Agenda
for
148th PCC Meeting

Date:26.06.2025
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

AGENDA FOR 148th PROTECTION COORDINATION SUB-COMMITTEE MEETING TO BE HELD ON 26th JUNE 2025 AT 10:30 HRS THROUGH MS TEAMS

PART – A

ITEM NO. A.1: Confirmation of Minutes of 147th Protection Coordination sub-Committee Meeting held on 28th May 2025 through MS Teams.

The minutes of 147th Protection Coordination sub-Committee meeting held on 28.05.2025 was circulated vide letter dated 20.06.2025.

Members may confirm the minutes of the Meeting.

PART – B

ITEM NO. B.1: Disturbance at 220 k V Chatra (JUSNL) S/s on 1st May 2025 at 13:04 Hrs

220kV Chatra S/s is connected through S/c from Daltongunj & Latehar S/s each. On 1st May 2025 at 13:04 Hrs, 220 kV Daltongunj-Chatra line got tripped from Daltonganj end in Zone 3 distance protection and simultaneously, 220 kV Latehar–Chatra line also got tripped from Latehar end in Zone 3 distance protection subsequently 220kV Chatra S/s became dead.

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

Load Loss: 30 MW
Outage Duration: 00:53 Hrs
JUSNL may explain.

ITEM NO. B.2: Disturbance at 220 k V Garhwa (JUSNL) S/s on 4th May 2025 at 15:36 Hrs

220 k V Garhwa S/s is radially connected through 220kV-Daltongunj-Garhwa D/C. Prior to disturbance 220kV Datongunj- Garhwa- 2 was under tripped condition from 16:25 Hrs of 03/05/2025 due to snapping of conductor. On 4th May 2025 at 15:36 Hrs, 220kV Datongunj-Garhwa -1 got tripped on R phase fault subsequently 220kV Garhwa S/s became dead.

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

Load Loss: 80 MW
Outage Duration: 02:54 Hrs
JUSNL may explain.

ITEM NO. B.3: Repeated Disturbance at 400 k V Dikchu HEP on 10th May 2025 at 11:35 Hrs and on 22nd May 2025 at 12:52 Hrs

a) Disturbance at 400 k V Dikchu HEP on 10th May 2025 at 11:35 Hrs

On 10th May 2025 at 11:35 Hrs, high resistive fault occurred in 400 kV Rangpo-Dikchu line and line got tripped on B phase fault from both ends. Since Dikchu S/s was radially connected to Rangpo, 400kV Dikchu S/s became dead.

No Load Los and Gen. Loss
Outage Duration: 01:22 Hrs

b) Disturbance at 400 k V Dikchu HEP on 22nd May 2025 at 12:52 Hrs

On 22nd May 2025 at 12:51 Hrs, high resistive fault got occurred in 400kV Dikchu-Rangpo-II (Bypassing Teesta-III) and same fault was sensed by Dikchu 400/132kV ICT consequently ICT got tripped on O/C earth fault. Further faulty line got tripped from both end after 3 sec. Due to tripping of 400/132kV ICT, both units at Dikchu got tripped on over frequency due to loss of evacuation path.

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

Gen. Loss: 103 MW
Outage Duration: 00:32 Hrs
Dikchu HEP may explain

ITEM NO. B.4: Disturbance at 400 k V Mejia (DVC) S/s on 23rd May 2025 at 20:09 Hrs

On 23-05-2025, at 20:09 Hrs, Total Power Failure occurred at 400kV Mejia due to operation of bus bar differential protection of both the 400kV main buses while performing bus change operation on GT 8.
Detailed report from ERLDC is attached at **Annexure B.4.**

Gen. Loss: 962 MW
Outage Duration: 00:32 Hrs
DVC may explain

ITEM NO. B.5: Disturbance at 220 k V Joda (OPTCL) S/s on 31st May 2025 at 12:07 Hrs

Prior to the disturbance 220kV Joda-TTPS- 2 and 220/132kV ICT 3 under breakdown condition and Joda load was feeding through Ramchandrapur S/c and TTPS -1(LILO at Telkoi). During shifting of 220/132kV ICT 1 from main bus 1 (220/132kV ICT #1 & 2 connected through 220kV main bus#1) to 220kV main bus 2 heavy sparking observed while opening of isolator of ICT 1 which created a three-phase bus fault at Joda S/s consequently 220kV Ramchandrapur & TTPS circuit got tripped in Zone 4 protection and 220kV Joda S/s became dead.

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

Load Loss: 213 MW
Outage Duration: 00:31 Hrs
OPTCL may explain.

ITEM NO. B.6: Tripping of ICTs during the month of May 25

Sl. No	Name of the Element	Trip Date	Trip Time	Remarks	Utility
1	400KV/220KV 500 MVA ICT 2 AT SATGACHIA	11-05-2025	06:23	Differential Protection operated due to B phase LA blast	WBSETCL
2	400KV/220KV 315 MVA ICT 1 AT RTPS	10-05-2025	08:40	NGT BUCHHOLZ TRIP in 33 KV tertiary winding coming under differential zone	DVC
3	400KV/220KV 315 MVA ICT 1 AT MEERAMUNDALI	08-05-2025	13:16	During bus fault, said ICT tripped in non-directional high	OPTCL

				set backup o/c protection (3.7 KA fault current)	
4	400KV/220KV 315 MVA ICT 2 AT MEERAMUNDALI	08-05-2025	13:16	During bus fault, said ICT tripped in non-directional high set backup o/c protection (3.7 KA fault current)	OPTCL
5	400KV/220KV 315 MVA ICT 4 AT JEERAT	06-05-2025	14:18	Tripped to bus 1 bus bar spurious operation	WBSETCL
6	400KV/220KV 315 MVA ICT 2 AT JEERAT	06-05-2025	14:18	Tripped to bus 1 bus bar spurious operation	WBSETCL
7	400KV/220KV 500 MVA ICT 2 AT BUXAR TPP	06-04-2025	11:52	REF operated.	SJVN
8	400KV/220KV 500 MVA ICT 3 AT CHANDAUTI (PMTL)	02-05-2025	20:54	Y-ph Differential protection, due to some foreign object (GI Wire) came in contact with live part.	PMTL
9	400KV/220KV 315 MVA ICT 3 AT JAMSHEDPUR	01-05-2025	16:08	CB of 220kV Ramchandarpur-Chaibasa(JUSNL Line) fail at Ramchandarpur s/s so Back Up impedance Z-3 Operated. Bus also tripped with Chandil line and ICT 3.	PG ER-I

Concerned utilities may explain.

ITEM NO. B.7: Tripping of Buses during the month of May 25

Sl. No	**Name of the Element**	**Trip Date**	**Trip Time**	**Remarks**	**Utility**
1	220KV MAIN BUS - 1 AT TASHIDING	23-05-2025	12:28:00	Tripped during Bus bar relay checking	Shiga Energy Private Limited (SEPL)
2	400KV MAIN BUS - 1 AT CHANDWA	21-05-2025	14:11:00	Busbar protection operated due to flashover in Latehar GIS bay	Powergrid ER1
3	400KV MAIN BUS - 2 AT JHARSUGUDA	12-05-2025	18:06:00	Busbar protection operated due to CT failure of main bay of Bus Reactor-1	PG Odisha
4	400KV MAIN BUS - 2 AT MERAMUNDALI	08-05-2025	13:16:00	Pipe connected from R-ph CT to CB of 400 KV Mendhasal-2 at Meramundali has dropped due to damage of CT side clamp	OPTCL

Concerned utilities may explain.

ITEM NO. B.8: Repeated tripping of transmission lines during the month of May 25

Sl.No.	Name of the Element	No. of times Tripped	Remarks	Utility
1	400KV-GMR-ANGUL-1	3	Tripped on R-phase to ground fault and FD was 37 kM from GMR end in 2 instances.	GMR/PG ODISHA
2	400KV-RANCHI-RAGHUNATHPUR-3	3	Tripped on R phase and B phase fault in 2 instances and DT received at Ranchi in one instance.	DVC/PG ER-I
3	220KV-DALTONGANJ-CHATRA-1	4	Tripped on Y-B fault in 2 instances.	JUSNL/PG ER-1
4	220KV-BOLANGIR (PG)-KESINGA-1	3	Tripped on R phase to ground fault and R-Y fault in 2 instances. A/r successful from Bolangir end in one instance.	OPTCL
5	220KV-KARAMNASHA (NEW)-SAHUPURI-1	3	Tripped on Over current protection from BSPTCL end.	BSPTCL
6	220KV-CHUKHA-BIRPARA D/C	3	Line tripped on phase-to-phase fault in all instances.	PG ER-II/ BHUTAN

Concerned utilities may explain.

ITEM NO. B.9: 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 May'25, detailed list attached as **Annexure B.9.**

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

Sl.no	Utility Name	January	February	March 2025	April 2025	May 2025
1	PG-ER-1	Yes (13.02.2025)			Yes (23.02.2025)	
2	PG-ER-2	Yes	Yes	Yes (19.04.2025)	Yes	
3	PG-Odisha	Yes (07.02.2025)	Yes (06.03.2025)	Yes (21.4.2025)	Yes (12.05.2025)	Yes (16.06.2025)
4	WBSETCL/ WBPDCL	Yes	Yes (06.03.2025)	Yes (08.04.2025)	Yes (07.05.2025)	Yes (09.06.2025)

		(11/02/2025)				
5	BSPTCL/ BGCL	Yes (10.02.2025)	Yes (10.03.2025)	Yes (11.04.2025)	Yes (13.05.2025)	Yes (18.06.2025)
6	OPTCL/ OHPC	Yes (10.02.2025)	Yes (17.03.2025)	Yes (15.04.2025)	Yes (15.05.2025)	Yes (16.06.2025)
7	DVC				Yes (12.05.2025)	
8	JUSNL	Yes (13.02.2025)	Yes (05/03/2025)	Yes (23.04.2025)	Yes (21.05.2025)	Yes (22.06.2025)
9	Sikkim					
10	OPGC					
11	PMTL					
12	NTPC-KHSTPP	Yes	Yes	Yes	Yes (23.05.25)	Yes (14.06.2025)
13	NTPC-FSTPP					
14	NTPC-BARH		Yes (07.03.2025)	Yes (15.04.2025)	Yes (09.05.2025)	Yes (14.06.2025)
15	NTPC-TSTPP					
16	NTPC-KBUNL					
17	NPGC					
18	BRBCL					
19	NTPC-DARILAPLI	Yes (12/02/2025)	Yes (01/03/2025)	Yes (02.04.2025)	Yes (02.04.2025)	Yes (02.06.2025)
20	NTPC-NORTH KARNPUARA	Yes (01/03/2025)	Yes (01/03/2025)			
21	ATL					
22	APNRL					
23	CBPTCL					
24	DMTCL	Yes (03/02/2025)	Yes (03/04/2025)	Yes (02/04/2025)	Yes (03.05.2025)	Yes (04/06/2025)
25	ENICL	Yes (12.02.2025)	Yes		Yes (13.05.2025)	

26	Chuzachen HEP					
27	Jorethang HEP	Yes (01/02/2025)	Yes (01/03/2025)	Yes (02.04.2025)	Yes (02.05.2025)	Yes (01/06/2025)
28	Tashiding Hep	Yes (01/02/2025	Yes (02/03/2025)	Yes (01.04.2025)	Yes (03.05.2025)	Yes (02/06/2025)
29	GMR					
30	IBEUL					
31	JITPL					
32	MPL					
33	NKTL					
34	OGPTL	Yes (12.02.2025)	Yes		Yes (13.05.2025)	
35	PMJTL					
36	Powerlink					
37	PKTCL	Yes (12.02.2025)	Yes		Yes (13.05.2025)	
38	CESC	Yes (17.02.2025)				
39	Rongnichu HEP					
40	SPTL					
41	TVNL	Yes (04.02.2025)	Yes (05.03.2025)	Yes (01.04.2025)	Yes (03.05.2025)	Yes (04.06.2025)

Members may discuss.

ITEM NO. B.10: 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	Received
8	DVC	Not Received
9	CESC	Not received
10	NTPC	Not received

In 147th PCC Meeting, PCC advised remaining utilities to share nominations to ERPC by one week.

Members may update.

ITEM NO. B.11: Single Line Tripping Incidences in month of May 2025

Single line tripping incidents in the month of May 2025 which needs explanation from constituents of either end is attached at **Annexure B.11.**

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. Observations, if any on the format may be submitted to ERPC Secretariat.

In 147th PCC Meeting, ERPC representative informed that 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.
He further told that Draft Protection audit format for carrying out third party protection audit is attached at **Annexure C.1**.

PCC advised all utilities to submit observations, if any on the format to ERPC Secretariat by 30th May 2025.

Members may update.

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 147th PCC Meeting, ERPC representative informed that internal protection audit plan for FY 2025-26 has been submitted by WBSETCL vide mail dated 7th May 2025.
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 147th 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 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): 11-06-2025

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

220kV Chatra S/s connected via S/c from Daltongunj & Latehar each S/s. At 13:04 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 30 MW occurred at Chatra. Power was extended through 220kV Latehar-Chatra S/C at 13:57 Hrs.

2. **Time and Date of the Event (घटना का समय और दिनांक):** 13:04 hrs of 01.05.2025

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)	50.316	22325	20741	146	1635
Post Event (घटना के बाद)	50.316	22383	20711	146	1605

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 30 MW at Chatra S/s.
7. **Duration of interruption (रुकावट की अवधि):** 00:53 Hrs (53 minutes)

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

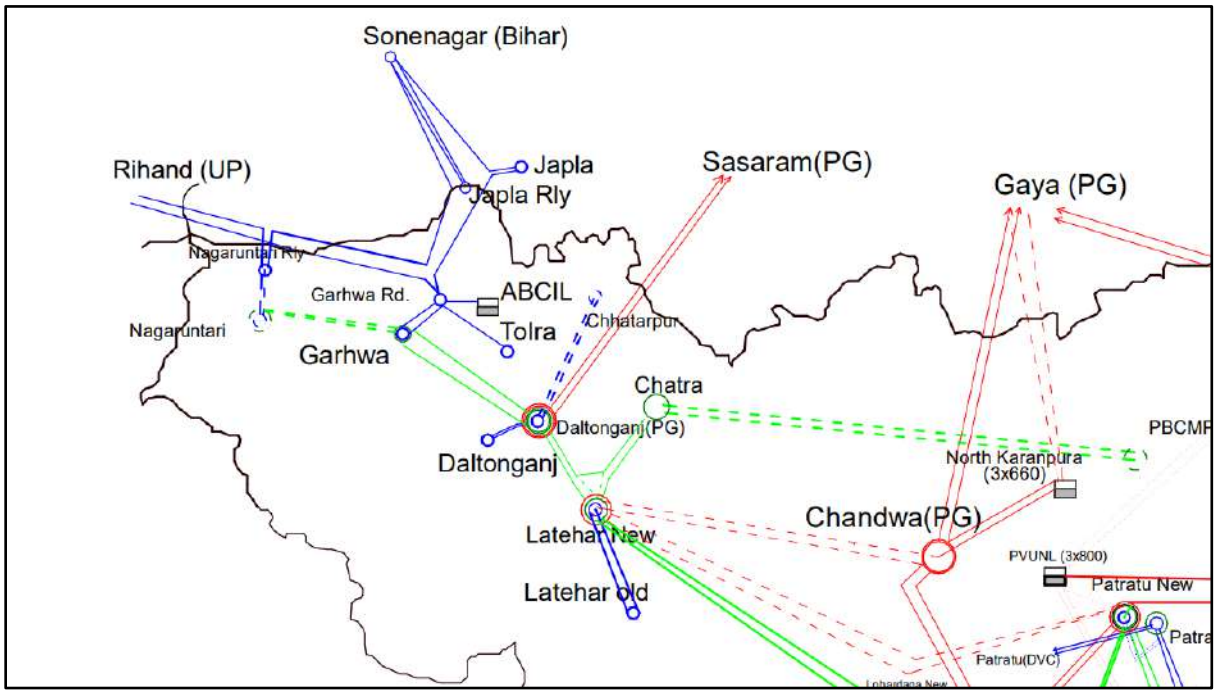


Figure 1: Network across the affected area

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

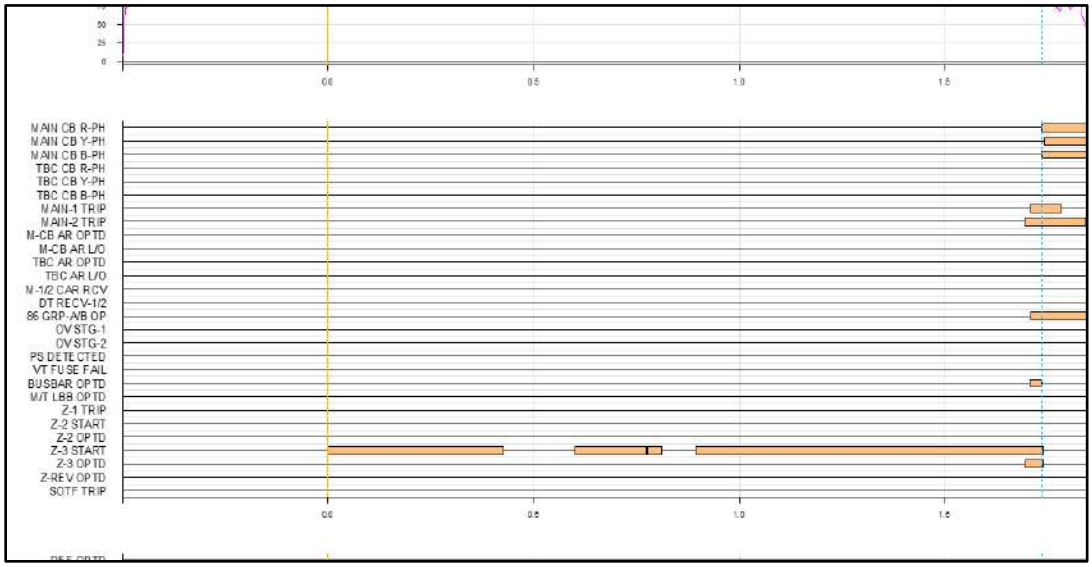
10. **Major Elements Tripped (प्रमुख ट्रिपिंग):**

क्रoसo	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220kV Latehar-Chatra	13:04:47	Tripped from Latehar end only Y-B fault, Z-3, FD: 299 km, Iy: 0.596 kA, Ib:0.628 kA	Not tripped	13:57

2	220kV Daltongunj-Chatra		Tripped from Daltongunj end only (Y-B fault, Z-3, FD: 150 km, Iy: 0.95 kA, Ib: 0.955 kA)	Not tripped	14:45

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 13:04:45 Hrs Y-B phase fault occurred and 220kV Chatra-Latehar line got tripped from Latehar end in Z-3 protection.



DR of Daltongunj-Chatra at Daltongunj

- Same fault was sensed by Daltongunj in Z-3 protection and pick up drop after 400 msec and again Z-3 picked up at 13:04:47 Hrs and at 13:04:47:850 Hrs(after 800 msec) 220kV Daltongunj-Chatra line tripped from Daltongunj end.

Figure 3: PMU of Voltage at Daltongunj

- 220kV Chatra S/s became dead.
- Total load loss of 30 MW occurred at Chatra.
- Power was extended through 220kV Latehar-Chatra at 13:57 Hrs.

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

- In 147th PCC meeting, it was confirmed that weak end infeed protection was enabled at Chatra end, but during this fault also it there was no pickup and fault clearance from Chatra end.
- As per setting of weak infeed it appears the undervoltage is set at 40%, so this may be reviewed and increased up to **70 to 80% for** weak infeed operation and CB status open on carrier to be ensured hence **Weak end infeed protection scheme may be reviewed accordingly.**
- High resistive fault occurred in 220kV line and sensed in Z-3 protection from both remote ends. **Resistive reach setting** for both feeders may be checked at remote end.

Tripping Record of 220/132/33 kV Chatra (Itkhori) GSS

Sl. No.	Date	Time	Element's Name	Relay End -1	Relay End -2
1	06-04-2025	08:35 hrs	220 kV Chatra - Latehar	YB, Z1, 9.87 km, Iy - 1.227 kA, Ib- 1.266 kA	
2	16-04-2025	09:13 hrs	221 kV Chatra - Latehar	YB, Z1, 45.27 km, Iy - 1.01 kA, Ib- 1.053 kA	
3	27-04-2025	19:08 hrs	222 kV Chatra - Latehar	No DR recorded	YB, Z3, Iy- 559 A, Ib – 595.9 A
4	01-05-2025	13:04 hrs	223 kV Chatra - Latehar	No DR recorded	YB, Z3, 299.1 km, Iy – 570.80 A, Ib – 596.7 A
1	23-03-2025	09:47 hrs	220 kV Chatra - Daltonganj	YB, Z1, 76.348 km, Iy - 1.202 kA, Ib 1.19 kA	YB, Z3, Iy – 937 A, Ib – 912 A
2	27-04-2025	19:08 hrs	221 kV Chatra - Daltonganj	M2: No Zone pick up, Iy- 682 A, Ib – 638 A	YB, Z3, 231 km, Iy – 927.6 A, Ib – 896.1 A
3	01-05-2025	13:04 hrs	222 kV Chatra - Daltonganj	M2: No Zone pick up, Iy- 650 A, Ib – 612 A	YB, Z3, 144 km, Iy – 944 A, Ib – 955 A
4	09-05-2025	10:18 hrs	220 kV Chatra - Daltonganj	YB, Z1, 26.075 km, Iy - 986.4 A, Ib- 1.04 kA	YB, Z2 (inst. Trip on carr received), Iy – 1.43 kA, Ib – 1.35 kA

- Lines connected from 220kV Chatra S/s tripped multiple times in **Y_B** fault during last 2 month. You are requested to plan for **patrolling** of both lines to avoid tripping and disturbance at Chatra S/s.

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**

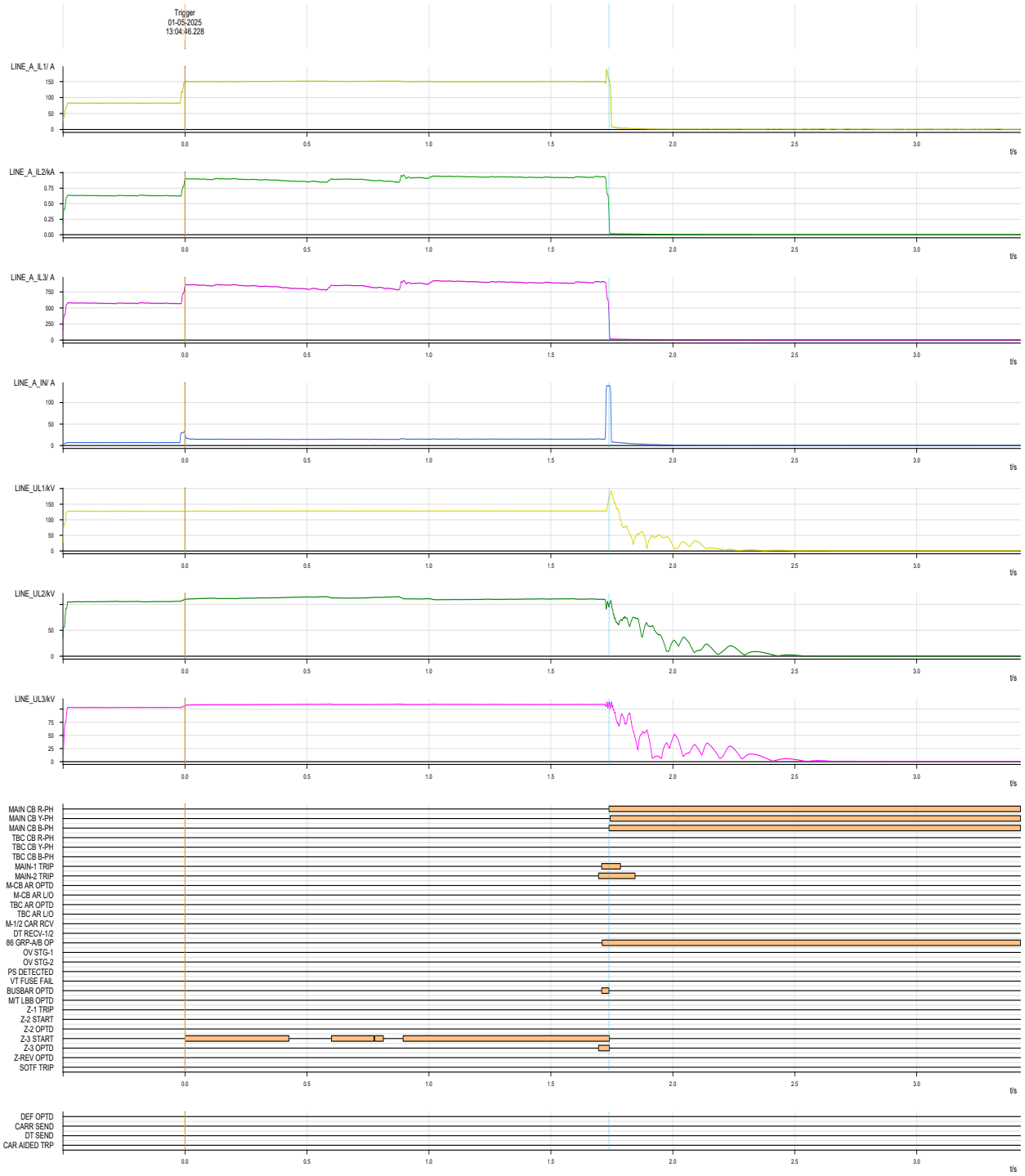
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु): Nil

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

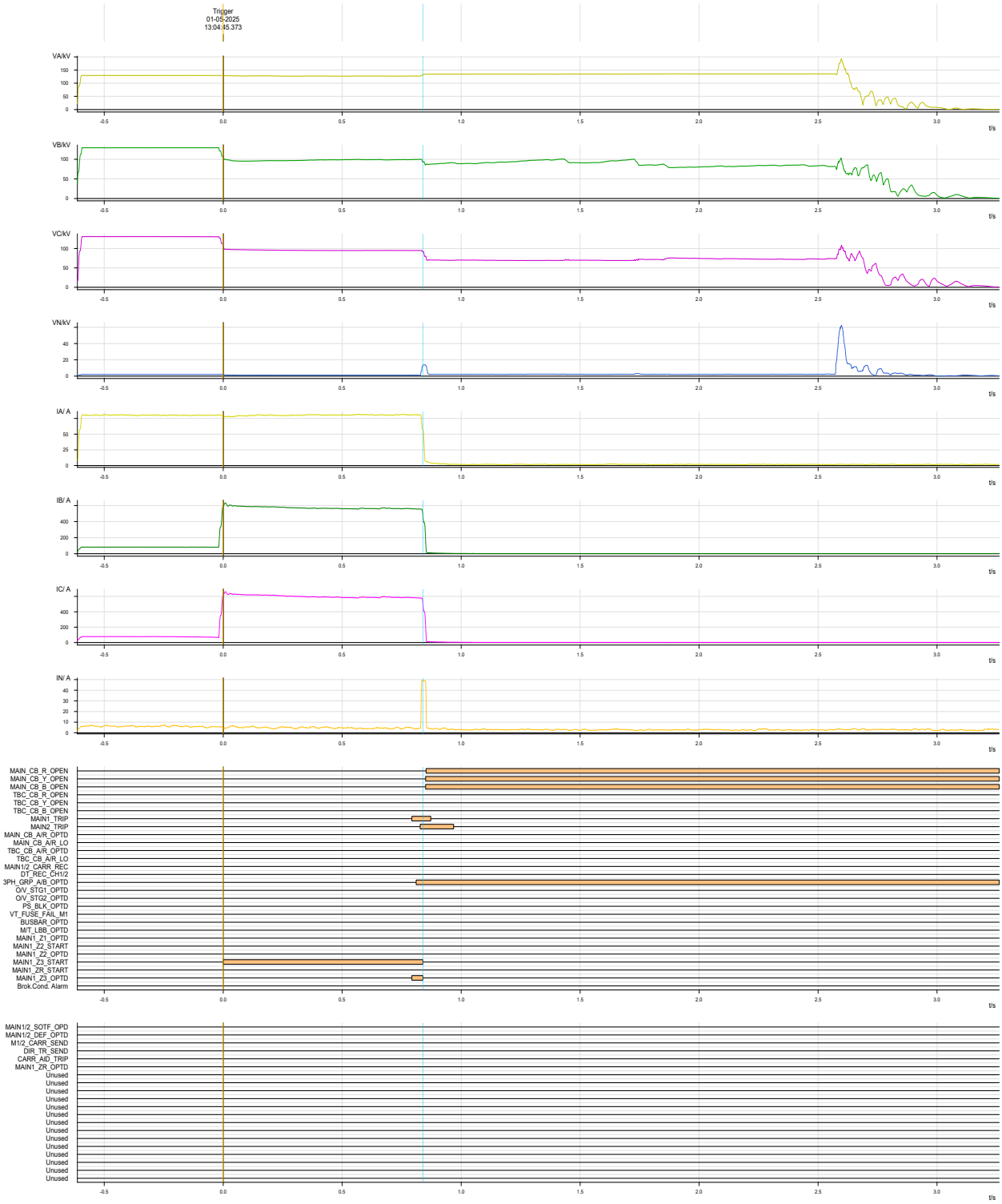
**** Remaining SOE not available at ERLDC end.**

Annexure 2:

DR of 220kV Daltongunj -Chatra at Daltongunj :



DR of 20kV Latehar -Chatra at Latehar:



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): 04-05-2025

1. Event Summary (घटना का सारांश):

At 15:36 Hrs, Garhwa is radially connected with 220 kV Daltongunj- Garhwa D/C. 220 kV Daltongunj- Garhwa -2 was already out and Ckt -1 tripped on R-earth fault. Due to the tripping of this element, there was no source available in this area leading to load loss of 80 MW at Garhwa (JH) area. Power restored through 220 KV Daltonganj (PG) –Garhwa #2 at 18:30 Hrs.

