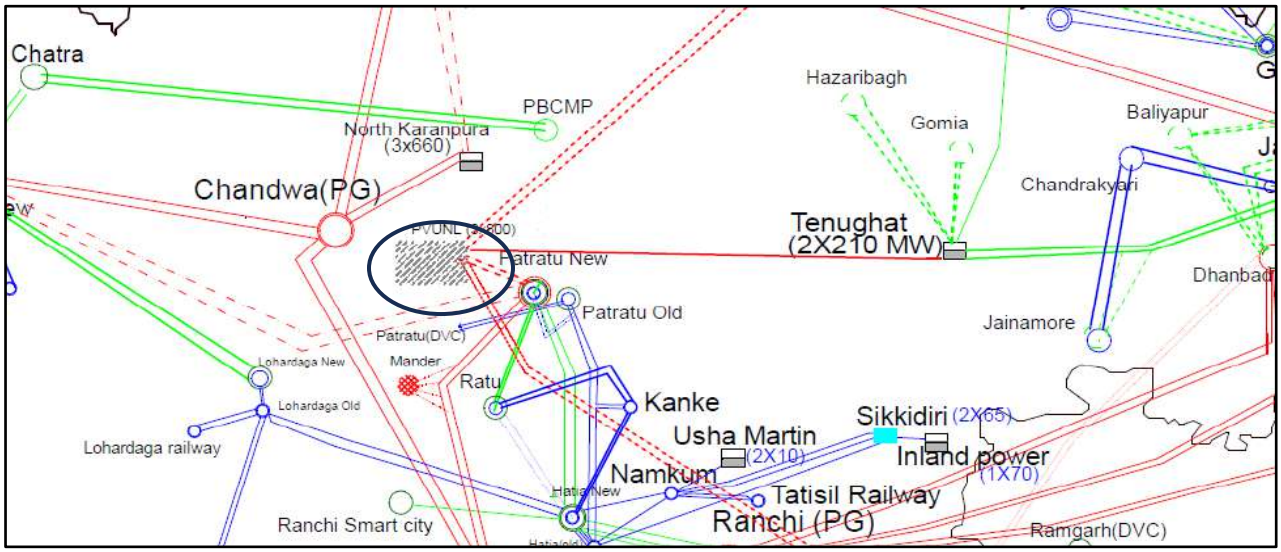


Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग):

Event 1: At 14:45 Hrs on 05/04/2025:

क्र०स०o	नाम	Trip time (hh:mm: ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	400 kV Tenughat-PVUNL-1	14:44:28 Hrs	Tripped on B_N fault.	PVUNL: Didn't trip	15:33 Hrs

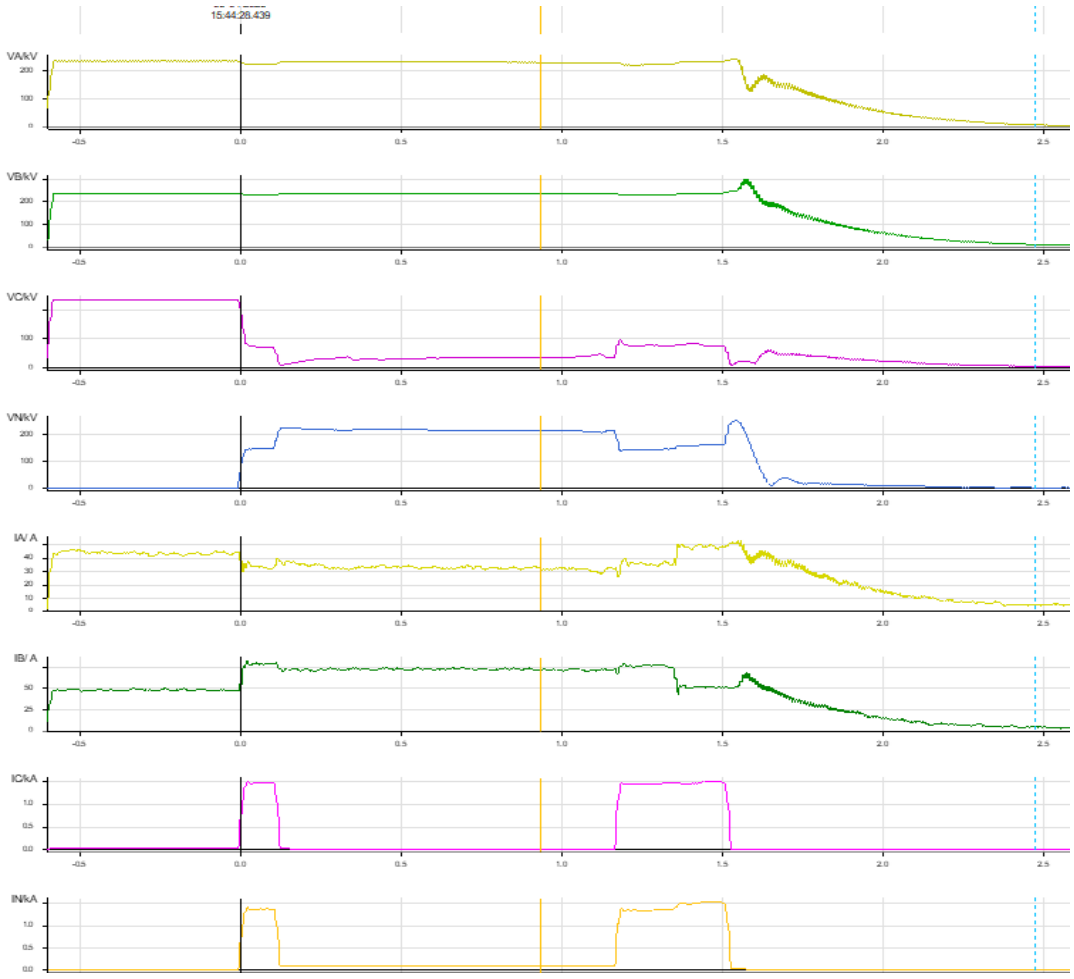
Event 2: At 15:45 Hrs on 10/04/2025

क्र०स०o	नाम	Trip time (hh:mm: ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	400 kV Tenughat-PVUNL-1	15:45:59 Hrs	Tripped on B_N fault.	PVUNL: Didn't trip	18:45 Hrs

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

Event 1: At 14:45 Hrs on 05/04/2025:

- Prior to the event PVUNL drawing 4 MW start power radially from Tenughat.
- As per information received from Tenughat, at 14:45 Hrs on 05/04/2025, 400 kV Tenuhat-PVUNL tripped due Overvoltage stage-1 protection from Tenughat end but as per DR and PMU R-phase to ground fault occurred and A/r attempted but after 350 msec, line tripped on Z-2 protection form Tenughat end.
- At the A/R instance from Tenughat it tripped after zone-2 time as no carrier received from Patratu end because Patratu is radial and no sources is there.



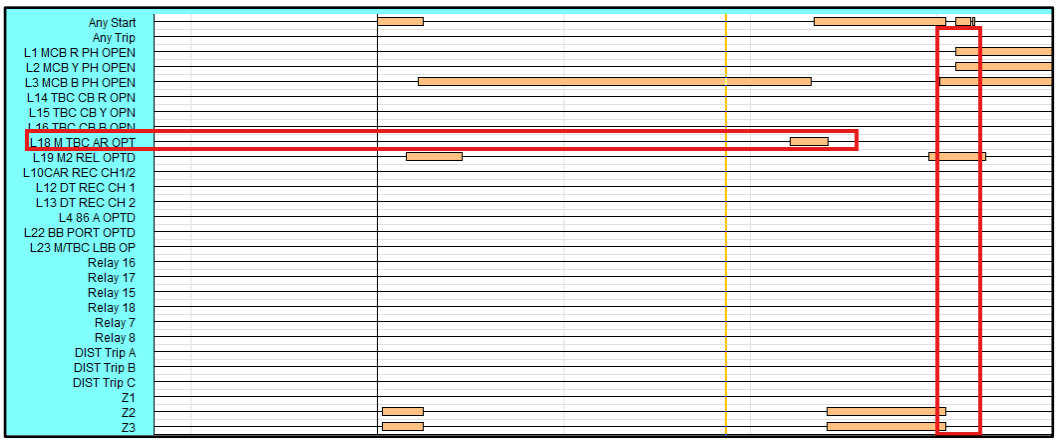


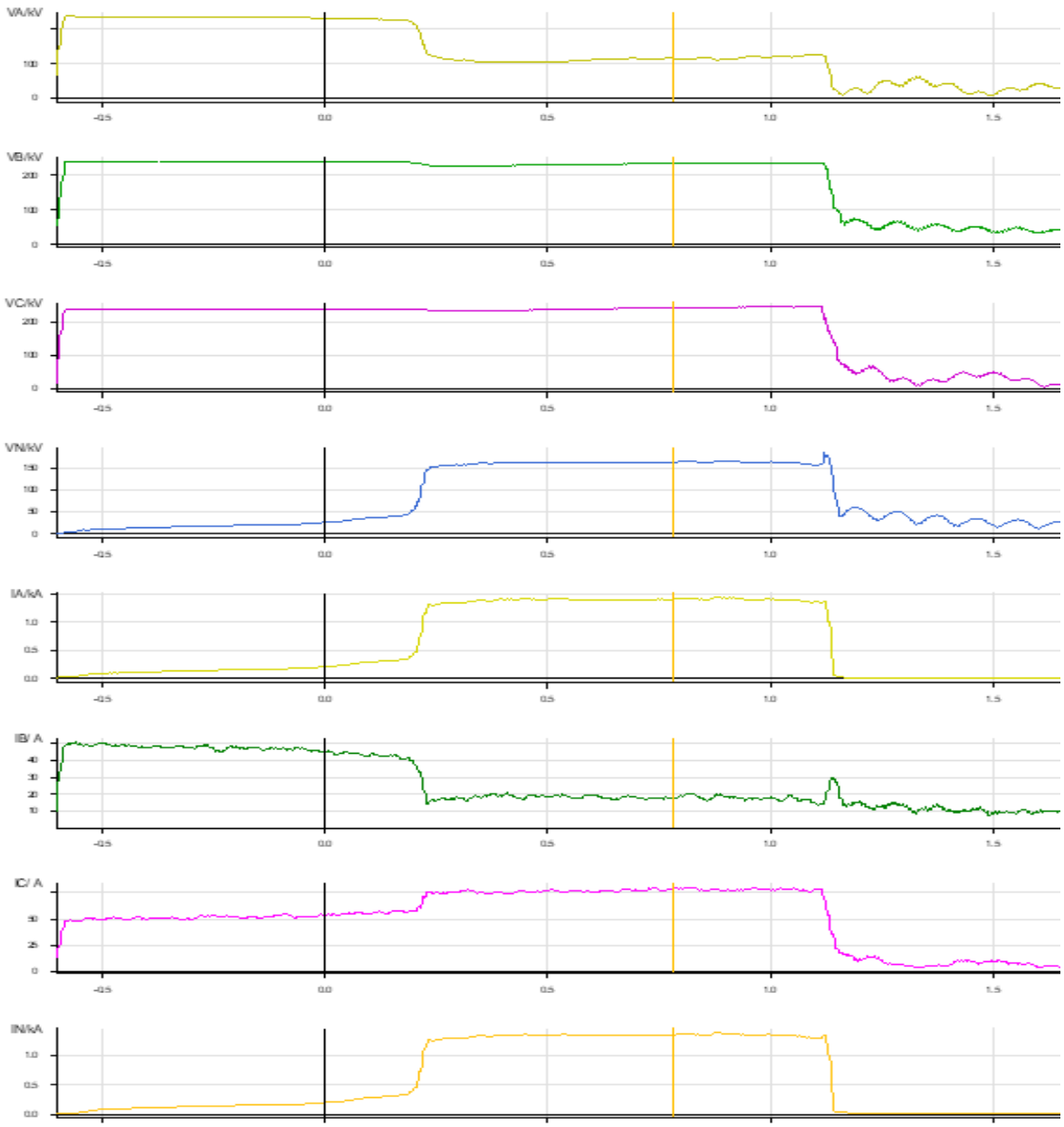
Figure 2: DR of 400kV Tenughat-PVUNL at Tenughat

Figure 3: PMU snapshot of 220 kV Bus voltage at Tenughat

- As PVUNL drawing start power radially from Tenughat end.
- 400kV PVUNL became dead, and 4 MW load loss occurred.

<u>Event 2: At 15:45 Hrs on 10/04/2025</u>

- Prior to the event PVUNL drawing 4 MW start power radially from Tenughat.
- At 15:45 Hrs on 10/04/2025, R- phase to ground fault occurred and fault sensed in Z-3 protection and after 1 sec line got tripped.
- As PVUNL drawing start power radially from Tenughat end.
- 400kV PVUNL became dead, and 4 MW load loss occurred.


VA/kV
VB/kV
VC/kV
VN/kV
IA/kA
IB/ A
IC/ A
IN/kA

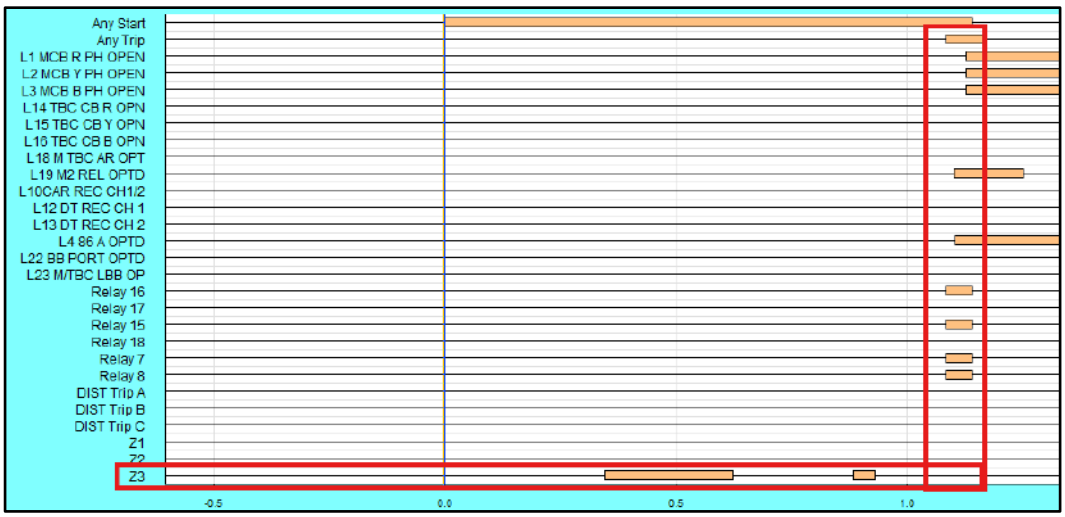


Figure 4: DR of 400kV Tenughat-PVUNL at Tenughat

Figure 5: PMU snapshot of 220 kV Bus voltage at Tenughat

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

- In event 1 at the A/R instance from Tenughat it tripped after zone-2 time as no carrier received from Patratu end because Patratu is radial and no sources is there.
- Fault in event#2 cleared after 1 sec in zone-3 protection. Zone- setting may be checked. Should have sensed at least Zone-2 .
- **In both cases delayed fault clearance occurred, as Patratu is not contributing to fault so there is no protection pickup at their end hence to enable faster clearance of fault and to give a permissive trip to other end it is suggested that weak end infeed protection may be enabled at PVUNL end.**

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

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

S.No.	Issues	Regulation Non-Compliance	Utilities

1.	**DR/EL not provided within 24 Hours**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**NA**

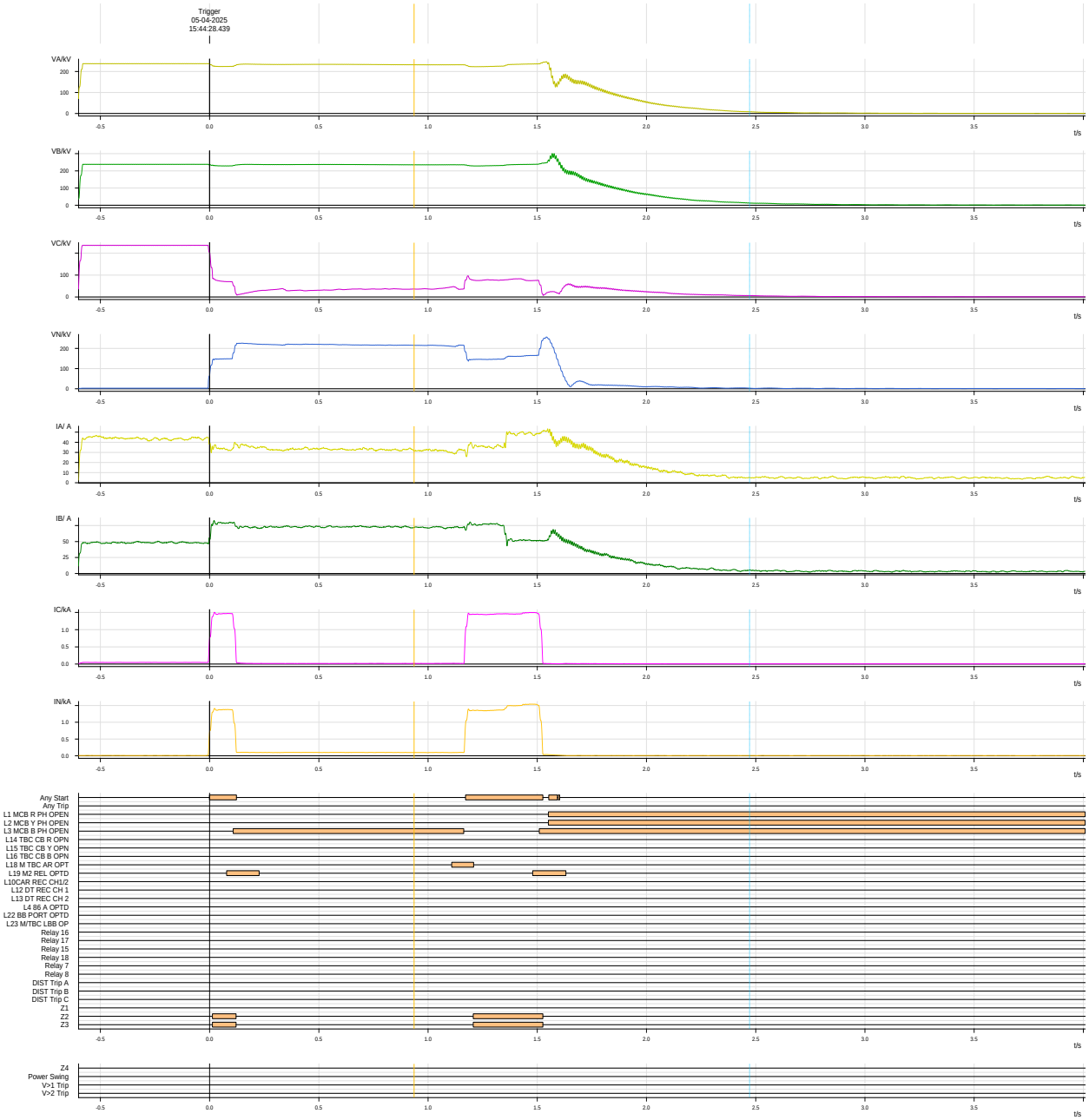
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु): Nil

Annexure 1: (Sequence of Events-As per ERLDC SCADA)

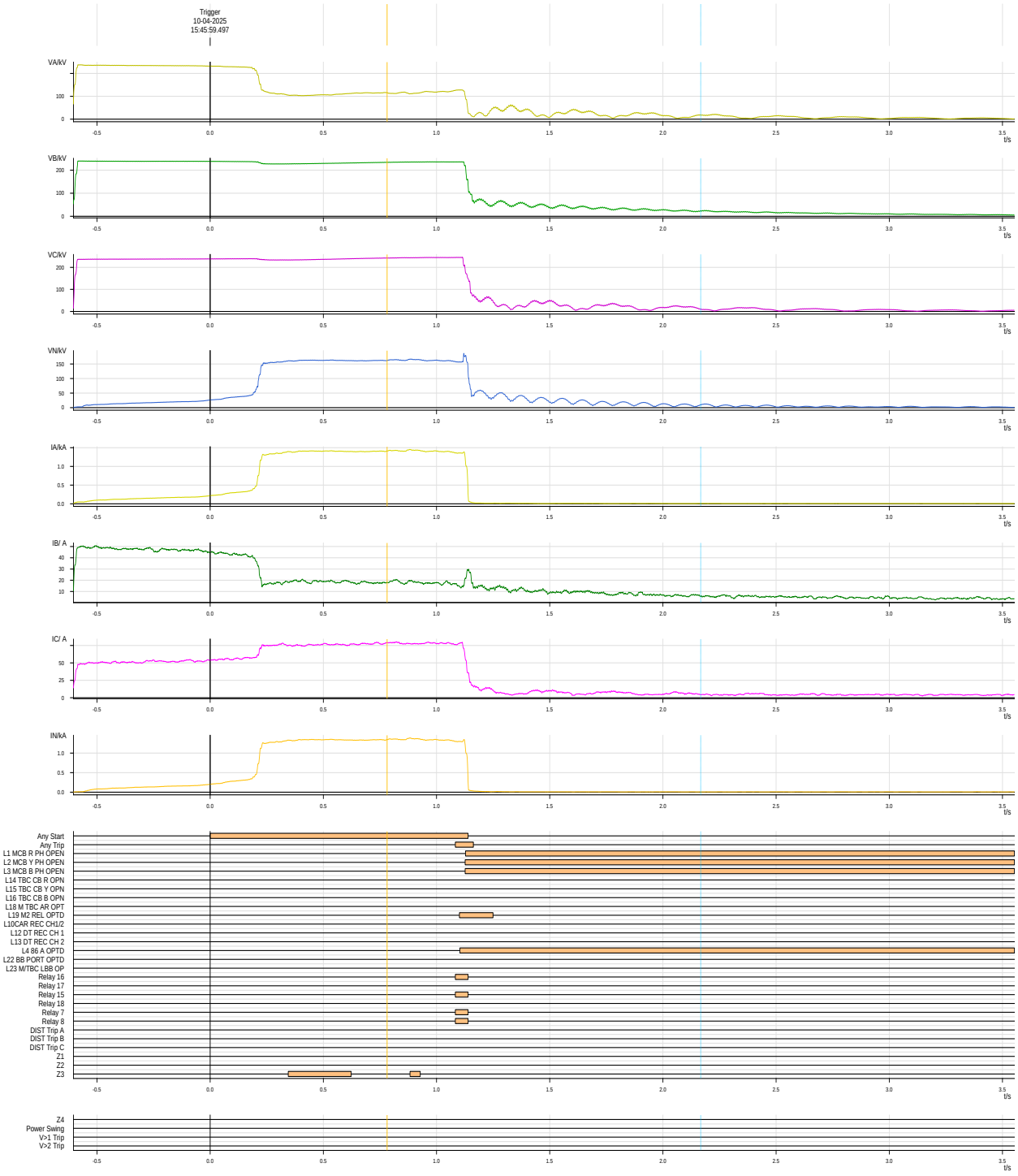
SOE data not available at ERLDC Scada.

Annexure 2:

DR of 400kV Tenughat-PVUNL-1 at Tenughat (Event-1)



DR of 400kV Tenughat-PVUNL-1 at Tenughat (Event-2)



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, टालिगंज, कोलकाता - 700033
Office : 14, Golf Club Road, Tollygunge, Kolkata - 700033
CIN : U40105DL2009GOI188682, Website : www.erldc.in, E-mail : erldcinfo@grid-india.in, Tel.: 033 23890060/0061

पूर्वी क्षेत्र के 220/132 केवी फतुहा में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event at 220/132 kV Fatuha 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): 07-05-2025

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

At 16:05 Hrs 132 KV Fatuha-Katra T/L tripped on B_N fault. While charging attempt of said line at 16:20 Hrs, line didn't hold and 132 KV Y-ph and B-ph CT at Fatuha GSS got bust and fire was observed in control cable of 100 MVA Tr-01 & Tr-02. All emanating lines and 220/132kV ICTs hand tripped for safety purpose. 220/132kV Fatuha S/s became dead. Total 100 MW load loss occurred in Fatuha and Katara areas.
Power was restored at 16:45 Hrs by extending power from 220 KV Fatuha Sipara line.

2. **Time and Date of the Event (घटना का समय और दिनांक):** 18:36 hrs of 15.04.2025
3. **Event Category (ग्रिड घटना का प्रकार): Grid Disturbance (GD)-1**
4. **Location/Control Area (स्थान/नियंत्रण क्षेत्र):** Bihar
5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
				Bihar	Bihar
Pre-Event (घटना पूर्व)	50.071	28677	26197	226	4597
Post Event (घटना के बाद)	50.071	28677	26097	226	4497

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

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां	NIL.

जो बंद है)	
Weather Condition (मौसम स्थिति)	Normal.

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Total load loss of 100 MW at Fatuha S/s.

7. **Duration of interruption (रुकावट की अवधि):** 00:25 Hrs.

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

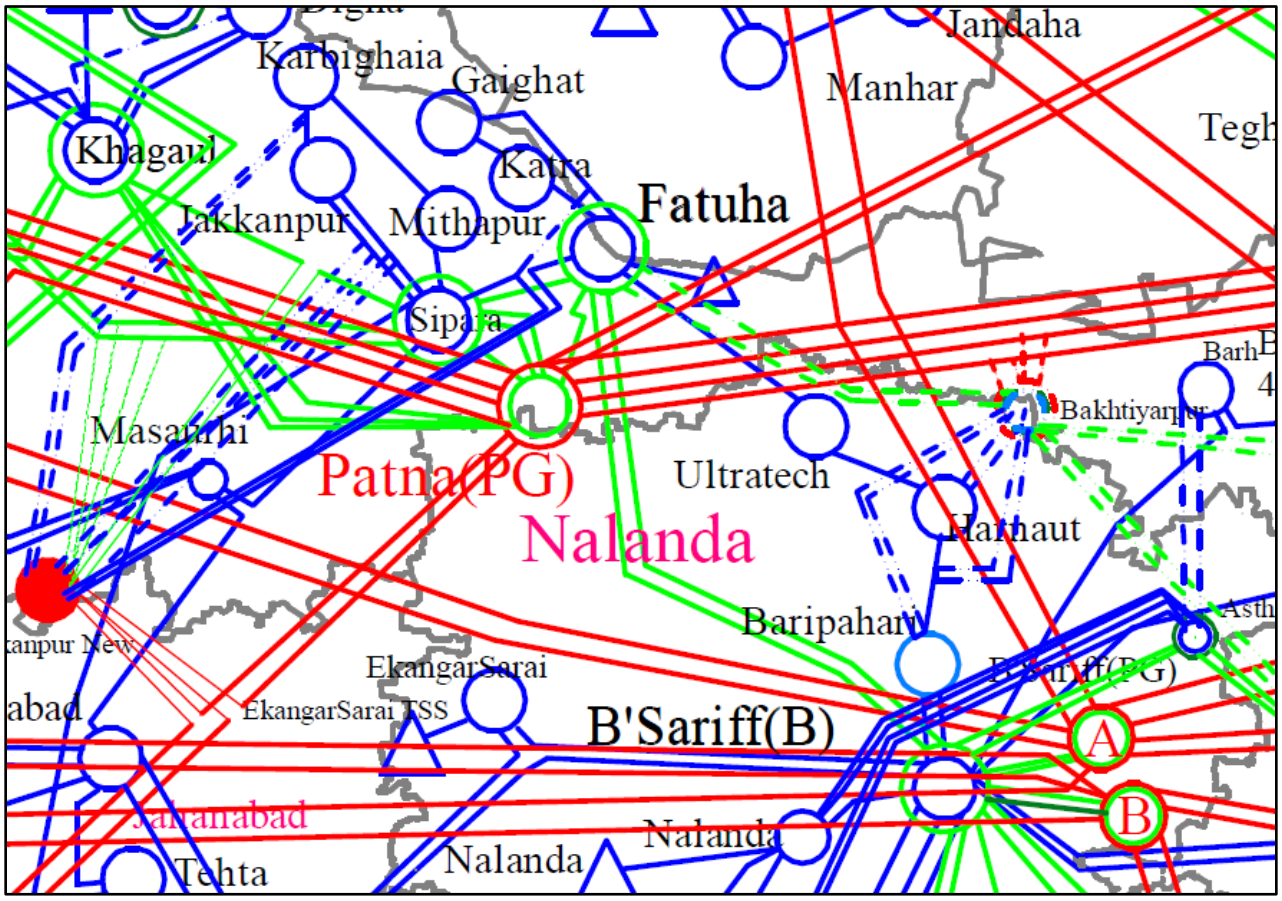


Figure 1: Network across the affected area

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

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

क्रoसo	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220 KV Fatuha Sipara	16:20 Hrs	DT received.	Hand tripped	16:45
2	220 KV Patna Fatuha		Patna: Z-3, FD 41km	Hand tripped	18:48
3	220 KV Biharshariff Fatuha -1		Backup relay: - over current stage 2 trip	Hand tripped	16:51
4	220 KV Biharshariff Fatuha -2		Backup relay: - over current stage 2 trip	Hand tripped	16:51
5	220 KV Fatuha Bus 1 &2		Hand tripped		16:45
6	220 / 132 kV ICT 1 at Fatuha		Master tripped		-
7	220 / 132 kV ICT 2 at Fatuha		Master tripped		-
8	220 / 132 kV ICT 3 at Fatuha		Master tripped		16:54
9	220 / 132 kV ICT 4 at Fatuha		Master tripped		16:57
10	220 / 132 kV ICT 5 at Fatuha		Master tripped		-

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

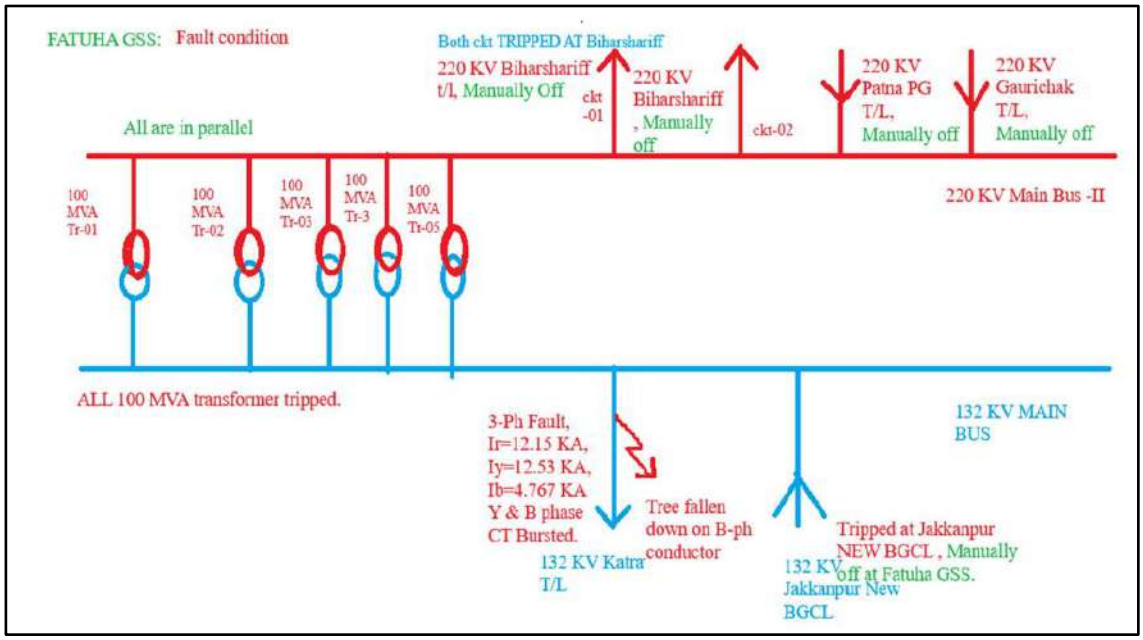


Figure 2: SLD of Fatuha S/s

- At 16:05 Hrs 132 KV Fatuha-Katra T/L tripped on B_N fault. (As reported tree fell on C-phase conductor near tower location number 24-25 from Fatuha S/s).
- At 16:20 Hrs charging attempt of 132 KV Fatuha-Katra line was taken and line didn't hold due to persistent 3 phase fault and Y & B phase CT burst at Fatuha S/s.
- Due to CT bursting all 220/132kV ICTs tripped on master trip.
- 132kV Jakkanpur circuit tripped from remote end in Z-2 protection.
- 220kV Biharsariff D/C tripped on backup over current from remote end.
- Due to CT bursting fire was observed in control cable of 100 MVA ICT#1 & 2 and all emanating line from Fatuha end hand tripped for safety purpose.
- 220kV Fatuha S/s became dead.
- Total load loss of 100 MW occurred at Fatuha S/s
- Power was restored at 16:45 Hrs by extending power from 220 KV Fatuha Sipara line.

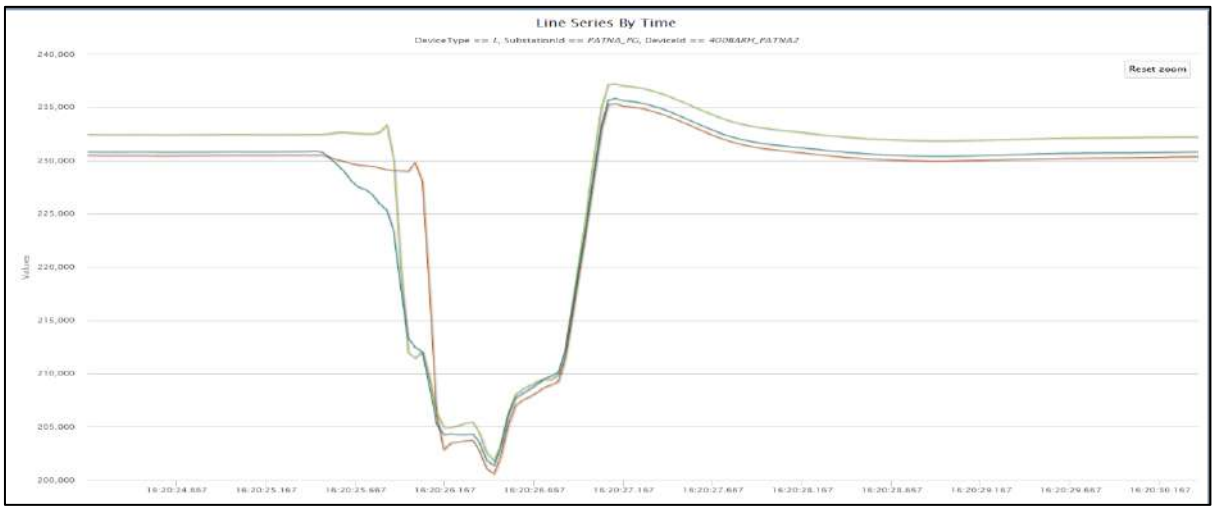


Figure 2: PMU of Patna voltage

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

- It is requested to review over current setting in your jurisdiction to avoid such type of unwanted tripping. Action in this regard to be taken for all substation and adherence to **CEA protections standards** to be ensured**. If Overcurrent to be enabled, it has to be kept in AND logic with VT fuse failure and Pickup to be at least 120% of Thermal Rating.**
- **Root Cause analysis for CT blast to be done and to be reported to RLDC/RPC and CEA.**

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

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

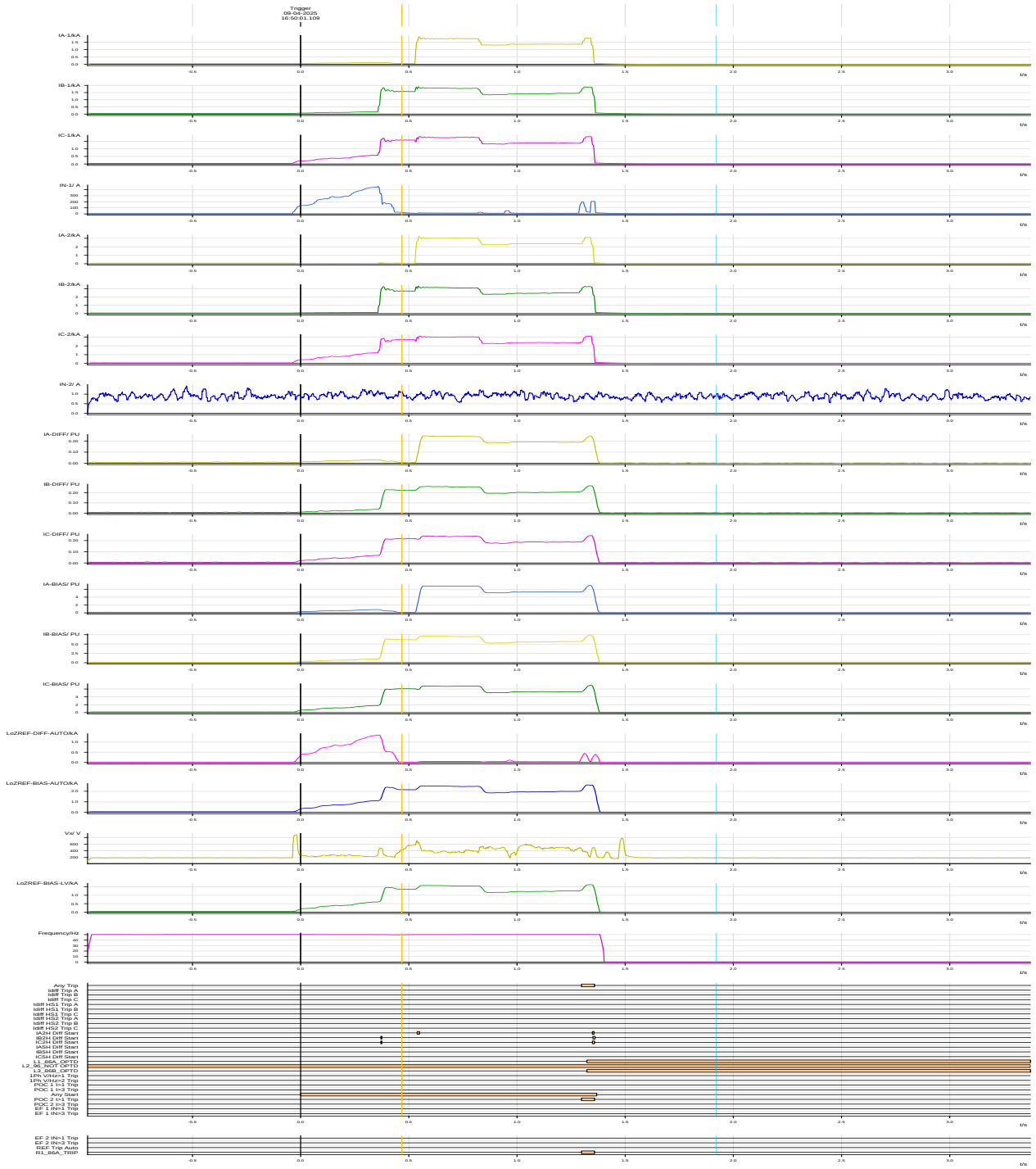
S.No.	Issues	Regulation Non-Compliance	Utilities
1.	**DR/EL not submitted within 24 hours**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**BSPTCL**

15. Key Lessons Learnt (प्रमुख अधिगम बिंदु): Nil

Annexure 1: (Sequence of Events-As per ERLDC SCADA):

**** SOE not available at ERLDC end.**

Annexure 2:


Trigger
09-04-2025
16:50:01.109
IA-1/kA
IB-1/kA
IC-1/kA
IN-1/ A
IA-2/kA
IB-2/kA
IC-2/kA
IN-2/ A
IA-DIFF/ PU
IB-DIFF/ PU
IC-DIFF/ PU
IA-BIAS/ PU
IB-BIAS/ PU
IC-BIAS/ PU
LoZREF-DIFF-AUTO/kA
LoZREF-BIAS-AUTO/kA
Vx/ V
LoZREF-BIAS-LV/kA
Frequency/Hz
t/s
Any Trip
Idiff Trip A
Idiff Trip B
Idiff Trip C
Idiff HS1 Trip A
Idiff HS1 Trip B
Idiff HS1 Trip C
Idiff HS2 Trip A
Idiff HS2 Trip B
Idiff HS2 Trip C
IA2H Diff Start
IB2H Diff Start
IC2H Diff Start
IA5H Diff Start
IB5H Diff Start
IC5H Diff Start
L1_86A_OPTO
L2_86A_OPTO
L3_86A_OPTO
1Ph V/Hz>1 Trip
1Ph V/Hz>2 Trip
POC 1 I>1 Trip
POC 1 I>2 Trip
Any Start
POC 2 I>1 Trip
POC 2 I>2 Trip
EF 1 IN>1 Trip
EF 1 IN>3 Trip
EF 2 IN>1 Trip
EF 2 IN>3 Trip
REF Trip Auto
R1_86A_TRIP

Event Details

DATE: 09.04.2025

TIME: 16:05 Hrs

DISTURBANCE REPORT OF 220/132/33 KV FATUHA GSS:

132 KV Fatuha-Katra T/L tripped on 09.04.2025 at 16:05 hrs , GSS Katra became powerless.

After taking trial of 132 KV Fatuha-Katra T/L at 16:20 hrs, line did not hold, tripped on 3 -phase fault with bursting of 132 KV Y-ph and B-ph CT at Fatuha GSS. All 5x100 MVA Auto-Transformer (i.e, Tr-01,Tr-02,Tr-03,Tr-04,Tr-05) tripped.

As fire caught in control cable of 100 MVA Tr-01 & Tr-02 , all 220 KV Transmission line i.e, 220 KV Fatuha –Biharshariff ckt -01 & ckt-02, 220 KV Fatuha –Patna PG ckt -01, 220 KV Fatuha-Gaurichak (BSPTCL) T/L made manually off at fatuha GSS end.

132 KV Fatuha-Jakkanpur (new) made manually off at Fatuha GSS and tripped at Jakkanpur new BGCL.

During Patrolling of 132 KV Fatuha-Katra T/L, it was found that a tree has fallen on C-Ph conductor near location no. 24 -25 approx. 7 Km from Fatuha GSS.

Weather Condition:Clear

Relay details:

S.No.	Tripping DATE & TIME, Name of Element	Restoration DATE & TIME	Fatuha GSS : Sending power	Katra GSS : Receiving power
1	09-04-2025, 16:05 hrs 132 KV Fatuha-Katra T/L Total line length=16.88 Km	16.04.2025 13:07 hrs	Distance relay, Start B, Start N, Trip B , Trip N, Any Trip, fault location=1.765 km, Trip zone 1, system frequency=50.12 Hz, fault duration =47 ms, CB operate time=42 ms, Ia=543.1 A < -20.30 degree, Ib=10.73 KA < -166.6 degree, Ic=0 <0 degree, In=10.29 KA < -164.9 degree, Va=75.36 KV <7.150 degree, Vb=40.64 KV <-146 degree, Vc=43.92 KV <138.6 degree. Vn=17.69 KV <62.70 degree	No relay observed. Total power fail at Katra GSS. At 16:13 hrs power avail from Fatuha-Gaighat –katra line.

2			**Fatuha GSS: Sending power**	**Katra GSS**
	09-04-2025, 16:20 hrs 132 KV Fatuha-Katra T/L Total line length=16.88 Km		Distance relay, Start A, Start B, Start C, Start N, Trip A, Trip B, Trip C, Trip N, Any trip Trip Zone 1, fault location - 6237 m, system frequency =50.05 Hz, fault duration =39 ms, CB operate time =34 ms Ia=12.15 KA<144 degree, Ib=12.53 KA<22.17 degree, Ic=4.767 A<-107.7 degree, In=7.344 KA<87.38 degree, Va=3468 V <-7.475 degree, Vb=8513 V<1.834 degree, Vc= 10.36 KV <-41.25 degree, Vn=20.94 KV <-19.55 degree.	Total power fail. At 16:40 hrs, power avail from Gaighat-Gaurichak via Fatuha-Gaighat-katra T/L.

S.No.	Tripping DATE & TIME, Name of Element	Restoration DATE & TIME	Fatuha GSS	
03	09-04-2025, 16:20 hrs 100 MVA Tr-01 at Fatuha GSS	11.04.2025 19:41 hrs	P642 RELAY Tripped phase =C POC 2=POC Trip 1 System frequency=50 .05 Hz Fault duration =1.325 s CB operate time=52 ms Relay trip time=1.268 s Ia1=60.32 A, Ib1=70.41 A, Ic1=219.3 A, Ia2=46.98 A, Ib2=76.42 A, Ic2=478.1 A	
04	09-04-2025, 16:20 hrs 100 MVA Tr-02 @ Fatuha GSS	Not restored.	WTI, OTI, Bucholz, Prd 1 & 2, OSR 1 & OSR 2, Master trip relay,	
			P642 RELAY	
			Tripped phase C POC2 =POC Trip 1 Fault duration=1.365 s CB operate time=62 ms Relay trip time =1.298 s, Ia1=58.90 A, Ib1=72.56 A, Ic1=210.1A, Ia2=41.45 A, Ib2=89.36 A, Ic2=433.2 A	

S.No.	Tripping DATE & TIME, Name of Element	Restoration DATE & TIME	Fatuha GSS	
05	09-04-2025, 16:20 hrs 100 MVA Tr-03 @ Fatuha GSS	09.04.2025 16:46 hrs	P642 Relay System frequency 50.04 Hz Start B, Start C, Ia1=108.4 A, Ib1=1.104 KA,Ic1=995.2 A Ia2=169.7 A, Ib2=1.924 KA,Ic2=1.699 KA Ia diff=17.95 Mpu, Ib diff=150.4 Mpu, Icdiff=132.4 Mpu, Ia bias=444.4 Mpu, Ib bias=4.264 Mpu, Ic bias=3.876 PU EF1 derived 46.49 milliamp, EF2 derived=141.3 milliamp	
06	09-04-2025, 16:20 hrs 100 MVA Tr-04 at Fatuha GSS	09-04-2025, 16:57 hrs	86A operated	
07	09-04-2025, 16:20 hrs 100 MVA Tr-05 at Fatuha GSS	09-04-2025, 16:46 hrs	HV Back up relay Ia =2281 A, Ib=2390 A, Ic=2224 A, In=63.29 A Va=88312 V, Vb=91425 V, Vc=95306 V, Vn=10546.88 V, Frequency=50.031 Hz	

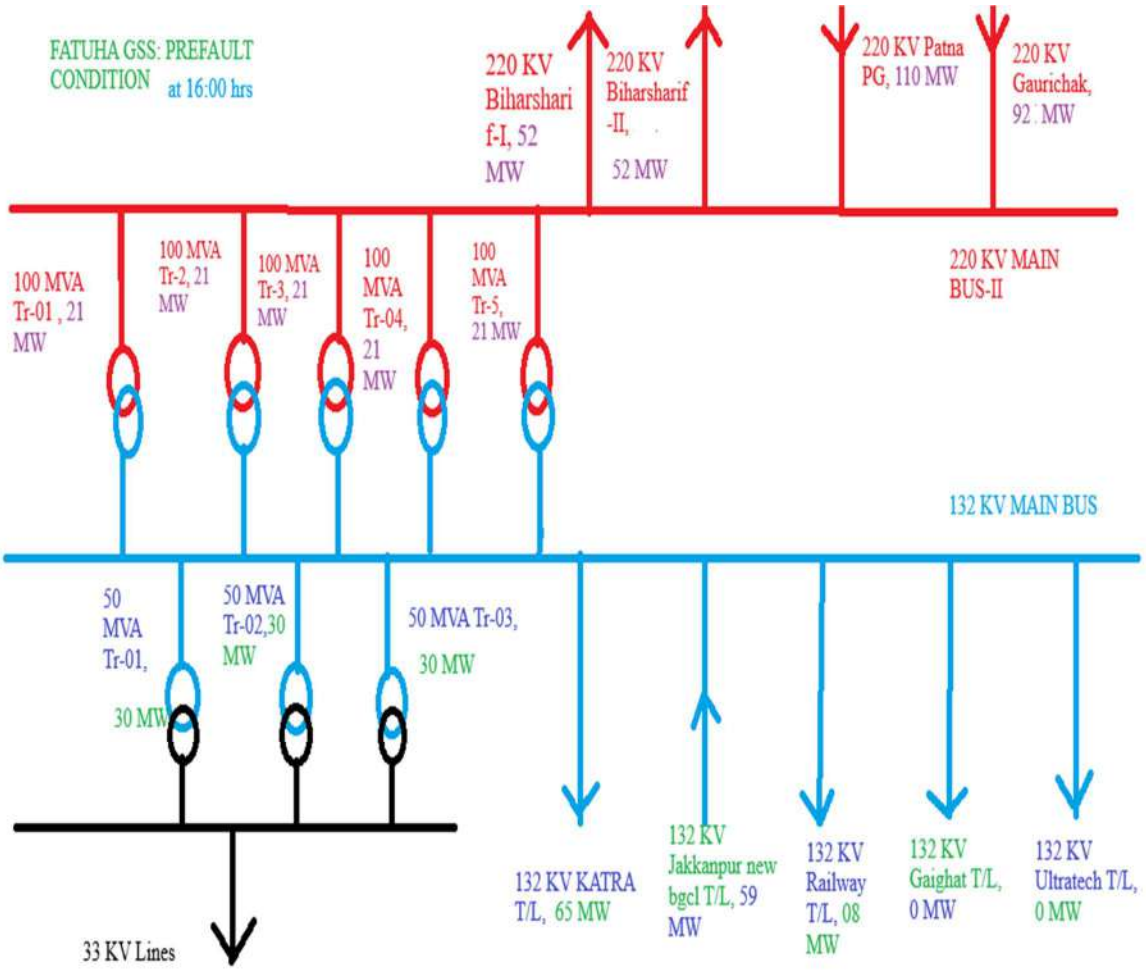
S.No.	Tripping DATE & TIME, Name of Element	Restoration DATE & TIME	Fatuha GSS: Receiving power	Jakkanpur new GSS (BGCL): Sending power
08	09-04-2025, 16:20 hrs 132 KV Fatuha – Jakkanpur new (BGCL) T/L: Total line length=40.20 Km BGCL Portion:28.20 Km Bsptcl Portion: 12 Km	09-04-2025, 18:04 hrs	Manually off	Distance relay, Tripped Phase A B C, Relay definite trip, Ia=2.77 KA Ib=2.75 KA, Ic=2.81 KA Fault location=41.3 Km Distance (%) to fault=102.8 %
			Fatuha GSS	**Biharshariff GSS**
09	09-04-2025 16:20 hrs 220 KV Fatuha-Biharsharif ckt-01 T/L L.L=45 km	09-04-2025 16:50 hrs	Manually off	Backup relay:-over current stage 2 trip,trip phase BC,Ia=307A,Ib=237A,Ic=678A,In=245A ,Vab=224 kv,Vbc=221 kv,Vca=218kv
			Fatuha GSS	**Biharshariff GSS**
10	09-04-2025 16:20 hrs 220 KV Fatuha-Biharsharif ckt-02 T/L L.L=45 km	09-04-2025 17:00 hrs	Manually off	Backup relay:-over current stage 2 trip, trip phase BC, Ia=302 A ,Ib=552A, Ic=821A, In=234A Vab=224 KV, Vbc=219kV,Vca=218 KV
11	09-04-2025 16:20 hrs 220 KV Fatuha-Patna PG T/L-27km	09-04-2025 16:45 hrs	**Fatuha GSS: Manually off**	**Gaurichak BSPTCL: Not tripped**

S.No.	Tripping DATE & TIME, Name of Element	Restoration DATE & TIME		
12	09-04-2025 16:20 hrs 220 KV Fatuha-Patna PG T/L L.L=27 km	09-04-2025 18:48 hrs	**Fatuha GSS: Manually off**	**Patna PG: NA**

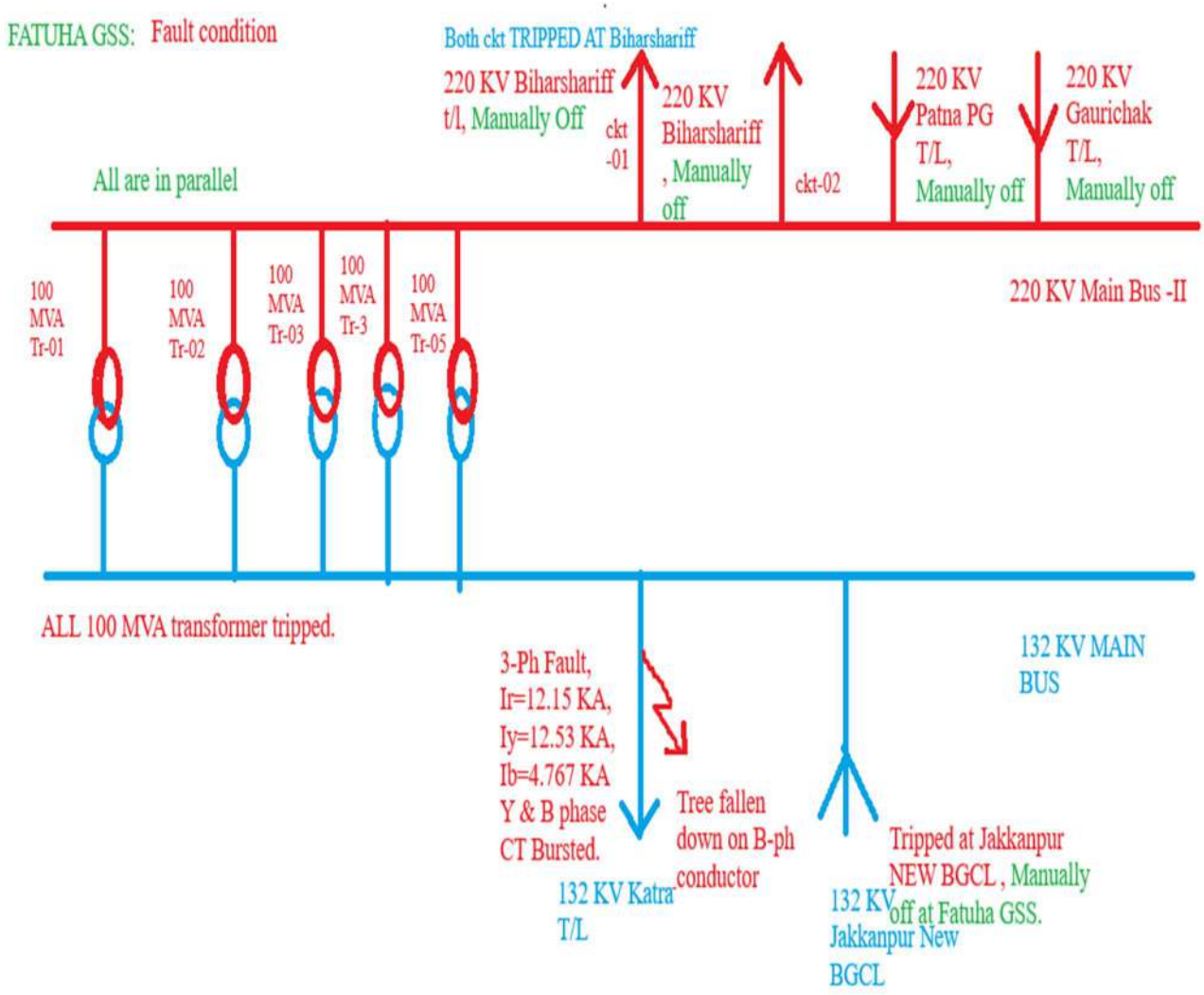
SLD of FATUHA GSS:

SLD FATUHA 2023.pdf

SLD: 220/132/33 KV FATUHA GSS: DURING FAULT CONDITION:



SLD: 220/132/33 KV :During Fault condition:



FATUHA SS

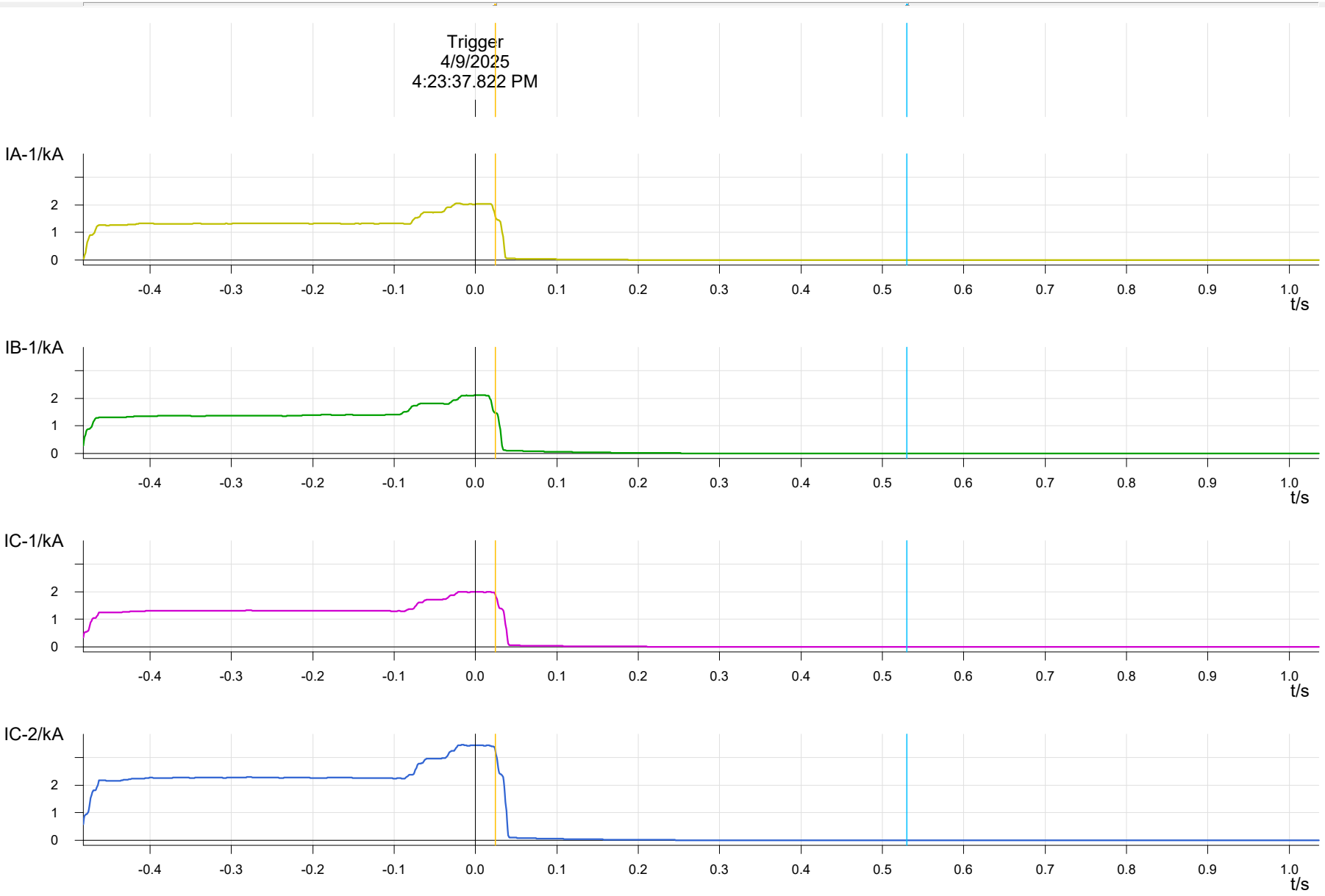
File path: C:\USERS\ADMIN\DESKTOP\FATUHA GSS-09.4.25\100MVAT4-87\25.04.09 16.23.37.000.000.CFG

