



Agenda for 130th PCC Meeting

Date: 10/11/2023
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

AGENDA FOR 130th PROTECTION COORDINATION SUB-COMMITTEE MEETING TO BE HELD ON 10th NOVEMBER 2023 AT 11:00 HRS AT ERPC, KOLKATA

PART – A

ITEM NO. A.1: Confirmation of Minutes of 129th Protection Coordination sub-Committee Meeting held on 8th Sep 2023 through MS Teams online platform.

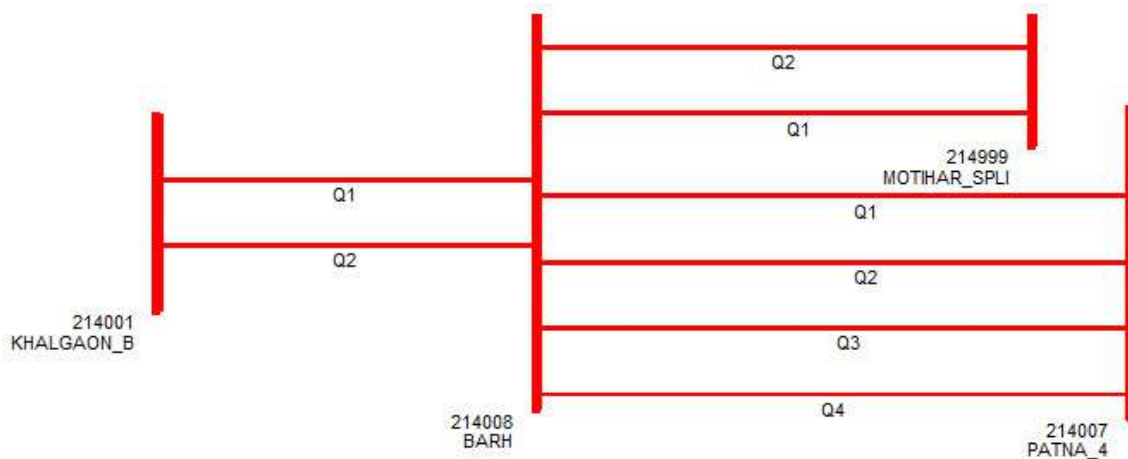
The minutes of 129th Protection Coordination sub-Committee meeting held on 08.09.2023 was circulated vide letter dated 22.09.2023.

Members may confirm.

PART – B

ITEM NO. B.1: Disturbance at 400 kV Barh (NTPC) S/s on 27.10.2023 at 10:15 Hrs

On 27.10.2023 at 10:15 Hrs, autorecloser attempt was observed for 400 kV Barh-Motihari-2 which was successful from both ends. However, teed protection got operated in its tie bay at Barh end and the dia element 400 kV Kahalgaon-Barh-2 got tripped. It is observed that at the same time, 660 MW Unit 2 at Barh also got tripped on GT differential protection.



**Gen. Loss: 570 MW
Outage Duration: 08:14 Hrs**

NTPC may explain.

ITEM NO. B.2: Total Power Failure at 400 kV Teesta V(NHPC), 400 kV Teesta III(SUL) and 400 kV Dikchu S/s on 04.10.2023 at 02:55 Hrs

On 04.10.2023 at 00:50 hrs, due to continuous high silt and rise in inflow in the upstream area of the reservoir, all units at Teesta-III (6*200 MW) (On bar gen 1300 MW) were taken out of bar. 400 kV Teesta III – Dikchu & 400 kV Teesta-III -Rangpo lines were hand tripped from Teesta III HEP end at 01:08 hrs and consequently Teesta-III substation became dead.

Further, at 01:49 hrs, both units at Dikchu (2*48 MW) were taken out of bar due to flash flood and all units of Teesta V (3*170 MW, generating around 504 MW) were taken out of service at 02:37 hrs due to high silt.

At 02:55 hrs, 400 kV-Rangpo-Teesta-V- D/C tower get collapsed at loc. No. 1 and Teesta-V substation became dead. Further at 06:15 Hrs, 400 kV Dikchu- Rangpo line breaker was opened from Dikchu HEP consequently Dikchu substation became dead.