2. Time and Date of the Event (घटना का समय और दिनांक): At 15:36 Hrs on 04/05/2025:

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation in MW	Regional Demand in MW	State Generation in MW	State Demand in MW
				Jharkhand	Jharkhand
Pre-Event (घटना पूर्व)	50.020	24113	23260	144	1402
Post Event (घटना के बाद)	50.020	24113	23180	144	1322

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

Important Transmission Line/Unit if under outage	220kV Daltonganj (PG) –Garhwa ckt -02 was already in tripped condition from

(महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो बंद है)	16:25 of 03/05/2025 due to snapping of conductor 132 KV Japla New Garhwa old was charged at no load
Weather Condition (मौसम स्थिति)	Normal

1. **Load and Generation loss (**लोड और जेनरेशन हानि**):** Approximate load loss of 80 MW at Garhwa (JH) area.

6. **Duration of interruption (**रुकावट की अवधि**):** 2 Hours and 54 minutes

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

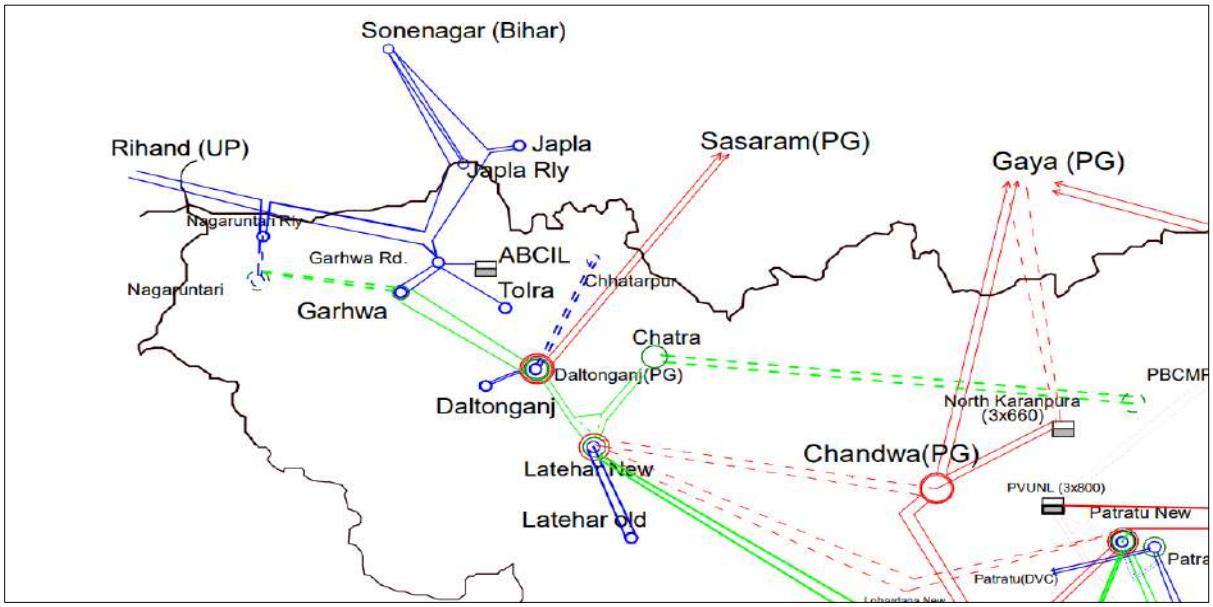


Figure 1: Network across the affected area

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

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

क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220 KV Daltonganj (PG) – Garhwa ckt -01	15:36	R-ph, FD:84 Km, FC:1.86 kA operated. Fault current: Ib-1.302 kA	R-N,Ir- 0.7A, Z 1, FD 1.6km	09:52hrs / 05.05.25

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

- 220Kv Garhwa S/s is radially connected through 220kV-Daltongunj-Garhwa D/C.
- Prior to disturbance, 220kV Datongunj-Garhwa ckt 2 was under tripped condition from 16:25 Hrs of 03/05/2025 due to snapping of conductor.
- At 15:36 Hrs, 220kV Datongunj-Garhwa ckt 1 tripped on R-Earth fault on carrier receipt at Daltonganj end where fault was detected in zone 2. Autoreclose failed after one second at Daltonganj end.
- Due to tripping of this element, 220kV Garhwa S/s became dead. Total load loss of 80 MW occurred at Garhwa S/s.

Figure 2: PMU at Sasaram during 220 KV Daltonganj Garhwa ckt 1 tripping

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

- DR not generated at Garhwa end due to scada/communication related issue.
- 220 KV Daltonganj (PG) –Garhwa ckt -02 tripped on previous day on jumper snapping was not in service.It came into service at 18:30 hrs(after 3 hrs from the disturbance).Early restoration would have avoided the disturbance.
- Japla ,Rihand and Garhwa new sources were kept separate and not synchronised at 132 KV Garhwa old.

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

Japla and Garhwa new sources were synchronised later at 132 KV Garhwa Old.

13. 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, Powergrid ER-I**
2	**Detailed report not submitted within 7 days**	IEGC section 37.2 (e)	**JUSNL**

14. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Radial connection has risk of increased load loss. Keeping multiple sources in loop lead to reliability.
- Keeping multiple circuits in service for a radial connection is helpful. So quick restoration of parallel ckts is necessary.

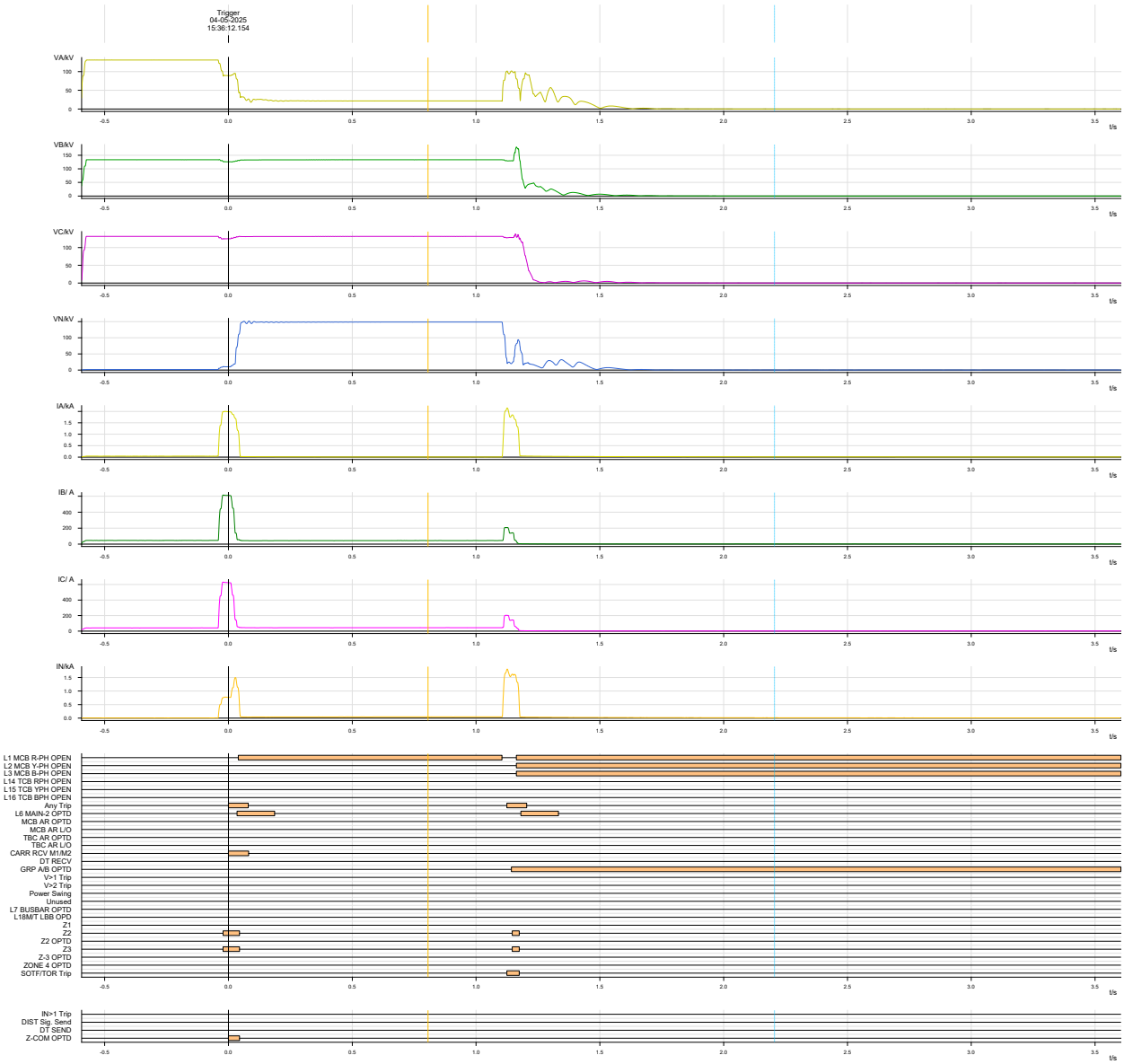
Annexure 1: (Sequence of Events-As per ERLDC SCADA):

TIME	MILLI_SEC	OSI_KEY	STATION	DESCRIPTION	STATUS
04-05-2025 15:36	187	2254040	DALTN_PG	220_GARHWA_1_CB	Travel
04-05-2025 15:36	189	1254181	DALTN_PG	220_GARHWA_1_MP2	Operated
04-05-2025 15:36	340	1254181	DALTN_PG	220_GARHWA_1_MP2	Normal
04-05-2025 15:36	265	2254040	DALTN_PG	220_GARHWA_1_CB	Closed
04-05-2025 15:36	310	2254040	DALTN_PG	220_GARHWA_1_CB	Open
04-05-2025 15:36	335	1254181	DALTN_PG	220_GARHWA_1_MP2	Operated
04-05-2025 15:36	486	1254181	DALTN_PG	220_GARHWA_1_MP2	Normal
04-05-2025 15:53	684	2254176	DALTN_PG	220_GARHWA_2_MB2_ISO	Travel
04-05-2025 15:54	76	2254176	DALTN_PG	220_GARHWA_2_MB2_ISO	Closed
04-05-2025 15:54	674	2254177	DALTN_PG	220_GARHWA_2_L_ISO	Travel
04-05-2025 15:54	320	2254177	DALTN_PG	220_GARHWA_2_L_ISO	Closed
04-05-2025	839	2254041	DALTN_PG	220_GARHWA_2_CB	Closed

16:14					
04-05-2025 16:43	220	2254010	DALTN_PG	400_Main_Bus_R1_Main_CB	Open
04-05-2025 16:48	285	2254084	DALTN_PG	400_Main_Bus_R1_L1_ISO	Closed
04-05-2025 16:49	940	2254010	DALTN_PG	400_Main_Bus_R1_Main_CB	Closed
04-05-2025 17:16	516	2254040	DALTN_PG	220_GARHWA_1_CB	Closed
04-05-2025 17:24	49	2254040	DALTN_PG	220_GARHWA_1_CB	Open

Annexure 2:

DR at 220 KV Daltonganj Garhwa ckt 2:


Trigger
04-05-2025
15:36:12.154
VA/kV
VB/kV
VC/kV
VN/kV
IA/kA
IB/ A
IC/ A
IN/kA
t/s
L1 MCB R-PH OPEN
L2 MCB Y-PH OPEN
L3 MCB B-PH OPEN
L14 TCB RPH OPEN
L15 TCB YPH OPEN
L16 TCB BPH OPEN
Any Trip
L6 MAIN-2 OPTD
MCB AR OPTD
MCB AR L/O
TBC AR OPTD
TBC AR L/O
CARR RCV M1/M2
DT RECV
GRP A/B OPTD
V>1 Trip
V>2 Trip
Power Swing
Unused
L7 BUSBAR OPTD
L18M/T LBB OPD
Z1
Z2
Z2 OPTD
Z3
Z-3 OPTD
ZONE 4 OPTD
SOTF/TOR Trip
IN>1 Trip
DIST Sig. Send
DT SEND
Z-COM OPTD

ग्रिड-इंडिया GRID-INDIA ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
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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): 11-06-2025

1. Event Summary (घटना का सारांश):

Event 1: At 11:35 Hrs on 10/05/2025:

At 11:35 Hrs, high resistive fault occurred in 400 kV Rangpo-Dikchu line and line tripped on B-Earth fault from both ends. As Dikchu was radially connected to Rangpo, 400kV Dikchu S/s became dead. During disturbance schedule of Dikchu was Zero so no generation loss reported.
400 kV Rangpo-Dikchu charged at 12:57 Hrs.

Event 2: At 12:52 Hrs on 22/05/2025:

At 12:51 Hrs, high resistive fault occurred in 400kV Dikchu-Rangpo CKT-II (Bypassing Teesta-III) and same fault was sensed by Dikchu 400/132kV ICT and ICT got tripped on O/C earth fault. Further faulty line tripped from both end after 3 sec. Due to tripping of 400/132kV ICT both units at Dikchu tripped on over frequency due to loss of evacuation path. Generation loss of 103 MW was reported.
Dikchu Unit#1 & 2 synchronized at 13:26 Hrs and 13:27 Hrs respectively.

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

Event 1: At 11:35 Hrs on 10/05/2025
Event 2: At 12:52 Hrs on 22/05/2025

3. Event Category (ग्रिड घटना का प्रकार)

Event 1: At 11:35 Hrs on 10/05/2025: Grid Disturbance (GD)-1
Event 2: At 12:52 Hrs on 22/05/2025: Grid Incident (GI)-2

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

Event 1: At 11:35 Hrs on 10/05/2025:

	Frequency in Hz	Regional Generation in MW	Regional Demand in MW
Pre-Event (घटना पूर्व)	49.935	24876	28056
Post Event (घटना के बाद)	49.938	24876	28056

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)	Normal

Event 2: At 12:52 Hrs on 22/05/2025:

	Frequency in Hz	Regional Generation in MW	Regional Demand in MW
Pre-Event (घटना पूर्व)	49.983	21277	25492
Post Event (घटना के बाद)	49.981	21174	25492

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

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

Event 1: At 11:35 Hrs on 10/05/2025: No generation loss reported (Schedule was zero during disturbance)

Event 2: At 12:52 Hrs on 22/05/2025: Generation loss of 103 MW was reported.

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

Event 1: At 11:35 Hrs on 10/05/2025: 01:22 Hrs (1 hour 22 minutes).
Event 2: At 12:52 Hrs on 22/05/2025: 00:32 Hrs (32 Minutes).

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

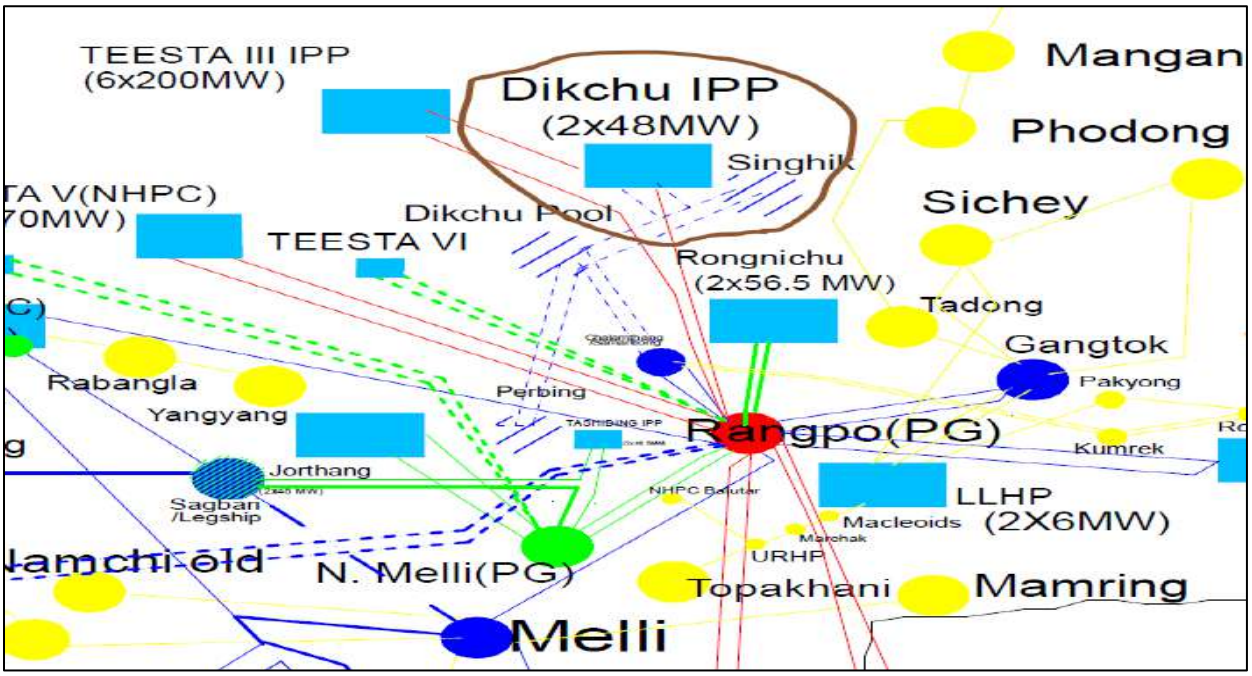


Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग):

Event 1: At 11:35 Hrs on 10/05/2025:

क्रoसo	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	400 kV Rangpo-Dikchu	11:35:44	Directional earth fault relay operated. Fault current: Ib-1.302 kA	DT received.	12:57

Event 2: At 12:52 Hrs on 22/05/2025:

क्रoसo	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	400/132 kV Dikchu ICT	12:51:49	Over current earth fault protection operated.		13:24
2	Dikchu Unit-1		Over frequency/Overspeed		13:26
3	Dikchu Unit-2		Over frequency/Overspeed		13:27
4	400kV Dikchu-Rangpo CKT-II (Bypassing Teesta-III)	12:51:50	Directional earth fault relay operated.	DT received.	17:13

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

Event 1: At 11:35 Hrs on 10/05/2025:

- Prior to the disturbance Dikchu was radially connected to Rangpo and schedule was Zero.
- At 11:35:38 Hrs high resistive fault occurred in 400kV Rangpo-Dikchu line.
- During this time generation of Dikchu was zero so no fault feeding from Dikchu and no relay picked up from Dikchu.
- Fault was feeding from Rangpo end and after 6 sec directional earth fault protection operated at Rangpo end and DT send to Dikchu.

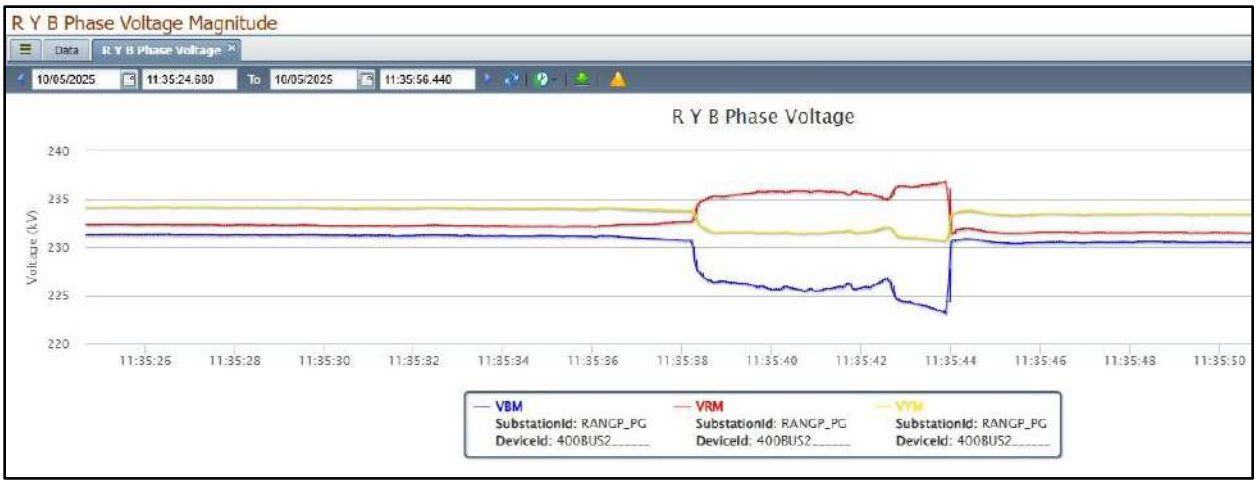


Figure 2: PMU of voltage at Rangpo

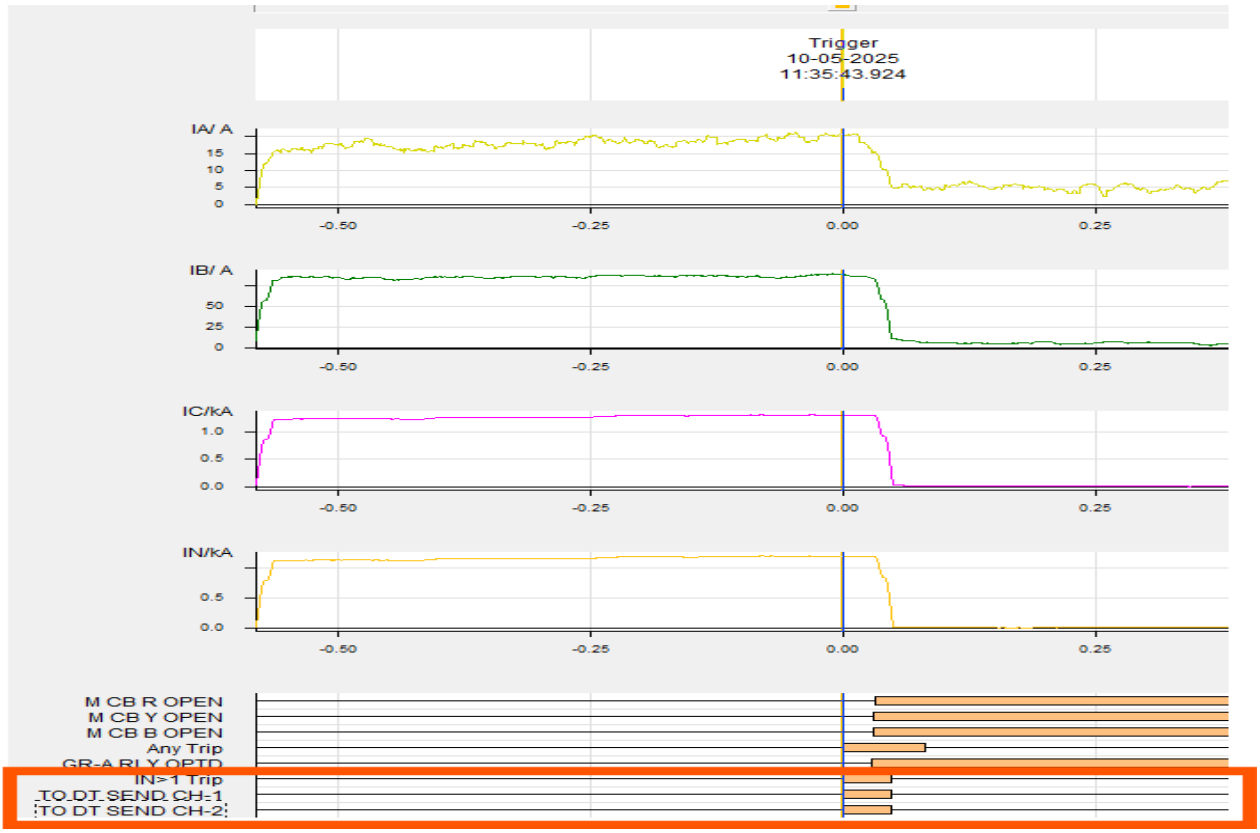


Figure 3: DR of Rangpo-Dikchu at Rangpo

- 400kV Rangpo-Dikchu tripped at 11:35:44 Hrs.
- 400kV Dikchu S/s became dead.
- At this time schedule of Dikchu was Zero so no generation loss reported.
- 400 kV Rangpo-Dikchu charged at 12:57 Hrs.

Event 2: At 12:52 Hrs on 22/05/2025:

- Prior to the disturbance Dikchu was connected to 400kV Dikchu-Rangpo #1 and 400kV Dikchu-Rangpo #2 (Bypassing Teesta-III).
- Generation of Dikchu was around 103 MW.
- At 12:51:47 Hrs high resistive fault occurred in 400kV Dikchu-Rangpo #2 (Bypassing Teesta-III) and fault was feeding from Dikchu through 400/132kV ICT.
- After 1200 msec, **at 12:51:48:562 Hrs** 400/132kV ICT at Dikchu tripped on O/C earth fault protection.
- Due to 400/132 kV ICT tripping, Dikchu unit#1 & 2 tripped on Over frequency/Overspeed.
- **Generation loss of 103 MW occurred at Dikchu**.
- Further fault was feeding from Rangpo end and after 1.5 sec O/C directional earth fault operated at Rangpo and DT send to Dikchu end.
- At 12:51:50 Hrs 400kV Dikchu-Rangpo #2 (Bypassing Teesta-III) tripped from both end and fault got cleared.

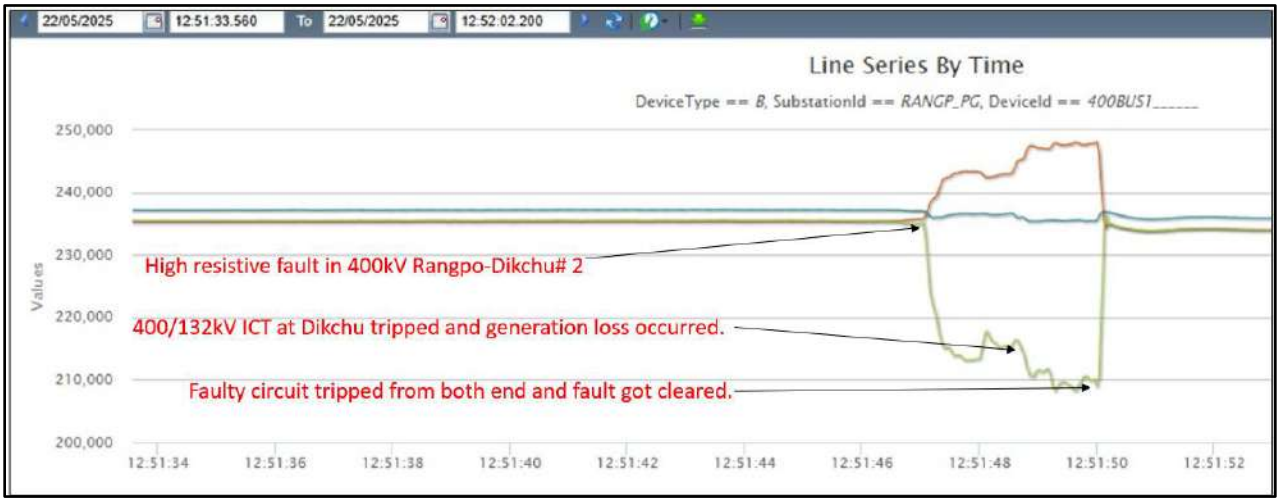
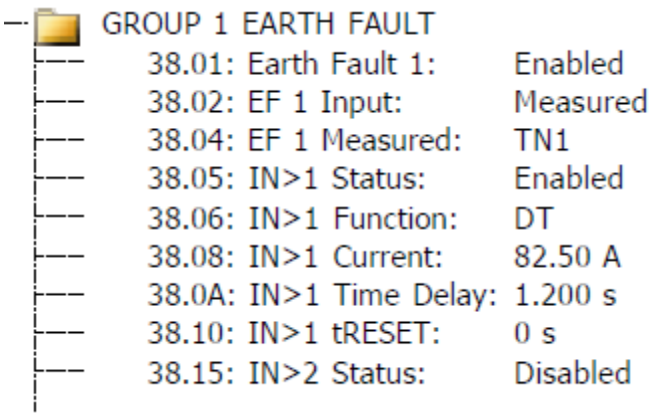


Figure 4: PMU of voltage at Rangpo

- 400kV Rangpo-Dikchu #2 charged at 17:13 Hrs and Dikchu Unit#1 & 2 synchronized at 13:26 Hrs and 13:27 Hrs respectively.

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

- **Earth Fault setting of ICT at Dikchu S/s:**



- For 400/132kV 270 MVA ICT, Current pick-up value is 82.50 A, which is below 20% of rated current (675*0.20=135 A) of ICT.
- Earth Fault scheme set as Definite Time Delay with 1.2 Sec time delay.
- Earth fault current pick up value for ICT to be revised and kept **at least 20-30 % of rated current.**
- Earth fault scheme should be **IDMT type** and TMS setting should be co-ordinated in such a way so that for a fault at HV side, line should clear the fault first, so operation time of ICT to be kept higher than the time taken by line protection to clear the fault.
- DEF Protection should have operated at Dikchu end, It took more than 3 seconds to clear the fault that too from Rangpo end so you are requested to check DEF protection settings and revise it accordingly for faster clearance of fault.