Start time: 4/9/2025 4:23:37.340 PM

Sample rate: 1201 Hz

Value representation: secondary

Record type: COMTRADE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4:23:37.822 PM
IA-1/kA
IB-1/kA
IC-1/kA
IC-2/kA
2
1
0
-0.4
-0.3
-0.2
-0.1
0.0
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0.3
0.4
0.5
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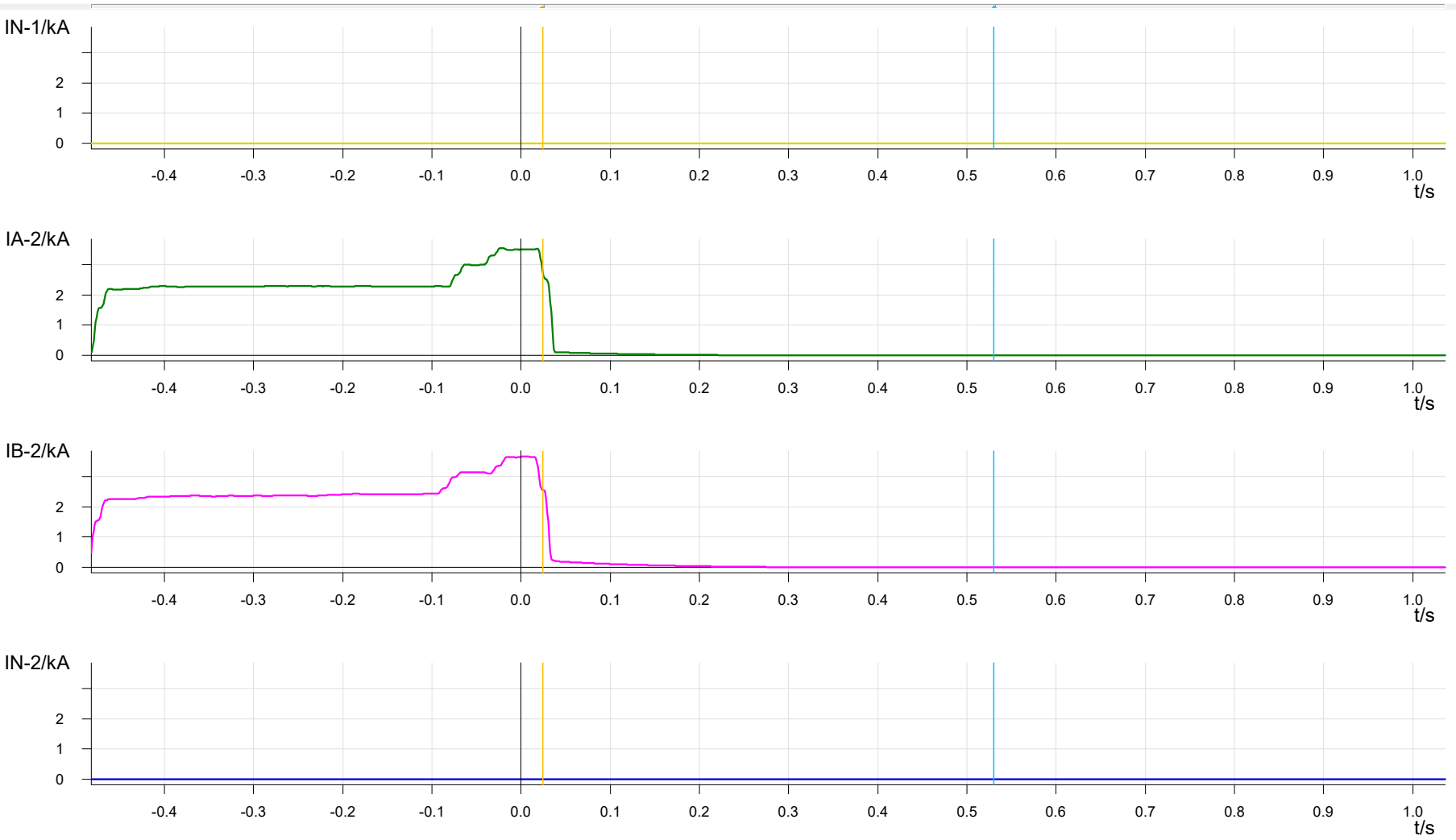
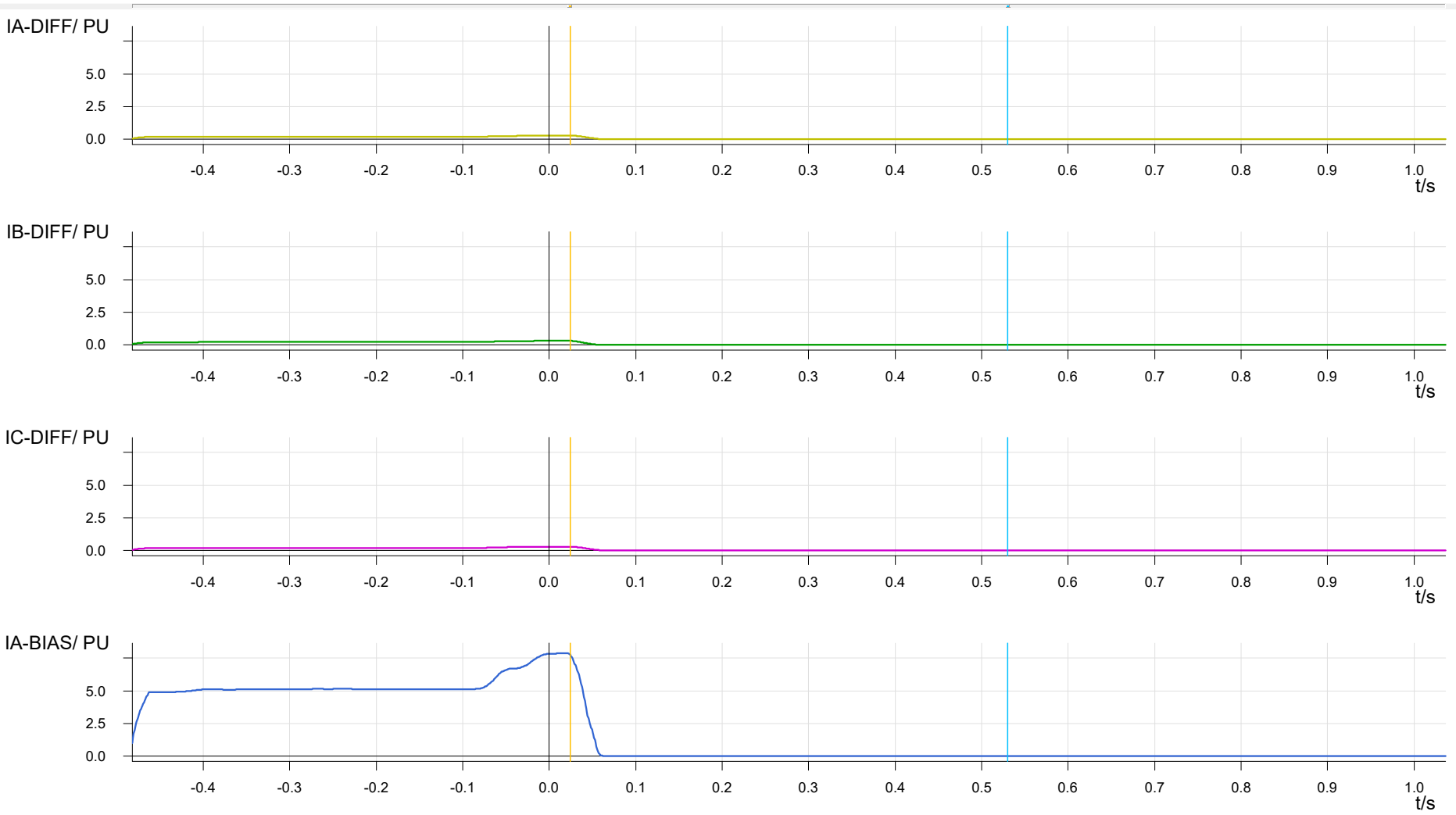
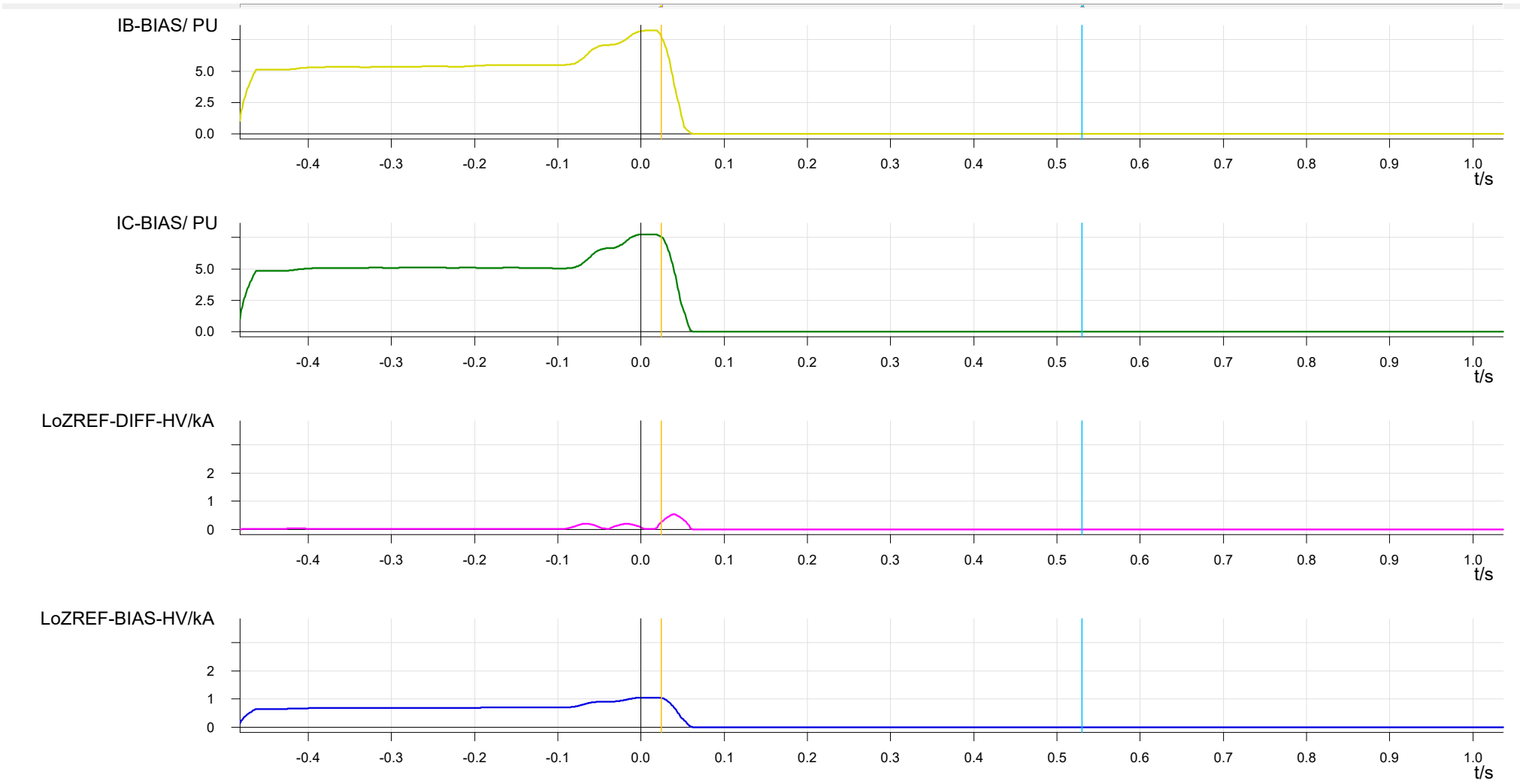
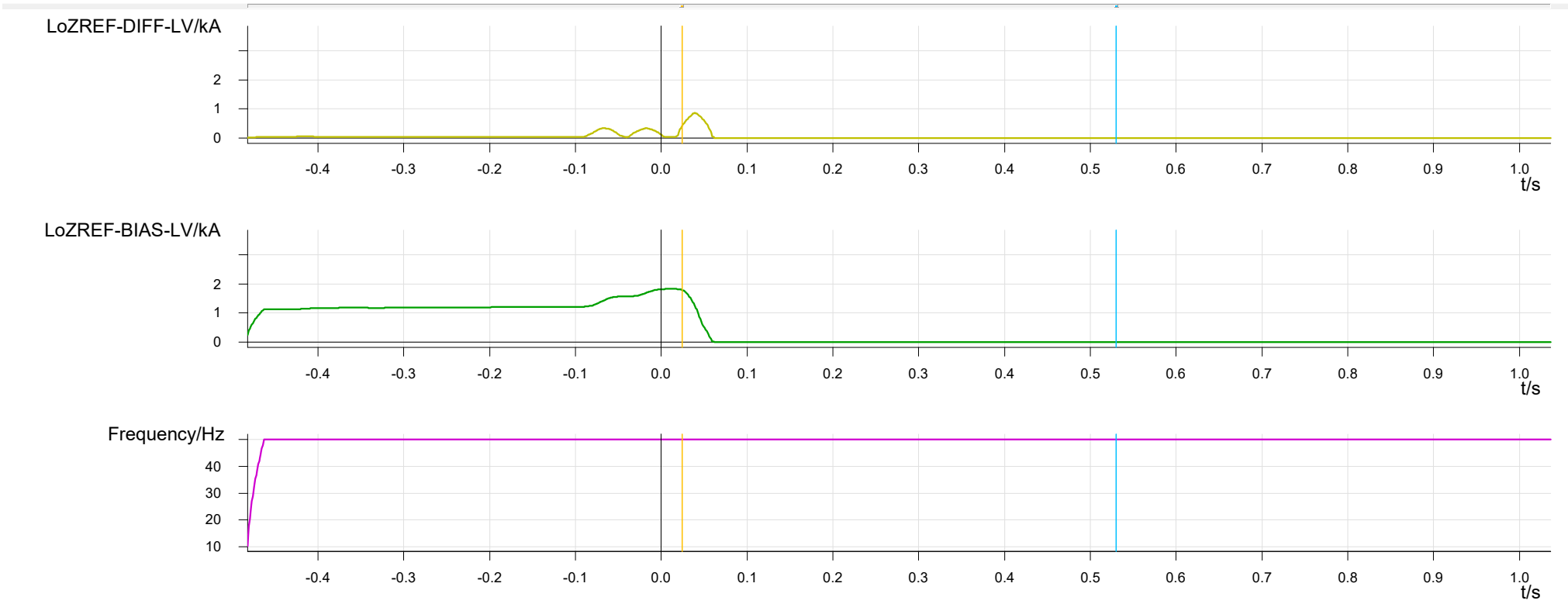
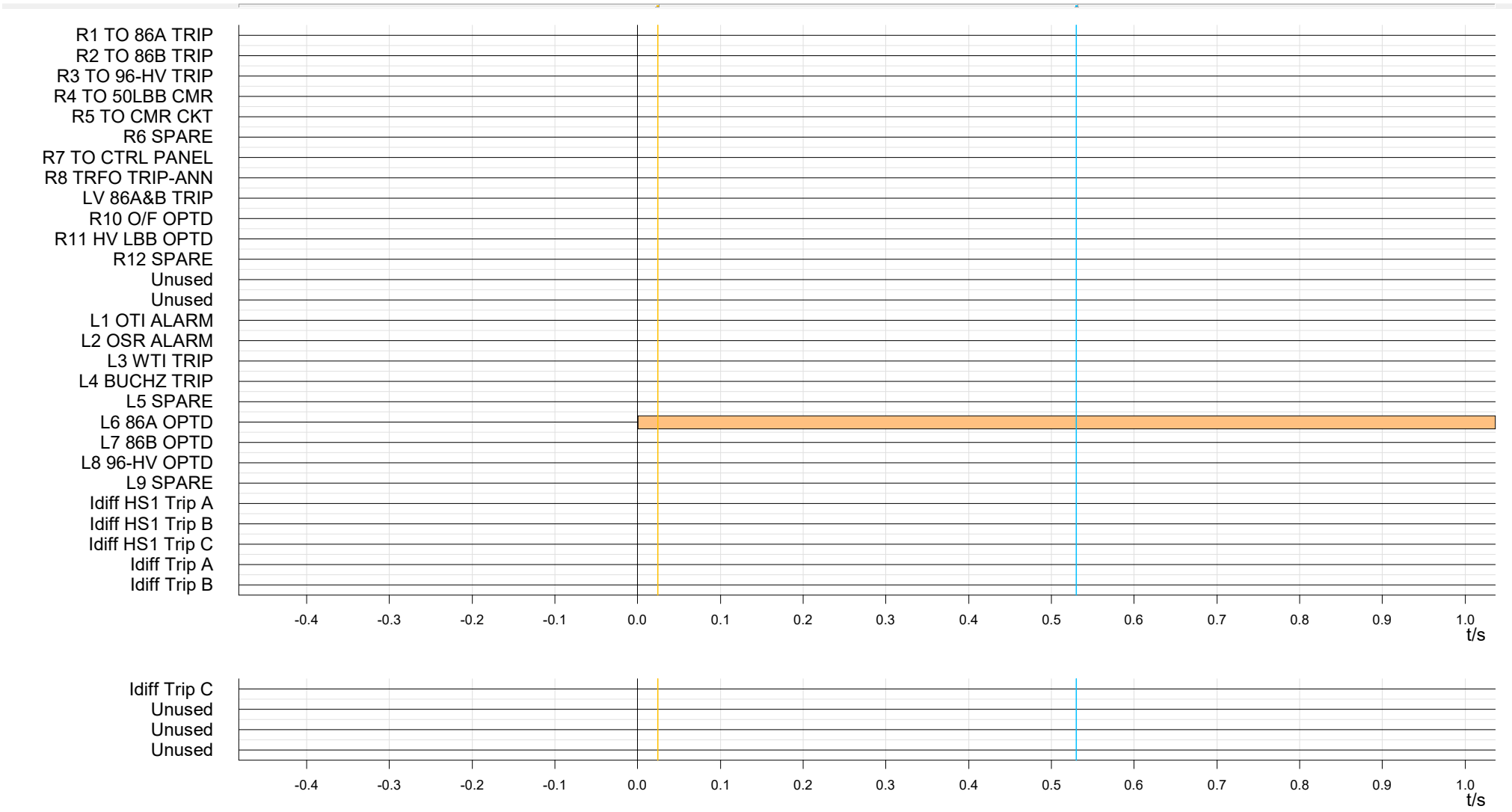
0.8
0.9
1.0
t/s


IN-1/kA
2
1
0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
IA-2/kA
2
1
0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
IB-2/kA
2
1
0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
IN-2/kA
2
1
0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s


IA-DIFF/ PU
5.0
2.5
0.0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
IB-DIFF/ PU
5.0
2.5
0.0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
IC-DIFF/ PU
5.0
2.5
0.0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
IA-BIAS/ PU
5.0
2.5
0.0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s


IB-BIAS/ PU
5.0
2.5
0.0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
IC-BIAS/ PU
5.0
2.5
0.0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
LoZREF-DIFF-HV/kA
2
1
0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
LoZREF-BIAS-HV/kA
2
1
0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s


LoZREF-DIFF-LV/kA
2
1
0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
LoZREF-BIAS-LV/kA
2
1
0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
Frequency/Hz
40
30
20
10
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s


R1 TO 86A TRIP
R2 TO 86B TRIP
R3 TO 96-HV TRIP
R4 TO 50LBB CMR
R5 TO CMR CKT
R6 SPARE
R7 TO CTRL PANEL
R8 TRFO TRIP-ANN
LV 86A&B TRIP
R10 O/F OPTD
R11 HV LBB OPTD
R12 SPARE
Unused
Unused
L1 OTI ALARM
L2 OSR ALARM
L3 WTI TRIP
L4 BUCHZ TRIP
L5 SPARE
L6 86A OPTD
L7 86B OPTD
L8 96-HV OPTD
L9 SPARE
Idiff HS1 Trip A
Idiff HS1 Trip B
Idiff HS1 Trip C
Idiff Trip A
Idiff Trip B
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
Idiff Trip C
Unused
Unused
Unused
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s

FATUHA SS

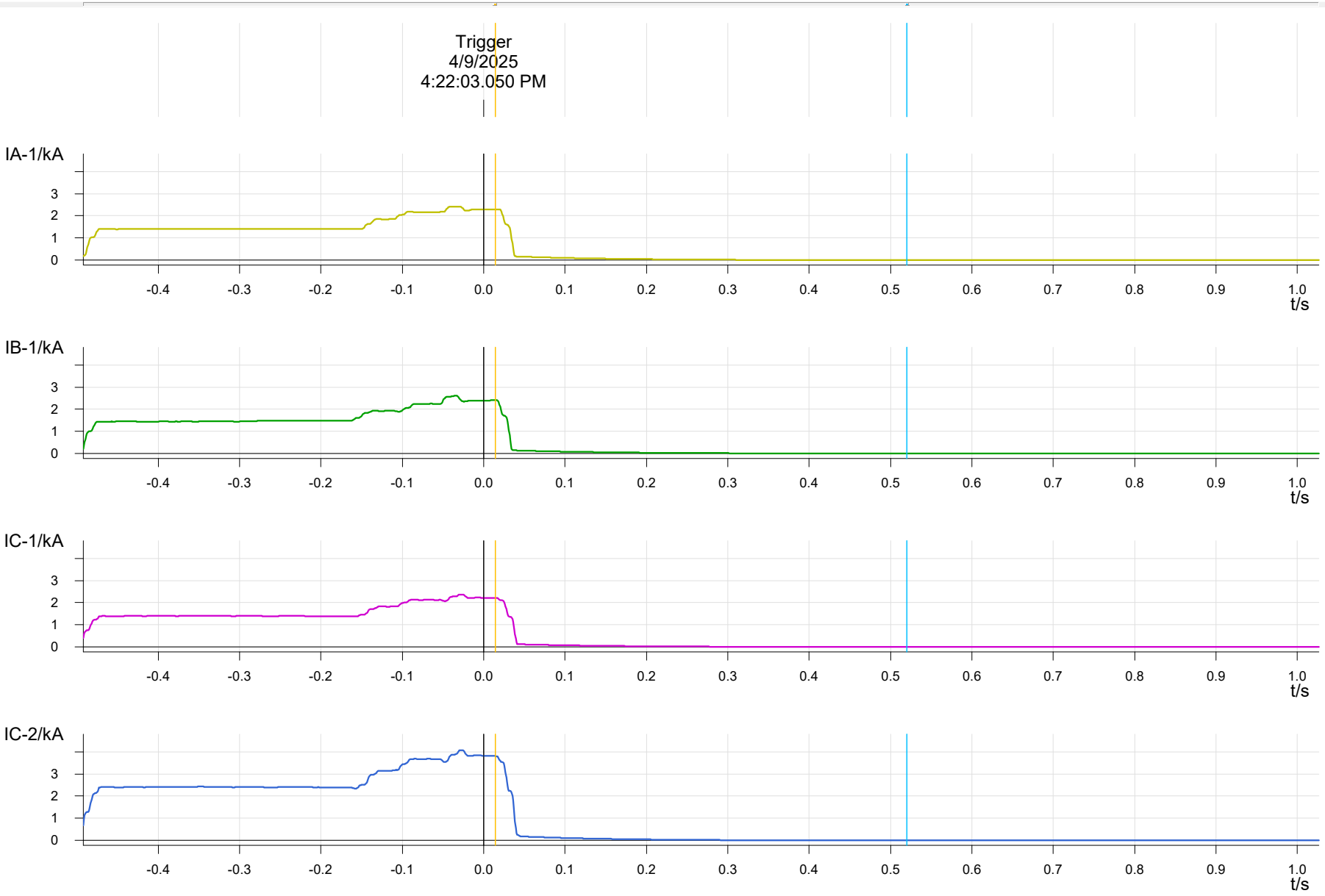
File path: C:\USERS\ADMIN\DESKTOP\FATUHA GSS-09.4.25\100MVAT5-87\25.04.09 16.22.03.000.000.CFG

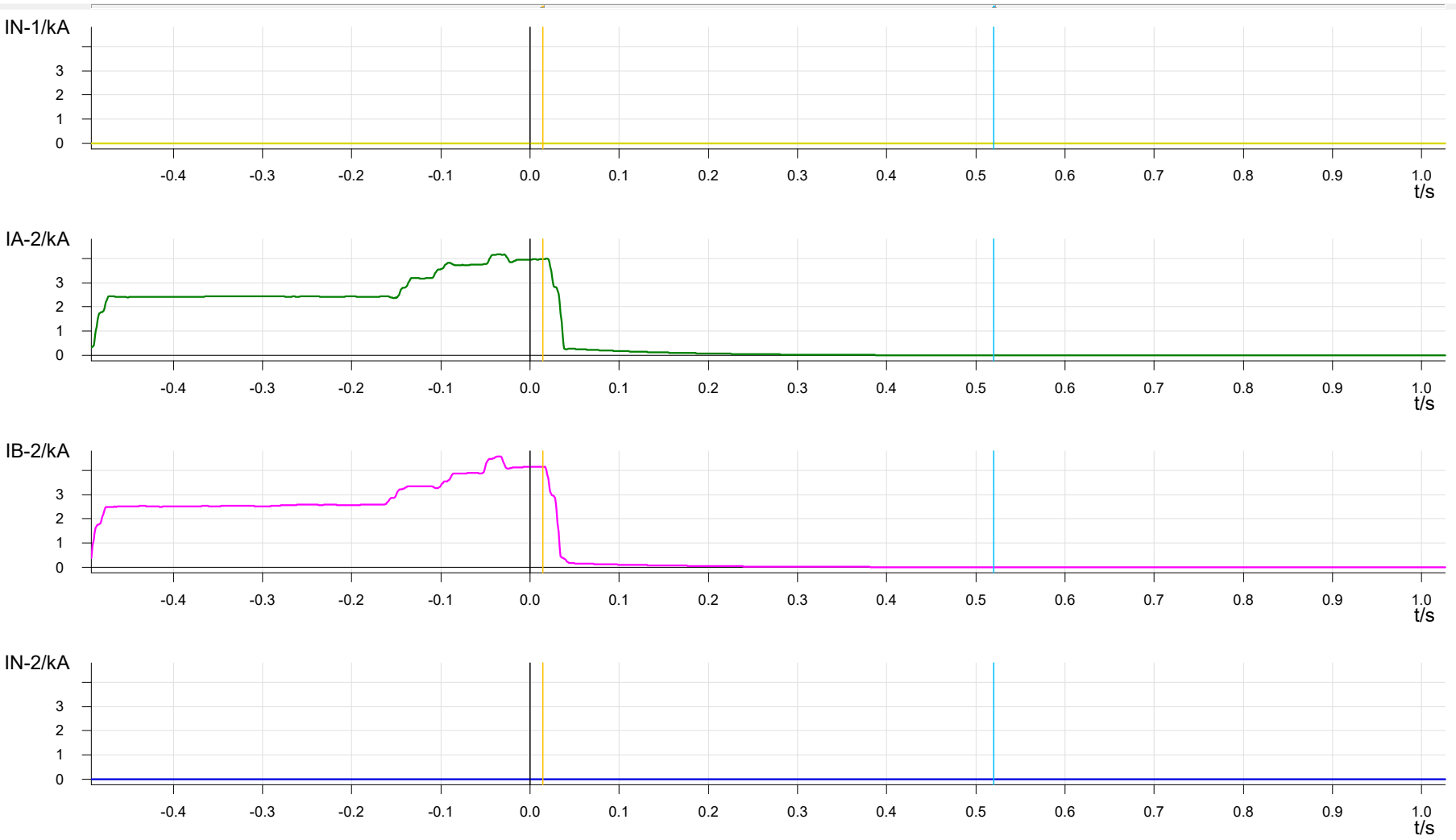
Start time: 4/9/2025 4:22:02.558 PM

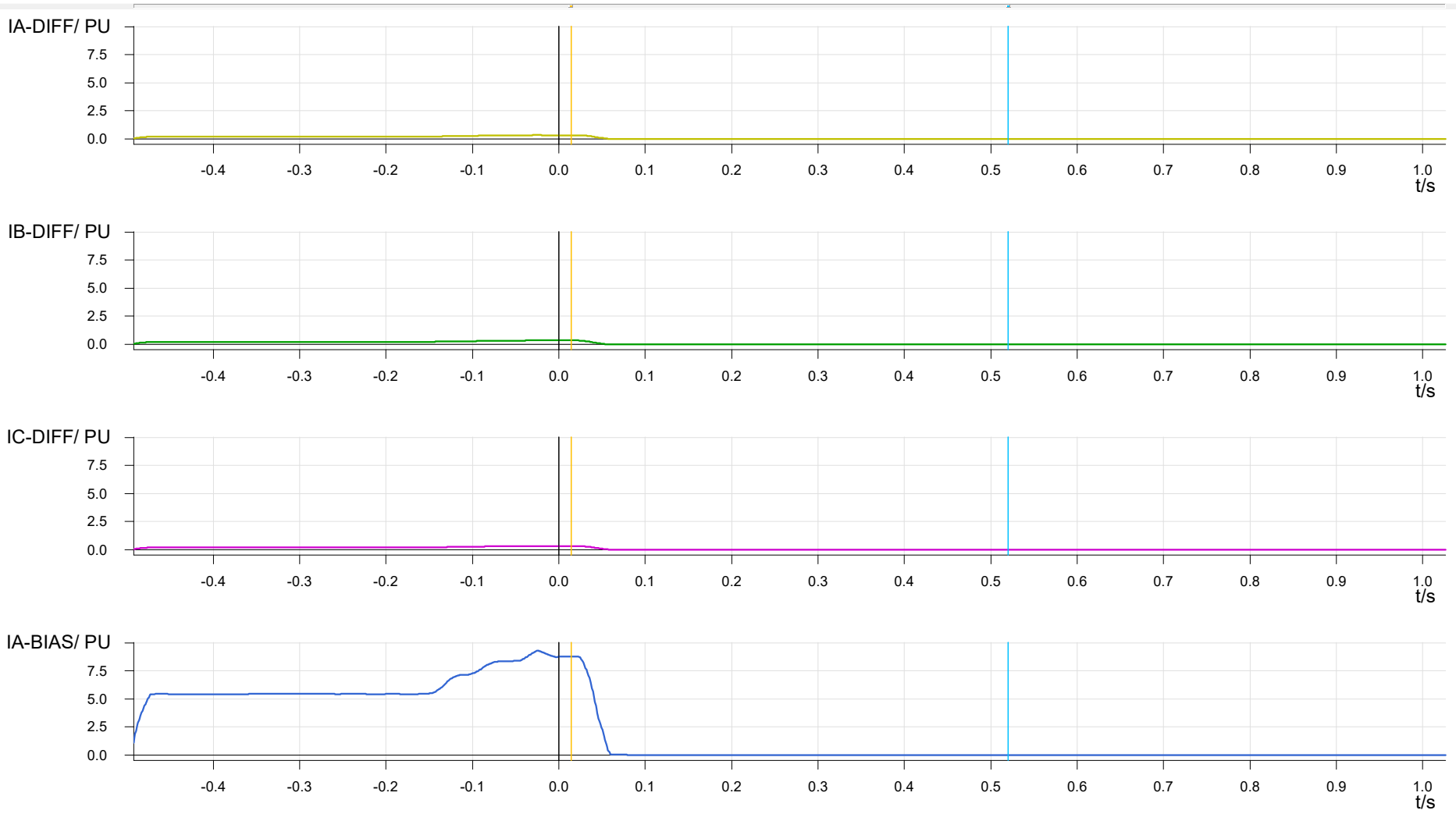
Sample rate: 1201 Hz

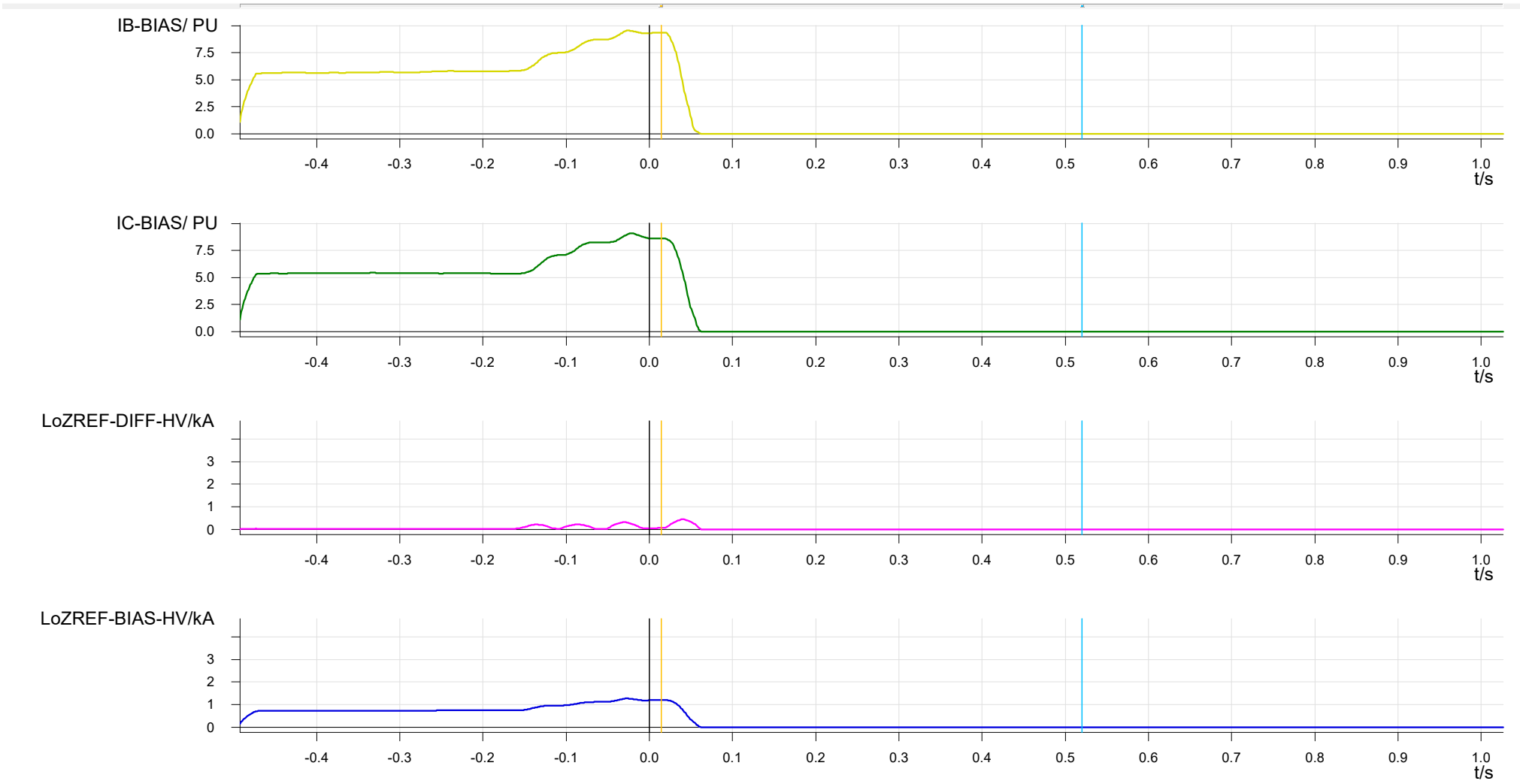
Value representation: secondary

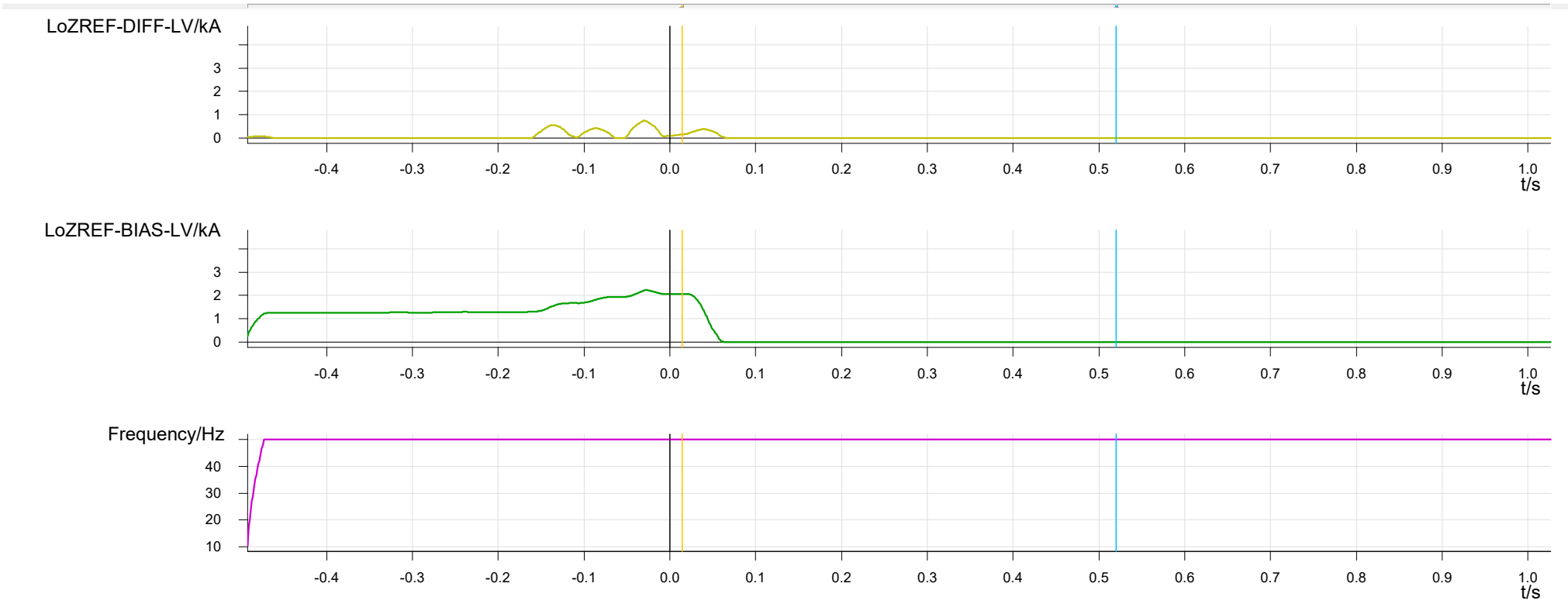
Record type: COMTRADE

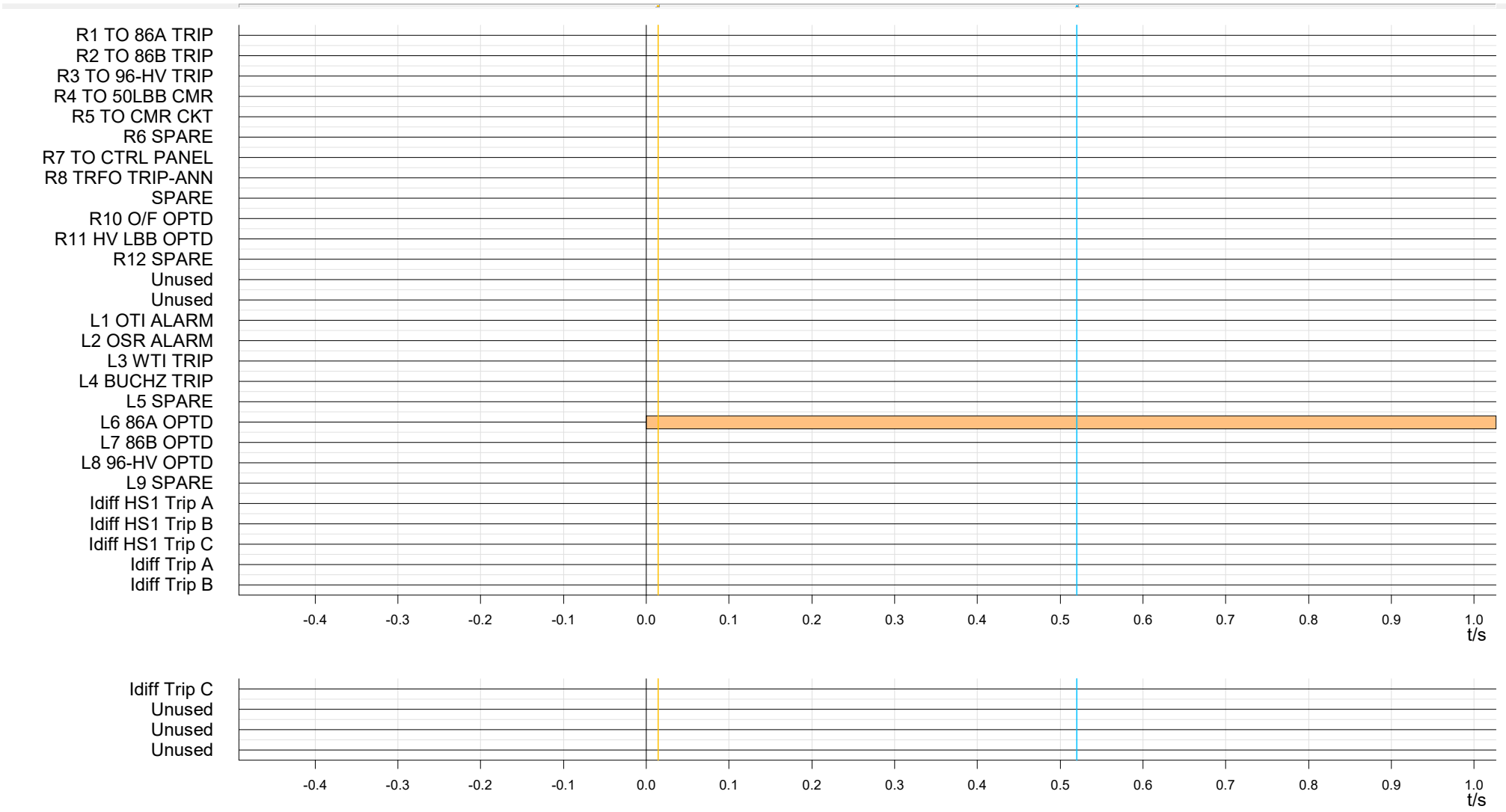

Trigger
4/9/2025
4:22:03.050 PM
IA-1/kA
IB-1/kA
IC-1/kA
IC-2/kA
3
2
1
0
-0.4
-0.3
-0.2
-0.1
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
t/s


IN-1/kA
3
2
1
0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
IA-2/kA
3
2
1
0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
IB-2/kA
3
2
1
0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
IN-2/kA
3
2
1
0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s


IA-DIFF/ PU
7.5
5.0
2.5
0.0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
IB-DIFF/ PU
7.5
5.0
2.5
0.0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
IC-DIFF/ PU
7.5
5.0
2.5
0.0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
IA-BIAS/ PU
7.5
5.0
2.5
0.0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s


IB-BIAS/ PU
7.5
5.0
2.5
0.0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
IC-BIAS/ PU
7.5
5.0
2.5
0.0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
LoZREF-DIFF-HV/kA
3
2
1
0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
LoZREF-BIAS-HV/kA
3
2
1
0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s


LoZREF-DIFF-LV/kA
3
2
1
0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
LoZREF-BIAS-LV/kA
3
2
1
0
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
Frequency/Hz
40
30
20
10
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s


R1 TO 86A TRIP
R2 TO 86B TRIP
R3 TO 96-HV TRIP
R4 TO 50LBB CMR
R5 TO CMR CKT
R6 SPARE
R7 TO CTRL PANEL
R8 TRFO TRIP-ANN
SPARE
R10 O/F OPTD
R11 HV LBB OPTD
R12 SPARE
Unused
Unused
L1 OTI ALARM
L2 OSR ALARM
L3 WTI TRIP
L4 BUCHZ TRIP
L5 SPARE
L6 86A OPTD
L7 86B OPTD
L8 96-HV OPTD
L9 SPARE
Idiff HS1 Trip A
Idiff HS1 Trip B
Idiff HS1 Trip C
Idiff Trip A
Idiff Trip B
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s
Idiff Trip C
Unused
Unused
Unused
-0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
t/s

FATHUA SS

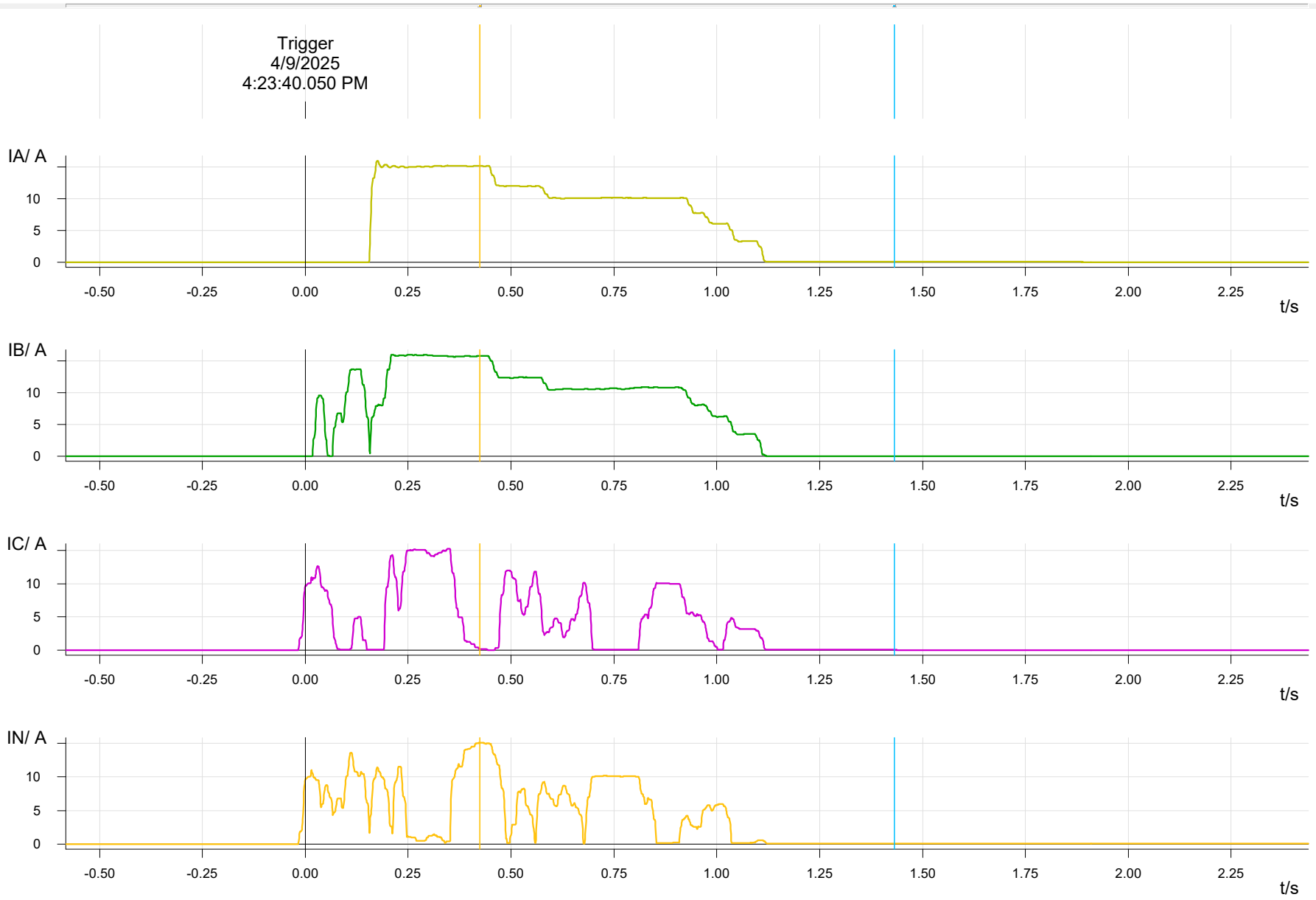
File path: C:\USERS\ADMIN\DESKTOP\FATUHA GSS-09.4.25\FATUHA-KATRA TL-DISTANCE RSLAY-09.04.25\25.04.09 16.23.40.000.000.CFG

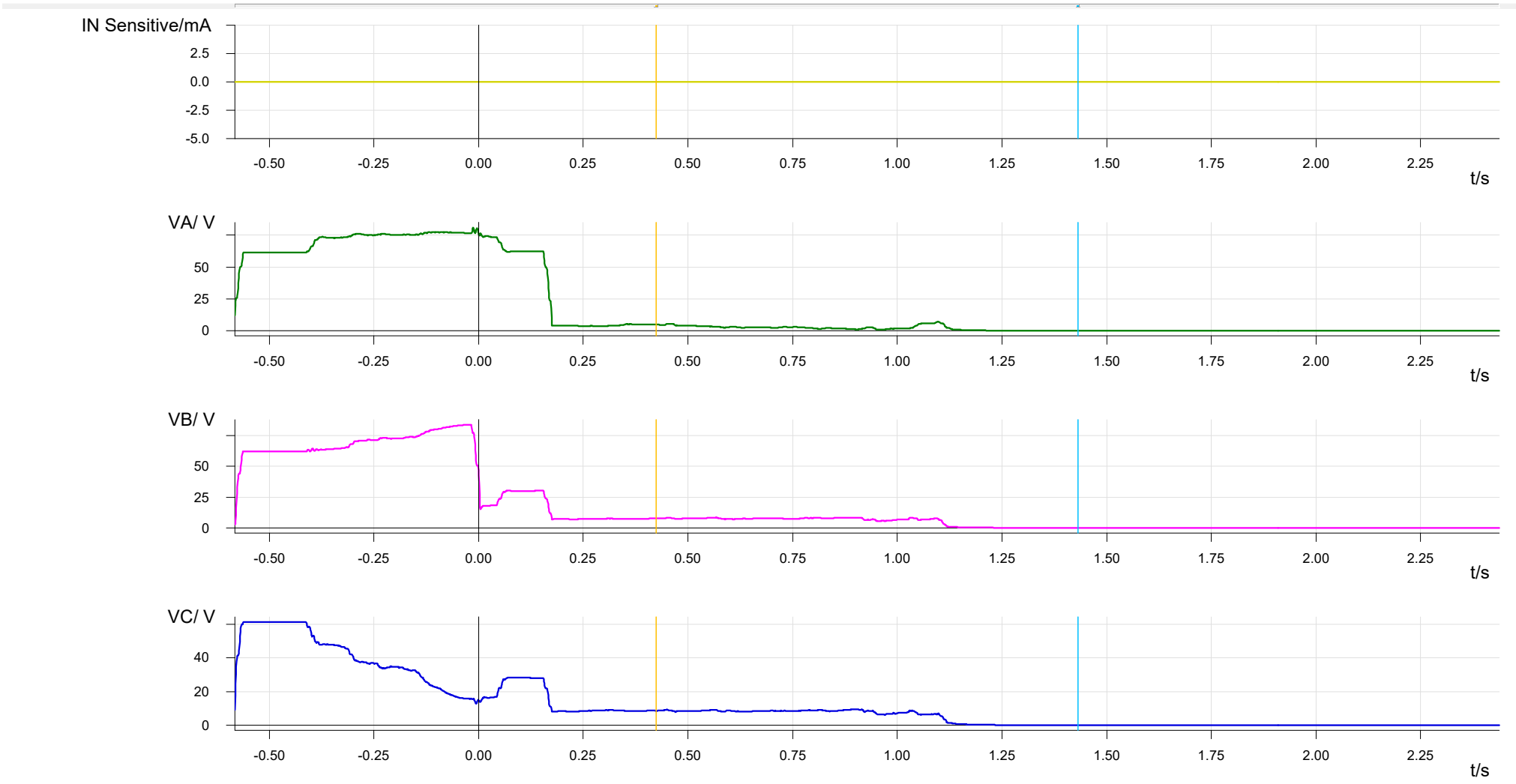
Start time: 4/9/2025 4:23:39.468 PM

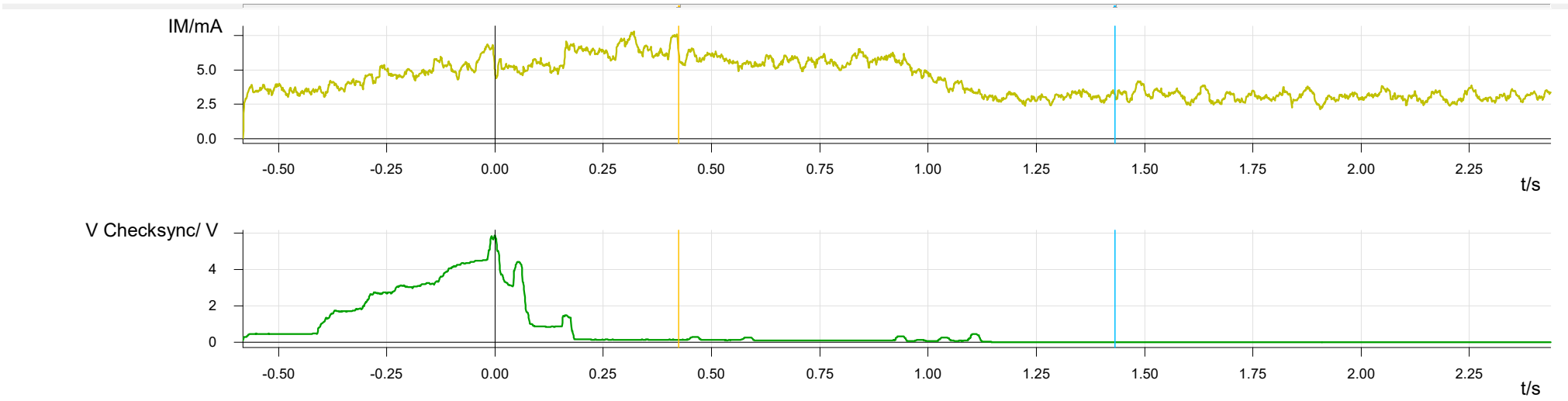
Sample rate: 2400 Hz

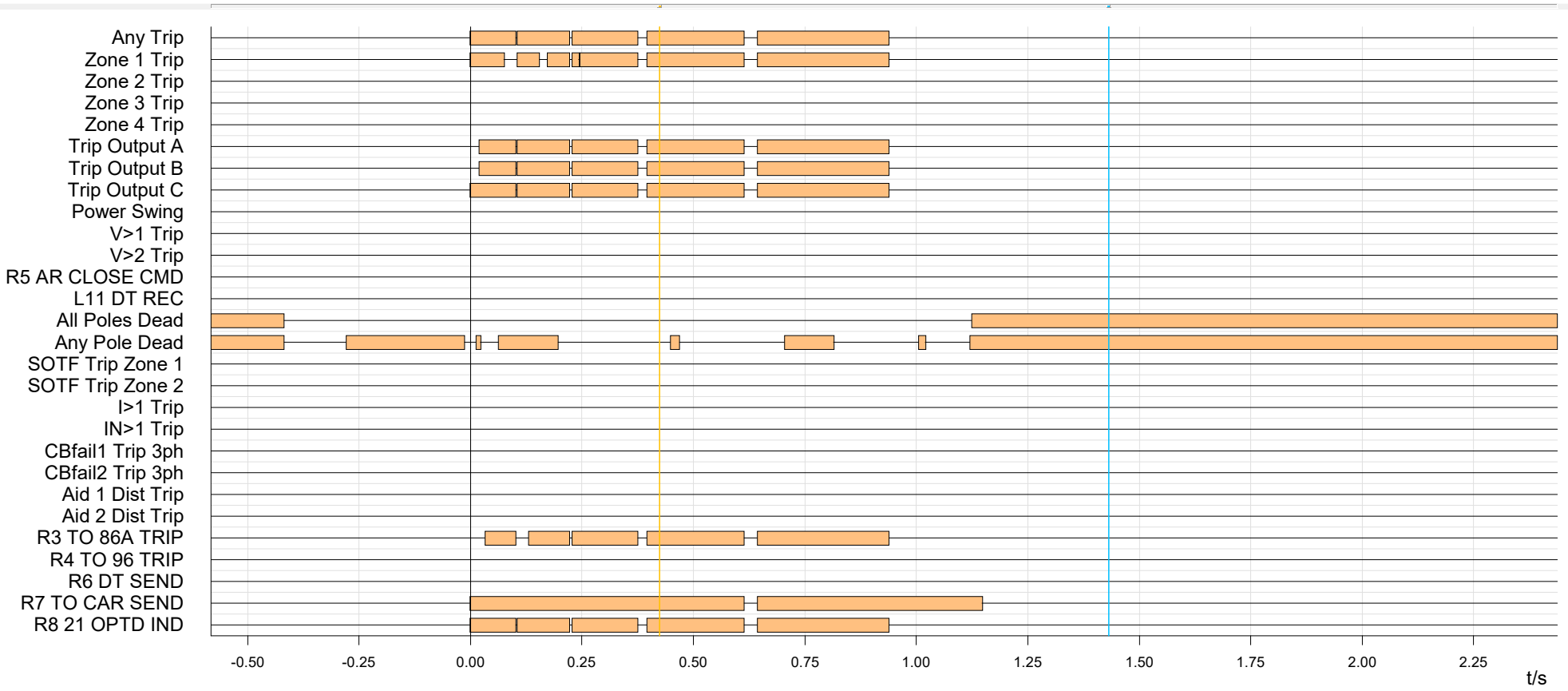
Value representation: secondary

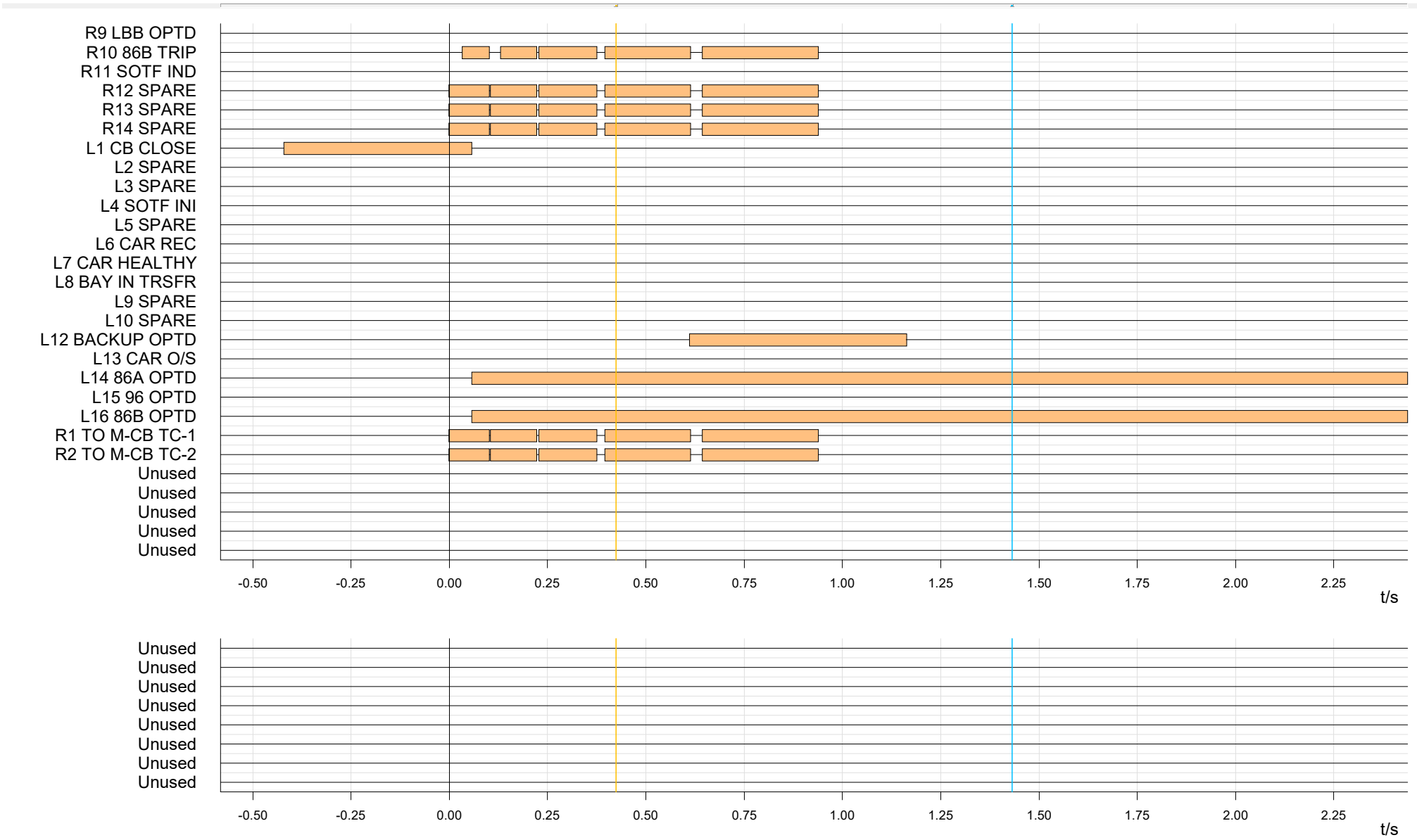
Record type: COMTRADE


Trigger
4/9/2025
4:23:40.050 PM
IA/ A
IB/ A
IC/ A
IN/ A
10
5
0
-0.50
-0.25
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
t/s


IN Sensitive/mA
2.5
0.0
-2.5
-5.0
-0.50 -0.25 0.00 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25
t/s
VA/ V
50
25
0
-0.50 -0.25 0.00 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25
t/s
VB/ V
50
25
0
-0.50 -0.25 0.00 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25
t/s
VC/ V
40
20
0
-0.50 -0.25 0.00 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25
t/s


IM/mA
5.0
2.5
0.0
-0.50
-0.25
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
t/s
V Checksync/ V
4
2
0
-0.50
-0.25
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
t/s


Any Trip
Zone 1 Trip
Zone 2 Trip
Zone 3 Trip
Zone 4 Trip
Trip Output A
Trip Output B
Trip Output C
Power Swing
V>1 Trip
V>2 Trip
R5 AR CLOSE CMD
L11 DT REC
All Poles Dead
Any Pole Dead
SOTF Trip Zone 1
SOTF Trip Zone 2
I>1 Trip
IN>1 Trip
CBfail1 Trip 3ph
CBfail2 Trip 3ph
Aid 1 Dist Trip
Aid 2 Dist Trip
R3 TO 86A TRIP
R4 TO 96 TRIP
R6 DT SEND
R7 TO CAR SEND
R8 21 OPTD IND
-0.50
-0.25
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
t/s


R9 LBB OPTD
R10 86B TRIP
R11 SOTF IND
R12 SPARE
R13 SPARE
R14 SPARE
L1 CB CLOSE
L2 SPARE
L3 SPARE
L4 SOTF INI
L5 SPARE
L6 CAR REC
L7 CAR HEALTHY
L8 BAY IN TRSFR
L9 SPARE
L10 SPARE
L12 BACKUP OPTD
L13 CAR O/S
L14 86A OPTD
L15 96 OPTD
L16 86B OPTD
R1 TO M-CB TC-1
R2 TO M-CB TC-2
Unused
Unused
Unused
Unused
Unused
-0.50
-0.25
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
t/s
Unused
Unused
Unused
Unused
Unused
Unused
Unused
Unused
-0.50
-0.25
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
t/s

FATHUA SS

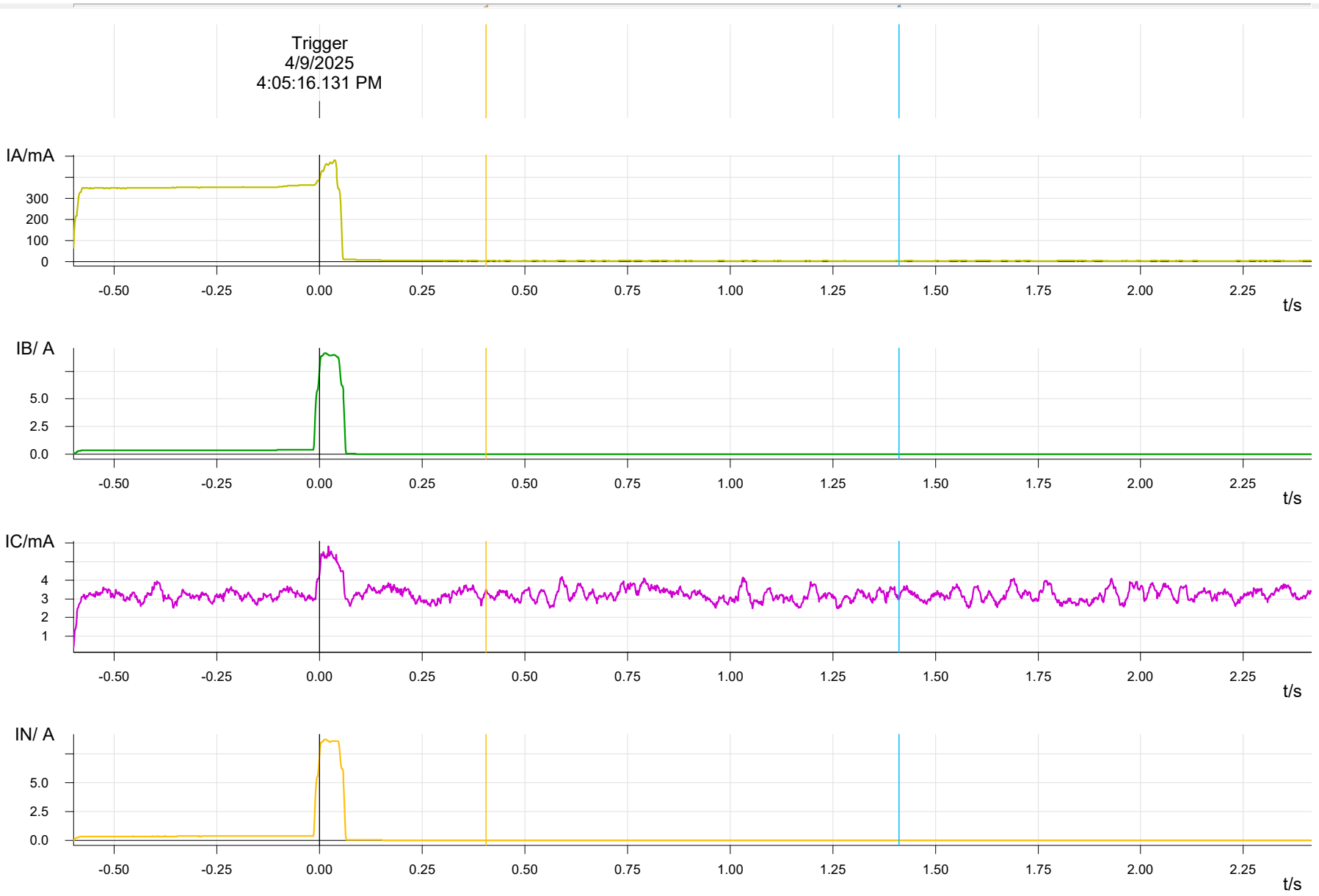
File path: C:\USERS\ADMIN\DESKTOP\FATUHA GSS-09.4.25\FATUHA-KATRA TL-DISTANCE RSLAY-09.04.25\25.04.09 16.05.16.000.000.CFG