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

Load Loss: 0 MW, Gen. Loss: 0 MW

Teesta V(NHPC), Teesta III(SUL) & Dikchu HEP may explain.

ITEM NO. B.3: Total Power Failure at 220 kV Rongnichu S/s on 09.10.2023 at 11:13 Hrs

On 09.10.2023 at 11:13 Hrs, 220 kV Rangpo-Rongnichu-2 got tripped on Y_B fault, leading to loss of evacuation path for two running units at Rongnichu as 220 kV Rangpo-Rongnichu-1 was already under emergency shutdown. Consequently, total power failed occurred at Rongnichu S/s.

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

Gen. Loss: 103 MW

Outage Duration: 07:04 Hrs

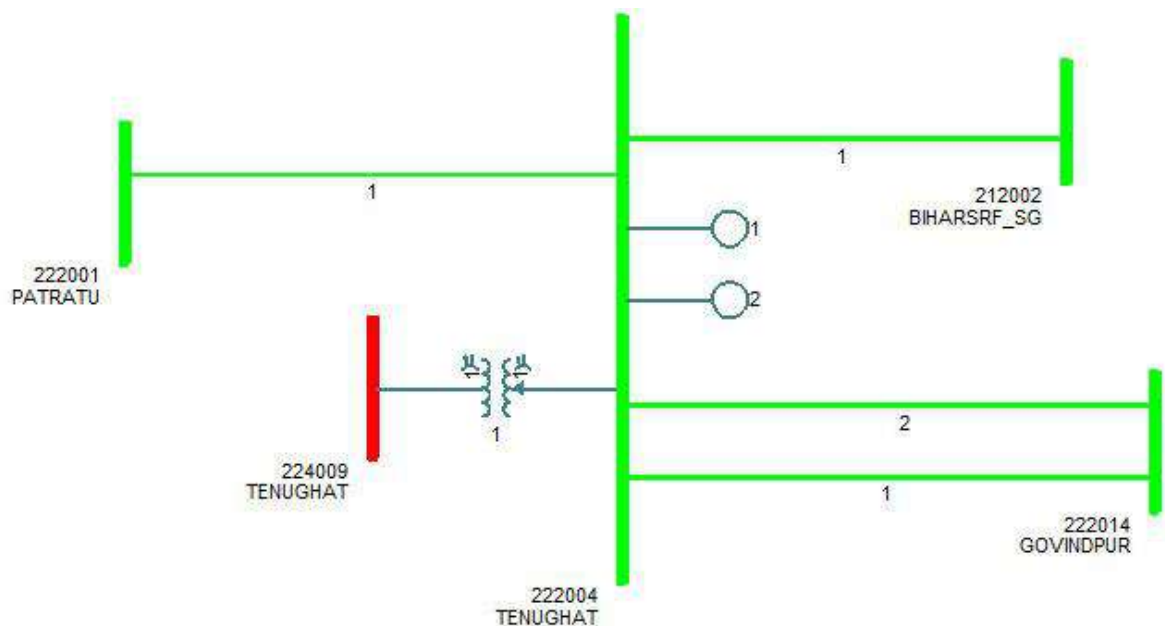
Rongnichu HEP may explain.

ITEM NO. B.4: Disturbance at 220 kV Tenughat (JUSNL) S/s on 08.09.2023 at 20:33 Hrs

On 08.09.2023 at 20:30 Hrs, 220 kV Maithon-Dumka-1 got tripped due to R phase fault leading to increase in loading of 220 kV Maithon-Dumka-2, which got tripped at 20:33 Hrs due to R phase fault. After 12 seconds, 220 kV Tenughat-Biharsharif also got tripped from Biharsharif end which led to islanding of entire Tenughat, Govindpur, Dumka, Godda, Deoghar complex with one unit of Tenughat. As generation of one unit of Tenughat was 140 MW and 410 MW load was present at time of islanding hence island didn't survive due to Load – Generation mismatch subsequently the island collapsed immediately.

A Meeting was conducted among ERPC, ERLDC and concerned utilities on 16th Oct 2023. The action points finalised in the meeting is attached at **Annexure B.4.1.**

Powergrid vide email dated 16th Oct 2023 replied that DTPC of Dumka-1&2 line at Maithon end belongs to JUSNL hence DTPC issue rectification may be taken care by JUSNL.