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

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):

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

Event 1: At 11:35 Hrs on 10/05/2025:

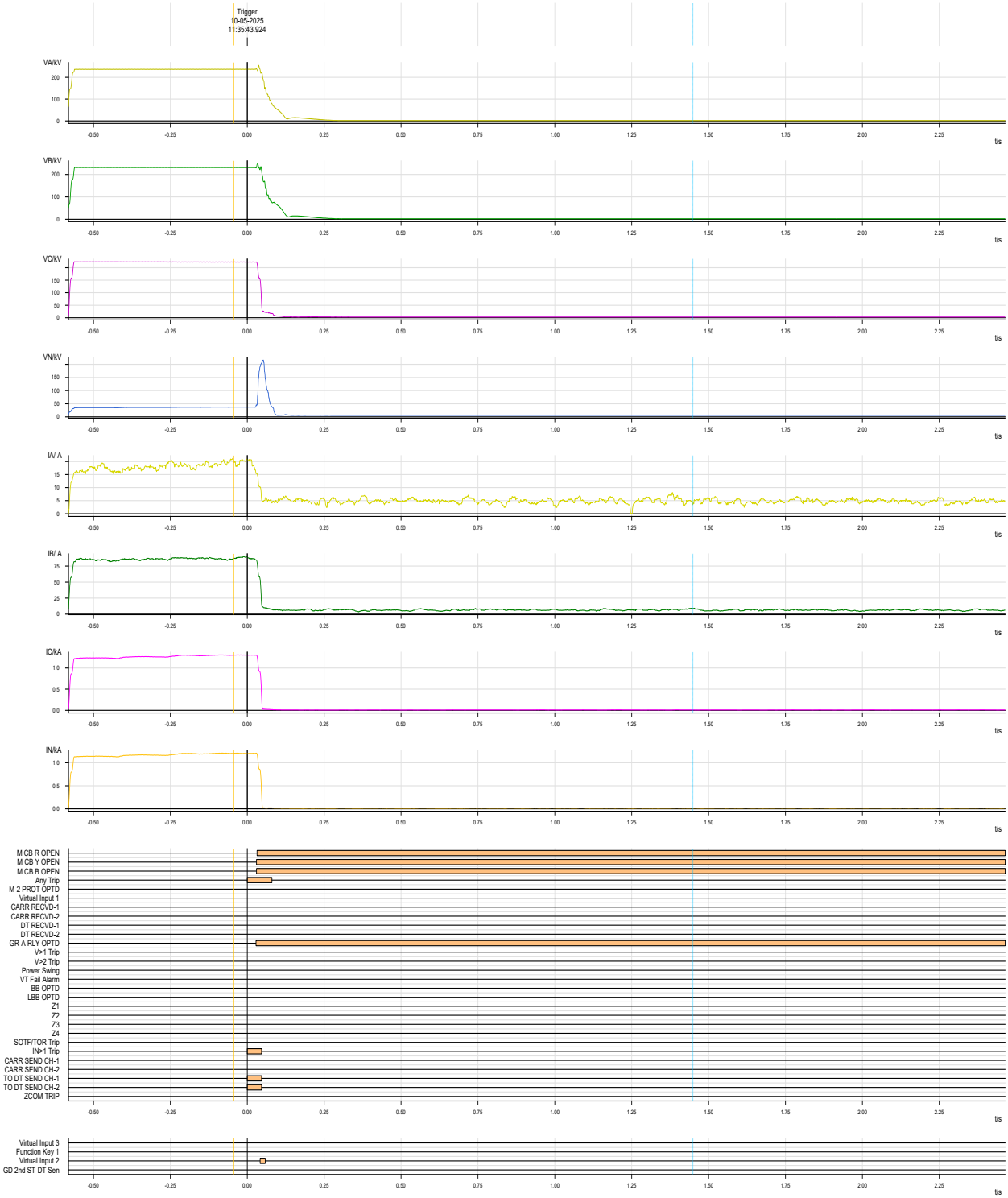
TIME	MILLI_SEC	STATION	DESCRIPTION	STATUS
10-05-2025 11:35	650	DKCHU_PG	132/11_Xfmr1_Pri_CB	Open
10-05-2025 11:35	954	RANGP_PG	400_DIKCHU_PG_CB	Open

Event 2: At 12:52 Hrs on 22/05/2025:

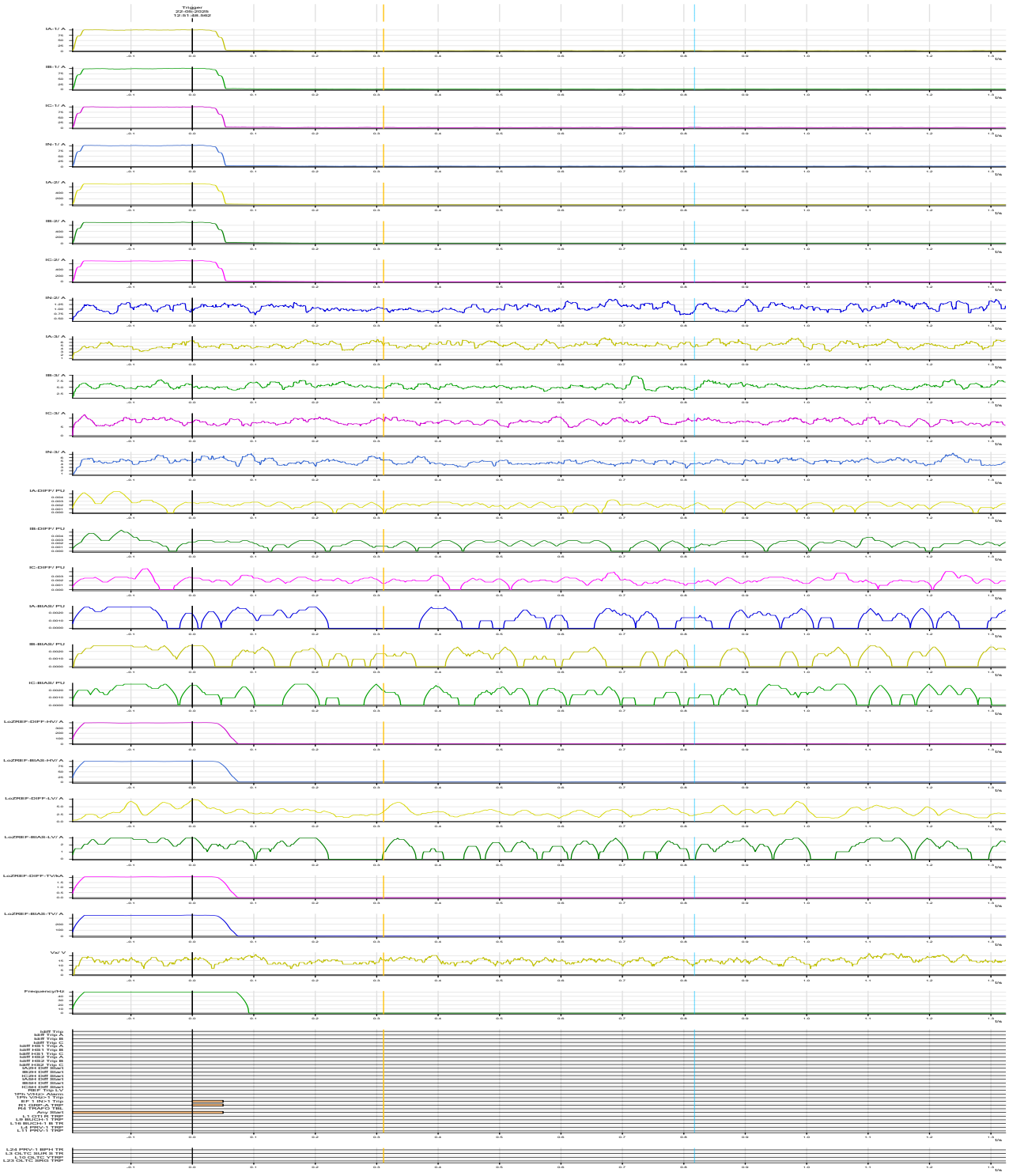
TIME	MILLI_SEC	STATION	DESCRIPTION	STATUS
22-05-2025 12:51	369	DKCHU_PG	132_ICT_1_Sec_CB	Open
22-05-2025 12:51	31	RANGP_PG	400_DKCHU_PG_2_CB	Open
22-05-2025 12:51	229	DKCHU_PG	132_UNIT_H_2_CB	Open
22-05-2025 12:51	269	DKCHU_PG	132_UNIT_H_1_CB	Open

Annexure 2:

DR of 400 Rangpo-Dikchu at Rangpo:



DR of 400/132kV ICT at Dikchu:



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[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
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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): 23-05-2025

1. Event Summary (घटना का सारांश):

Event 1: At 20:09 Hrs on 10/05/2025:

At 20:09 Hrs on 23-05-2025, Total Power Failure occurred at 400KV Mejia due to operation of bus differential protection of both the 400kV main buses while performing bus change operation on GT 8. 400kV Mejia S/s became dead. Total generation loss of 962 MW occurred at Mejia S/s. 400kV Main bus #1 was restored at 21:46 hrs on 23/05/25 after extending power through 400 KV Mejia Maithon ckt 1.

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

At 20:09 Hrs on 23/05/2025

3. Event Category (ग्रिड घटना का प्रकार)

Grid Disturbance (GD)-1

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation in MW	Regional Demand in MW	State Generation in MW	State Demand in MW
				DVC	DVC
Pre-Event (घटना पूर्व)	50.026	32408	27015	5725	3111
Post Event (घटना के बाद)	50.021	31446	27015	4763	3111

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)	NA
Weather Condition (मौसम स्थिति)	Normal

6. Load and Generation loss (लोड और जेनरेशन हानि): 962 MW

7. Duration of interruption (रुकावट की अवधि): 1 Hour and 37 Minutes

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

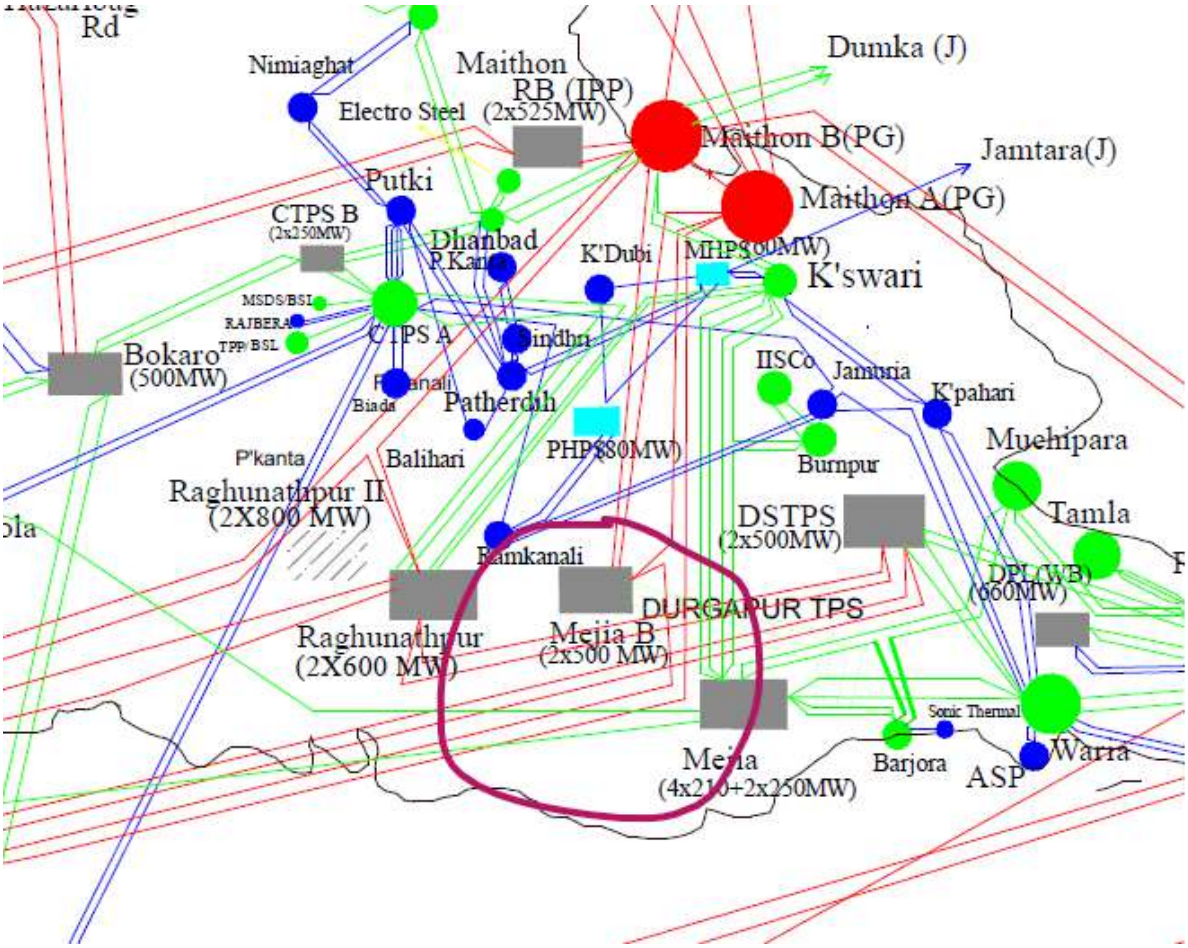


Figure 1: Network across the affected area

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	400KV MAIN BUS - 1 AT MEJIA-B	20:09	Bus bar differential protection operated.		21:46
2	400KV MAIN BUS - 2 AT MEJIA-B		Bus bar differential protection operated.		13:26
3	400KV-MAITHON-MEJIA-1		Tripping due to bus bar differential protection	DT RECEIVED AT Maithon	13:27
4	400KV-MAITHON-MEJIA-2		Tripping due to bus bar differential protection	DT RECEIVED AT Maithon	17:13
5	400KV-MAITHON-MEJIA-3		Tripping due to bus bar differential protection	DT RECEIVED AT Maithon	
6	400KV-JAMSHEDPUR-MEJIA-1		Tripping due to bus bar differential protection	DT RECEIVED AT JAMSHEDPUR	
7	MEJIA -UNIT 7		Tripping due to bus bar differential protection		
8	MEJIA -UNIT 8		Tripping due to bus bar differential protection		

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

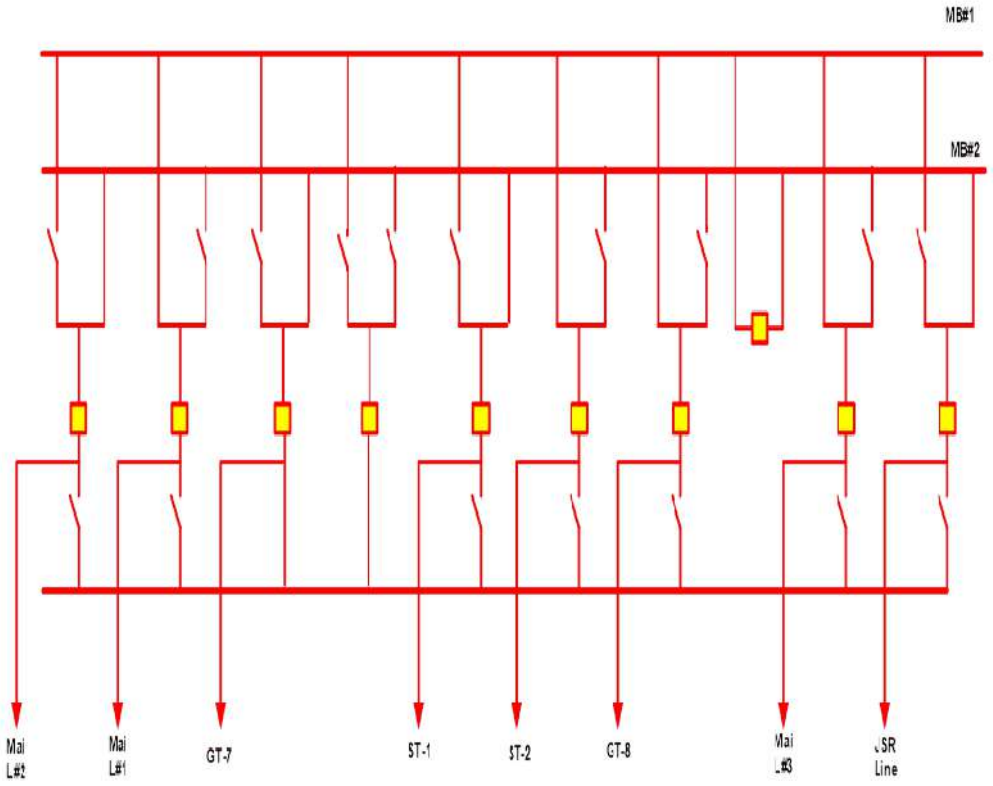


Figure 2: Bus-Configuration at 400 KV Mejia B at the time of incident

After going through site information,,SCADA logs,DR and PMU ,the occurrences are constructed as follows

- Oil pressure A/R Lock out appeared in GT 7 Circuit Breaker at 18.53hrs.
- On physical inspection huge oil leakage found in the said breaker.
- GT 7 was to be diverted through transfer bus-Coupler breaker on Main Bus 2 however due to problem in Main Bus 2 isolator of Bus-Coupler bay, GT 7 was connected to Main Bus 1 through transfer Bus-Coupler breaker.
- After diverting GT#7 to Bus-Coupler, for even bus loading it was decided to changeover Unit 8 from Main Bus#1 to Main Bus#2.
- Process of transferring GT 8 to Main Bus 2 began. Main Bus 2 isolator status for GT8 appeared as closed in SAS. So open command was given to the Main Bus#1 isolator of GT 8.
- While opening the MB#1 isolator huge sparking appeared in the switchyard and bus differential protection operated causing tripping of both the buses.
- Upon investigating the switchyard, it was found that Y-Phase Main Bus#2 isolator was not properly closed.

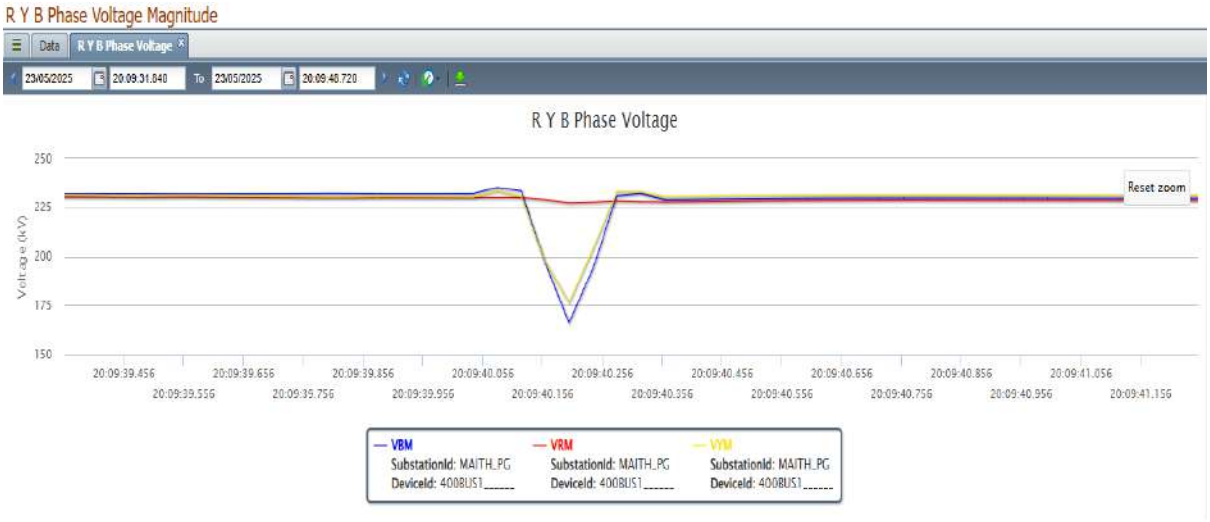
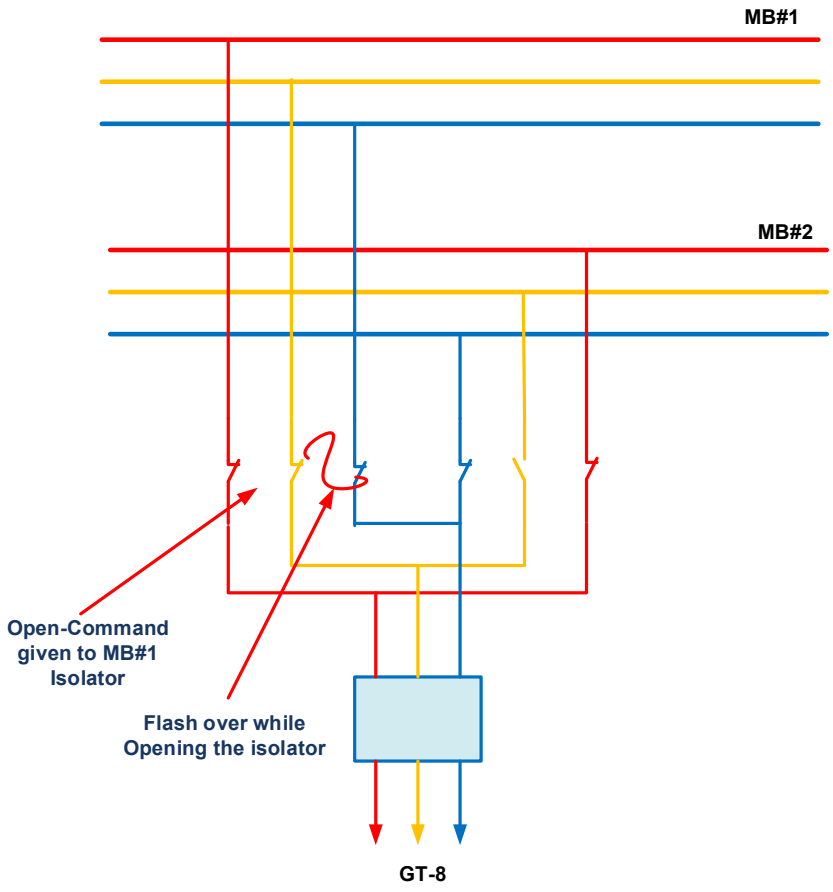


Figure 2: Fault clearing as seen in PMU



Situation when fault occured

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

- Main and tie CB trip signal is not configured in DR channel at Maithon end for Mejia maithon ckt 3

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

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):

- For proper surveillance of isolator contacts, visual monitoring system through camera needs to be installed. Installation and commissioning of camera in 400 KV switchyard of MTPS may be taken up.
- Such type of isolator malfunctioning occurred due to improper operation of isolator. Proper checking of bus side isolators can be done during Main bus shutdown only. All bus side isolators shall be checked during annual winter maintenance once in a year by taking main bus shutdown.

Annexure 1: (Sequence of Events-As per ERLDC SCADA): Not available at ERLDC

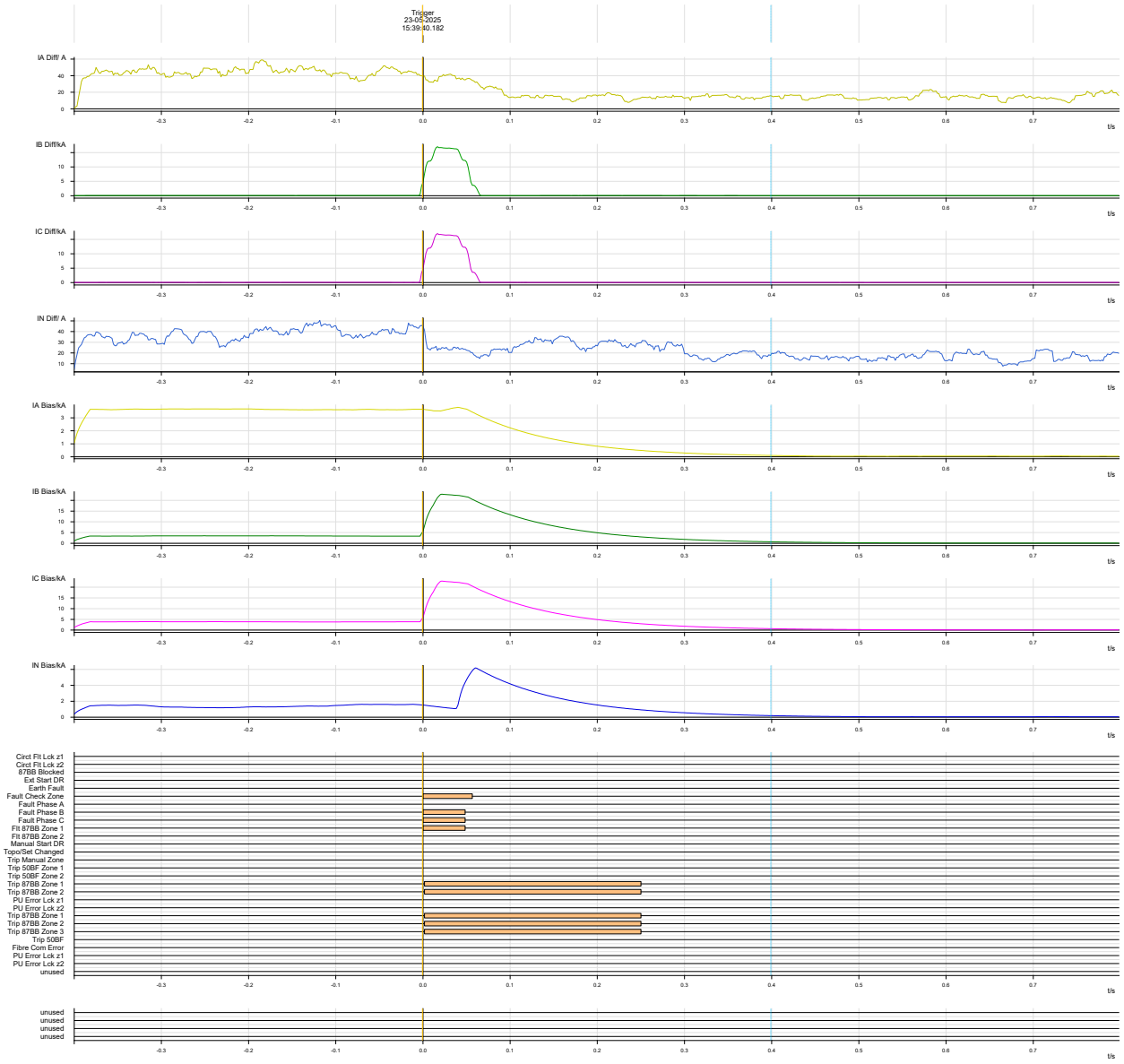
SOE in site-

SL NO	DATE	TIME	EVENTS
1	23.05.2025	18:53:21:548	GT-1 AR LOCKOUT
2	23.05.2025	19:29:26:908	GT-1 89D CLOSE COMMAND ISSUED FROM SAS
3	23.05.2025	19:29:53:259	GT-1 CLOSING LOCK OUT OIL PRESSURE
4	23.05.2025	20:00:15:448	TRANSFER BUS COUPLER 89A CLOSED
5	23.05.2025	20:02:45:924	GT-1 BAY NORMAL MODE RESET
6	23.05.2025	20:02:45:925	GT-1 BAY INTER MODE SET
7	23.05.2025	20:08:13:936	GT-2 _89 B CLOSE COMMAND ISSUED

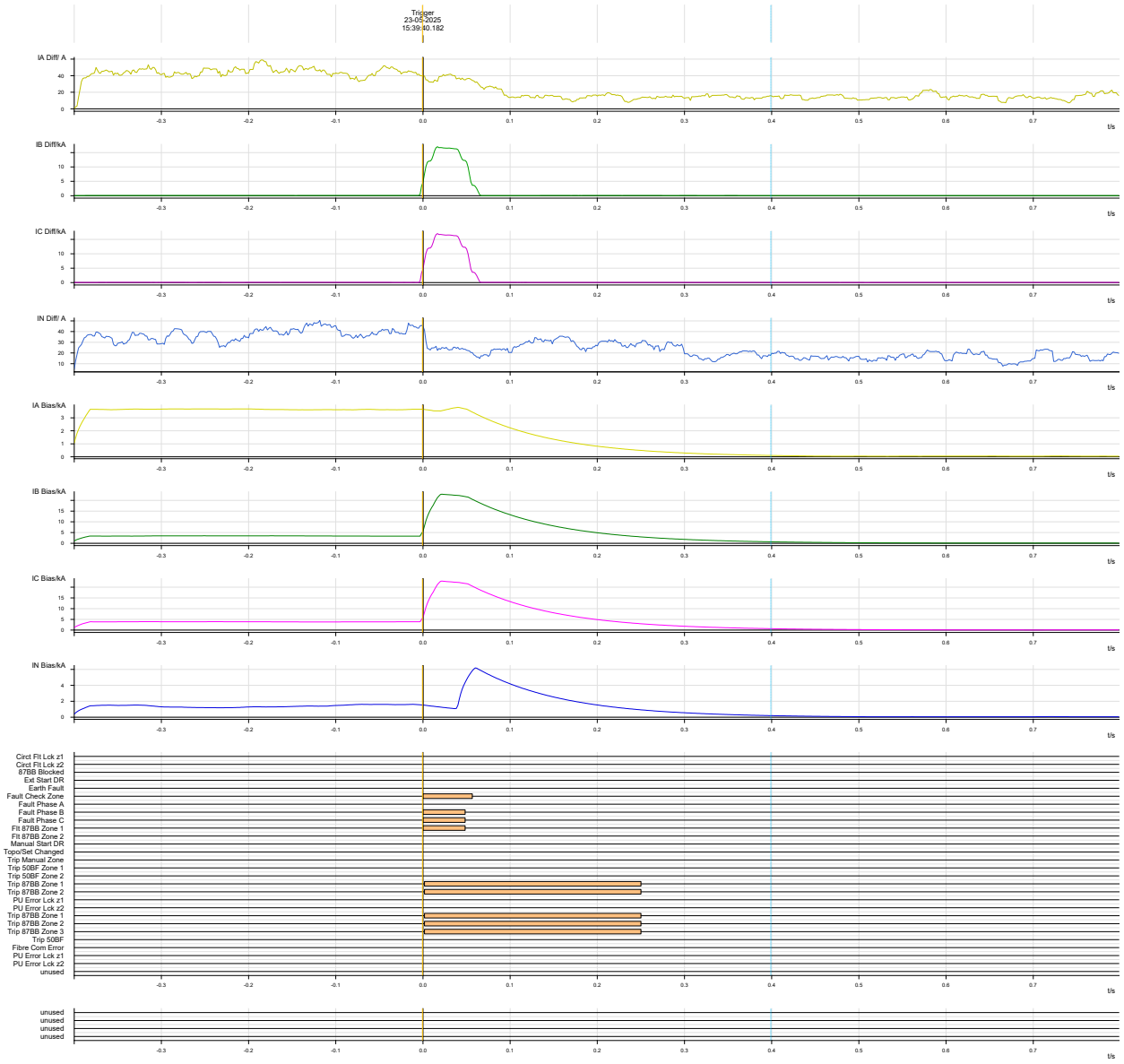
8	**23.05.2025**	**20:08:20:538**	**GT-2 89 B CLOSED**
9	**23.05.2025**	**20:09:25:325**	**GT-2 89A OPEN COMMAND ISSUED**
10	**23.05.2025**	**20:09:40.181**	**BB-Protection Operated**
11	**23.05.2025**	**20:09:40:211**	**TRIP LOCKOUT OIL PRESSURE ALARM**
12	**23.05.2025**	**20:09:40:217**	**TRIP LOCKOUT SF6/OIL/N2 ALARM**
13	**23.05.2025**	**20:09:40:224**	**GT-1 CIRCUIT BREAKER B-PHASE OPENED**
14	**23.05.2025**	**20:09:40:241**	**GT-1 CIRCUIT BREAKER Y-PHASE OPENED**
15	**23.05.2025**	**20:09:40:241**	**GT-1 CIRCUIT BREAKER R-PHASE OPENED**
16	**23.05.2025**	**20:09:40:241**	**GT#2 CB OPENED**