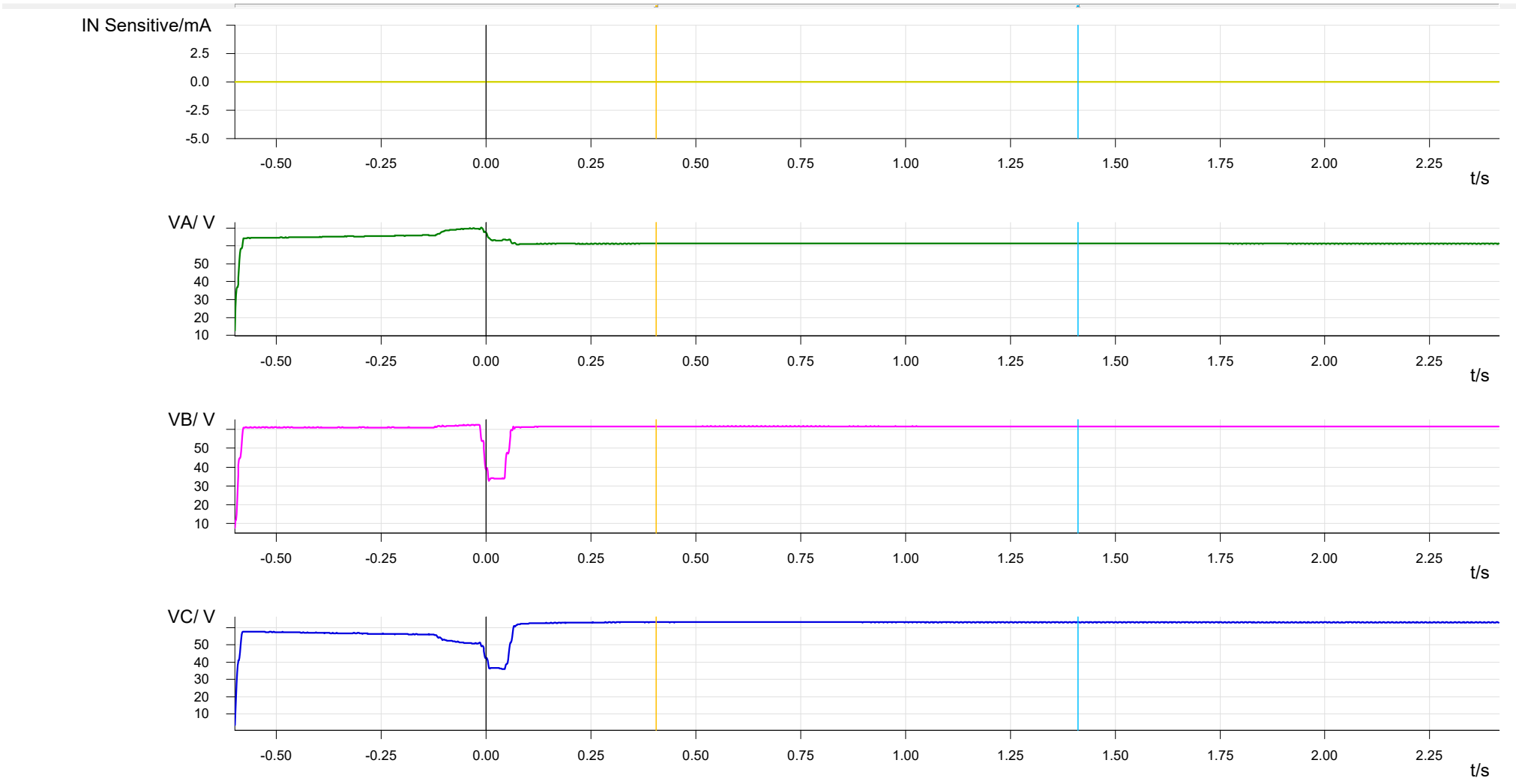
Start time: 4/9/2025 4:05:15.532 PM

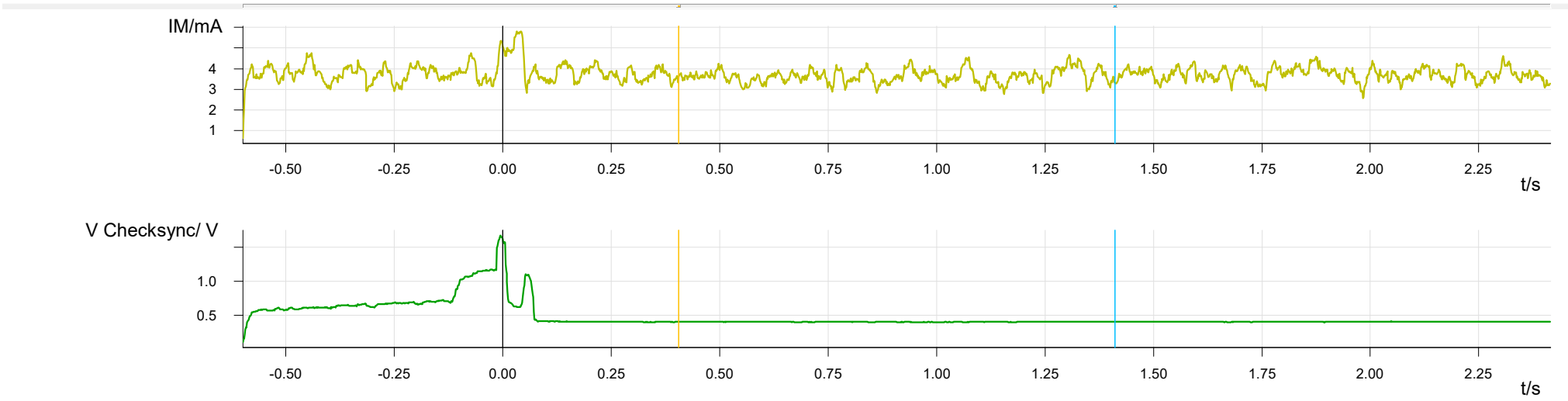
Sample rate: 2404 Hz

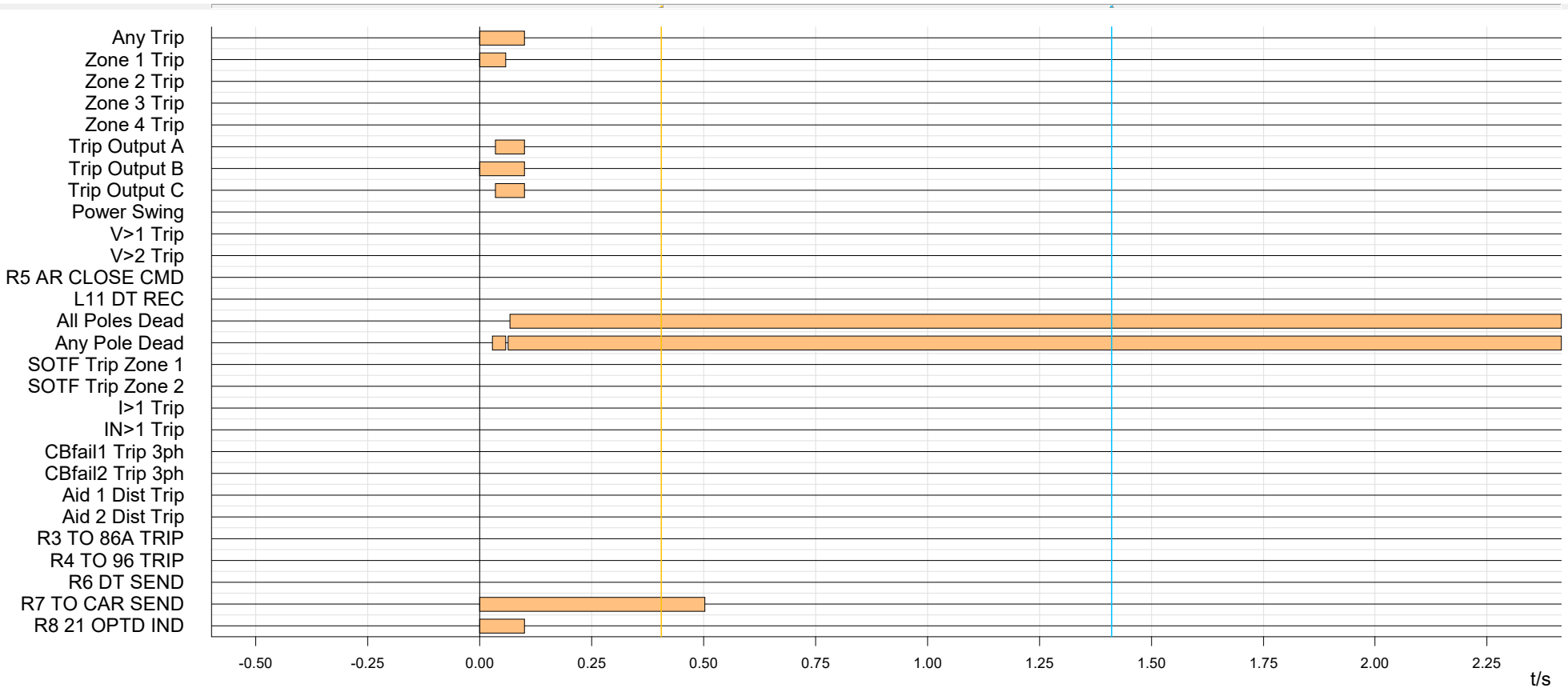
Value representation: secondary

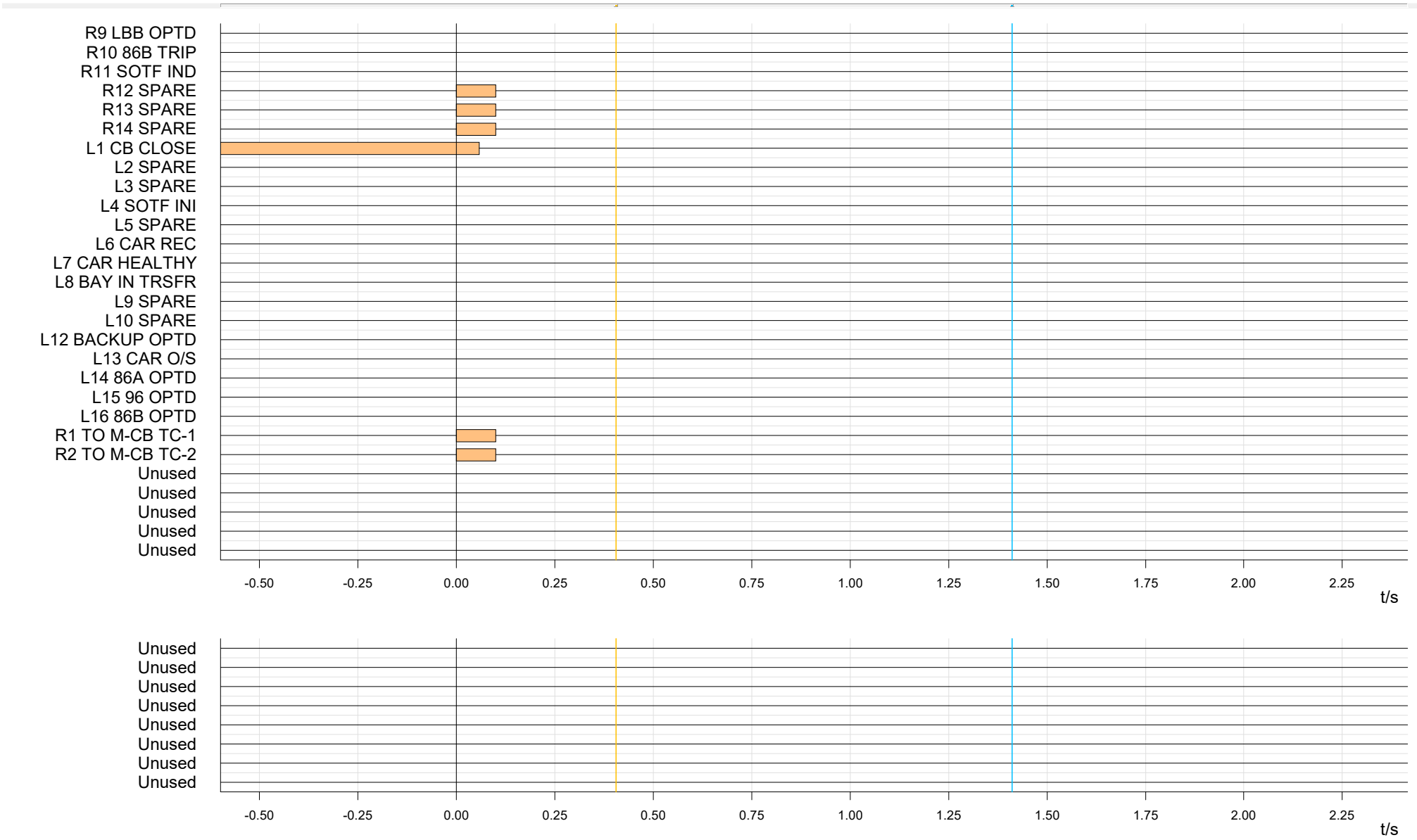
Record type: COMTRADE


Trigger
4/9/2025
4:05:16.131 PM
IA/mA
300
200
100
0
IB/ A
5.0
2.5
0.0
IC/mA
4
3
2
1
IN/ A
5.0
2.5
0.0
-0.50
-0.25
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
t/s


IN Sensitive/mA
2.5
0.0
-2.5
-5.0
-0.50 -0.25 0.00 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25
t/s
VA/ V
50
40
30
20
10
-0.50 -0.25 0.00 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25
t/s
VB/ V
50
40
30
20
10
-0.50 -0.25 0.00 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25
t/s
VC/ V
50
40
30
20
10
-0.50 -0.25 0.00 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25
t/s


IM/mA
4
3
2
1
-0.50
-0.25
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
t/s
V Checksync/ V
1.0
0.5
-0.50
-0.25
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
t/s


Any Trip
Zone 1 Trip
Zone 2 Trip
Zone 3 Trip
Zone 4 Trip
Trip Output A
Trip Output B
Trip Output C
Power Swing
V>1 Trip
V>2 Trip
R5 AR CLOSE CMD
L11 DT REC
All Poles Dead
Any Pole Dead
SOTF Trip Zone 1
SOTF Trip Zone 2
I>1 Trip
IN>1 Trip
CBfail1 Trip 3ph
CBfail2 Trip 3ph
Aid 1 Dist Trip
Aid 2 Dist Trip
R3 TO 86A TRIP
R4 TO 96 TRIP
R6 DT SEND
R7 TO CAR SEND
R8 21 OPTD IND
-0.50
-0.25
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
t/s


R9 LBB OPTD
R10 86B TRIP
R11 SOTF IND
R12 SPARE
R13 SPARE
R14 SPARE
L1 CB CLOSE
L2 SPARE
L3 SPARE
L4 SOTF INI
L5 SPARE
L6 CAR REC
L7 CAR HEALTHY
L8 BAY IN TRSFR
L9 SPARE
L10 SPARE
L12 BACKUP OPTD
L13 CAR O/S
L14 86A OPTD
L15 96 OPTD
L16 86B OPTD
R1 TO M-CB TC-1
R2 TO M-CB TC-2
Unused
Unused
Unused
Unused
Unused
-0.50 -0.25 0.00 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25
t/s
Unused
Unused
Unused
Unused
Unused
Unused
Unused
Unused
-0.50 -0.25 0.00 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25
t/s

PGCIL Jakkanpur-2855 / 132kV / Line B108 JAKK108DIS

File path:

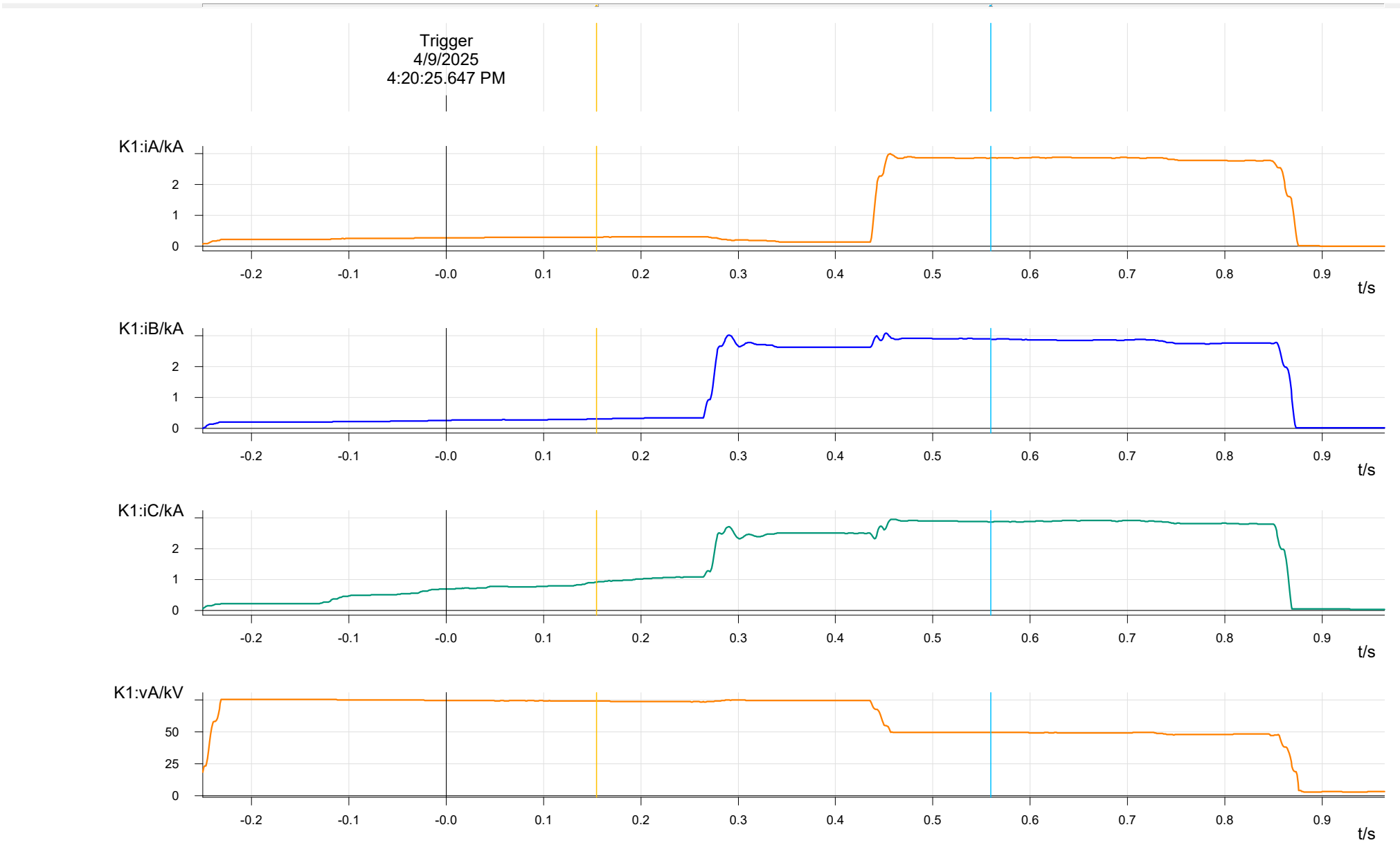
C:\USERS\ADMIN\DESKTOP\FATUHA GSS-09.4.25\132 KV JAKKANPUR NEW END ,DETAIL\132KV JAKKANPUR NEW DR09-04-2025\132KV FATUHA CKT 09-04-2025\FR000054.CFG

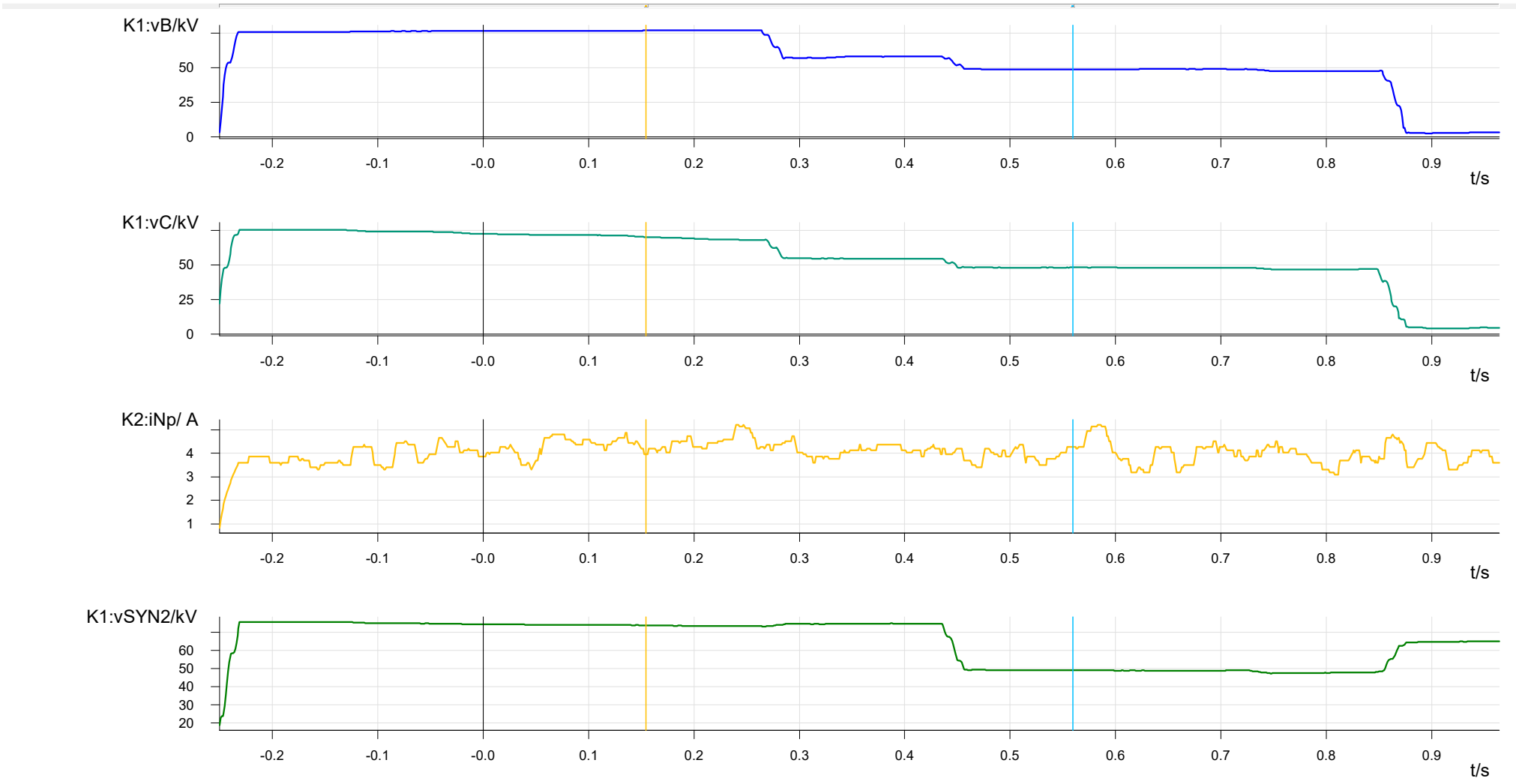
Start time: 4/9/2025 4:20:25.397 PM

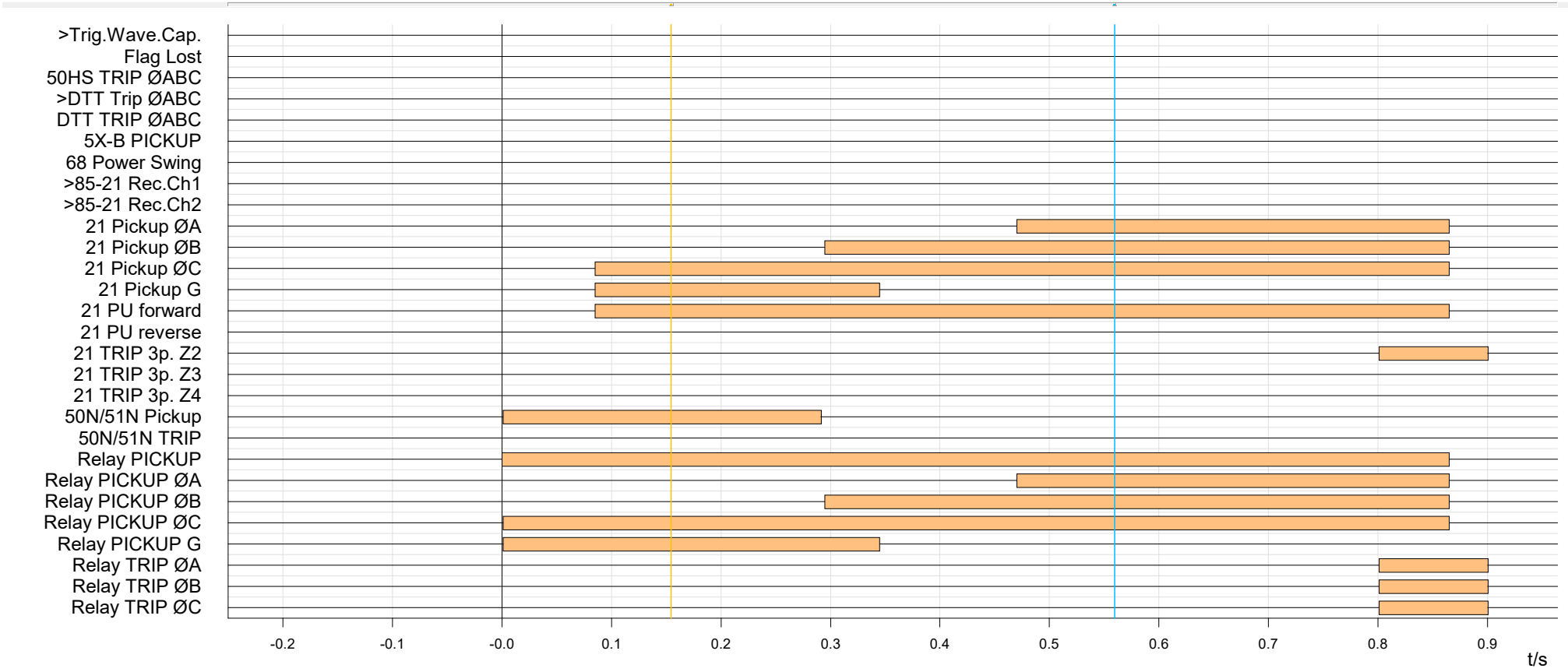
Sample rate: 1000 Hz

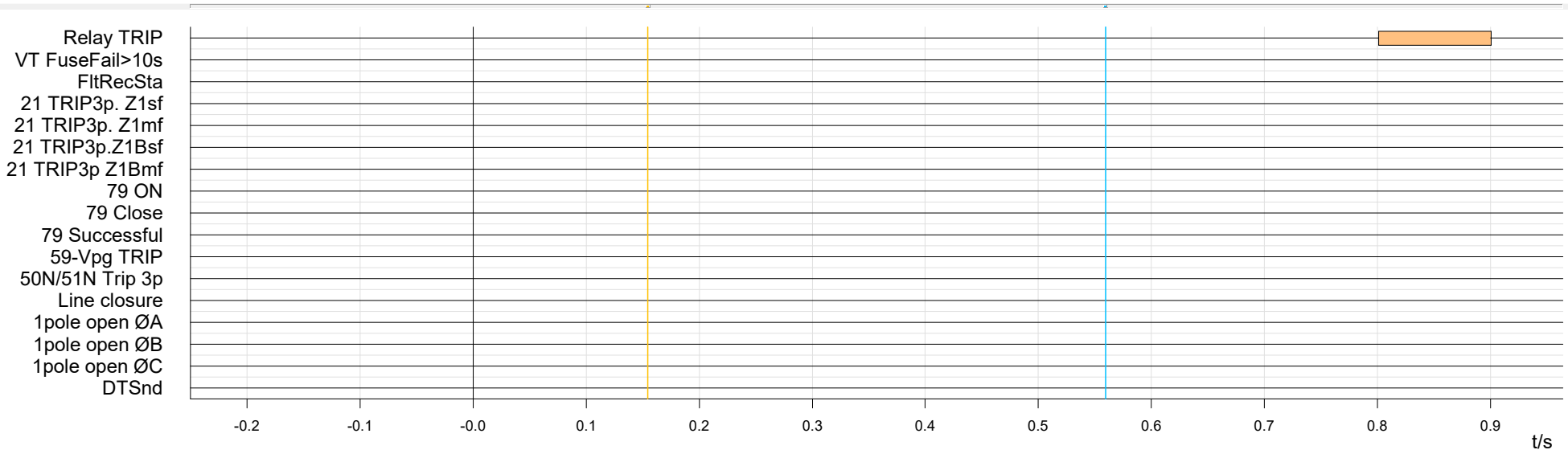
Value representation: primary

Record type: COMTRADE


Trigger
4/9/2025
4:20:25.647 PM
K1:iA/kA
2
1
0
-0.2
-0.1
-0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
t/s
K1:iB/kA
2
1
0
-0.2
-0.1
-0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
t/s
K1:iC/kA
2
1
0
-0.2
-0.1
-0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
t/s
K1:vA/kV
50
25
0
-0.2
-0.1
-0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
t/s


K1:vB/kV
50
25
0
-0.2
-0.1
-0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
t/s
K1:vC/kV
50
25
0
-0.2
-0.1
-0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
t/s
K2:iNp/ A
4
3
2
1
-0.2
-0.1
-0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
t/s
K1:vSYN2/kV
60
50
40
30
20
-0.2
-0.1
-0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
t/s


>Trig.Wave.Cap.
Flag Lost
50HS TRIP ØABC
>DTT Trip ØABC
DTT TRIP ØABC
5X-B PICKUP
68 Power Swing
>85-21 Rec.Ch1
>85-21 Rec.Ch2
21 Pickup ØA
21 Pickup ØB
21 Pickup ØC
21 Pickup G
21 PU forward
21 PU reverse
21 TRIP 3p. Z2
21 TRIP 3p. Z3
21 TRIP 3p. Z4
50N/51N Pickup
50N/51N TRIP
Relay PICKUP
Relay PICKUP ØA
Relay PICKUP ØB
Relay PICKUP ØC
Relay PICKUP G
Relay TRIP ØA
Relay TRIP ØB
Relay TRIP ØC
-0.2
-0.1
-0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
t/s


Relay TRIP
VT FuseFail>10s
FltRecSta
21 TRIP3p. Z1sf
21 TRIP3p. Z1mf
21 TRIP3p.Z1Bsf
21 TRIP3p Z1Bmf
79 ON
79 Close
79 Successful
59-Vpg TRIP
50N/51N Trip 3p
Line closure
1pole open ØA
1pole open ØB
1pole open ØC
DTSnd
-0.2
-0.1
-0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
t/s

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, टालिगंज, कोलकाता - 700033
Office : 14, Golf Club Road, Tollygunge, Kolkata - 700033
CIN : U40105DL2009GOI188682, Website : www.erldc.in, E-mail : erldcinfo@grid-india.in, Tel.: 033 23890060/0061

पूर्वी क्षेत्र के 220/132 केवी हटिआ में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event at 220/132 kV Hatia 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): 02-05-2025

1. Event Summary (घटना का सारांश):

Prior to the disturbance 220kV Hatia-Ranchi #2 was under plan shutdown. At 18:36 Hrs R-Earth fault occurred in 220kV-Hatia- Lohardaga #2(220kV Hatia- Lohardaga D/C kept idle charged from Hatia end) which was sensed by Hatia in reverse zone-4 protection instead of forward zone-1 protection due to reverse polarity of CT at Hatia end. All emanating line from Hatia tripped in Z-2 protection from remote end and Z-4 protection from Hatia end. 220kV Hatia S/s became dead and total 130 MW load loss occurred at Hatia.
Power was extended at 19:25 Hrs through 220 kV Ranchi- Patratu New D/C.

2. Time and Date of the Event (घटना का समय और दिनांक): 18:36 hrs of 15.04.2025

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
				Jharkhand	Jharkhand
Pre-Event (घटना पूर्व)	50.06	32746	24100	289	1308
Post Event (घटना के बाद)	50.05	32596	23950	289	1158

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

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां	220 kV Hatia II – PGCIL – I (under plan shutdown).

जो बंद है)	
Weather Condition (मौसम स्थिति)	Normal.

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Approximate load loss of 150 MW at Hatia S/s.
7. **Duration of interruption (रुकावट की अवधि):** Around 00:50 Hrs.

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

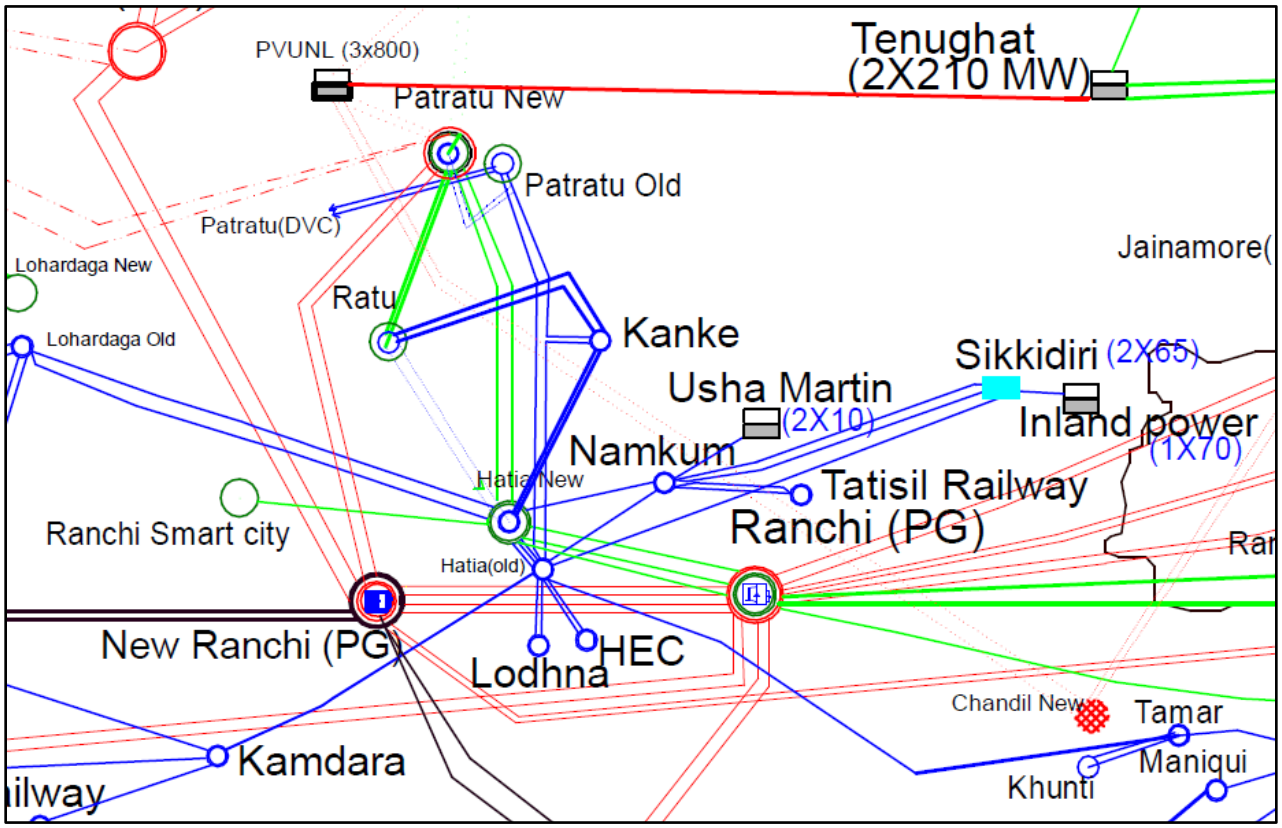


Figure 1: Network across the affected area

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

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

क्रo सo	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220 kV Hatia– Ranchi (PG) – II	18:36	Tripped on Over Voltage	R_N, Z-2, Fault Current- 3.73	19:29

			Protection	kA	
2	220 kV Hatia– Ranchi (PG) – III		R_N, Z-4, 1.9 km, Fault Current- 3.97 kA	R_N, Z-2, Fault Current- 3.95 kA 2	19:28
3	220 kV Hatia– Patratu – I		R_N, Z-4, 0.8 km, Fault Current- 1.95 kA	R_N, Z-2, 61.69 km, Fault Current- 1.709 kA	19:25
4	220 kV Hatia– Patratu – II		R_N, Z-4, 1.1 km, Fault Current- 1.95 kA	R_N, Z-2, 61.73 km, Fault Current- 1.735 kA	19:25
5	220 kV Hatia– Lohardaga – I		Tripped on Over Voltage Protection	-	Kept idle charged
6	220 kV Hatia– Lohardaga – II		R_N, Z-4, 1.9 km, Fault Current- 3.97 kA	-	
7	220 kV Hatia– Smart City s/c		Tripped on Over Voltage Protection	-	

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

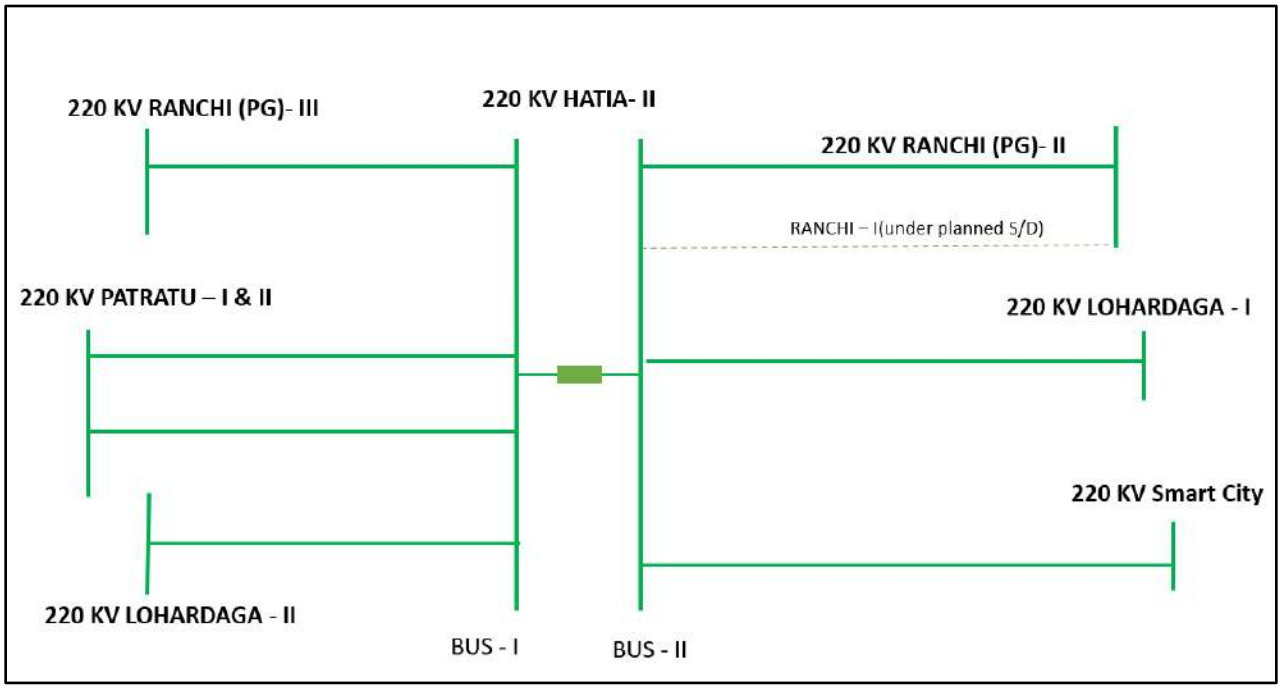


Figure-2: Single Line Diagram of Hatia S/s

- Prior to disturbance 220kV Hatia-Ranchi #1 was under planned S/D.
- At 18:36 Hrs R-Earth fault occurred in 220kV Hatia-Lohardaga #2 which was idle changed from Hatia end.
- This fault sensed by Hatia in reverse zone-4 protection instead of forward zone-1 protection **due to reverse polarity of CT at Hatia end**.

1.1 Trip Log - 000035 / 15-04-2025 18:40:33.213 - SPS_DUMKA / SPS DUMKA_23.10.24 / Hatia II_16.04.25 / Lohar - II/7SA522

Trip Log - 000035 / 15-04-2025 18:40:33.213 - SPS_DUMKA / SPS DUMKA_23.10.24 / Hatia II_16.04.25 / Lohar- II/7SA

Number	Indication	Value	Date and time	Cause	State
00301	Power System fault	35 - ON	15.04.2025 18:40:33.213		
00302	Fault Event	35 - ON	15.04.2025 18:40:33.213		
03682	Distance Pickup L1E	ON	0 ms		
03707	Distance Loop L1E selected reverse	ON	0 ms		
01335	Earth fault protection Trip is blocked	ON	4 ms		
03805	Distance TRIP command Phases L123	ON	505 ms		
03821	Distance TRIP 3phase in Z4	ON	505 ms		
00536	Relay Definitive TRIP	ON	505 ms		
00533	Primary fault current IL1	10.42 kA	509 ms		
00534	Primary fault current IL2	0.02 kA	509 ms		
00535	Primary fault current IL3	0.02 kA	509 ms		

Figure-3: Event Log of Hatia-Lohardaga #2 at Hatia

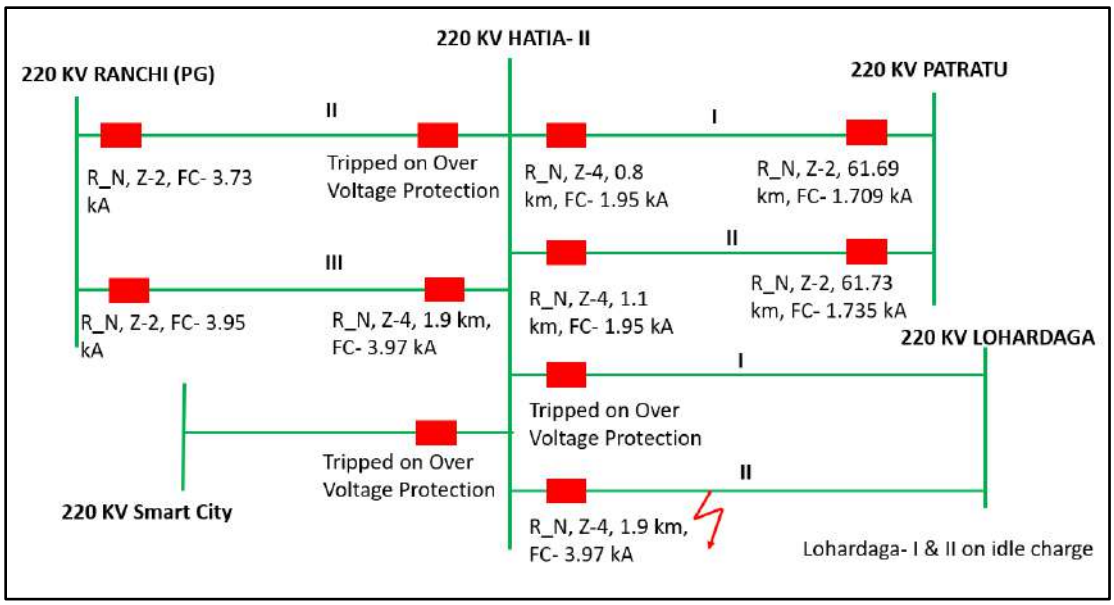


Figure-4: SLD of Hatia with tripping details

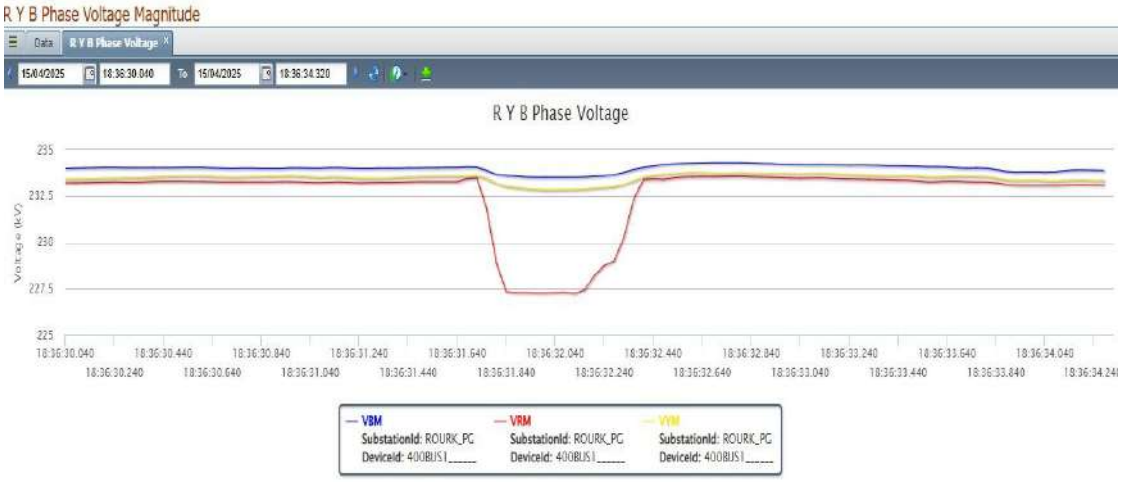


Figure-5: PMU of Rourkela Voltage

- 220kV Hatia-Patratu D/C and Ranchi #2 & 3 tripped on Z-2 protection from remote end.
- 220kV Hatia-Patratu D/C, Lohardaga #2 and Ranchi #3 tripped on Z-4 protection from Hatia end.
- Bus coupler tripped in Z-4 protection after 500 msec.
- Bus bar was unhealthy due to improper isolator status.
- After tripping of bus coupler fault in Lohardaga line cleared and 220kV bus#2 connected through 132kV system.
- 220kV Hatia-Smart City, Lohardaga #1 and Ranchi #2 which was connected to 220kV bus#2, tripped on over voltage protection from Hatia end.
- All emanating lines from Hatia tripped and 220kV Hatia S/s became dead.
- Total load loss of 150 MW occurred at Hatia and.

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

- Due to reverse CT polarity at Hatia fault in Lohardaga line was sensed in reverse Zone-4 protection instead of forward Zone-1 protection**. CT polarity of all feeders needs to be check.**
- Zone-4 not picked up for 220kV-Hatia-Ranchi#2 at Hatia end and further line tripped on over voltage protection from Hatia end after 5 sec. **Zone-4 setting may be checked.**
- Due to unhealthy bus bar protection all feeders connected to Hatia got tripped and disturbance occurred.
- If Bus bar protection operated, then partial feeders would have tripped, and disturbance would have not occurred**. It is requested to ensure all Bus bar protection healthiness in JUSNL jurisdictions to avoid disturbance**.
- As per operating procedure distance protection setting for anti-theft charged line should be instantaneous for all zones protection. If distance protection setting kept as per operating procedure for anti-theft charged line, then fault in Lohardaga line would clear instantaneously even in Zone-4 protection also and disturbance would not occur. It is requested to check and ensure setting of anti-theft charged line as per operating procedures.
- DR at Hatia are not time synchronised.
- Detailed report received from SLDC is attached in Annexure:3

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

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

S.No.	Issues	Regulation Non-Compliance	Utilities
1.	**DR/EL not submitted within 24 hours**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**JUSNL, PG(ER-1)**

15. Key Lessons Learnt (प्रमुख अधिगम बिंदु): Nil

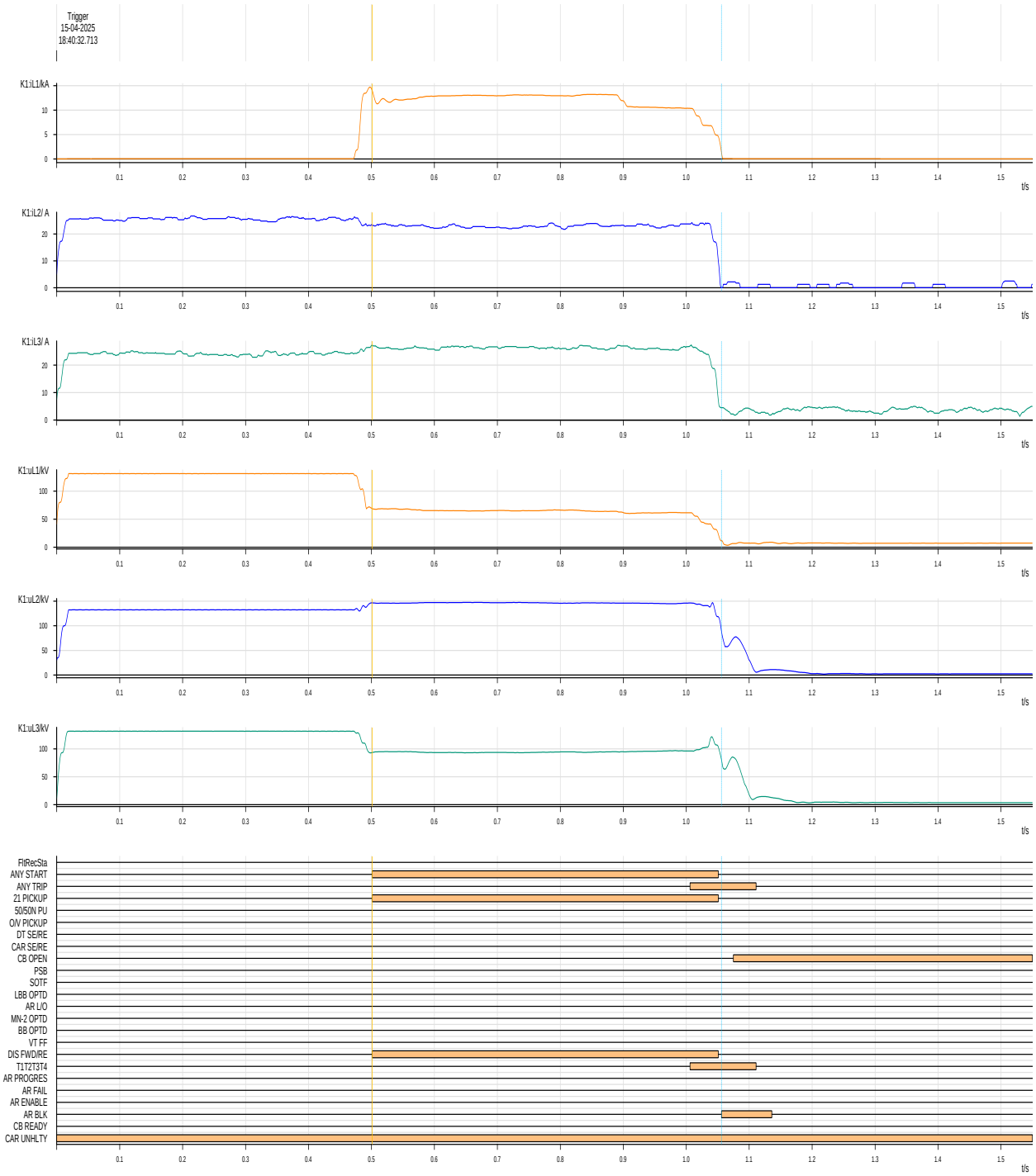
Annexure 1: (Sequence of Events-As per ERLDC SCADA):

TIME	MILLI_SEC	STATION	DESCRIPTION	STATUS
15-04-2025 18:36	973	RANCH_PG	220_HATNW_JH_3_CB	Open

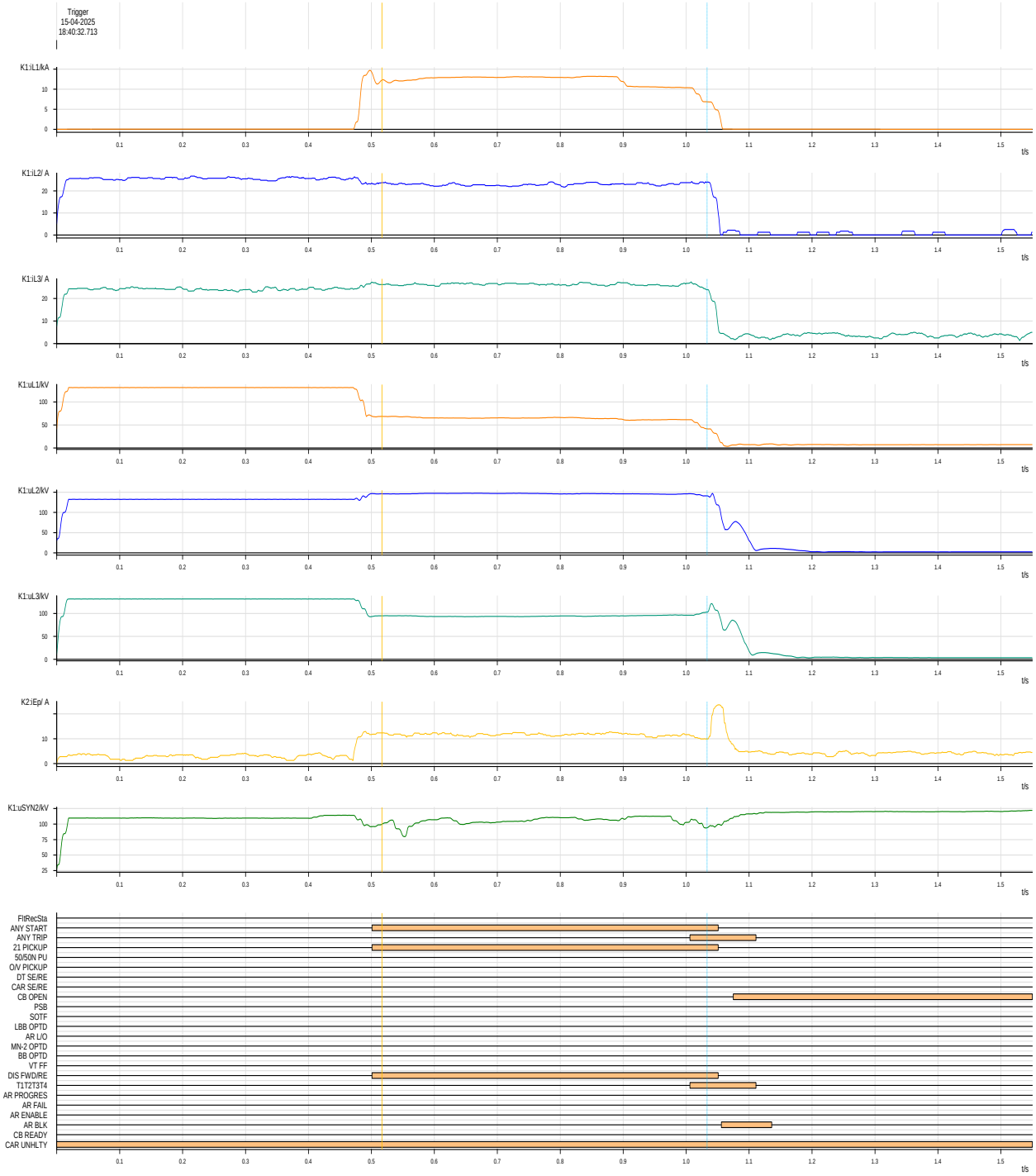
**** Remaining SOE not available at ERLDC end.**

Annexure 2:

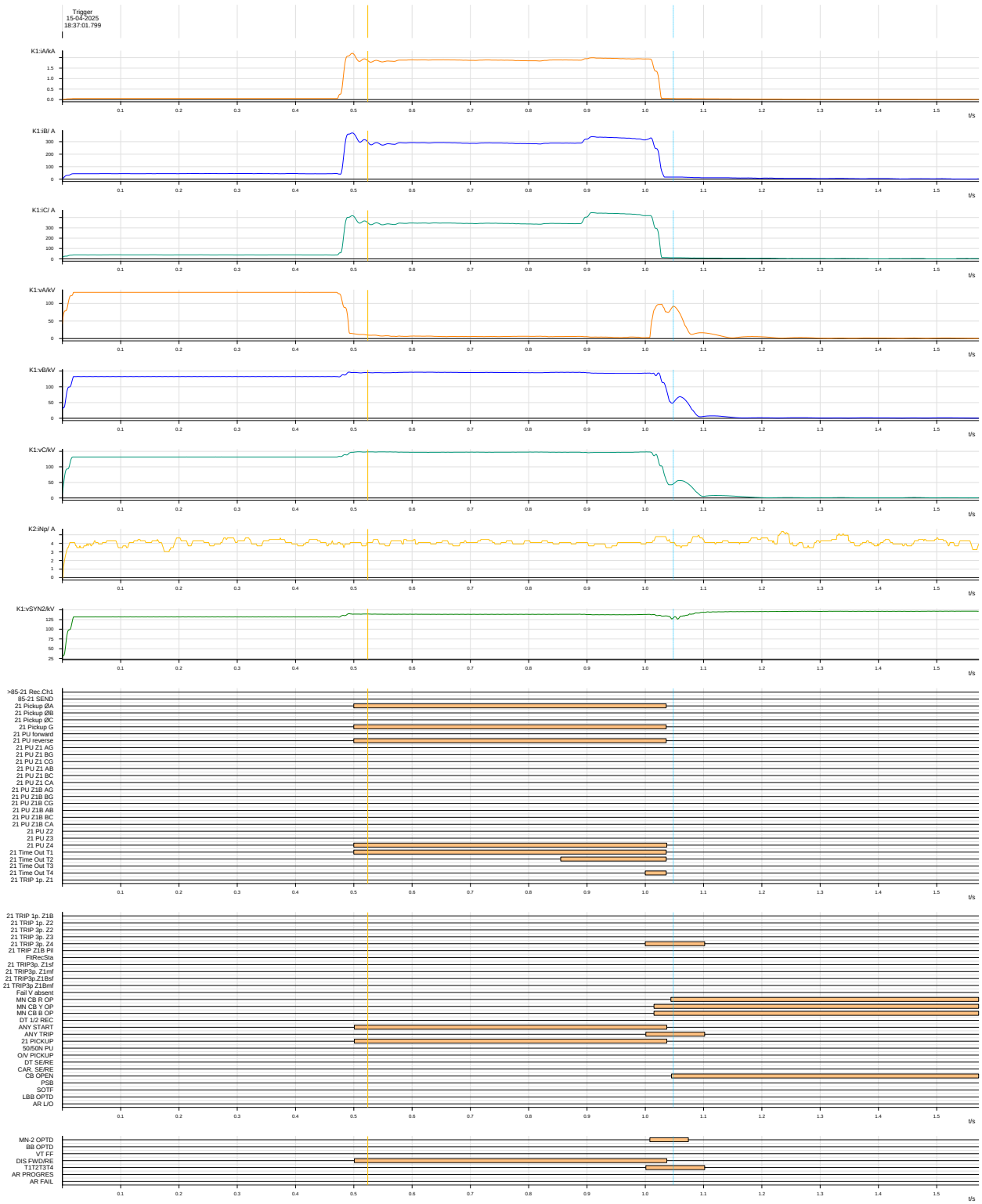
DR of 220 kV Hatia– Lohardaga – 2 at Hatia:



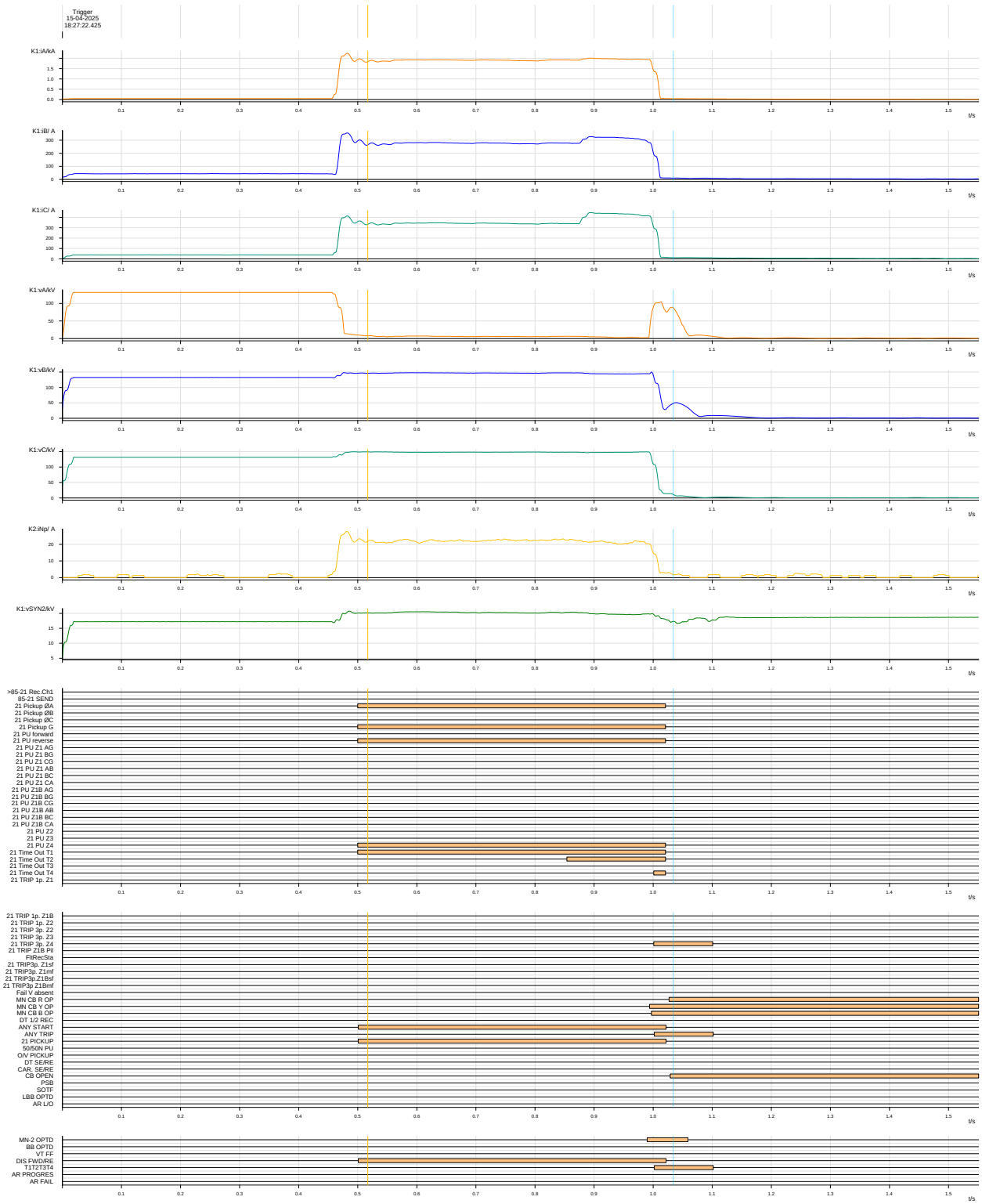
DR of 220 kV Hatia– Lohardaga – 1 at Hatia:



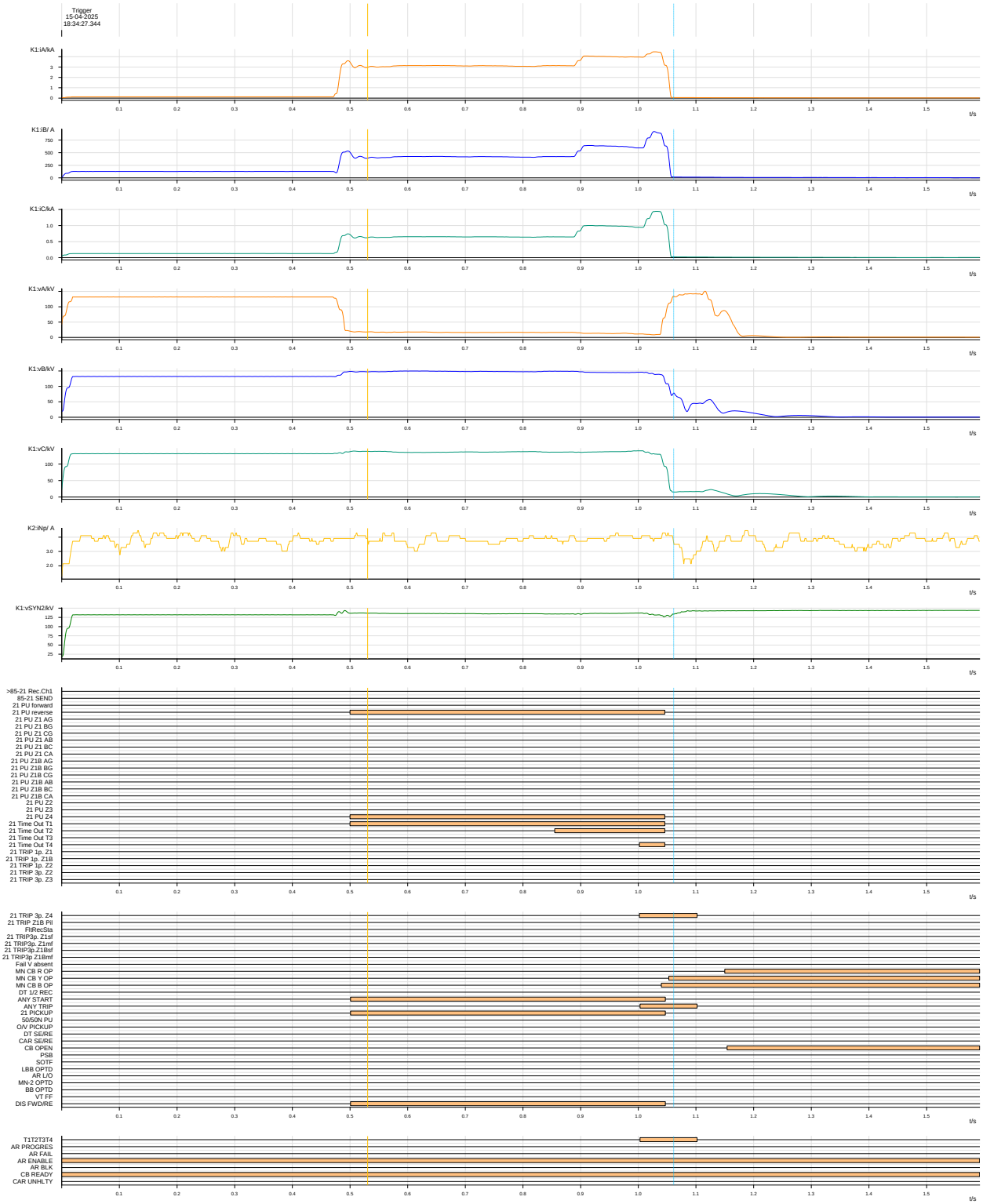
DR of 220 kV Hatia– Patratu – 1 at Hatia:



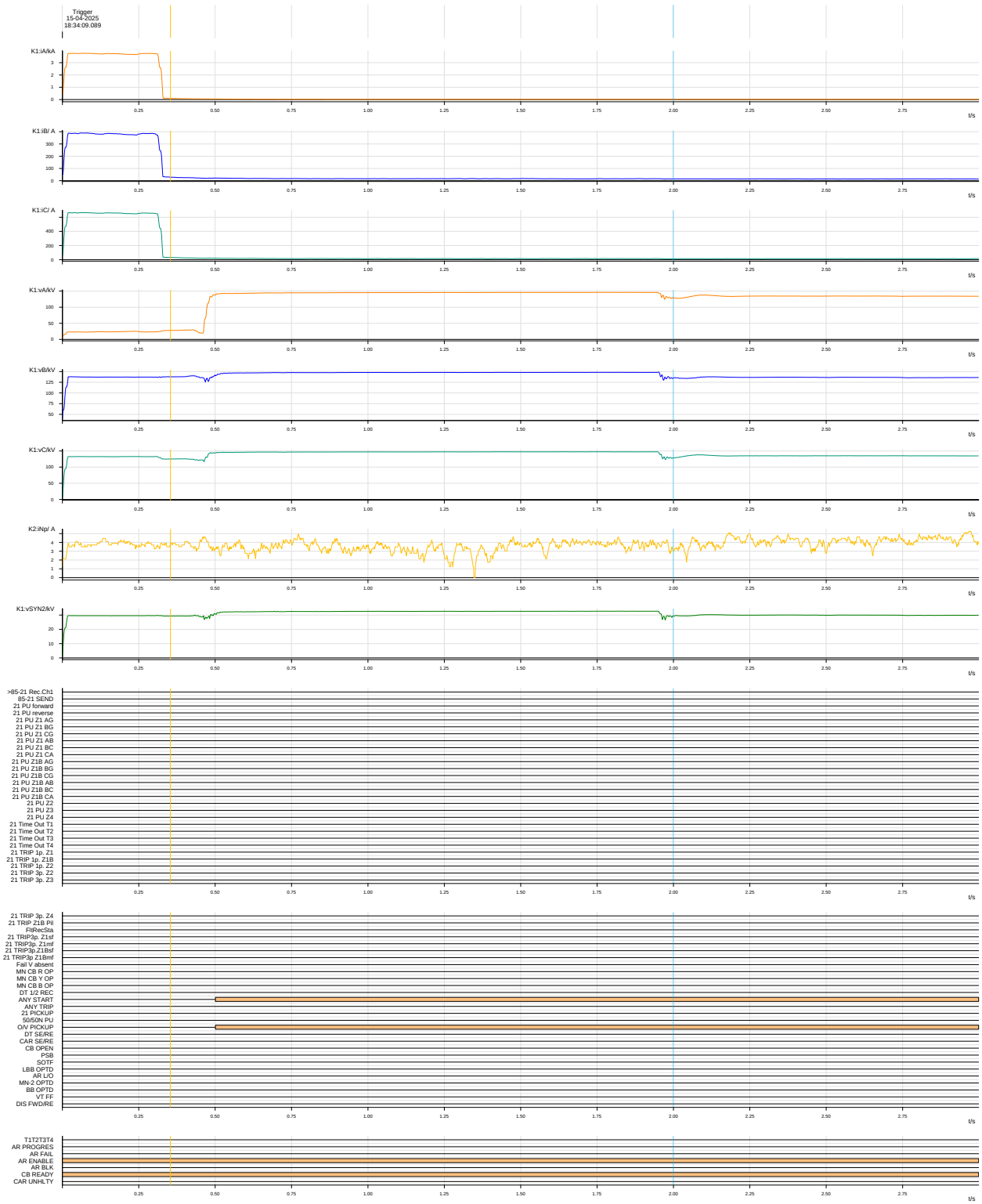
DR of 220 kV Hatia– Patratu – 2 at Hatia:



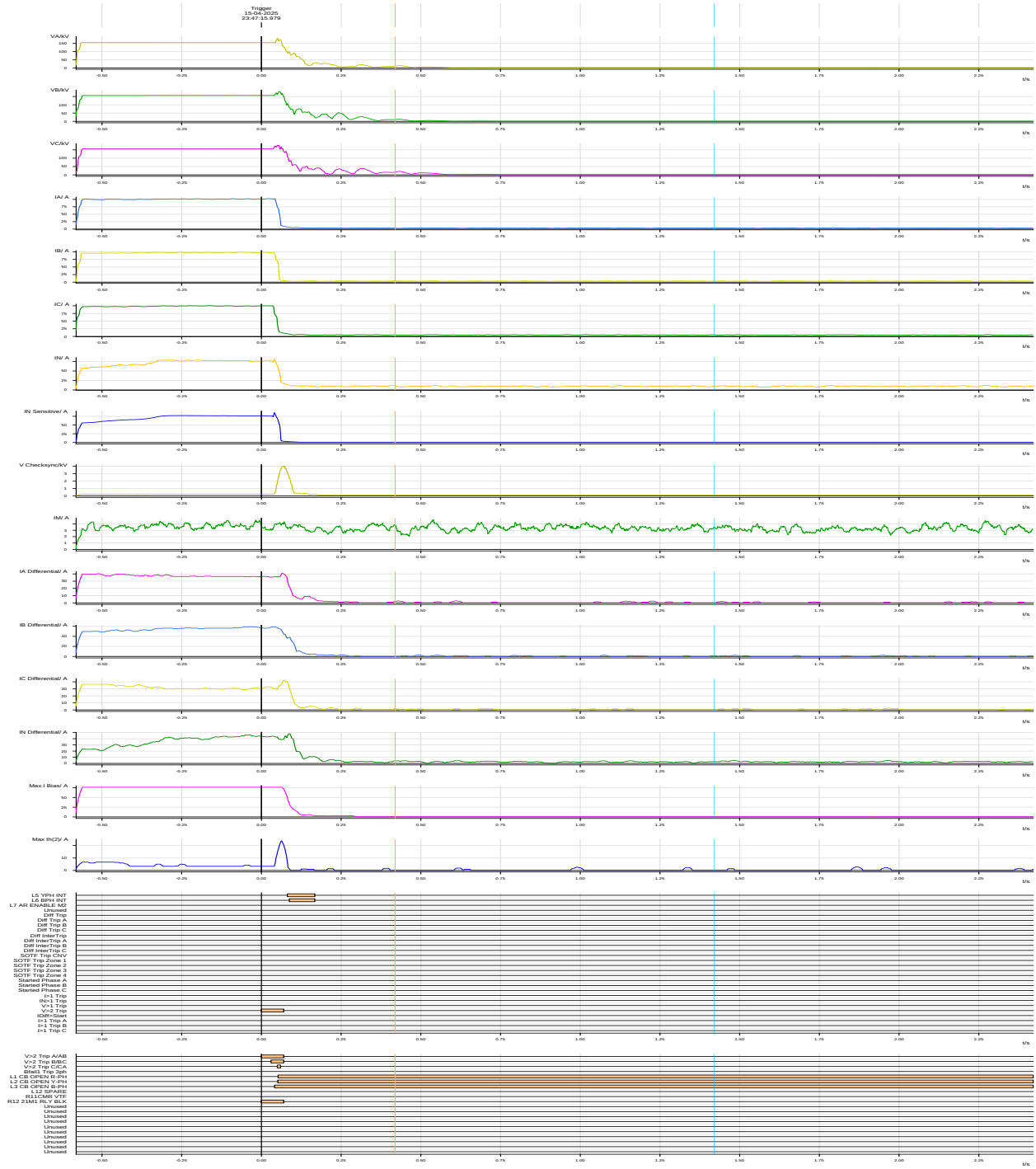
DR of 220 kV Hatia– Ranchi – 3 at Hatia:



DR of 220 kV Hatia– Ranchi – 2 at Hatia:



DR of 220 kV Hatia– Smart City at Hatia:



Annexure:3

<u>Total Power Failure (TPF) AT 220/132 kV HATIA - II GSS ON 15.04.2025 at 18:36 hrs</u> :-

Overview of Incident :-

At 18:36 hrs, 220 KV Ranchi (PG) – II & III and 220 kV Patratu – I & II feeders tripped on RN fault from Hatia- II end as well as remote end which leads to loss of all incoming 220 kV feeders and resulting Total Power failure at 220/132 GSS Hatia – II.