Detailed report from ERLDC is attached at **Annexure B.4.2.**

Load Loss: 437 MW, Gen. Loss: 140 MW

Outage Duration: 00:34 Hrs

JUSNL & BSPTCL may update.

ITEM NO. B.5: Major grid events other than GD/GI

A. Disturbance at Angul S/s on 12.10.2023 at 17:49 Hrs

On 12th October 2023, at 17:49 hrs, multiple number of trippings occurred at Angul S/s. During the incident, 765kV Bus 1&2, 765kV Angul-Srikakulam D/C, 765kV Angul-Jharsuguda Ckt-3&4, 765/400kV ICT-3 &4, 400kV Bus-1, 400kV Angul-GMR Ckt 2 and 400kV Angul-JITPL Ckt1 got tripped at 765/400 kV Angul S/s. It was reported that both 765 kV Bus & 400 kV Bus 1 got tripped due to operation of bus bar differential protection.

Report from ERLDC and Powergrid Odisha is attached at **Annexure B.5.A.**

Powergrid Odisha may explain.

B. Bus tripping occurred in Eastern Region during September and October 2023

Element Name	Tripping Date	Reason	Utility
400 kV Main Bus-1 at Keonjhar	01.09.23 at 10:18 Hrs	LBB relay operated	PG Odisha
220 kV Main Bus-1 at Ramchandrapur	01.10.23 at 04:38 Hrs	Bus PT failed	JUSNL

220 kV Main Bus-2 at Budhipadar	06.10.23 at 16:14 Hrs	-	OPTCL
220 kV Main Bus-1 at Ramchandrapur	20.10.23 at 00:11 Hrs	Bus Bar differential operated	JUSNL

Concerned utilities may explain.

ITEM NO. B.6: Repeated tripping of 220 kV Darbhanga (DMTCL)-Laukahi D/c

It has been observed that 220 kV Darbhanga (DMTCL)-Laukahi D/c had tripped quite frequently (18 times) in last three months. Details is attached at **Annexure B.6**.

BSPTCL may explain.

ITEM NO. B.7: Repeated Tripping of Transmission Lines in the month of September and October'23

S.No.	Name of the Element	No. of times Tripped	Remarks	Utility
1	220 kV Ranchi-Mejia-1	6	R_N fault in 4 instances.	DVC
2	220 kV Rengali(PG)-Rengali(OPTCL)-1	6	No fault in line. Tripped from OPTCL end only	OPTCL
3	400 kV PPSP-Bidhannagar-2	6	Line charged within 30 minutes in 4 cases. 5 out of 6 faults in B_ph	WBSETCL
4	400 kV Lapanga-Sterlite-2	4	R_N fault in all cases. Fault around 3 km from Sterlite in 3 instances.	OPTCL

Concerned utilities may explain.

ITEM NO. B.8: Tripping Incidence in month of Sep 2023 and Oct 2023

Single line tripping incidents in the month of Sep 2023 and Oct 2023 which needs explanation from constituents of either end is attached at **Annexure B.8**.

Members may discuss.

PART- C: OTHER ITEMS

ITEM NO. C.1: Internal Protection Audit Plan of Sub stations for the Year 2024-25

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 2024-25 to ERPC by 31.10.2023. Annual audit plans for internal audit of their protection systems and third party protection audit shall be furnished separately.

Members may discuss.

ITEM NO. C.2: Submission of protection settings for newly charged elements/change in network configuration

In 123rd PCC Meeting, PCC advised all the utilities to intimate any changes in network configuration in their intra state network regularly and review the settings accordingly & upload the relay settings in PDMS by using DMNS portal or by sending the settings file in desired format to erpc-protection@gov.in.

The updated status of protection settings for new elements charged in ER Grid from Nov 22 to Oct 2023 is given at **Annexure C.2**.

Members may update.

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

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

Members may update the latest status.