Annexure 2:

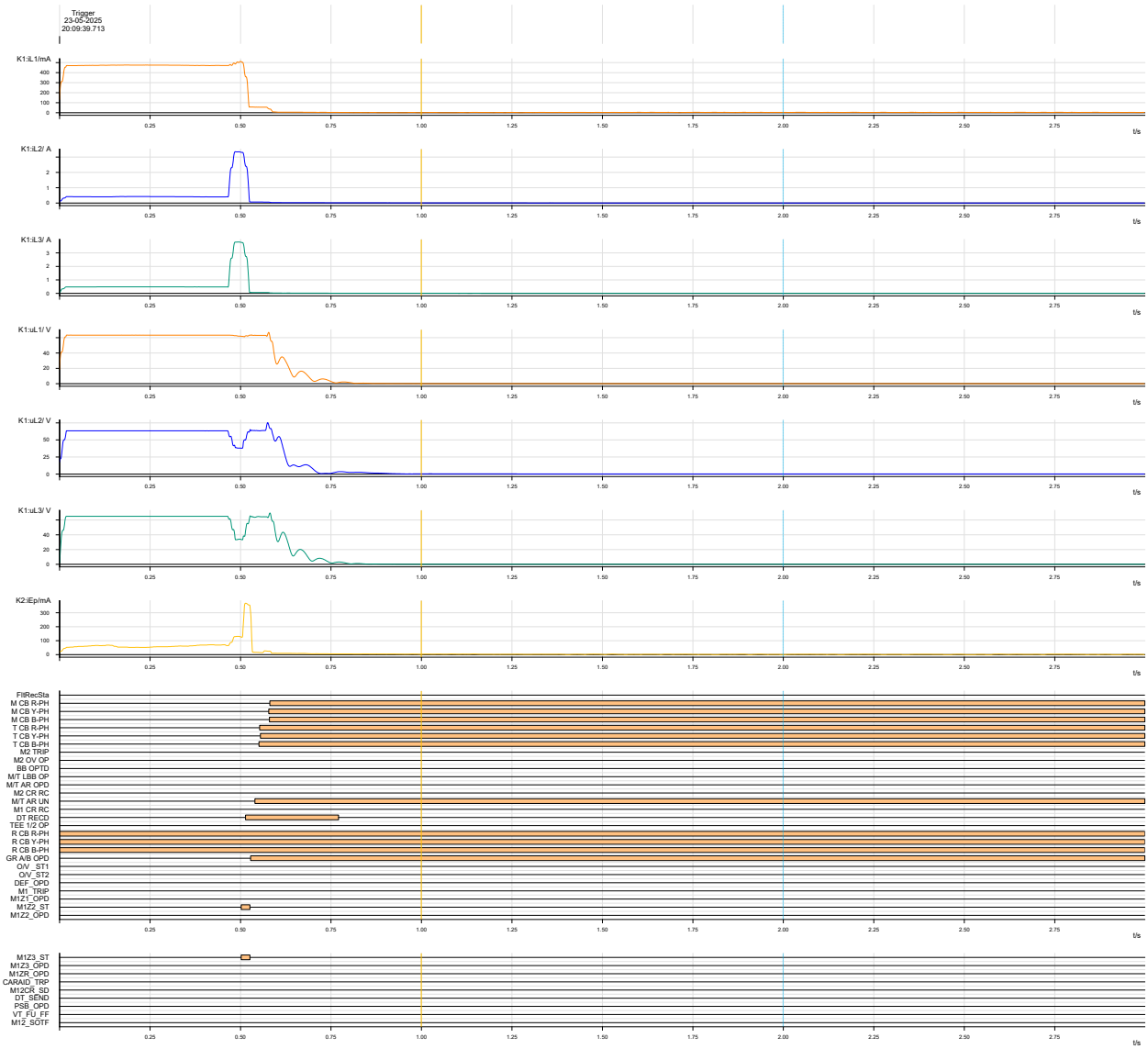
DR of CU of 400 KV Mejia Bus 1



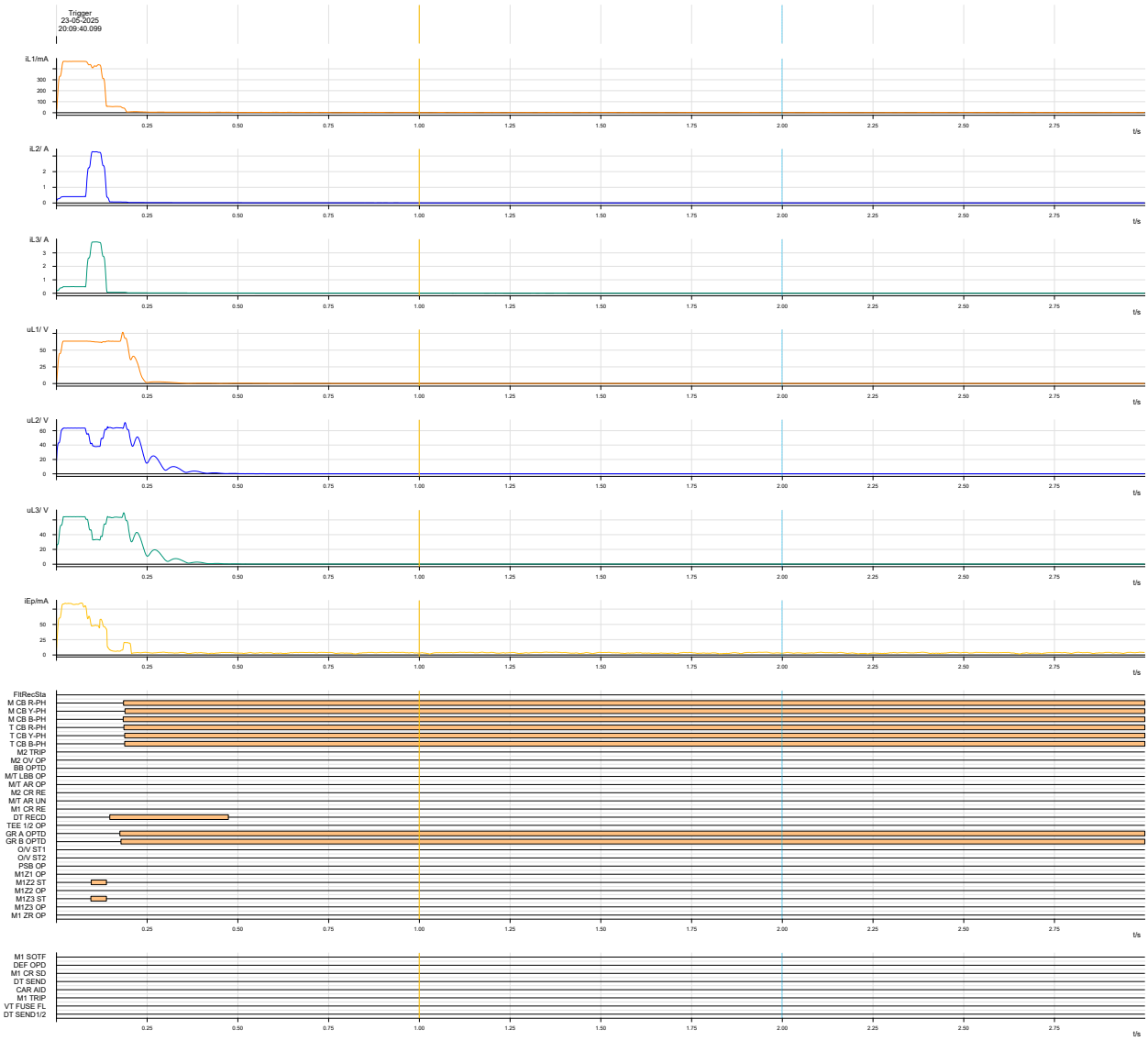
DR of CU of 400 KV Mejia Bus 2



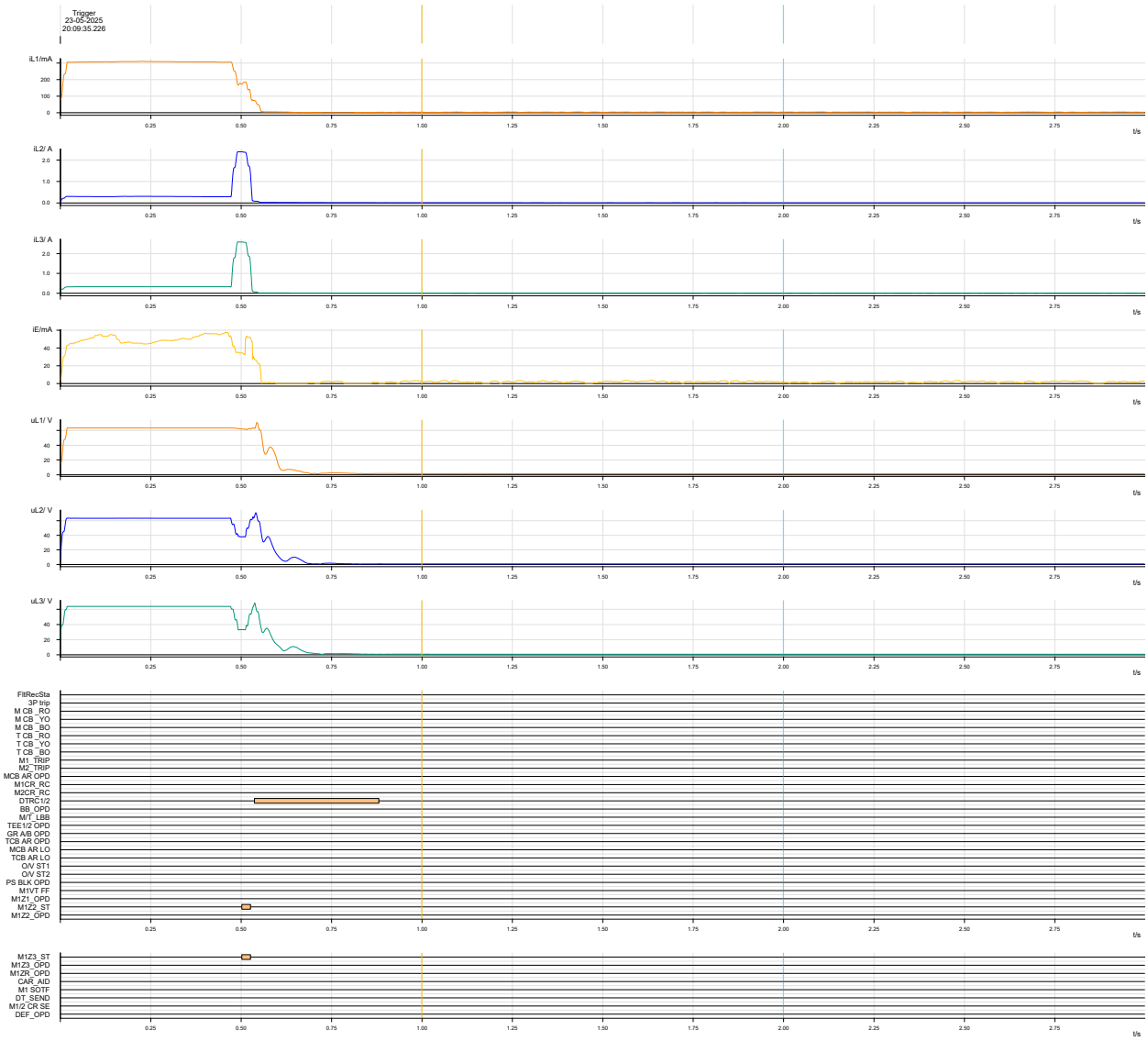
DR of Maithon Mejia line 1 at Maithon end



DR of Maithon Mejia line 2 at Maithon end



DR of Maithon Mejia line 3 at Maithon end



Report and PPT received from DVC is attached as annexure

Annexure 1

Report from DVC on Mejia total power failure

Investigation report on 400KV TPF at MTPS on 23-05-2025

Brief History: - It was reported that TPF occurred at 400KV MTPS on 23-05-2025 at around 20:09 hrs., due to operation of Main#1 & Main#2 bus differential protection while performing bus change operation on GT#8.

Bus Distribution at the time of incidence: -

Bay	Connected to Bus	Bay	Connected to Bus
GT#7	2	GT#8	1
ST#1	2	ST#2	1
Maithon L#2	2	Maithon L#1	1
JSR Line	2	Maithon L#3	1
B/C	1		

SLD is given in Annexure-I

Relay Indications: -

Bay	Relay
GT#7	96
GT#8	96
ST#1	96
ST#2	96
Maithon L# 1	96
Maithon L# 2	96
Maithon L# 3	96
JSR Line	96
Bus-Coupler	96
Bus-Differential Main#1	Zone#1 Trip, Zone#2 Trip
Bus-Differential Main#2	Zone#1 Trip, Zone#2 Trip

Fault Current recorded by the Bus-Differential relay

Relay	R-Ph Current	Y-Ph Current	B-Ph Current
Main#1	38 A	16562 A	16492 A
Main#2	38 A	16520 A	16454 A

Chronology of events as recorded in SAS is given below: -

SL NO	DATE	TIME	EVENTS
1	23.05.2025	18:53:21:548	GT-1 AR LOCKOUT
2	23.05.202	19:29:26:908	GT-1 89D CLOSE COMMAND ISSUED FROM SAS

	5		
3	23.05.2025	19:29:53:259	GT-1 CLOSING LOCK OUT OIL PRESSURE
4	23.05.2025	20:00:15:448	TRANSFER BUS COUPLER 89A CLOSED
5	23.05.2025	20:02:45:924	GT-1 BAY NORMAL MODE RESET
6	23.05.2025	20:02:45:925	GT-1 BAY INTER MODE SET
7	23.05.2025	20:08:13:936	GT-2 _89 B CLOSE COMMAND ISSUED
8	23.05.2025	20:08:20:538	GT-2 89 B CLOSED
9	23.05.2025	20:09:25:325	GT-2 89A OPEN COMMAND ISSUED
10	23.05.2025	20:09:40.181	BB-Protection Operated
11	23.05.2025	20:09:40:211	TRIP LOCKOUT OIL PRESSURE ALARM
12	23.05.2025	20:09:40:217	TRIP LOCKOUT SF6/OIL/N2 ALARM
13	23.05.2025	20:09:40:224	GT-1 CIRCUIT BREAKER B-PHASE OPENED
14	23.05.2025	20:09:40:241	GT-1 CIRCUIT BREAKER Y-PHASE OPENED
15	23.05.2025	20:09:40:241	GT-1 CIRCUIT BREAKER R-PHASE OPENED
16	23.05.2025	20:09:40:241	GT#2 CB OPENED

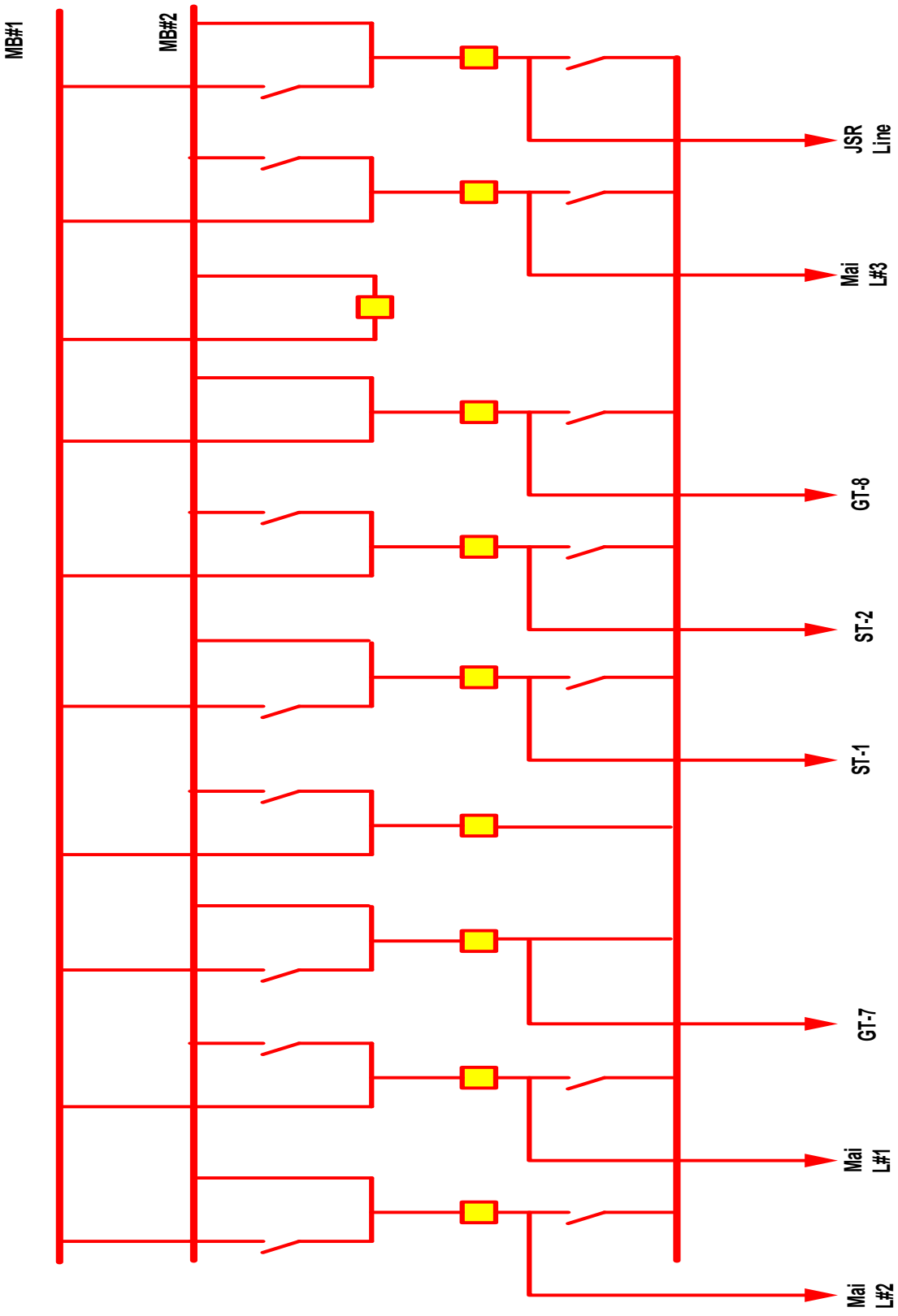
ANALYSIS OF EVENTS

After going through SAS events, the following observations were noted: -

1. Oil pressure A/R Lock out appeared in GT#7 Circuit Breaker at 18.53hrs.
2. On physical inspection huge oil leakage found in the said breaker.
3. GT#7 was to be diverted through Bus-Coupler breaker on Main Bus#2 however due to problem in Main Bus#2 isolator of Bus-Coupler bay, GT#7 was connected to Main Bus#1 through Bus-Coupler breaker.
4. After diverting GT#7 to Bus-Coupler, for even bus loading it was decided to changeover Unit#8 from Main Bus#1 to Main Bus#2.
5. GT#8 was transferred to Main Bus#2. Main Bus#2 isolator status for GT#8 appeared as closed in SAS. After GT#8 was transferred to Main Bus#2, open command was given to the Main Bus#1 isolator of GT#8.

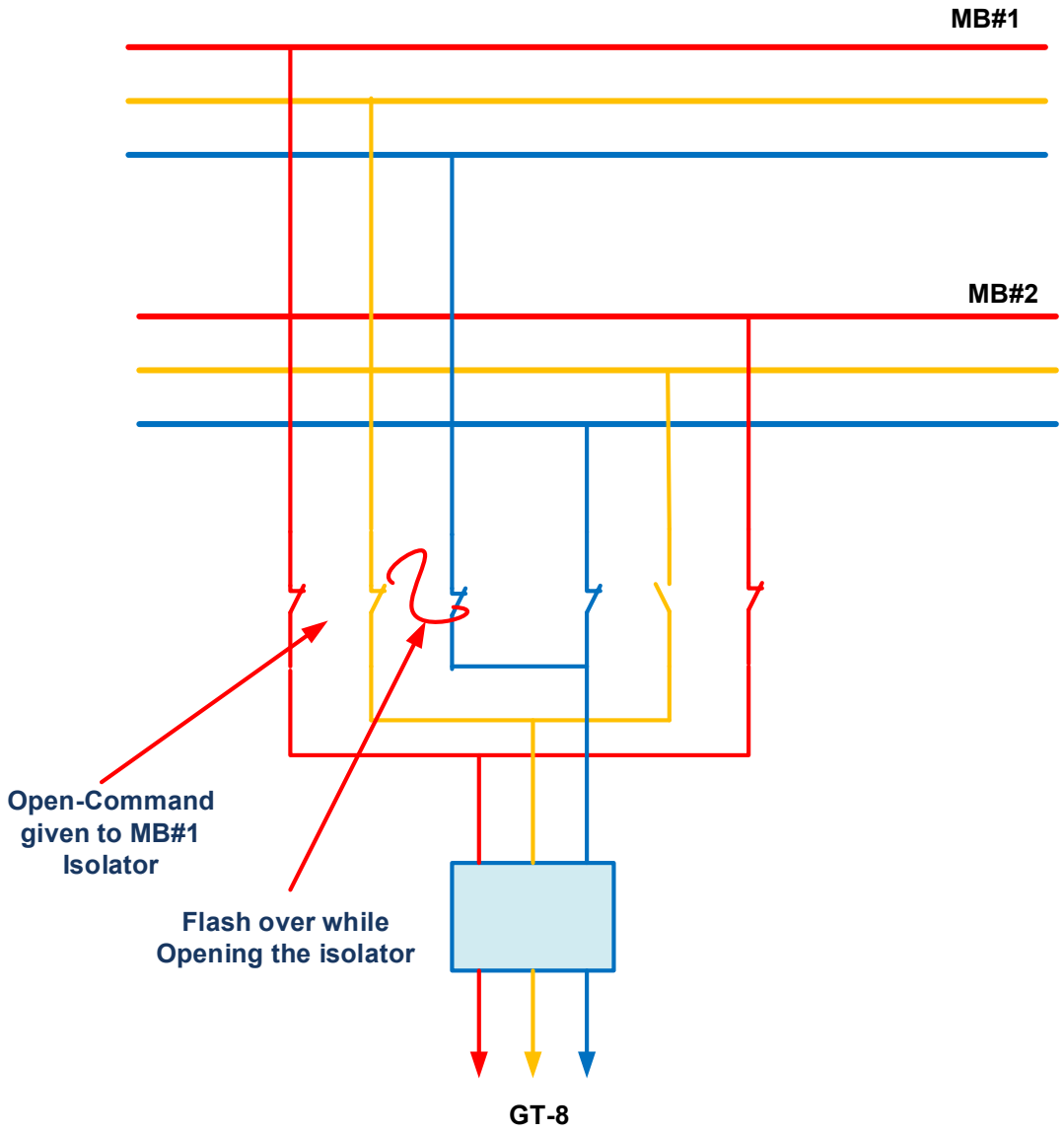
6. While opening the MB#1 isolator huge sparking appeared in the switchyard and bus differential protection operated causing tripping of both the buses.
7. Upon investigating the switchyard, it was found that Y-Phase Main Bus#2 isolator was not properly closed.

Annexure-I
Bus-Configuration at the time of incidence



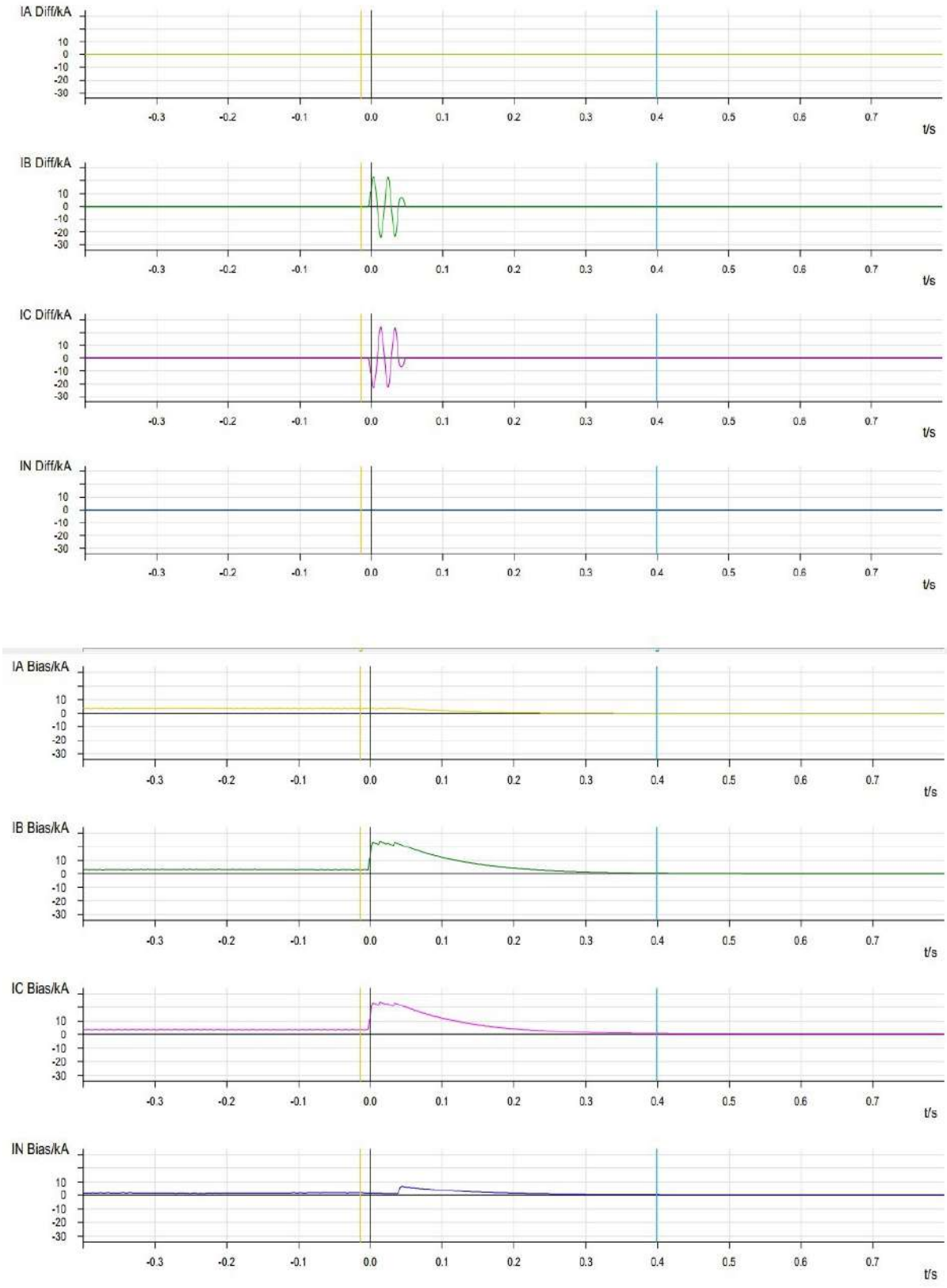
Annexure-II

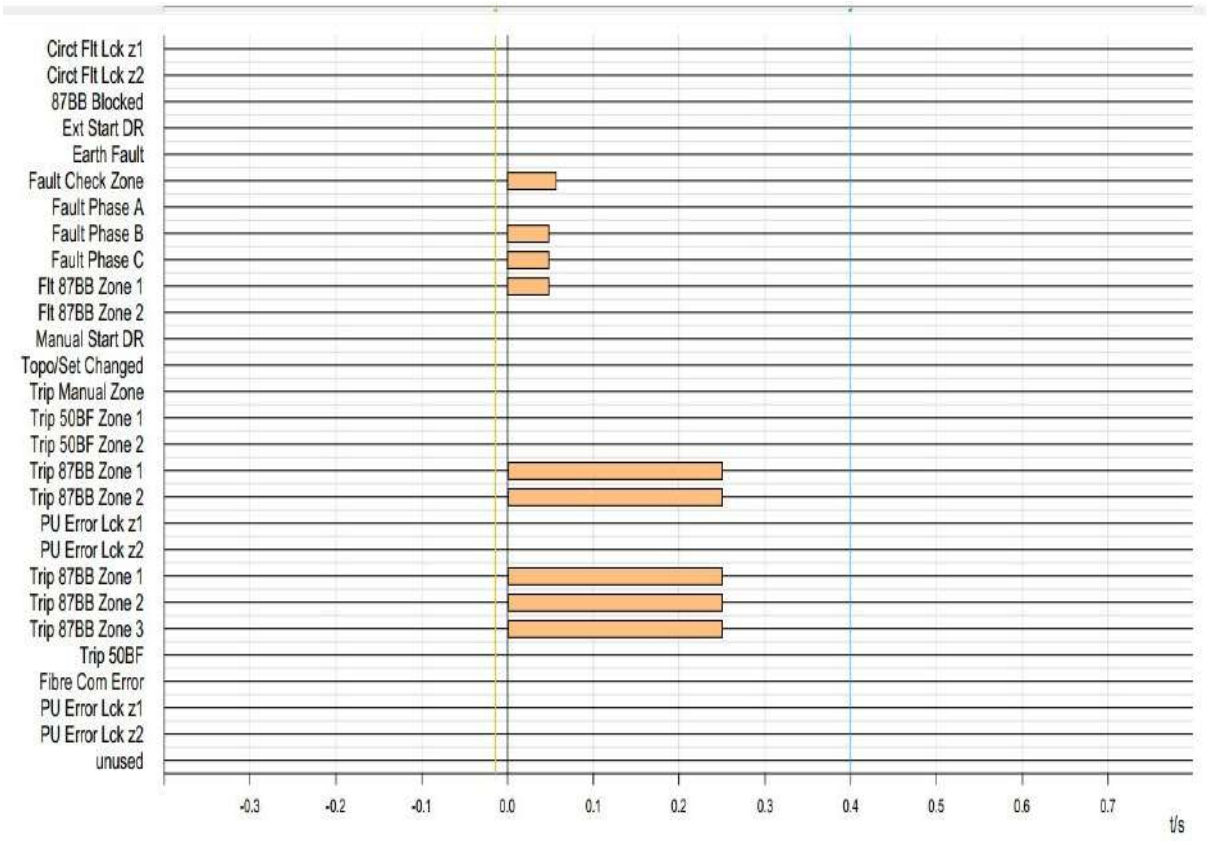
Situation while fault occurred



Annexure-III

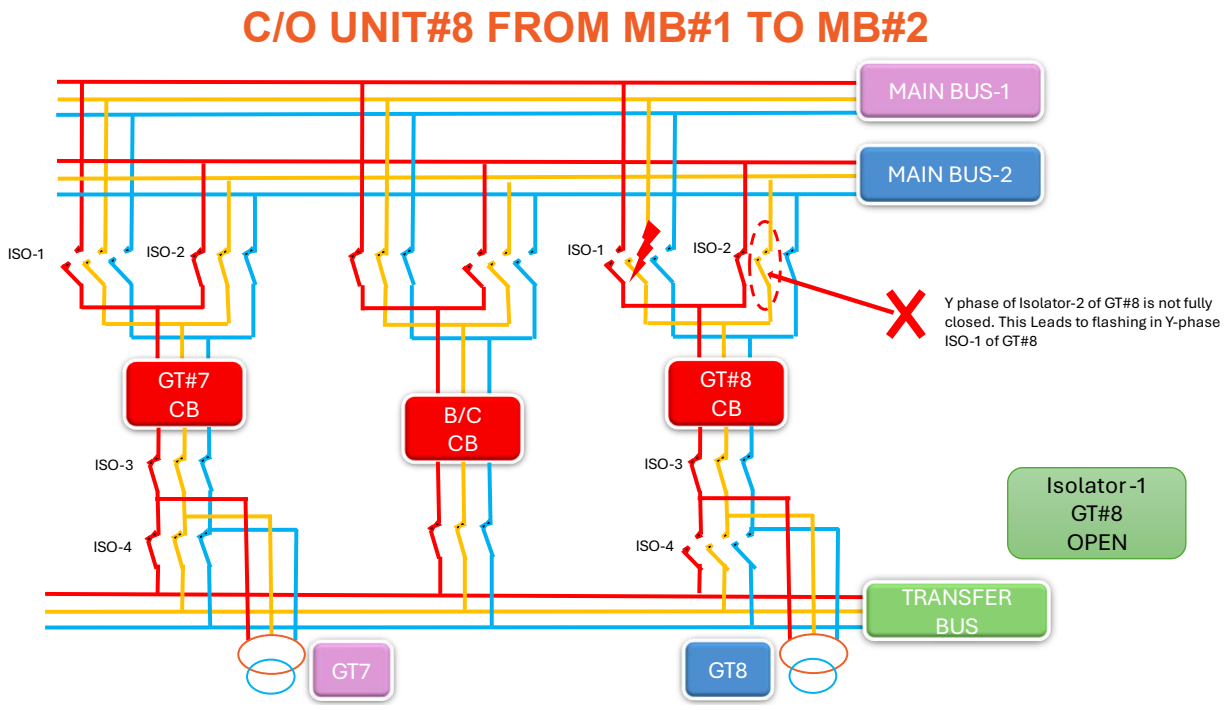
CU Relay DR


IA Diff/kA
IB Diff/kA
IC Diff/kA
IN Diff/kA
IA Bias/kA
IB Bias/kA
IC Bias/kA
IN Bias/kA
10
0
-10
-20
-30
-0.3
-0.2
-0.1
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
t/s