Load loss: 150 MW

Weather Condition – Inclement weather.

Outage duration :- 50 Minutes

Elements tripped during the event:-

- 220 kV Hatia II – Ranchi (PG) – II & III
- 220 kV Hatia II – Patratu – I & II
- 220 kV Hatia II – Lohardaga – I & II (On Idle charge)
- 220 kV Hatia II – Smart City s/c

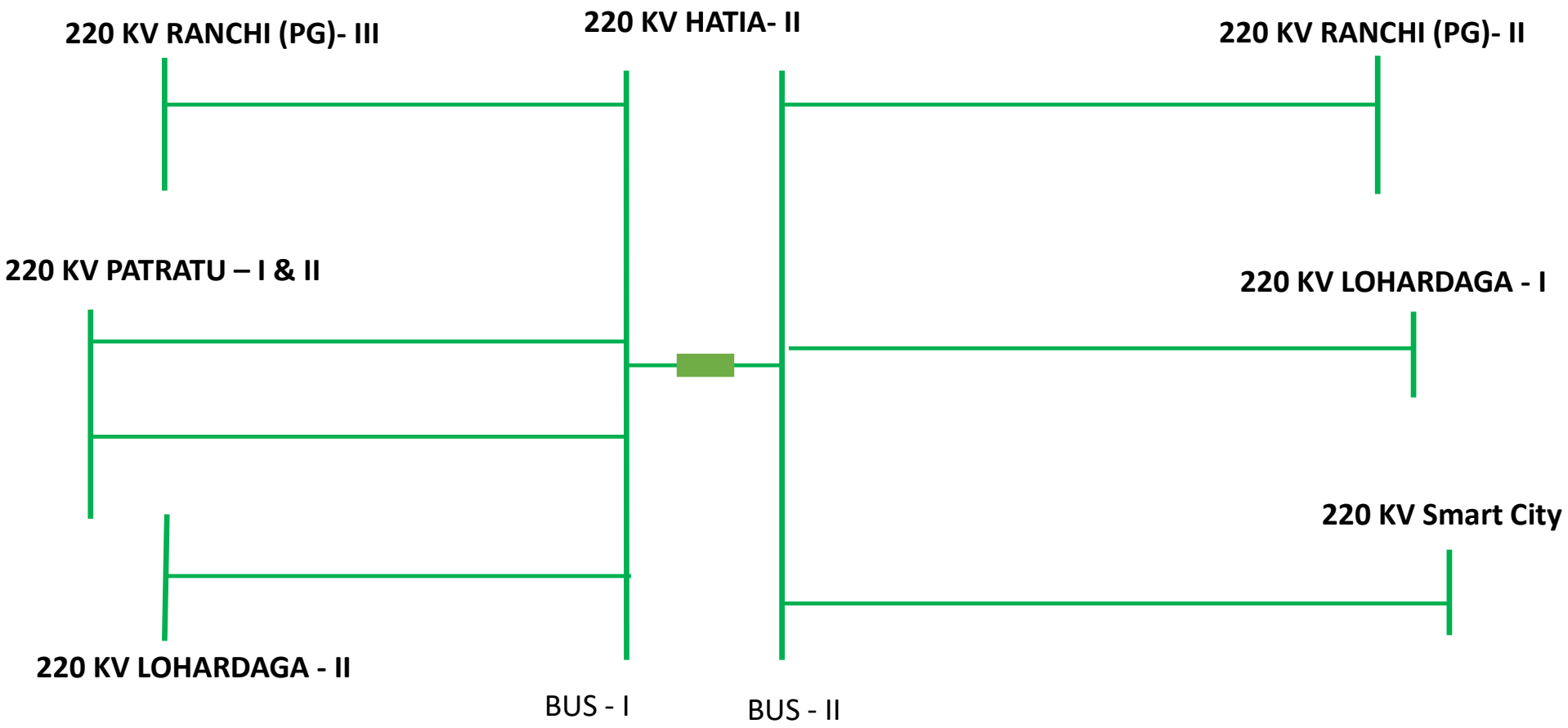
Elements under outage :- 220 kV Hatia II – PGCIL – I (under plan shutdown)

<u>Feeders Position</u> :-

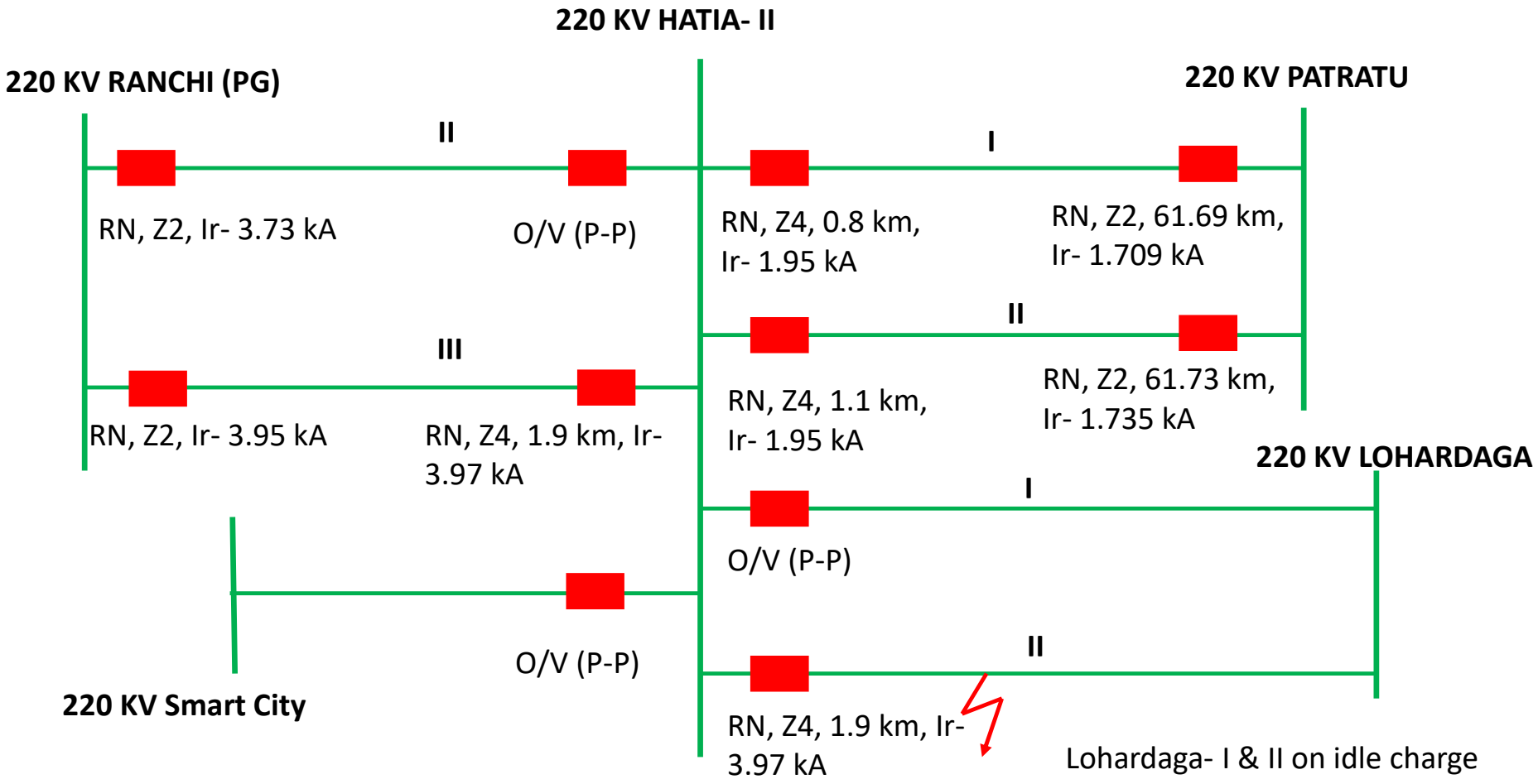
Main Bus – I : 220 kV Ranchi (PG) – III, 220 kV Patratu – I & II, 220 kV Lohardaga – II, ICT - I

Main Bus – II : 220 kV Ranchi (PG) – II, 220 kV Lohardaga – I, 220 kV Smart City, ICT – II & III

PREFAULT FEEDERS POSITION



FAULT CONDITION



Sl. No	Element	Relay at End 1	Relay at End 2	Restoration Time	Remarks
1	220 kV Hatia II – Ranchi (PG) – II	O/V (P-P)	RN, Z2, Ir- 3.73 kA	19:29	
2	220 kV Hatia II – Ranchi (PG) – III	RN, Z4, 1.9 km, Ir- 3.97 kA	RN, Z2, Ir- 3.95 kA 2	19:28	
3	220 kV Hatia II – Patratu – I	RN, Z4, 0.8 km, Ir- 1.95 kA	RN, Z2, 61.69 km, Ir- 1.709 kA	19:25	
4	220 kV Hatia II – Patratu – II	RN, Z4, 1.1 km, Ir- 1.95 kA	RN, Z2, 61.73 km, Ir- 1.735 kA	19:25	
5	220 kV Hatia II – Lohardaga – I	O/V (P-P)	-		Both lines were idle charge.
6	220 kV Hatia II – Lohardaga – II	RN, Z4, 1.9 km, Ir- 3.97 kA	-		
7	220 kV Hatia II – Smart City s/c	O/V (P-P)	-		
8	220 kV Bus Coupler	E/F, 1.284 kA			

Fault Analysis :-

- There was RN fault in 220 kV Hatia II – Lohardaga – II which was sensed in Z4 due to reverse polarity of CT and issued trip command to breaker.
- 220 kV Ranchi (PG) – III, 220 kV Patratu – I & II feeders also sensed this fault in Z4 simultaneously and tripped these feeders along with Bus coupler on Z4 time.
- 220 kV Ranchi (PG) – II & III, 220 kV Patratu – I & II feeders also tripped from remote end on Z2.
- At the time of incident 220 kV Hatia II – Lohardaga – I & II feeders was on idle charge.

Fault Analysis :-

- 220 kV Ranchi (PG) – II & III feeders tripped on Z2 in <450 ms from remote end.

- 220 kV Patratu – I & II feeders tripped on Z2 in <600 ms from remote end. (tZ2= 500 ms at Patratu end)

- At the time of incident Bus bar protection is unhealthy (got blocked) due to improper isolator status.

Protection/Operational issues observed

- CT polarity of 220 kV Hatia II – Lohardaga – II feeder for both Main – 1 & 2 core was found reverse. This has been rectified on 17.04.2025.

- Setting of 220 kV Hatia II – Lohardaga – I & II feeders was not kept as per idle charge (no load) condition.

  The setting of these feeders were revised as per idle charge (no load) condition on 16.04.2025.

- Bus bar protection is unhealthy due to improper isolator status.

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, टालिगंज, कोलकाता - 700033
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पूर्वी क्षेत्र के 220/132 केवी बेगुसराई और बरौनी में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event at 220/132/33 kV Begusarai and 220 KV Barauni TPS 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): 02-05-2025

1. Event Summary (घटना का सारांश):

1st event- On 20/04/25 at 10:00 Hrs, due to bursting of 132 KV Y phase PT at Begusarai, a three phase Bus fault at 132 KV Begusarai substation occurred which was ultimately cleared through remote ends of 220 KV lines from Begusarai in zone 3. At this time, Barauni 220 KV bus 2 along with unit 8 and Mokama ckt 2 and Hazipur ckt 2 also tripped on LBB operation. Above event led to loss of 170 MW at Begusarai and 220 MW at Barauni.

2nd event – After above tripping in Barauni, another bus with unit 9, Hazipur ckt 1 and Mokama ckt 1 were in service,At 12:43 hrs fault occurred in 220 KV Barauni Hazipur ckt 1,which led to island formation of Unit 9 with Mokama loads through Mokama ckt 1.Ultimately island collapsed due to load generation imbalance leading to 257 MW load loss and 199 MW generation loss.

2. Time and Date of the Event (घटना का समय और दिनांक): 10:00:37 hrs of 20.04.2025

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

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

5. Antecedent Conditions for 1st event (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
				Bihar	Bihar
Pre-Event (घटना पूर्व)	50.05	22948	23066	452	4883
Post Event (घटना के बाद)	50.05	22716	22896	232	4713

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

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो बंद है)	1.220 KV Begusarai-BTPS 2 2.220 KV Begusarai-Saharsa PG 1 3.220 KV Begusarai-Samastipur 2 4.220 KV Begusarai-Khagaria D/C
Weather Condition (मौसम स्थिति)	Normal.

6. Antecedent Conditions for 2nd event (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
				Bihar	Bihar
Pre-Event (घटना पूर्व)	50.05	21499	24663	199	5074
Post Event (घटना के बाद)	50.05	21300	24406	0	4817

7. Load and Generation loss (लोड और जेनरेशन हानि**):**

Event 1 Approximate load loss of 170 MW at Begusarai S/s and 220 MW Generation at Barauni.

Event 2 Approximate load loss of 257 MW at Mokama S/s and 199 MW Generation at Barauni.

Total 420 MW generation loss and 427 MW Load loss.

8. Duration of interruption (रुकावट की अवधि**): Event 1** From 10:00:37 Hrs. to 10:30 hrs.

Event 2 From 12:43 Hrs. to 13:30 hrs

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

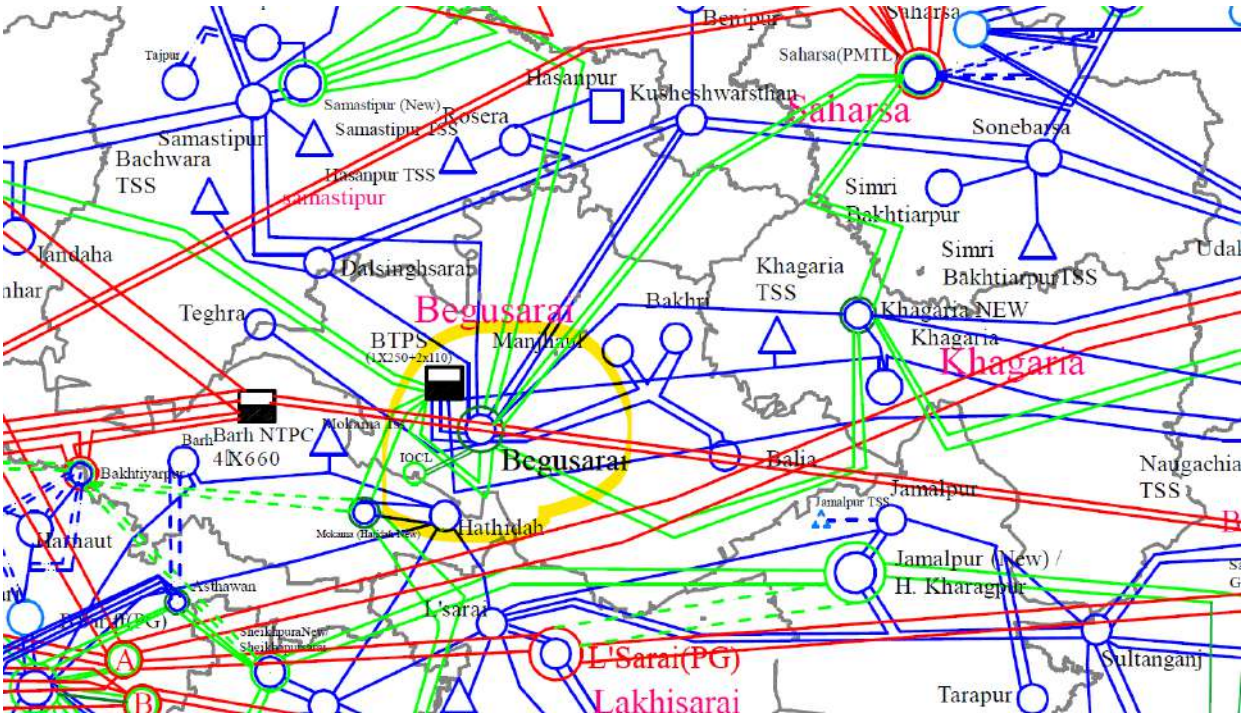


Figure 1: Network across the affected area

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

11. Major Elements Tripped (प्रमुख ट्रिपिंग):

Event 1

क्रoसo	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220/132 KV 100 MVA ICT 1 at Begusarai	10:00:37	Tripped on Directional earth fault high set	-	NA
2	220/132 KV 100 MVA ICT 2 at Begusarai		Tripped on Directional earth fault high set	-	NA
3	220/132 KV 100 MVA ICT 3 at Begusarai		Started Tripping on Directional earth fault but R ph stuck	-	NA
4	220 KV Begusarai-BTPS 1		Tripped on Zone 3 from	No tripping at Begusarai	NA

			Barauni end		
5	220 KV Begusarai-Saharsa PG 2		Tripped on Zone 3 from Saharsha end	No tripping at Begusarai	11:44
6	220 KV Begusarai-BTPS 2		BFR protection initiated for connected bus at Barauni	Line already open	
7	220 KV Begusarai-Samastipur 1		Tripped from Samastipur end on zone 3.DR not available	No tripping at Begusarai -	NA
8	220 KV Bus 2 at Barauni connected to Begusarai ckt 2		Tripped on LBB	-	NA
9	220 KV Barauni-Hajipur 2		Tripped with 220 KV Bus 2 at Barauni	-	NA
10	220 KV Barauni-Mokama 2		Tripped with 220 KV Bus 2at Barauni	-	NA
11	Unit 8 at Barauni		Tripped with 220 KV Bus 2 at Barauni	-	NA

Event 2

क्रoसo	**नाम**	**Trip time (hh:mm:ss)**	**उप केंद्र 1 रिले संकेत**	**उप केंद्र 2 रिले संकेत**	**Restoration time**
1	220 KV Barauni-Hajipur 1	12:43	**Dist protection Z2,Ib2.176 KA,ic 2.461 KA,Zone 1**	Hazipur did not trip as fed radially	13:32
2	220 KV Barauni-Mokama 1		-	-	13:30
3	Unit 9 at Barauni		Underfrequency stage 2 at 12:43:08 sec	-	19:25

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

Event 1

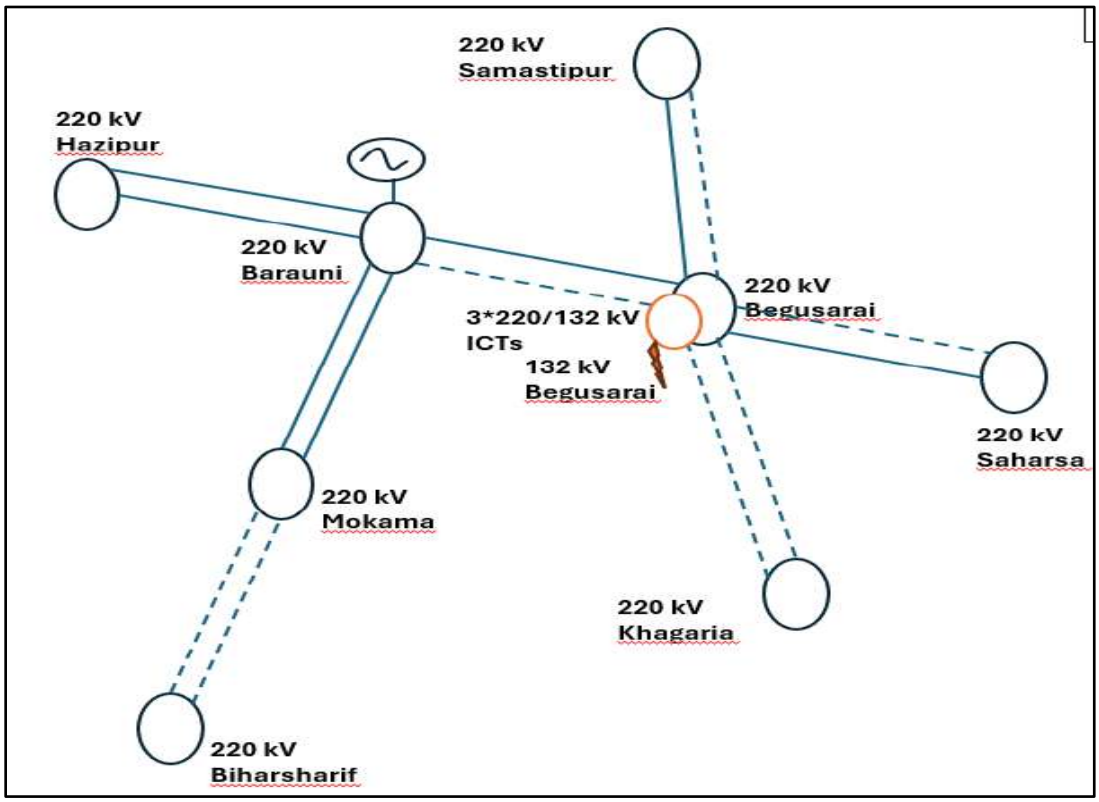


Figure-2: Single Line Diagram of Hatia S/s

Event 1

- On 20/04/25 at 10:00 Hrs, due to bursting of 132 KV Y phase PT at Begusarai, it got evolved to a three phase Bus fault at 132 KV Begusarai substation.
- 3x 100 MVA 220/132 KC ICT 1 ,2 and 3 tripped on DEF high set, however R ph in ICT 3 at HV side got stuck.
- As 220 KV Begusarai also did not have bus bar protection, so fault was cleared from connected lines all lines connected to Begusarai tripped (Begusarai ckt 1, Samastipur 1, Saharsha ckt 2) on Zone 3. Rest other lines from Begusarai were already under shutdown.
- Thus, total load loss occurred at 220/132 KV Begusarai s/s.
- At the same instance, as fault was being fed via220 KV Barauni -begusarai -1 the parallel circuit 220 KV Barauni Begusarai ckt 2 which was under shutdown saw induced current in its CT as it was not earthed both side and initiated trip in Zone 1.
- Since its breaker phases were already open, LBB protection operated after 200 msec which led to tripping of 220 KV barauni bus 2 leading to generation loss of Unit 8 and connected lines like Mokama ckt 2 and hazipur ckt 2.

Below is the network condition after Event-1.

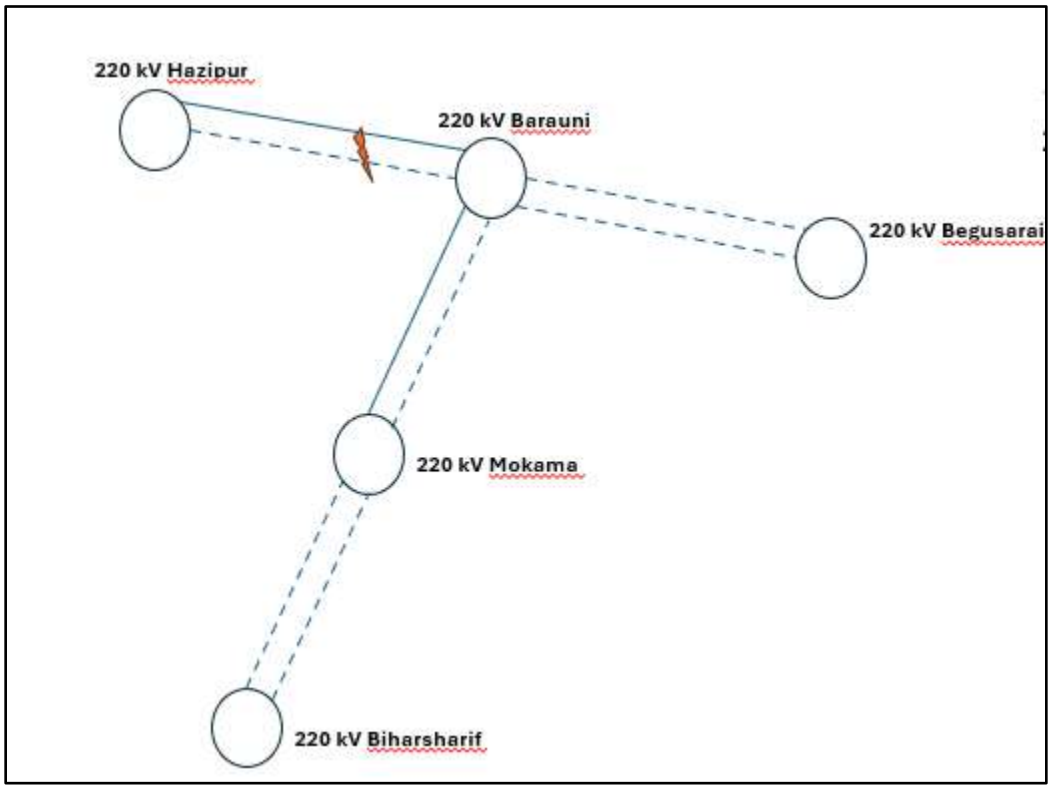


Figure-3: Event Log of Hatia-Lohardaga #2 at Hatia

Event 2

- After Event 1, 220 KV Barauni bus 1 was in service with Unit 9, Hazipur ckt 1 and Mokama ckt 2.
- Y-B fault appeared in 220 KV Barauni Hazipur ckt 1 which tripped on Zone 1.
- As a result, Unit 9 of Barauni in bus 1 formed an island with Mokama loads.Due to load generation imbalance, unit tripped in underfrequency stage 2(Load-257 MW generation 199 MW).

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

- First event occurred at 10:00 Hrs but lines from Barauni were not charged for more than two and half hours. At 12:43 Hrs, another event occurred. If 220 kV Barauni-Begusarai-1 or 220 kV Barauni-Hazipur-2 was charged in time, the 2nd event could have been avoided. **Better Co-ordination required between BTPS and BSPTCL /SLDC for faster restoration**.
- 220 KV Mokama is kept radially on Barauni and thus Biharshariff Mokama d/c was kept open. As Barauni was only evacuating through a single circuit of Hazipur after 1st Event and if Biharshariif -Mokama would have been closed, the 2nd event could have been avoided.

- on 115th PCC, similar issue was discussed and recommendation on the same line was given. The apprehension in keeping above lines out was overloading in 220 KV Barauni - Begusarai d/c But as after 1st event one One unit was present there was no chance of overloading.
- Also these ckts have been reconductored with HTLS with ampacity up to 400 MW and overloading is not a concern. **Operational SOP to be prepared for Closing Biharshariff - Mokama Under Contingency by SLDC. BTPS and BSPTCL to ensure protection setting of these lines accordingly so that Full line capacity can be utilised.**
- Bus bar protection is not available at Begusarai. Both disturbances could have been avoided if bus bar protection was available. **BSPTCL to ensure Busbar as early as possible.**
- At Barauni, CT is on the line side. For such scheme, local CT earthing should be done, which was discussed in 104th PCC meeting. Such action would avoid operation of Zone in Barauni Begusarai ckt 2 which was already under shutdown and would not have led to initiation of LBB signal for 220 KV bus 2 at Barauni thus avoiding 225 MW generation in event 1. **BTPS to Ensure local CT earthing form Next Shutdown**.
- 220 KV Begusarai Saharsha ckt 2 tripped on zone 3 at Saharsha end which was delayed upto 2 sec.
- DR is not available as informed at Samastipur end.
- Bus bar CU DR length at Barauni is 1.2 sec.
- Record notes of Meeting to discuss disturbance at Begusarai (At 10:00 Hrs) and Barauni (At 12:43 Hrs) on 20.04.2025 is attached in Annexure:3

14. Action Taken/Remedial Measures (सुधारात्मक उपाय):

- An online meeting (MS Teams) was held at 15:00 Hrs on 25.04.2025 with representatives from ELRDC, SLDC Bihar, Barauni TPS, BSPTCL to discuss the disturbance occurred at Begusarai on 20.04. 2025.Following action points were agreed:
    - BSPTCL to share Ampacity of 220 kV Barauni-Bagusarai D/c. -**BSPTCL**
    - BSPTCL and Barauni NTPC to change CT core to 1600:1 at both ends of 220 kV Begusarai-Barauni D/c to facilitate utilization of full capacity of the line. Protection setting at both ends to be change accordingly. -**BSPTCL, Barauni**
    - SLDC Bihar to facilitate shutdown of the lines to incorporate necessary changes. -**SLDC Bihar**
    - SLDC Bihar to ensure that at any point of time, Barauni NTPC remains connected at two nodes in the grid to avoid islanding of the generating S/s. -**SLDC Bihar**

- SLDC Bihar to ensure that, Barauni plant always remain connected at two nodes in the grid to avoid islanding of the generating S/s. Biharshariif -Mokama D/C to be closed accordingly as per the need to ensure the same -**SLDC Bihar**
- BSPTCL to expedite commissioning of Bus bar protection for 220 kV and 132 kV Bus at Begusarai. - **BSPTCL**
- Local earthing for CT to be done for those lines having CT on the line side while the line is in shutdown. – **Barauni**

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

S.No.	Issues	Regulation Non-Compliance	Utilities
1.	**DR/EL not submitted within 24 hours**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**BSPTCL, PG(ER-1)**

16. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- LOCAL CT earthing to be ensured for line which is under Shutdown so that for a fault in Parallel line induced current in CT should not cause LBB Operation.
- Operational SOP to be prepared for closing Biharshariff -Mokama line .

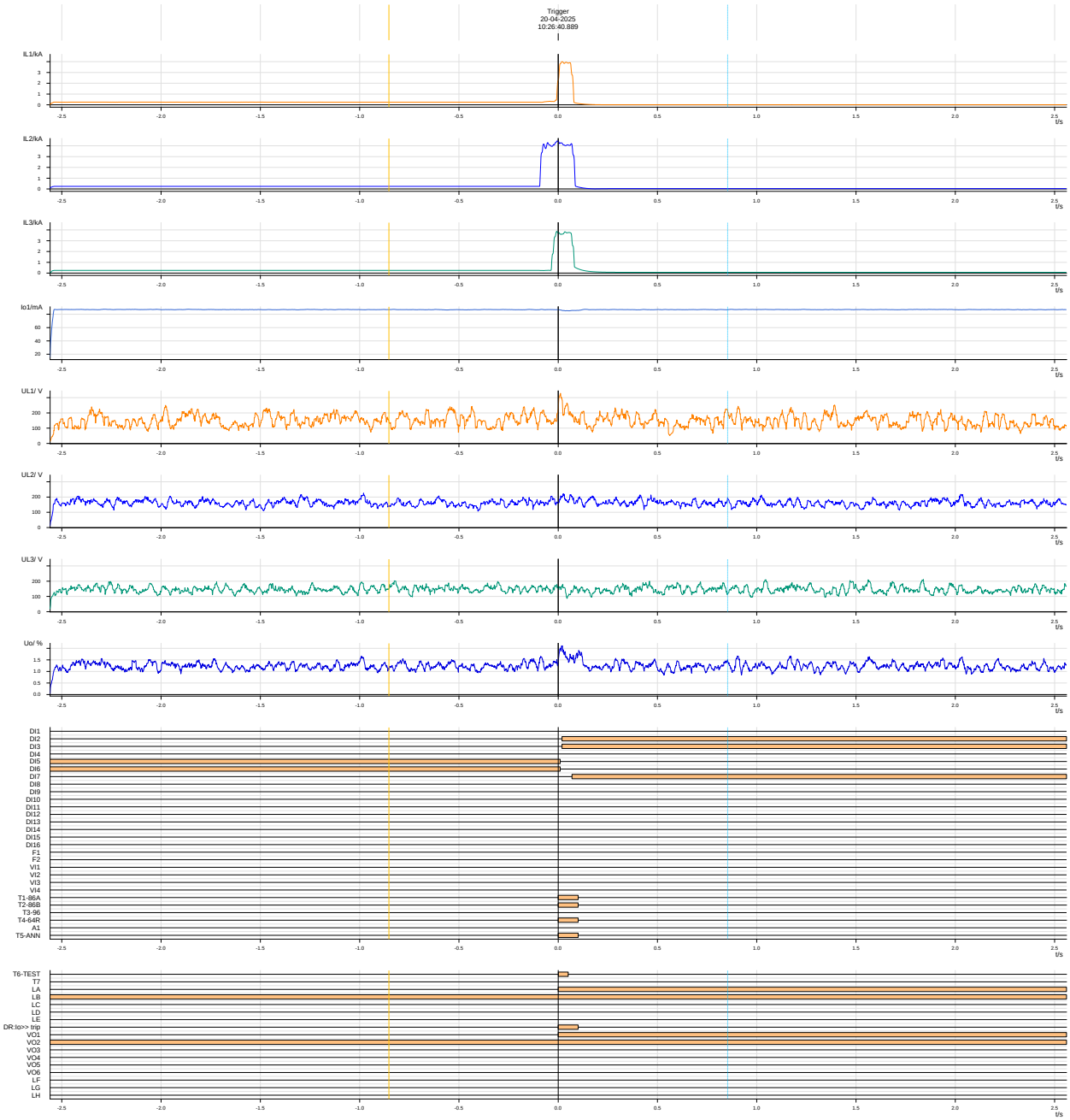
Annexure 1: (Sequence of Events-As per ERLDC SCADA):

Not available with ERLDC

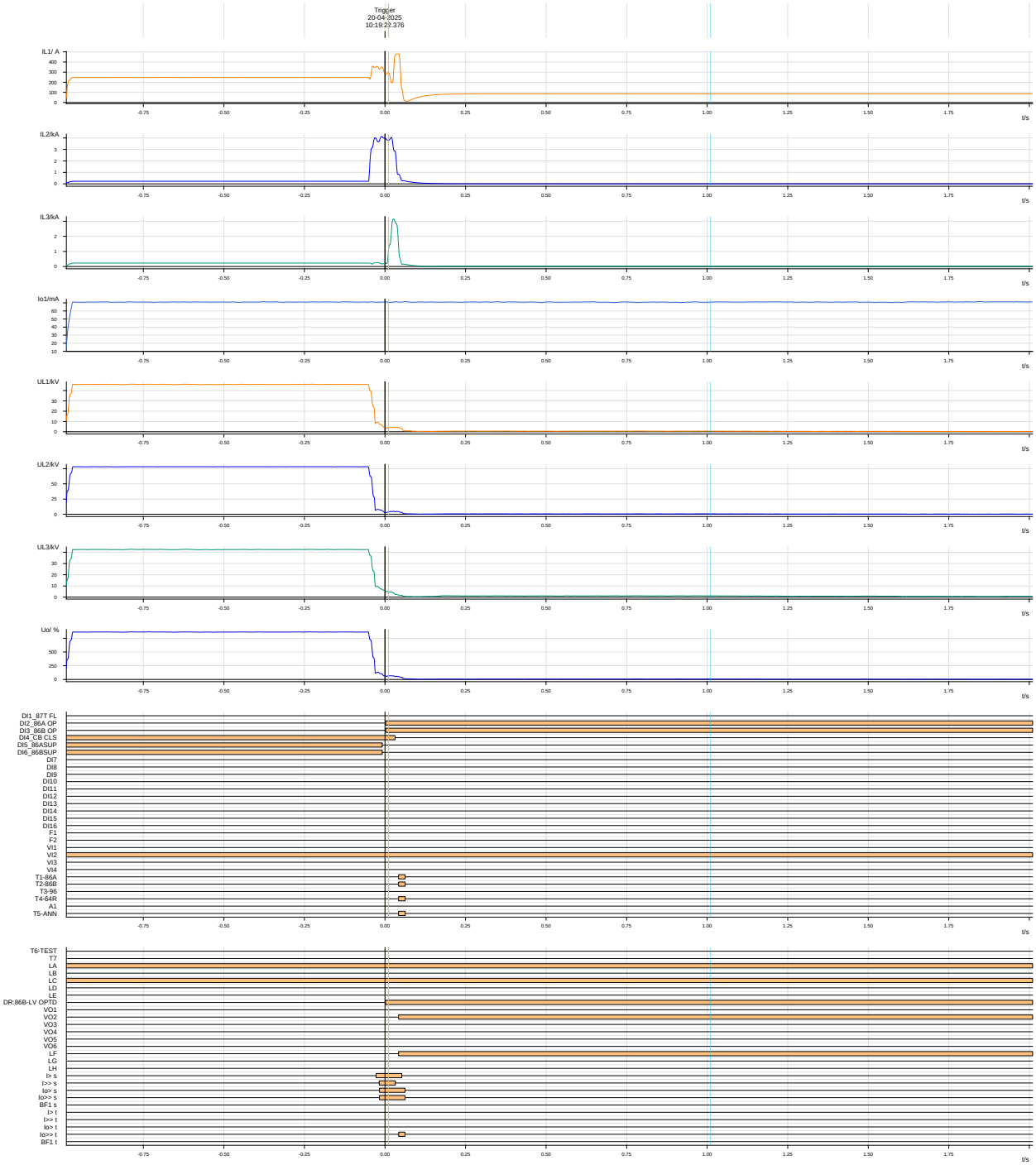
Annexure 2:

Event 1

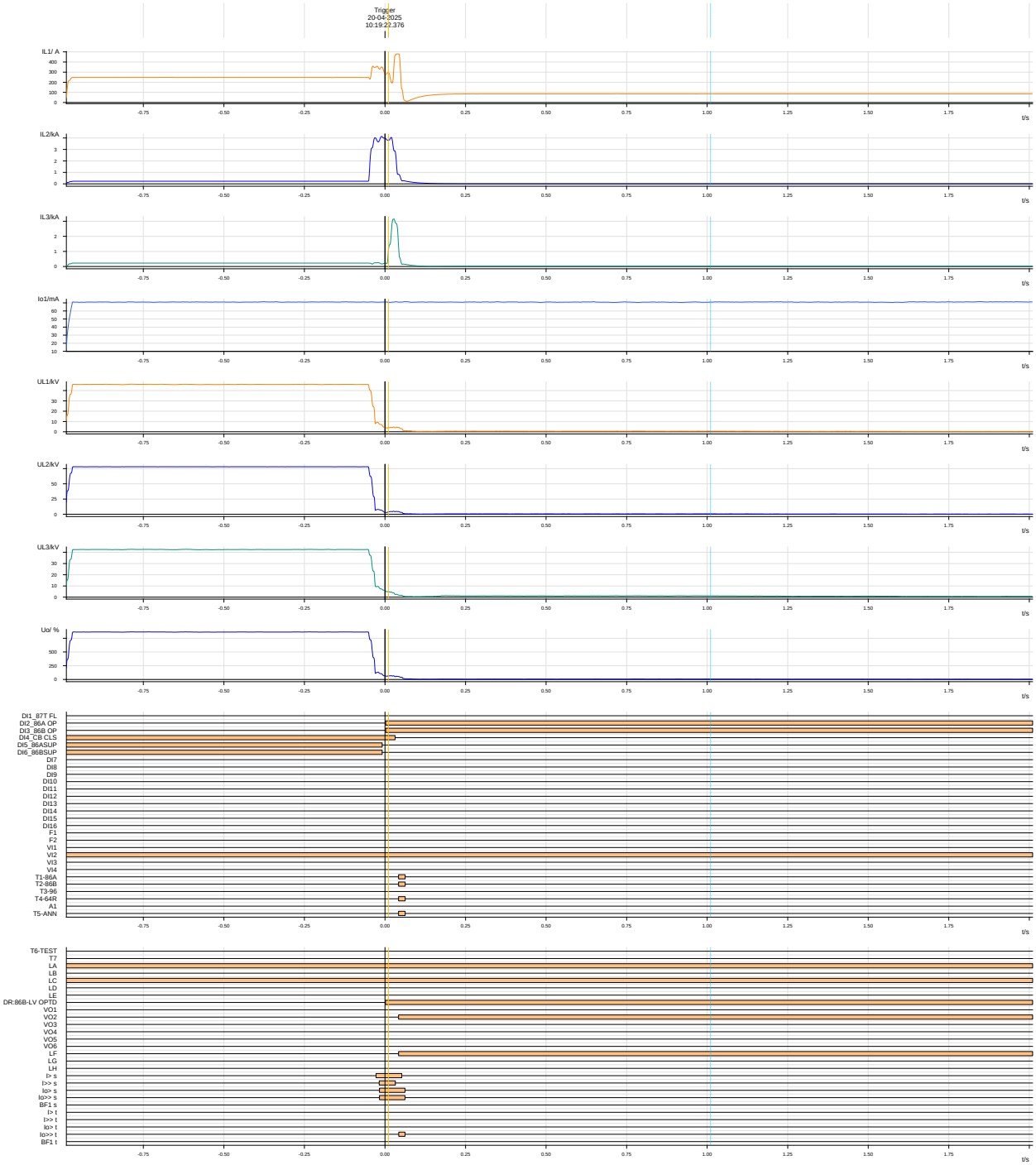
DR of 220/132 KV 100 MVA Transformer 1



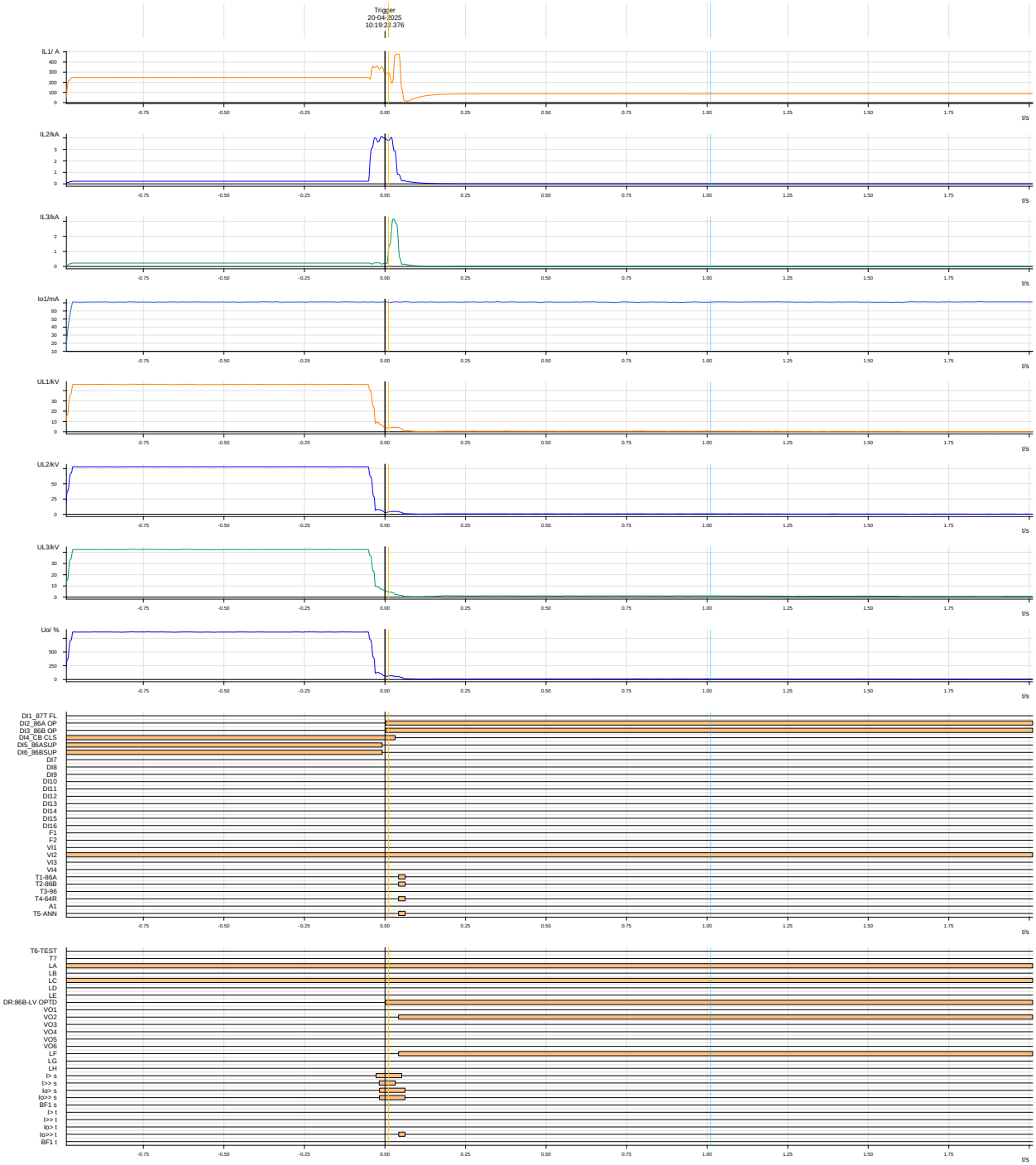
DR of 220/132 KV 100 MVA Transformer 2



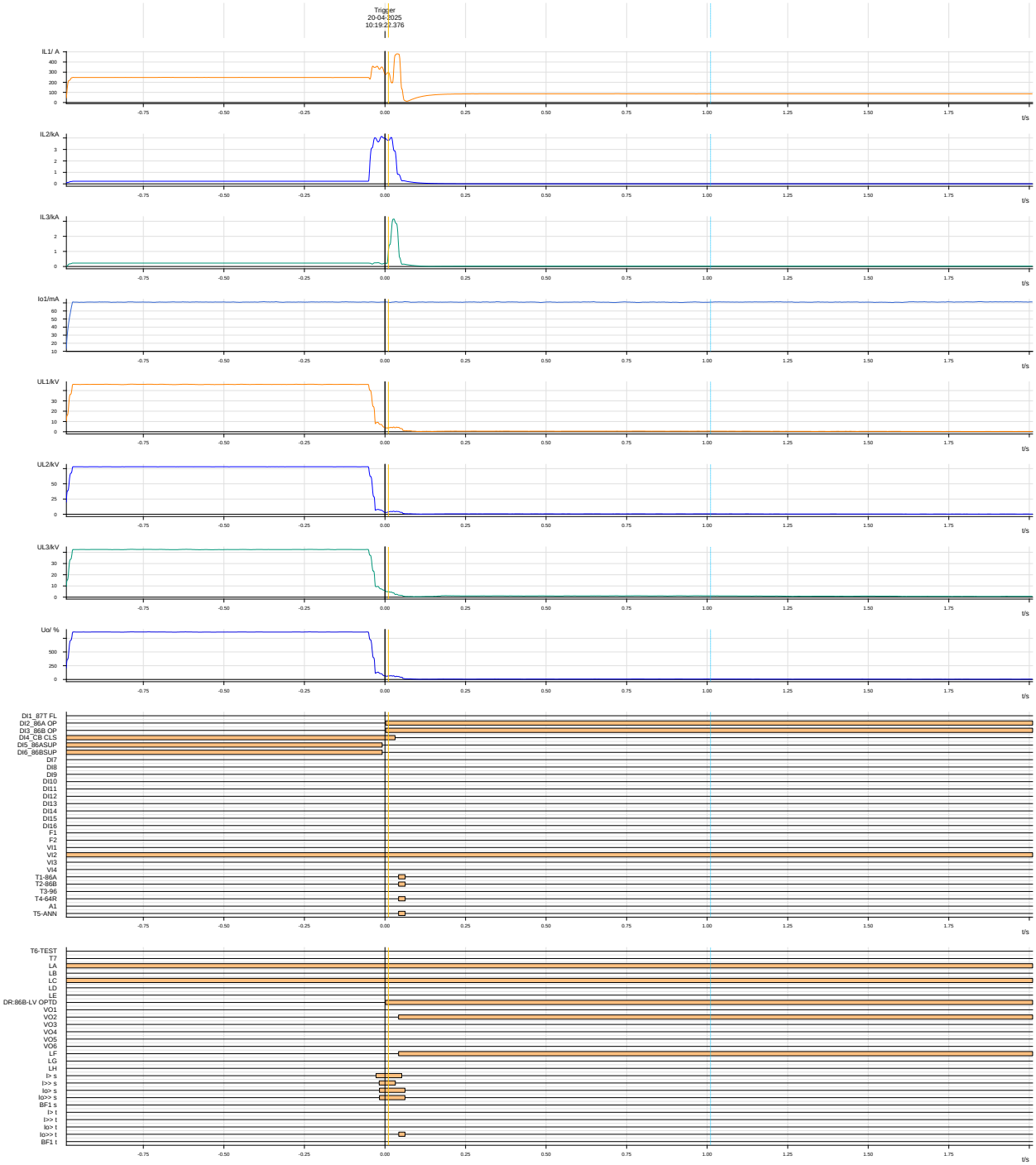
DR of 220/132 KV 100 MVA Transformer 3



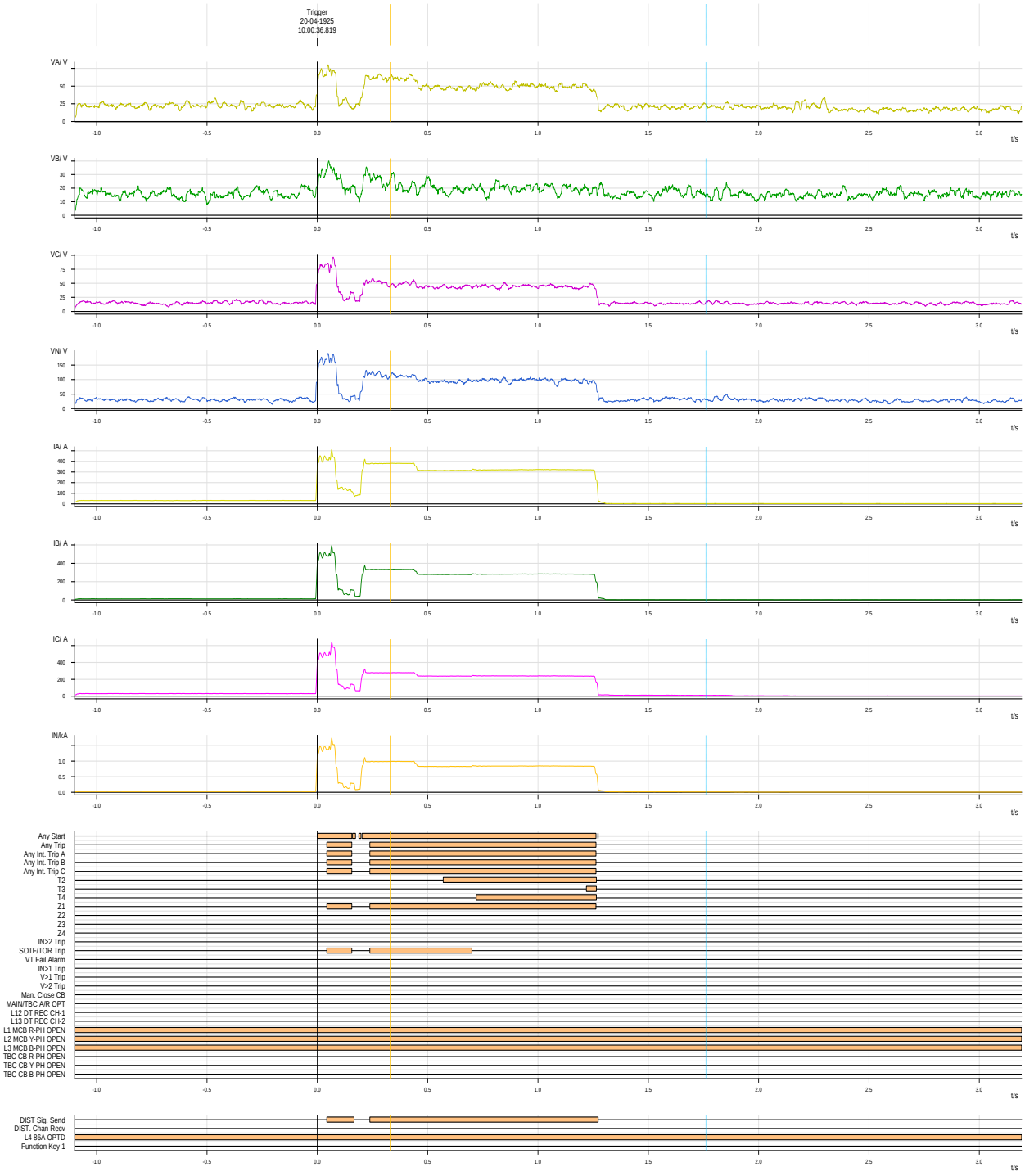
DR of 220 KV Saharsha Begusarai Ckt 2 (Saharsha end):



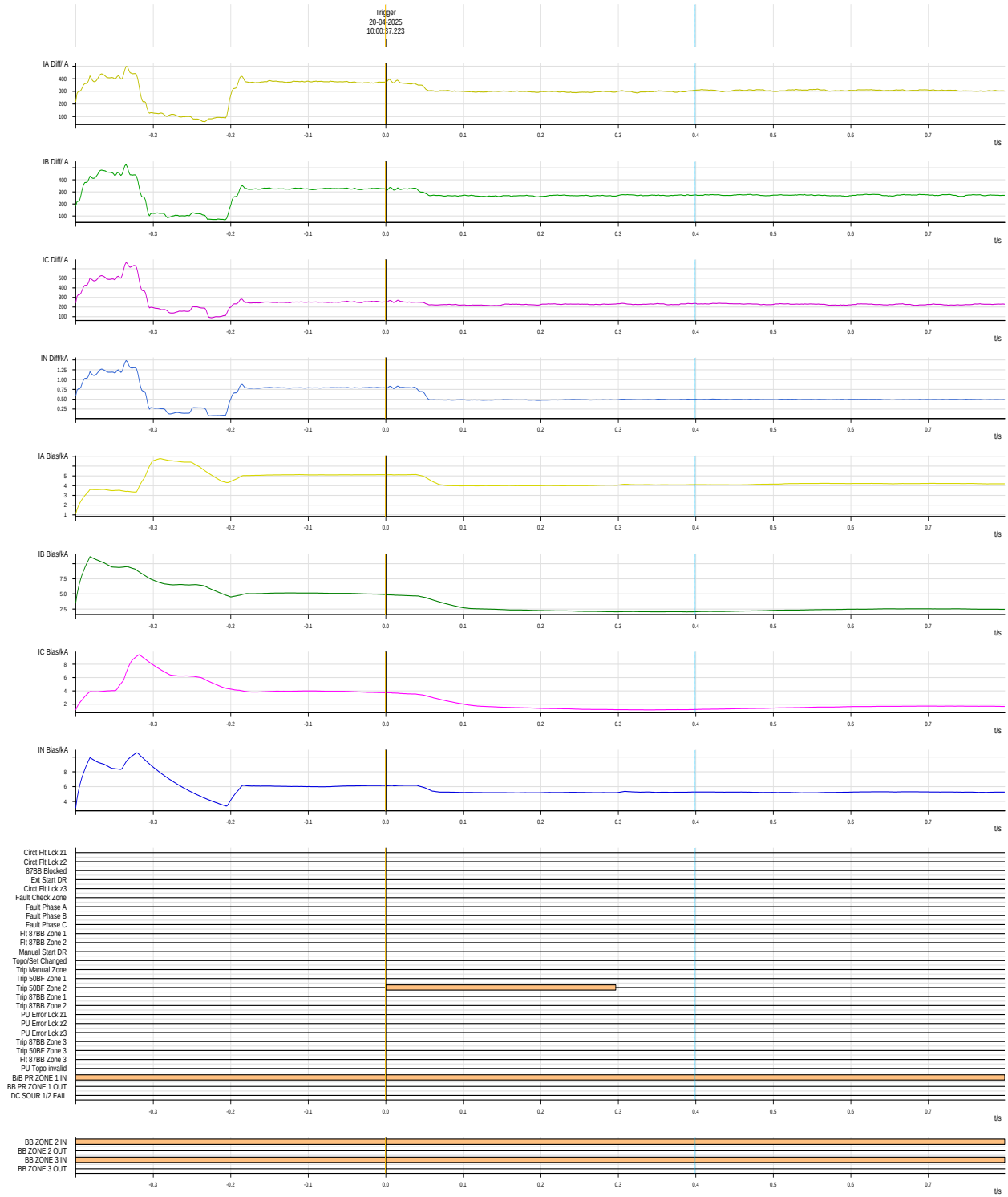
DR of 220 KV BTPS Begusarai Ckt 1 (BTPS end):



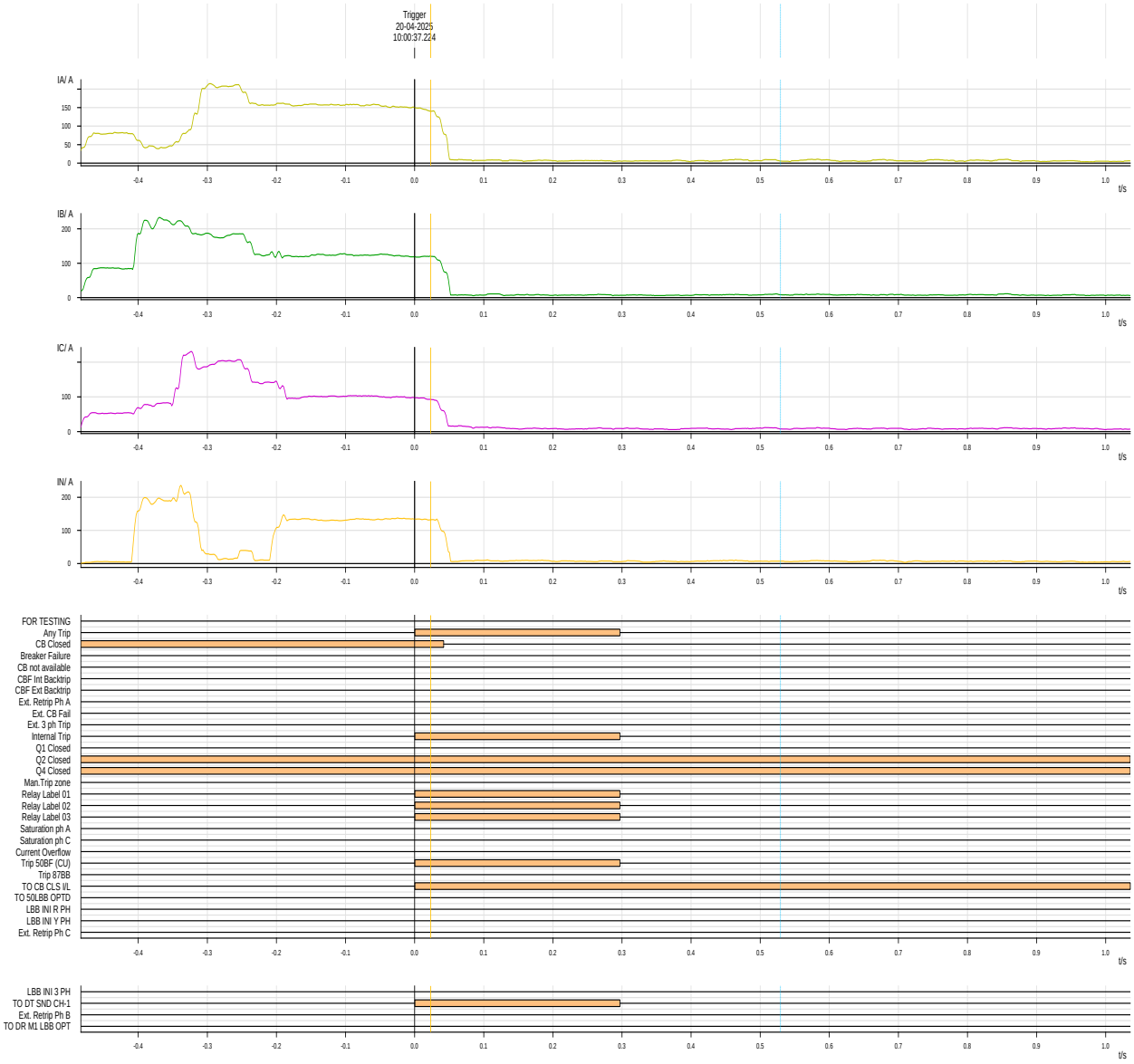
DR of 220 KV BTPS Begusarai Ckt 2 (BTPS end):