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




पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / Eastern Regional Load Despatch Centre

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CIN : U40105DL2009GOI188682, Website : www.erldc.in, E-mail : erldcinfo@grid-india.in, Tel.: 033 23890060/0061

**पूर्वी क्षेत्र के 400 केवी तीस्ता-III, दिक्चू, तीस्ता-V उप-केन्द्र में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report
of grid event in 400 kV Teesta-III, Dikchu, Teesta-V 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):12-10-2023

1. Event Summary (घटना का सारांश):

At 00:50 hrs on 04-10-2023, due to continuous high silt and rise in inflow in the upstream area of the reservoir, all units at Teesta-III (6*200 MW) (On bar gen 1300 MW) taken out of bar. 400 kV Teesta III – Dikchu & 400 kV Teesta-III -Rangpo lines were hand tripped from Teesta III HEP at 01:08 hrs and consequently Teesta-III substation became dead. Both units at Dikchu (2*48 MW) taken out of bar at 01:49 hrs due to flash flood. All units of Teesta V (3*170 MW, generating around 504 MW) were taken out of service at 02:37 hrs due to high silt. 400 kV-RANGPO-TEESTA-V-D/C tower collapsed at loc. No. 1 at 02:55 hrs and Teesta-V substation became dead. 400 kV Dikchu- Rangpo line breaker opened from Dikchu HEP at 06:15 hrs and Dikchu substation became dead.

2. Time and Date of the Event (घटना का समय और दिनांक): 02:55 hrs of 04.10.2023

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand
Pre-Event (घटना पूर्व)	49.984	27350	20289
Post Event (घटना के बाद)	49.984	27350	20289

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

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विद्युत उत्पादन इकाइयां जो बंद हैं)	Nil
Weather Condition (मौसम स्थिति)	Incessant Rainfall in North Sikkim. GLOF event in South Lohnak lake

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Considering Teesta III, Teesta V and Dikchu, together, a total generation of approx. 1919 MW was lost during 00:50 hrs to 02:37 Hrs.

7. **Duration of interruption (रुकावट की अवधि):** Not restored yet.

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

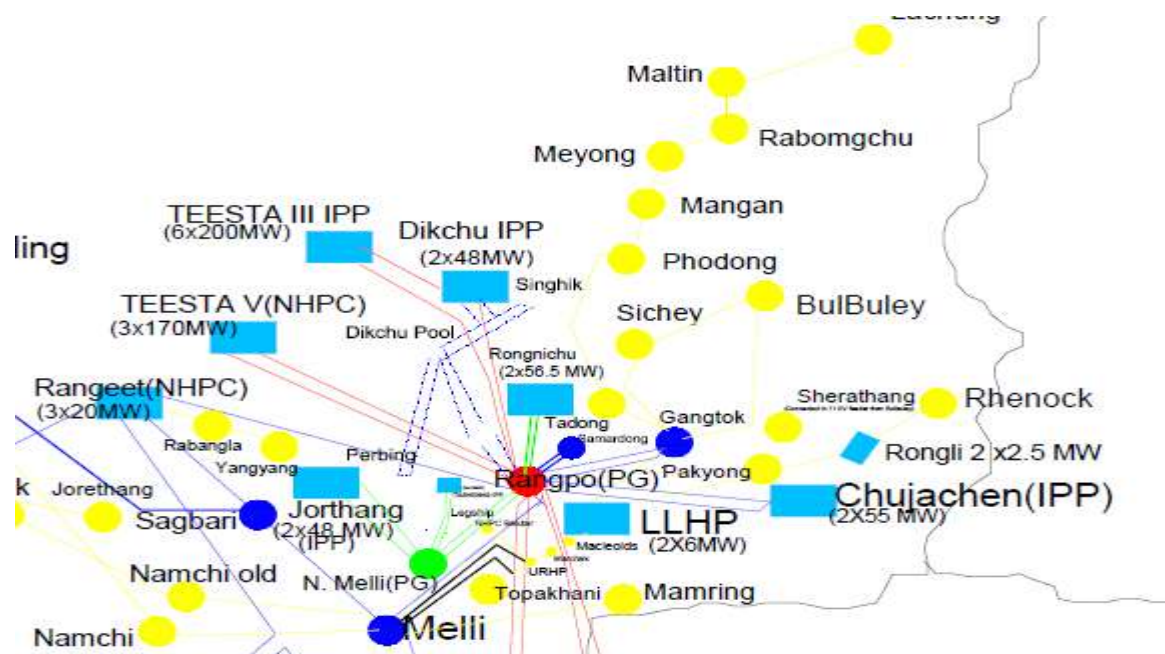


Figure 1: Network across the affected area

9. **Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण):** Tower of 400 kV Rangpo-Teesta-V D/c collapsed at loc. No.1