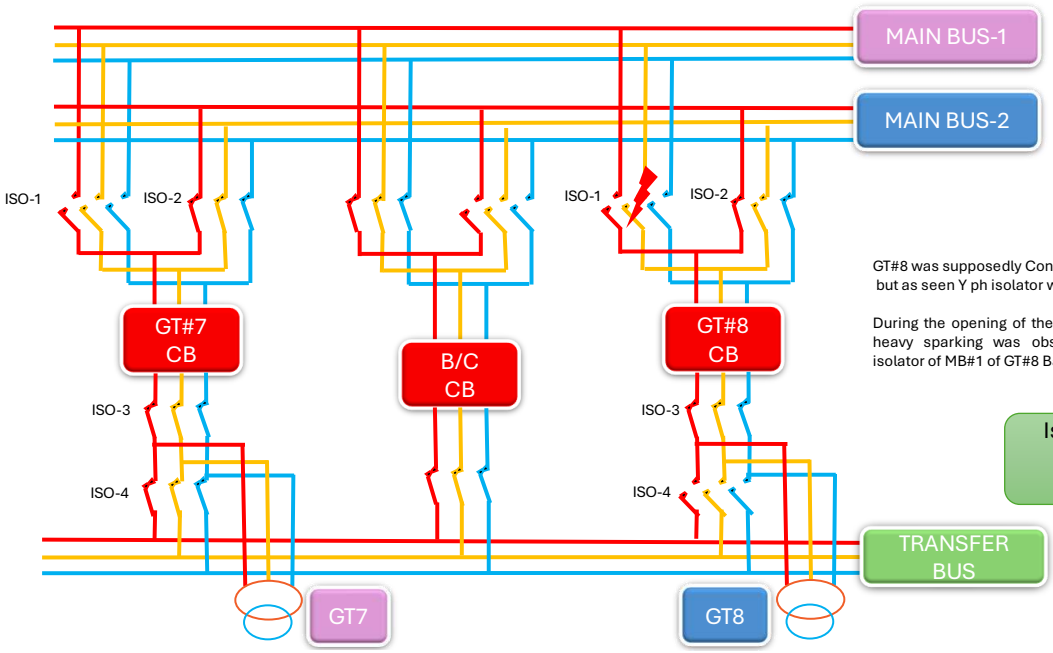


Annexure 2

Slides from DVC presentation showing prime cause of the event



C/O UNIT#8 FROM MB#1 TO MB#2

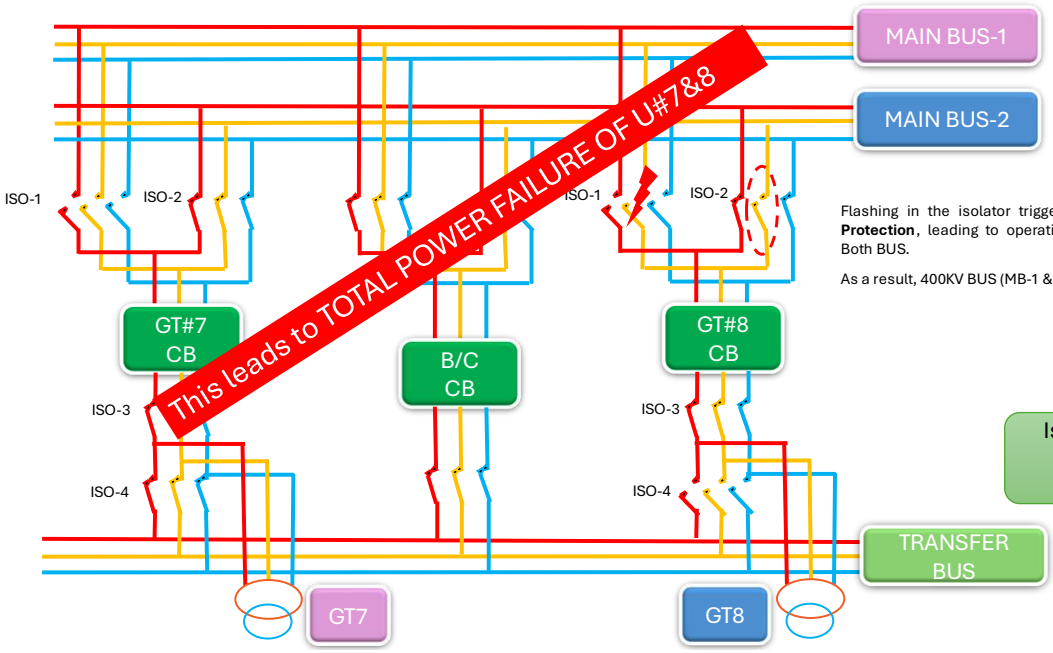


GT#8 was supposedly Connected to Main Bus#2 but as seen Y ph isolator was not actually closed

During the opening of the MB#1 isolator for GT#8, heavy sparking was observed in the Y phase isolator of MB#1 of GT#8 Bay

Isolator -1 GT#8 OPEN

TOTAL POWER FAILURE OF U#7&8



Flashing in the isolator triggered the **Bus Differential Protection**, leading to operation BUSBAR protection of Both BUS.

As a result, 400KV BUS (MB-1 & MB-2) become DEAD.

Isolator -1 GT#8 OPEN

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): 14-06-2025

1. Event Summary (घटना का सारांश):

At 12:07 Hrs on 31/05/2025, 220kV Joda substation became dead due to tripping of all sources, resulting in an approximate load loss of 213 MW. Upon investigation, it was found that the incident was triggered by the bus fault created while changeover of autotransformer 1 from 220 KV Bus 2 to Bus 1 and resulting tripping of all lines in reverse zone.

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

At 12:07 Hrs on 31-05-2025

3. Event Category (ग्रिड घटना का प्रकार)

Grid Disturbance (GD)-1

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation in MW	Regional Demand in MW	State Generation in MW	State Demand in MW
				Odisha	Odisha
Pre-Event (घटना पूर्व)	49.97	21986	27490	1628	6094
Post Event (घटना के बाद)	50.00	21991	27277	1632	5881

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

Important Transmission Line/Unit if under outage	• 100 MVA 220/132 Autotransformer 3

(महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो बंद है)	• 220 KV Joda Telkoi ckt • 132 KV Rourkella Beekay steel ckt was no load charged • 132 KV Turumunga Polasponga ckt no load charged
Weather Condition (मौसम स्थिति)	Normal

6. Load and Generation loss (लोड और जेनरेशन हानि): 213 MW

7. Duration of interruption (रुकावट की अवधि): 31 Minutes

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

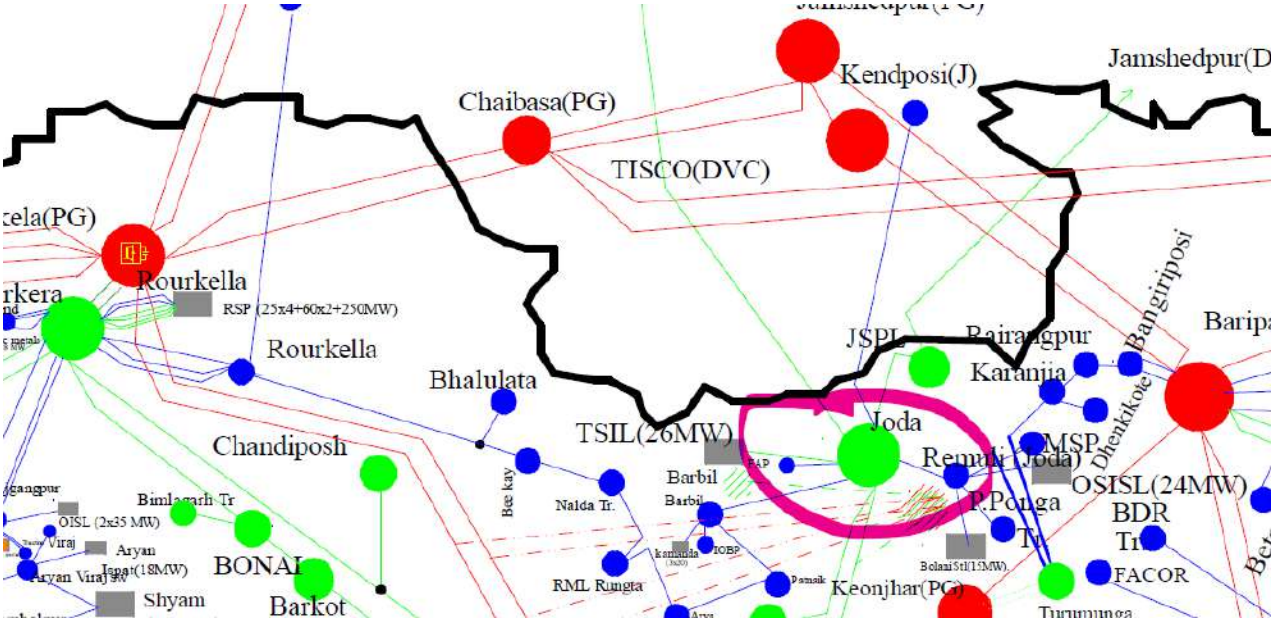


Figure 1: Network across the affected area

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 (Joda)	उप केंद्र 2 रिले संकेत	Restoration time
1	220kv Bus coupler at Joda Joda –Ramachandrapur	12:07	Tripped on overcurrent Earth protection at Joda		NA
2	220kv Joda – Ramachandrapur ckt		Tripped on Z4 at Joda	Tripped on Z2 and master trip	12:38

				(M2) at Ramchandrapur	
3	220kv Joda –TTPS direct ckt		Tripped on Z4	No tripping	12:42
4	220kv Joda –JSPL ckt		No tripping	Tripped on Z1 from Jspl end	17:13
5	220kv Joda –TSL ckt		Hand tripping later	No tripping	NA
6	220kv Joda –TSIL		Hand tripping later	Tripping informed	12:45
7	100 MVA 220/132 Autotransformer 1		Did not trip		12:42
8	100 MVA 220/132 Autotransformer 2		Hand tripping later		12:42
9	132 KV Joda kendposi ckt		Hand tripping later	No trip	12:57

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

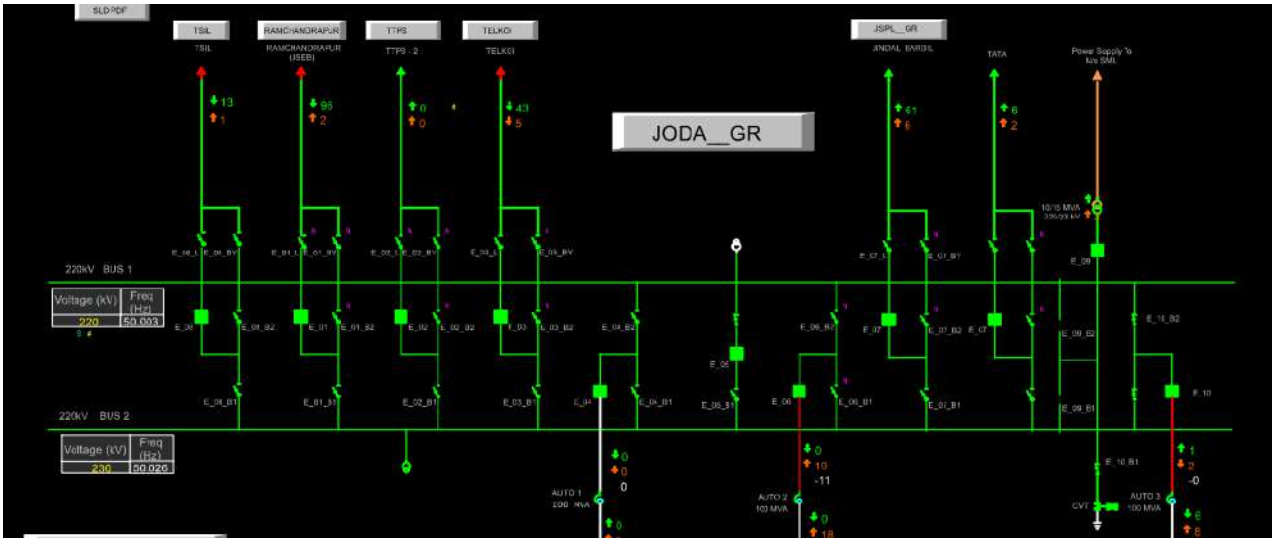


Figure 2: Bus-Configuration at 220 KV Joda at the time of incident

- Prior to the incident, 100 MVA 220/132 Autotransformer 3 and 220 KV telkoi Joda feeder was in off condition.

- It was decided to keep autotransformer in Bus 1 for balanced operation. During Auto TRF-1 change over from Bus-2 to Bus-1 through parallel operation, heavy spark observed in 89A Isolator connected to Bus 2 which might have created the fault.
- From DR, it is seen that Y-B fault is first seen which got evolved to three phase fault.
- Then as no bus bar protection was available 220KV Ramchandrapur fdr tripped on Zone-4 and TTPS-1(direct circuit) tripped on Zone-4 from local end by 300 msec, JSPL tripped on Zone-1 from remote end and fault was cleared.
- Bus Coupler tripped on E/F due to unbalance current flows through BC during paralleling operation of Auto Trf-1 through Isolator 89A .It tripped after 2.5 seconds from initiation of 300 A unbalance current, so arcing might have developed in last 300 msec of it when around 1500 A was seen in other lines. Site confirmed arcing marks were on B ph of 89 A isolator connected to Bus 1 of 100 MVA Autotranformer 1.
- Other feeders like 220 KV TSl and TSIL did not trip.200/132 KV Autotransformer also did not trip due to no source available from 132 KV side.
- TISL feeder was exporting to Joda 220 KV prior to the event. It has been informed that the line was tripped from TSIL end but details of relay is yet awaited.

Figure 2: Fault clearing as seen in PMU

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

- Bus bar protection not operational at Joda
- DR length of bus coupler is 1.8 sec less than 3 sec and not time synchronised.
- Non operation of 220 KV JSPL and TISL feeder in Zone 4
- OPTCL may confirm what led to the arcing development in autotransformer bus 1 side isolator contact in last 300 msec observed within 2500 msec of unbalanced current operation through bus coupler

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

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

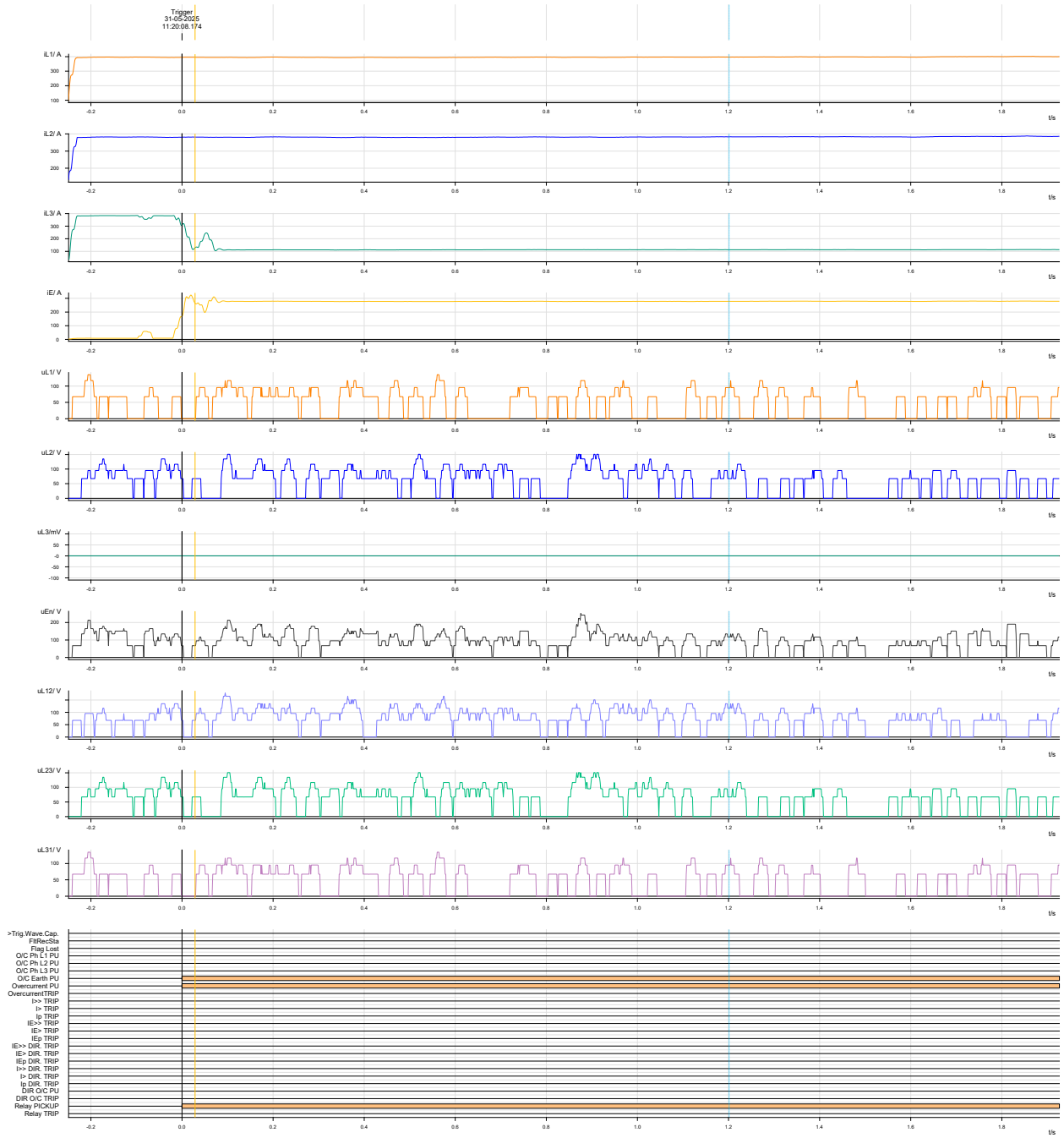
S.No.	Issues	Regulation Non-Compliance	Utilities
1.	**DR/EL not submitted within 24 hours**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**OPTCL**
2	**Report not submitted within 7 days of the incident**	IEGC section 37.2 (c)	**OPTCL**

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

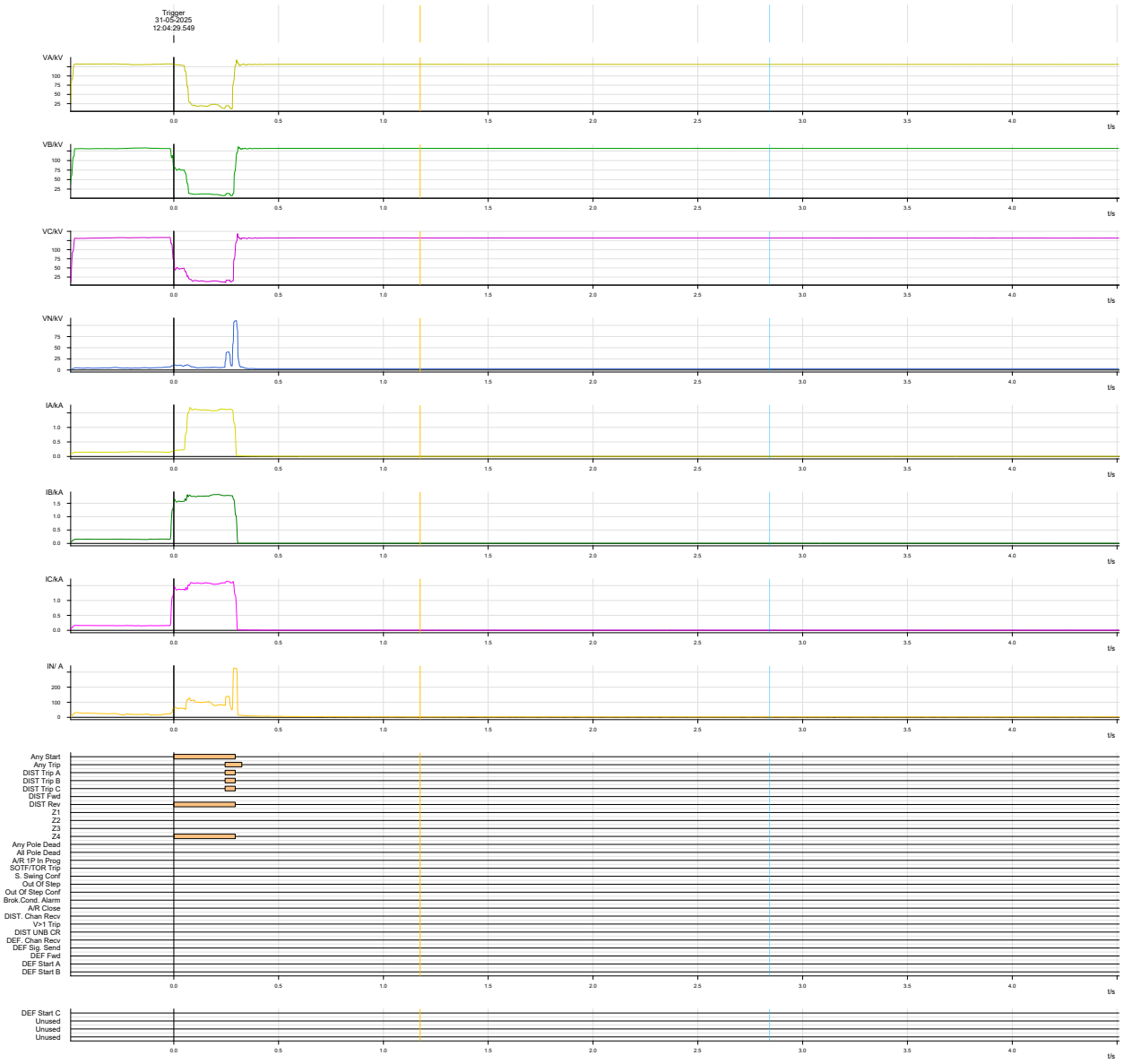
Annexure 1: (Sequence of Events-As per ERLDC SCADA): Not available at ERLDC

Annexure 2:

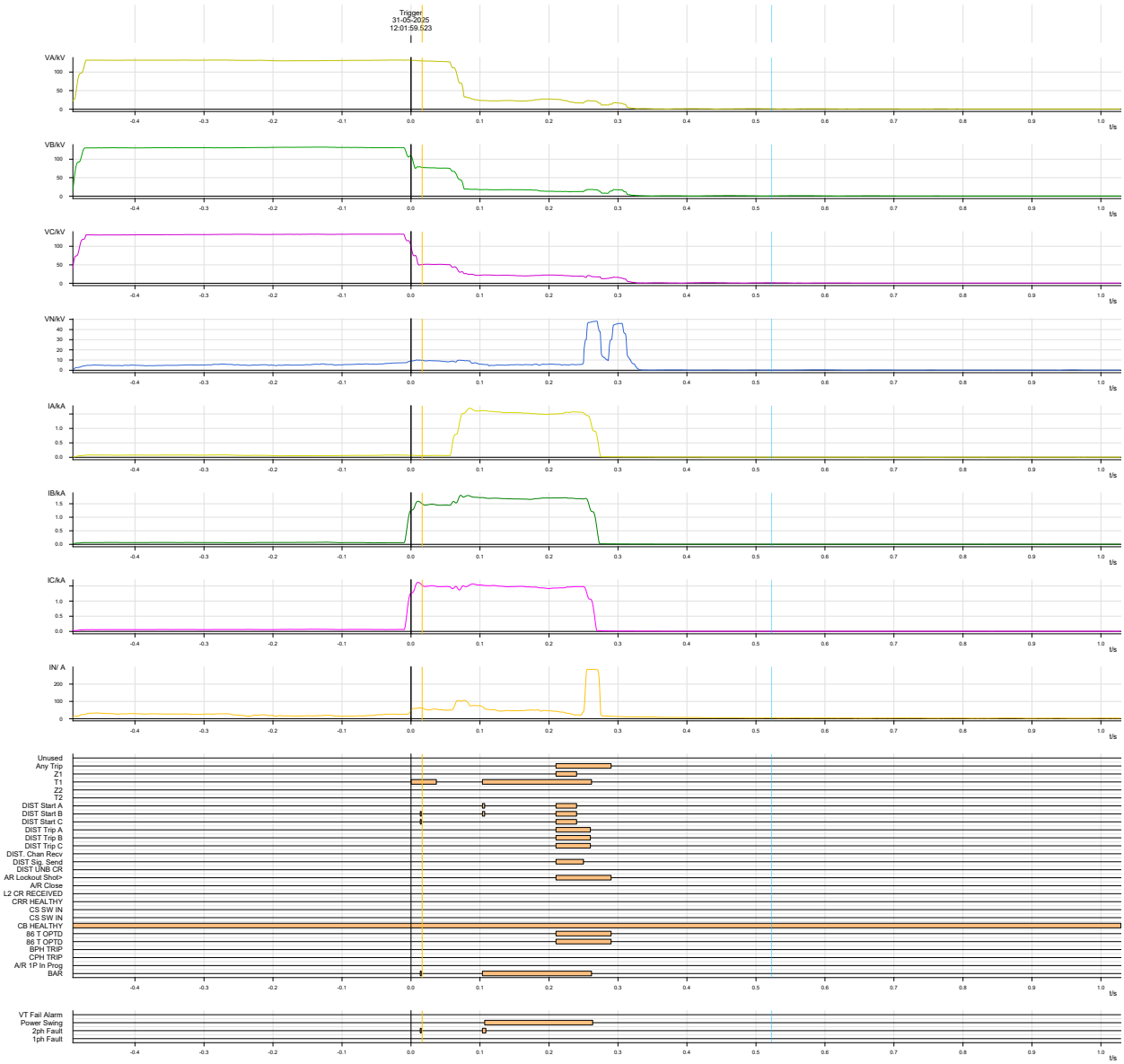
<u>DR of 220 KV Joda Bus coupler</u>



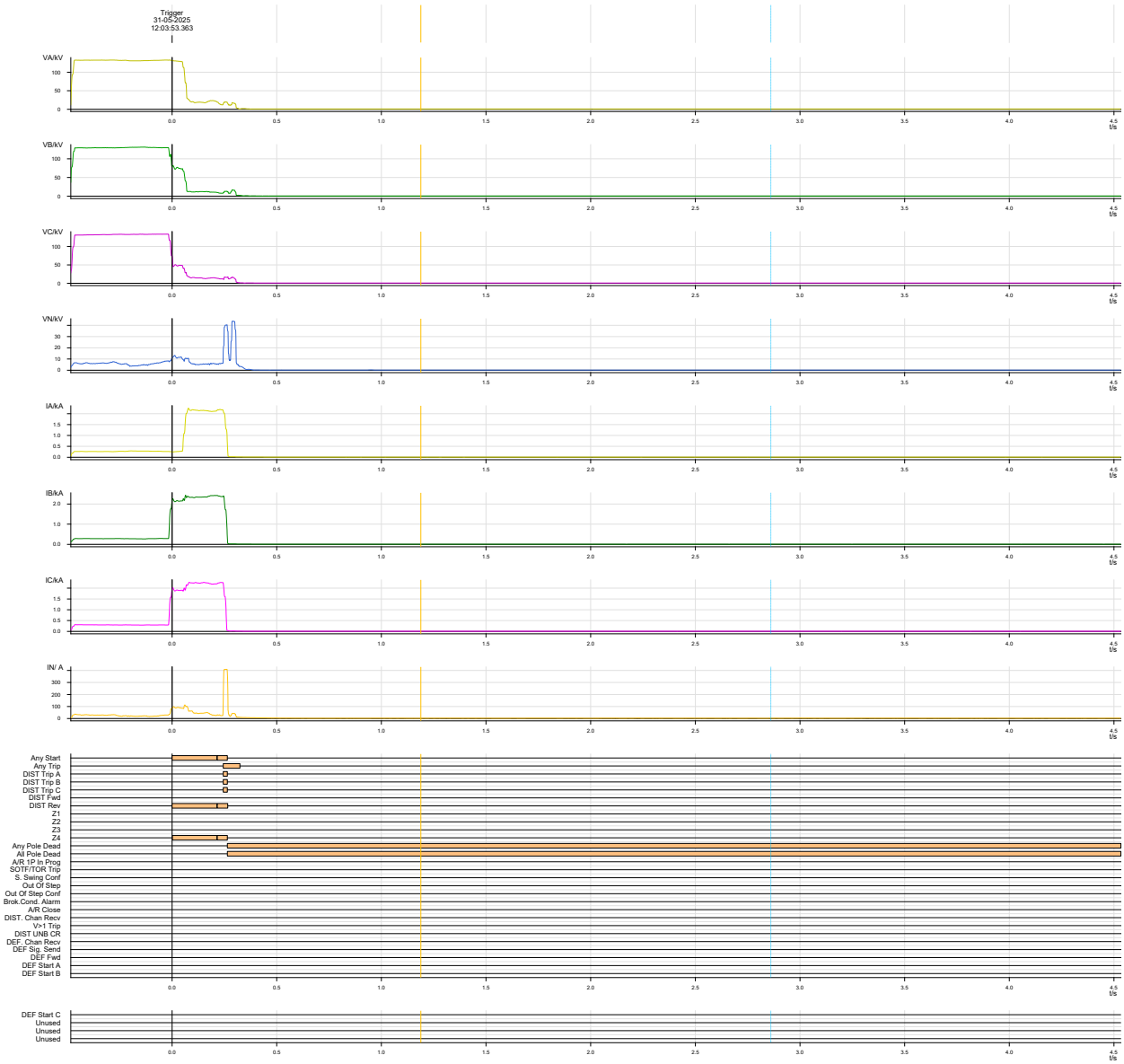
DR of 220 KV Joda TTPS line as Joda end



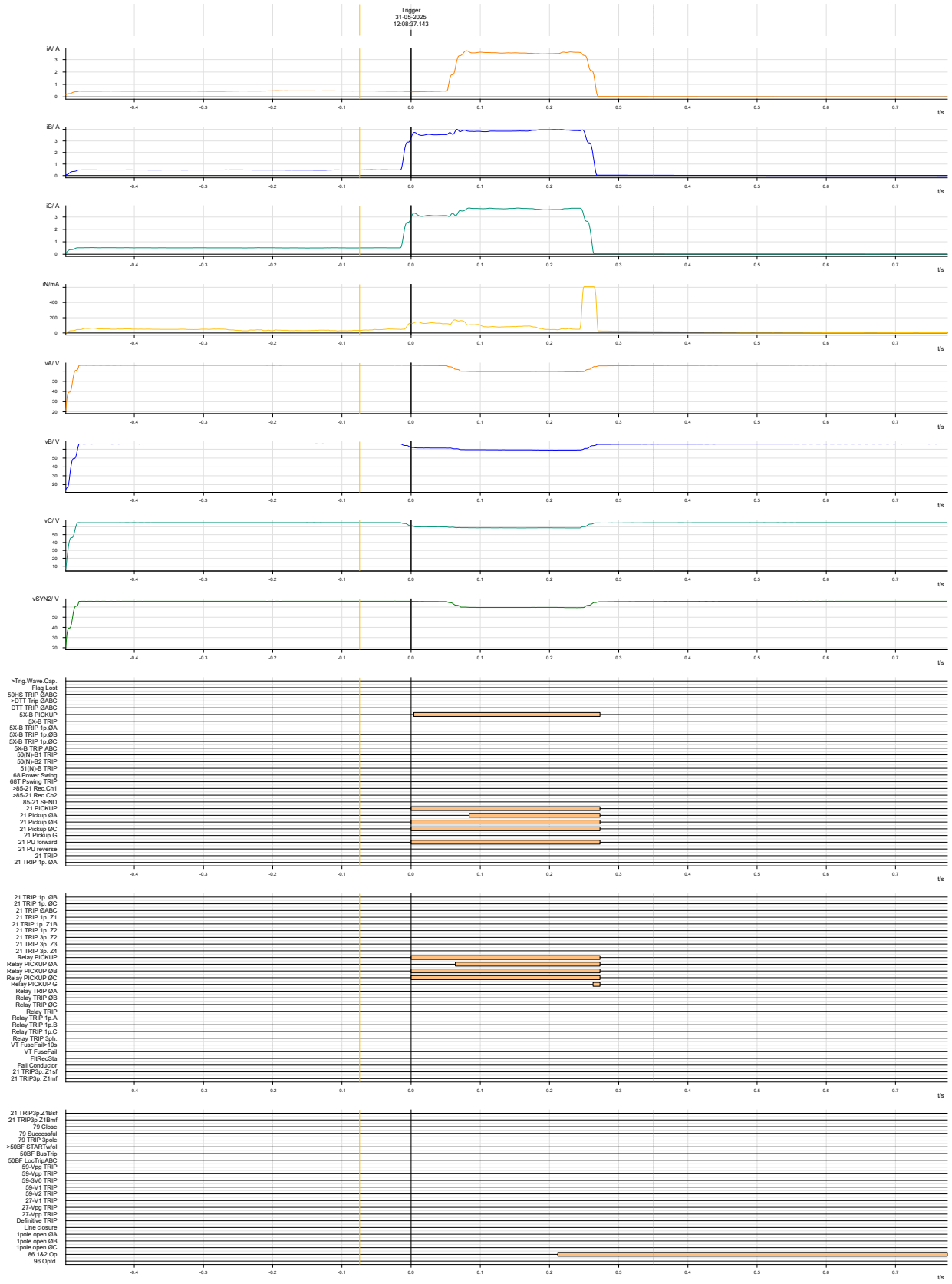
DR of 220 KV Joda JSPL line as JSPL end



DR of 220 KV Ramchandrapur Joda at Joda end



DR of 220 KV Ramchandrapur Joda at Ramchandrapur end


Trigger
31-05-2025
12:08:37.143
iA/ A
iB/ A
iC/ A
iN/mA
vA/ V
vB/ V
vC/ V
vSYN2/ V
t/s
>Trig.Wave.Cap.
Flag Lost
50HS TRIP ØABC
>DTT Trip ØABC
DTT TRIP ØABC
5X-B PICKUP
5X-B TRIP
5X-B TRIP 1p.ØA
5X-B TRIP 1p.ØB
5X-B TRIP 1p.ØC
5X-B TRIP ABC
50(N)-B1 TRIP
50(N)-B2 TRIP
51(N)-B TRIP
68 Power Swing
68T Pswing TRIP
>85-21 Rec.Ch1
>85-21 Rec.Ch2
85-21 SEND
21 PICKUP
21 Pickup ØA
21 Pickup ØB
21 Pickup ØC
21 Pickup G
21 PU forward
21 PU reverse
21 TRIP
21 TRIP 1p. ØA
21 TRIP 1p. ØB
21 TRIP 1p. ØC
21 TRIP ØABC
21 TRIP 1p. Z1
21 TRIP 1p. Z1B
21 TRIP 1p. Z2
21 TRIP 3p. Z2
21 TRIP 3p. Z3
21 TRIP 3p. Z4
Relay PICKUP
Relay PICKUP ØA
Relay PICKUP ØB
Relay PICKUP ØC
Relay PICKUP G
Relay TRIP ØA
Relay TRIP ØB
Relay TRIP ØC
Relay TRIP
Relay TRIP 1p.A
Relay TRIP 1p.B
Relay TRIP 1p.C
Relay TRIP 3ph.
VT FuseFail>10s
VT FuseFail
FltRecSta
Fail Conductor
21 TRIP3p. Z1sf
21 TRIP3p. Z1mf
21 TRIP3p.Z1Bsf
21 TRIP3p.Z1Bmf
79 Close
79 Successful
79 TRIP 3pole
>50BF STARTwoI
50BF BusTrip
50BF LocTripABC
59-Vpg TRIP
59-Vpp TRIP
59-3V0 TRIP
59-V1 TRIP
59-V2 TRIP
27-V1 TRIP
27-Vpg TRIP
27-Vpp TRIP
Definitive TRIP
Line closure
1pole open ØA
1pole open ØB
1pole open ØC
96 1&2 Op
96 Optd.

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				
400 KV-NEW DUBURI 400KV-400 KV-PANDIABIL 400KV(PGCIL)-1	29-05-2025	14:25:00	30-05-2025	01:04	400kV Pandiabili-Duburi Line tripped on line fault during heavy rain & lightening at 14:25Hrs. Initially line tripped on Y-Ph fault, after 117 msec relay again seen the fault in R-Ph (which is with dead time), relay issued the 3-ph trip. R/I at Pandiabilis/s: M1: Z1, Y-N, 23km, 7.4kA (1st fault) M1: Z1, R-N, 19km, 7.6kA (2nd fault) M2: Z1, Y-N, 91 km, 7.00kA(1st fault) M2: Z1,R-N, NA km, 4.6kA (2nd fault)		1	1	0	0	0	0	1	1	1	
400 KV-JEYPORE 400/220 KV-400 KV-GAJUWAKA-2	22-05-2025	19:21:00	22-05-2025	20:04	Line tripped due to Over voltage. Following a thorough examination of the DR, it was observed that the over voltage condition did not activated by Main I & II relays. Further investigation revealed that the Over voltage Aux. Relay of Main II relay was found to be damaged \ It is anticipated that this malfunction of the relay lead to tripping of JYP-GAZ II line by sending DT to remote end. The defective relay has been replaced with new relay, and the line was taken into service at 20:04:00Hrs on dtd. 22.05.2025.		0	1	1	0	0	0	1	0.5	0.5	Line tripped due to Aux, relay failure, & Same repalced with new one.
400 KV-GMR KAMALANGA21/400-400 KV-ANGUL -1	21-05-2025	23:00:00	22-05-2025	20:02	400kV Angul-GMR Line-1 -AR operation remained unsuccessfull due to fault appeared durig reclaim time in R-Phase. R/I at Angul s/s Z1; RN fault, 1.1km, 20.14kA Z1; RN fault, 1.1km, 21.014kA		1	1	0	0	0	0	1	1	1	
400 KV-JHARSUGUDA 765 KV-400 KV-RAIGARH_PGCIL-4	19-05-2025	18:24:00	19-05-2025	19:33	Tripped on line fault during heavy rain & lightening at 18:24Hrs R/I at Sundargarh s/s: M1: Z1, B-N, 11.83km, 16.38KA M2: Z1, B-N, 12.40 km, 16KA. AR is not attempted as line was in non-auto mode for Reconductoring work		1	1	0	0	0	0	1	1	1	
400 KV-JEYPORE 400/220 KV-400 KV-GAZUWAKA-1	15-05-2025	17:19:00	15-05-2025	18:52	Line tripped on Over voltage		1	1	0	0	0	0	1	1	1	
400 KV-JEYPORE 400/220 KV-400 KV-GAZUWAKA-2	15-05-2025	17:19:00	15-05-2025	18:18			1	1	0	0	0	0	1	1	1	
400 KV-JHARSUGUDA 765 KV-400 KV-OPGC-1	13-05-2025	14:17:00			Line tripped on persistent fault t B-N fault in line. Relay indication details are Main-1, Z1; BN Fault; 31.89 km; 8.17 kA Main-2, Z1; BN Fault; 33.55 km; 8 kA		1	1	0	0	0	0	1	1	1	
765 KV-ANGUL -765 KV-SRIKAKULAM-1	12-05-2025	13:09:00	12-05-2025	13:57	Line triped on persisitent fault R/I at Angul: Z1; BN fault, 38.7km, 8.31kA Z1; BN fault, 37.2km, 8.74kA		1	1	0	0	0	0	1	1	1	
400 KV-JHARSUGUDA 765 KV-400 KV-STERLITE400KV -2	10-05-2025	09:25:00	10-05-2025	10:11	DT recived in only CH-1 from Vedanta end.Main and Tie Bay got tripped at Sundargarh end. But Line was is charge from Vedanta End.		1	0	0	1	0	0	1	0.5	0.5	DT recived in only CH-1 from Vedanta end.Main and Tie Bay got tripped at Sundargarh end. But Line was is charge from Vedanta End
400 KV-ROURKELA 400KV-400 KV-Chaibasa(400/220kV)-1	09-05-2025	14:42:00	09-05-2025	17:43	Line tripped on Ph-Ph Fault R/I at RKL: Main-1, Z2; YBN Fault;124.6 km; 3.89 kA Main-2, Z2; YBN Fault; 123.7 km; 3.8 kA		1	1	0	0	0	0	1	1	1	
400 KV-RENGALI 400KV-400 KV-INDRAVATI 400KV-1	03-05-2025	18:14:00	03-05-2025	22:04	Line triped on persisitent fault R/I at Rengali: Z1; BN fault, 156km, 1.8kA Z1; BN fault, km, 1.8kA		1	1	0	0	0	0	1	1	1	
400 KV-JHARSUGUDA 765 KV-400 KV-OPGC-1	03-05-2025	17:29:00	03-05-2025	17:29:00	AR sucessful from Sundargarh end due to transient R-N fault in line. Relay indication details are Main-1, Z-1, R-N, Ir-8.98kA, F.L-39.82KM Main-2, Z-1, R-N, Ir-8.58kA, F.L-42.06KM Line belongs to M/s Indigrid.		1	1	0	0	0	0	1	1	1	
765 KV-JHARSUGUDA 765 KV-765 KV-RAIPUR-2	01-05-2025	16:12:00	01-05-2025		Line triped on persisitent fault R/I at Sundargarh: Z1; BN fault, 38.7km, 8.31kA Z1; BN fault, 37.2km, 8.74kA		1	1	0	0	0	0	1	1	1	

NTPC Barh

Month	May

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)
01.05.2025	Barh-Patna 3	C-N fault	Fault in zone-1 (C-N fault). Successful A/r occurred at NTPC Barh end for both main and tie CB (Fault Current: 12.79 kA)	1	0	0	0
01.05.2025	Barh-Kahalgaon-1	B-N fault	Fault in zone-1 (B-N fault). Successful A/r occurred at NTPC Barh end for both main and tie CB (Fault Current: 20 kA)	1	0	0	0
01.05.2025	Barh-Kahalgaon-1	C-N fault	Fault in zone-1 (C-N fault). Successful A/r occurred at NTPC Barh end for both main and tie CB (Fault Current: 11 kA)	1	0	0	0
21.05.2025	Barh-Motihari 1	C-N fault	Fault in zone-2 (C-N fault, Fault current: 5 kA). Carrier was received, but A/R was in non-auto mode (approved by ERLDC for PID scanning of insulators) which led to three pole tripping	1	0	0	0
22.05.2025	Barh-Kahalgaon-2	No Fault	DT received from Kahalgaon end	1	0	0	0
31.05.2025	Barh-Motihari 1	C-N fault	Fault in zone-2 (C-N fault, Fault current: 3.5 kA). Carrier was received, but A/R was in non-auto mode (approved by ERLDC for PID scanning of insulators) which led to three pole tripping	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 Jun'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

PPI - May 2025

Protection Perfomance Indices for the month-MAY-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))	Remarks/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-01 Main 4052 CB	01.05.2025	9:24	01.05.2025	9:37	ZONE-02		0		1		1		0	0	0		Zone -2 Y phase fault Fault current 2.853 KA,Distance-185KM. Tie CB A/R successful. Main CB A/R unsuccesful. Line remained charged through Tie Bay. Main CB A/R shall be checked.
2	BARH-01 MAIN 4052 TIE 4152 CB & BANKA-01	01.05.2025	10:06	01.05.2025	10:38 Barh-01 & 10:39 Banka-01	ZONE-01		1		0		0		1	1	1		Zone-01 Y phase fault /Fault current-9.3KA/45KM in Kh Barh -1 Line. Kh Barh Line - 1 tripped at both end. Since Kh Banka Line - 1 is charged only through Tie Bay 41, Banka - 1 line tripped at Kahalgaon end
3	BARH-01 Main 4052 CB	01.05.2025	14:20	01.05.2025	14:46	ZONE-02		0		1		1		0	0	0		Zone-02 B-phase fault/Fault current-3.647KA/DISTANCE-60% . Tie CB A/R successful . Main CB A/R unsuccesful. Line remained charged through Tie CB
4	DURGAPUR-02 MAIN 1852 AND TIE 1752CB	15.05.2025	12:28	15.05.2025	12:55	ZONE-01		0		1		1		0	0	0		Zone - 1 Fault current-2KA Distance 48%. A/R unsuccesful for Main & Tie CB. A/R circuit checked and rectified for Main CB. A/R for Tie CB shall be checked
5	DURGAPUR-01 MAIN 1952 AND TIE 2052CB	15.05.2025	14:28	15.05.2025	14:57	ZONE-01		0		1		1		0	0	0		Zone-01 Fault Current- 4.870KA/Distance-74 KM. A/R unsuccesful for Main & Tie CB. A/R circuit checked and rectified for Main CB. A/R circuit for Tie CB shall be checked.
6	FARAKKKA-01 MAIN CB & TIE CB	23.05.2025	21:52	24.05.2025	0:55			1		0		0		1	1	1		Both Main & Tie CB remained closed at Kahalgaon end.

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 13/6/25

Checked By Debasish 14/6/25

Reviewed By

जी. भास्कर / G. BASKAR
अपर महाप्रबंधक (प्र.एवंअनु./ई.एम.डी) / AGM (O&M/E.M.D.)
एनटीपीसी लिमिटेड / NTPC Limited
कहलगाँव, भागलपुर / Kahalgaon, Bhagalpur

BSPTCL

Protection Performance Indices for the month of March'25

S. No.	Name of the element	Tripping Date	Tripping time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc		Nu		Nf		Dependability index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf))	Remarks (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-KARAMNASHA (NEW)-SAHUPURI-1	27-05-2025	19:32	27-05-2025	21:38	Ir-491.1 A, Iy-615.7A, Ib-568A	Line did not tripped	1		0		0		1	1	1	Tripped on overload. Existing conductor is old Zebra Conductor.To prevent its snapping oveload setting 600A.Frequent Jumpher snapping and conductor snapping in this line.
2	220KV-SITAMARHI-MOTIPUR-1	24-05-2025	23:06	27-05-2025	11:40	-	Motipur End: Y-B, FD:25.86 Km, FCy:5.286 kA, FCb:5.418 kA		1		0		0	1	1	1	
3	220KV-KARAMNASHA (NEW)-SAHUPURI-1	22-05-2025	19:14	22-05-2025	20:31	Karmnasha: O/C, Ir-510.6A, Iy-596.6A, Ib-552.4A	-	1		0		0		1	1	1	Tripped on overload. Existing conductor is old Zebra Conductor.To prevent its snapping oveload setting 600A.Frequent Jumpher snapping and conductor snapping in this line.
4	220KV-KISHANGANJ(PG)-KISHANGANJ(BSPTCL)-4	21-05-2025	03:52	21-05-2025	17:50	KISHANGANJ(PG) end : R_N, FD=0.22 KM ,FC= 22.8 kA	KISHANGANJ(BH) end: R-Ph, Z-2, 16.25kA,5.869 km		1		0		0	1	1	1	
5	220KV-NEW PURNEA-MADHEPURA-1	16-05-2025	20:46	17-05-2025	13:31	Purnea:Bphase,Z1	Madhepura:BN pickup, Z1, IL1 130.9 A, IL2 93.2 A, IL3 2.066 kA, dist 19.47 km	1	1	0	0	0	0	1	1	1	
6	220KV-DARBHANGA(DMTCL)-LAUKAHI-1	16-05-2025	06:23	17-05-2025	15:51	Z1, Y-N, 3.78kA, 39.5km	Z1, 46.18 KM , 2.56 KA		0		0		1	0	0	0	PLCC issue
7	220KV-PUSAULI-NADHOKAR-2	11-05-2025	17:05	11-05-2025	17:45	Nadhokar :Z-1, 1.8 km;	pusauli :1.2 km, 13.56 kA,R-N, Z-1		1		0		0	1	1	1	
8	220KV-KHAGARIA-NEW PURNEA-2	11-05-2025	12:42	11-05-2025	13:42	New Purnea end: YB fault, 13.6 km, Iy- 8.6 kA, Ib- 8.69 kA	Khagaria end: Zone -1, Y ph B ph, Ir- 110.9A, Iy- 2.172kA, Ib- 2.094kA	1	1	0	0	0	0	1	1	1	
9	220KV-SAHARSA(PMTL)-BEGUSARAI-1	06-05-2025	01:22	06-05-2025	03:13	SAHARSA: RN fault, 25 km, 5.1 kA	Begusarai end: RN fault, Zone 1, Dist 61.20Km, Ir=2.456KA		1		0		0	1	1	1	
10	220KV-MUZAFFARPUR(PG)-GORAUL(BH)-2	05-05-2025	23:53	06-05-2025	01:24	Muzaffarpur: DT Received, 5.6km,14.64kA,R-Ph, Z-I	GSS Goraul:- RN fault, Zone -1, Fault distance -7.5 KM, Ir-3.55 KA	0	1	0	0	1	0	Muz-0 Gor-1	Muz-0 Gor-1	Muz-0 Gor-1	autoreclose successful at goraul.A/r not attempted at muzaffarpur due to faulty BCU
11	220KV-CHANDAUTI (PMTL)-SONENAGAR-1	03-05-2025	15:30	03-05-2025	16:51	Chandauti : Direction earth fault protection operated	Sonenagar : DT received		1		0		0	1	1	1	
12	220KV-SITAMARHI-MOTIPUR-2	02-05-2025	13:33	02-05-2025	14:22	Sitahmari: A/R successfuly Operated;	Motipur:Fault loc-34.02km Zone-01 Ir-231.2A, Iy-124.7A Ib- 2.5KA		0		0		1	0	0	0	Carrier issue at Motipur
13	220KV-PUSAULI-Karamnasa-1	01-05-2025	20:32	02-05-2025	15:36	pusauli: R-N, IR:6.271 kA, IB:1.345 kA, fd:22.15 Km, Z-1			1		0		0	1	1	1	

JUSNL

Protection Performance Indices for the month of May' 25 (In compliance of Clause 15(6) of IEGC 2023)

S. No.	Name of the element	Tripping Date	Tripping Time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc		Nu		Nf		Dependability index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf))	Remarks (Reason for performance indices less than 1)
						End A	End B	End A	End B	End A	End B	End A	End B				
1	220 kV Ramchandrapur - Chaibasa - 02	01-05-2025	16:08			BN, Z2, IB - 10.98 KA		1		1		0		1	0.5	0.5	Pole got burst of Chaibasa -02 feeder. Bus -2 got tripped.
2	220 kV Ramchandrapur - Chandil	01-05-2025	16:08	01-05-2025	17:02	BN, Z4	BN, Z2	1		0		0		1	1	1	
3	220KV-DALTONGANJ-CHATRA-1	03-05-2025	15:35	03-05-2025	17:39	Chatra : Z1, 1.7 KA , 7.2 KM	Daltongonj: DT Received	1		1		0		1	0.5	0.5	3ph tripping for 1ph fault
4	220KV-DALTONGUNJ-GARWAH (NEW)-2	03-05-2025	16:25	04-05-2025	18:30	Daltongonj: R-N, 1.8 KM , 7.04 KA	Garwah: Not tripped		1		0		0	1	1	1	
5	220 kV Jasidih - Giridih - 01	03-05-2025	16:40			BN, Z2, 1.23 kA		1		1		0		1	0.5	0.5	
6	220 kV Jasidih - Giridih - 02	03-05-2025	16:40					1		1		0		1	0.5	0.5	DR not available
7	220KV-DALTONGUNJ-GARWAH (NEW) - 1	05-05-2025	09:52	06-05-2025	15:19	-	RN, Z1, 1.556 km, A/r successful but tripped in reclaim time.		1		0		0	1	1	1	
8	220 kV Latehar - Lohardaga - 02	05-05-2025	09:52	06-05-2025	15:19	RN, Z1, 8.073 km, IR - 3.059 KA		1		1		0		1	0.5	0.5	
9	220 kV Latehar - Lohardaga - 02	07-05-2025	14:11	07-05-2025	15:27												
10	220KV-DALTONGANJ-CHATRA-1	09-05-2025	10:18	09-05-2025	17:12	Daltongunj: R-B, 115 KM;	Chatra: Ir 986A, Ib 1.040kA, Zone 01 fault distance 26.07km	1		0		0		1	1	1	
11	220KV-CHANDIL-STPS(WBPDCL)-1	14-05-2025	09:04	14-05-2025	09:57	Chandil end:- Zone -1, Ia=0.12 KA, Ib= 0.11 KA, Ic=2.96 KA, fault distance =27.4kM.	STPS: z-2, 83 km, IB=0.859 kA, B-N.	1		0		0		1	1	1	
12	220KV-CHANDIL-RANCHI-1	17-05-2025	14:25	18-05-2025	13:48	Chandil: Z-I, Ia:1.88kA,70.1km, R-Ph	Ranchi: R-Ph, 9.59kA, 14.94km,Z-I	1		0		0		1	1	1	
13	220KV-RANCHI-HATIA-1	17-05-2025	14:56	17-05-2025	19:02	Ranchi: B-Ph, 6.717km,11.27kA, Z-I	Hatia: Ic 3.831kA, Z-I, 27.03km,B-Ph;		1		0		0	1	1	1	
14	220 kV Dumka II (Madanpur) - Govindpur - 02	17-05-2025	16:03	17-05-2025	18:55		BN, Z1, 34.28 km, IB - 2.07 kA		1		1		0	1	0.5	0.5	PLCC not healthy
15	220 kV Latehar - Chatra	18-05-2025	14:12			RN, Z1, 74.83 km, IR - 1.23 KA		1		0		0		1	1	1	
16	220KV-CHANDIL-RANCHI-1	18-05-2025	14:34	18-05-2025	15:32	Chandil:- R-Y, IR-2.57kA, IY-23.kA, Z1,80.4km	Ranchi:- R-Y, 17.5km, IR-12.95kA,IY- 12.6kA	1		0		0		1	1	1	
17	220KV-RANCHI-HATIA-3	20-05-2025	14:56	20-05-2025	15:30	Not tripped	Hatia: R-N, 7.48 kA, 3.68 km		1		0		0	1	1	1	
18	220 kV TVNL - Govindpur - 01	20-05-2025	15:09	20-05-2025	15:40		RN, Z1, 63.69 km, IR - 1.47 kA		1		1		0	1	0.5	0.5	3ph tripping for 1ph fault
19	220KV-DALTONGANJ-CHATRA-1	21-05-2025	13:34	21-05-2025	14:59	A/r successful from Daltonganj end.	Chatra End: Zone-1, Distance-114 km, Ia-496.8 A, Ib-528A, Ic-189.6A, R-Y phase fault.	1		0		0		1	1	1	
20	220 kV Jasidih - Giridih - 01	21-05-2025	16:20	21-05-2025	17:41	YN, Z2, 1.27 kA		1		0		0		1	1	1	
21	220 kV Jasidih - Giridih - 02	21-05-2025	16:20	21-05-2025	17:41			1		1		0		1	0.5	0.5	DR not available
22	220 kV Latehar - Chatra	30-05-2025	11:07					1		1		0		1	0.5	0.5	DR not available
23	220 kV Ramchandrapur - Joda	31-05-2025	12:06			RYBN, Z2	RYBN, Z4	1		0		0		1	1	1	

OPTCL

PROTECTION PERFORMANCE INDICES AS PER TRIPPING LIST OF PCC MEETING AGENDA FOR THE MONTH OF MAY 2025 FOR OPTCL ,SLDC,ODISHA																
SL.NO	NAME OF THE ELEMENT	TRIPPING DATE	TRIPPING TIME	RESTORATION DATE	RESTORATION TIME	REASON(RELAX INDICATION)		NC		NU		NF		DEPENDABILITY INDEX (NC/NC+NF)	SECURITY INDEX (NC/NC+NU)	RELIABILITY INDEX(NC/NC+NU+NF)	REMARKS
						END-A	END-B	END-A	END-B	END-A	END-B	END-A	END-B				
1	400 KV NEW DUBURI-PANDIABIL-I	29/05/25	14:25	30/05/25	01:04	Z-1/R-Y-N/Ir=7.6 KA/Iy=7.4 KA/24 KM	Z-1/Y-N/Iy=3.04 KA/106.7 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	LINE TRIPPED ON PHASE TO PHASE FAULT
2	220 KV BUDHIPADAR-RAIGARH-I	29/05/25	13:43	29/5/2025	18:25	Z-1/R-N/Ir=21.16 KA/0.971 km	Z-1/R-Y-B TRIPPED	1	1	0	0	0	0	END A=1 ,END B=1	END A=1 ,END B=1	END A=1 ,END B=1	R- PHASE TRIPPED FROM BUDHIPADAR END IN ZONE-1 & 3 PHASE TRIPPED FROM RAIGARGH END
3	400 KV MRDL-TSTPP-II	29/5/25	12:19	29/05/25	15:42	Z-1/B-N/Ib=6.62 KA/27.8 KM	Z-1/B-N/Ib=3.41 KA/41.6 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	A/R FAILED AFTER 1 SEC
4	220 KV BOLANGIR PG-KESINGA-I	26/05/25	16:30	26/05/25	17:35	Z-1/B-N/Ib=7.79 KA/3.8 KM	Z-1/B-N/Ib=1.78 KA/89 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	A/R SUCCESFUL FROM BOLANGIR END & 3 PHASE TRIPPING FROM KESINGA END
5	220 KV BOLANGIR PG-KESINGA-I	24/05/25	11:44	24/05/25	17:59	Z-1/R-E/Ir=2.09 KA/47.1 KM	Z-1/R-E/Ir=1.877 KA/38.7 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	A/R FAILED AFTER 1 SEC
6	220 KV BUDHIPADAR-RAIGARH-I	19/05/25	18:54	20/05/25	00:24	Z-1/R-E/Ir=20.79 KA/9.54 KM	Z-1/R-E	1	1	0	0	0	0	END A=1 ,END B=1	END A=1 ,END B=1	END A=1 ,END B=1	R-PHASE TRIPPED FROM BOTH END & AFTER 500msec THREE-PHASE TRIPPING OCCOURED
7	220 KV BUDHIPADAR-KORBA-II	05-03-2025	17:10	05-03-2025	23:13	Z-1/R-E/Ir=6.1 KA/26 KM	Z-1/R-E/Ir=1.321 KA/167 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	A/R NOT ATTEMPTED FROM SINGLE PHASE FAULT FROM BUDHIPADAR END & ALSO KORBA END