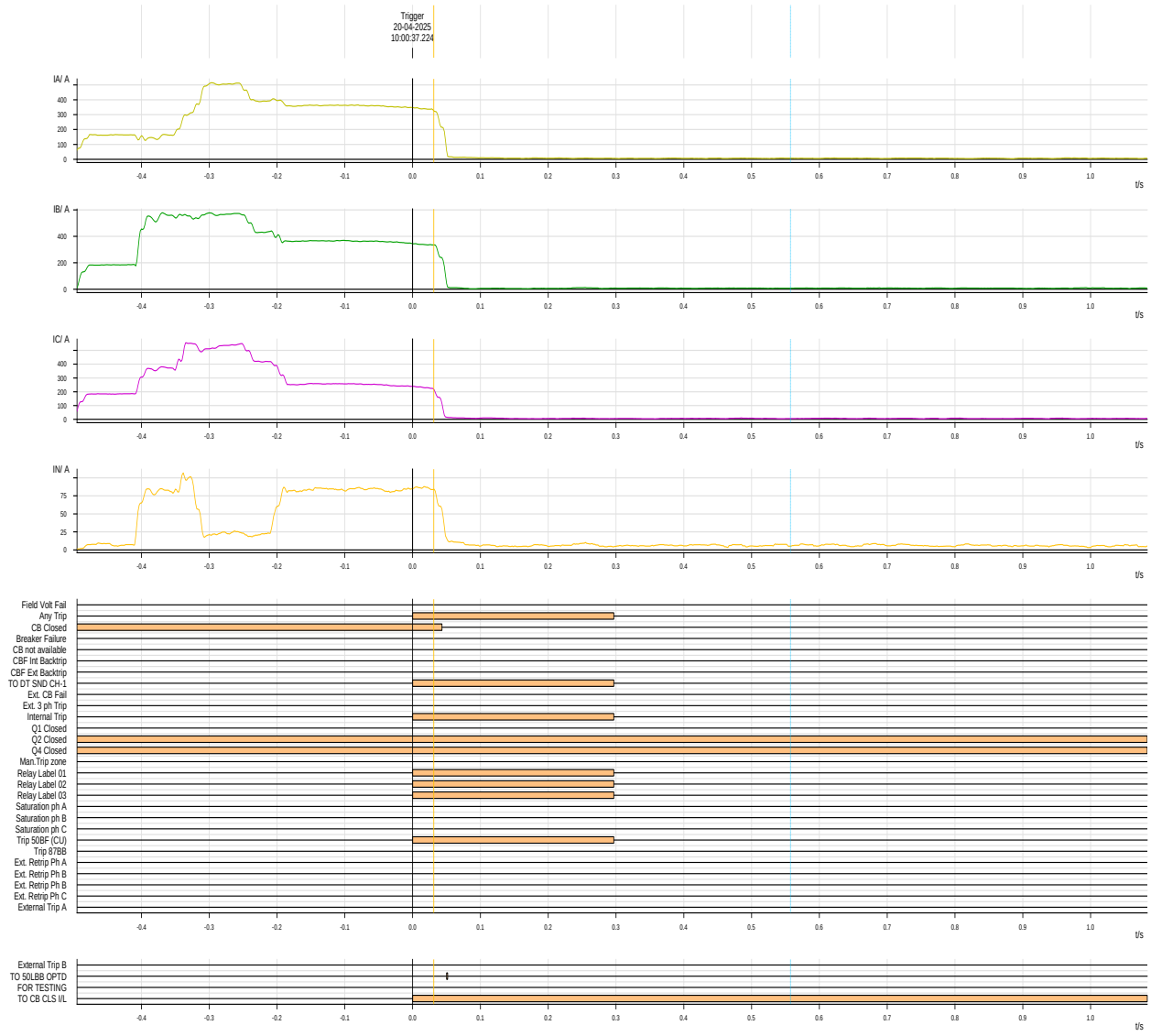
DR of BTPS(Barauni) bus 2 CU



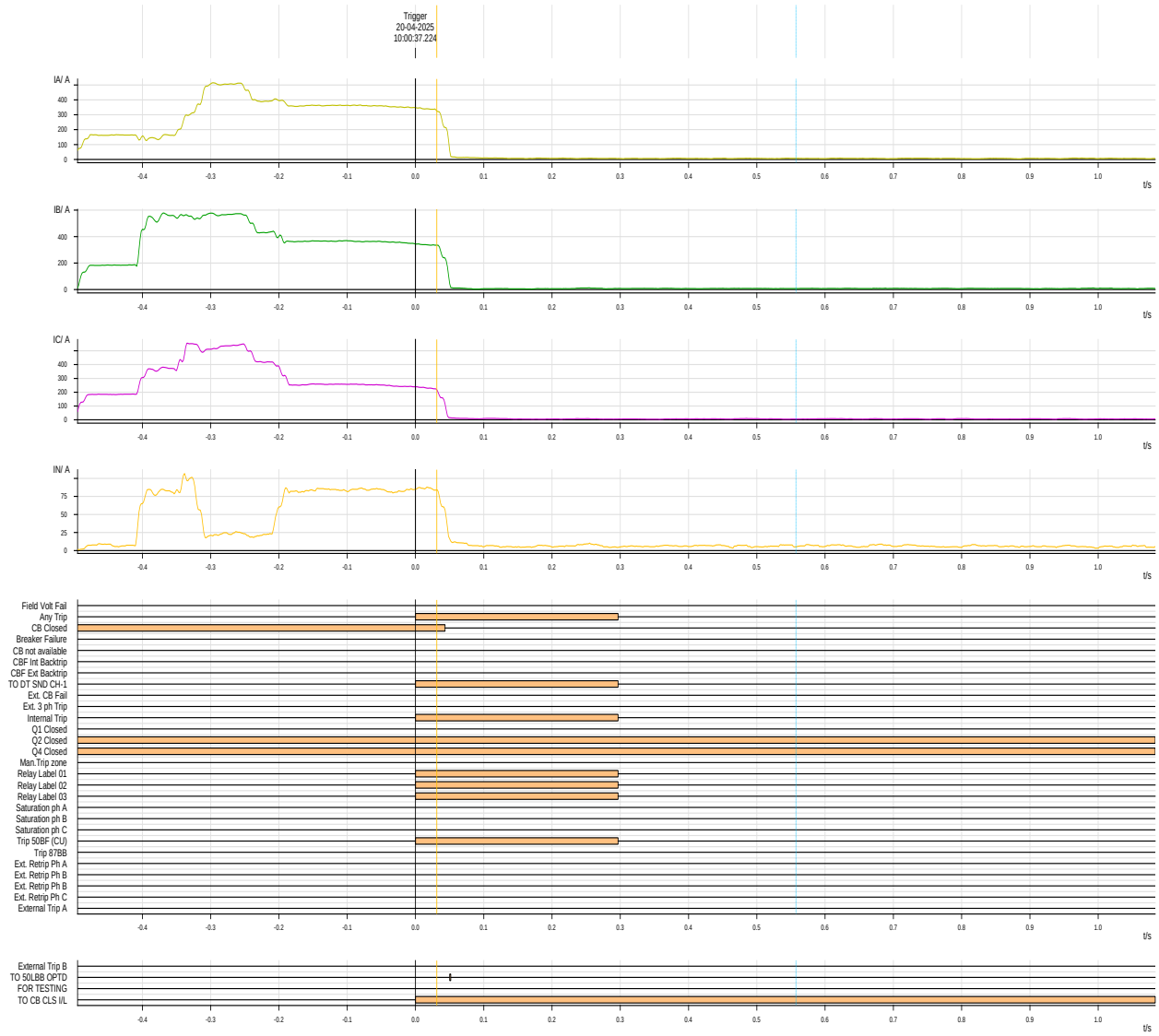
DR of 220 kV Barauni bus 2 PU for Mokama ckt 2:



DR of 220 kV Barauni bus 2 PU for Hazipur ckt 2:

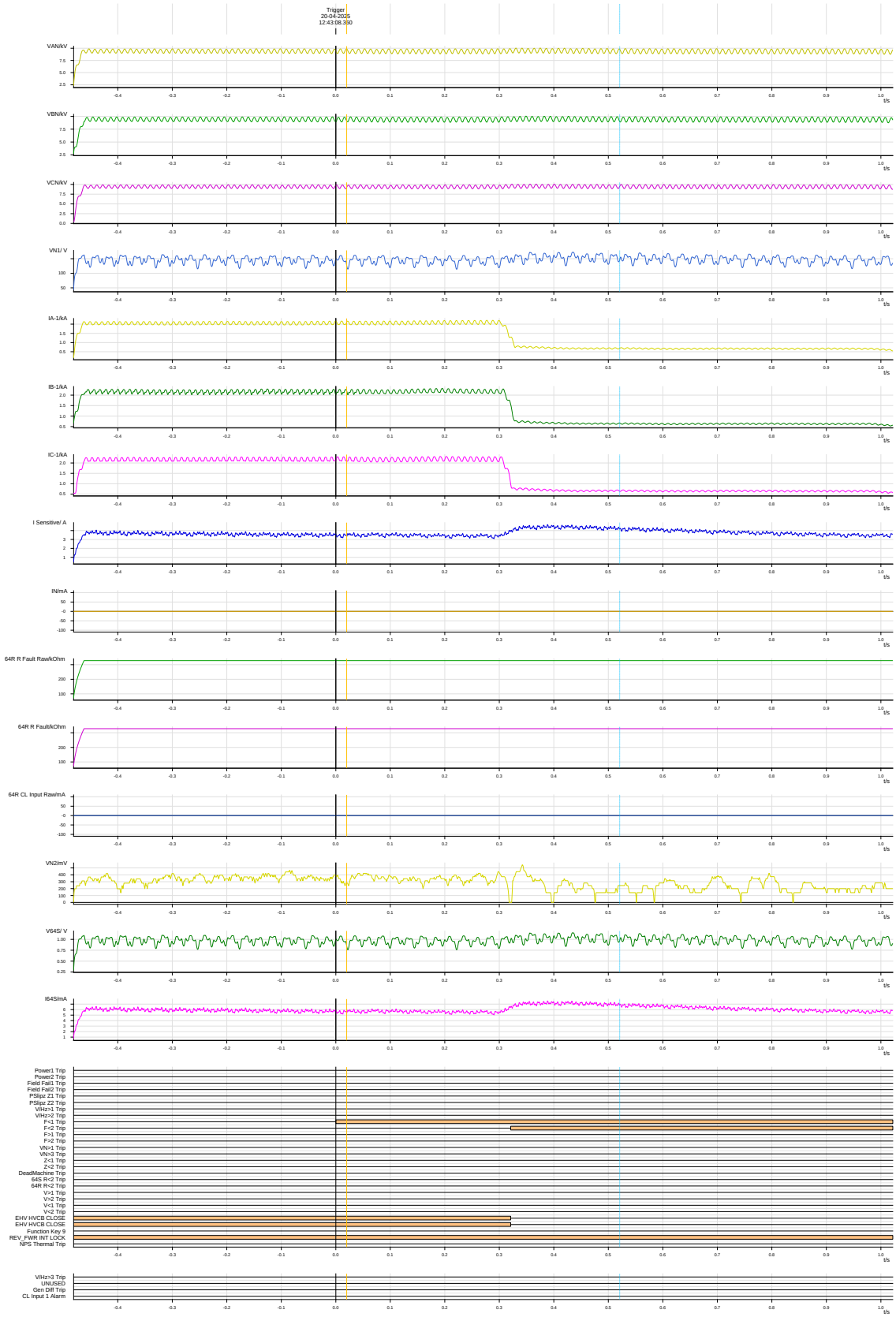


DR of 220 kV Barauni bus 2 PU for GT 8 :

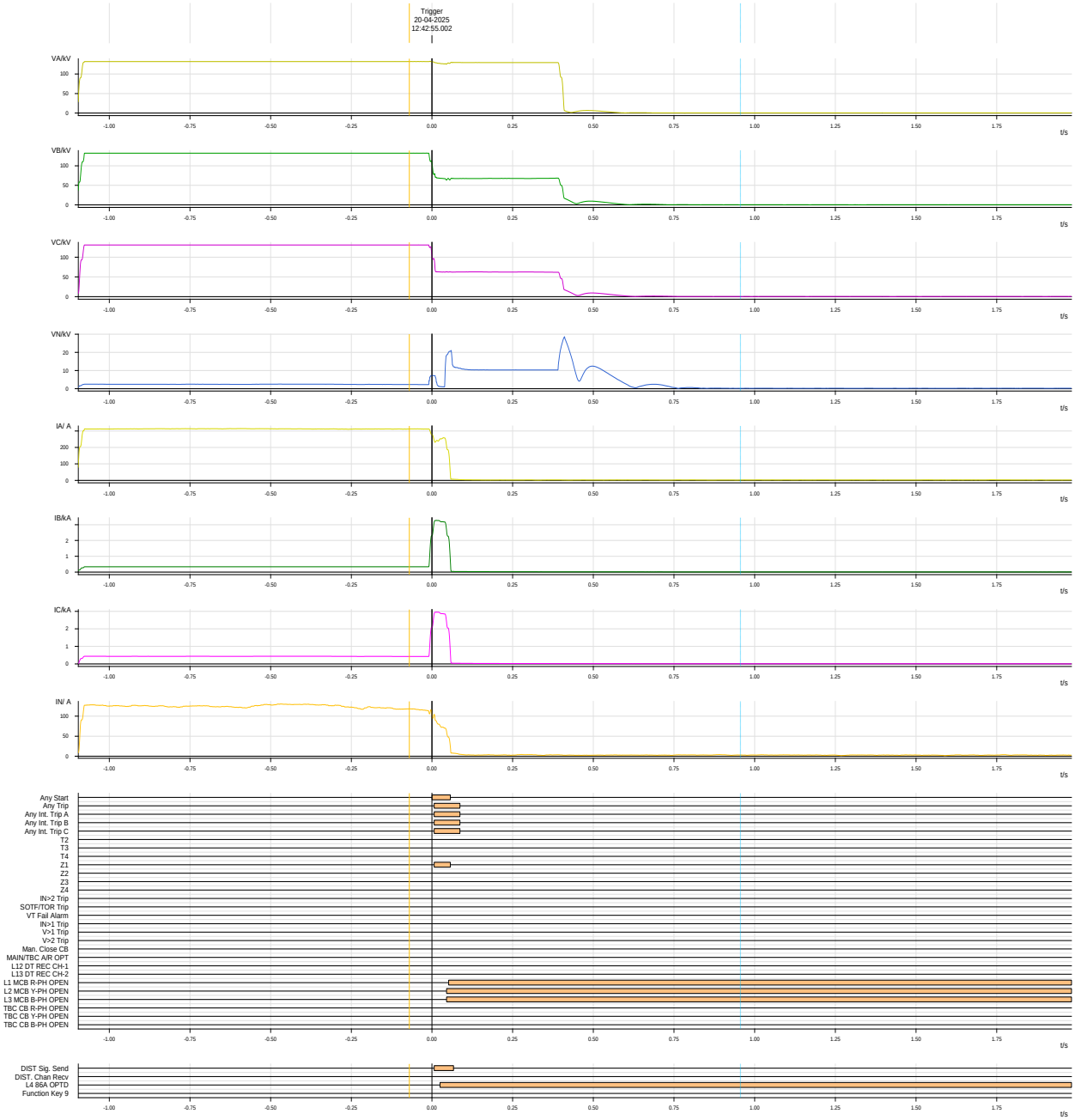


Event 2

DR of 220 kV Barauni GT 9 at 12:43 :


Trigger
20-04-2025
12:43:08.350
VAN/kV
VBN/kV
VCN/kV
VN1/ V
IA-1/kA
IB-1/kA
IC-1/kA
I Sensitive/ A
INImA
64R R Fault Raw/kOhm
64R R Fault/kOhm
64R CL Input Raw/mA
VN2/mV
V64S/ V
I64S/mA
Power1 Trip
Power2 Trip
Field Fail1 Trip
Field Fail2 Trip
PSlipz Z1 Trip
PSlipz Z2 Trip
V/Hz>1 Trip
V/Hz>2 Trip
F<1 Trip
F<2 Trip
F>1 Trip
F>2 Trip
VN>1 Trip
VN>3 Trip
Z<1 Trip
Z<2 Trip
DeadMachine Trip
64S R<2 Trip
64R R<2 Trip
V>1 Trip
V>2 Trip
V<1 Trip
V<2 Trip
EHV HVCB CLOSE
EHV HVCB CLOSE
Function Key 9
REV_PWR INT LOCK
NPS Thermal Trip
V/Hz>3 Trip
UNUSED
Gen Diff Trip
CL Input 1 Alarm
t/s

DR of 220 kV Barauni Haipur ckt 1 at 12:43 :



Annexure:3

Record notes of Meeting to discuss disturbance at Begusarai (At 10:00 Hrs) and Barauni (At 12:43 Hrs) on 20.04.2025

An online meeting (MS Teams) was held at 15:00 Hrs on 25.04.2025 with representatives from ELRDC, SLDC Bihar, Barauni TPS, BSPTCL to discuss the disturbance occurred at Begusarai on 20.04.2025. Following points were discussed:

- ERLDC explained the disturbance resulting in load loss at Begusarai(Bihar) of 170 MW and generation loss of 228 MW at Barauni TPS during the first event at 10:00 Hrs.
- Protection and operational issues observed during the disturbance was highlighted. It was noted that the 220 kV Biharsharif–Mokama D/C line is being kept open to control the loading on the 220 kV Barauni–Begusarai D/C, which has been reconductored with HTLS conductor.
- The first event occurred at 10:00 hrs; however, the lines from Barauni was not charged for more than two and a half hours, leading to a second event at 12:43 hrs.
- The second event could have been avoided if any of 220 kV Biharsharif–Mokama D/C line was in service or 220 kV Barauni–Begusarai-1 or 220 kV Barauni–Hazipur-2 had been charged in time.
- Non-availability of Bus bar protection at Begusarai was identified as a key protection shortfall that contributed to the disturbance.
- Furthermore, at Barauni, CTs are located on the line side, and it was emphasized that for such schemes, local CT earthing should be carried out, as discussed earlier during the 104th PCC meeting.
- A brief presentation of the event is attached at Annexure-1.

Following action points were agreed upon:

- BSPTCL to share Ampacity of 220 kV Barauni-Bagusarai D/c. -**BSPTCL**
- BSPTCL and Barauni NTPC to change CT core to 1600:1 at both ends of 220 kV Begusarai-Barauni D/c to facilitate utilization of full capacity of the line. Protection setting at both ends to be change accordingly. -**BSPTCL, Barauni**
- SLDC Bihar to facilitate shutdown of the lines to incorporate necessary changes. -**SLDC Bihar**
- SLDC Bihar to ensure that at any point of time, Barauni NTPC remains connected at two nodes in the grid to avoid islanding of the generating S/s. **-SLDC Bihar**
- SLDC Bihar to ensure that, Barauni plant always remain connected at two nodes in the grid to avoid islanding of the generating S/s. Biharshariif -Mokama D/C to be closed accordingly as per the need to ensure the same **-SLDC Bihar**
- BSPTCL to expedite commissioning of Bus bar protection for 220 kV and 132 kV Bus at Begusarai. - **BSPTCL**
- Local earthing for CT to be done for those lines having CT on the line side while the line is in shutdown. – **Barauni**

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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Office : 14, Golf Club Road, Tollygunge, Kolkata - 700033
CIN : U40105DL2009GOI188682, Website : www.erldc.in, E-mail : erldcinfo@grid-india.in, Tel.: 033 23890060/0061

पूर्वी क्षेत्र के 220/132 केवी बोधगया में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event at 220/132 kV Bodgaya 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): 07-05-2025

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

Prior to the disturbance, 220kV Gaya – Bodhgaya D/C tripped at 19:30 Hrs from Bodhgaya end on over current protection (As per SCADA 202 MW power flow in each circuit). At 19:42 Hrs 220 KV Khizersarai-Bodhgaya D/C tripped from Bodhgaya end due to snapping of R-phase conductor. 220kV Bodhgaya S/s became dead. Around 310 MW load loss occurred at Bodhgaya end.
Power was extended through Gaya-Bodhgaya D/C at 20:06 Hrs.

2. **Time and Date of the Event (घटना का समय और दिनांक):** 19:42 hrs of 21.04.2025
3. **Event Category (ग्रिड घटना का प्रकार): Grid Disturbance (GD)-1**
4. **Location/Control Area (स्थान/नियंत्रण क्षेत्र):** Bihar
5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
				Bihar	Bihar
Pre-Event (घटना पूर्व)	49.916	31730	28157	222	6791
Post Event (घटना के बाद)	49.916	31730	27847	222	6481

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

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां	220kV Gaya – Bodhgaya D/C tripped at 19:30 Hrs on O/C. 132 KV Chandauti (PMTL)-Chandauti D/C was under S/D.

जो बंद है)	
Weather Condition (मौसम स्थिति)	Normal.

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Approximate load loss of 310 MW at Bodhgaya S/s.
7. **Duration of interruption (रुकावट की अवधि):** 00:24 Hrs.

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

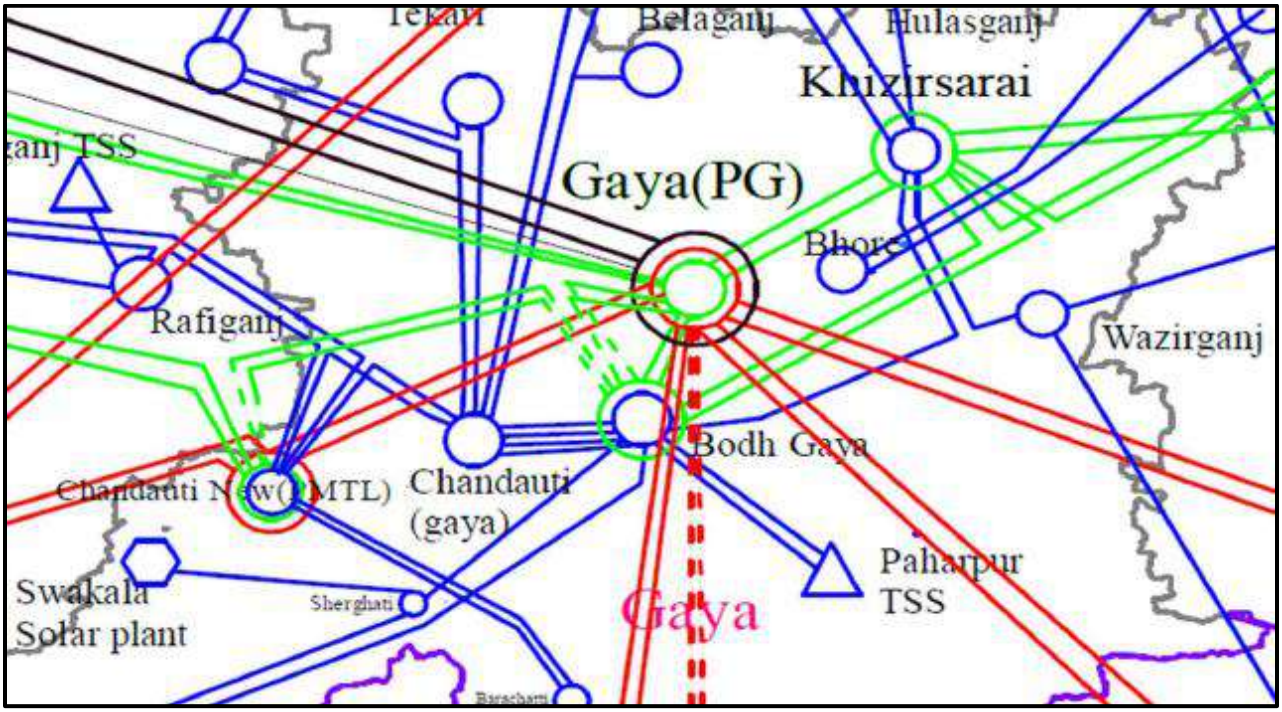


Figure 1: Network across the affected area

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

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

क्रoसo	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220 KV Khizersarai-Bodhgaya #1	19:42:	-	R-phase to ground fault	-
2	220 KV Khizersarai-Bodhgaya #2		-	Y-phase to ground	-

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

- **Pre disturbance condition:**

- 132 KV Chandauti (PMTL)-Chandauti D/C was under S/D due to some work at PMTL end, and Chandauti (BSPTCL) was radially connected from 132 kV Bodhgaya S/s.
- 220 KV Gaya (PG)-Bodhgaya circuit-3 & 4 anti-theft from Bodhgaya end due to defective BCU at Gaya (PG) end (Bays are being maintained by BSPTCL).
- At 19:30 Hrs 220kV Gaya – Bodhgaya D/C tripped from Bodhgaya end on over current protection (As per SCADA 202 MW power flow in each circuit and over current setting kept at 0.7, CTR-800/1 A, TMS- 0.4).

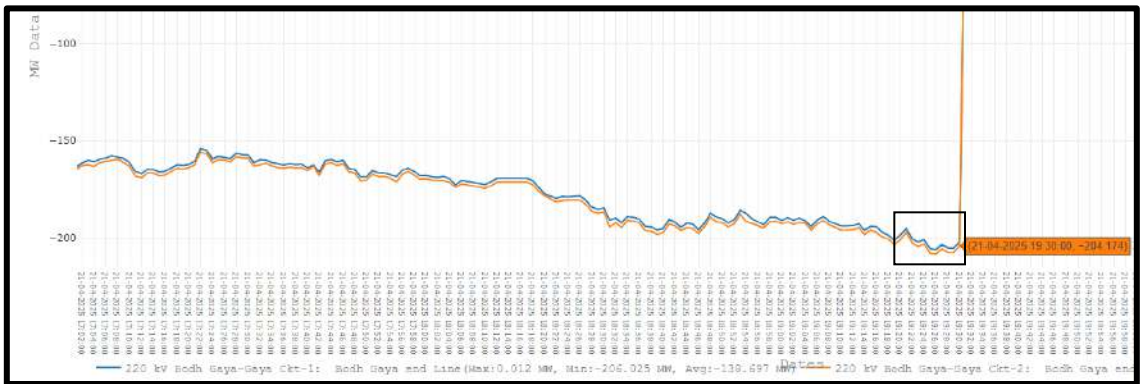


Figure-2: Power flow of 220kV Gaya Bodhgaya D/C as per SCADA

- After tripping of 220kV Gaya – Bodhgaya D/C, load of Bodhgaya was radially connected to 220kV Khizersarai only.

Event on 19:42 Hrs:

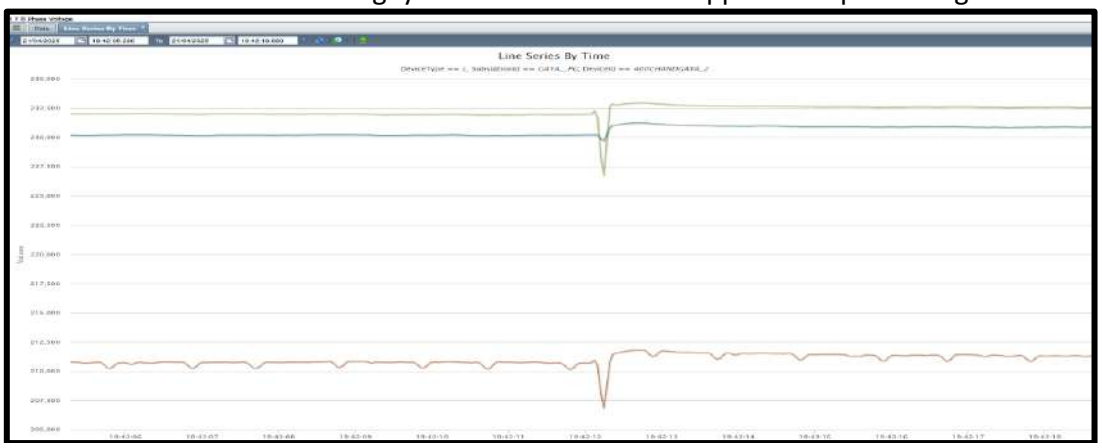
- At 19:42 Hrs 220kV Bodhgaya-Khizersarai D/C tripped from Bodhgaya end due to snapping of R-phase conductor of 220 KV Khizersarai-Bodhgaya #1.
- At the same time 220kV Bodhgaya-Khizersarai #2 also tripped on Y-phase to ground fault.
- 

Figure-3: PMU of Gaya Voltage

- 220kV Bodhgaya-Khizersarai D/C tower collapsed was reported at tower location no 92-93.
- 220kV Bodhgaya S/S became dead.
- Total load loss of 310 MW occurred at Bodhgaya.
- Power was extended through Gaya-Bodhgaya D/C at 20:06 Hrs.

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

- As per SCADA maximum power flow in 220kV Gaya Bodhgaya D/C touched 202 MW which was below its thermal limit, but due to incorrect O/C setting both circuits tripped, and disturbance occurred. Over current setting was enabled and kept at 0.7, CTR-800/1 A, TMS- 0.4.
- It is requested to review over current setting in your jurisdiction to avoid such type of unwanted tripping. Action in this regard to be taken for all substation and adherence to **CEA protections standards** to be ensured**. If Overcurrent to be enabled, it has to be kept in AND logic with VT fuse failure and Pickup to be at least 120% of Thermal Rating.**
- Reason of non-availability of DR at Bodhgaya S/s may be submitted and status of DR extracting status may be submitted.
- Detailed report received from BSPTCL is attached in Annexure:2

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

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

S.No.	Issues	Regulation Non-Compliance	Utilities
1.	**DR/EL not submitted within 24 hours**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**BSPTCL**

15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

Backup-Overcurrent to be disabled at all 220 KV and above stations where Main 1 and Main-2 protections are present. This is violation of CEA standards and leading to unwanted tripping and disturbances.

If Overcurrent to be enabled, it has to be kept in AND logic with VT fuse failure and Pickup to be at least 120% of Thermal Rating.

Annexure 1: (Sequence of Events-As per ERLDC SCADA):

Annexure 2:

Data for GD at Bodhgaya SS at 19:42 Hrs, 21-04-2025

1. **List of lines and units tripped during the event**
   - 220 kV Gaya (PG)-Bodhgaya circuit 1 at 19:30 Hrs.
   - 220 kV Gaya (PG)-Bodhgaya circuit 2 at 19:30 Hrs.
   - 220 KV Khizersarai-Bodhgaya circuit-1 & 2 at 19:42 Hrs.

2. **Antecedent condition prior to the event**
   - 220 KV Gaya (PG)-Bodhgaya circuit-1 & 2 and 220 kV Bodhgaya-Khizesarai D/C T/L was in sync at Bodhgaya GSS and Khizesarai SS was drawing power from Bodhgaya.
   - 220 KV Gaya (PG)-Bodhgaya circuit-3 & 4 are charged in anti-theft condition from Bodhgaya end due to defective BCU at Gaya (PG) end (Bays are being maintained by BSPTCL).
   - Chandauti (BSPTCL) was completely fed from 132 kV Bodhgaya-Chandauti Q/C T/Ls .

3. **List of elements (which have influence on the event) which were under outage prior to the event.**
   - 220 KV Gaya (PG)-Bodhgaya circuit-3 & 4 are charged in anti-theft condition from Bodhgaya end due to defective BCU at Gaya (PG) end (Bays are being maintained by BSPTCL).
   - 132 KV Chandauti (PMTL)-Chandauti D/C T/Ls were under s/d due to some work at PMTL end.

4. **Amount of load and generation loss in MW =** 310 MW (approx.)

5. **Amount of energy unserved in MU to consumer/customer** = 0.124 MU.

6. **Duration of the event (Duration may be considered when more than half elements have been restored)** = 24 minutes

7. **Catering load from alternate source (if done after the event)-** NO

8. **Root cause for tripping of lines (Source of fault if any; Malfunction of protection system if any)**
   - Malfunction of O/C E/F relay of 220 KV Gaya (PG)-1 bay.
   - Snapping of R-phase conductor of 220 KV Bodhgaya-Khizersarai circuit-1 from mid joint between tower location number 92 & 93 resulting in collapse of these towers causing breakdown of 220 KV Bodhgaya-Khizersarai D/C T/L.

9. **Remedial action taken (if any)**
   - DR/EL has been configured properly in O/C E/F relays of 220 KV and 132 KV bays.
   - **O/C setting in all 220 KV feeders at Bodhgaya has been disabled.**
   - SAS implementing agency M/s KRR has been instructed to test the O/C E/F relay of Gaya (PG) bays along with checking its setting, wiring & configuration to ensure its proper operation.

10. **Restoration of elements**
    - At 20:06 Hrs 220 KV Gaya (PG)-1 & 2 was taken in service.

11. **Weather condition during the event:** Normal.

12. **DR/EL in comtrade format (.cfg and .dat) recorded for the tripping of lines and units**
    - DR was not configured properly in O/C E/F relays of 220 KV and 132 KV bays by the SAS implementing agency M/s KRR.
    - M/s KRR has been asked to submit the distance relay's DR of 220 KV Khizersarai bay at Bodhgaya SS.

Analysis of GD at 220 KV Bodhgaya SS on 21-04-2025

- 220 KV Gaya (PG)-Bodhgaya D/C T/L and 220 kV Bodhgaya-Khizesarai D/C T/L was in sync at Bodhgaya GSS and Khizesarai SS was drawing power from Bodhgaya.
- 220 KV Gaya (PG)-Bodhgaya circuit-3 & 4 are charged in anti-theft condition from Bodhgaya end due to defective BCU at Gaya (PG) end (bays are being maintained by BSPTCL).
- 132 KV Chandauti (PMTL)-Chandauti D/C T/Ls were under s/d due to some work at PMTL end, hence Chandauti (BSPTCL) was being fed radially from 132 kV Bodhgaya-Chandauti Q/C T/Ls .
- Total load of/from Bodhgaya SS was about 310 MW.
- Weather was normal.
- At 19:30 Hrs firstly 220 kV Gaya (PG)-Bodhgaya circuit 1 tripped from Bodhgaya end on O/C at 570 A (O/C setting was at 0.7, CTR-800/1 A, TMS- 400 ms, SI), subsequently total load shifted on Gaya (PG)- 2 and 220 KV Khizersarai D/C T/L. At 922 A, 220 kV Gaya (PG)-Bodhgaya circuit 2 also tripped on O/C (O/C setting was at 0.7, CTR-800/1 A, TMS- 400 ms, SI), resulting in shifting of total load of about 310 MW to 220 KV Khizersarai-Bodhgaya D/C T/L.
- At 19:42 Hrs 220 KV Khizersarai-Bodhgaya D/C T/L tripped from Bodhgaya end due to snapping of R-phase conductor of 220 KV Khizersarai-Bodhgaya circuit-1 from mid joint between tower location number 92 & 93 resulting in collapse of these towers and breakdown of both circuits.
- 220 KV Gaya (PG)-Bodhgaya circuit-1 & 2 was restored at 20:06 Hrs.

Observation made during fault analysis:

- SAS work is under progress at GSS Bodhgaya by M/s KRR.
- DR was not configured properly in O/C E/F relays of 220 KV and 132 KV bays resulting in unavailability of DRs for proper analysis of this event.
- Despite of instruction for not keeping O/C setting in 220 KV bays, O/C setting was enabled in all 220 KV bays at Bodhgaya end by the SAS implementing agency M/s KRR.
- It seems that O/C E/F relay of 220 KV Gaya (PG)-1 bay has malfunctioned causing its tripping at 570 A only.

Remedial action taken:

- DR has been configured properly in O/C E/F relays of 220 KV and 132 KV bays.
- O/C setting in all 220 KV bays at Bodhgaya has been disabled.
- SAS implementing agency M/s KRR has been instructed to test the O/C E/F relay of Gaya (PG) bays along with checking its setting, wiring & configuration to ensure its proper operation.

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, टालिगंज, कोलकाता - 700033
Office : 14, Golf Club Road, Tollygunge, Kolkata - 700033
CIN : U40105DL2009GOI188682, Website : www.erldc.in, E-mail : erldcinfo@grid-india.in, Tel.: 033 23890060/0061

पूर्वी क्षेत्र के 220/132 केवी चतरा में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event at 220/132 kV Chatra 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): 14-05-2025

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

220kV Chatra S/s connected via S/c from Daltongunj & Latehar each S/s. At 19:08 Hrs, 220 kV Daltongunj- Chatra line tripped from Daltonganj end in Z-3 distance protection and simultaneously, 220 kV Latehar–Chatra line also tripped from Latehar end in Z-3 distance protection. 220kV Chatra S/s became dead. Total load loss of 20 MW occurred at Chatra. Power was extended through 220kV Daltongunj-Chatra at 21:42 Hrs.

2. **Time and Date of the Event (घटना का समय और दिनांक):** 19:08 hrs of 27.04.2025

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

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

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

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
				Jharkhand	Jharkhand
Pre-Event (घटना पूर्व)	50.07	31693	25077	152	1668
Post Event (घटना के बाद)	50.05	31702	25086	152	1648

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

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां	NIL

जो बंद है)	
Weather Condition (मौसम स्थिति)	Normal.

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Approximate load loss of 20 MW at Chatra S/s.
7. **Duration of interruption (रुकावट की अवधि):** 2 hours and 34 minutes.

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

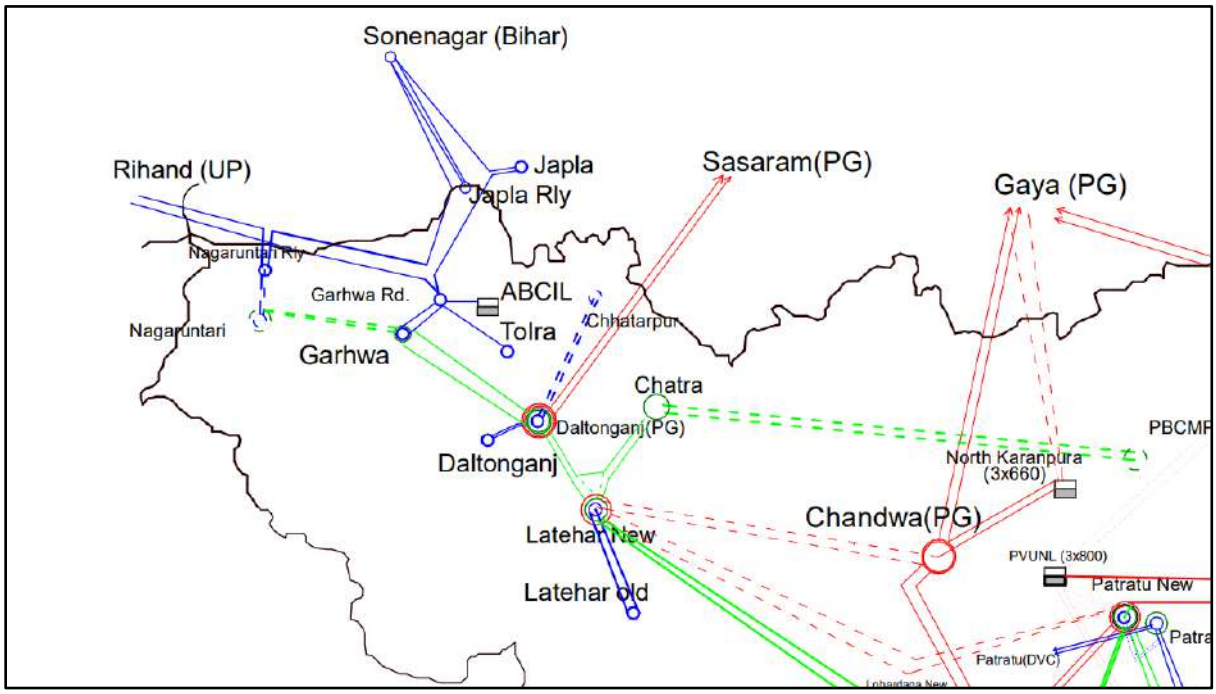


Figure 1: Network across the affected area

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

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

क्रoसo	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220kV Latehar-Chatra	19:08	Tripped from Latehar end only (Y-B fault, Z-3, 293.4 km Iy 0.52 kA, Ib 0.60 kA)	Not tripped	-

2	220kV Daltongunj-Chatra		Tripped from Daltongunj end only (Y-B fault, Z-3, 149.7 km, Iy 0.92 kA, Ib 0.89 kA)	Not tripped	21:42

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

- Prior to disturbance 220kV Chatra load was radially connected to Daltongunj and Latehar S/s.
- At 19:08 Hrs Y-B phase fault occurred in 220kV Chatra-Latehar line.
- Fault was not cleared from Chatra end, and same fault was sensed in Z-3 protection from Daltongunj end.

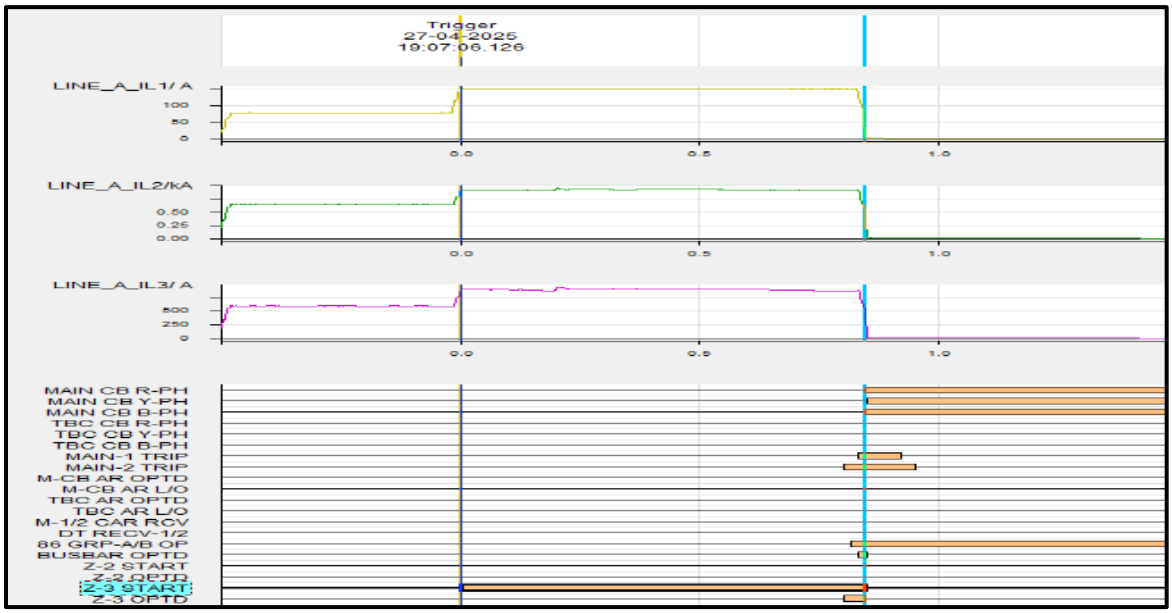


Figure 2: DR of 220kV Daltongunj -Chatra at Daltongunj

Figure 3: PMU of Voltage at Daltongunj

- 220kV Daltongunj and Latehar S/C tripped on Z-3 protection from remote end.
- 220kV Chatra S/s became dead.
- Total load loss of 20 MW occurred at Chatra.
- Power was extended through 220kV Daltongunj-Chatra at 21:42 Hrs.

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

- As per verbal communication with JUSNL, high resistive fault was occurred in 220kV Chatra-Latehar line and fault was not cleared from Chatra end and further same fault was sensed by Daltongaunj and Latehar in Zone-3 protection and got cleared after 500 msec.
- As fault was reported in between 220kV Latehar-Chatra line, reason of **Zone-3 protection operation at Latehar** may be explain. It is requested to **review resistive reach impedance value and distance protection** setting at Latehar end.
- It is requested to JUSNL to review **protection setting at 220kV Chatra S/s** and reason of not operating any protection at Chatra end may be shared.
- History of GD at Chatra S/s:

Sr. No	Disturbance Date and Time	Tripping of Daltongaunj-Chatra		Tripping of Latehar-Chatra	
		R/I at Daltongaunj	R/I at Chatra	R/I at Latehar	R/I at Chatra
1	At 19:08 Hrs on 27/04/2025	Zone-3	Didn't trip	Zone-3	Didn't trip
2	At 13:10 Hrs on 08/07/2024	Zone-3	Didn't trip	DEF operated	Didn't trip

- In both disturbance due to weak infeed from Chatra (Chatra is radially connected to Daltongaunj and Latehar as a Load) no protection pickup at their end hence to enable faster clearance of fault and to give a permissive trip to other end it is suggested that **weak end infeed protection may be enabled at Chatra end.**

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

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

S.No.	Issues	Regulation Non-Compliance	Utilities
1.	**DR/EL not submitted within 24 hours**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**JUSNL**

15. Key Lessons Learnt (प्रमुख अधिगम बिंदु): Nil

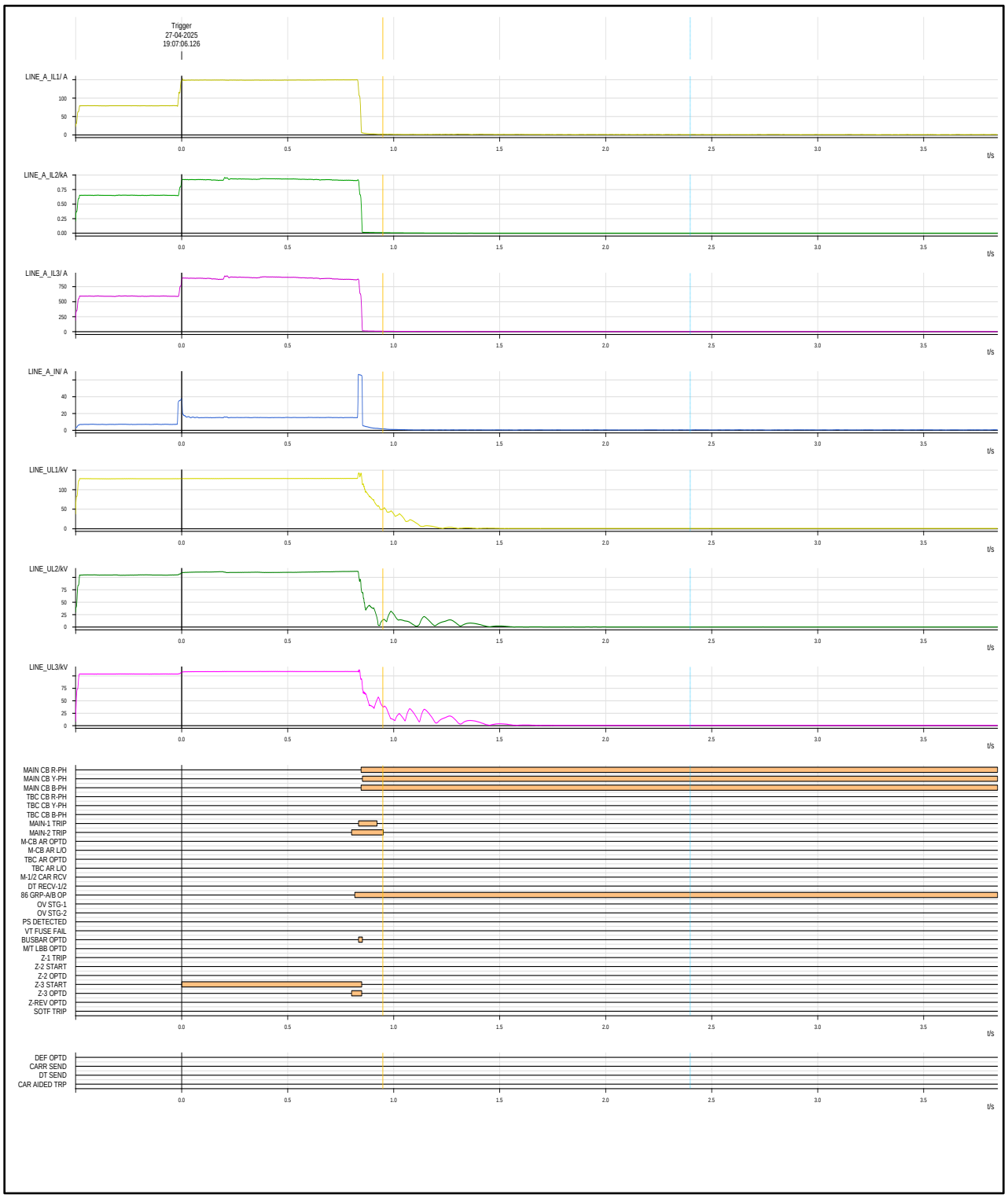
Annexure 1: (Sequence of Events-As per ERLDC SCADA):

TIME	MILLI_SEC	STATION	DESCRIPTION	STATUS
27-04-2025 19:07	957	DALTN_PG	220_CHATRA_1_CB	OPEN

**** Remaining SOE not available at ERLDC end.**

Annexure 2:

DR of 220kV Daltongunj -Chatra at Daltongunj



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, टालिगंज, कोलकाता - 700033
Office : 14, Golf Club Road, Tollygunge, Kolkata - 700033
CIN : U40105DL2009GOI188682, Website : www.erldc.in, E-mail : erldcinfo@grid-india.in, Tel.: 033 23890060/0061

पूर्वी क्षेत्र के 400 केवी दिक्चू में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event at 400 kV Dikchu 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): 07-05-2025

1. Event Summary (घटना का सारांश):

At 20:34 Hrs, 400 kV Rangpo-Dikchu tripped on Y-Earth fault from Dikchu end and as Dikchu is radially connected to Rangpo both units of Dikchu tripped Due to loss of evacuation path. Total generation loss of 96 MW occurred at Dikchu.
400 kV Rangpo-Dikchu charged at 21:26 Hrs. Dikchu Unit#1 & 2 synchronized at 21:34 Hrs and 21:49 Hrs respectively.

2. Time and Date of the Event (घटना का समय और दिनांक): 20:34 hrs of 30.04.2025

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	**Regional Generation in MW**	**Regional Demand in MW**
Pre-Event (घटना पूर्व)	50.02	32489	24973
Post Event (घटना के बाद)	50.01	32393	24973

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

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो बंद है)	Dikchu -Teesta-3 -Rangpo is under long outage since Cloudburst event
Weather Condition (मौसम स्थिति)	Inclement weather in Dikchu Area

6. Load and Generation loss (लोड और जेनरेशन हानि): Generation loss of 96 MW at Dikchu S/s.

7. Duration of interruption (रुकावट की अवधि): 00:52 Hrs.

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

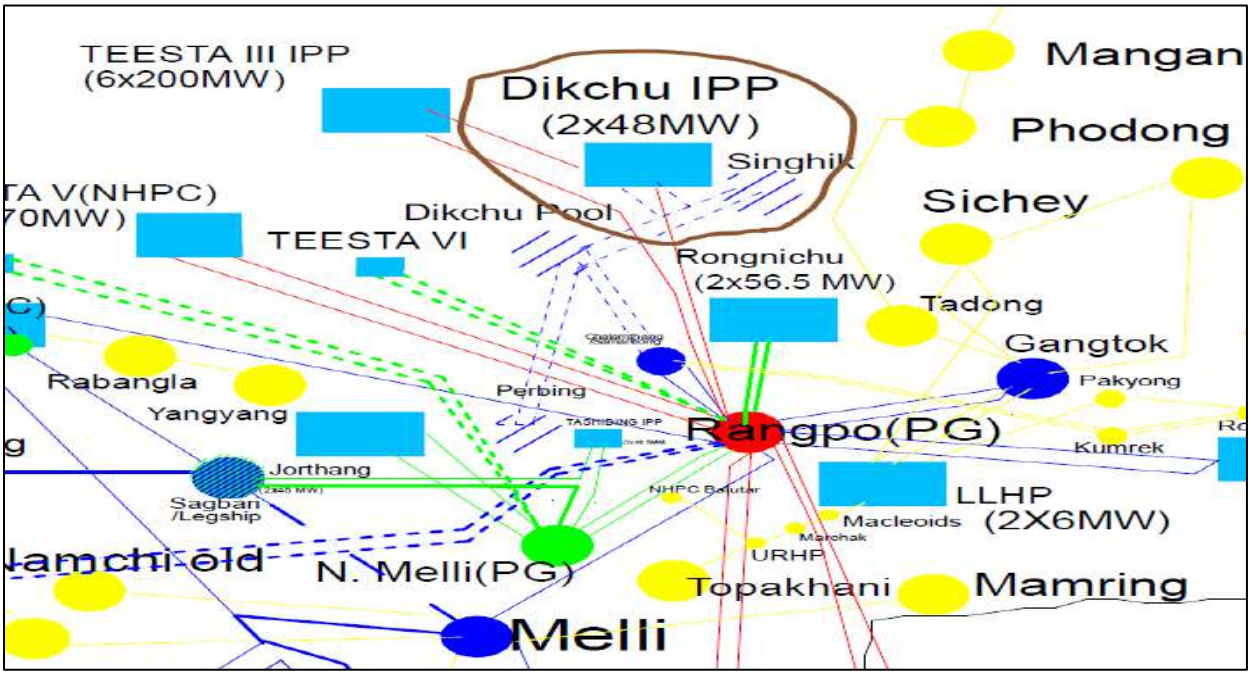


Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग):

क्रoसo	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	400 kV Rangpo-Dikchu	20:34	A/r successful from Rangpo end.	Dikchu end: Y-ph, FD:33.57 Km, FC:0.864 kA	21:26
2	Dikchu Unit-1		Over frequency/Overspeed		21:34
3	Dikchu Unit-2		Over frequency/Overspeed		21:49

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

- Tie bay of Rangpo & Teesta-III at Dikchu was out of service due to long outage of 400kV Rangpo-Teesta-III circuit so Dikchu -Rangpo was only connected with Main Bay.
- Dikchu generation was radially evacuated through 400kV Rangpo-Dikchu S/c.

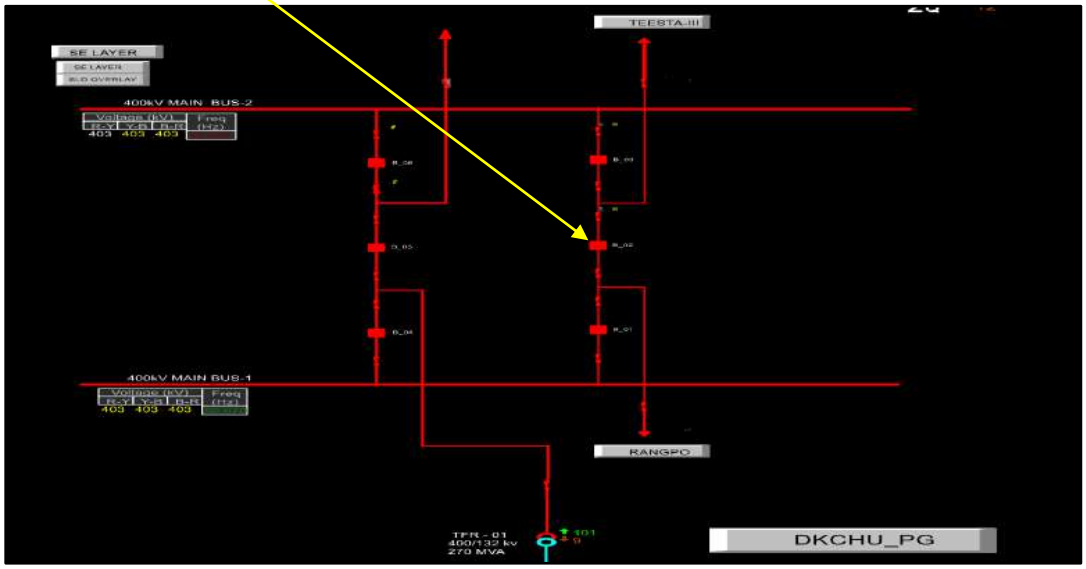


Figure 2: SLD of 400kV Dikchu S/s

- At 20:34 Hrs Y-phase to ground fault occurred and A/r successful from Rangpo end.
- Fault was sensed in zone-2 and Carrier was received at Dikchu and instantaneous Three phase tripping occurred instead of single-phase tripping.
- As per DR Tie A/r lockout signal also became high before tripping which led to three phase tripping from Dikchu end and Non-operation of A/R attempt.

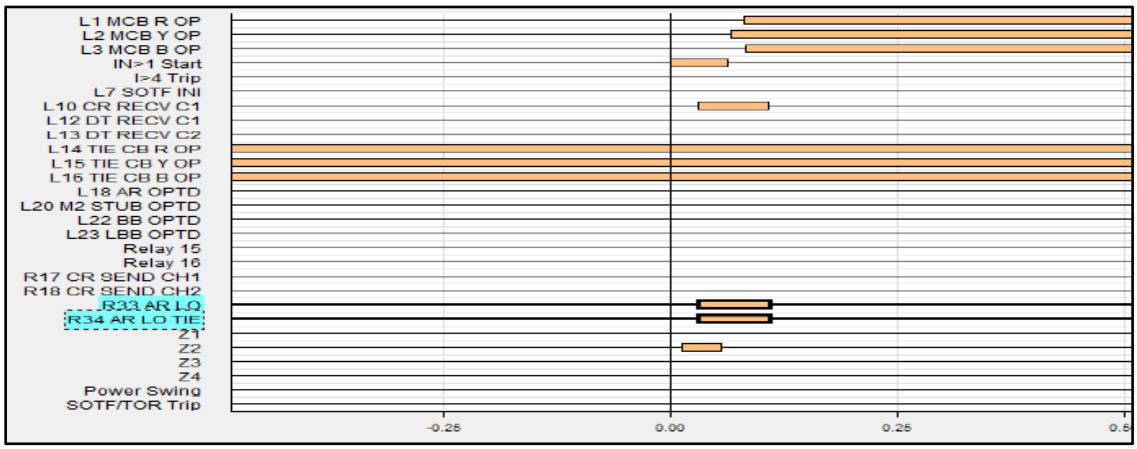


Figure 3: DR of 400kV Rangpo-Dikchu at Dikchu

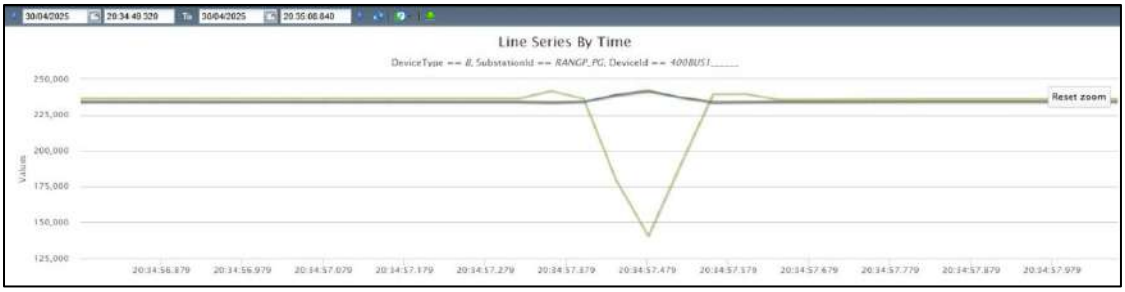


Figure-4: PMU of Rangpo voltage

- Dikchu Unit#1 & 2 tripped on Overspeed protection due to loss of evacuation path.
- 400kV Dikchu S/s became dead.
- Total 96 MW generation loss occurred at Dikchu generating station.
- 400 kV Rangpo-Dikchu charged at 21:26 Hrs. Dikchu Unit#1 & 2 synchronized at 21:34 Hrs and 21:49 Hrs respectively.

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

- Tie bay of Rangpo & Teesta-III was out of service due to long outage of 400kV Rangpo-Teesta-III circuit. For Single phase to ground fault A/r successfully occurred at Rangpo end, but due to A/r lockout signal high at Dikchu end A/r not attempted and three phase tripping occurred at Dikchu end.
- A/r scheme may be checked and confirmed by Dikchu end to avoid three phase tripping for transient single phase to ground fault.

13. Action Taken/Remedial Measures (सुधारात्मक उपाय): Informed Under reveiw.

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

S.No.	Issues	Regulation Non-Compliance	Utilities
1.	**DR/EL not submitted within 24 hours**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**NA**

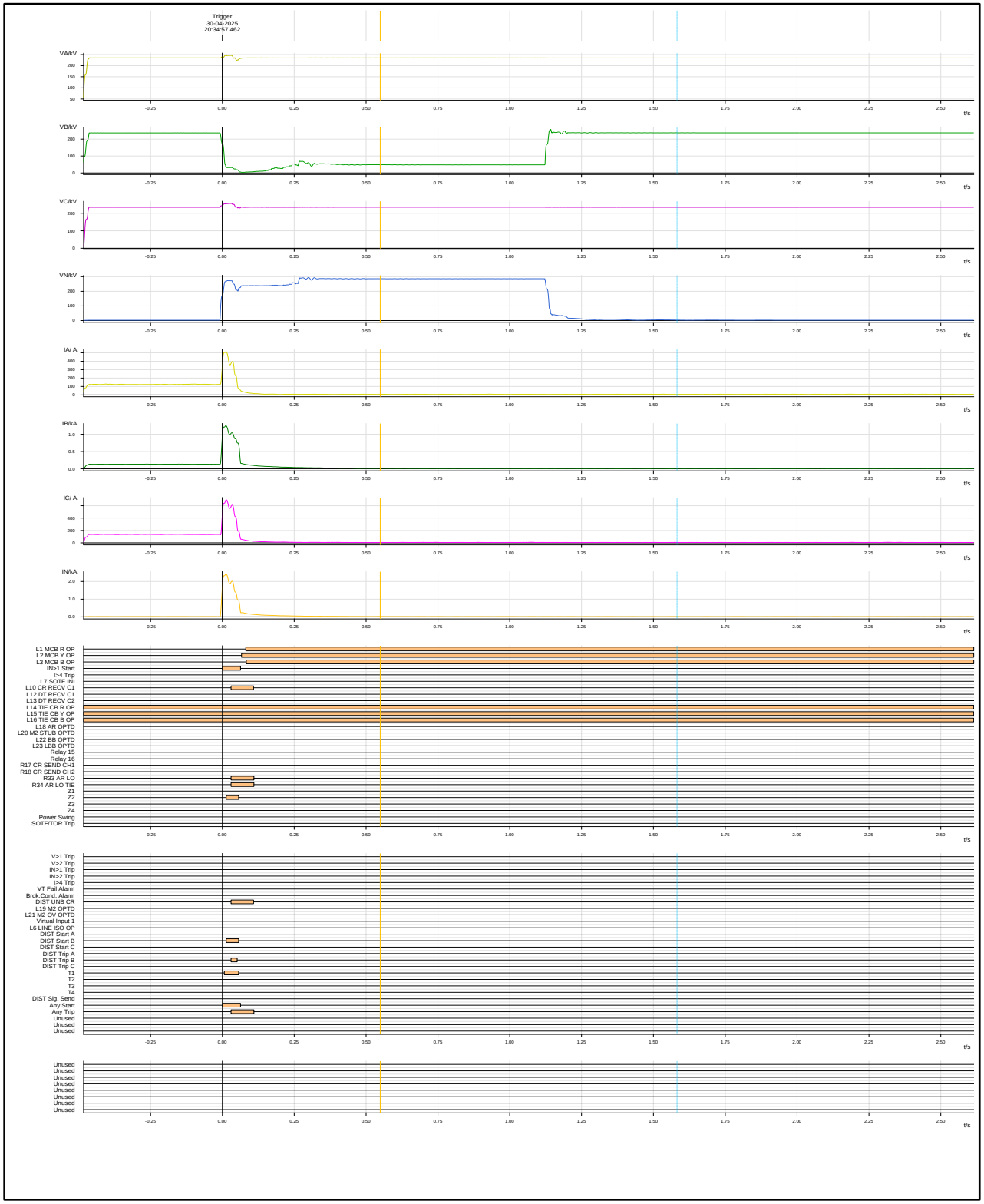
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु): A/R Lockout Scheme should be immune to outage of any Tie or Main Bay element.