10. Major Elements Tripped (प्रमुख ट्रिपिंग)

क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	400 kV Rangpo-Teesta V-1	02:55:13	Rangpo: R-B-Ph,11.507km,11.6kA	-	Not restored yet
2	400 kV Rangpo-Teesta V-2	02:55:12	Rangpo: Y-N,12.135km,9.21kA	-	

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

A GLOF (Glacial Lake Outburst Flood) event occurred at South Lohnak lake in North Sikkim led to high rise in inflow and silt in Teesta River. 400 kV Teesta-III, Dikchu and Teesta-V desynchronized their units one by one and around 1900 MW generation loss occurred.

Sequence of Events:

- At 00:50 Hrs: 6*200 MW units at Teesta-3 was desynchronized one by one due to high silt content.
- At 01:08 Hrs: 400 kV Teesta 3-Rangpo and 400 kV Teesta 3-Dikchu hand-tripped from Teesta-3 as a precautionary measure. 400 kV Teesta-3 S/s became dead.
- At 01:49 Hrs: 2*48 MW units at Dikchu desynchronized due to flash flood.
- At 02:37 Hrs: 3*170 MW units at Teesta-5 desynchronized due to high silt content.
- At 02:55 Hrs: 400 kV Teesta V-Rangpo D/c tower collapsed at loc. 1 just outside Teesta-5 switchyard. At 02:55:12 Hrs 400 kV Rangpo-Teesta V-2 tripped due to Y_N fault. After, 800 msec, fault appeared in B_ph of the line and three phase tripped. At the same time, 400 kV Rangpo-Teesta V-1 tripped due to phase-to-phase fault. 400 kV Teesta V S/s became dead.
- At 06:15 Hrs: 400 kV Rangpo-Dikchu hand-tripped from Dikchu end as a precautionary measure. 400 kV Dikchu S/s became dead.

PMU Snapshot:

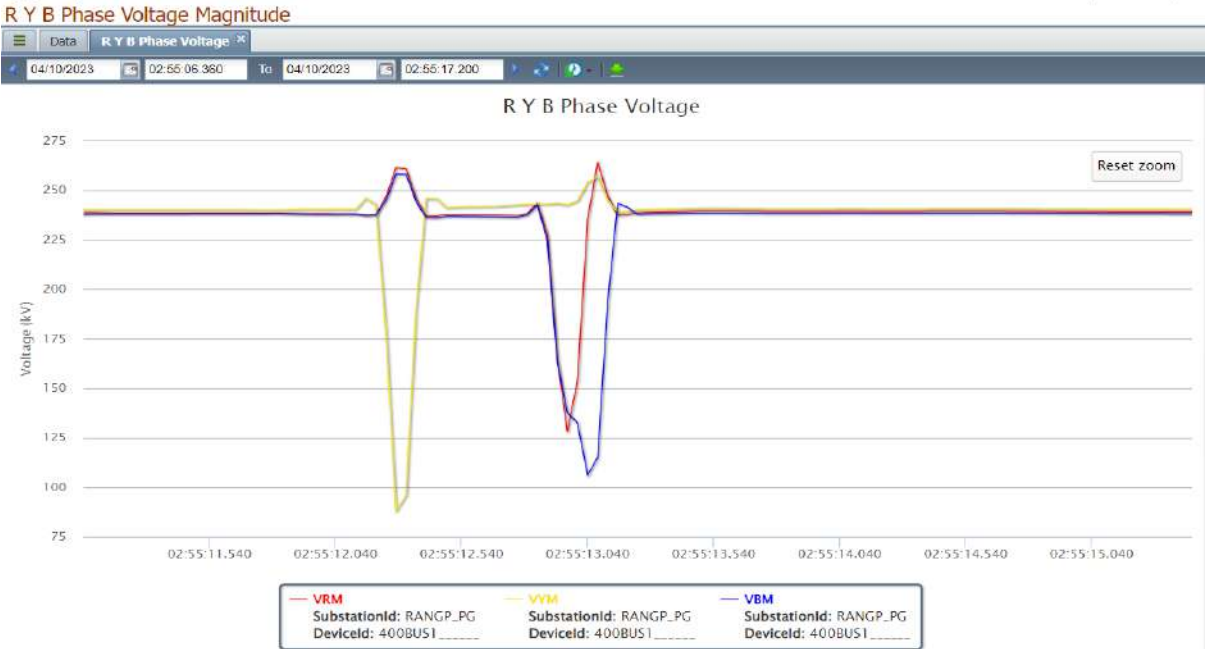


Figure 2: PMU snapshot of 400 kV Rangpo S/S during the tower collapse of 400 kV Rangpo-Teesta-V D/c at 02:55 hrs of 04.10.23

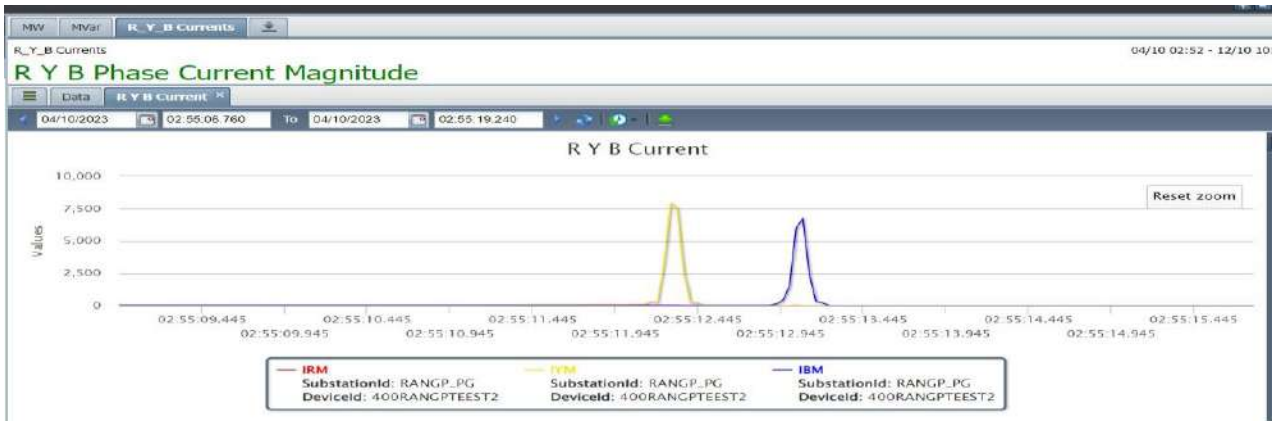


Figure 3: PMU snapshot of current of 400 kV Rangpo-Teesta V-2 @ Rangpo

SCADA Snapshot:

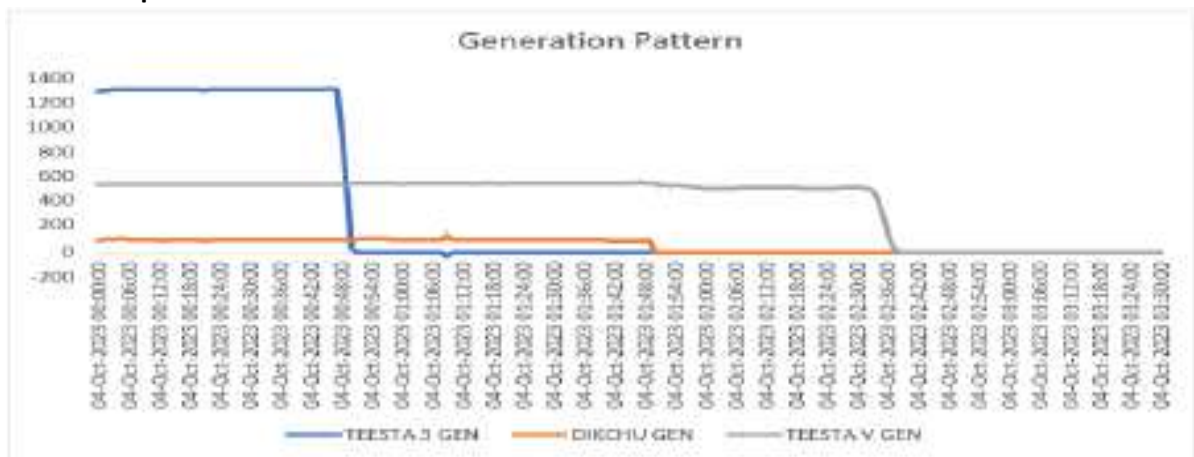


Figure 4: Generation outage sequence during the event

- In case of extreme weather event, when generation has already been desynchronized and information received about intensity of the problem, S/s may be completely isolated by hand-tripping the lines as a safety measure

12. **Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या):** From PMU and SCADA data, no discrepancies observed in protection operation.