WBSETCL

Protection Performance Indices for the month of MAY'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)
						End A	End B	End A	End B	End A	End B	End A	End B				
1	Kharagpur-KTPP -1	01.05.25	15:35:00	01.05.25	16:44:00	B-phase, Zone-1, A/r optd., A/R L/O		1		0		0		1	1	1	
2	Durgapur-PPSP#2	01.05.25	16:41:00	01.05.25	16:59:00	R-phase, Zone-1, CS,CR,A/R L/O		1		0		0		1	1	1	
3	New Chhanditala-Midnapore #1	01.05.25	18:37:00	01.05.25	19:38:00	Y-phase, Zone-1, A/R OFF., A/R L/O		1		0		0		1	1	1	
4	NBU-Siliguri PG #1	03.05.25	20:51:00	03.05.25	21;25:00	B-phase, Zone-1, AR-OFF, 3-p Trip		1		0		0		1	1	1	
5	NBU-Siliguri PG #1	04.05.25	03:55:00	04.05.25	04:23:00	B-phase, Zone-1, AR-OFF, 3-p Trip		1		0		0		1	1	1	
6	NBU-Siliguri PG # 1	06.05.25	05:54:00	06.05.25	06:36:00	B-phase, Zone-1, AR-OFF, 3-p Trip		1		0		0		1	1	1	
7	Jeerat -Sagardighi #2	06.05.25	14:18:00	06.05.25	14:47:00	Busbar Trip relay-96 operated		1		0		0		1	1	1	
8	Jeerat -New-Chanditala	06.05.25	14:18:00	06.05.25	14:41:00	Busbar Trip relay-96 operated		1		0		0		1	1	1	
9	Jeerat 315 MVA TR #2	06.05.25	14:18:00	06.05.25	14:39:00	Busbar Trip relay-96 operated		1		0		0		1	1	1	
10	Jeerat 315 MVA TR #4	06.05.25	14:18:00	06.05.25	14:43:00	Busbar Trip relay-96 operated		1		0		0		1	1	1	
11	Jeerat-Rajarhat PG # 1	06.05.25	14:18:00	06.05.25	14:53:00	Busbar Trip relay-96 operated		1		0		0		1	1	1	
12	Newtown AA3- Rajarhat PG #1	06.05.25	15:00:00	06.05.25	20:00:00	B-phase, Zone-2,A/R close , A/R L/O		1		0		0		1	1	1	
13	Gokarno-Rajarhat #1	06.05.25	15:19:00	06.05.25	15:48:00	Y-phase, Zone-1,A/R close , A/R L/O		1		0		0		1	1	1	
14	NBU-Siliguri PG # 2	08.05.25	08:40:00	08.05.25	09:00:00	Load rejection operated		1		0		0		1	1	1	
15	New-Town AA3-Subhasgram PG	09.05.25	14:36:00	09.05.25	14:54:00	R-phase, Zone-1, A/r optd., A/R L/O		1		0		0		1	1	1	
16	Satgachia 500 MVA 400/220/KV TR#2	11.05.25	06:23:00	13.05.25	08:10;00	Diff. Optd		1		0		0		1	1	1	
17	Jeerat- BKTPP	12.05.25	12:01:00	12.05.25	12:12:00	R-phase, Zone-2,A/R close , A/R L/O		1		0		0		1	1	1	
18	Kharagpur-Chaibasa #1	12.05.25	16:59;00	12.05.25	20:40:00	Zone-1, Y-B Phase fault, 3-p trip		1		0		0		1	1	1	
19	Kharagpur-KTPP # 1	12.05.25	18:41:00	12.05.25	19:16:00	R-phase, Zone-1,A/R close , A/R L/O		1		0		0		1	1	1	
20	Kharagpur-KTPP # 2	12.05.25	18:41:00	12.05.25		NO TRIPPINGS		0		0		0		0	0	0	
21	Kurseong-Siliguri PG #1	13.05.25	07:58:00	13.05.25	08:41:00	R-phase, Zone-1,A/R close		1		0		0		1	1	1	
22	Gokarno-Sagardighi # 2	13.05.25	09:41:00	13.05.25		NO TRIPPINGS		0		0		0		0	0	0	
23	Gokarno-Sagardighi # 2	13.05.25	09:48:00	13.05.25	22:51:00	B-phase, Zone-2,A/R close , A/R L/O	B-phase, Zone-1,A/R close , A/R L/O	1	1	1	1	1		1	1	1	
24	Jeerat-BKTPP	13.05.25	15:56:00	13.05.25	16:10;00	R-phase, Zone-2,A/R close , A/R L/O		1		0		0		1	1	1	
25	Jeerat-BKTPP	13:05:25	16:23:00	14.05.25	00:54:00	Zone-2, Y-B Phase fault, 3-p trip		1		0		0		1	1	1	
26	Arambag-Old PPSP	15:05:25	17:54:00	15:05:25	18:20:00	B-phase, Zone-1, A/R OFF., A/R L/O		1		0		0		1	1	1	
27	Durgapur-PPSP# 1	17:05:25	17:28:00	17:05:25	17:58:00	Zone-1, B-phase, CS,CR, A/R L/O		1		0		0		1	1	1	
28	Arambag-Old PPSP	20:05:25	16:50:00	20:05:25	17:37:00	Zone-2, R-phase,CS, CR, A/R L/O		1		0		0		1	1	1	
29	Gokarno-SGTPP # 2	21:05:25	19:45:00	21:05:25	20:59:00	Zone-1, B-phase, A/R close, A/R L/O		1		0		0		1	1	1	
30	Jeerat--Subhasgram PG-1	23.05.25	20:28:00	23.05.25	23:06:00	Zone-1, Y-B Phase fault, 3-p trip		1		0		0		1	1	1	
31	Jeerat--New-Jeerat # 1	26.05.25	09:05:00	26.05.25	11:16:00	Line Diff. Optd, A/R close, A/R L/O		1		0		0		1	1	1	
32	Jeerat--New-Jeerat # 2	26.05.25	10:51:00	26.05.25	21:34:00	Line Diff. Optd, A/R close, A/R L/O		1		0		0		1	1	1	
33	Jeerat--New-Jeerat # 1	28.05.25	02:51:00	28.05.25	12:31:00	Line Diff. Optd, A/R close, A/R L/O		1		0		0		1	1	1	
34	Kharagpur- Midnapore PG #2	29.05.25	12:55:00	29.05.25		No TRIPPINGS		0		0		0		0	0	0	

DMTCL

Protection Performance Indices for the month of May'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					
1	400 KV Motihari - Gorakhpur Circuit - 2	05-05-2025	17:33:00 PM	05-05-2025	18:45:00 PM	Darbhanga End:Line Tripped in Zone-1, B-Phase fault, F.D:- 155.1 km, F.C:- 1.77kA. Note: DMTCL LILO line length 37.5Km.	Line Tripped in Zone-1, B-Phase fault, F.D-9.1km	1	1	0	0	0	0	1	1	1		Reason: heavy rain and lightning thunder.
2	400 KV Darbhanga - Muzaffarpur circuit - 1	05-12-2025	22:40:00 PM	05-12-2025	23:27:00 PM	Darbhanga End: Line Tripped in Zone-2, B-Phase fault, Fc-6.52, Km-85.9. Note: Line lenth 63Km, Reason: Due to heavy lighting.	Line Tripped in B-Phase fault, Fc-6.52, Reason: Due to heavy lighting.	1	1	0	0	0	0	1	1	1		Reason: heavy rain and lightning thunder.
3	400 kV Motihari - Barh Circuit - 1	31/5/2025	14:26:00 PM	31/5/2025	19:44:00 PM	Darbhanga End:Line Tripped in Zone-1, B-Phase fault, F.D:- 9.8 km, F.C:- 9.55kA, NOTE:- A/R was in Non- auto mode due to PID test by RTAMC.	Line Tripped in Zone-2, B-Phase fault, fc 1.85kA, F.D-179.5km.	1	1	0	0	0	0	1	1	1		NOTE:- A/R was in Non- auto mode due to PID test by RTAMC. Reason: Due to heavy lighting.

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	01.05.2025	14:37	01.05.2025	15:56	E/F		1		0		0		1.0000	1.0000	1.0000	
2	400KV TTPS-PVUNL T/L	17.05.2025	14:44	17.05.2025	15:51	O/V		1		0		0		1.0000	1.0000	1.0000	
3	220KV TTPS-Govindpur-1 T/L	20.05.2025	15:07	20.05.2025	15:40	O/C Zone 1 - 5.385km		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

Jorethang

Jorethang Loop Hydro Electric Project 2 X 28 MW

Protection Performance Indices for the MAY-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 Tripping	
2	220KV Jorethang- 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.																	

Tashiding

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	10-05-2025	18:44:38	10-05-2025	20:00:00	No Alarm	fault location 1.945km Fault Current IB-21kA,IC-12.17kA	--	--	--	--	--	--	--	--	--	TRIPPING(220kV New Melli - Legship Line)	--
2	220KV Tashiding- New Melli Line-2	10-05-2025	18:44:38	10-05-2025	19:13:00	Earth fault B,C Phase Z1 ,fault location 19.85km Fault Current IA-9.217A,IB-533.6A,IC-471.3A	fault location 2.897km Fault Current IB-7.85kA,IC-7.939kA	--	--	--	--	--	--	--	--	--	TRIPPING (220KV Tashiding- New Melli Line-2)	--

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.

List of important transmission lines in ER which tripped in May-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	PMU Location	DR Configuration Discrepancy(Local End)	DR Configuration Discrepancy(Remote End)	DR/EL RECEIVED FROM LOCAL END	DR/EL RECEIVED FROM REMOTE END	LOCAL END UTILITY	REMOTE END UTILITY
1	400KV-BARH-MOTIHARI-1	31-05-2025	14:26	31-05-2025	19:45	Barh-B-Y, 179.5km , 1.85kA	Motihari-B-Y, 9.45kA, FD-9.7kM,Z-1	Y-B	100 msec	Line tripped on phase to phase fault.	BARH			NO	NO	NTPC	DMTCL
2	220KV-CHUKHA-BIRPARA-1	30-05-2025	22:57	31-05-2025	16:57	Three phase fault, FD-27.289km, Zone I trip, IR-3.0kA, IY-2.73kA, IB-5.17kA,	B_R_Y , 44.22 km, 3.03 Ka, 3.045.85 Ka,	R-Y-B	100 msec	Line tripped on R-Y-B fault.	BINAGURI			NO	YES	BHUTAN	PG(ER-II)
3	220KV-CHUKHA-BIRPARA-2	30-05-2025	22:57	31-05-2025	03:06	R-Y-B Fault, FD-27.022km, Z-I, IR-2.92kA, IB- 2.63 Ka	R-Y -B , 40.632 km, 3.38 kA,	R-Y-B	100 msec	Line tripped on R-Y-B fault.	BINAGURI			NO	YES	BHUTAN	PG(ER-II)

4	400KV-RANCHI-RAGHUNATHPUR-3	29-05-2025	11:48	29-05-2025	13:00	DT Received at Ranchi	Not tripped	No Fault	NA	DT received at Ranchi. DVC and PG(ER-I) may explain.	RANCHI			YES	NA	PG(ER-I)	DVC
5	400KV-NEW DUBURI-PANDIABILI-1	29-05-2025	14:25	30-05-2025	01:04	New dubri: R-Y-N fault(phase to phase) IR:7.6 KA IY:7.4KA Dist:24 km Z1 optd.	Pandiabili: Event-1:-IY-3.04 KA,Y-N,fault Distance-106.7 Km,Zone-1 Event-2:-IR-2.94 KA,Loop-R-N,fault Distance-111.1	R-Y	100 msec	Line tripped on phase to phase fault.	PANDIABILI			NO	NO	OPTCL	OPTCL
6	220KV-BUDHIPADAR-RAIGARH-1	29-05-2025	13:43	29-05-2025	18:25	Zone-1, R-N, FD-971.4m Fault current, IR-21.16KA	-	R-Earth	100 msec	R phase tripped from Budipadar end in Z-1 protection and after 500 msec three phase tripped from remote end.	Budhipadar			YES	NO	OPTCL	WRLDC
7	400KV-MEERAMUNDALI-TSTPP-2	29-05-2025	12:19	29-05-2025	15:42	Meeramundali: B Ph,Z1,27.8 KM ,6.62 KA	TSTPP: B Ph , Z1, 41.6 KM,3.4 KA	B-Earth	100 msec	A/r failed after 1 sec.	TSTPP			YES	NO	OPTCL	NTPC

8	220KV-KARAMNASHA (NEW)-SAHUPURI-1	27-05-2025	19:32	27-05-2025	21:38	Ir-491.1 A, Iy-615.7A, Ib-568A	Line did not tripped	-	> 400 msec	as per PMU Three phase voltage dip observed. BSPTCL may explain.	Sasaram			NO	NO	BSPTCL	NRLDC
9	400KV-JEERAT-NEW JEERAT-1	28-05-2025	02:51	30-05-2025	12:32	New jeerat - B_N , FC 13.9 kA , 17.4 km	JEERAT - B_N , 4.5 km , 17.9 kA	B-Earth	100 msec	A/r failed after 1 sec.	Jeerat(WB)			YES	YES	WBSETCL	PG(ER-II)
10	400KV-NEW JEERAT-SUBHASGRAM(PG)-1	28-05-2025	02:31	06-06-2025	12:45	New jeerat - Y_N, 44.2 km , 6.553 kA	Subhasgram- Y_N, 49.3 km , 5.3 kA	Y-Earth	100 msec	A/r failed after 1 sec.	Subhasgram(PG)			YES	YES	PMJTL	PG(ER-II)
11	220KV-BOLANGIR (PG)-KESINGA-1	26-05-2025	16:30	26-05-2025	17:35	Kesinga:B-N, Z1, 89 kms, Ib =1.78 kA	Bolangir: Z1, B-N, 3.8 kms, IB = 7.79 kA (A/R successful)	B-Earth	100 msec	A/r successful from Bolangir end. Three phase tripping from Kesinga end. OPTCL may explain.	Bolangir			NO	NO	PG ODISHA	OPTCL

12	400KV-JEERAT-NEW JEERAT-2	26-05-2025	10:51	26-05-2025	21:34	Jeerat: B-Ph, 18.4km,10.567kA,	New Jeerat: B-ph, 4km,9.275kA	B-Earth	100 msec	A/r failed after 1 sec from N Jeerat end and three phase tripping from Jeerat end. WB may explain.	Jeerat			YES	YES	WBSETCL	PMJTL
13	400KV-NEW JEERAT-SUBHASGRAM(PG)-1	26-05-2025	10:51	26-05-2025	10:58	Not tripped	Tripped from Subhasgram end only	B-Earth	100 msec	A/r failed after 1 sec.	Subhasgram			NO	YES	PMJTL	PG(ER-II)
14	400KV-JEERAT-NEW JEERAT-1	26-05-2025	09:05	26-05-2025	11:16	Jeerat :Blue ph, 4.4 km,17.21 kA,Z-I	New Jeerat: B-Ph,5.810kA, 19.10km, Z-I	B-Earth	100 msec	A/r failed after 1 sec.	Jeerat			YES	YES	WBSETCL	PMJTL
15	220KV-CHUKHA-BIRPARA-2	25-05-2025	21:47	25-05-2025	22:27	-	A/r successful at Birpara end R/I: FC: IY=2.43KA, FD=37.9 KM	Y-Earth	100 msec	A/r successful from Birpara end. Line tripped from Chukha end.	Alipurduar			NO	YES	BHUTAN	PG(ER-II)

16	220KV-CHUKHA-BIRPARA-1	25-05-2025	21:08	25-05-2025	22:23	-	Birpara end: RY_N, FC: IR=2.82KA, IY=3.31KA FD=47.3 KM	R-Y	100 msec	Line tripped on phase to phase fault.	Alipurduar			NO	YES	BHUTAN	PG(ER-II)
17	220KV-SITAMARHI-MOTIPUR-1	24-05-2025	23:06	27-05-2025	11:40	-	Motipur End: Y-B, FD:25.86 Km, FCy:5.286 kA, FCb:5.418 kA	Y-B	100 msec	Line tripped on phase to phase fault.	Sitamarhi			YES	YES	PG (ER-I)	BSPTCL
18	220KV-BOLANGIR (PG)-KESINGA-1	24-05-2025	11:44	24-05-2025	17:59	R-E, 2.09 kA, 47.1 km	R-E, 1.877 kA, 38.7 km	R-Earth	100 msec	A/r fail after 1 second	Bolangir			NO	NO	PG ODISHA	IOPTCL
19	400KV-FSTPP-KHSTPP-1	23-05-2025	21:51	24-05-2025	00:56	Main bay of Kahalgaon-1 at Farakka was already out		No Fault	-	Due to tripping of FSTPP-Baharampur #2(KHSTPP and Baharampur circuit are in same dia at FSTPP)	Farakka			YES	NA	NTPC	NTPC

20	400KV-FSTPP-BAHARAMPUR-2	23-05-2025		24-05-2025	00:55	FSTPP : R phase overvoltage	BAHARAMPUR : DT Received	No Fault	-	Tie bay LBB operated at Farakka. NTPC may explain.	Farakka			YES	YES	NTPC	PG(ER-II)
21	400KV-JEERAT-SUBHASGRAM-1	23-05-2025	20:28	23-05-2025	23:04	Jeerat end:- Z1, 26.1 KM, YB, IY = 9.86 KA, IB= 9.43 KA	Subhasgram : Z-1 ,YB fault, 30.71km, Iy= 5.97 kA,ib= 6.4 kA	Y-B	100 msec	Line tripped on phase to phase fault.	Subhasgram			YES	YES	WBSETCL	PG(ER-II)
22	220KV-TASHIDING-Legship-1	23-05-2025	12:28	23-05-2025	13:06	Tripped due to during Bus bar relay checking		No Fault	-	Line tripping during Bus bar relay testing. Tashding may explain.	Rangpo			NO	NO	TASHIDING	SIKKIM
23	400KV-JEYPORE-GAJUWAKA-2	22-05-2025	19:21	22-05-2025	20:04	tripped due to due to maloperation of one of the aux relay (O/V stg-1/2)		No Fault	-	Voltage in Y - Phase is higher than other two phases but still under permissible limits , suggesting mal operation of relay	Jeypore			NO	NO	PG ODISHA	SRLDC

24	220KV-KARAMNASHA (NEW)-SAHUPURI-1	22-05-2025	19:14	22-05-2025	20:31	Karmnasha: O/C, Ir-510.6A, Iy-596.6A, Ib-552.4A	-	No Fault	-	As per PMU and DR no fault observed, Line tripped on O/C. BSPTCL may explain.	Sasaram			YES	NO	BSPTCL	NRLDC
25	220KV-JAMSHEDPUR-JINDAL-1	22-05-2025	16:43	22-05-2025	17:13	R, Y & B ph optd, Zone 1 optd, 86 L/O optd,	-	R-Y-B	100 msce	As per PMU three phase fault occurred and line tripped	Jamshedpur			NO	NO	DVC	OPTCL
26	400KV-GOKARNA-SAGARDIGHI-2	21-05-2025	19:45	21-05-2025	20:11	Gokarno: Z-1, B ph, 16.2 km, 9.08 kA	Sagardighi: Z-1, B ph, 20.08 km, 1.23 kA	B-Earth	100 msec	A/r successful from both end. Line tripped in reclaim time.	DURGAPUR			YES	YES	WBSETCL	WBPDCL
27	400KV-GMR-ANGUL-1	21-05-2025	23:00	21-05-2025	23:55	GMR: R-Ph, Z-1, 37km,3.01kA	Angul: R-Ph, Z-I, 19.49kA, 1km	R-Earth	100 msec	A/r successful from both end. Line tripped in reclaim time.	ANGUL			NO	NO	GMR	PG ODISHA

28	400KV-NEW JEERAT-SUBHASGRAM(PG)-2	21-05-2025	23:23	22-05-2025	06:01	New Jeerat: R-Ph, Z-I, 80km, 3.916kA	Subhasgarm: R-Ph, Z-I, 23.1km,10.44kA.	R-Earth	100 msec	A/r fail after 1 second	SUBHASGRAM			NO	YES	PMJTL	PG(ER-II)
29	400KV-GMR-ANGUL-1	22-05-2025	00:34	22-05-2025	20:02	GMR: R-Ph, Z-2, 37km,3.01kA	Angul: R-Ph, Z-I, 19.49kA, 1km	R-Earth	100 msec	A/r successful from both end. Line tripped in reclaim time.	ANGUL			NO	NO	GMR	PG ODISHA
30	220KV-DALTONGANJ-CHATRA-1	21-05-2025	13:34	21-05-2025	14:59	A/r successful from Daltonganj end.	Chatra End: Zone-1, Distance-114 km, Ia-496.8 A, Ib-528A, Ic-189.6A, R-Y phase fault.	R-Y	200 msec	A/r successful from Daltonganj end and after 3 sec line tripped on phase to phase fault.	Daltonganj			YES	NO	PG(ER-I)	JUSNL
31	400KV-BIHARSARIFF(PG)-PUSAULI-1	21-05-2025	14:04	21-05-2025	15:10	Biharshariff end : FD-131.9KM, FC-2.782KA	Y-N, Z-1	Y-Earth	100 msec	Three phase tripping for phase to ground fault as A/R was in non auto mode due to PID testing by ER-I	Bihasrhariff			YES	YES	PG(ER-I)	PG(ER-I)

32	400KV-BARH-MOTIHARI-1	21-05-2025	11:17	21-05-2025	12:11	BARH:B-N , 1.8KA, Z2 ,230KM	MOTIHARI: B-N, IB= 9.55KA, 9.8KM ,Z1	B-Earth	100 msec	Three phase tripping for phase to ground fault as A/R was in non auto mode due to PID testing by ER-I	Barh			YES	YES	NTPC	DMTCL
33	220KV-KISHANGANJ(PG)-KISHANGANJ(BSPTCL)-4	21-05-2025	03:52	21-05-2025	17:50	KISHANGANJ(PG) end : R_N, FD=0.22 KM ,FC= 22.8 kA	KISHANGANJ(BH) end: R-Ph, Z-2, 16.25kA, 5.869 km	R-Earth	350 msec	A/r failed after 1 sec from PG end and three phase tripping from BSPTCL end in Z-2 protection after 700 msec from R phase tripping at BSPTCL end.	Kishanganj			YES	YES	PG(ER-I)	BSPTCL
34	765KV-NEW RANCHI-DHARAMJAIGARH-1	20-05-2025	15:59	20-05-2025	17:05	New Ranchi End: R-N, FD:93.3 Km, FC:3.87 kA, Z-1	-	R-Earth	100 msec	A/r failed after 1 sec.	Nranchi			YES	NO	PG(ER-I)	WRLDC
35	400KV-RANCHI-RAGHUNATHPUR-3	20-05-2025	15:45	20-05-2025	21:29	-	Raghunathpur End: Z-1, R-ph, FD:84 Km, FC:4.495 Ka	R-Earth	100 msec	A/r failed after 1 sec.	Ranchi			YES	NO	PG(ER-I)	DVC

36	220KV-RANCHI-HATIA-3	20-05-2025	14:56	20-05-2025	15:30	Not tripped	Hatia: R-N, 7.48 kA, 3.68 km	R-Earth	100 msec	A/r successful from Ranchi end and three phase tripping from Hatia end. JUSNL may explain.	Ranchi			YES	NO	PG(ER-I)	JUSNL
37	400KV-KODERMA-BOKARO-1	20-05-2025	14:53	20-05-2025	15:46	Koderma : Zone-1, Optd. R ph, Fault current-3.12KA Dist-90.1 KM	Did not trip	R-Earth	100 msec	Line tripped on phase to ground fault.	RANCHI			NO	NO	DVC	DVC
38	400KV-DHANBAD-RANCHI-1	19-05-2025	19:31	19-05-2025	19:59	DHANBAD: B-N,3.02 KM , 12.56 KA	RANCHI :A/R successfully Operated	R-Earth	100 msec	A/r successful from Ranchi end and three phase tripping from Dhanbad end. NKTL may explain.	Dhanbad			YES	NO	PG(ER-I)	NKTL
39	220KV-BUDHIPADAR-RAIGARH-1	19-05-2025	18:54	20-05-2025	00:24	BUDHIPADAR: Rph , 9.54 KM , 20.79 KA	-	R-Earth	120 msec	R phase tripped from both end and after 500 msec three phase tripping occurred.	Budhipadar			YES	NO	OPTCL	WRLDC

40	400KV-MAITHON-KHSTPP-2	19-05-2025	18:43	19-05-2025	19:29	KHSTPP: B-N, 2.9kA, 145km	Maithon: A/R successful	B-Earth	100 msec	A/r successful from Maithon end. Three phase tripping from Kahalgaon end. NTPC may explain.	Maithon			YES	NO	PG(ER-II)	NTPC
41	400KV-JHARSUGUDA-RAIGARH-4	19-05-2025	18:24	19-05-2025	19:33	Jharsuguda: Z-1, B-N, Ib-16.38kA, F.L-11.83KM	-	B-Earth	100 msec	Three phase tripping for phase to ground fault due to A/R was in non auto mode for reconductoring works	Jharsuguda			YES	NO	PG ODISHA	WRLDC
42	220KV-CHANDIL-RANCHI-1	18-05-2025	14:34	18-05-2025	15:32	Ranchi:- R-Y, 17.5km, IR-12.95kA,IY-12.6kA	Chandil:- R-Y, IR-2.57kA, IY-23.kA, Z1,80.4km	R-Y	100 msec	As per PMU line tripped on phase to phase fault.	New Ranchi			NO	NO	JUSNL	PG(ER-I)
43	400KV-RANCHI-RAGHUNATHPUR-2	18-05-2025	14:14	18-05-2025	15:09	Raghunathpur end : R-Ph , 1.79 KA , 155 KM	Ranchi : No tripping	R-Earth	100 msec	As per PMU line tripped on phase to ground fault.	New Ranchi			NO	NO	PG(ER-I)	DVC

44	400KV-RANCHI-NEW RANCHI-3	18-05-2025	14:14	18-05-2025	22:20	Ranchi : 2.7 km, 23.24 kA , R-N ,	New Ranchi :92.8 km, 6.77 kA, R-N	R-Earth	100 msec	Line tripped in reclaim time.	New Ranchi			NO	NO	PG(ER-I)	PG(ER-I)
45	400KV-RANCHI-RAGHUNATHPUR-3	18-05-2025	14:10	18-05-2025	16:24	Ranchi: 2.188km,20.87kA,B-Ph	Raghunathpur: B & Y Ph , 1.733 KA, 155 KM		100 msec	As per PMU line tripped on phase to ground fault.	New Ranchi			NO	NO	PG(ER-I)	DVC
46	400KV-PPSP-BIDHANNAGAR-1	17-05-2025	17:28	17-05-2025	17:58	PPSP: C-Ph, Z-I, 106.7km,	Bidhannagar: C-Ph, Z-I,58.2km, 4.824kA	B-Earth	100 msec	Three phase tripping for phase to ground fault.	Durgapur			NO	YES	WBSEDCL	WBSETCL
47	400KV-DSTPS(ANDAL)-RAGHUNATHPUR-1	17-05-2025	17:01	17-05-2025	23:28	-	RTPS end: Zone-1 Tripped, B-ϕ Fault, Fault Current :B-ϕ =11043.98A ,Fault ,Fault loop:-L3-N Fault Distance:	B-Earth	100 msec	As per PMU line tripped on phase to ground fault.	Jamshedpur			NO	NO	DVC	DVC

48	400KV-DSTPS(ANDAL)-RAGHUNATHPUR-2	17-05-2025	17:01	17-05-2025	23:27	-	RTPS end: Zone-1 Tripped, B-ϕ Fault, Fault Current :B-ϕ =13439.48A ,Fault ,Fault loop:-L3-N Fault Distance: 15.96KM	B-Earth	100 msec	As per PMU line tripped on phase to ground fault.	Jamshedpur			NO	NO	DVC	DVC
49	400KV-MAITHON-GAYA-2	17-05-2025	16:42	17-05-2025	17:48	Maithon: B-Ph, Y-Ph, Ib:15.3kA, Iy: 15.96kA, 33.2km	Gaya: 247km,1.6kA,B-Ph	B-Y	100 msec	Line tripped on phase to phase fault.	Maithon			YES	YES	PG(ER-II)	PG(ER-I)
50	220KV-MAITHON-DHANBAD-2	17-05-2025	16:30	17-05-2025	17:47	Maithon Not Tripped.	Dhanbad: 96 Relay Operated	R-Earth	640 msec	Bus bar protection operated.	Maithon			NA	NO	PG(ER-II)	DVC
51	220KV-MAITHON-DHANBAD-1	17-05-2025	16:30	17-05-2025	17:52	Maithon: Z-3, R-Ph,.97kA	Not tripped	R-Earth	640 msec	Line tripped from Maithon end in Z-3 protection due to bus fault at Dhanbad which got cleared after bus bar operation at Dhanbad. PG and DVC may explain.	Maithon			NO	NA	PG(ER-II)	DVC