Annexure 1: (Sequence of Events-As per ERLDC SCADA):

TIME	MILLI_SEC	STATION	DESCRIPTION	STATUS
30-04-2025 20:34	559	DKCHU_PG	132_ICT_1_Sec_CB	Open
30-04-2025 20:34	559	DKCHU_PG	132_ICT_1_Sec_CB	Open
30-04-2025 20:34	559	DKCHU_PG	132_UNIT_H_2_CB	Open
30-04-2025 20:34	559	DKCHU_PG	132_UNIT_H_2_CB	Open
30-04-2025 20:34	559	DKCHU_PG	132/11_Xfmr1_Pri_CB	Open
30-04-2025 20:34	559	DKCHU_PG	132/11_Xfmr1_Pri_CB	Open
30-04-2025 20:34	579	DKCHU_PG	132_UNIT_H_1_CB	Open
30-04-2025 20:34	579	DKCHU_PG	132_UNIT_H_1_CB	Open
30-04-2025 20:34	595	RANGP_PG	400_DIKCHU_PG_CB	Closed

Annexure 2:

DR of 400kV Rangpo-Dikchu at Dikchu:



PG ER-1

Annexure B.11

Protection Performance Indices for the month of April'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	Security Index (Nc/(Nc+Nu))	Reliability Index	Remarks (Reason for performance indices less
						End A	End B	End A	End B	End A	End B	End A	End B				
1	132kV ARA-ARA(BSPTCL)-1	14-04-2025	16:24:00	14-04-2025	18:13:00	TRIPPED FROM BOTH ENDS DUE TO Y-N FAULT ARA (AFAS):FD-2.005KM, FC-8.849KA FAULT IS UNDER BSPTCL JURISDICTION	Other Utility	1	NA	0	NA	0	NA	1	1	1	
2	132kV ARA-ARA(BSPTCL)-1	10-04-2025	14:12:00	10-04-2025	15:55:00	TRIPPED FROM BOTH ENDS DUE Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. FAULT DETAILS ARA(AFAS)- M1: FD-0.325KM, FC- 11.031KA FLASHOVER ON CONDUCTOR AT LOC NO 02 AND 03	Other Utility	1	NA	0	NA	0	NA	1	1	1	
3	132kVARA-DUMRAON(BSPTCL)-1	25-04-2025	10:55:00	25-04-2025	12:11:00	TRIPPED FROM BOTH ENDS DUE TO R-N FAULT . ARA AFASA DETAILS- M1: FD- 48.43 KM, FC- 1.427KA. FAULT IS UNDER BSPTCL JURISDICTION.	Other Utility	1	NA	0	NA	0	NA	1	1	1	
4	132kVARA-DUMRAON(BSPTCL)-1	25-04-2025	12:36:00	25-04-2025	19:03:00	TRIPPED FROM BOTH ENDS DUE TO R-N FAULT ARA SITE DETAILS- FC - 892.9A, FD- 40.23 KM FAULT IS UNDER BSPTCL JURISDICTION	Other Utility	1	NA	0	NA	0	NA	1	1	1	
5	220 kV DALKHOLA-PURNEA -1	28-04-2025	03:01:00	28-04-2025	03:01:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO R-N FAULT DUE TO LOCALIZED CYCLONE AROUND FAULT AREA PURNEA (SITE)- M1: FD- 28.07KM, FC- 3.548KAFAULT AREA- NEW PURNEA TLM. FLASHOVER MARKS FOUND IN BETWEEN CC RING AND INSULATOR (CROSS ARM END) OF R-PH (TOP CONDUCTOR) AT LOC NO 28.		NA	1	NA	0	NA	0	1	1	1	
6	220kV GAYA-BODHGAYA(BSPTCL)-1	21-04-2025	19:30:00	21-04-2025	20:06:00	TRIPPED FROM BODH GAYA END ONLY DUE TO OPERATION OF OVER CURRENT AND E/F PROTECTION. FAULT IS UNDER BSPTCL JURISDICTION.	Other Utility	1	NA	0	NA	0	NA	1	1	1	
7	220kV GAYA-BODHGAYA(BSPTCL)-2	21-04-2025	19:30:00	21-04-2025	20:06:00	TRIPPED FROM BODH GAYA END ONLY DUE TO OPERATION OF OVER CURRENT AND E/F PROTECTION. FAULT IS UNDER BSPTCL JURISDICTION.	Other Utility	1	NA	0	NA	0	NA	1	1	1	
8	220kV GAYA-DEHRI(BSPTCL)-2(LILO PART.)	10-04-2025	14:18:00	10-04-2025	18:24:00	TRIPPED FROM BOTH ENDS DUE TO B-N FAULT. GAYA (SITE)- M1: FD- 69.5KM, FC- 2.32KA FAULT IS UNDER BSPTCL JURISDICTION	Other Utility	1	NA	0	NA	0	NA	1	1	1	
9	220kV GAYA-DEHRI(BSPTCL)-2(LILO PART.)	20-04-2025	11:50:00	20-04-2025	11:50:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO B-N FAULT GAYA (SITE):M1-FD-32.4KM, FC-3.39KA. FAULT IS UNDER BSPTCL JURISDICTION		1	NA	0	NA	0	NA	1	1	1	
10	220kV RANCHI-CHANDIL(JUSNL)	14-04-2025	16:38:00	14-04-2025	16:38:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO R-N FAULT RANCHI (SITE):M1-FD-49.4KM, FC-3.26KA FAULT IS UNDER JUSNL JURISDICTION		1	NA	0	NA	0	NA	1	1	1	
11	220kV RANCHI-HATIA(JSEB)-1	20-04-2025	12:57:00	20-04-2025	16:41:00	TRIPPED DUE TO Y-B PH TO GROUND FAULT RANCHI(AFAS):- M1-FD-37.455KM, FC-6.343KA FAULT IS UNDER JUSNL JURISDICTION	Other Utility	1	NA	0	NA	0	NA	1	1	1	
12	220kV RANCHI-HATIA(JSEB)-2	15-04-2025	18:36:00	15-04-2025	19:36:00	TRIPPED FROM BOTH ENDS IN Z-2 DUE TO R-N FAULT. RANCHI SITE DETAILS: FC=3.74KA, FD=36.3KM. FAULT IS UNDER JUSNL JURISDICTION	Other Utility	1	NA	0	NA	0	NA	1	1	1	
13	220kV RANCHI-HATIA(JSEB)-3	13-04-2025	00:23:00	13-04-2025	01:15:00	TRIPPED FROM BOTH ENDS DUE TO R-N FAULT RANCHI AFAS DETAILS: M1: FC: 2.109 kA, FD: 40.100KM. FAULT IS UNDER JUSNL JURISDICTION	Other Utility	1	NA	0	NA	0	NA	1	1	1	
14	220kV RANCHI-HATIA(JSEB)-3	15-04-2025	18:36:00	15-04-2025	19:28:00	TRIPPED FROM BOTH ENDS IN Z-2 DUE TO R-N FAULT. RANCHI SITE DETAILS: FC=3.97KA, FD=33.8KM. FAULT IS UNDER JUSNL JURISDICTION	Other Utility	1	NA	0	NA	0	NA	1	1	1	
15	220kV SASARAM-NADOKHAR(BSPTCL)-1	10-04-2025	13:23:00	10-04-2025	13:23:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO THUNDERSTORM AND LIGHTENING. PUSAULI SITE-M1-FD-2.32 KM, FC-8.03S, M2-FD-3.1 KM, FC-7.92 KA. FAULT IS UNDER BSPTCL JURISDICTION.		1	NA	0	NA	0	NA	1	1	1	
16	220kV SASARAM-NADOKHAR(BSPTCL)-1	26-04-2025	11:44:00	26-04-2025	12:11:00	TRIPPED DUE TO B-N FAULT FAULT DETAIL- SASARAM(SITE)- M1 : Z3, FC - 2.116KA, FD- 44.91KM FAULT IS UNDER BSPTCL JURISDICTION	Other Utility	1	NA	0	NA	0	NA	1	1	1	
17	220kV SASARAM-NADOKHAR(BSPTCL)-1	25-04-2025	13:41:00	25-04-2025	15:19:00	TRIPPED ONLY FROM SASARAM DUE TO B-N FAULT IN ZONE-3 DUE TO FAULT IN TRANSFORMER AT NODOKHAR END (BSPTCL). SASARAM SITE DETAILS- M1: FD- 82.78KM, FC-1.32KA. FAULT IS UNDER BSPTCL JURISDICTION	Other Utility	1	NA	0	NA	0	NA	1	1	1	
18	220kV SASARAM-NADOKHAR(BSPTCL)-1	13-04-2025	08:56:00	13-04-2025	10:31:00	TRIPPED FROM BOTH ENDS DUE TO R-N FAULT.FAULT DETAILS, SASARAM(SITE)-M1: FD- 1.12KM FC-13.69KA M2: FD- 1.2KM FC-13.121KA FAULT IS UNDER BSPTCL JURISDICTION	Other Utility	1	NA	0	NA	0	NA	1	1	1	
19	220kV SASARAM-NADOKHAR(BSPTCL)-2	25-04-2025	13:41:00	25-04-2025	15:19:00	TRIPPED ONLY FROM SASARAM DUE TO B-N FAULT IN ZONE-3 DUE TO FAULT IN TRANSFORMER AT NODOKHAR END (BSPTCL). SASARAM SITE DETAILS- M1: FD= 118.40; FC=.905KA FAULT IS UNDER BSPTCL JURISDICTION	Other Utility	1	NA	0	NA	0	NA	1	1	1	
20	220kV SASARAM-NADOKHAR(BSPTCL)-2	26-04-2025	11:44:00	26-04-2025	12:11:00	TRIPPED DUE TO B-N FAULT FAULT DETAIL- SASARAM(SITE)- M1 : Z3, FC - 1.463KA, FD- 64.80KM FAULT IS UNDER BSPTCL JURISDICTION	Other Utility	1	NA	0	NA	0	NA	1	1	1	
21	315MVA,400/220KV ICT-3 AT BIHARSHARIFF	14-04-2025	17:51:00	14-04-2025	18:59:00	TRIPPED DUE TO OPERATION OF HV BACKUP E/F RELAY (FAULT IN 132KV FEEDER AT BSPTCL END AS REPORTED BY BSPTCL). FAULT UNDER BSPTCL JURISDICTION		1	NA	0	NA	0	NA	1	1	1	
22	315MVA,400/220KV ICT-3 AT BIHARSHARIFF	10-04-2025	16:05:00	10-04-2025	19:02:00	TRIPPED ONLY FROM BIHARSHARIF(BSPTCL) 220KV END DUE TO PROBLEM AT BSPTCL END.		1	NA	0	NA	0	NA	1	1	1	
23	400 kV BIHARSHARIF-BALIA-1	10-04-2025	15:47:00	10-04-2025	17:01:00	TRIPPED FROM BOTH ENDS DUE TO R-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. BALIA:- FC-2.650KA FD-241.5KM.	Other Utility	1	NA	0	NA	0	NA	1	1	1	
24	400 kV BIHARSHARIF-BALIA-2	12-04-2025	22:42:00	12-04-2025	23:37:00	TRIPPED FROM BOTH ENDS DUE TO B-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. BIHARSHARIF SITE DETAILS- M1, Z1, FD- 1.375KM, FC- 18.3KA. 220KV KHIZARSHARAI CKT - 1 AND 2 (BSPTL LINE) IS UNDER PASSED WITH 400KV BIHARSHARIF-BALIA CKT # 1AND2 LINE AND FLASH OVER MARK FOUND BETWEEN OPGW OF 220KV KHIZARSHARAI LINE AND BOTTOM CONDUCTOR OF 400KV BSF-BALIA CKT#2 LINE	Other Utility	1	NA	0	NA	0	NA	1	1	1	

25	400 kV BIHARSHARIF-BALIA-2	10-04-2025	15:47:00	11-04-2025	15:45:00	TRIPPED FROM BOTH ENDS DUE TO B-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. BIHARSHARIF SITE DETAILS: M1: FC=18.34KA, FD=1.4KM. EARTHWIRE SNAPPED AT LOC.-37	Other Utility	1	NA	0	NA	0	NA	1	1	1	
26	400 kV BIHARSHARIF-BALIA-2	10-04-2025	13:53:00	10-04-2025	13:53:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO R-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. FAULT DETAILS- BIHARSHARIFF(SITE)- M1: FD- 179.9KM, FC- 2.246KA, M2: FD- 174.7KM, FC- 2.35KA. ONE NO. BURNT PORCELAIN INSULATOR STRING WAS FOUND AT LOC NO. 462		1	NA	0	NA	0	NA	1	1	1	
27	400 KV JAKKANPUR NABINAGAR-2	09-04-2025	17:30:00	09-04-2025	17:30:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO R-N FAULT DUE TO LOCALIZED CYCLONE. FAULT DETAILS(JAKKANPUR)- M1: FD- 118.5KM, FC- 3.017KA. FLASHOVER BETWEEN R-PHASE(MIDDLE PHASE) ARCING HORN AND JUMPER AT LOC-10(DC+3)		NA	NA	NA	NA	NA	NA	NA	NA	NA	
28	400 kV TATA DVC-BARIPADA-1	20-04-2025	17:34:00	20-04-2025	19:37:00	A/R SUCCESSFUL FROM BARIPADA END AND TRIPPED FROM TISCO END DUE TO B-N FAULT TISCO (SITE): M1: FD-2.08KM, FC- 8.77KA FAULT IS UNDER DVC JURISDICTION		NA	NA	NA	NA	NA	NA	NA	NA	NA	
29	400kV DALTONGANJ-SASARAM-2	10-04-2025	14:10:00	10-04-2025	14:10:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING. SASARAM(SITE)- M1: FD= 35.03 KM, FC= 6.5 kA, M2-FD= 35.94KM, FC=6.714kA. FLASHOVER MARK ON Y-PAHSE(TOP PHASE) INSULATOR AND ONE DISC BROKEN OF PORCELAIN ISULATOR AT LOC-113.		1	NA	0	NA	0	NA	1	1	1	
30	400kV BANKA BIHARSARIF-1	18-04-2025	05:45:00	18-04-2025	17:16:00	TRIPPED FROM BOTH ENDS DUE TO R-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. FAULT DETAILS-BIHARSHRIF(SITE)-M1:FD-97.9KM FC-3.54KA M2: FD-87.40KM FC-3.49KA. INSULATOR DECAPPED AT LOCATION 291		1	1	0	0	0	0	1	1	1	
31	400kV BANKA BIHARSARIF-1	10-04-2025	16:19:00	10-04-2025	16:37:00	TRIPPED FROM BOTH ENDS DUE TO R-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA.. BIHARSHARIF(AFAS): M1-FC-5.031KA,FD-44.163KM.		1	1	0	0	0	0	1	1	1	
32	400kV BANKA BIHARSARIF-2	10-04-2025	16:19:00	10-04-2025	16:55:00	TRIPPED FROM BOTH ENDS DUE TO Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. BIHARSHARIF SITE: M1: FD=23.7KM, FC=6.29KA.		1	1	0	0	0	0	1	1	1	
33	400kV BIHARSHARIF-MUZAFFARPUR-2	10-04-2025	15:52:00	10-04-2025	17:41:00	TRIPPED FROM BOTH ENDS DUE TO B-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. BIHARSHARIF:- FC-2.162KA,FD-3.52KM FLASHOVER ON JUMPER AND CROSS ARM AT LOC NO 48.		1	1	0	0	0	0	1	1	1	
34	400kV BIHARSHARIF-SASARAM-1	14-04-2025	13:34:00	14-04-2025	13:34:00	A/R SUCCESSFULL FROM BOTH ENDS DUE TO B-N FAULT TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. FAULT DETAILS. BIHARSHRIF(AFAS)-M1: FD- 155.369KM, FC- 2.771KA.		1	1	0	0	0	0	1	1	1	
35	400kV BIHARSHARIF-SASARAM-1	10-04-2025	15:45:00	10-04-2025	16:24:00	TRIPPED FROM BOTH ENDS DUE TO B-N FAULT BIHARSHARIF (AFAS) M1-FC-11.8KA,FD-10.27KM, M2-FC-11.719KA,FD-10.352KM IT IS FOUND THAT BSPTL 132KV LINE IS UNDER PASSED WITH 400KV BIHARSHARIF-SASARAM CKT # 1AND2 LINE. AFTER TRIPPING OPGW HAS BROKEN DUE TO FLASHING BETWEEN OPGW OF 132KV BSPTL LINE AND BOTTOM CONDUCTOR OF 400KV BSF-SASARAM CKT #-1 LINE. HEAVY STROM, THUNDERING AND RAINING HAS BEEN OCCURED AT THE TIME OF TRIPPING.		1	1	0	0	0	0	1	1	1	
36	400kV CHANDWA-GAYA-1	09-04-2025	13:57:00	09-04-2025	13:57:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO R-N FAULT DUE TO THUNDERSTORM AND LIGHTENING. CHANDWA(SITE): M1-FC-6.7KA,FD-41.9KM, M2-FC-6.8KA,FD-42.6KM FLASHOVER BETWEEN ARCING HORN, INSULATOR, GRADING RING, CC-RING AT LOC-103(DA+3)		1	1	0	0	0	0	1	1	1	
37	400kV FARAKKA(NTPC)-KAHALGAON(NTPC)-1	18-04-2025	11:13:00	18-04-2025	20:05:00	TRIPPED DUE TO JUMPER SNAPPED BETWEEN CT AND WAVE TRAP OF 400KV KHALGAON-FARAKKA-1 AT NTPC KAHALGAON END FAULT IS UNDER NTPC KAHALGAON END		NA	NA	NA	NA	NA	NA	NA	NA	NA	
38	400kV FARAKKA(NTPC)-KAHALGAON(NTPC)-1	26-04-2025	13:33:00	26-04-2025	20:14:00	TRIPPED DUE TO Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA.. FARAKA SITE DETAILS- FD- 40.39KM, FC- 7.911KA. AT LOC NO 89, FLASH OVER MARK FOUND ON CC RING Y PHASE .		NA	NA	NA	NA	NA	NA	NA	NA	NA	
39	400kV FARAKKA(NTPC)-KAHALGAON(NTPC)-1	26-04-2025	12:58:00	26-04-2025	13:21:00	TRIPPED DUE TO Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA FARAKA SITE DETAILS- 36.79KM, FC- 9.293KA. AT LOC NO 89, FLASH OVER MARK FOUND ON CC RING Y PHASE .		NA	NA	NA	NA	NA	NA	NA	NA	NA	
40	400kV FARAKKA(NTPC)-KAHALGAON(NTPC)-2	23-04-2025	11:23:00	23-04-2025	11:23:00	A/R SUCCESSFULLY OPERATED FROM BOTH ENDS DUE TO Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. KAHALGAON (SITE): FC-14.8KA,FD-8.8KM .		NA	NA	NA	NA	NA	NA	NA	NA	NA	
41	400kV FARAKKA(NTPC)-KAHALGAON(NTPC)-2	26-04-2025	13:57:00	26-04-2025	16:40:00	TRIPPED ONLY FROM FARAKA END DUE TO R-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. FARAKKA END DETAILS: FD=29.23KM, FC=8.9KA. BUSH FIRE FOUND BETWEEN LOC NO 119 TO 120.		NA	NA	NA	NA	NA	NA	NA	NA	NA	
42	400kV FARAKKA(NTPC)-KAHALGAON(NTPC)-2	23-04-2025	15:07:00	23-04-2025	18:23:00	TRIPPED DUE TO Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA .FAULT DETAILS- KAHALGAON(SITE)-FD-8.2KM FC-23.5KA. CONDUCTOR SNAPPED BETWEEN LOC.NO.-239-240		NA	NA	NA	NA	NA	NA	NA	NA	NA	
43	400kV GAYA MAITHON-1	10-04-2025	15:13:00	11-04-2025	14:39:00	TRIPPED FROM BOTH ENDS DUE TO R-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. GAYA(SITE) M1-FC-2.62KA,FD-51.0KM R-PH CONDUCTOR SNAPPED AT LOCATION NO 40/41	Other Utility	1	NA	0	NA	0	NA	1	1	1	
44	400kV JAMSHEDPUR-BARIPADA-2	17-04-2025	14:47:00	17-04-2025	14:47:00	A/R SUCCESSFULLY OPERATED FROM BOTH ENDS DUE TO R-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. JAMSHEDPUR AFAS DETAIL: FC=3.73KA, FD=120.465KM. FLASH OVER MARK OBSERVED AT R PHASE (TOP) BETWEEN ARCING HORN, AND CC RING		1	NA	0	NA	0	NA	1	1	1	
45	400kV KAHALGAON(NTPC)-BANKA-1	18-04-2025	11:13:00	18-04-2025	11:41:00	Other Utility	TRIPPED DUE TO JUMPER SNAPPED BETWEEN CT AND WAVE TRAP OF 400KV KHALGAON-FARAKKA-1 AT NTPC KAHALGAON END. FAULT IS UNDER NTPC KAHALGAON END	NA	1	NA	0	NA	0	1	1	1	
46	400kV KAHALGAON(NTPC)-BARH(NTPC)-1	18-04-2025	11:13:00	18-04-2025	11:39:00	TRIPPED DUE TO JUMPER SNAPPED BETWEEN CT AND WAVE TRAP OF 400KV KHALGAON-FARAKKA-1 AT NTPC KAHALGAON END. FAULT IS UNDER NTPC KAHALGAON END		NA	NA	NA	NA	NA	NA	NA	NA	NA	
47	400kV KAHALGAON(NTPC)-BARH(NTPC)-1	09-04-2025	05:36:00	09-04-2025	05:36:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO R-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. BARH: M1-Z1, FD-67.55KM, FC-5.885KA.		NA	NA	NA	NA	NA	NA	NA	NA	NA	
48	400kV KAHALGAON(NTPC)-BARH(NTPC)-2	10-04-2025	16:53:00	10-04-2025	17:32:00	A/R SUCCESFULLY OPERATED FROM BARH END AND TRIPPED FROM KAHALGAON END. FAULT IS UNDER NTPC KAHALGAON END		NA	NA	NA	NA	NA	NA	NA	NA	NA	
49	400kV KAHALGAON(NTPC)-BARH(NTPC)-2	18-04-2025	11:13:00	18-04-2025	11:44:00	TRIPPED DUE TO JUMPER SNAPPED BETWEEN CT AND WAVE TRAP OF 400KV KHALGAON-FARAKKA-1 AT NTPC KAHALGAON END FAULT IS UNDER NTPC KAHALGAON END		NA	NA	NA	NA	NA	NA	NA	NA	NA	
50	400kV KAHALGAON(NTPC)-BARH(NTPC)-2	26-04-2025	13:33:00	26-04-2025	15:03:00	TRIPPED DUE TO TRIPPING OF 400KV KAHALGAON FARAKKA CKT 1 AS BOTH ARE IN SAME DIA AND MAIN BAY OF BARH 2 IS UNDER SHUTDOWN DUE TO BAY UPGRADATION WORK AT NTPC KAHALGAON END		NA	NA	NA	NA	NA	NA	NA	NA	NA	
51	400kV KAHALGAON(NTPC)-BARH(NTPC)-2	26-04-2025	12:58:00	26-04-2025	13:26:00	TRIPPED DUE TO TRIPPING OF 400KV KAHALGAON FARAKKA CKT 1 AS BOTH ARE IN SAME DIA AND MAIN BAY OF BARH 2 IS UNDER SHUTDOWN DUE TO BAY UPGRADATION WORK AT NTPC KAHALGAON END		NA	NA	NA	NA	NA	NA	NA	NA	NA	
52	400kV KAHALGAON(NTPC)-BARH(NTPC)-2	05-04-2025	18:38:00	05-04-2025	19:06:00	TRIPPED ONLY FROM KAHALGAON END AND AR SUCCESSFUL FROM BARH END, DUE TO R-N FAULT . BARH END DETAILS: FD=14.54KM, FC=22.38KA.		NA	NA	NA	NA	NA	NA	NA	NA	NA	

53	400kV KAHALGAON(NTPC)-BARH(NTPC)-2	05-04-2025	19:06:00	06-04-2025	10:38:00	AFTER SUCCESSFUL A/R, THE LINE REMAINED CHARGED FROM BARH END. HOWEVER, GENERATOR PROTECTION AND LINE PROTECTION WERE PICKED UP WITH HEAVY DIP IN VOLTAGE AT BARH END. FOR SAFETY OF GENERATING UNITS, BARH HAS OPENED CB OF BARH-KAHALGAON-2 LINE AT 19:06HRS AT ITS END. SHUTDOWN TAKEN BY NTPC BARH.	NA	NA	NA	NA	NA	NA	NA	NA	NA	
54	400kV KAHALGAON(NTPC)-LAKHISARAI-1	18-04-2025	05:53:00	18-04-2025	05:53:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. FAULT DETAIL-LAKHISARAI(AFAS)-M2:FD-72.66KM FC-3.983KA FLASH OVER MARK FOUND ON Y PHASE INSULATOR AT LOC NO 185	NA	1	NA	0	NA	0	1	1	1	
55	400kV KAHALGAON(NTPC)-LAKHISARAI-1	10-04-2025	18:06:00	10-04-2025	18:06:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO Y-N DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA FAULT DETAIL- LAKHISARAI (SITE)-M1 : FC - 3.247KA, FD- 74.47KM FLASH OVER MARK FOUND ON ARCHING HORN AND CONDUCTOR R PHASE AT LOC NO 194	NA	1	NA	0	NA	0	1	1	1	
56	400kV KAHALGAON(NTPC)-LAKHISARAI-2	10-04-2025	16:52:00	11-04-2025	02:31:00	Other Utility — TRIPPED DUE TO Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. FAULT DETAILS-LAKHISARAI-FD-0KM, FC-10.67KA. Y-PH LA DAMAGED AT LAKHISARAI SS.	NA	1	NA	0	NA	0	1	1	1	
57	400kV KAHALGAON(NTPC)-MAITHON-1	17-04-2025	15:34:00	17-04-2025	15:34:00	A/R SUCCESSFULLY OPERATED FROM BOTH END DUE TO Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA . KAHALGAON END DETAILS: FC-4.31KA,FD-96.4KM FLASH OVER MARK FOUND ON INSULATOR AT TOWER NO 261	NA	NA	NA	NA	NA	NA	NA	NA	NA	
58	400kV KAHALGAON(NTPC)-MAITHON-1	23-04-2025	15:06:00	23-04-2025	16:00:00	TRIPPED DUE TO OVER VOLTAGE AT KAHALGAON AND DT RECEVIED AT MAITHON END. FAULT UNDER NTPC KAHALGAON JURISDICTION	NA	NA	NA	NA	NA	NA	NA	NA	NA	
59	400kV KODERMA(DVC)-BIHARSHARIF-1	10-04-2025	15:52:00	10-04-2025	17:23:00	Other Utility — TRIPPED FROM BOTH ENDS DUE TO Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. BIHARSHARIF SITE DETAIL- FC-8.182KA,FD-8.7KM. FLASH OVER MARK FOUND BETWEEN TOP-PHASE (Y-PH) JUMPER TO MIDDLE CROSS-ARM AT LOC.NO.- 268	NA	1	NA	0	NA	0	1	1	1	
60	400kV KODERMA(DVC)-GAYA-1	10-04-2025	15:31:00	10-04-2025	15:31:00	A/R SUCESSFULLY OPERATED FROM BOTH ENDS DUE TO R-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. GAYA SITE: M1: FD=37.7KM, FC=8.34KA. FLASHOVER ON JUMPER AND CROSS ARM AT LOC NO 12	NA	1	NA	0	NA	0	1	1	1	
61	400kV LAKHISARAI-BIHARSHARIF-1	10-04-2025	16:10:00	10-04-2025	16:10:00	A/R SUCCESSFULLY OPERATED FROM BOTH ENDS DUE TO B-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. FAULT DETAILS-LAKHISARAI-M1-FD-119.7KM, FC-2.15KA	1	1	0	0	0	0	1	1	1	
62	400kV LAKHISARAI-BIHARSHARIF-1	12-04-2025	22:56:00	12-04-2025	22:56:00	A/R SUCCESSFUL FROM BOTH END DUE TO Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING . BIHARSHARIF SITE DETAILS- M1, Z1, FD- 12.45KM, FC- 11.43KA FLASHOVER BW JUMPER AND TOWER BODY AT LOC.NO-07	1	1	0	0	0	0	1	1	1	
63	400kV MOTIHARI(DMTCL)-GORAKHPUR-2	10-04-2025	02:34:00	10-04-2025	02:34:00	A/R SUCESSFUL FROM BOTH ENDS DUE TO B-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. GORAKHPUR(SITE)- M1:FD-2KM FC-17.5KA M2:FD-2KM FC-17.46KA FLASH OVER MARK OBSERVED ON PORCELAIN INSULATOR AND COPPER BOND AT LOCATION NO 789	NA	NA	NA	NA	NA	NA	NA	NA	NA	
64	400kV NEW RANCHI-CHANDWA-1	13-04-2025	02:02:00	13-04-2025	02:02:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING. NEW RANCHI DETAILS- M1: FC-15.47KA, FD- 13.9 KM. FLASH OVER MARK IN B/W ARCING HORN TO JUMPER AT LOCATION NO-40(DB+0)	1	1	0	0	0	0	1	1	1	
65	400kV NEW RANCHI-CHANDWA-2	29-04-2025	17:27:00	29-04-2025	17:27:00	A/R SUCCESFULLY OPERATED FROM BOTH ENDS DUE TO R-N FAULT DUE TO LOCALIZED CYCLONE AROUND FAULT AREA CHANDWA(SITE): M1-FC-8.7KA,FD-24.1KM.	1	1	0	0	0	0	1	1	1	
66	400kV PATNA-BALIA-3	18-04-2025	07:22:00	18-04-2025	07:22:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO R-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. FAULT DETAILS-PATNA(AFAS)-PATNA(AFAS)-M1:FD-1.7KM FC-28.92KA. FLASH OVER B/W JUMPER SUB CONDUCTOR AND MIDDLE CROSS ARM(LOC-TL006, R-PHASE, TOP PHASE)	1	NA	0	NA	0	NA	1	1	1	
67	400kV PATNA-BALIA-3	06-04-2025	11:52:00	06-04-2025	11:52:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO B-N FAULT DUE TO THUNDERSTORM AND LIGHTENING. PATNA (SITE)-M1-FD-52.5KM, FC-6.88KA, FD-52.3KM, FC-6.98KA. B-PHASE PORCELAIN INSULATOR DECAPPED AT LOC-324.	1	NA	0	NA	0	NA	1	1	1	
68	400kV PATNA-BALIA-3	14-04-2025	16:43:00	14-04-2025	16:43:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO B-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. PATNA (SITE):M1-FD-35KM, FC-9.24KA, M2-FD-34.6KM, FC-10KA. FLASH OVER B/W CC RING AND TOWER BODY AT LOC.NO-275	1	NA	0	NA	0	NA	1	1	1	
69	400kV PATNA-SAHARSA-1	09-04-2025	02:41:00	09-04-2025	02:41:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO B-N FAULT DUE TO THUNDERSTORM AND LIGHTENING.SAHARSA(SITE):M1-FD-98.8KM, FC-4.109KA, M2-FD-100.2KM, FC-3.646KA. FLASHOVER BETWEEN B-PHASE JUMPER AND ARCING HORN, YOKE PLATE AT LOC-579(DD+0)	1	1	0	0	0	0	1	1	1	
70	400kV PATNA-SAHARSA-1	27-04-2025	19:53:00	27-04-2025	19:53:00	A/R SUCCESSFUL FROM BOTH END DUE TO R-N FAULT DUE TO LOCALIZED CYCLONE AROUND FAULT AREA. PATNA SITE DETAILS- M1: FD-42.39KM, FC- 7.042 KA. FLASHOVER ON ARCING HORN AND CC-RING AT LOC.-771	1	1	0	0	0	0	1	1	1	
71	400kV PATNA-SAHARSA-2	18-04-2025	04:57:00	18-04-2025	04:57:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO-Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. FAULT DETAIL-SAHRSA(SITE)-M1: 105.7KM FC-4.72KA M2: 104.9KM FC-3.410KA FLASH OVER MARK OBSERVED ON INSULATOR AT LOCATION -616	1	1	0	0	0	0	1	1	1	
72	400kV PATNA-SAHARSA-2	10-04-2025	15:36:00	10-04-2025	16:47:00	TRIPPED FROM BOTH ENDS DUE TO Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. PATNA AFAS DETAIL: M1: FC=22.617KA, FD=6.155KM. FLASH OVER MARK OBSERVED BETWEEN JUMPER SUB CONDUCTOR AND TOWER BODY AT LOC.NO.- 896	1	1	0	0	0	0	1	1	1	
73	400kV PATNA-SAHARSA-2	10-04-2025	15:35:00	10-04-2025	15:35:00	A/R SUCESSFULLY OPERATED FROM BOTH ENDS DUE TO Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. PATNA(SITE) M1-FC-21.62KA,FD-5.978KM FLASH OVER MARK OBSERVED BETWEEN JUMPER SUB CONDUCTOR AND TOWER BODY AT LOC.NO.- 896	1	1	0	0	0	0	1	1	1	
74	400kV RANCHI-DHANBAD-2(MRB LILO)	28-04-2025	19:29:00	28-04-2025	19:29:00	A/R SUCCESSFUL FROM BOTH END DUE TO R-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. RANCHI SITE DETAILS- M1: FD- 119.8KM, FC- 3.19KA FLASH OVER MARK FOUND ON INSULATOR AT TOP PHASE TOWER NO 241	1	NA	0	NA	0	NA	1	1	1	
75	400kV RANCHI-MAITHON-1	28-04-2025	19:52:00	28-04-2025	19:52:00	A/R SUCCESSFUL FROM BOTH END DUE TO R-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. RANCHI SITE DETAILS- M1: FD- 130.5KM, FC- 3.021KA AT LOC NO 204(DA+0), FLASH OVER SPOT CLEARLY VISIBLE ON CC RING, INSULATOR DISC, AND ARCING HORN	1	NA	0	NA	0	NA	1	1	1	
76	400kV RANCHI-ROURKELA-1	10-04-2025	16:55:00	10-04-2025	16:55:00	A/R SUCCESFULLY OPERATED FROM BOTH ENDS DUE TO R-N FAULT DUE TO THUNDERSTORM AND LIGHTENING. FAULT DETAILS- ROURKELA- M1-FD- 46.5 KM = ,FC-5.5 KA. M2: FD-61.3KM, FC-5.9 KA. FLASHOVER BETWEEN TOP PHASE ARCING HORN AND CC-RING AT LOC-241	1	NA	0	NA	0	NA	1	1	1	
77	400kV SAHARSA-DARBHANGA-2(LILO PORTION)	09-04-2025	08:22:00	09-04-2025	08:25:00	A/R SUCCESSFUL FROM SAHARSA BUT TRIPPED FROM DARBHANGA END DUE TO Y-N FAULT SAHARSA(SITE):- M1-FC-5.8KA,FD-47.8KM FAULT IS UNDER ATL JURISDICTION — Other Utility	1	NA	0	NA	0	NA	1	1	1	
78	400kV SASARAM-ALLAHABAD	10-04-2025	12:10:00	10-04-2025	12:10:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO B-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA. FAULT DETAILS- SASARAM(SITE)- M1: FD- 114.8KM, FC- 1.593KA. FLASH OVER MARK OBSERVED ON CC RING AT LOCATION 450	1	NA	0	NA	0	NA	1	1	1	

79	400KV-BIHARSHARIF-SAHUPURI-ACL-CKT1	28-04-2025	10:08:00	28-04-2025	10:08:00	A/R SUCCESSFUL FROM BOTH SIDES DUE TO Y-N FAULT,FAULT DETAILS BIHARSHRIF(SITE)-M1:FD-283.7KM, FC-2.258KA M2:FD-286.5KM, FC-1.48KA FAULT UNDER UPPTCL JURISDICTION		1	NA	0	NA	0	NA	1	1	1	
80	400KV-BIHARSHARIF-SAHUPURI-ACL-CKT1	10-04-2025	15:45:00	10-04-2025	18:09:00	TRIPPED FROM BOTH ENDS DUE TO B-N FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA.. BIHARSHARIF SITE DETAILS: M1: FC=11.67KA, FD=8.12KM. FLASHOVER BETWEEN PILOT CC-RING AND ARCING HORN AT LOC.NO.- 18	Other Utility	1	NA	0	NA	0	NA	1	1	1	
81	400KV-BIHARSHARIF-SAHUPURI-ACL-CKT2	10-04-2025	15:27:00	10-04-2025	17:07:00	TRIPPED FROM BOTH ENDS DUE TO Y-N FAULT DUE TO THUNDERSTORM AND LIGHTENING. BIHARSHAIRF(SITE):- M1-FC-9.7KA,FD-23.5KM. FLASH OVER MARK FOUND BETWEEN R-PH (BOTTOM-PH) JUMPER TO TOWER BODY AT LOC.NO.63. HEAVY STORM, THUNDERING AND RAINING HAS BEEN OCCURED AT THE TIME OF TRIPPING.	Other Utility	1	NA	0	NA	0	NA	1	1	1	
82	50MVAR,BUS REACTOR-1 AT BIHARSHARIFF	10-04-2025	15:54:00	10-04-2025	17:27:00	TRIPPED DUE TO TRIPPING OF 400KV BUS-3 AT BIHARSHARIF DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA.		1	NA	0	NA	0	NA	1	1	1	
83	765kV SASARAM-FATEHPUR	14-04-2025	15:46:00	14-04-2025	18:07:00	TRIPPED FROM BOTH ENDS DUE TO B-R PH TO GROUND FAULT DUE TO THUNDERSTORM AND LIGHTENING AROUND FAULT AREA SASARAM(SITE): M1-FD-3.173KM, IR -3.822KA, IB-3.850KA THE OPGW OF 220KV BSPTCL LINE HAD FOUND LOW CLEARANCE (5 METERS) FROM BOTTOM CONDUCTOR (R-PHASE AND B-PHASE) OF 765KV SASARAM-FATEHPUR BETWEEN TOWER LOC NO. 14(C+3), 3.69 KM AND 15(C+9), 4.08 KM.	Other Utility	1	NA	0	NA	0	NA	1	1	1	

PG Odisha

Protection Performance Indices for the month of April-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	**400KV-BARIPADA-TISCO-1**	20-04-2025	17:34	20-04-2025	19:37	Line AR successful at Baripada end and Line tripped from TISCO end AT Baripada END: Main-1 :B-N fault ,Zone-2 carrier aided ,Ib- 2.87 kA,F.Distance- 108.3 km Main-2:B-N fault ,Zone-2 carrier aided ,Ib-2.866 kA,F.Distance- 102.96 km	AT TISCO END: MAIN-1: B-N FAULT, ZONE-1, F.C-8.77 KA, F.D-2.08 KM MAIN-2: B-N FAULT, ZONE-1, F.C-10.09 KA, F.D-1.925 KM	1	0	0	1	0	1	0.5	0.5	0.333333333	Line A/R Successful at Baripada end. But tripped from TISCO end
2	**400KV-BOLANGIR (PG)-ANGUL-1**	19-04-2025	10:54	19-04-2025	11:35	Line tripped on persistent fault R/I at Bolangir END: M1:B-G fault,1.91kA,Z1 Trip ,67.8km M2:B-G fault,1.97kA,Z1 trip,65km	Line tripped on persistent fault R/I at Angul END: M1:B-G fault,2.86kA,Z1 Trip ,132.8km M2:B-G fault,2.89kA,Z1 trip,133.8km	1	1	0	0	0	0	1	1	1	
3	**220KV-BARIPADA-BALASORE-2**	18-04-2025	16:43	20-04-2025	17:40	AUTORECLOSE UNSUCCESSFUL AND LINE TRIPPED DUT TO THE PERSISTING FAULT. AT BARIPADA END: MAIN-1: B-N FAULT, ZONE-2 AIDED, F.C-1.995 KA, F.D-76.30 KM MAIN-2: B-N FAULT, ZONE-2 AIDED, F.C-	Line tripped on persistent fault R/I at BALASORE END: MAIN-1: YBN FAULT, ZONE-1, IY-8.08 KA, IB-8.09 KA, F.D-0.59 KM MAIN-2: YBN FAULT, ZONE-1, IY-7.8 KA, IB-7.0 KA, F.D-0.6 KM	1	1	0	0	0	0	1	1	1	
4	**765KV-JHARSUGUDA-RAIPUR PS (DURG)-2**	18-04-2025	15:43	18-04-2025	22:28	Line tripped on Ph-Ph fault M1:Z1B, RY-G, Ir-5.38kA, Iy-4.16kA, F.L-274KM M2:Z1B, RY-G, Ir-4.93kA, Iy-4.47kA, F.L-275.3KM	Line tripped on persistent fault M1: Z1; RY Fault; 42.108 km; 18.54 kA M2: Z1; RY Fault; km; 18.5kA	1	1	0	0	0	0	1	1	1	

NTPC Barh

Month	April						
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)**
05.04.2025	**Barh-Kahalgaon-2**	**R-N fault**	**Fault in zone-1 (R-N fault). Successful A/r occurred at NTPC Barh end (Fault Current: 22.38 kA; Fault Distance: 14.54 kms from Barh end)**	1	0	0	0
10.04.2025	**Barh-Kahalgaon-2**	**R-N fault**	**Fault in zone-1 (R-N fault). Successful A/r occurred at NTPC Barh end(Fault Current: 6.32 kA; Fault Distance: 74.64 kms from Barh end)**	1	0	0	0
18.04.2025	**Barh-Kahalgaon-1**	**No Fault**	**Line fault in Farakka-Kahalgaon 1**	1	0	0	0
18.04.2025	**Barh-Kahalgaon-2**	**No Fault**	**Line fault in Farakka-Kahalgaon 1. Main bay at Kahalgaon end was under shutdown**	1	0	0	0
26.04.2025	**Barh-Kahalgaon-1**	**No Fault**	**Tripped along with 400 KV FSTPP KHSTPP -1 , Main bay not available at KHSTPP end**	**1**	0	0	0
26.04.2025	**Barh-Kahalgaon-2**	**No Fault**	**Tripped along with 400 KV FSTPP KHSTPP -1 , Main bay not available at KHSTPP end**	**1**	0	0	0
26.04.2026	**Barh-Kahalgaon-2**	**No Fault**	**Tripped along with 400 KV FSTPP KHSTPP -1 , Main bay not available at KHSTPP end**	**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			

Performance Indices of Darlipali STPP for April'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

NTPC Kahalgaon

Protection Perfomance Indices for the month-APRIL-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 perfomace indices less than 1)	Analysis for the event
						End A	End B	End A	End B	End A	End B	End A	End B					
1	BARH-02 TIE 3252 CB	05.04.2025	18.38	05.04.2025	10.38	Zone-02 (R-phase)carrier received		0		1		1		0	0	0		400KV KH-BARH-02 charged through tie bay at 18.34 at kahalgaon end sync at barh end at 18.36hrs. Line tripped at 18.38 hrs at kahalgaon end on Zone 02 with carrier received (R phase) and Line was in charged condition at barh end. Line Manually tripped at Barh end at 19.07 hrs.
2	BARH-01 MAIN 4052 CB	08.04.2025	5.36	08.04.2025	6.11	ZONE-01(R-PHASE)		0		1		1		0	0	0		AR unsuccessful in main CB. Tie CB AR successful Distance 44.8% Fault current 4.3KA. Main BKR AR shall be made through during planned SD.
3	LAKHISARAI-02 MAIN 752 AND 852 TIE CB	10.04.2025	16.52	11.04.2025	2.31	ZONE-02(R,Y,B)		1		0		0		1	1	1		LA Damaged at Lakhisarai-02 end Distance 133.9KM Fault current R-0.5KA/Y-3.5KA/0.48KA.
4	BARH-02 TIE 3252 CB	10.04.2025	16.53	10.04.2025	17.32	ZONE-01(R-PHASE)		0		1		1		0	0	0		Distance-69.5% Fault current R phase-3.2KA. Tie CB AR shall be made through during planned SD.
5	BARH-01 MAIN 4052 CB TIE BANKA-01	13.04.2025	0.28	13.08.2025	2.15	ZONE-01(R-PHASE)		0		1		1		0	0	0		Distance 32.4% Fault current-6KA. Main BKR AR shall be made through during planned SD.
6	MAITHON-01 MAIN 2852 & 2952 TIE CB	17.04.2025	15.34	17.04.2025	17.46	ZONE-01(Y-PHASE)		0		1		1		0	0	0		Distance 94.6KM AR unsuccessful. AR shall be made through during planned SD.
7	FARKKA-01 MAIN AND TIE	18.04.2025	11.13	18.04.2025	20.05	ZONE-01(Y-PHASE)		1		0		0		1	1	1		Farakka-01 line Y-PHASE CT to Wave trap jumper disconnected. Kh- Barh Line - 2 was charged through Tie bay only, hence the line tripped due to tripping of Farakka - 1. Barh - 1 line tripped on Z-4 since time delay for Z-4 was set as 0 sec. Since Banka - 1 line was charged through tie bay only, the line also tripped. Z-4 time delay changed to 500ms for Barh-1.
	BARH-01 MAIN 4052 CB				11.39	ZONE-04		0		1		1		0	0	0		
	BARH-02 TIE 3252 CB				11.44	Line charged through Tie bay only due to nn availability of Main Bay		1		0		0		1	1	1		
	BANKA-01				11.41	Line charged through Tie bay only due to nn availability of Main Bay		0		1		1		0	0	0		
8	FARAKKA-02 MAIN AND TIE	23.04.2025	15.07	24.04.2025	18.23	ZONE-01(Y-PHASE)		1		0		0		1	1	1		Distance-8.2KM Fault Current Y-ph 23.5KA.
9	MAITHON-01 MAIN 2852 & 2952 TIE CB	23.04.2025	15.07	23.04.2025	16.00	Over voltage stage-02		0		1		1		0	0	0		400KV Kh Maithon Line - 1 was on same dia as Kh Farakka - 2. O/V stage - 2 developed in the line and tripped since delay time for O/V stage -2 was 0 sec. The delay time increased to 100ms as per protection philosophy.
10	DURGAPUR-02 MAIN AND TIE	25.04.2025	11.29	25.04.2025	12.16	ZONE-01(Y-PHASE)		0		1		1		0	0	0		Distance-122KM/Fault Current-3KA. A/R checked and rectified.
11	BARH-02 TIE 3252 CB	26.04.2025	12.58	26.04.2025	13.26	NO PROTECTION TRIP		1		0		0		1	1	1		Line tripped due to tripping of Farakka - 1 Line since Barh -2 line was charged through Tie bay only.
12	FARAKKA-01 MAIN AND TIE	26.04.2025	12.58	26.04.2025	13.21	ZONE-01(Y-PHASE)		1		0		0		1	1	1		Distance 54.5KM/Fault Current-7.09KA
13	BARH-02 TIE 3252 CB	26.04.2025	13.33	26.04.2025	15.03	NO PROTECTION TRIP		1		0		0		1	1	1		Line tripped due to tripping of Farakka - 1 Line since Barh -2 line was charged through Tie bay only.
14	FARAKKA-01 MAIN AND TIE	26.04.2025	13.33	26.04.2025	20.14	ZONE-01(Y-PHASE)		1		0		0		1	1	1		Distance 52.5KM/Fault Current-7.24KA
15	FARAKKA-02 MAIN AND TIE	26.04.2025	13.56	26.05.2025	16.37	ZONE-01(R-PHASE)		1		0		0		1	1	1		Distance 57.3KM/Fault Current-5.92KA

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
Sr. Manager, EMD

Checked By
AGM/EMD

Reviewed By
DGM(EMD)

BSPTCL

Protection Performance Indices for the month of March'25

S. No.	Name of the element	Tripping Date	Restoration Date	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	220KV-KHAGARIA-NEW PURNEA-2	27-04-2025 (11:16:00)	27-04-2025 12:18	Khagaria: Zone -1, Y ph B ph, Distance - 96.47km, Ir- 109.7A, Iy- 1.330kA, Ib- 1.275kA,	Purnea: Z1, Y-B, 2.1 kM, Iy 14.7kA, Ib 14.61 kA.	1	1	0	0	0	0	1	1	1	Line tripped on phase to phase fault.
2	220KV-TENUGHAT-BIHARSARIFF-1	26-04-2025 13:21	26-04-2025 19:09	Tenughat: E/F, Zone-2, R-N , Distance- 116.1 km, Ir- 300 A, Iy 93.99 A,Ib- 108.66 A	Biharshariff: R-N, FD-90km, Z1,Ir-01KA, Iy-160A, Ib-176A.		0		0		1	0	0	0	PLCC not functioning as stated earlier
3	220KV-PUSAULI-NADHOKAR-1	26-04-2025 11:44	26-04-2025 12:11	Pusauli: B-N , Z-3,44.91 km,2.116 KA	Lines tripped from Pusauli PG end., most probably due to fault in 220 KV Nadokhar -Dehri D/C (line charged on no-load from Nadokhar) lines.However 220 KV Dehri D/C line tripped from Nadokhar end but with delayed clearance.Agency has been called for testing of relays in 220 KV Nadokhar -Dehri D/C lines, as the bays are newly commissioned.										
4	220KV-PUSAULI-NADHOKAR-2	26-04-2025 11:44	26-04-2025 12:11	Pusauli: B-N , Z-3,64.8 km,1.463 KA											
5	220KV-MUZAFFARPUR(PG)-GORAUL(BH)-2	26-04-2025 11:04	26-04-2025 12:46	Muzaffarpur: B-N, 8.8kA, 6.3km,	Goraul: B-N, 6.3 KM, 1.39 KA	1	1	0	0	0	0	1	1	1	
6	220KV-HAZIPUR-MUZAFFARPUR-1	26-04-2025 10:39	26-04-2025 17:30	Hazipur : Z-1,BN Fault, FD-29.69 KM,Ib-2.614 KA	Muzaffarpur : Z-1, BN Fault, FD -33.1 km, Ib 4.116 KA	1	0	0	0	0	1	Hazipur-1 Muz-0	Hazipur-1 Muz-0	Hazipur-1 Muz-0	PLCC issue
7	220KV-TENUGHAT-BIHARSARIFF-1	26-04-2025 10:09	26-04-2025 11:02	Tenughat: Z-1, R-N ,FC- 0.81 KA , FD- 126 KM	Biharshariff : FC: 2.4 KA , FD-57 KM		0		0		1	0	0	0	PLCC not functioning as stated earlier
8	220KV-PATNA-KHAGAUL-1	26-04-2025 08:49	26-04-2025 09:44	Patna: A/R Successful,	YB FAULT, 16.7km, IB=1.4 Ka,IC=7.8 kA		1		0		0	1	1	1	A/Rsuccessful from Patna end. Line tripped from Khagaul end(phase to phase fault).
9	220KV-NEW PURNEA-MADHEPURA-1	25-04-2025 17:20	27-04-2025 17:20	Zone-1 ,YB Fault, dist-23.40km , Iy- 5.991KA, Ib- 4.204 KA,	Y_N, FC-3.53 kA	1	1	0	0	0	0	1	1	1	
10	220KV-PUSAULI-NADHOKAR-1	25-04-2025 13:41	25-04-2025 15:23	Sasaram: B-Ph, Z-3, 82.78 km, 1.32kA	Lines tripped from Pusauli PG end., most probably due to fault in 220 KV Nadokhar -Dehri D/C (line charged on no-load from Nadokhar) lines.However 220 KV Dehri D/C line tripped from Nadokhar end but with delayed clearance.Agency has been called for testing of relays in 220 KV Nadokhar -Dehri D/C lines, as the bays are newly commissioned.										
11	220KV-PUSAULI-NADHOKAR-2	25-04-2025 13:41	25-04-2025 15:23	Sasaram: B-Ph, Z-3, 0.898kA											
12	220KV-GAYA-BODHGAYA-2	21-04-2025 19:30	21-04-2025 20:06	Not tripped	Tripped on overcurrent		0		1		0	0	0	0	power flow in each ckt was around 202 MW, Line tripped from Bodhgaya end on over current.O/C setting has been disabled in both circuits.
13	220KV-GAYA-BODHGAYA-1	21-04-2025 19:30	21-04-2025 20:06	Not tripped	Tripped due to overcurrent		0		1		0	0	0	0	
14	220KV-KHAGARIA-NEW PURNEA-2	20-04-2025 13:10	20-04-2025 16:23	Khagaria end: Zone -1, B ph, Distance - 42.38km, FC- 2.376kA,	Purnea end: B_N, FD: 62.7 km, FC: 2.1 kA, Zone-1	1	0	0	0	0	1	Khagaria-1 Purnea-0	Khagaria-1 Purnea-0	Khagaria-1 Purnea-0	PLCC issue
15	220KV-PATNA-KHAGAUL-1	19-04-2025 10:42	19-04-2025 13:13	Patna: B-N, 13kA, 8.3km	khagaul: Z-1 , 5.369 KA, 17.45 KM		1		0		0	1	1	1	
16	220KV-PUSAULI-NADHOKAR-1	13-04-2025 08:56	13-04-2025 10:31	Pusauli: R-N, 1.3 km, 12.5 kA,	Nadhokhar: R_N, Zone-1, Fc: 7 kA, FD: 2km		1		0		0	1	1	1	
17	220KV-KHAGARIA-NEW PURNEA-1	13-04-2025 01:45	13-04-2025 02:52	Khagaria: B-N , Iy- 168.3A, Ib- 1.242kA, Dist- 59.73km:	Purnea :B-N fault , 2.6 KA, 70.3km	1	1	0	0	0	0	Khagaria-1 Purnea-1	Khagaria-1 Purnea-1	Khagaria-1 Purnea-1	
18	220KV-KHAGARIA-NEW PURNEA-2	13-04-2025 01:45	13-04-2025 02:52	Khagaria:Y B, Iy- 3.363kA, Ib- 1.835kA, Dist- 61.34km	Purnea: Y-B Fault, Iy 5.8 KA, 3.91 KA 35 Km	1	1	0	0	0	0	Khagaria-1 Purnea-1	Khagaria-1 Purnea-1	Khagaria-1 Purnea-1	
19	220KV-SAHARSA-BEGUSARAI-1	13-04-2025 00:33	13-04-2025 02:59	Begusarai: Z-1, R phase FD - 60 KM IR - 2.36KA:	Saharsa :R-N , 25.5km, 4.95 KA		1		0		0	1	1	1	
20	220KV-DARBHANGA (DMTCL)-SAMASTIPUR-1	13-04-2025 00:19	13-04-2025 00:43	Darbhanga: B- ph , 793 A, 35 km	Samastipur:IB-1.73KA Z 1,Fd -24.6KM		0		0		1	0	0	0	PLCC issue
21	220KV-SAHARSA(PMTL)-BEGUSARAI-2	12-04-2025 23:45	13-04-2025 03:00	Begusarai :- Z-1,FD 20.93 KM IB - 2.83KA;	Saharsa :- B-N, 93.3km, 1.7 KA		1		0		0	1	1	1	

22	220KV-MUZAFFARPUR(PG)-HAZIPUR-2	10-04-2025 15:40	10-04-2025 17:24		Busbar protection operated at bus 2 at Hazipur zone-2, Ib-diff. 8KA		1		0		0	1	1	1	Bus bar differential protection operated for B-N dault.Due to heavy wind,Handle lock of earth switch of Bus-2 found damaged due to which earth switch came to induction range of isolator. Due to this, 220KV Hajipur new-Amnour (BGCL) ckt-2, 220KV Hajipur new- Muz. (PG) ckt-2, 200MVA Tranformer-2 also tripped.
23	220KV-PATNA-FATUHA-1	10-04-2025 15:24	10-04-2025 17:03	a/r successful in Patna	Fatuha end: Zone-1, FC: 10.5 kA, FD: 2.662 km R-N		0		0		1	0	0	0	Breaker issue
24	220KV-PATNA-KHAGAUL-1	10-04-2025 15:12	10-04-2025 19:04	Patna: Y-B fault, IY,IB= 9.6 kA, 14.5 km			1		0		0	1	1	1	
25	220KV-HAZIPUR-MUZAFFARPUR-1	10-04-2025 14:40	10-04-2025 16:03	Hazipur: Rph, 9 km, A/R successful		1	0	0	0	0	1	Hazipur-1 Muz-0	Hazipur-1 Muz-0	Hazipur-1 Muz-0	PLCC issue
26	220KV-MUZAFFARPUR(PG)-GORAUL(BH)-1	10-04-2025 14:20	11-04-2025 14:58	At Muzaffarpur(PG) end:- Fault distance-12.5 KM, Zone-1 Ia-9.16 KA, Ib-344 A, Ic-455 A, Van-75 KV, Vbn-134 KV, Vcn-132 KV,	At GSS Goraul end:- zone-1, Fault distance-4.7 KM Ia-5.6 KA, Ib-313 A, Ic-355 A, Van-6.7 KV, Vbn-148 KV, Vcn-143 KV		0		0		1	0	0	0	R phase Spring Charge issue.
27	220KV-DEHRI-GAYA-2	10-04-2025 14:18	10-04-2025 18:24	DEHRI end: Zone-1, FD: 20.46KM Fc-3. 878KA		1		0		0		1	1	1	
28	220KV-SAHARSA(PMTL)-KHAGARIA(NEW)-1	10-04-2025 05:55	10-04-2025 06:37	R/I :Zone-1, B_N, F Current : 2.864kA, F Dist : 56.63km			1		0		0	1	1	1	
29	220KV-DARBHANGA (DMTCL)-DARBHANGA-1	09-04-2025 05:48	09-04-2025 08:25	DMTCL END: B_N, F Current - 10.35kA, F Dist-2.23 KM;	DARBHANGA (BSEB): B_N, F Current : 7.49 kA		0		0		1	0	0	0	Due to A/R issue Main 1 Relay replaced
30	220KV-DARBHANGA (DMTCL)-MOTIPUR-2	06-04-2025 12:10	06-04-2025 16:30	R/I at Darbhanga :Y_B, Iy 3.61 kA, Ib3 .63 kA, F Dist 57.7 km from Darbhanga;	at Motipur end : Y_B, Iy 3.944kA, Ib 3.917kA, F Dist 49.50 km		1		0		0	1	1	1	Line tripped on phase to phase fault.
31	220KV-CHANDAUTI (PMTL)-SONENAGAR-2	06-04-2025 11:58	06-04-2025 18:24	R/I at Chandauti : Y_B, Iy 5.8 kA, Ib-5.5 kA, Z-1 F Dist 31 km from Chandauti	, at Sonenagar: Y_B, Iy 2.599 KA Ib 2.679KA,F Dist 42.57 km from Sonenagar		1		0		0	1	1	1	Line tripped on phase to phase fault.
32	220KV-TENUGHAT-BIHARSARIFF-1	06-04-2025 11:21	06-04-2025 17:46	Tenughat end: R-E, F/C 0.5kA, 95.5 km;	Biharsariff end: Main 2 protection operated: R-E, 109.33km, F/C 1.05 kA		0		0		1	0	0	0	PLCC not functioning as stated earlier
33	220KV-SAHARSA(PMTL)-BEGUSARAI-2	02-04-2025 10:15	02-04-2025 12:43	Saharsa: R-Y Fault, 33.86km, Ir 5.57 KA, Iy 5.57 KA;	Begusarai: Dist- 56.3Km, IR=3.62kA, IY=3.57kA		1		0		0	1	1	1	Line tripped on phase to phase fault.

JUSNL

Protection Performance Indices for the month of April' 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	220kV Madanpur (Dumka II) - Jasidih Ckt-02	10-04-2025	17:51	10-04-2025	19:29												DR not available
2	220kV Madanpur (Dumka II) - Maithon Ckt-02	10-04-2025	21:16	10-04-2025	22:52	BN, Z1, 1.28 kA. A/R successful	Maithon end: B-n, 2.679 kA, 19.047 km from Maithon	1		0		0		1	1	1	
3	220 kV Hatia II - Patratu - 02	13-04-2025	00:24	13-04-2025	01:32	Main Bus - 2 tripped.		1		0		0		1	1	1	ICT- 3 tripped on E/F from LV side (Ib- 2.88 kA) along with Main Bus-2
4	220 kV Hatia II - Ranchi_PG - 03	13-04-2025	00:24	13-04-2025	01:16			1		0		0		1	1	1	
5	220 KV Govindpur - TVNL - 02	14-04-2025	15:29	14-04-2025	15:58	RN, Z1, 1.50 kA.		1		1		0		1	0.5	0.5	A/R not attempted.
6	220 kV Hatia II - Ranchi_PG - 02	15-04-2025	18:35	15-04-2025	19:29	O/V trip	RN, Z2, Ir- 3.73 kA	1		1		0		1	0.5	0.5	Bus bar protection was not operated due to improper isolator status.
7	220 kV Hatia II - Ranchi_PG - 03	15-04-2025	18:35	15-04-2025	19:28	RN, Z4, 1.9 km, Ir- 3.97 kA	RN, Z2, Ir- 3.95 kA	1		1		0		1	0.5	0.5	
8	220 kV Hatia II - Patratu - 01	15-04-2025	18:35	15-04-2025	19:25	RN, Z4, 0.8 km, Ir- 1.95 kA	RN, Z2, 61.69 km, Ir- 1.709 kA	1		1		0		1	0.5	0.5	
9	220 kV Hatia II - Patratu - 02	15-04-2025	18:35	15-04-2025	19:25	RN, Z4, 1.1 km, Ir- 1.95 kA	RN, Z2, 61.73 km, Ir- 1.735 kA	1		1		0		1	0.5	0.5	
10	220 kV Hatia II - Lohardaga - 01	15-04-2025	18:35	15-04-2025	20:33	O/V trip		1		1		0		1	0.5	0.5	Both lines were idle charge. CT polarityu of ckt- 02 was found reverse.
11	220 kV Hatia II - Lohardaga - 02	15-04-2025	18:35	15-04-2025	20:33	RN, Z4, 1.9 km, Ir- 3.97 kA		1		1		0		1	0.5	0.5	
12	220KV Latehar - CHATRA - 2	16-04-2025	11:14	16-04-2025	11:43	YB, Z1	YB, Z1, 45.27 km, Iy - 1.01 kA, Ib- 1.05 kA		1		0		0	1	1	1	
13	220kV Madanpur (Dumka II) - Godda - 02	18-04-2025	06:38	18-04-2025	07:41												DR not available
14	220KV Latehar - CHATRA - 2	18-04-2025	07:35	18-04-2025	08:29												DR not available
15	220 kV Hatia II - Ranchi_PG - 01	20-04-2025	12:58	20-04-2025	16:44	YN, Z1, 14.05 kA, A/R successful but tripped in reclaim time.		1		0		0		1	1	1	
16	220kV Madanpur (Dumka II) - Jasidih Ckt-01	21-04-2025	11:13	21-04-2025	11:52		LBB optd		1		0		0	1	1	1	LBB optd due B phase pole stuck in 220 kV Giridih - 2 feeder
17	220kV Madanpur (Dumka II) - Jasidih Ckt-02	21-04-2025	11:13	21-04-2025	11:29		LBB optd		1		0		0	1	1	1	
18	220 KV Jasidih - Giridih - 01	21-04-2025	11:13	21-04-2025	11:04	LBB optd		1		0		0		1	1	1	
19	220 KV Jasidih - Giridih - 02	21-04-2025	11:13	21-04-2025	11:47	BN, Z2, Ib- 1.39 kA	BN, Z1	1	1	1	0	0	0	1	0.5	0.5	B ph pole got stuck at Jasidih end
20	220 kV Chandil - Ramchandrapur	22-04-2025	14:04	22-04-2025	14:19												
21	220KV CHANDIL - STPS	24-04-2025	11:12:00	24-04-2025	12:12:00	Chandil: Ia 0.28kA, Ib 0.46kA, Ic 1.63kA, Distance 95.1km	Santaldih: B-Y, Z-I, 26.8km,2.97kA	1		0		0		1	1	1	
22	220KV CHANDIL - STPS	25-04-2025	10:44:00	25-04-2025	18:02:00	Chandil: Zone-1 Trip, Y&B Phase Trip, Distance- 36.4 km , Ia- 0.06 KA, Ib- 4.17 KA, Ic- 4.13 KA	Y&B Phase Trip, Zone-1, Distance-59.27km, Ib- 3.21 kA, Ic- 3.23 Ka	1		0		0		1	1	1	
23	220kV Madanpur (Dumka II) - Jasidih Ckt-01	25-04-2025	13:32:00	25-04-2025	13:44:00												DR not available
24	220kV Madanpur (Dumka II) - Jasidih Ckt-02	25-04-2025	13:32:00	25-04-2025	13:58:00												DR not available
25	220kV Madanpur (Dumka II) - Godda - 01	26-04-2025	10:37:00	26-04-2025	11:07:00	SPS operated at Dumka II.		1		0		0		1	1	1	
26	220kV Madanpur (Dumka II) - Godda - 02	26-04-2025	10:37:00	26-04-2025	11:07:00			1		0		0		1	1	1	
27	220kV Madanpur (Dumka II) - Jasidih Ckt-02	26-04-2025	17:18:00	26-04-2025													DR not available
28	220KV-DALTONGANJ-CHATRA-1	27-04-2025	19:08:00	27-04-2025	21:42:00		Did n't trip. YB, Iy - 951.8 A, Ib- 943.7 A (Downstream fault)		1		0		1	0.5	1	0.5	
29	220KV Latehar - CHATRA - 2	27-04-2025	19:08:00	27-04-2025	20:48:00	YB, Z3, Iy- 565 A, Ib - 602 A	Did n't trip.	1		0		0		1	1	1	
30	220KV CHANDIL - Ramchandrapur	28-04-2025	21:04:00														DR not available

DVC

SL NO.	VOLTAGE LEVEL	LINE NUMBER AND LINE LENGTH	S/D,B/D,TRIP, AUTO RECLOSE	INITIALISATION TIME	NORMALISATION TIME	OUTAGE HOUR	OUTAGE DESCRIPTION WITH RELAY INDICATION AND PLCC COUNTER READING		PRELIMINARY FINDINGS	ACTION TAKEN/REMEDIAL ACTION
1	132 KV	L#6 (CTPS-GOLA) Line Length:66.7 km	CTPS End :TRIPPED GOLA End:TRIPPED	13.04.25,14:10 hrs	13.04.25,14:22 hrs	0.1 Hrs	**CTPS END** **Protection Operated**:Directional O/C & E/F OPERATED **Bay Position**:Normal Fault in Phase:--BLUE-Phase **Fault Distance: NA** **Fault Loop: CN** **Auxilary Relay:** 86 Operated: **Autoreclose Status: NA** **Fault Resistance:** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy, **Fault Current:**IR=IA=141.2 A,IB=147.9 A,IC=1213 A **Voltage during Fault : . VAN= KV, VBN= KV,VCN= KV**	**GOLA END** **Protection Operated:**Distance Protection Zone-3, o/c START i>1, EF START IN Bay Position:Normal **Fault in Phase**:--BLUE-Phase **Fault Distance:** 29.4 KM **Fault Loop:CN** **Auxilary Relay: Operated**:86 OPTD **Autoreclose Status: Unsucessfull** **Fault Resistance:** Ω **Carrier Status:** Carrier Switch-IN,Carrier Healthy,	**PRELIMINARY FINDINGS:**	**REMEDIAL ACTION REQUIRED:**
2	220 KV	Line#217(DHANBAD-MAITHON PG) Line Length: 52 km	DHANBAD End :AUTORECLOSED MAITHON PG End:AUTORECLOSE	13.04.25,12:49 hrs	13.04.25,12:49 hrs		**DHANBAD END** Protection Operated:DISTANCE PROTECTION OPTD, B-ph,Z1, CARRIER RECIVED, CARRIER SEND Bay Position:Normal Fault in Phase:BLUE-Phase Fault Distance: 24.9 KM (M1); 25.40 KM (M2) Fault Loop:C-N Auxilary Relay: 94 OPTD Autoreclose Status: Sucessful Fault Resistance: Ω Carrier Status: Carrier Switch-IN, CARRIER HEALTHY, Fault Current: IA= A,IB= A,IC= 2690 A Voltage during Fault : . VAN= KV, VBN= KV,VCN= KV	**MAITHON_PG END** **Protection Operated:Distance Protection Zone-1 Operated, CARRIER RECEIVED, CARRIER SEND** **Bay Position:Normal** **Fault in Phase:BLUE-Phase** **Fault Distance: 29.3 KM (M1), 33.53 KM (M2)** **Fault Loop:C-N** **Auxilary Relay: 94 OPTD** **Autoreclose Status: Sucessful** **Fault Resistance: Ω** **Carrier Status: Carrier Switch-IN, CARRIER HEALTHY, Ic=3.03 kA**		
									PRELIMINARY FINDINGS: TREE REACHED IN THE VICINITY OF B PH CONDUCTOR IN BETWEEN LOC 96-97.	**REMEDIAL ACTION REQUIRED**: TREE TRIMMING DONE AT SAID LOCATION

3	220 KV	Line#217(DHANBAD-MAITHON PG) Line Length: 52 km	DHANBAD End :TRIPPED MAITHON PG End:TRIPPED	13.04.25,15:43 hrs	13.04.25,12:49 hrs		**DHANBAD END** **Protection Operated:DIRECTIONAL EARTH FAULT OPERATED** **Bay Position:Normal** **Fault in Phase:BLUE- PHASE** **Fault Distance: 52.3 KM (M1); 24.9 KM (M2)** **Fault Loop:C-N** **Auxilary Relay: 86 OPTD** **Autoreclose Status: NA** **Fault Resistance: Ω** **Carrier Status: Carrier Switch-IN, CARRIER HEALTHY,** **Fault Current: IA=200 A,IB=220 A,IC= 780 A** **Voltage during Fault : . VAN= KV, VBN= KV,VCN= KV**	**MAITHON_PG END**		
4	220 KV	L#259 (MTPS-RANCHI_PG) Line Length:250 km	MTPS End :AUORECLOSED RANCHI_PG End:AUTORECLOSED	14.04.25,18:44 hrs	14.04.25,18:44 hrs		**MTPS END** **Protection Operated**: Rph, Z1 OPERATED **Bay Position**:Normal Fault in Phase:--RED-Phase **Fault Distance: 25.5 km** **Fault Loop: AN** **Auxilary Relay: 186A** Operated: **Autoreclose Status: SUCESSFULL** **Fault Resistance:** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy, **Fault Current:**IR=IA=6230 A,IB=183 A,IC=100 A **Voltage during Fault : . VAN=109.64 KV, VBN=131.17 KV,VCN=127.46 KV**	**RANCHI_PG END**	**PRELIMINARY FINDINGS:FROM DR IT SEEMS THAT BACKFLASHOVER MAY OCCURRED AT THE FAULT LOCATION**	**REMEDIAL ACTION REQUIRED:**
5	400 KV	L#401 (DSTPS-RTPS CKT 1) Line Length:70.5 km	DSTPS End :TRIPPED RTPS End: TRIPPED	14.04.25,17:07 hrs			**DSTPS END** **Protection Operated**: Bph, Z2, OPERATED **Bay Position**:Normal Fault in Phase:--BLUE-Phase **Fault Distance: 72 KM(M1), 70.5 KM (M2)** **Fault Loop: CN** **Auxilary Relay: 86C1, 86C2, 86A, 86B,86** Operated: **Autoreclose Status: UNSUCESSFULL** **Fault Resistance:** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy, **Fault Current:**IR=IA=4697 A,IB= A,IC= A **Voltage during Fault : . VAN= KV, VBN= KV,VCN= KV**	**RTPS END** Protection Operated: Bph, Z1 OPERATED Bay Position:Normal Fault in Phase:--YELLOW -BLUE-Phase Fault Distance: 4 km Fault Loop: Auxilary Relay: 86A, 86B,86 Operated: Autoreclose Status: UNSUCESSFULL Fault Resistance: Ω Carrier Status: Carrier Switch-IN,Carrier Healthy, Fault Current:IR=IA=71.308 A,IB= 291.48 A,IC=2056 A Voltage during Fault : . VAN=241.28 KV, VBN=204.78 KV,VCN= 210.19 KV	**PRELIMINARY FINDINGS:**	**REMEDIAL ACTION REQUIRED:**

6	400 KV	L#402 (DSTPS-RTPS CKT 2) Line Length:70.5 km	DSTPS End :TRIPPED RTPS End: TRIPPED	14.04.25,17:05 hrs			**DSTPS END** **Protection Operated**: R,Y,B ph, Z2, CARRIER AIDED OPERATED **Bay Position**:Normal Fault in Phase:--RED-YELLOW-BLUE-Phase **Fault Distance: 62.96 KM(M1), 70.5 KM (M2)** **Fault Loop: CN** **Auxilary Relay: 86C1, 86C2, 86A, 86B,86** Operated: **Autoreclose Status: UNSUCESSFULL** **Fault Resistance:** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy, **Fault Current:**IR=IA=6249 A,IB= A,IC= A **Voltage during Fault : . VAN= KV, VBN= KV,VCN= KV**	**RTPS END** Protection Operated:Yph, Bph, Z1 OPERATED Bay Position:Normal Fault in Phase:--YELLOW -BLUE-Phase Fault Distance: NA Fault Loop: Auxilary Relay: 86A, 86B,86 Operated: Autoreclose Status: UNSUCESSFULL Fault Resistance: Ω Carrier Status: Carrier Switch-IN,Carrier Healthy, Fault Current:IR=IA=194.85 A,IB= 584.40 A,IC=3168 A Voltage during Fault : . VAN=225.57 KV, VBN=212.71 KV,VCN= 137.21 KV	**PRELIMINARY FINDINGS: IT SEEMS THAT BACKFLASHOVER MAY OCCURRED AT THE FAULT LOCATION**	**REMEDIAL ACTION REQUIRED:**
7	132 KV	L#60 (CTPS-RAMKANALI) Line Length:60 km	CTPS End :TRIPPED RAMKANALI End:TRIPPED	15.04.25,03:58 hrs	15.04.25,04:15 hrs	0.14 Hrs	**CTPS END** **Protection Operated**:DISTANCE PROTECTION OPERATED, Rph, Z1, o/c start I>1, E/F Start IN1 **Bay Position**:Normal Fault in Phase:--Red-Phase **Fault Distance: 2.793 kM** **Fault Loop: CN** **Auxilary Relay:** 86 Operated: **Autoreclose Status: NA** **Fault Resistance:** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy,	**RAMKANALI END** **Protection Operated:**DISTANCE PROTECTION OPERATED, Rph, Z2, CARRIER RECEIVED, CARRIER AIDED TRIP Bay Position:Normal **Fault in Phase**:--RED-Phase **Fault Distance:** 72.6 KM **Fault Loop:AN** **Auxilary Relay: Operated**:86 OPTD **Autoreclose Status: Unsucessful** **Fault Resistance:** Ω **Carrier Status:** Carrier Switch-IN,Carrier Healthy,	**PRELIMINARY FINDINGS:**	**REMEDIAL ACTION REQUIRED:**
8	132 KV	L#111 (NK-MASILUNG) Line Length: km	NK End :TRIPPED MASILUNG End:NO TRIPPING	15.04.25,17:55 hrs	15.04.25,19:06 hrs		**NK END** **Protection Operated**:DISTANCE PROTECTION OPERATED, Rph, Yph, Z1, o/c start I>1, E/F Start IN1 **Bay Position**:Normal Fault in Phase:--Red-Yellow-Phase **Fault Distance: 2.102 kM** **Fault Loop: CN** **Auxilary Relay:** 86 Operated: **Autoreclose Status: NA** **Fault Resistance:** Ω Fault Current:IR=IA=3919 A,IB= 1841 A,IC=221 A Voltage during Fault : . VAN= 9.894 KV, VBN=7.29 KV,VCN=69.11 KV	**MASILUNG END** **Protection Operated: NO TRIPPING**	**PRELIMINARY FINDINGS:**	**REMEDIAL ACTION REQUIRED:**
9	132 KV	L#112 (NK-MASILUNG) Line Length: km	NK End :TRIPPED MASILUNG End:NO TRIPPING	15.04.25,17:55 hrs	15.04.25,18:04 hrs		**NK END** **Protection Operated**:DISTANCE PROTECTION OPERATED, Rph, Bph, Z1, o/c start I>1, E/F Start IN1 **Bay Position**:Normal Fault in Phase:--Red-Blue-Phase **Fault Distance: 18.82 kM** **Fault Loop: ACN** **Auxilary Relay:** 86 Operated: **Autoreclose Status: NA** **Fault Resistance:** Ω	**MASILUNG END** **Protection Operated: NO TRIPPING**	**PRELIMINARY FINDINGS:**	**REMEDIAL ACTION REQUIRED:**
10	132 KV	L#110 (BIADA-CTPS) Line Length: km	BIADA End :TRIPPED CTPS End:NO TRIPPING	20.04.25, 11:42 hrs	20.04.25,14:40 hrs		**BIADA END** **Protection Operated**:DISTANCE PROTECTION OPERATED, Yph, Bph, Z1, o/c start I>1, E/F Start IN1 **Bay Position**:Normal Fault in Phase:-YELLOW-BLUE PHASE **Fault Distance: kM** **Fault Loop:** **Auxilary Relay:** 86 Operated: **Autoreclose Status: NA** **Fault Resistance:** Ω	**CTPS END** **Protection Operated:DISTANCE PROTECTION OPERATED, Rph, Yph, Bph, Z1, o/c start I>1, E/F Start IN1** **Bay Position:Normal** **Fault in Phase:--Red-Yellow-Blue-Phase** **Fault Distance: 1.2 kM** **Fault Loop:** **Auxilary Relay: 86 Operated:** **Autoreclose Status: NA** **Fault Resistance: Ω**	**PRELIMINARY FINDINGS:**	**REMEDIAL ACTION REQUIRED:**

11	132 KV	L#3 (JSR-MOSABANI) Line Length:39 km	JSR End :TRIPPED MOSABANI End:TRIPPED	21.04.25,12:40 hrs	21.04.25,12:56 hrs	0.26 Hrs	**MOSABANI END** **Protection Operated**:Directional O/C & E/F OPERATED **Bay Position**:Normal Fault in Phase:--BLUE-Phase **Fault Distance: NA** **Fault Loop: CN** **Auxilary Relay:** 86 Operated: **Autoreclose Status: NA** **Fault Resistance:** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy, **Fault Current:**IR=IA=114.89 A,IB=90.794 A,IC=778.1 A **Voltage during Fault : . VAN=78.36 KV, VBN=75.06 KV,VCN=69.21 KV** **PLCC COUNTER READING :** **Before Fault: TX=10,85 RX=8,13** **After Fault: TX=10,85 RX= 8,13**	**JAMSHEDPUR END** **Protection Operated:**Distance Protection Zone-2, o/c START i>1, EF START IN Bay Position:Normal **Fault in Phase**:--BLUE-Phase **Fault Distance:** 37.2 KM **Fault Loop:CN** **Auxilary Relay: Operated**:86 OPTD **Autoreclose Status: Unsucessfull** **Fault Resistance:** Ω **Carrier Status:** Carrier Switch-IN,Carrier Healthy, Fault Current:IR=IA=8.9 A,IB=9.5 A,IC=1208 A Voltage during Fault : . VAN=75.29 KV, VBN=76.56 KV,VCN=74.92 KV PLCC COUNTER READING : Before Fault: TX= 7,20 RX= 22,24	**PRELIMINARY FINDINGS:** TREE FOUND BETWEEN LOC 110 -111	**REMEDIAL ACTION REQUIRED: TREE TRIMMING CARRIED OUT AT SAID LOCATION**
12	220 KV	L#259 (MTPS-RANCHI_PG) Line Length:232 km	MTPS End :TRIP RANCHI_PG End:TRIP	24.04.25,11:08 hrs	24.04.25,11:08 hrs		**MTPS END** **Protection Operated**: Bph, Z1 OPERATED,CARRIER SEND **Bay Position**:Normal Fault in Phase:--BLUE-Phase **Fault Distance: 37.49 km** **Fault Loop: CN** **Auxilary Relay: 86** Operated: **Autoreclose Status: UNSUCESSFULL** **Fault Resistance:** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy, **Fault Current:**IR=IA=90.45 A L-9.5°,IB=54.43 A L-97.2°,IC=3731.21 A L-1.7° **Voltage during Fault : . VAN=139.39 KV L-66.1°, VBN=128.85 KV L172.7°,VCN=115.20 KV L49.0°**	**RANCHI_PG END** **Protection Operated: Bph, Z2 OPERATED** **Bay Position:Normal** **Fault in Phase:--BLUE-Phase** **Fault Distance: 173.6 km** **Fault Loop: CN** **Auxilary Relay: 86 Operated:** **Autoreclose Status: UNSUCESSFULL** **Fault Resistance: Ω** **Carrier Status: Carrier Switch-IN,Carrier Healthy,** **Fault Current:IR=IA= A,IB= A,IC=960 A**	**PRELIMINARY FINDINGS:FROM DR IT SEEMS THAT BACKFLASHOVER MAY OCCURRED AT THE FAULT LOCATION**	**REMEDIAL ACTION REQUIRED:**
13	220 KV	L#249 (RAMGARH-RANCHI_PG) Line Length:70.5 km	RAMGARH End :TRIPPED RANCHI End: TRIPPED	22.04.25,08:40 hrs			**RAMGARH END** **Protection Operated**: Yph, Z1, OPERATED **Bay Position**:Normal Fault in Phase:--YELLOW-Phase **Fault Distance: 1.2 KM** **Fault Loop: BN** **Auxilary Relay: 86A, 86B,86** Operated: **Autoreclose Status: UNSUCESSFULL** **Fault Resistance:0.81 +j 0.23** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy, **Fault Current:**IR=IA=724.997L158.67° A,IB=9757 A L160.2°,IC=428.70 A L178.4° **Voltage during Fault : . VAN=100.11 KV L12.7°, VBN=36.15 KV L175.4° VCN=160.00 KV L123.9°**	**RANCHI_PG END** Protection Operated: Yph, Z1 OPERATED, PSB OPERATED Bay Position:Normal Fault in Phase:--YELLOW Phase Fault Distance: km Fault Loop: Auxilary Relay: 86A, 86B,86 Operated: Autoreclose Status: UNSUCESSFULL Fault Resistance: Ω Carrier Status: Carrier Switch-IN,Carrier Healthy, Fault Current:IR=IA=724A,IB=975 A,IC=428 A	**PRELIMINARY FINDINGS: Y PH CVT FAILED AT RAMGARH**	**REMEDIAL ACTION REQUIRED:**
14	220 KV	L#229 (KALYANESWARI-BURNPUR) Line Length:17 km	KALYANESWARI End :TRIPPED BURNPUR End: TRIPPED	22.04.25,16:01 hrs	22.04.25,21:50 hrs		**KALYANESWARI END** **Protection Operated**: Y ph, Z1, CARRIER SEND **Bay Position**:Normal Fault in Phase:--YELLOW-Phase **Fault Distance: 1.3 KM** **Fault Loop: BN** **Auxilary Relay: 86A, 86B,86** Operated: **Autoreclose Status: UNSUCESSFULL** **Fault Resistance:** 0.00 + j 0.20 Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy, **Fault Current:**IR=IA=587.65 A L341.3°,IB= 24918.433 A L162.7° ,IC=380.43 A L358.7° **Voltage during Fault : . VAN=146.4 KV L356.9°, VBN=261.7 KV L282.4° VCN=109.43 KV L112.2°**	**BURNPUR END** Protection Operated	**PRELIMINARY FINDINGS: Y PH LA FAILED AT KALYANESWARI END.**	**REMEDIAL ACTION REQUIRED:**
15	132 KV	L#60 (CTPS-RAMKANALI) Line Length:60 km	CTPS End :TRIPPED RAMKANALI End:TRIPPED	26.04.25,16:42 hrs	26.04.25,04:15 hrs	0.14 Hrs	**CTPS END** **Protection Operated**:DISTANCE PROTECTION OPERATED, Yph, Bph, Z2, o/c start I>1, E/F Start IN1 **Bay Position**:Normal Fault in Phase:--YELLOW, BLUE-Phase **Fault Distance: 46.42 kM** **Fault Loop: YBN** **Auxilary Relay:** 86 Operated: **Autoreclose Status: NA** **Fault Resistance:** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy	**RAMKANALI END** **Protection Operated:**DISTANCE PROTECTION OPERATED, Yph, Bph, Z1, Z2, CARRIER SEND, Bay Position:Normal **Fault in Phase**:--YELLOW, BLUE-Phase **Fault Distance:** 28.8 KM **Fault Loop:YBN** **Auxilary Relay: Operated**:86 OPTD **Autoreclose Status: Unsucessfull** **Fault Resistance:** Ω **Carrier Status:** Carrier Switch-IN,Carrier Healthy	**PRELIMINARY FINDINGS:**	**REMEDIAL ACTION REQUIRED:**

16	132 KV	L#39 (JSR-PURULIA) Line Length: 97 km	JSR End :NO TRIP PURULIA End: TRIP	26.04.25,19:14:14:942 hrs			**PURULIA END** **Protection Operated**:DIRECTIONAL EARTH FAULT OPERATED **Bay Position**:Normal Fault in Phase:--BLUE-Phase **Fault Distance: NA** **Fault Loop: CN** **Auxilary Relay:** 86 Operated: **Autoreclose Status: NA** **Fault Resistance:** Ω Fault Current:IR=IA=40.00 A L20.3°,IB= 40.84 A L-138°,IC=307.22 A L112.7°, IN=292.38 A L112.5° Voltage during Fault : . VAN= 77.8 KV L0°, VBN=75.89 KV L-119.3°,VCN=75.513 KV L115.9°, Vn=7.80 KV L12.9°	**JAMSHEDPUR END** **Protection Operated: NO TRIPPING**	**PRELIMINARY FINDINGS:**	**REMEDIAL ACTION REQUIRED:**
17	132 KV	L#40 (JSR-PURULIA) Line Length: 97 km	JSR End :NO TRIP PURULIA End: TRIP	26.04.25,19:14:33:865 hrs			**PURULIA END** **Protection Operated**:DIRECTIONAL EARTH FAULT OPERATED **Bay Position**:Normal Fault in Phase:--BLUE-Phase **Fault Distance: NA** **Fault Loop: CN** **Auxilary Relay:** 86 Operated: **Autoreclose Status: NA** **Fault Resistance:** Ω Fault Current:IR=IA=86.165 A L46.8°,IB= 48.76 A L-166°,IC=142.27 A L111.3°, IN=187.45 A L102.4° Voltage during Fault : . VAN= 78.28 KV L0°, VBN=76.496 KV L-118.8°,VCN=76.076 KV L118°, Vn=5.7 KV L1.8°	**JAMSHEDPUR END** **Protection Operated: NO TRIPPING**	**PRELIMINARY FINDINGS:**	**REMEDIAL ACTION REQUIRED:**
18	132 KV	L#77 (RAMGARH-PATRATU) Line Length:25.5 km	RAMGARH End :TRIPPED PATRATU End:TRIPPED	28.04.25,17:26 hrs	28.04.25,17:41 hrs		**RAMGARH END** **Protection Operated**:RPH,Z1, O/C START I>1 **Bay Position**:Normal Fault in Phase:--RED-Phase **Fault Distance: NA** **Fault Loop: AN** **Auxilary Relay:** 86 Operated: **Autoreclose Status: NA** **Fault Resistance:2.58 +j3.54** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy, **Fault Current:**IR=IA=953.116 A,IB=238.69 A,IC=451.37 A, In=282.97 A L295.9° **Voltage during Fault : . VAN=36.62 KV L348.9°, VBN=71.37 KV L245.0,VCN=75.72 KV L110.2°** **PLCC COUNTER READING :** **Before Fault: TX=06,01 RX=25,02**	**PATRATU END** **Protection Operated:No relay indication appeared** PLCC COUNTER READING : Before Fault: TX= 26,3 RX= 6,1 After Fault: TX= 26,3 RX= 6,1	**PRELIMINARY FINDINGS:**	**REMEDIAL ACTION REQUIRED:**
19	132 KV	L#78 (RAMGARH-PATRATU) Line Length:25.5 km	RAMGARH End :AUTORECLOSED PATRATU End:TRIPPED	28.04.25,17:26 hrs	28.04.25,17:35 hrs		**RAMGARH END** Protection Operated:Directional O/C & E/F OPERATED O, Z1	**PATRATU END** **Protection Operated:Distance Protection Zone-2, O/C START I>1, E/F START IN1, CARRIER RECEIVED, CARRIER SEND**	PRELIMINARY FINDINGS:	**REMEDIAL ACTION REQUIRED:**
20	220 KV	Line#254(CTPS-BSL) Line Length: 18.0 km	CTPS End :TRIPPED BSL End:TRIPPED	28.04.25,19:00 hrs	28.04.25,19:45 hrs		**BSL END** **Protection Operated:Distance Protection Zone-1 Operated.** **Bay Position:Normal** **Fault in Phase:RED-Phase** **Fault Distance: 12.1 KM ,** **Fault Loop:BC** **Auxilary Relay: 86 OPTD** **Autoreclose Status: TRIPPED** **Fault Resistance: Ω** **Carrier Status:** **Fault Current: IA= 4730 A**	**CTPS END** **Protection Operated:Distance Protection Zone-1 Operated, CARRIER RECEIVED, CARRIER SEND** **Bay Position:Normal** **Fault in Phase:RED-Phase** **Fault Distance: 6.8 KM ,** **Fault Loop:BC** **Auxilary Relay: 86 OPTD** **Autoreclose Status: TRIPPED** **Fault Resistance: Ω** **Carrier Status: ,** **Fault Current: IA= 14390 A L-53.7°,IB= 400.1 A 71.0°,IC= 656.5 A L123.9°, In=13452 A L-54.7°** **Voltage during Fault : . VAN=78.26 KV L0°, VBN=124.13 KV L-93.6°,VCN=109.09 KV L126.8°**	PRELIMINARY FINDINGS: INJSULATOR FLASH OVER MAY OCCUR.	**REMEDIAL ACTION REQUIRED:**

21	132 KV	L#6 (GOLA-CTPS) Line Length:66.72 km	GOLA End :TRIPPED CTPS End:TRIPPED	28.04.25,18:55 hrs			**GOLA END** **Protection Operated**:Distance Protection Zone-1 Operated, o/c START i>1, EF START IN1, CARRIER SEND **Bay Position**:Normal Fault in Phase:--YELLOW-Phase **Fault Distance: -175.8 KM** **Fault Loop: BN** **Auxilary Relay:** 86 Operated: **Autoreclose Status: Unsucessful** **Fault Resistance:** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy, **PLCC COUNTER READING :** **COUNTER FAULTY**	**CTPS END** **Protection Operated:**Distance Protection Zone-2, o/c START i>1, EF START IN1 Bay Position:Normal **Fault in Phase**:--YELLOW-Phase **Fault Distance:** 70.15 KM **Fault Loop:BN** **Auxilary Relay: Operated**:86 OPTD **Autoreclose Status: Unsucessfull** **Fault Resistance:** Ω **Carrier Status:** Carrier Switch-IN,Carrier Healthy, Fault Current: IA= 417.88 A L-11.5°,IB= 1638.8 A L174.0°,IC=319.73 A L24.4°, In=965 A L166.7° Voltage during Fault : . VAN=75.71 KV L0°, VBN=66.68 KV L-120.8°,VCN=77.01 KV L122.3° PLCC COUNTER READING : COUNTER FAULTY	**PRELIMINARY FINDINGS: INJSULATOR FLASH OVER MAY OCCUR.**	**REMEDIAL ACTION REQUIRED:**
22	132 KV	L#7 (GOLA-CTPS) Line Length:66.72 km	GOLA End :AUTORECLOSED CTPS End:TRIPPED	28.04.25,18:55 hrs			**GOLA END** **Protection Operated**:Distance Protection Zone-1 Operated, o/c START i>1, EF START IN1, CARRIER SEND **Bay Position**:Normal Fault in Phase:--YELLOW-Phase **Fault Distance: 25.76 KM** **Fault Loop: BN** **Auxilary Relay:** 94 Operated: **Autoreclose Status: sucessful** **Fault Resistance:** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy, **PLCC COUNTER READING :** **COUNTER FAULTY**	**CTPS END** **Protection Operated:**Distance Protection Zone-2, o/c START i>1, EF START IN1 Bay Position:Normal **Fault in Phase**:--YELLOW-Phase **Fault Distance:** 63.39 KM **Fault Loop:BN** **Auxilary Relay: Operated**:86 OPTD **Autoreclose Status: Unsucessfull** **Fault Resistance:** Ω **Carrier Status:** Carrier Switch-IN,Carrier Healthy, Fault Current: IA= 276.96 A L-10°,IB= 1689.7 A L173.4°,IC=233.44 A L12.2°, In=1193.5 A L170.6° Voltage during Fault : . VAN=75.54 KV L0°, VBN=66.43 KV L-120.6°,VCN=76.91 KV L122.1° PLCC COUNTER READING : COUNTER FAULTY	**PRELIMINARY FINDINGS: INJSULATOR FLASH OVER MAY OCCUR.**	**REMEDIAL ACTION REQUIRED:**
23	132 KV	L#24 (HWH-BELMURI) Line Length:49.3 km	HWH End :TRIPPED BELMURI End:TRIPPED	29.04.25,20:58 hrs			**BELMURI END** **Protection Operated**:Distance Protection Zone-1 Operated, o/c START i>1, EF START IN1, CARRIER SEND **Bay Position**:Normal Fault in Phase:--YELLOW-Phase **Fault Distance: KM** **Fault Loop: BN** **Auxilary Relay:** 86 Operated: **Autoreclose Status: Unsucessful** **Fault Resistance:** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy,	**HWH END** **Protection Operated:**Distance Protection Zone-1, o/c START i>1, EF START IN1 Bay Position:Normal **Fault in Phase**:--YELLOW-Phase **Fault Distance:** 18.53 KM **Fault Loop:BN** **Auxilary Relay: Operated**:86 OPTD **Autoreclose Status: Unsucessfull** **Fault Resistance:** Ω **Carrier Status:** Carrier Switch-IN,Carrier Healthy, Fault Current: IA= 63.79 A L-122.8°,IB= 1104.5 A L155.2°,IC=138.56 A L-22°, In=976.4 A L158.6° Voltage during Fault : . VAN=83.42 KV L0°, VBN=14.76 KV L-144.3°,VCN=86.01 KV L101.3°	**PRELIMINARY FINDINGS: JUMPER SNAPPED AT LOC NO.145**	**REMEDIAL ACTION REQUIRED:**
24	220 KV	L#228 (MTPS-KALYANESWARI) Line Length:55 km	MTPS End :TRIP KALYANESWARI End:TRIP	01.05.25,16:15 hrs			**MTPS END** **Protection Operated**: Rph, Z1 OPERATED,CARRIER SEND **Bay Position**:Normal Fault in Phase:--REDPhase **Fault Distance: 37.49 km** **Fault Loop: AN** **Auxilary Relay: 86** Operated: **Autoreclose Status: UNSUCESSFULL** **Fault Resistance:** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy,	**KALYANESWARI END** **Protection Operated: Rph, Z1 OPERATED** **Bay Position:Normal** **Fault in Phase:--RED-Phase** **Fault Distance: km** **Fault Loop: AN** **Auxilary Relay: 186A Operated:** **Autoreclose Status: SUCESSFULL** **Fault Resistance: Ω** **Carrier Status: Carrier Switch-IN,Carrier Healthy,** **Fault Current: IA= 6631.2 A L-76.8°,IB= 84.996 A L91.4°,IC=114.9 A L-42°, In=4530 A L19.4°** **Voltage during Fault : . VAN=96.73 KV L0°, VBN=130.6 KV L-118.9°,VCN=130.09 KV L119.8°**	**PRELIMINARY FINDINGS:FROM DR IT SEEMS THAT BACKFLASHOVER MAY OCCURRED AT THE FAULT LOCATION**	**REMEDIAL ACTION REQUIRED:**

25	220 KV	Line#252(GIRIDIH-KTPS) Line Length: 100.6 km	GIRIDIH End :AUTORECLOSED KTPS End:AUTORECLOSED	03.05.25,16:27:02 hrs			**GIRIDIH END** **Protection Operated:Distance Protection Zone-1 Operated, CARRIER RECEIVED, CARRIER SEND** **Bay Position:Normal** **Fault in Phase:YELLOW, BLUE-Phase** **Fault Distance: 25.72 KM ,** **Fault Loop:AN** **Auxilary Relay: 94 OPTD** **Autoreclose Status: SUCESSFULL** **Fault Resistance: Ω** **Carrier Status: Carrier Switch-IN, CARRIER HEALTHY,** **Fault Current: IA= 3003.7 A L-57.6°,IB= 80.96 A L17.7°,IC= 156.78 A L-67.72°, In=3181.7 A L-56.7°** **Voltage during Fault : . VAN=98.62 KV L0°, VBN=132.16 KV L-120.1°,VCN=128.19 KV L122.1°** **PLCC COUNTER READING :** **Before Fault: TX= 272,270 RX= 523,459**	**KTPS END** **Protection Operated:Distance Protection Zone-1 Operated, CARRIER RECEIVED, CARRIER SEND** **Bay Position:Normal** **Fault in Phase:RED-Phase** **Fault Distance: 75.3 KM ,** **Fault Loop:AN** **Auxilary Relay: 94 OPTD** **Autoreclose Status: SUCESSFULL** **Fault Resistance: Ω** **Carrier Status: Carrier Switch-IN, CARRIER HEALTHY,** **Fault Current: IA= 1194 A** **PLCC COUNTER READING :** **Before Fault: TX= 238,201 RX= 283,270** **After Fault: TX= 240,202 RX= 283,271**	**PRELIMINARY FINDINGS:FROM DR IT SEEMS THAT BACKFLASHOVER MAY OCCURRED AT THE FAULT LOCATION**	
26	220 KV	L#259 (MTPS-RANCHI_PG) Line Length:232 km	MTPS End :AUTORECLOSED RANCHI_PG End:AUTORECLOSED	28.04.25,18:51 hrs			**MTPS END** **Protection Operated**: Rph, Z1 OPERATED,CARRIER SEND **Bay Position**:Normal Fault in Phase:--RED-Phase **Fault Distance: 131.63 km** **Fault Loop: AN** **Auxilary Relay: 186A** Operated: **Autoreclose Status: SUCESSFULL** **Fault Resistance:** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy, **Fault Current:**IR=IA=1330.11 A L-74.2°,IB=124.62 A L-91.4°,IC=124.89 A L143.5° **Voltage during Fault : . VAN=125.83 KV L-0°, VBN=129.2 KV L-121.9°,VCN=129.33 KV L119.6°**	**RANCHI_PG END** **Protection Operated:**	**PRELIMINARY FINDINGS:FROM DR IT SEEMS THAT BACKFLASHOVER MAY OCCURRED AT THE FAULT LOCATION**	**REMEDIAL ACTION REQUIRED:**
27	220 KV	L#259 (MTPS-RANCHI_PG) Line Length:232 km	MTPS End :AUTORECLOSED RANCHI_PG End:AUTORECLOSED	30.04.25,15:14 hrs			**MTPS END** **Protection Operated**: Rph, Z1 OPERATED,CARRIER SEND **Bay Position**:Normal Fault in Phase:--RED-Phase **Fault Distance: 3.96 km** **Fault Loop: AN** **Auxilary Relay: 186A** Operated: **Autoreclose Status: SUCESSFULL** **Fault Resistance:** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy, **Fault Current:**IR=IA=16822 A L-63.3°,IB=226.90 A L-54.4°,IC=187.31 A L-85.6° **Voltage during Fault : . VAN=108.7 KV L-0°, VBN=131.47 KV L-108.7°,VCN=123.75 KV L130.5°**	**RANCHI_PG END** **Protection Operated:**	**PRELIMINARY FINDINGS:FROM DR IT SEEMS THAT BACKFLASHOVER MAY OCCURRED AT THE FAULT LOCATION**	**REMEDIAL ACTION REQUIRED:**
28	220 KV	L#259 (MTPS-RANCHI_PG) Line Length:232 km	MTPS End :AUTORECLOSED RANCHI_PG End:AUTORECLOSED	30.04.25,16:24 hrs			**MTPS END** **Protection Operated**: Rph, Z1 OPERATED,CARRIER SEND **Bay Position**:Normal Fault in Phase:--RED-Phase **Fault Distance: 12.95 km** **Fault Loop: AN** **Auxilary Relay: 186A** Operated: **Autoreclose Status: SUCESSFULL** **Fault Resistance:** Ω **Carrier Status**: Carrier Switch-IN,Carrier Healthy, **Fault Current:**IR=IA=9005.2 A L-72.6°,IB=166.57 A L-68.3°,IC=96.29 A L-119.7° **Voltage during Fault : . VAN=91.36 KV L-0°, VBN=130.65 KV L-117.9°,VCN=125.92 KV L122.2°**	**RANCHI_PG END** **Protection Operated:**	**PRELIMINARY FINDINGS:FROM DR IT SEEMS THAT BACKFLASHOVER MAY OCCURRED AT THE FAULT LOCATION**	**REMEDIAL ACTION REQUIRED:**
								NUMBER OF CORRECT OPERATION	NC	28
								NUMBER OF FAILURE	Nf	0

								NUMBER OF UNWANTED OPERATION	Nu	1
								NUMBER OF INCORRECT OPERATION	Ni	0
								Dependibility Index	D= Nc / (Nc+Nf)	0.96
								Security Index	S= Nc/ (Nc + Nu)	0.96
								Reliability Index	R= Nc / (Nc + Ni)	0.96

optcl

PROTECTION PERFORMANCE INDICES AS PER TRIPPING LIST OF PCC MEETING AGENDA FOR THE MONTH OF APRIL2025 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	400 KV MRDL-MDSL-I	26/04/25	17:30	30/04/25	20:56	Z-1/R-Y-B/Ir=0.06 KA/Iy=3.98 KA/Ib=5.77 KA/34.1 KM/SOTF	Z-1/Y-B/Iy=3.41 KA/71.5 KM/SOTF	1	1	0	0	0	0	END A=1 ,END B=1	END A=1 ,END B=1	END A=1 ,END B=1	400KV D/C TOWER COLLAPSED AT LOCATION NO. 110
2	400 KV MRDL-MDSL-II	26/04/25	17:30	05-04-2025	16:28	Z-1/B-N/7.86 KA/38.5 km	Z-1/R-Y-B/Ir=3.87 KA/Iy=0.09 KA/Ib=0.91 KA/68.66 KM	1	1	0	0	0	0	END A=1 ,END B=1	END A=1 ,END B=1	END A=1 ,END B=1	400KV D/C TOWER COLLAPSED AT LOCATION NO. 110
3	400 KV MRDL-TSTPP-I	24/04/25	12:51	24/04/25	14:21	NO TRIP	DT RECEIVED	0	1	0	1	0	1	END A=1 ,END B=0.5	END A=1 ,END B=0.5	END A=1 ,END B=0.33	LINE TRIPED AT TALCHER END DUE TO DT SENT FROM MRDL
4	401 KV MRDL-TSTPP-I	24/04/25	10:37	24/04/25	11:32	NO TRIP	DT RECEIVED	0	1	0	1	0	1	END A=1 ,END B=0.5	END A=1 ,END B=0.5	END A=1 ,END B=0.33	LINE TRIPED AT TALCHER END DUE TO DT SENT FROM MRDL
5	400 KV LAPANGA-STERLITE-II	22/04/25	13:10	22/04/25	13:35	Z-1/R-E/9.56 KA/13.1 KM		1	0	1	0	1	0	END A=0.5 ,END B=0	END A=0.5 ,END B=0	END A=0.33 ,END B=0	A/R FAILED AFTER 1 SEC
6	400 KV LAPANGA-OPGC(IB THERMAL-II)	22/04/25	13:10	22/04/25	13:39	NO TRIP	Z-1/B-E/6.2 KA/26 KM	0	1	0	1	0	1	END A=0 ,END B=0.5	END A=0 ,END B=0.5	END A=0 ,END B=0.33	B-E FAULT OCCURRED AT LAPANGA STERLITE FEEDER AND SAME FAULT WAS SENSED BY OPGC IN Z-3
7	400 KV LAPANGA-OPGC(IB THERMAL-I)	22/04/25	13:10	22/04/25	13:39	NO TRIP	Z-1/R-Y/IR=6.25 KA/IY=6.2 KA/42 KM	0	1	0	1	0	1	END A=0 ,END B=0.5	END A=0 ,END B=0.5	END A=0 ,END B=0.33	B-E FAULT OCCURRED AT LAPANGA STERLITE FEEDER AND SAME FAULT WAS SENSED BY OPGC IN Z-1
8	400 KV MRDL-MDSL-I	18/04/25	20:56	19/04/25	10:01	Z-1/B-E/3.83 KA/64.1 KM	Z-1/B-E/4.6 KA	1	1	0	0	0	0	END A=1 ,END B=1	END A=1 ,END B=1	END A=1 ,END B=1	A/R FAILED AFTER 1 SEC
9	400 KV NEW DUBURI-MRDL-II	18/04/25	20:00	19/04/25	09:18	Z-1/4.75 KA/56.4 KM	Z-1/R-E/6.98 KA/37.4KM	1	1	0	0	0	0	END A=1 ,END B=1	END A=1 ,END B=1	END A=1 ,END B=1	A/R FAILED AFTER 1 SEC
10	220 KV BARIPADA PG-BALASORE-II	18/04/25	16:43	20/04/25	17:40	Z-1/B-E/2.243kA/76.27KM		1	0	1	0	1	0	END A=0 ,END B=0.5	END A=0 ,END B=0.5	END A=0 ,END B=0.33	A/R FAILED AFTER 1 SEC FROM BARIPADA END

WBSETCL

Protection Performance Indices for the month of APRIL-'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	Durgapur-PPSP #2	05.04.2025	13:48:00	06.04.2025	05:03:00	Zone-1,B-Phase,CS, A/R L/O		1		0		0		1	1	1		
2	Arambag-PPSP (OLD)	05.04.2025	13:48:00	05.04.2025	14:22:00	Zone-1,B-Phase,CS ,CR, A/R L/O		1		0		0		1	1	1		A/R switch kept in Non-Auto mode.
3	Arambag- New PPSP	08.04.2025	04:10:00	08.04.2025	11:36:00	Manual CB OFF		1		0		0		1	1	1		
4	Arambag- New PPSP	10.04.2025	04:19:00	10.04.2025	09:34:00	Manual CB OFF		1		0		0		1	1	1		
5	Siliguri PG-Kurseong #1	10.04.2025	04:32:00	10.04.2025	05:13:00		Zone-1,Y-Phase,3-Phase Trip	1		0		0		1	1	1		
6	Siliguri PG-Kurseong #2	10.04.2025	04:32:00	10.04.2025			No Tripping at Kurseong End	1		0		0		1	1	1		
7	Gokarna- New Chanditala #1	10.04.2025	18:42:00	10.04.2025	19:43:00	Zone-1,B-Phase, A/R close,PD trip.	Zone-1,B-Phase,CS ,CR, A/R close	0	1	1	1	0						During Auto reclose time, PD operates which causes 3-phase trip. Attended and replaced the PD timer.
8	Durgapur-PPSP #2	10.04.2025	19:30:00	10.04.2025	20:33:00	Zone-1,R-Phase, CS ,A/R L/O.		1		0		0		1	1	1		
9	Gokarna-Sagardighi #1	10.04.2025	19:42:00	10.04.2025	21:47:00	Zone-1,B-Phase,CS ,CR, A/R close, AR L/O		1		0		0		1	1	1		
10	Kharagpur-KTPP #1	12.04.2025	21:01:00	12.04.2025	21:33:00	Zone-2,B-Phase,CS ,CR, A/R close		1		0		0		1	1	1		
11	Kharagpur-KTPP #1	18.04.2025	11:28;00	18.04.2025	11:59:00	Zone-1,R-Phase,CS ,CR, A/R close		1		0		0		1	1	1		
12	Durgapur-PPSP #1	19.04.2025	04:12:00	19.04.2025	04:55:00	Zone-1,R-Phase,CS ,CR, A/R L/O		1		0		0		1	1	1		
13	Durgapur-PPSP #2	23.04.2025	11:26:00	23.04.2025	11:47:00	Zone-1,B-Phase,CS ,CR, A/R L/O		1		0		0		1	1	1		
14	NBU-Siliguri PG	23.04.2025	11:47:00	23.04.2025	12:05:00	DR Not Available												
15	Durgapur-New-Chanditala	26.04.2025	20:50:00	26.04.2025	21:04:00	Zone-1,B-Phase,CS ,CR,DT Recv., ARL/O	Zone-1,B-Phase,CS ,CR, A/R close, ARL/O	1	1	0	0	0	0	1	1	1		

16	New Chanditala-Midnapore #1	26.04.2025	21:17:00	26.04.2025	21:40:00	Zone-1,Y-Phase,CS ,CR,DA/R Close., ARL/O		1		0		0		1	1	1		
17	Jeerat-Subhasgram PG #1	26.04.2025	22.04.2025	26.04.2025		No Tripping at Jeerat End												
18	Arambag-New-PPSP	28.04.2025	22:04:00	29.04.2025	01:04:00	Zone-1,R-B-Phase,CS ,3-phase Trip		1		0		0		1	1	1		
19	Arambag-Old PPSP	30.04.2025	15:01:00	30.04.2025	15:40:00	Zone-1,Y-Phase,CS ,CR, A/R Non Auto, AR L/O		1		0		0		1	1	1		
20	Arambag-Old PPSP	30.04.2025	15:50:00	30.04.2025	16:20:00	Zone-1,Y-Phase,CS ,CR, A/R Non Auto, AR L/O		1		0		0		1	1	1		

DMTCL

Protection Performance Indices for the month of April'2025																		
Sr.No.	Name of the Element	Tripping Date	Tripping Time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc	Nc	Nu	Nu	Nf	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					
	No-Tripping in April'2025 Month																	

Jorehang HEP

Jorethang Loop Hydro Electric Project 2 X 28 MW

Protection Performance Indices for the APRIL-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+N f))	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 Jorethang-New Melli Line-1																NO TRIPING	
2	220KV Jorethang-New Melli Line-2																NO TRIPING	

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.

Tashiding HEP

Tashiding Hydro Electric Project 2 X 48.5 MW

Protection Performance Indices for the APRIL -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+N f))	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	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NO TRIPPING	--
2	220KV Tashiding- New Melli Line-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NO TRIPPING	--

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.

TVNL

Protection Performance Indices for the month of APRIL 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)
						End A	End B	End A	End B	End A	End B	End A	End B				
1	400KV TTPS-PVUNL T/L	05.04.2025	14:45	05.04.2025	15:33	Over Voltage		1		0		0		1.0000	1.0000	1.0000	
2	220KV TTPS-Bihar Shariff T/L	06.04.2025	11:21	06.04.2025	17:46	E/F 95.49 Km		1		0		0		1.0000	1.0000	1.0000	
3	400KV TTPS-PVUNL T/L	10.04.2025	15:45	10.04.2025	18:45	E/F		1		0		0		1.0000	1.0000	1.0000	
4	220KV TTPS-Govindpur-2 T/L	14.04.2025	15:28	14.04.2025	15:58	O/C 20.80 Km		1		0		0		1.0000	1.0000	1.0000	
5	220KV TTPS-Bihar Shariff T/L	21.04.2025	12:08	21.04.2025	12:51	E/F 76.72 Km		1		0		0		1.0000	1.0000	1.0000	
6	220KV TTPS-Bihar Shariff T/L	26.04.2025	10:09	26.04.2025	11:02	E/F 126.2 Km		1		0		0		1.0000	1.0000	1.0000	
7	220KV TTPS-Bihar Shariff T/L	26.04.2025	13:20	26.04.2025	19:11	E/F 116.1 Km		1		0		0		1.0000	1.0000	1.0000	
8	400KV TTPS-PVUNL T/L	28.04.2025	08:07	28.04.2025	10:59	Over Voltage		1		0		0		1.0000	1.0000	1.0000	

NOTE:
Nc is the number of correct operations at internal power system faults
Nf is the number of failures to operate at internal power system faults.
Nu is the number of unwanted operations.
Ni is the number of incorrect operations and is the sum of Nf and Nu

ENICL, OGPTL, PKTCL

Protection Performance Indices for the month of April-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)							-	-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of April
		400 kv (Quad) D/C Bongaigaon - Alipurduar line CKT- 2(BNG- ALIP #2)	09-04-2025	05:09	09-04-2025	05:09	19.07kM , 11.33 kA	82.8kM, 3.93kA	1.00	1.00	-	-	-	-	-NA-	1	1	AR Success
		400 kv (Quad) D/C Alipurduar - Siliguri line CKT- 1(ALIP- SLG #1)	09-04-2025	02:47	09-04-2025	02:47	81.4kM, 0.707ka	91.73kM , 2.97kA	1.00	1.00	-	-	-	-	-NA-	1	1	AR Success
		400 kv (Quad) D/C Alipurduar - Siliguri line CKT- 1(ALIP- SLG #1)	13-04-2025	01:22	13-04-2025	01:22	18.7kM, 10.2kA	107.9kM , 2.67kA	1.00	1.00	-	-	-	-	-NA-	1	1	AR Success
		400 kv (Quad) D/C Purnia-Biharshrif Line CKT-2(NPRN- BSF# 2)	17-04-2025	21:29:00	17-04-2025	21:29:00	77.32 kM, 3.77 kA	04.65 kM, 4.14k	1.00	1.00	-	-	-	-	-NA-	1	1	AR Success
		400 kv (Quad) D/C Purnia-Biharshrif Line CKT-1 (NPRN-BSF#1)	10-04-2025	07:35:00	10-04-2025	07:35:00	37.436 kM, 7.950 kA	56.66 kM, 3.069	1.00	1.00	-	-	-	-	-NA-	1	1	AR Success
		400 kv (Quad) D/C Purnia-Biharshrif Line CKT-1 (NPRN-BSF#1)	12-04-2025	23:20:00	12-04-2025	23:20:00	204 kM, 2.06 kA	85.5 kM, 2.12 k	1.00	1.00	-	-	-	-	-NA-	1	1	AR Success
		400 kv (Quad) D/C Alipurduar - Siliguri line CKT- 2(ALIP- SLG #2)	13-04-2025	01:35:00	13-04-2025	01:35:00	34.5 kM, 7.152kA	3.26kM, 3.167k	1.00	1.00	-	-	-	-	-NA-	1	1	AR Success
		400 kv (Quad) D/C Purnia-Biharshrif Line CKT-1 (NPRN-BSF#1)	14-04-2025	14:39:00	15-04-2025	15:48:00	186.4 kM, 2.86 kA	4.6 kM, 16.18 kA	1.00	1.00	-	-	-	-	-NA-	1	1	Tripped due to Y-phase to earth
		400 kv (Quad) D/C Purnia-Biharshrif Line CKT-1 (NPRN-BSF#1)	17-04-2025	22:54:00	17-04-2025	22:54:00	117.4 kM, 0.356 kA	17.11 kM, 2.59 k	1.00	1.00	-	-	-	-	-NA-	1	1	Tripped due to R-phase to earth
		400 kv (Quad) D/C Alipurduar - Siliguri line CKT- 2(ALIP- SLG #2)	28-04-2025	03:40:00	28-04-2025	03:40:00	34.6 kM, 3.12kA	0.46 kM, 3.532 k	1.00	1.00	-	-	-	-	-NA-	1	1	AR Success
2	ODISHA GENRATION PHASE - II LIMITED	765kV D/C Jharsuguda(Sundargarh)-Raip	03-04-2025	18:08:00	03-04-2025	18:08:00	81.26 kM, 7.97kA	206kM, 3.75 kA	1.00	1.00	-	-	-	-	-NA-	1	1	AR Success
		765kV D/C Jharsuguda(Sundargarh)-Raip	18-04-2025	15:43:00	18-04-2025	22:28:00	274 kM	42.108 kM	1.00	1.00	-	-	-	-	-NA-	1	1	Line tripped due to R-Y Phase f
		765kV D/C Jharsuguda(Sundargarh)-Raip	28-04-2025	13:09:00	28-04-2025	18:51:00	267.8kM , 3.97 kA	45 kM , 11.08 kA	1.00	1.00	-	-	-	-	-NA-	1	1	Line tripped due to R -phase to
		765kV D/C Jharsuguda(Sundargarh)-Raip	29-04-2025	18:33:00	29-04-2025	18:33:00	126.5 kM , 5.92 kA	1.95 kM , 4.168	1.00	1.00	-	-	-	-	-NA-	1	1	AR Success
		765kV D/C Jharsuguda(Sundargarh)-Raip	29-04-2025	19:05:00	29-04-2025	19:05:00	49.06 kM , 11.93 kA	62.2 kM , 2.93 k	1.00	1.00	-	-	-	-	-NA-	1	1	AR Success

		400kV D/C LILO POINT (T. No. - 130) - Sundargarh							-	-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of April'
		400kV D/C OPGC-LILO POINT (T. No. - 130)							-	-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of April'
		400kV D/C IB-OPGC-Jharsuguda(Sundargarh) Ckt-1							-	-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of April'
3	PURULIA KHARAGPUR TRANSMISSION COMPANY LIMITED	400 kV Chaibasa-Kharagpur D/C line CKT- 1							-	-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of April'
		400 kV Chaibasa-Kharagpur D/C line CKT- 2							-	-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of April'
		400 KV,D/C New Ranchi-New Purulia Line: CKT-1							-	-	-	-	-	-	-NA-	-NA-	-NA-	No events in the month of April'
		400 KV,D/C New Ranchi-New Purulia Line	15-04-2025	19:35:00	15-04-2025	19:35:00	45.47 kM, 6.9 kA	58.4 kM, 4.16 k	1.00	1.00	-	-	-	-	-NA-	1	1	AR Success

List of important transmission lines in ER which tripped in April-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	220KV-KHAGARIA-NEW PURNEA-2	27-04-2025	11:16:00	27-04-2025	12:18	Khagaria: Zone -1, Y ph B ph, Distance - 96.47km, Ir- 109.7A, Iy- 1.330kA, Ib- 1.275kA,	Purnea: Z1, Y-B, 2.1 kM, Iy 14.7kA, Ib 14.61 kA.	Y_B	100 msec	Line tripped on phase to phase fault.			NO	NO	BSPTCL	PG ER-I
2	400KV-RAJARHAT-FSTPP-1	26-04-2025	22:37:00	26-04-2025	23:38	Rajarhat: R-Ph, 3.25KA, 110.km	FSTPP: Z-1, 215.5km,R-Ph, 2.2kA	R-Earth	100 msec	A/r failed after 1 second			NO	NO	PG ER-II	NTPC
3	400KV-NEW JEERAT-SUBHASGRAM(PG)-1	26-04-2025	22:02	28-04-2025	02:07	New Jeerat end : RN fault, 89.1 KM , 3.6 KA	Subhasgram end : R-N, Z1 , 13.54 KM , 12.99 KA,	R-Earth	100 msec	A/r failed after 1 second			NO	NO	PG ER-II	PG ER-II
4	400KV-NEW JEERAT-SUBHASGRAM(PG)-2	26-04-2025	21:57	27-04-2025	13:38	New Jeerat end: RN fault , 90 KM , 3.62 KA	Subhasgram end: R-N fault, Z1 , 1.8 KM, 17.8 KA,	R-Earth	100 msec	A/r failed after 1 second			NO	NO	PG ER-II	PG ER-II

5	400KV-MEDINIPUR-NEW CHANDITALA-1	26-04-2025	21:17	26-04-2025	21:39	Medinipur: Y-Ph, Z-I, 70.07km, 3.570KA	New chanditala: Y-Ph, Z-I, 18.25km, 11kA	Y-Earth	100 msec	A/r successful from both end. Line tripped in reclaim time			NO	YES	PMJTL	WBSETCL
6	400KV-BIDHANNAGAR-NEW CHANDITALA-1	26-04-2025	20:50	26-04-2025	21:04	Bidhannagar: B-Ph, 96km,Z-1, 3.45kA,	New Chanditala: B-Ph, Z-I,34.2km, 6.34kA	B-Earth	100 msec	A/r failed after 1 second			YES	YES	WBSETCL	WBSETCL
7	400KV-MEERAMUNDALI-MENDHASAL-1	26-04-2025	17:30	NA	NA	Main1:Y_B_N, Z1,SOTF.Ir=0.06 KA,Iy=3.98KA, Ib=5.77 KA. 34.1 Km,	Mendhasal End: Main1:Y_B_N, Z1,SOTF.Ir=0.06 KA,Iy=3.98KA, Ib=5.77 KA. 34.1 Km(Tower collapse at loc no 110)	Y_Earth	100 msec	A/r failed after 1 second			YES	NO	OPTCL	OPTCL
8	400KV-MEERAMUNDALI-MENDHASAL-II	26-04-2025	17:30	NA	NA	B_N, FC-7.4 kA, Z-1	Mendhasal End : main1: Event 1:R_E, Z1, Ir=7.86 Ka,33.5 Km Event2: z1, R_E, Ir=9.00 KA (Tower collapse at loc no 110)	R-Earth	100 msec	A/r failed after 1 second			YES	NO	OPTCL	OPTCL
9	400KV-RANCHI-RAGHUNATHPUR-3	26-04-2025	16:40	26-04-2025	18:35	Ranchi: Y-N, 3.3kA, 111 km, Z-1		Y-Earth	100 msec	A/r successful from both end. Line tripped in reclaim time			YES	NO	PG ER-I	DVC
10	400KV-RANCHI-RAGHUNATHPUR-2	26-04-2025	16:33	26-04-2025	18:32	Ranchi:R-N, 3.3 kA, 110 km, z-1	-	R-Earth	100 msec	A/r successful from both end. Line tripped in reclaim time			YES	NO	PG ER-I	DVC

11	400KV-FSTPP-KHSTPP-2	26-04-2025	13:57	26-04-2025	16:40	FSTPP :29.23km, Z-1, 8.997 KA,R-N	-	R-Earth	100 msec	Three phase tripping for phase to ground fault. NTPC may explain.			NO	YES	NTPC	NTPC
12	400KV-FSTPP-KHSTPP-1	26-04-2025	13:33	26-04-2025	20:14	Farakka: Y-N, 7.91 kA,40.39kM,	Kahalgaon: Y-N, 7.24 kA, 52.5kM,	Y-Earth	100 msec	A/r failed after 1 sec.			NO	YES	NTPC	NTPC
13	400KV-KHSTPP-BARH-2	26-04-2025	13:33	26-04-2025	15:03	Tripped along with 400 KV FSTPP KHSTPP -1 , Main bay not available at KHSTPP end		No Fault	-	Line tripped due to tripping of FSTPP-KHSTPP #1 as main bay of Barh #2 was under S/D.			NA	NA	NTPC	NTPC
14	220KV-TENUGHAT-BIHARSARIFF-1	26-04-2025	13:21	26-04-2025	19:09	Tenughat: E/F, Zone-2, R-N , Distance-116.1 km, Ir- 300 A, Iy- 93.99 A,Ib-108.66 A	Biharshariff: R-N, FD-90km, Z1,Ir-01KA, Iy-160A, Ib-176A.	R-Earth	350 msec	Line tripped in Z-2 protection from Tenughat end and Z-1 protection from Biharsariff end. Carrier not send from Biharsariff end. BSPTCL may explain			YES	NO	JUSNL	BSPTCL
15	400KV-KHSTPP-BARH-2	26-04-2025	12:58	26-04-2025	13:26	Tripped along with 400 KV FSTPP KHSTPP -1 , Main bay not available at KHSTPP end		No Fault	-	Line tripped due to tripping of FSTPP-KHSTPP #1 as main bay of Barh #2 was under S/D.			NA	NA	NTPC	NTPC
16	400KV-KHSTPP-BARH-1	26-04-2025	12:58			Tripped along with 400 KV FSTPP KHSTPP -1 , Main bay not available at KHSTPP end		No Fault	-	Line tripped due to tripping of FSTPP-KHSTPP #1 as main bay of Barh #2 was under S/D.			NA	NA	NTPC	NTPC

17	400KV-FSTPP-KHSTPP-1	26-04-2025	12:58	26-04-2025	13:21	Kahalgaon: Y-N, 7.1 kA, 10.5kM,	Farakka: Y-N, 9.293kA,36.79kM,	Y-Earth	100 msec	A/r failed after 1 second			NO	YES	NTPC	NTPC
18	220KV-PUSAULI-NADHOKAR-1	26-04-2025	11:44	26-04-2025	12:11	Pusauli: B-N , Z-3,44.91 km,2.116 KA	-	B-Earth	800 msec	As per PMU line tripped from Pusauli end in Z-3 protection. BSPTCL may explain.			NO	NO	PG ER-I	BSPTCL
19	220KV-PUSAULI-NADHOKAR-2	26-04-2025	11:44	26-04-2025	12:11	Pusauli: B-N , Z-3,64.8 km,1.463 KA	-	B-Earth	800 msec	As per PMU line tripped from Pusauli end in Z-3 protection. BSPTCL may explain.			NO	NO	PG ER-I	BSPTCL
20	220KV-MUZAFFARPUR(PG)-GORAUL(BH)-2	26-04-2025	11:04	26-04-2025	12:46	Muzaffarpur: B-N, 8.8kA, 6.3km,	Goraul: B-N, 6.3 KM, 1.39 KA	B-Earth	100 msec	A/r failed after 1 sec	DR length needs to be increased.		YES	NO	PG ER-I	BSPTCL
21	220KV-HAZIPUR-MUZAFFARPUR-1	26-04-2025	10:39	26-04-2025	17:30	Hazipur : Z-1,BN Fault, FD-29.69 KM,Ib-2.614 KA	Muzaffarpur : Z-1, BN Fault, FD -33.1 km, Ib 4.116 KA	B-Earth	100 msec				YES	YES	BSPTCL	PG ER-I
22	220KV-TENUGHAT-BIHARSARIFF-1	26-04-2025	10:09	26-04-2025	11:02	Tenughat: Z-1, R-N ,FC- 0.81 KA , FD-126 KM	Biharshariff : FC: 2.4 KA , FD-57 KM	R-Earth	100 msec	Three phase tripping for phase to ground fault. JUSNL and BSPTCL may explain.			YES	NO	JUSNL	BSPTCL

23	220KV-PATNA-KHAGAUL-1	26-04-2025	08:49	26-04-2025	09:44	Patna: A/R Successful,	B-N, 8.36km, 12.104 kA	B-Earth	100 msec	A/Rsuccessful from Patna end. Line tripped from Khagaul end.			YES	NO	PG ER-I	BSPTCL
24	400KV-BINAGURI-MALBASE-1	25-04-2025	20:12	25-04-2025	22:08	R/I at BInaguri : B_N, Z-2, F Current : 2.476 kA, F Dist 104.5 km; at	Malbase end: B_N, Ib=4.077kA	B-Earth	500 msec	Line tripped from Binaguri end in Z-2 protection.			NO	NO	PG ER-II	BHUTAN
25	220KV-ALIPURDUAR (PG)-SALAKATI-2	25-04-2025	18:36	25-04-2025	20:59	Alipurduar: R-N, 1.928kA, 60km	SALAKATI-R-N, 26.8KM, 4.12KA (A/R successful) ;	R-Earth	100 msec	A/r successful from Salakati end. Line tripped from Alipurduar end.					PG ER-II	NERLDC
26	220KV-ALIPURDUAR (PG)-SALAKATI-1	25-04-2025	18:36	26-04-2025	16:21	Alipurduar:R-Y, IR-2.23kA, IY-2.9kA, 61km	SALAKATI-R-Y, 32.39KM, 7.5KA;	R-Y	100 msec	Line tripped on phase to phase fault.					PG ER-II	NERLDC
27	220KV-NEW PURNEA-MADHEPURA-1	25-04-2025	17:20	27-04-2025	17:20	Zone-1 ,YB Fault, dist-23.40km , Iy-5.991KA, Ib- 4.204 KA,	Y_N, FC-3.53 kA	Y-Earth	100 msec	A/r failed after 1 second			NO	YES	PG ER-I	BSPTCL
28	220KV-PUSAULI-NADHOKAR-1	25-04-2025	13:41	25-04-2025	15:23	Sasaram: B-Ph, Z-3, 82.78 km, 1.32kA		B-Earth	800 msec	As per PMU line tripped from Pusauli end in Z-3 protection. BSPTCL may explain.			NO	NO	PG ER-I	BSPTCL

29	220KV-PUSAULI-NADHOKAR-2	25-04-2025	13:41	25-04-2025	15:23	Sasaram: B-Ph, Z-3, 0.898kA		B-Earth	800 msec	As per PMU line tripped from Pusauli end in Z-3 protection. BSPTCL may explain.			NO	NO	PG ER-I	BSPTCL
30	400KV-DURGAPUR-KAHALGAON-2	25-04-2025	11:29	25-04-2025	12:16	Durgapur: Y-Ph, 3.162kA,85km, Z-1	KHSTPP: 122km, Y-Ph, 3kA,Z-1	Y-Earth	100 msec	A/r failed after 1 second			NO	NO	PG ER-II	NTPC
31	220KV-CHANDIL-STPS(WBPDCL)-1	25-04-2025	10:44	25-04-2025	18:02	Chandil: Zone-1 Trip, Y&B Phase Trip, Distance- 36.4 km , Ia- 0.06 KA, Ib- 4.17 KA, Ic- 4.13 KA	Y&B Phase Trip, Zone-1, Distance-59.27km, Ib- 3.21 kA, Ic- 3.23 Ka	Y-B	100 msec	Line tripped on phase to phase fault.	DR length needs to be increased.		YES	NO	JUSNL	WBPDCL
32	400KV-MEERAMUNDALI-TSTPP-1	24-04-2025	12:51	24-04-2025	14:21	Not tripped	DT Received	No Fault	-	Line tripped from Talcher end only due to DT send from Meramundali end. OPTCL may explain..			NA	NO	OPTCL	NTPC
33	220KV-CHANDIL-STPS(WBPDCL)-1	24-04-2025	11:22	24-04-2025	12:12	Chandil: Ia 0.28kA, Ib 0.46kA, Ic 1.63kA, Distance 95.1km	santaldih: B-Y, Z-I, 26.8km,2.97kA	Y-B	100 msec	Line tripped on phase to phase fault.	DR length needs to be increased.		YES	NO	JUSNL	WBPDCL
34	220KV-RANCHI-MTPS(DVC)-1	24-04-2025	11:07	24-04-2025	11:56	Ranchi: B-Ph,1.073kA,181.903 km	MTPS:B-Ph,F/D#37.49KM zone-1	B-Earth	100 msec	Three phase tripping for phase to ground fault. PG ER-I and DVC may explain.			YES	NO	PG ER-I	DVC

35	400KV-MEERAMUNDALI-TSTPP-1	24-04-2025	10:37	24-04-2025	11:32	Not tripped	DT Received	No Fault	-	Line tripped from Talcher end only due to DT send from Meramundali end. OPTCL may explain..			NA	NO	OPTCL	NTPC
36	400KV-MAITHON-KHSTPP-1	23-04-2025	15:07	23-04-2025	16:00	DT received.	Over Voltage	No Fault	-	Maithon#1 and Farakka#2 is in same dia at Kahalgaon. Line tripped in O/V Stg-2 protection operated at Kahalgaon during tripping of Farakka-Kahalgaon #2.			NO	NO	PG ER-II	NTPC
37	400KV-FSTPP-KHSTPP-2	23-04-2025	15:07	24-04-2025	18:23	Z-1, Y_N,	Z-1, Y_N, FC-3.1 kA	Y-Earth	100 msec	A/r failed after 1 second			NO	NO	NTPC	NTPC
38	400KV-PPSP-BIDHANNAGAR-2	23-04-2025	11:26	23-04-2025	11:47	PPSP B_N, F Dist 34 km, Z-1	Dgp: B_N, F Current 1.8 kA, Z-2, Grp A, F Dist 164.5 km;	B-Earth	100 msec	Three phase tripping for phase to ground fault. WB may explain.			NO	YES	WBSEDCL	WBSETCL
39	400KV-LAPANGA-STERLITE-2	22-04-2025	13:10	22-04-2025	13:35	R/I at Lapanga end: R_N, F Current Ir 9.56 kA, F Dist 13.1 km	-	R-Earth	100 msec	A/r failed after 1 second					OPTCL	OPTCL
40	400KV-LAPANGA-OPGC (IB THERMAL)-2	22-04-2025	13:10	22-04-2025	13:39	Not tripped	Tripped at OPGC end, R/I at OPGC end : B_N, F Current Ib - 6.2 kA, F Dist 26km	B-Earth	100 msec	B-Earth fault occurred in 400kV Lapanga-Sterlite and same fault was sensed by OPGC and line tripped in Z-3 protection. OPTCL may explain.					OPTCL	OPTCL