52	400KV-DHANBAD-MAITHON RB-2	17-05-2025	16:29	17-05-2025	17:04	DHANBAD: Differntial , Y_ph Operated, 22.3km,Iy:3.3kA,	A/R Successful MPL: Differential Operated, Y-Ph O/C	R-Earth	100 msec	As per PMU line tripped on R phase to ground fault.	Maithon			NO	NA	NKTL	PG(ER-II)
53	220KV-RANCHI-HATIA-1	17-05-2025	14:56	17-05-2025	19:02	Ranchi: B-Ph, 6.717km,11.27kA, Z-I	Hatia: Ic 3.831kA, Z-I, 27.03km, B-Ph;	B-Earth	100 msec	A/r failed after 1 sec.	Ranchi			YES	YES	PG(ER-I)	JUSNL
54	400KV-TENUGHAT-PVUNL-1	17-05-2025	14:44	17-05-2025	15:50	Tenughat: Ia=16.94A, Ib=41.8A, Ic=31.98A , Zone-None	PVUNL: DT received.	No Fault	100 msec	Line tripped on over voltage protection.	Tenughat			YES	NO	JUSNL	PVUNL
55	220KV-CHANDIL-RANCHI-1	17-05-2025	14:25	18-05-2025	13:48	Chandil: Z-I, Ia:1.88kA,70.1km, R-Ph	Ranchi: R-Ph, 9.59kA, 14.94km, Z-I	R-Earth	100 msec	A/r failed after 1 sec.	Ranchi			YES	YES	JUSNL	PG(ER-I)

56	765KV-FATEHPUR-PUSAULI-1	17-05-2025	02:24	17-05-2025	03:22	Fatepur: 302 km, 2.5 kA, Y-N,Z-2.	Sasaram: 25 km, IY 3.4 kA, Z-1	Y-Earth	160 msec	Three phase tripping for phase to ground fault.	Sasaram			NO	YES	NRLDC	PG(ER-I)
57	220KV-NEW PURNEA-MADHEPURA-1	16-05-2025	20:46	17-05-2025	13:31		Madhepura:BN pickup, Z1, IL1 130.9 A, IL2 93.2 A, IL3 2.066 kA, dist 19.47 km	B-Earth	100 msec	A/r successful from Madhepura end. B phase jumper is found snapped at location no. 243 from Madhepura end	Purnea			NA	YES	PG(ER-I)	BSPTCL
58	400KV-MUZAFFARPUR(PG)-DHALKEBAR-2	16-05-2025	18:45	20-05-2025	16:23	Muzaffarpur (SITE): M1-FD-83.67KM, FC-3.932 kA, M2-FD-83KM, FC-4.251 kA	-	R-Earth	100 msec	A/r failed after 1 sec.	Muzzfarpur			YES	NO	PG(ER-I)	NEPAL
59	220KV-BIRPARA-MALBASE-1	16-05-2025	08:52	16-05-2025	09:52	Y_N, Z-2, F Current 1.732 kA, F Dist 39.421 km	Y_N, Iy=3.804kA, Zone 1, F Dist=31.54km;	Y-Earth	100 msec	A/r successful , line tripped within reclaim period	Binaguri			YES	NO	PG-ER II	BHUTAN

60	220KV-DARBHANGA(DMTCL)-LAUKAHI-1	16-05-2025	06:23	17-05-2025	15:51	Z1, Y-N, 3.78kA, 39.5km	Z1, 46.18 KM , 2.56 KA	Y-Earth	100 msec	Y ph polymer insulator punctured,Auto Re-close unsuccessful from Laukahi end ;AT DMTCL 3 ph trip for SLG occurred	New purnea			YES	NO	PG-ER I	BSPTCL
61	400KV-MERAMUNDALI-LAPANGA-2	15-05-2025	22:06	16-05-2025	15:01	Meeramundali:IR=6.55kA, RN, Z1, dist= 94.1km	Lapanga: RN,dist= 137.8 km(M1) 147 km(M2)	R-Earth	100 msec	Auto Reclose unsuccessful at both ends Insulator punctured at loc 127;	Meeramundali		DR length at meramandali 1.75 s instead of 3 sec	YES	YES	OPTCL	OPTCL
62	400KV-ARAMBAGH-PPSP-1	15-05-2025	17:54	15-05-2025	18:20	ARAMBAG: ZONE:1, B_N, DIST: 76.8 KM, FAULT CURRENT:4.06 KA	PPSP: ZONE:1, B_N, DIST: 116.3 KM	B-Earth	100 msec	3 ph trip for single phase fault	Arambagh PG			YES	NO	WBSETCL	WBSEDCL
63	400KV-MUZAFFARPUR(PG)-DHALKEBAR-2	15-05-2025	17:27	15-05-2025	19:18	Muzzafarpur end:-B-N , FD - 128 km , FC - 3.431 kA		B-Earth	100 msec	3 ph trip for single phase fault At Muzaffarpur ;Voltage buildup after 1 sec shows successful A/r at remote end	Muzzafarpur PG			YES	NO	PG-ER I	NEPAL

64	400KV-DURGAPUR-KHSTPP-1	15-05-2025	14:27	15-05-2025	14:57	Khstpp end: Y_N, Z-1, FD- 74 km, FC- 4.8 kA	R/I at Dgp end: Y_N , FD - 146.7 km . FC - 2.91 ka	Y-Earth	100 msec	A/r inhbit signal at kahalgaon end leading to 3 ph trip after 2.5 sec at kahalgaon;A/r successful at durgapur	Durgapur PG		DR length at Durgapur 2.5 s instead of 3 sec	YES	YES	PG-ER II	NTPC
65	400KV-JAMSHEDPUR-ANDAL-2	15-05-2025	14:21	15-05-2025	18:14	Jamshedpur end : Y_N, FD- 4.99 km, FC- 17.87 kA	DSTPS(Andal) end : Y-ph, Fault Current - 1.649 kA Fault Distance= 133.1 km, Z2	Y-Earth	100 msec	Tripped during reclaim time	Jamshedpur PG			YES	NO	PG-ER I	DVC
66	400KV-DURGAPUR-KAHALGAON-2	15-05-2025	12:29	15-05-2025	12:55	Durgapur: A/R successful, R ph, 122.3 km, 2.2 kA	KHSTPP: Z-1, R_N, FC:2kA, FD: 48%	R-Earth	100 msec	A/r successful at Durgapur;A/r attempt not taking place at kahalgaon and possibly PD operating .	Durgapur PG		DR length at Kahalgaon 2.5 s	YES	YES	PG-ER II	NTPC
67	220KV-MAITHON-DHANBAD-1	15-05-2025	11:53	15-05-2025	12:23		Dhanbad end:- Y_B, Zone-1 , fault dist- 28.7 KM, Fault current:Iy =4.18 Ka, Ib= 4.65 Ka	Y-B	100 msec	Phase to phase fault	Dhanbad PG			YES	NO	PG-ER I	DVC

68	400KV-MALBASE-BINAGURI-1	15-05-2025	07:41	15-05-2025	08:32	Malbase-Z1,81.6 KM , 2.45 KA	Did not trip	R-Earth	100 msec	A/r successful at Binaguri (7:41) Possible not attempted in Malbase	Binaguri			NO	YES	BHUTAN	PG-ER II
69	220KV-MAITHON-DHANBAD-2	14-05-2025	12:01	14-05-2025	12:34	Maithon: Y-B ph, Iy-4.2 kA, Ib-3.8 kA, 46 km	Dhanbad end: Y-B, Z1, fault dist-2.4 KM, Fault current Iy=12.841 amp, Ib= 13.2 Kamp	Y-B	160 msec	Phase to phase fault	Dhanbad PG		0.7 sec DR length may be kept 3 sec	YES	YES	PG-ER II	DVC
70	220KV-CHANDIL-STPS(WBPDCL)-1	14-05-2025	09:04	14-05-2025	09:57	Chandil end:- Zone -1, Ia=0.12 KA, Ib= 0.11 KA, Ic=2.96 KA, fault distance =27.4kM.	STPS: z-2, 83 km, IB=0.859 kA, B-N.	B-Earth	240 msec	3 ph trip for single ph fault at Chandil	Jamshedpur PG			YES	NO	JUSNL	WBPDCL
71	400KV-ALIPURDUAR (PG)-JIGMELLING-1	14-05-2025	00:12	14-05-2025	01:53	Alipurdaur end: RN fault, Z-2, 1.033 ka, 201.45 km.	Jigmelling end: Over Voltage Trip , YB Phase Faul	R-Earth	1880 msec	Tripped on Z2 and DT receipt at Alipurduar end	Alipurduar			YES	NO	PG-ER II	BHUTAN

72	400KV-ALIPURDUAR (PG)-JIGMELLING-2	14-05-2025	00:12	14-05-2025	02:08	Alipurdaur end: RN fault, Z-2, 2.341 ka, 199.7 km	Jigmelling end: Over Voltage Trip , YB Phase Fault	R-Earth	1880 msec	A/R unsuccessful t Alipurduar	Alipurduar			YES	NO	PG-ER II	BHUTAN
73	400KV-DURGAPUR-SAGARDIGHI-2	13-05-2025	16:23	13-05-2025	23:32	R-N fault	SgTPP End Relay Details: Main-1 Zone-1 R Phase Distance-104.1KM	R-Earth	100 msec	A/R unsuccessful at both ends	Durgapur PG		Sagardighi DR length is 1.2 sec against 3 sec	YES	YES	PG-ER II	WBPDCL
74	400KV-JEERAT-BAKRESWAR-1	13-05-2025	15:56	13-05-2025	16:10	Jeerat: Z-2, R ph, 128 km, 2.9 kA	Bakreswer: Z-1, R ph, 26 km, 5.6 kA;	R-Earth	100 msec	A/R unsuccessful after 1 sec	Jeerat WB			YES	NO	WBSETCL	WBPDCL
75	400KV-JHARSUGUDA(GIS)-OPGC-1	13-05-2025	14:17	13-05-2025	16:34	Jhasuguda: Z-1, B-N, Ib-8.17kA, F.L-31.89 km	OPGC: Zone-1, B_N, FC: 9.61 kA, FD: 32.2 km	B-Earth	100 msec	A/R unsuccessful after 1 sec	Jharsuguda			YES	NO	PG-Odisha	OPTCL

76	400KV-GOKARNA-SATGACHIA-2	13-05-2025	09:48	13-05-2025	22:51	Gokarna end: Zone: 2, Blue-PH, Dist: 93.92 KM, Fault Current: 2.561 KA	Satgachia end: Zone: 1, Blue Ph, Dist: 6.7 KM	B-Earth	100 msec	A/R unsuccessful after 1 sec	Rajarhat			YES	NO	WBSETCL	WBSETCL
77	400KV-DARBHANGA (DMTCL)-MUZAFFARPUR-1	12-05-2025	22:40	12-05-2025	23:27	Darbhanga: B-Ph,6.2528kA, Z-II, 85.9km	Muzaffarpur: 4.52km,17.4KA, B-Ph,Z-I	B-Earth	100 msec	A/r unsuccessful at Muzaffarpur;A/r attempt not seen at darbhanga	Muzaffarpur			YES	YES	DMTCL	PG-ER I
78	400KV-KHARAGPUR-KOLAGHAT-1	12-05-2025	18:41	12-05-2025	19:17	KGP: Zone - 1 Phase - R Distance - 4.49 KM Fault Current- R- 10.56 KA Auto reclose successful.	Kolaghat: NA	R-Earth	100 msec	A/r successful at kharagpur,Possible 3 ph trip at Kolaghat for a single phase fault	Kolaghat			YES	NO	WBSETCL	WBPDCL
79	400KV-KHARAGPUR-CHAIBASA-1	12-05-2025	16:59	12-05-2025	20:43	Relay of KGP: Zone - 1 Phase - Y-B Distance - 52.33 Km Fault Current- Y phase- 7.253 kA ,B phase - 6.952 kA		Y-B-N	100 msec	L-L-G fault	Chaibasa			YES	YES	WBSETCL	PG-ER I

80	765KV-ANGUL-SRIKAKULAM-1	12-05-2025	13:09	12-05-2025	13:56	Angul:B-N, Z1. 8.74 KA, 37.4 KM		B-Earth	100 msec	Tripped within reclaim time	Jharsuguda			YES	NO	PG-Odisha Projects	WBPDCL
81	400KV-JEERAT-BAKRESWAR-1	12-05-2025	12:01	12-05-2025	12:12	Jeerat: Z2, R-N, 140km, 2.7kA;	Barkeshwar: Z1, R-N, 26.55km, 5.57kA	R-Earth	100 msec	A/R unsuccessful	Bakreshwar			YES	NO	WBSETCL	WBPDCL
82	220KV-PUSAULI-NADHOKAR-2	11-05-2025	17:05	11-05-2025	17:45	Nadhokar :Z-1, 1.8 km;	pusauli :1.2 km, 13.56 kA,R-N, Z-1	R-Earth	100 msec	Tripped within reclaim time	Sasaram			YES	YES	PG-ER I	BSPTCL
83	220KV-KHAGARIA-NEW PURNEA-2	11-05-2025	12:42	11-05-2025	13:42	New Purnea end: YB fault, 13.6 km, Iy- 8.6 kA, Ib- 8.69 kA	Khagaria end: Zone -1, Y ph B ph, Ir-110.9A, Iy-2.172kA, Ib-2.094kA	Y-B	100 msec	Phase to phase fault	New Purnea			YES	NO	PG-ER I	BSPTCL

84	220KV-BIRPARA-MALBASE-1	10-05-2025	20:49	11-05-2025	00:15	Y-B-N FAULT Z3, F/C:IY-1.29KA,IB-2.08KA	at Malbase : TOV trip,B/B trip	Y-B-N	1000 msec	Phase to phase fault	Binaguri			YES	NO	PG-ER II	BHUTAN
85	400KV-BINAGURI-MALBASE-1	10-05-2025	20:49	11-05-2025	09:14	B-N FAULT , Z2, F/D-126.20 F/C-2.8 kA		B-Earth	100 msec	3 phase trip for single phase fault	Binaguri			YES	NO	PG-ER II	BHUTAN
86	220KV-Legship-NEW MELLI-1	10-05-2025	18:45	10-05-2025	20:00	New Melli: Y N Fault,1.94 kA,7.129 kM ;	Legship: not tripped	Y-Earth	100 msec	3 phase trip for single phase fault possibly DEF trip occured.May clarify	Rangpo			NO	NO	SIKKIM	PG-ER II
87	220KV-NEW MELLI-TASHIDING-2	10-05-2025	18:44	10-05-2025	19:13	New Melli-2.987KM,Y B, Iy-7.885kA, Ib-7.993kA		Y-B	100 msec	Phase to phase fault	Rangpo			YES	NO	PG-ER II	TASHIDING

88	220KV-CHUKHA-BIRPARA-2	10-05-2025	14:36	10-05-2025	16:39		Birpara: 70kM, RB, Z2, 2.8 kA	R-B-N	100 msec	3 ph trip at Birpara with phase to phase fault in Z2 but carrier received .Possibly fault is perceived as single phase fault from other end and Line getting successfully autoreclosed from other end	Alipurduar	Bhutan DR is dated 22.3.25		YES	YES	BHUTAN	PG-ER II
89	220KV-BIRPARA-MALBASE-1	10-05-2025	14:42	10-05-2025	16:50	Birpara: BN,Z-2,84.3kM,1.47KA;DEF		B-Easrth	2200 ms	DEF operation at birpara with Z3 start	Binaguri			YES	NO	PG-ER II	BHUTAN
90	400KV-BINAGURI-MALBASE-3	10-05-2025	14:42	10-05-2025	15:46	Binaguri: B-N , Z2, 126kM , Ib 2.6 kA		B-Easrth	1000 ms	Z2 fault seen at Binaguri withour carrier receipt;Hence 3 ph trip	Binaguri			YES	NO	PG-ER II	BHUTAN
91	220KV-CHUKHA-BIRPARA-1	10-05-2025	14:36	10-05-2025	16:15	Chukha: Zone-I, Dist= 25.131km, R-B phase fault, Ir=790.84A & Iy= 318.37A, Ib= 2130.96A & In= 2567.68A	Birpara: 55kM, R-B, Z2, 2.8 kA,	R-B-N	100 msec	phase to phase fault	Alipurduar	Bhutan DR is having timeof 13:3 hrs		YES	YES	BHUTAN	PG-ER II

92	400KV-JHARSUGUDA-STERLITE-2	10-05-2025	09:25	10-05-2025	10:11	jharsuguda: DT Received	Sterlite: Not Tripped	No fault	NA	Supurious Dt receipt at Jharsguda	JHARSUGUDA			YES	NO	PG Odisha projects	OTCL(Vedanta)
93	400KV-ROURKELA-CHAIBASA-2	09-05-2025	14:42	09-05-2025	17:42	Rourkela end: YBN fault, 3.34 kA, 126.8 km.	Chaibasa end: YBN fault, 17.17 kA, 7.16 km.	Y-B-N	100 msec	phase to phase to ground fault	ROURKELA			NO	YES	PG Odisha projects	PG-ER I
94	220KV-NEW TOWN(AA-III)-SUBHASGRAM(PG)-1	09-05-2025	14:36	10-05-2025	11:58	Newtown: Z1, RN fault, 13.81 km, 5.92 kA	Subhasgram end: RN , 5.03 km, 14 kA	R-Easrth	80 msec	A/R unsuccessful at newtown and DT sent to Subhasgram	SUBHASGRAM(PG)			YES	YES	Wbsetcl	PG-ER II
95	220KV-DALTONGANJ-CHATRA-1	09-05-2025	10:18	09-05-2025	17:12	Daltongunj: R-B, 115 KM;	Chatra: Ir 986A, Ib 1.040kA, Zone 01 fault distance 26.07km	Y-B	100 msec	phase to phase fault	Daltongunj			YES	YES	PG-ER I	JUSNL

96	220KV-BIRPARA-MALBASE-1	09-05-2025	02:06	09-05-2025	02:45	Birpara: Z-3, B-N, 0.91 kA		Y-B-N	1680 msec	Zone 3 operation from Birpara for Y-B-N fault	Binaguri			YES	NO	PG-ER II	BHUTAN
97	400KV-BINAGURI-MALBASE-1	09-05-2025	02:06	09-05-2025	03:19	Binaguri: Z-2, 120.14 km, B-N, 2.78 kA		Binaguri: Z-2, 120.14 km, B-N, 2.78 kA	1000 msec	Z2 operation at Binaguri , CARRIER NOT RECEIVED AT BINAGURI END FROM REMOTE END	Binaguri		Information not conclusively visible in Dr length provided	YES	YES	PG-ER II	BHUTAN
98	400KV-NEW DUBURI-TSL-2	08-05-2025	09:02	08-05-2025	09:52	Did not Tripped from New dubri emd	Inter trip signal; Maloperation suspected	NO fault found	NA	Spurious operation suspected	Pandiabili			NO	NO	OPTCL	OPTCL
99	400KV-MAITHON-DURGAPUR-2	07-05-2025	19:23	09-05-2025	07:48	Maithon: Y-N, FD 36.7 KM,Iy 6.5 KA	Durgapur: 26.3km, Y-N, 5.2 KA	Y-Earth	100 msec	A/R unsuccessful	Durgapur			NO	YES	PG-ER II	PG-ER II

100	220KV-NEW TOWN(AA-III)-RAJARHAT-1	06-05-2025	15:00	06-05-2025	20:00	N.TOWN: B-E, Zone - 1, 5.1 km, F/C 9KA;	Rajarhat: 0.5 km, B-E, 19.19 kA	R-Earth	100 msec	A/R unsuccessful	Rajarhat			YES	YES	WBSETCL	PG-ER II
101	220KV-SAHARSA(PMTL)-BEGUSARAI-1	06-05-2025	01:22	06-05-2025	03:13	SAHARSA: RN fault, 25 km, 5.1 kA	Begusarai end: RN fault, Zone 1, Dist 61.20Km, Ir=2.456 KA	B-Earth	100 msec	A/R unsuccessful	SAHARSA			YES	YES	PG-ER I(PMTL)	BSPTCL
102	220KV-MUZAFFARPUR(PG)-GORAUL(BH)-2	05-05-2025	23:53	06-05-2025	01:24	Muzaffarpur: DT Received, 5.6km,14.64 kA,R-Ph, Z-I	GSS Goraul:- RN fault, Zone -1, Fault distance - 7.5 KM, Ir-3.55 KA	R-Earth	100 msec	autoreclose successful at goraul.A/r not attempted at muzaffarpur due to faulty BCU	MUZAFFARPUR	1.5 sec DR length at Muzaffarpur		YES	YES	PG-ER I	BSPTCL
103	400KV-BIHARSARIFF(PG)-SAHUPURI(CHANDAULI)-2	05-05-2025	21:34	05-05-2025	23:14	Biharshariff: Y-Ph, Z-I, 4.05KA,90.21km,A/R Successful;	Chandauli : Y-N FAULT	Y-Earth	100 msec	Successful autoreclose from Biharshariff but possible no attempt from Sahupuri end	BIHARSHARIFF			YES	NO	PG-ER I	UPPTCL(NR)

104	400KV-GORAKHPUR-MOTIHARI-2	05-05-2025	17:37	05-05-2025	18:45	Motihari: B-N, 1.79 kA, 155 km		B-Earth	100 msec	3 ph trip for single phase dault	Muzzfarpur			NO	YES	NR	PG-ER I
105	400KV-NEW PPSP-NEW RANCHI-2	05-05-2025	14:12	05-05-2025	17:38	NPPSP: B-N, Z1, 33km, 3.98kA	RANCHI: B-N, 1.43 Km ,27.05 KA	B-Earth	100 msec	A/R unsuccessful from New Ranchi end	PPSP			NO	YES	WBSETCL	PG-ER I
106	400KV-RENGALI-INDRAVATI-1	03-05-2025	18:14	03-05-2025	19:00	Rengali : B-N, 156km, 1.969 Km	Indravati : B-N, 160 Km, 1.56 KA	B-Earth	100 msec	It seems total 4 faults were there and at first instance at 18:11Hrs, A/R was successful from both ends, but MCB remained open at Rengali end , and in the remaining 2 instances A/R was successful from both ends	Rengali	DR Channel in Rengali is to be checked. May be Ib and In are coming as Ir and Iy		YES	YES	PG-ODISHA PROJECTS	PG-ODISHA PROJECTS
107	220KV-KATAPALLI-BOLANGIR(PG)-1	03-05-2025	17:50	03-05-2025	18:35	Bolangir: R-N. 2.26kA, 55km	Katapalli : Not tripped	R-Earth	100 msec	A/r attempt not taken from Bolangir for single phase fault;probably a/r successful from katapalli	Bolangir			NO	YES	OPTCL	PG-ODISHA PROJECTS

108	400KV-JHARSUGUDA(GIS)-OPGC-1	03-05-2025	17:29	03-05-2025	18:03	OPGC :Z-1, 8.9km,R-Ph, 18 kA;	Jharsuguda : R-Ph, Z-1 , 8.98 kA, 39.82 kM	R-Earth to R-Y	100 msec	Autoreclose successful from jharsguda end main bay only and possible 3 phase trip took place from OPGC end	Jharsuguda			YES	NO	PG-ODISHA PROJECTS	OPTCL(OPGC)
109	220KV-BUDHIPADAR-KORBA-2	03-05-2025	17:11	03-05-2025	23:13	Budhipadar : R-N , Z-1, 26 km, 6.1 kA	Korba : Z-2, Fd-167 km, Ir - 1.321kA,	R-Earth	100 msec	Autoreclose not attempted for single phase fault from Budhipadar end and possible from korba end also	Budhipadar			YES	NO	OPTCL(OPGC)	Chattisgarh(WR)
110	220KV-DALTONGUNJ-GARWAH (NEW)-2	03-05-2025	16:25	04-05-2025	18:30	Daltongonj: R-N, 1.8 KM , 7.04 KA	Garwah: Not tripped	R-Earth	100 msec	Autoreclose unsuccessful and single phase fault evolved to phas e to phase fault during a/r attempt	Daltonganj			YES	NO	PG-ERI	JUSNL
111	220KV-DALTONGANJ-CHATRA-1	03-05-2025	15:35	03-05-2025	17:39	Chatra : Z1, 1.7 KA , 7.2 KM	Daltongonj: DT Received	R-Earth	100 msec	Autoreclose successful from Daltonganj and not attempted in Chatra	Daltonganj			YES	YES	PG-ERI	JUSNL

112	220KV-CHANDAUTI (PMTL)-SONENAGAR-1	03-05-2025	15:30	03-05-2025	16:51	Sonenagar : DT received	Chandauti : Direction earth fault protection operated	B-Earth	750 msec	DEF trip (MNPREP3P) at Chandauti and DT RECEIPT AT SONENEGAR for Single phase fault	Gaya			YES	YES	PG-ERI (PMTL)	BSPTCL
113	220KV-SITAMARHI-MOTIPUR-2	02-05-2025	13:33	02-05-2025	14:22	Sitahmari: A/R successfuly Operated;	Motipur:Fault loc-34.02km Zone-01 Ir-231.2A, Iy-124.7A Ib- 2.5KA	B-Earth	100 msec	A/R succesfull from Sitamarhi end only and not operated at Motipur end	Sitamarhi			YES	YES	PG-ERI (PMTL)	BSPTCL
114	220KV-PUSAULI-Karamnasa-1	01-05-2025	20:32	02-05-2025	15:36	pusauli: R-N, IR:6.271 kA, IB:1.345 kA, fd:22.15 Km, Z-1		R-Earth	160 msec	A/R unsuccessful at Pusauli end;Jumper snapping case and Post fault voltage at Pusauli showiung bus health voltage	Sasaram			YES	NO	PG-ERI	BSPTCL
115	400KV-MEDINIPUR-NEW CHANDITALA-1	01-05-2025	18:37	01-05-2025	19:38	Medinipur: Y-E, Zone -1 2.4 kA, 71.4 km	New Chandital a: Z-1, Y-Phase, Distance: 15.15 Km, Fault Current: 11.17 KA.	Y-Earth	200 msec	Tripped in reclaim time 10 sec after initiall successful autoreclose	Medinipur			YES	YES	PG-ERII	WBSETCL

Annexure C.1

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																
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4			Core - 1																
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5			Core - 1																
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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
147th PCC Meeting			
1.	Repeated disturbance at 400 kV PVUNL S/s	PVUNL representative replied that update regarding implementation of week infeed protection will be shared to ERPC/ERLDC after consultation with protection team. ERLDC representative said that in case of disturbance held on 5th April 2025, after auto-recloser attempt at Tenughat side, line must have tripped in SOTF at Tenughat end instead of pickup in zone 2 protection. PCC advised TVNL representative to review protection settings at their end for 400KV Tenughat-PVUNL line in consultation with CRITL, JUSNL.	
2.	Disturbance at 220/132 kV Fatuha (BSPTCL) S/s on 9th April 2025 at 16:20 Hrs	PCC advised BSPTCL representative that backup overcurrent protection settings of ICTs should be reviewed for faster clearing of fault. Further, as per ERPC protection philosophy, backup overcurrent protection should not be kept for 220 k V and above lines hence overcurrent protection settings for 220 k V and above lines should be disabled.	
3.	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	PCC advised SLDC Bihar, BSPTCL and BTPS representative to share further updates in remedial actions to ERPC/ERLDC	
4.	Disturbance at 220 kV Bodhgaya (BSPTCL) S/s on 21st April 2025 at 19:42 Hrs	PCC advised BSPTCL representative to discuss with ERPC, ERLDC and SLDC Bihar in order to implement overcurrent protection settings or SPS at	

		Khizirsarai end for 220 kV Bodhgaya-Khizesarai D/C. BSPTCL representative replied that they are planning to test Disturbance Recorder by agency on 5th June 2025 in which issue will be rectified.	
5.	Disturbance at 220 kV Chatra (JUSNL) S/s on 27th April 2025 at 19:08 Hrs	PCC advised JUSNL representative to review distance protection settings at Latehar end for 220 k V Latehar – Chatra line in consultation with ERLDC. It further advised JUSNL representative to share past records of tripping incidents for which week infeed protection had operated successfully at Chatra end to ERPC/ERLDC.	
6.	Tripping of 400KV/220KV 315 MVA ICT 1 AT LATEHAR(JUSNL) on 22nd April 2025 at 20:10 Hrs and Tripping of 400KV/220KV 315 MVA ICT 2 AT LATEHAR(JUSNL) on 16th April 2025 at 19:35 Hrs	PCC advised Powergrid representative to share present status of restoration of ICTs to ERPC/ERLDC.	
7.	Repeated Tripping of 400KV/220KV 315 MVA ICT 3 AT BIHARSARIFF on 10th April 2025 at 16:05 Hrs and on 14th April 2025 at 17:51 Hrs	PCC advised PG and BSPTCL representative to share report of incident occurred on 10th April 2025 and 14th April 2025 respectively to ERPC/ERLDC.	
8.	Tripping of 400 kV BIHARSARIFF(PG) Bus 3 on 10th April 2025 at 15:55 Hrs	PCC advised PG representative to share report of bus tripping to ERPC/ERLDC.	
9.	Repeated tripping of 220kV-TENUGHAT-BIHARSARIFF-1	PCC advised BSPTCL representative to share present status of commissioning work of	

		wave trap and PLCC at Tenughat end along with target date to ERPC/ERLDC.	
10.	Repeated tripping of 220kV-PUSAULI-NADHOKAR-1	PCC advised BSPTCL representative to share the settings of 220KV- Nadhokhar – Dehri D/c prior charging to ERPC/ERLDC.	
11.	Repeated tripping of 220kV-PATNA-KHAGAUL-1,	PCC advised BSPTCL representative to take appropriate action for rectifying clearance issue caused due to dumping. It further advised BSPTCL representative to test auto-recloser of 220kV-PATNA-KHAGAUL-1 at their end and share observation report to ERPC/ERLDC. PCC advised BGCL to test auto-recloser of 220kV-PATNA-KHAGAUL-3 at their end and share observation report to ERPC/ERLDC.	
146th PCC Meeting			
12.	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.	ERLDC representative informed that settings had been received from NTPC Kahalgaon and is under review.
141st PCC Meeting			
13.	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	BSPTCL representative informed that tenndering work for hiring agency regarding clerance test , tower footinnng resistance etc is in progress. Further, report will be shared by 30th June 2025.
139th PCC Meeting			

14.	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 remedial measures taken for protection/ operation issues to ERPC/ERLDC on periodic basis.	In 147th PCC, ERLDC representative said that o/c e/f settings had been received for Katapalli S/s however it had not been received for other nearest Substations like Lapanga S/s, Burla S/s which will be required for review. PCC advised SLDC Odisha and OPTCL to share o/c e/f settings (TMS and pickup) for adjacent S/s feeders to ERPC/ERLDC for further review.

136th PCC Meeting			
15.	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 147th PCC, TVNL representative informed that engineer from SLDC has visited the site for installation of battery bank however JUSNL, CRITL team had not visited till date.