41	400KV-LAPANGA-OPGC (IB THERMAL)-1	22-04-2025	13:10	22-04-2025	13:39	Not tripped	Tripped only at OPGC end , R/I at OPGC R_Y, F Current : Ir 6.25 kA, Iy 6.2 kA, F Dist 42 km	R_Y	100 msec	B-Earth fault occurred in 400kV Lapanga-Sterlite and same fault was sensed by OPGC and line tripped in Z-1 protection. OPTCL may explain.					OPTCL	OPTCL
42	220KV-RANCHI-RAMGARH-1	22-04-2025	08:40	22-04-2025	16:47	Ranchi end: Y-N, fd-4.11 KM, fc-2.337 kA	Ramgarh end: Y-E, Zone - 1, F/C 9.75 kA; CT burst at Ramgarh end reported	Y-Earth	100 msec	A/r successful from Ranchi end. Line tripped from Ramgarh end.			YES	NO	PG ER-I	JUSNL
43	220KV-GAYA-BODHGAYA-2	21-04-2025	19:30	21-04-2025	20:06	Not tripped	Tripped on overcurrent	No Fault	-	As per SCADA power flow in each ckt was around 202 MW, Line tripped from Bodhgaya end on over current. BSPTCL may explain			NA	NO	PG ER-I	BSPTCL
44	220KV-GAYA-BODHGAYA-1	21-04-2025	19:30	21-04-2025	20:06	Not tripped	Tripped due to overcurrent	No Fault	-	As per SCADA power flow in each ckt was around 202 MW, Line tripped from Bodhgaya end on over current. BSPTCL may explain			NA	NO	PG ER-I	BSPTCL
45	220KV-BUDHIPADAR-RAIGARH-1	21-04-2025	13:01	21-04-2025	13:31	Raigarh: B-N, 32 km, 2.94 kA	A/r successful from Budipadar end.	B-Earth	100 msec	A/r successful from Budipadar end. Line tripped from Raigarh end.			YES	NO	OPTCL	WRLDC
46	400KV-BARIPADA-TISCO-1	20-04-2025	17:34	20-04-2025	19:37	A/R successful at Baripada end [R/I at Baripada end : B_N, F Current 3.808 kA, F Distance 115.3 km; B-N fault Zone-1 Ib-8.77kA Fault distance: 2.08 KM, A/R unsuccessful]	Tripped at TISCO end,	B-Earth	100 msec	A/r successful from Baripada end. Line tripped from TISCO end due to unsuccessful A/r operation.			YES	NO	PG ODISHA	DVC

47	220KV-KHAGARIA-NEW PURNEA-2	20-04-2025	13:10	20-04-2025	16:23	Khagaria end: Zone -1, B ph, Distance -42.38km, FC-2.376kA,	Purnea end: B_N, FD: 62.7 km, FC: 2.1 kA, Zone-1	B-Earth	100 msec	A/r successful from N Purnea end. Line tripped from Khagaria end. BSPTCL may explain.			NO	YES	BSPTCL	PG ER-I
48	220KV-RANCHI-HATIA-1	20-04-2025	12:57	20-04-2025	16:44	Ranchi end: YBN, Zone-1, FC: 6.3 kA, FD: 37.41 km.	Hatia end: B_N, Zone-1, FC: 12.36 kA, FD: 2.16 KM	B-Earth	500 msec	Phase to ground fault converted into phase to phase fault and three phase tripping occurred.			YES	YES	PG ER-I	JUSNL
49	400KV-BOLANGIR (PG)-ANGUL-1	19-04-2025	10:54	19-04-2025	11:35	; Bolangir: B-n, 77.26 km, 1.9 KA	Angul : B-N, 118.7 km, 3.03 KA	B-Earth	100 msec	A/r successful from both end. Line tripped in reclaim time			YES	YES	PG ODISHA	PG ODISHA
50	220KV-PATNA-KHAGAUL-1	19-04-2025	10:42	19-04-2025	13:13	Patna: B-N, 13kA, 8.3km	khagaul: Z-1 , 5.369 KA, 17.45 KM	B-Earth	100 msec	A/r failed after 1 second			YES	NO	PG ER-I	BSPTCL
51	400KV-PPSP-BIDHANNAGAR-1	19-04-2025	04:12	19-04-2025	04:55	PPSP:Zone-1,Active Gr1,21M2- Zone -1, R ph, Distance -115.7K	DGP: Rph , Zone -1,fult cuurent -5.396KA.fault Distance-50.17KM	R-Earth	100 msec	R-N fault seen in PMU;3 ph trip for single ph fault.WBSETCL may explain			NO	YES	WBSEDCL	WBSETCL
52	400KV-MEERAMUNDALI-MENDHASAL-1	18-04-2025	20:56	19-04-2025	10:01	Meramundali: Z1,B_N,Ib=3.83KA, Dist=64.1KM	FC-4.6 Ka, B_N, Z-1	B-Earth	100 msec	A/r failed after 1 second			YES	YES	OPTCL	OPTCL

53	400KV-NEW DUBURI-MEERAMUNDALI-2	18-04-2025	20:00	19-04-2025	09:18	Meramundali: R Ph , 6.98KA, 37.4KM	New Duburi: Zone-I, Fault distance-56.4 KM, IL1-4.75KA	R-Earth	100 msec	A/r failed after 1 second from Baripada end.			YES	YES	OPTCL	OPTCL
54	220KV-BARIPADA-BALASORE-2	18-04-2025	16:43	20-04-2025	17:40	Baripada End : FAULT TYPE: B Phase to Ground Fault FAULT CURRENT: 2.343 kA LOCATION: 76.270km	-	B-Earth	100 msec	A/r failed after 1 second from Baripada end.			YES	NO	PG ODISHA	OPTCL
55	765KV-NEW RANCHI-DHARAMJAIGARH-2	18-04-2025	16:00	18-04-2025	16:59	NEW RANCHI SITE DETAILS:M1: FD-289.5 Km, FC(B-Ph) - 1.9 kA.	-	B-Earth	100 msec	A/r successful from both end. Line tripped in reclaim time			NO	NO	PG ER-I	WRLDC
56	765KV-JHARSUGUDA-RAIPUR PS (DURG)-2	18-04-2025	15:43	18-04-2025	22:28	Jharsuguda End: R-Y, Z-2, FD:274 Km, Fcr:5.38 kA, Fcy:4.16 kA	-	R-Y	100 msec	Line tripped on phase to phase fault.			YES	NO	PG ODISHA	WRLDC
57	400KV-KHARAGPUR-KOLAGHAT-1	18-04-2025	11:28	18-04-2025	11:59	KGP: Z1, R PH, 19.84 KM, 7.896 kA, A/R Successful	KTPP : Z1, R PH, 56.31 KM, 4.2 kA, A/R Lock out	R-Earth	100 msec	A/r successful from Kharagpur end. Line tripped from Kolaghat end. WB may explain.			YES	NO	WBSETCL	WBSETCL
58	400KV-KHSTPP-BARH-2	18-04-2025	11:13	18-04-2025	11:44	-	-	No Fault	-	Main bay at Kahalgaon was under S/D and line charged through Tie bay. Due to tripping of Farakka #1, line got tripped.(Farakka #1 & Barh#2 is in same Dia)			NA	NA	NTPC	NTPC

59	400KV-KHSTPP-BANKA (PG)-1	18-04-2025	11:13	18-04-2025	11:41	-	-	No Fault	-	Main bay at Banka#1 was under S/D and line charged through Tie bay. Due to tripping of Barh #1, line got tripped.(Banka #1 & Barh#1 is in same Dia)			NA	NA	NTPC	PG ER-I
60	400KV-KHSTPP-BARH-1	18-04-2025	11:13	18-04-2025	11:39	KHSTPP: FD:-2.6 Km, Y-ph, FC:28.99 kA, Z-4		Y-Earth	100 msec	Fault in Farakka-Kahalgaon #1 near Kahalgaon end sensed in Z-4 protection and line tripped within 100 msec in Z-4 protection. Kahalgaon may explain.			NO	YES	NTPC	NTPC
61	400KV-FSTPP-KHSTPP-1	18-04-2025	11:13	18-04-2025	20:05	Y_E Fault	Y_N, FC-42.1 kA	Y-Earth	500 msec	Y-phase to ground sensed by Kahalgaon end and three phase tripped in Z-1 protection and from remote end fault was cleared after 500 msec. A/r failed after 1 sec from Kahalgaon end.			NO	YES	NTPC	NTPC
62	220KV-PATNA-KHAGAUL-3	18-04-2025	07:05	18-04-2025	07:52	A/R successful at Patna, R/I at Patna: R_N, F Dist 20.24 km, F Current 7.049 kA,	Tripped at Khagaul end; Tripped due to (R-N) phase fault distance 4.5km from Khagaul end , fault current-(Ir) -12.67kA	R-Earth	100 msec	A/r successful from Patna end and three phase tripping from Khagaul end. BSPTCL may explain.			NO	NO	PG ER-I	BSPTCL
63	400KV-BIHARSARIFF(PG)-BANKA(PG)-1	18-04-2025	05:45	18-04-2025	17:16	R/I at Biharsariff : R_N, F Dist 101.4 km, F Current 3.59 kA,	Banka R_N, F Dist 88.2 km, F Current 3.9 Ka	R-Earth	100 msec	A/r failed after 1 second			YES	YES	PG ER-I	PG ER-I
64	400KV-BIHARSARIFF(PG)-BANKA(PG)-1	18-04-2025	03:46	18-04-2025	05:49	R/I at Patna, B_N, F Dist 27.6 km, F Current 4.49 kA	-	B-Earth	350 msec	Line tripped in Z-2 protection from Patna end.			YES	NO	PG ER-I	BSPTCL

65	400KV-NEW PURNEA-BIHARSARIFF(PG)-1	17-04-2025	21:28	17-04-2025	22:54	R/I New Purnea : R_N, F Current : 2.1 kA, F Dist - 168.1 km;	Biharsariff end: R_N, F Current : 2.59 kA, F Dist - 117.11 km	R-Earth	100 msec	A/r successful from both end. Line tripped in reclaim time			YES	YES	PG ER-I	PG ER-I
66	400KV-MERAMUNDALI-LAPANGA-1	17-04-2025	13:04	17-04-2025	16:35	Meramundali: : Z1,R_ B,ph,Ir=9.35KA,Iy=0 .57KA,Ib=8.69KA.di st=42.3KM	Lapanga: FAULT LOOP R-B,DIST-151.1KM,R-PH CURRENT = 3.082KA,Y-PH CURRENT = 0.560KA,B-PH CURRENT = 3.720A,Fault Duration = 49.9mSec	R-B	100 msec	Line tripped on phase to phase fault.			YES	YES	OPTCL	OPTCL
67	220KV-RANCHI-HATIA-2	15-04-2025	18:36	15-04-2025	19:36	Ranchi end : Ranchi Hatia Z-2: R_N,FC=3.74 kA, FD=36.3 KM	Hatia end: :- Ia= 0.01 kA, Ib=0.01 kA,	R-Earth	350 msec	Line tripped from Ranchi end in Z-2 protection, no zone picked up from Hatia end and line tripped after 5 sec from Hatia end in over voltage protection. JUSNL may explain.			YES	YES	PG ER-I	JUSNL
68	220KV-RANCHI-HATIA-3	15-04-2025	18:36	15-04-2025	19:28	Ranchi: R-Ph, Z-2, 4.46kA, 40.1km	Hatia : Ia=3.97kA,Ib=0.59kA,Ic=0.74 kA, fault location 1.93km	R-Earth	500 msec	Line tripped from Ranchi end in Z-2 protection and Z-4 protection from Hatia end.			YES	YES	PG ER-I	JUSNL
69	400KV-SAGARDIGHI-FSTPP-1	15-04-2025	17:52	15-04-2025	18:30	Tripped during SD of 400 kV FSTPP_ Rajarhat	No tripping at Sagardighi	Maloperation	NA	No fault in the line.Hand trip of rajarhat farakka line led to DT sending to rajarhat end and Farakka end for Sagardighi line.Receving PLCC frequency of the line for DT is to be kept different for			NO	NO	WBPDCL	NTPC
70	400KV-DSTPS(ANDAL)-RAGHUNATHPUR-1	14-04-2025	17:07	15-04-2025	00:28	DSTPS: Fault Current IC(B-ph)=4.697 kA Fault Distance= 72 km. Zone2	RTPS: RTPS end: B-E, zone 1, 15.19 kA, 4.17 km	Y-B	100 msec	Y-B phase fault from PMU			NO	NO	DVC	DVC

71	400KV-DSTPS(ANDAL)-RAGHUNATHPUR-2	14-04-2025	17:07	15-04-2025	00:43	DSTPS: Fault Current IC(B-ph)=6.249 kA Fault Distance= 62.96 km. Zone2	RTPS: RTPS end: B-E, zone 1, 15.19 kA, 4.17 km	Y-B	100 msec	Y-B phase fault from PMU			NO	NO	DVC	DVC
72	765KV-FATEHPUR-PUSAULI-1	14-04-2025	15:46	14-04-2025	18:07	SASARAM (AFAS):M2-FD-5.125KM, FC-3.921KA, M1-FD-5.216KM, FC-3.966KA.		R-B	100 msec	R-B fault seen in PMU;R-B fault,Z-1 operated			Yes	NO	NR	PG ER-I
73	400KV-NEW PURNEA-BIHARSARIFF(PG)-1	14-04-2025	14:39	15-04-2025	15:48	Biharshariff: Y-Ph,4.6km,16.18kA,	New Purnea: Y-Ph, 186.4km,2.8kA,	Y-Earth	200 msec	Y-N fault;A/r lockout			Yes	Yes	PG ER-I	PG ER-I
74	220KV-MAITHON-DHANBAD-1	13-04-2025	15:43	13-04-2025	19:29	R/I at Dhanbad end: DEF trip,52.3km;	at Maithon end: B_N, Z-1	B-N	1.1 sec	DEF operated for B-N fault			Yes	NO	PG ER-II	DVC
75	400KV-BINAGURI-MALBASE-1	13-04-2025	11:30	13-04-2025	13:23	Binaguri: Z-2, B ph, 116.13 km, 1.57 kA		Y-B	100 msec	Y-B ph seen in PMU,Zone 2 trip ;So A/R lockout			Yes	NO	PG ER-II	BHUTAN
76	220KV-PUSAULI-NADHOKAR-1	13-04-2025	08:56	13-04-2025	10:31	Pusauli: R-N, 1.3 km, 12.5 kA,	Nadhokhar: R_N, Zone-1, Fc: 7 kA, FD: 2km	R-N	100 msec	R-N ;A/R Lockout			NO	NO	PG ER-I	PG ER-I

77	220KV-KHAGARIA-NEW PURNEA-1	13-04-2025	01:45	dumra	02:52	Khagaria: B-N , Iy-168.3A, Ib- 1.242kA, Dist- 59.73km:	Purnea :B-N fault , 2.6 KA, 70.3km	Y-B fault	100 msec	Line tripped on Y-B fault from both sides on Z-1.. Carrier sent from New Purnea			YES	YES	BSPTCL	PG ER-I
78	220KV-KHAGARIA-NEW PURNEA-2	13-04-2025	01:45	13-04-2025	02:52	Khagaria:Y B, Iy-3.363kA, Ib-1.835kA, Dist-61.34km	Purnea: Y-B Fault, Iy 5.8 KA, 3.91 KA 35 Km	Y-B fault	100 msec	Line tripped on Y-B fault from both sides on Z-1.. Carrier sent from New Purnea			YES	YES	BSPTCL	PG ER-I
79	220KV-SAHARSA-BEGUSARAI-1	13-04-2025	00:33	13-04-2025	02:59	Begusarai: Z-1, R phase FD - 60 KM IR - 2.36KA:	Saharsa :R-N , 25.5km, 4.95 KA	R-Earth	100 msec	R-n fault ;A/R lockou after 1 sec			YES	YES	PG ER-I	BSPTCL
80	220KV-DARBHANGA (DMTCL)-SAMASTIPUR-1	13-04-2025	00:19	13-04-2025	00:43	Darbhanga: B- ph , 793 A, 35 km	Samastipur:IB-1.73KA Z 1,Fd -24.6KM	B-Earth	100 msec	B-N fault		DR length is 0.7 sec after fault not allowing to see whether A/R attempt occurre	NO	YES	DMTCL	BSPTCL
81	220KV-SAHARSA(PMTL)-BEGUSARAI-2	12-04-2025	23:45	13-04-2025	03:00	Begusarai :- Z-1,FD 20.93 KM IB - 2.83KA;	Saharsa :- B-N, 93.3km, 1.7 KA	R-B	100 msec	Z-1 operated at Saharsha forR_B fault Hence a/r attempt not seen			YES	YES	,PMTL	BSPTCL
82	400KV-BIHARSARIFF(PG)-BALIA-2	12-04-2025	22:47	12-04-2025	23:37	Biharshariff: B-N, FD:1.48 KM, FC:1.38 KA	Balia: FC: 2.52 KA. FD:241.8 KM	B-Earth	100 msec	B-N fault,A/R fail after dead time at iharshariff,A/r lockout and carrier sent to remote end			YES	NO	PG ER-I	PGCIL NR

83	400KV-KHARAGPUR-KOLAGHAT-1	12-04-2025	21:01	12-04-2025	21:22	KTPP end: R/I Z-1, B Ph, Distance 2.488 KM, IB 15.98 KA;	AR successfully operated at KGP 400 KV with R/I B Ph, Z -2, Distance 73.41 KM, IB 3.208 KA	B-Earth	100 msec	A/R successful from KGP on B-N fault.possible tripping for opposite end.			YES	NO	WBSETCL	WBSETCL
84	400KV-MEERAMUNDALI-TSTPP-1	11-04-2025	18:07	11-04-2025	19:11	TSTPP end: Zone-1, 38 Km, R phase, fault current: 3.2 KAmp.	Meeramundali end: A/r successful	R-Earth	100 msec	No tripping at Meramandali,Tripping from Talchr end			NO	NO	OPTCL,	NTPC
85	400KV-MEERAMUNDALI-NEW DUBURI-2	10-04-2025	21:56	10-04-2025	22:36	Meramundali: Z-I, R-Ph,7.06kA, 37.3km	New Duburi: Z-i. 69.3km,R-Ph, 4.78 km	R-Earth	100 msec	R-N fault,A/r successful from Meramandali.Also A/r successful from New duburi at 21:56,then at 21;59 possible trip on reclaim time			YES	YES	OPTCL	,OPTCL,
86	220KV-MAITHON(PG)-DUMKA-2	10-04-2025	21:35	10-04-2025	22:52	Maithon end: B-n, 2.679 kA, 19.047 km from Maithon		B-Earth	100 msec	Tripped in Z1 from maithon end;A/r successful from Dumka			YES	YES	PGCIL	JUSNL
87	400KV-GOKARNA-SAGARDIGHI-1	10-04-2025	19:42	10-04-2025	21:47	Gokarno end: B Phase, Zone 1, Distt. 17.28 km, current - 9.44 kA	Sagardighi end: Zone-1, B-Phase, Distance-29.41KM Fault Current-11.17KA	B-Earth	100 msec	Tripped on reclaim time after successful A/r 4 sec prior.BAR signal ON,A/R lockout signal seen			YES	YES	WBSETC	WBPDCL
88	400KV-PPSP-BIDHANNAGAR-2	10-04-2025	19:30	10-04-2025	20:33	Bidhannagar end: Rph, Z1, 86.41m, 18.02kA	. PPSP end: Rph-N (no distance/zone shown as reported by site)	R-Earth	100 msec	R-N fault seen.A/R blocked at Bidhannagar due to DEF/SOTF signal			YES	NO	WBSETCL	WBSEDCL

89	400KV-GOKARNA-NEW CHANDITALA-1	10-04-2025	18:42	10-04-2025	19:43	New Chanditala end: A/R successful.	Gokarna end: B-N, Z1, 38.15km, 6.731kA	B-Earth	100 msec	A/R successful at New Chanditala;Gokarno end R and Y phase tripped on A/r failure but B phase tripped 1 sec later with a BAR signal			YES	YES	WBSETCL	WBSETCL
90	400KV-KHSTPP-BARH-2	10-04-2025	16:53	10-04-2025	17:32	Fault distance-74.64km Ia-6.321kA Ib-539.8A Ic-292.2A		R-Earth	100 msec	Barh end A/r successful			NO	YES	NTPC	NTPC
91	400KV-LAKHISARAI-KHSTPP-2	10-04-2025	16:52	11-04-2025	02:31	Y ph LA damage at Lakhisarai end		Y-Earth	100 msec	A/R successful at Lakhisarai end and then trip in reclaim time after 4 sec due Y ph LA damage			YES	NO	PGCIL	NTPC
92	400KV-BIHARSARIFF(PG)-BANKA(PG)-1	10-04-2025	16:19	10-04-2025	16:37	Banka: R ph, 2.5 kA, 147 km		R-Earth	100 msec	R ph Z1,Fault in reclaim time			YES	YES	PGCIL	PGCIL
93	400KV-BIHARSARIFF(PG)-BANKA(PG)-2	10-04-2025	16:19	10-04-2025	16:55	Banka end: Y_N, FC: 2.6 kA, FD: 160 km		Y-Earth	100 msec	Tee protection,O/V stage 1 protection and bus bar protection signal appearing at Biharsharif end.A/R fail	11 unidentified signals bi 19 to bin 28 at Biharshariff		YES	YES	PGCIL	PGCIL
94	400KV-KODERMA-BIHARSARIFF(PG)-1	10-04-2025	15:52	10-04-2025	17:26	Biharshariff: Y ph, 8.7 km, 8.1 kA		Y-Earth	100 msec	A/r lockout/SOTF after fault in Y ph	some spare signals at Biharsahriff end		NO	YES	DVC	PGCIL

95	400KV-BIHARSARIFF(PG)-MUZAFFARPUR(PG)-2	10-04-2025	15:52	10-04-2025	17:41	MUZAFFARPUR(PG): B_N, FC:2.79kA, FD: 124.9 km		B-Earth	100 msec	Initial fault R-N,A/r lockout in B-N		Muzaffarpur end DR is 1 sec after fault ,it shoudl be 2.5 sec	YES	YES	PGCIL ER 1	PGCIL ER 2
96	400KV-BIHARSARIFF(PG)-BALIA-1	10-04-2025	15:47	10-04-2025	17:01		BALIA END: R-N FAULT FC-2.650KA,FD-241.5KM	B-Earth	100 msec	A/r successful at Biharshariff			YES	NO	PGCIL ER 1	PGCIL NR
97	220KV-TENUGHAT-BIHARSARIFF-1	10-04-2025	15:47	10-04-2025	17:51	Handtripped from Biharshariff end due to sparking	NO tripping at Tenughat end	No fault	-	Handtripping			NO	NO	JUSNL	BSPTCL
98	400KV-BIHARSARIFF(PG)-BALIA-2	10-04-2025	15:47	11-04-2025	15:45		BALIA END: B-N FAULT, FC-3.242KA, FD-241.8KM	B-Earth	100 msec	B-N fault ;Tripped in reclaim time after 6 sec			YES	NO	PGCIL ER 1	PGCIL NR
99	400KV-BIHARSARIFF(PG)-SAHUPURI(CHANDAULI)-1	10-04-2025	15:45	10-04-2025	18:09	BIHARSHARIF END: B-N FAULT FC-11.67KA, FD-8.124KM		B-Earth	100 msec	B-N;A/R failure after 1 sec			YES	NO	PGCIL ER 1	PGCIL NR
100	400KV-BIHARSARIFF(PG)-PUSAULI-1	10-04-2025	15:45	10-04-2025	16:24	Sasaram: B ph, 2.5 kkA, 178 km;	Biharsharif: B ph, 11.8 kA, 10.27 km	B-Earth	100 msec	B-N faulr;A/r lockout after 1 sec			YES	YES	PGCIL ER 1	PGCIL ER 2

101	220KV-MUZAFFARPUR(PG)-HAZIPUR-2	10-04-2025	15:40	10-04-2025	17:24	Busbar protection operated at bus 2 at Hazipur zone-2, Ib-diff. 8KA		B-Earth	100 msec	Bus bar differential protection operated for B-N dault.Due to heavy wind,Handle lock of earth switch of Bus-2 found damaged due to which earth switch came to induction range of isolator. Due to this 220KV		AT Hazipur one DR is showing B-N fault while other is showing Y-N	NO	YES	PGCIL ER 2	BSPTCL
102	400KV-PATNA-SAHARSA-2	10-04-2025	15:36	10-04-2025	16:47	Patna end: Y-N FC-22.7 kA FD-6.2km		Y-Earth	100 msec	Initially B-N fault seen,after 1 sec Y-N fault seen and carried aided trip occurred in Saharsha and probably TOR trip in Patna.Patna 2nd event Dr is pending			YES	YES	PGCIL ER 1	PMTL
103	400KV-BIHARSARIFF(PG)-SAHUPURI(CHANDAULI)-2	10-04-2025	15:27	10-04-2025	17:07	Biharsharif: Y ph, 9.7 kA, 23 km		Y-Earth	100 msec	Y-N fault followed by R_N fault within 1 sec			YES	NO	PGCIL ER 1	PGCIL NR
104	220KV-PATNA-FATUHA-1	10-04-2025	15:24	10-04-2025	17:03	Fatuha end: Zone-1, FC: 10.5 kA, FD: 2.662 km R-N	a/r successful in Patna	R-Earth	100 msec	Patna side DR is showing successful A/r in R-N fault;R-N fault in stormy weather,Tripping in fatuha;a/r successful in Patna			YES	NO	PGCIL ER 1	BSPTCL
105	220KV-GAYA-KHIZERSARAI-2	10-04-2025	15:24	10-04-2025	19:26	KHIZERSARAI end: R_N, FD: 0.5 km, FC: 12.42 kA		R-Earth	100 msec	3 ph trip observed for R-N fault ;PG may explain	Virtual outpur 4 and 5 in gaya DR is unidentified		YES	NO	PGCIL ER 1	BSPTCL
106	400KV-MAITHON-GAYA-1	10-04-2025	15:13	11-04-2025	14:39	Gaya: R ph, 3.5 kA, 62 km :	Maithon:R ph, 207 km, 1.96 kA	R-Earth	100 msec	R-N fault ;A/R Lockout			YES	YES	PGCIL ER 2	PGCIL ER 1

107	220KV-PATNA-KHAGAUL-1	10-04-2025	15:12	10-04-2025	19:04	Patna: Y-B fault, IY,IB= 9.6 kA, 14.5 km		Y-B fault	100 msec	Y-B fault,3 ph trip			YES	NO	PGCIL ER 1	BSPTCL
108	220KV-HAZIPUR-MUZAFFARPUR-1	10-04-2025	14:40	10-04-2025	16:03	Hazipur: Rph, 9 km, A/R successful		R-Earth	100 msec		Wrong DR uploaded at Hazipur 15:40 in place of 14:40)		NO	NO	BSPTCL	PGCIL ER 1
109	220KV-MUZAFFARPUR(PG)-GORAUL(BH)-1	10-04-2025	14:20	11-04-2025	14:58	At Muzaffarpur(PG) end:- Fault distance-12.5 KM, Zone-1 Ia-9.16 KA, Ib-344 A, Ic-455 A, Van-75 KV, Vbn-134 KV, Vcn-132 KV,	At GSS Goraul end:- zone-1, Fault distance-4.7 KM Ia-5.6 KA, Ib-313 A, Ic-355 A, Van-6.7 KV, Vbn-148 KV, Vcn-143 KV	R-Earth	100 msec	Three phase trip for R_N fault at Goraul;R ph remaining open for less than 0.05 sec thus less than required deionisation time		Few signals in DR are unidenti fied	YES	NO	PG -ER1	,BSPTCL
110	220KV-DEHRI-GAYA-2	10-04-2025	14:18	10-04-2025	18:24	DEHRI end: Zone-1, FD: 20.46KM Fc-3.878KA		B-Earth	100 msec	B-N fault.A/r lockout after dead time			NO	YES	BSPTCL	PGCIL,
111	220KV-ALIPURDUAR (PG)-SALAKATI-2	10-04-2025	09:41	10-04-2025	10:56	Alipurduar: B-N, 88.29KM, 2.28kA	:SALAKATI-M1:B-N ,10.5 KA , 11.67 KM, Z1 trip	B-Earth	100 msec	B-N fault,VT fuse fail and A/R block signals are high			YES	NO	PGCIL ER2 ,	PGCIL NER
112	400KV-BINAGURI-MALBASE-1	10-04-2025	08:07	10-04-2025	08:34	Binagur: Z-1, Y-Earth, FC-3.4 kA	-	Y-Earth	100 msec	Ar/ successful from Binaguri end. Three phase tripping occurred on phase to ground fault (Transient) from Malbase end. Bhutan may review A/r scheme.			YES	NO	PGCIL ER2 ,	BHUTAN

113	220KV-SAHARSA(PMTL)-KHAGARIA(NEW)-1	10-04-2025	05:55	10-04-2025	06:37	Tripped only at Khagaria end, R/I :Zone-1, B_N, F Current : 2.864kA, F Dist : 56.63km		B-Earth	100 msec	A/R successful at Saharsha end;DR at Khagaria also showing A/r successful.SO next DR at Khagaria may be pending			YES	YES	PMTL	,BSPTCL
114	400KV-SAHARSA-DARBHANGA (DMTCL)-2	09-04-2025	08:22	09-04-2025	08:53	A/r successful from Saharsa end	Line Tripped from Darbhanga End only: Y-Ph,7.58kA,25.2km	Y-Earth	100 msec	A/r successful from Saharsa end and three phase tripping from DMTCL end. DMTCL may explain.			YES	NO	PG ER-I	DMTCL
115	220KV-DARBHANGA (DMTCL)-DARBHANGA-1	09-04-2025	05:48	09-04-2025	08:25	DMTCL END: B_N, F Current -10.35kA, F Dist-2.23 KM;	DARBHANGA (BSEB): B_N, F Current : 7.49 kA	B-Earth	100 msec	Three phase tripping for phase to ground fault. DMTCL and PG ER-1 may explain.			YES	YES	DMTCL	PG ER-I
116	400KV-SUBHASGRAM-HALDIA-2	06-04-2025	14:25	06-04-2025	21:47	Subhasgram: B-N 49.6 KM ,5.06 KA	HEL: Fault in B phase,Fault Current 4.41 KA, Fault Distance 28.42 KM from HEL.	B-Earth	100 msec	B-N fault with a/r failure;Tripped within reclaim time as seen in PMI.Z1 operated with A/r lockout and carrier receipt.			YES	NO	PGCIL	CESC
117	400KV-SUBHASGRAM-HALDIA-2	06-04-2025	14:00:00	06-04-2025	14:24	at Subhasgram : B_N, Ib -5.2 kA, F Dist 53 KM	R/I at Haldia end: B_N, Z1 Dist 25.1 km , Ib2.92 kA;	B-Earth	100 msec	B-N fault,A/R lockout after 1 second,Z1 operated			YES	NO	PGCIL	CESC
118	220KV-DARBHANGA (DMTCL)-MOTIPUR-2	06-04-2025	12:10	06-04-2025	16:30	R/I at Darbhanga :Y_B, Iy 3.61 kA, Ib3 .63 kA, F Dist 57.7 km from Darbhanga;	at Motipur end : Y_B, Iy 3.944kA, Ib 3.917kA, F Dist 49.50 km	Y-B	100 msec	Line tripped on phase to phase fault.			YES	YES	DMTCL	BSPTCL

119	220KV-CHANDAUTI (PMTL)-SONENAGAR-2	06-04-2025	11:58	06-04-2025	18:24	R/I at Chandauti : Y_B, Iy 5.8 kA, Ib-5.5 kA, Z-1 F Dist 31 km from Chandauti	, at Sonenagar: Y_B, Iy 2.599 KA Ib 2.679KA,F Dist 42.57 km from Sonenagar	Y-B	100 msec	Line tripped on phase to phase fault.		DR at Sonenagar is not time Synchronized.	YES	YES	PMTL,	BSPTCL,
120	220KV-TENUGHAT-BIHARSARIFF-1	06-04-2025	11:21	06-04-2025	17:46	Tenughat end: R-E, F/C 0.5kA, 95.5 km;	Biharsariff end: Main 2 protection operated: R-E, 109.33km, F/C 1.05 kA	R-Earth	100 msec	Three phase tripping for phase to ground fault. BSPTCL and JUSNL may explain.			NO	YES	JUSNL,TVNL	BSPTCL,
121	400KV-KHSTPP-BARH-2	05-04-2025	18:37	06-04-2025	10:38	Barh - Zone-1 (R-N fault) FC - : 22.38kA FD - 14.54km ,	KHSTPP - R_N fault zone - 2	R-Earth	100 msec	A/r successful from Barh end. Three phase tripping occurred at Kahalgaon end on phase to ground fault. Kahalgaon may explain.			NO	YES	NTPC	NTPC
122	400KV-ARAMBAGH-PPSP-1	05-04-2025	13:48	05-04-2025	14:41	Arambagh end:- C Ph, Zone-1, FD: 132.7 km, FC- 1.638 KA.	PPSP end:- C Ph, Z-1, 50 km. Ic- 4.33 KA.	B-Earth	100 msec	Three phase tripping for phase to ground fault. WB may explain.			YES	NO	WBSETCL	WBSETCL
123	400KV-PPSP-BIDHANNAGAR-2	05-04-2025	13:48	06-04-2025	05:03	B- ph, Zone-1, FD: 11.85 km, FC- 11.7 KA. PPSP	end:-B-N, FC: 80 A, FD: 174 km	B-Earth	100 msec	Three phase tripping for phase to ground fault. WB may explain.			NO	YES	WBSETCL	WBSETCL
124	400KV-BINAGURI-MALBASE-1	05-04-2025	06:10	05-04-2025	07:08	Binaguri End: Z2,FD=103KM ,FC=1.423kA	,Malbase End: Z-1, Ia= 383.8A, Ib= 341.2A, Ic= 2937A & In= 3382A	B-Earth	500 msec.	Due to fault in Bhutan Jurisdiction, Line tripped from Binaguri end in Z-2 protection.			YES	NO	PG-ER-II	BHUTAN

125	400KV-MEDINIPUR-KHARAGPUR-2	02-04-2025	18:50	NA	NA	Tripped on DP. Tower Collapsed		R_Y_B	100 msec	As per PMU three phase fault observed due to Tower Collapsed.			NO	NO	PG-ER-II	WBSETCL
126	400KV-MEDINIPUR-KHARAGPUR-1	02-04-2025	18:45	NA	NA	Tripped on DP. Tower Collapsed		R_Y_B	100 msec	As per PMU three phase fault observed due to Tower Collapsed.			NO	NO	PG-ER-II	WBSETCL
127	220KV-SAHARSA(PMTL)-BEGUSARAI-2	02-04-2025	10:15	02-04-2025	12:43	Saharsa: R-Y Fault, 33.86km, Ir 5.57 KA, Iy 5.57 KA;	Begusarai: Dist- 56.3Km, IR=3.62kA, IY=3.57kA	R-Y	100 msec	Line tripped on phase to phase fault.			YES	YES	PMJTL	BSPTCL

THIRD PARTY PROTECTION AUDIT REPORT

General information

Substation name: .....

SS voltage level: .....

Fault level of all equipment (for that voltage level) .....

Date of commissioning of the substation: .....

Region: .....

Audit date: .....

Name of utility which owns the substation .....

Audit Team

Name	Company name

Client Team

Name	Company name

Attached documents:	
1	List of the faults that was/were not eliminated by the protection;
2	Record of previous trippings for last **one year** and associated fault analysis.
3	Single/three pole auto-recloser events, if any in last six months.
4	Details on periodicity of relay testing and latest relay test report
5	CT characteristics at all taps in case of multi-ratio CTs
6	df/dt, UFR relay details and settings if its available
7	Special Protection Schemes details if applicable. (Including test results & last operation records), implemented schematic diagram for SPS
8	Single Line Diagram

Generator Protection-Checklist

		Audited Data					
Sl. No.	**Relay Configuration - Generator Protections**	**Response**					
1	Name, voltage, power						
2	Are used 2 groups of protections (Group A and Group B) for Generator Unit protection?	Yes/No					
3	Are Group A and Group B protections connected to separate DC sources for Generator Unit?	Yes/No					
4	Do the Group A and Group B protections have separate lockout relays?	Yes/No					
5	Generator Protection	Unit/GCB Scheme					
	Details of Type Relays		**Main**		**Backup**		**Other Protections**
			A	**B**	**A**	**B**	
	Details of composite type numerical relays						
6	Relay make and model						
	Whether the relay is functional?	Yes/No					
	Date of testing						
	Mention all the active protections						
	Differential protection	Yes/No					
	100% Stator Earth Fault protection	Yes/No					
	95% Stator Earth Fault protection	Yes/No					
	Inter-turn Fault protection	Yes/No					
	Loss of Excitation protection	Yes/No					
	Negative Phase Sequence Current protection	Yes/No					
	Low Forward Power/ Reverse Power protection	Yes/No					
	Out-of-step/ Pole slipping protection	Yes/No					
	Over-Voltage protection	Yes/No					
	Under-frequency protection	Yes/No					
	Back-up Impedance protection	Yes/No					
	Accidental back-energisation/ Dead machine protection	Yes/No					

Generator Protection-Checklist

6	Rotor Earth-Fault protection	Yes/No					
	Thermal Over-load protection	Yes/No					
	Over-Fluxing Protection	Yes/No					
	Breaker failure active	Yes/No					
	Disturbance Report active	Yes/No					
7	Connected to Trip Coil 1/Trip Coil2/Both						
8	Feed from DC supply 1/DC supply 2						
9	Connected to dedicated CT core?						
	Define CT core no. to which the relay is connected						
10	CT ratio selected						
11	VT ratio selected						
12	**Details of separate relays if applicable**						
	Relay 1 make and model						
	Functions available in Relay 1						
	Relay 1 Functional?	Yes/No					
	Date of Testing						
	Relay 2 make and model						
	Functions available in Relay 2						
	Relay 2 Functional?	Yes/No					
	Date of Testing						
	Relay 3 make and model						
	Functions available in Relay 3						
	Relay 3 Functional?	Yes/No					
	Date of Testing						
13	Are all the Lock out relays (86) considered for Generator Unit protection provided with supervision relays (74/86)?	Yes/No					
14	Do the Generator Unit protection panels have supervision relays for DC supply-1 & DC supply-2 (74/DC-1 & 74/DC-2)?	Yes/No					

Transmission Line Distance Protection - Check List

	Audited data				
No.	**Relay configuration - Line distance protection**				
1	Name and length of line				
2	Series compensated? Y/N				
3	Is this a cable feeder / line feeder/ composite feeder (line+cable)?				
4	Which mode of communication is used (PLCC/ OPGW)				
	Details of type relays		**Main-1 Relay**	**Main-2 Relay**	**Other Relays (Back-up relays, DR, FL etc.)**
5	**Details of composite type numerical relays**				
	Relay make and model				
	Whether the relay is functional?	Yes/ No			
	Date of testing				
	Mention all the active protections-21, 87L, 67, 67N, 51, 51N	21/87L/67/67N/51/51N			
	Mode of Carrier aided scheme for 21 (If POR scheme is used whether Current Reversal Guard Logic implemented?)	Accelerated Under reach/ Permissive Under reach/Intertripping Under reach/ Permissive Overreach/ Blocking Over reach/ Phase Comparison Protection (for PLCC)			
	Carrier aided scheme active for 67/67N	Yes/ No			
	Mode of Carrier aided scheme for 67/67N	Directional Comparison Protection (Permissive)/ Directional Comparison Protection (Blocking)			
	For 87L which scheme is used? (Pilot wire communication/ digital communication)				
	Power swing/out of step active?	Yes/No			
	SOTF active?	Yes/No			
	Auto Reclose (79) active?	Yes/No			
	Breaker failure active	Yes/ No			
	Load Encroachment active	Yes/ No			
	STUB Protection active	Yes/ No			
	Fault locator active?	Yes/No			
	Disturbance Recorder active?	Yes/No			

Transmission Line Distance Protection - Check List

6	Relay Connected to Trip Coil-1/ Trip Coil-2 or both?				
7	Feed from DC supply 1 / DC Supply 2				
8	Connected to Dedicated CT core? Define CT core no. to which the relay is connected				
9	CT ratio selected				
10	VT ratio selected				
11	**Details of separate relays if applicable**				
	Relay 1 make and model				
	Functions available in Relay 1	Auto reclose/ Breaker Failure/ 67/67N/51/51N			
	Relay 1 Functional	Yes/ No			
	Date of Testing				
	Relay 2 make and model				
	Functions available in Relay 2	Auto reclose/ Breaker Failure/ 67/67N/51/51N			
	Relay 2 Functional	Yes/ No			
	Date of Testing				
	Relay 3 make and model				
	Functions available in Relay 3	Auto reclose/ Breaker Failure/ 67/67N/51/51N			
	Relay 3 Functional	Yes/ No			
	Date of Testing				
	Relay 4 make and model				
	Functions available in Relay 4	Auto reclose/ Breaker Failure/ 67/67N/51/51N			
	Relay 4 Functional	Yes/ No			
	Date of Testing				
12	VT Fuse failure protection present & used to block distance function operation?	Yes/No			
13	Overvoltage protection available	Yes/ No			
	Functional with two stage protection	Yes/No			
14	Are all the auxiliary relays (94) considered for Line protection (Main-1/ Main-2/ Backup) provided with supervision relays (74/ 94) ?	Yes/No			
15	Do the Line Protection protection panels have supervision relays for DC supply-1 & DC supply-2 (74/DC-1 & 74/DC-2)?	Yes/No			

Transformer Protection Audit - Check List

	Audited data						
No	**Relay configuration - Power Transformers protections**						
1	Name, voltage, power						
2	Are used 2 groups of protections (Group A and Group B) for transformer protection?	Yes /No					
3	Are Group A and Group B protections connected to separate DC sources for power transformers?	Yes /No					
4	Do the Group A and Group B protections have separate lockout relays?	Yes /No					
5	**Details of type relays**		**Main**		**Back up**		**Other Protections**
			A	**B**	**A**	**B**	
	Details of composite type numerical relays						
	Relay make and model						
	Whether the relay is functional?	Yes /No					
	Date of testing						
	Mention all the active protection						
	Differential protections						
	REF protection						
	Back-up directional O/C +E/F protection						
	Overfluxing protection						
	Connected to Trip Coil 1/Trip Coil 2/Both						
	Feed from DC supply 1/DC supply 2						
	Breaker failure active	Yes /No					
	Disturbance Report active	Yes /No					
	Connected to dedicated CT core? Define CT core no. to which the relay is connected						
	CT ratio selected	Yes /No					
	Is CT supervision enabled or not in case of Transformer differential protection ?	Yes /No					
6	Are all the Lock out relays (86) considered for Transformer protection provided with supervision relays (74/86) ?	Yes/No					
7	Do the Transformer protection panels have supervision relays for DC supply-1 & DC supply-2 (74/DC-1 & 74/DC-2)?	Yes/No					
8	OTI/WTI working	Yes /No					
9	Bucholz/PRD working	Yes/No					
10	LA rating HV side	Yes/No					
11	LA rating LV side	Yes/No					

Current Transformer - Check list

Audited data																				
No	CT ID Bay Name	Voltage level (kV)	CT core	Protection/ Metering	Accuracy Class	CT ratio (All available ratios for a multi-ratio CT)	Ratio Adopted	Connected to which relays/ meters?	In case of a protection CT, is the relay setting calculation done based on the CT Ratio adopted at site	Date of CT Testing	Ratio measured			Error Calculated			Knee Point Voltage		
											R PHASE	Y PHASE	B PHASE	R PHASE	Y PHASE	B PHASE	R PHASE	Y PHASE	B PHASE
1			Core - 1																
			Core - 2																
			Core - 3																
			Core - 4																
			Core - 5																
2			Core - 1																
			Core - 2																
			Core - 3																
			Core - 4																
			Core - 5																
3			Core - 1																
			Core - 2																
			Core - 3																
			Core - 4																
			Core - 5																
4			Core - 1																
			Core - 2																
			Core - 3																
			Core - 4																
			Core - 5																
5			Core - 1																
			Core - 2																
			Core - 3																
			Core - 4																
			Core - 5																
6			Core - 1																
			Core - 2																
			Core - 3																
			Core - 4																
			Core - 5																
7			Core - 1																
			Core - 2																
			Core - 3																
			Core - 4																
			Core - 5																
8			Core - 1																
			Core - 2																
			Core - 3																
			Core - 4																
			Core - 5																

Note: Please specify special cases when the phases have different parameters.

Voltage Transformer - Check List

Audited data																	
No	CVT/VT ID Bay Name	CVT/VT core	Protection/ Metering	Ratio	Accuracy Class	Connected to which relays?	Is the relay setting calculation and relay configuration files based on the VT Ratio? (Applicable for VTs connected to distance protection/ synchro check relays)	For Synchrocheck relays, is the VT Input connected Ph-Ph or Ph- Neutral (Which phases R/Y/B?)	Date of VT Testing	Ratio measured			Error Calculated		
										R PHASE	Y PHASE	B PHASE	R PHASE	Y PHASE	B PHASE
1		Core - 1													
		Core - 2													
		Core - 3													
		Core - 4													
2		Core - 1													
		Core - 2													
		Core - 3													
		Core - 4													
3		Core - 1													
		Core - 2													
		Core - 3													
		Core - 4													
4		Core - 1													
		Core - 2													
		Core - 3													
		Core - 4													
5		Core - 1													
		Core - 2													
		Core - 3													
		Core - 4													
6		Core - 1													
		Core - 2													
		Core - 3													
		Core - 4													

Note: Please specify special cases when the phases have different parameters.

Circuit Breaker - Check list

	Audited data									
No.	**CB ID Bay Name**									
1	CB Rated voltage (KV)									
2	Make & Model									
3	Date of commissioning									
4	Type of CB (SF6/ MOCB/ ABCB etc.)									
5	Is the Breaker healthy/ functional (Yes/ No)									
6	Rated Breaking current (kA)									
7	Number of closing coils									
8	Healthiness of closing coil									
9	Number of tripping coils									
10	Healthiness of Tripping Coil									
11	Trip Circuit Supervision Relay available for monitoring Trip Circuit -1 & Trip Circuit-2 with breaker in both open and closed condition (Yes/ No)									
12	Are the Trip Circuit Supervision relays functional/ healthy									
13	One/three pole operation									
14	For breakers with single poles, is pole discrepancy relay provided?									
15	Does the Pole discrepancy relay have facility for Stage-1 (own breaker tripping) & Stage-2 (Boundary breaker tripping)									
16	What monitoring devices are provided for checking the dielectric medium of the breaker? (for eg. Gas pressure low etc.)									
17	What action is initiated by each of different Stages of these devices (Alarm/ Block tripping)									
18	PIR (Available/ Not)									
19	Timing of Pole discrepancy relay is as per standard or not.									
20	Last CB timing taken and it is within permissible limit or not									
21	Last contact resistance of CB taken and it is permissible limit or not.									

Shunt Reactor Protection Audit - Check list

	Audited data						
No	**Relay configuration - Shunt reactor protections**						
1	Are used 2 groups of protections (Group A and Group B) for shunt reactors protection?	Yes /No					
2	Are Group A and Group B protections connected to separate DC sources for shunt reactors?	Yes /No					
3	Do the Group A and Group B protections have separate lockout relays?	Yes /No					
4	**Details of type relays**		**Main**		**Back up**		**Other**
			A	**B**	**A**	**B**	**Protections**
	Details of composite type numerical relays						
	Relay make and model						
	Whether the relay is functional?	Yes /No					
	Date of testing						
	Mention all the active protection						
	Differential protection						
	REF protection						
	Back-up directional O/C +E/F protection						
	Overfluxing protection						
	Connected to Trip Coil1 / Trip Coil2 / Both						
	Feed from DC supply 1/DC supply2						
	Breaker failure active	Yes /No					
	Disturbance Recorder active	Yes /No					
	Connected to dedicated CT core?Define CT core no.to which the relay is connected						
	CT ratio selected						
	Is CT supervision enabled or not in case of Reactor differential protection ?	Yes /No					
5	Are all the Lock out relays (86) considered for Reactor protection provided with supervision relays (74/ 86) ?	Yes/No					
6	Do the Reactor protection panels have supervision relays for DC supply-1 & DC supply-2 (74/DC-1 & 74/DC-2)?	Yes/No					
7	OTI/WTI indications working	Yes /No					
8	Bucholtz/PRD working	Yes/No					
9	LA rating HV side	Yes/No					

AC System and DG Audit - Check List

	Audited Data			
No	**AC Supply System**		**Supply I**	**Supply II**
1	Source of AC HT supplies	Name of source		
	In case of two AC HT supplies,the supplies are arranged from independent sources	Yes/No		
	Voltage/Source of supply			
	Supply changeover method between Supply I and Supply II	Auto/Manual		
2	**DG**			
	DG available	Yes/No		
	DG:Make and rating power			
	What loads are supplied by the DG ?			
	DG starting is Auto/manual	Auto/Manual		
	Supply changeover method between Normal AC Supply and DG			
3	The SS to furnish the supply changeover scheme/ single line diagram			
4	**Maintenance/ Testing Plan**			
	What is the maintenance plan/ schedule followed by the utility for maintenance of DG ?			
5	Single Line Diagram	Yes/No	If Yes,attach Hard Copy	

DC System Audit - Check list

	Audited data					
No	**DC supply systems**		**220V DC 1**	**220V DC 2**	**48V DC 1**	**48V DC 2**
1	Type of Batteries	Non Sealed/Sealed lead with recombination of gas/ Nickel-Cadmium/Other				
2	Number of Cells per bank					
3	Date of procurement/ commissioning of the Battery					
4	Is the battery functional and in good condition?	Yes/No				
5	Availability of Battery Charger	Yes/No				
6	Date of procurement/ commissioning of the Charger					
7	Is the Charger functional ?	Yes/No				
8	Used combination for charging	Two sets of battery and charger /single battery with charger /one battery with two chargers				
9	Measured voltage (to be measured at the farthest panel)					
	Positive to Earth					
	Negative to Earth					
10	Availability of Battery Ground Fault Detectors?	Yes/No				
12	The protection relays and trip circuits are segregated into two independent system feed through fuses from two different DC sources	Yes/No			N/A	N/A
13	**Maintenance/Testing Plan**					
	What is the maintenance/testing plan/schedule followed by the utility for maintenance of battery and charger?					

Communication System - Check list

	Audited data					
No	**Communication System**		**765 kV System**	**400 kV System**	**220 kV System**	**132 kV System**
1	a) Type of communication for Main-1 Protection	PLCC/ OPGW				
	b) Type of communication for Main-2 Protection	PLCC/ OPGW				
	c) Mode used for Data communication					
	d) Mode used for Speech communication					
2	**PLCC Details**					
	a) Do you use PLCC for teleprotection of distance relays ?	Yes/No				
	b) Specify type of Coupling	Ph-Ph/ Ph-G/ Inter-Circuit				
	c) Whether redundant PLCC channels provided for 400 kV & 765 kV lines	Yes/ No				
	d) Specify number of PLCC channels per circuit	One/ Two				
	e) No. of protection channels No. of data channels No. of speech channels					
	f) Whether dependability & security of each tele-protection channel measured and record kept?	Yes/No				
	g) Is the PLCC equipment and channels healthy & functional	Yes/No				
3	**OPGW Details**					
	a) Redundancy maintained by providing two sets of Fibre Optic Equipment	Yes/ No				
	b) Card level redundancy (Power supply card, protection card, CPU board) maintained in each fibre optic equipment	Yes/ No				
	c) Separate DC battery supply or common DC battery supply separately fused for each fibre optic equipment.	Yes/No				
	d) Are the Fibre Optic equipment and channels healthy & functional	Yes/No				
4	**Time Synchronization Equipment Details**					
	a) Whether GPS based time synchronizing equipment is provided at the substation for time synchronizing of Main relays/ DR/ Event logger/ SAS/ PMU/ Line Current Differential Relays	Yes/ No				

Communication System - Check list

	Audited data					
4	b) Are Time Synchronization Equipment (TSE) complete with antenna, all cables, processing equipments etc. provided to receive synchronizing pulse through Global Positioning system (GPS) compatible for synchronization of event logger, disturbance recorder and SCADA/ automation system.	Yes/ No				
	c) Are the Main Relays/ DR/ Event Logger/SAS/ PMU/ Line current differential relays time synchronized.	Yes/ No				
5	**Disturbance Recorder and Event Logger Details** Check all these items for individual relay.					
	a) Is the Disturbance recorder provided on all the feeders of 765kV, 400 kV & 220 kV Substations?	Yes/ No				
	b) Is the Fault locator provided on all the line feeders of 765kV, 400 kV & 220 kV Substations?	Yes/ No				
	c) Whether the Disturbance recorder is Standalone or part of main relay	Yes/ No				
	d) Whether Disturbance Recorder is having automatic fault record download facility to a central PC	Yes/ No				
	e) Disturbance Recorders functional ?	Yes/ No				
	f) Whether substation (765, 400, 220 kV) is having Event Logger facility (stand alone or built-in-SAS)	stand alone/ built-in-SAS				
	g) Event Logger functional ?	Yes/ No				

Synchro-check Protection Audit - Check list

Audited data			
No	**Relay configuration - Synchro-check protections**		
	Details of type relays		
	Details of composite type numerical relays		
1	Relay make and model		
2	Whether the relay is functional?	Yes /No	
3	Date of testing		
4	Voltage measurement	P-P or P-N	
5	What is the set value of voltage difference (ΔU) ?	%	
6	What is the set value of Phase angle difference ($\Delta\varphi$) ?	°	
7	What is the set value of frequency slip? (Δf)	mHz	
8	What is the set time delay of output relay? (DELAY)	sec	
9	Settings value for dead bus/line	%	

Bus Bar and Breaker Failure Protection Audit - Check List

	Audited data							
No	**BB and BF protection**		**220 kV**		**400 kV**		**765 kV**	
	BUSBAR PROTECTION							
1	Main BB available or not ?	Yes/No						
2	Back-up busbar protection to be provided by either of the following:	For 132kV & 220kV			N/A		N/A	
	- Remote -end distance relay overreaching elements (second zone)	Yes/No			N/A		N/A	
	- Reverse looking element of the local distance relay	Yes/No			N/A		N/A	
	- Directional back-up overcurrent relays at remote end.	Yes/No			N/A		N/A	
3	Redundant BBP available or not?	Yes/No						
4	Type of bus Bar arrangement (Select from the choices)	1 and 1/2 Circuit Breaker scheme						
		Single busbar						
		Double busbar						
		Main-1, Main-2 & Transfer						
			Busbar 1 (BB1)	**Busbar 2 (BB2)**	**Busbar 1 (BB1)**	**Busbar 2 (BB2)**	**Busbar 1 (BB1)**	**Busbar 2 (BB2)**
5	Main 1 relay Make	for ex: REB 500						
	Main 1 relay functional	Yes/No						
	Main 1 relay type	Low/High impendance						
	Connected to Trip Coil1 / Trip Coil2							
	Feed from DC supply 1/DC supply2							
6	Main 2 relay Make	for ex: REB 500						
	Main 2 relay functional	Yes/No						
	Main 2 relay type	Low/High impendance						
	Connected to Trip Coil 1/Trip Coil2							
	Feed from DC supply 1/DC supply2							
7	Trip to both coils in case of one BBP	Yes/No						

Bus Bar and Breaker Failure Protection Audit - Check List

No	BB and BF protection		220 kV				400 kV				765 kV			
			BB1 Main-1	BB1 Main-2	BB2 Main-1	BB2 Main-2	BB1 Main-1	BB1 Main-2	BB2 Main-1	BB2 Main-2	BB1 Main-1	BB1 Main-2	BB2 Main-1	BB2 Main-2
8	Dedicated CT core for each BB protection	Yes/No												
9	*To be filled for High Impedance busbar protection*													
	a) Is the high impedance protection used for simple busbar arrangement like 1 and 1/2 breaker scheme or single busbar arrangement	Yes/No												
	b) Whether the CT ratios and charcteristics are same (Vk etc.)	Yes/No												
	c) Whether stability check has been conducted?	Yes/No												
	d) Is CT supervision relay provided or not?	Yes/No												
	e) In case of busbar protection where isolator contacts are used for zone selectivity/ CT selection, please fill the below items:													
	- Is check zone enabled or not??	Yes/No												
	- Is Check zone measurement connected to separate CT cores ?	Yes/No												
	- If check zone Is not enabled, Is the relay setting increased to value higher than the heaviest loaded feeder current.	Yes/No												
10	*To be filled for Low Impedance busbar protection*													
	a) Centralised BBP	Yes/No												
	b) or discentralized BBP with peripheral units?	Yes/No												
	b) Whether stability check has been conducted?	Yes/No												
	c) Is CT supervision enabled or not ?	Yes/No												
	d)In case of busbar protection where isolator contacts are used for zone selectivity/ CT selection, please fill the below items:													
	- Is check zone enabled or not ?	Yes/No												
	- If check zone Is not enabled, Is the relay setting increased to value higher than the heaviest loaded feeder current.	Yes/No												
11	One zone for one bus	Yes/No												
12	Are all the Busbar protection Lock out relays (86BB) provided with supervision relays (74/ 86BB) ?	Yes/No												
13	Do all the Busbar protection panels have supervision relays for DC supply-1 & DC supply-2 (74/DC-1 & 74/DC-2)?	Yes/No												

Bus Bar and Breaker Failure Protection Audit - Check List

No	BB and BF protection		220 kV	400 kV	765 kV
	BREAKER FAILURE PROTECTION				
14	Breaker failure included in BB protection	Yes/No			
15	Breaker failure included in Line/transformer protections	Yes/No			
16	Separate BFP provided	Yes/No			
17	If separate BFP is provided, furnish Make/ Model				
18	BFP relay functional	Yes/No			
19	BFP conditons: Current presence	Yes/No			
20	BFP conditons: CB closed position	Yes/No			
21	BFP retrip active (first stage)	Yes/No			
22	Tripping time for BFP (second stage) 0.2s< t <0.3s	Yes/No			
23	Are Breaker Failure potection auxiliary relay for Stage-1 (94BF) and Lock out relay for Stage-2 (86BF) provided with supervision relays (74/ 94BF & 74/86BF)	Yes/No			
24	Do all the Breaker Failure protection panels have supervision relays for DC supply-1 & DC supply-2 (74/DC-1 & 74/DC-2)	Yes/No			

General Remarks

Bay name/Bus	Voltage	Protection/Element/ Equipment/ System audited	Remarks/Deficiences/Nonconformity observed	Recommended actions to be taken

□ Inventory Management Audit Checklist

I. Review of Availability of Maintenance Spares

Item	Checkpoint	Yes/No	Remarks
1.1	Are mandatory spares available for all voltage levels (66 kV and above)?		
1.2	Are minimum spare quantities maintained per CEA Annexure A & B guidelines?		
1.3	Are additional spares maintained for cyclone-prone or inaccessible areas?		
1.4	Is the stock of fast-moving and high-failure-rate items adequate?		
1.5	Are tools & plants (T&P) like ERS, lifting devices, and testers included?		
1.6	Are SF6 gas, insulating oil, and relay modules available as per norms?		
1.7	Are battery banks and chargers maintained with spare cells and parts?		

II. Review of Procurement Action for Spares and T&P

Item	Checkpoint	Yes/No	Remarks
2.1	Is there a defined procurement plan for replenishment of consumed spares?		
2.2	Is replenishment of consumed mandatory spares done within 6 months?		
2.3	Are procurement lead times (especially for imported items) well defined?		
2.4	Has digitization of inventory via ERP/SAP been implemented?		
2.5	Are procurement records and stock movement logs properly maintained?		
2.6	Are emergency procurement protocols for disaster situations established?		
2.7	Are provisions made for shared use of regional/state-level spares?		

III. Assessment of Storage and Preservation Practices

Item	Checkpoint	Yes/No	Remarks
3.1	Are storage facilities compliant with OEM and CEA recommendations?		
3.2	Are spares stored in weatherproof, labeled, and ventilated spaces?		
3.3	Are preservation practices in place (e.g. oil circulation, SF6 pressure check)?		
3.4	Is first-in-first-out (FIFO) inventory rotation followed?		
3.5	Are preventive maintenance checks done on stored spares periodically?		
3.6	Are critical documents like test certificates, OEM manuals, and warranty records maintained?		
3.7	Is physical verification of spares done half-yearly, and reports submitted to CEA?		

□ Checklist: Special Maintenance Tools & Testing Equipment

I. Availability of Maintenance Tools & Equipment

Item No.	Checkpoint	Yes/No	Remarks
1.1	Are essential hand tools and kits available for substation maintenance?		
1.2	Is specialized equipment like crimpers, torque wrenches, and hydraulic tools available?		
1.3	Are emergency restoration systems (ERS) and lifting gear maintained at all locations?		
1.4	Are test equipment sets (e.g., relay testers, insulation testers) available at each site/substation?		

II. Healthiness of Maintenance Tools

Item No.	Checkpoint	Yes/No	Remarks
2.1	Are tools inspected regularly for wear, damage, or expiry?		
2.2	Are faulty or unsafe tools removed from service immediately?		
2.3	Are T&P items stored and maintained as per OEM specifications and manuals?		

III. Calibration of Testing Equipment

Item No.	Checkpoint	Yes/No	Remarks
3.1	Are all meters, relays, and testers within their calibration validity?		
3.2	Is calibration performed by accredited labs or traceable to NABL standards?		
3.3	Are calibration records, stickers, and certificates maintained and periodically reviewed?		

IV. Review of Testing Procedures

Item No.	Checkpoint	Yes/No	Remarks
4.1	Are standard testing procedures (STPs) documented and accessible to staff?		
4.2	Is safety ensured during testing (use of gloves, live-line tools, barriers, etc.)?		
4.3	Are test results properly recorded and archived as per QA documentation protocols?		

ANNEXURE C.4

Sl No.	Name of the incidence	PCC Recommendation	Latest status
146th PCC Meeting			
1.	Tripping of 400KV/220KV 315 MVA ICT 1 AT LATEHAR(JUSNL) on 7th March 2025 at 11:40 Hrs and on 30th March 2025 at 03:17 Hrs	PCC advised JUSNL representative to share detailed report of the event to ERPC/ERLDC**.**	
2.	Tripping of 400KV/220KV 315 MVA ICT 1 AT BAKRESWAR on 28th March 2025 at 12:57 Hrs	PCC advised WBPDCL representative to share report to ERPC/ERLDC after conducting testing of CT.	
3.	Tripping of 400KV/220KV 250 MVA ICT 2 AT TENUGHAT on 13th March 2025 at 07:12 Hrs	PCC advised TVNL representative to share report to ERPC/ERLDC.	
4.	Tripping of 400 k V Main Bus 1 at FSTPP on 21st March 2025 at 04:50 Hrs	PCC advised NTPC representative to share report of event to ERPC/ERLDC.	
5.	Tripping of 400 k V Main Bus 1 at Meeramundali on 10th March 2025 at 17:17 Hrs	PCC advised OPTCL representative to share report of event to ERPC/ERLDC.	
6.	Tripping of multiple lines at 400 KV kahalgaon s/w due to wrong settings on 18/04/2025	ERLDC representative submitted that is requested to important generators to share pdf file of settings extracted from relay itself to ERPC/ERLDC for further review.	
141st PCC Meeting			

7.	Repeated tripping of 220KV-KHAGARIA-NEW PURNEA-1&2	PCC advised BSPTCL representative to resolve all issues associated with tripping of line along with root cause analysis of repeated tripping of line after flood ends and share analysis report to ERPC/ERLDC	In 146th PCC Meeting, BSPTCL representative informed that report will be shared by 15th May 2025 to ERPC/ERLDC.
139th PCC Meeting			
8.	Total Power failure at 220/132 kV Katapalli (OPTCL) S/s on 29.08.2024 at 06:52 Hrs	OPTCL representative informed that it is planned to test relays by availing shutdown of lines as earliest as possible however at present they are facing difficulty in getting shutdown of lines due to evacuation path issue for heavy generation of Burla PH. PCC advised OPTCL to investigate about reason behind non-operation of protection on 29th Aug 2024 and submit observation to ERPC/ERLDC. PCC advised SLDC Odisha, OPTCL to communicate with Hindalco to explore possibility of setting delay time of 100-150 ms in islanding scheme of Hindalco to avoid islanding in transient faults and submit summary of discussion and decision taken to ERPC/ERLDC. PCC advised SLDC Odisha, OPTCL, OHPC representative to review o/c e/f settings at Lapanga, Burla, Chiplima, Katapalli, Sambalpur for all feeders and submit revised settings to ERPC/ERLDC Subsequently a meeting will be conducted among ERPC, ERLDC, OPTCL, OHPC, SLDC Odisha representative to finalize the settings. PCC advised OPTCL representative to share status of	In 145th PCC Meeting, SLDC representative informed that meeting had been done subsequently OPTCL and OHPC are advised to share settings to SLDC which is expected to be received by 1st week of April 2025. Further, ERPC and ERLDC can convey meeting after 10th April 2025. In 146th PCC Meeting, SLDC Odisha representative said that settings had been shared to ERLDC. ERLDC representative informed that settings are being reviewed.

		remedial measures taken for protection/ operation issues to ERPC/ERLDC on periodic basis.	
136th PCC Meeting			
9.	Disturbance at 220 kV Tenughat (TVNL) S/s on 29.05.2024 at 12:57 Hrs	PCC advised JUSNL representative to rectify auto-reclose issue at Govindpur end by next week and intimate to ERPC/ERLDC. TVNL representative informed that settings at their end had been implemented by CRITL, JUSNL team and he further assured that O/C E/F settings will be revised at the earliest after consultation with CRITL, JUSNL team. PCC advised CRITL, JUSNL team to test auto-reclose and carrier at both Govindpur as well as Tenughat end.	In 145th PCC Meeting, JUSNL, SLDC Jharkhand and TVNL representatives to coordinate and resolve auto-relcoser issue at Tenughat end and share report to ERPC/ERLDC. It further advised JUSNL representative to share contact details of concerned person(Hazaribagh division) to ERPC so that communication can be shared from ERPC side. In 146th PCC Meeting, TVNL representative informed that as per communication received from Govindpur end JUSNL, CRITL team will visit Tenughat S/s soon for detailed checking of auto-recloser. PCC advised TVNL representative to share observation report to ERPC/ERLDC after detailed checking of auto-recloser by CRITL team.