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

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

S.No.	Issues	Regulation Non-Compliance	Utilities
2.	Whether DR/EL provided within 24 Hours?	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	PG ER-2, Teesta V

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

Annexure 1

SOE_PG							
Date/Time	Station Name	Point Name	Value	Time Quality	Scan Quality		
04/10/23 03:36:00:878	BHVDC_PG	220_ACFBank2_Capacitor5_CB	Open		Good	Good	Good
04/10/23 03:36:00:852	BHVDC_PG	220_ACFBank2_Capacitor5_CB	Travel		Good	Good	Good
04/10/23 03:14:00:561	PURNW_PG	220_KHAGR_BH_2_CB	Closed		Good	Good	Good
04/10/23 03:00:51:667	CHEP_PG	132_RANGP_2_PG_Main_CB	Open		Good	Good	Good
04/10/23 02:55:13:097	RANGP_PG	400_TEEST_PG_2_CB	Open		Good	Good	Good
04/10/23 02:55:13:015	RANGP_PG	400_TEEST_PG_1_CB	Open		Good	Good	Good
04/10/23 02:55:12:344	RANGP_PG	400_TEEST_PG_2_CB	Travel		Good	Good	Good
04/10/23 02:46:33:437	BHVDC_PG	220_ACFBank2_Reactor3_CB	Closed		Good	Good	Good
04/10/23 02:46:33:409	BHVDC_PG	220_ACFBank2_Reactor3_CB	Travel		Good	Good	Good
04/10/23 02:41:06:633	TEEST_PG	400_RANGP_PG_2_CB	Open		Good	Good	Good
04/10/23 02:40:57:431	TEEST_PG	400_RANGP_PG_1_CB	Open		Good	Good	Good
04/10/23 02:37:44:261	TEEST_PG	400_Unit1_CB	Open		Good	Good	Good
04/10/23 02:37:04:784	TEEST_PG	400_Unit3_CB	Open		Good	Good	Good
04/10/23 02:36:10:360	TEEST_PG	400_Unit2_CB	Open		Good	Good	Good
04/10/23 02:04:37:930	DKCHU_PG	400_ICT_1_Pri_Main_CB	Open		Good	Good	Good
04/10/23 02:04:37:930	DKCHU_PG	400_FUTURE_1_Main_CB	Open		Good	Good	Good
04/10/23 01:25:35:685	DKCHU_PG	400_TEES3_PG_Main_CB	Open		Good	Good	Good
04/10/23 01:25:35:683	DKCHU_PG	400_TEES3_PG_RANGP_PG...	Open		Good	Good	Good
04/10/23 01:25:35:664	DKCHU_PG	400_TEES3_PG_MP1	Operated		Good	Good	Good
04/10/23 01:25:35:662	DKCHU_PG	400_TEES3_PG_MP2	Operated		Good	Good	Good
04/10/23 00:43:20:024	PURNW_PG	400_MALDA_PG_1_Main_Bu...	Closed		Good	Good	Good
04/10/23 00:39:39:932	PURNW_PG	400_MALDA_PG_1_Main_CB	Closed		Good	Good	Good
04/10/23 00:38:49:760	TEES3_PG	400_DKCHU_PG_CB	Open		Good	Good	Good
04/10/23 00:38:47:740	TEES3_PG	400_DKCHU_PG_CB	Travel		Good	Good	Good
04/10/23 00:19:55:160	TEES3_PG	400_UNIT6_H_CB	Open		Good	Good	Good
04/10/23 00:19:52:480	TEES3_PG	400_UNIT6_H_CB	Travel		Good	Good	Good
04/10/23 00:19:48:700	TEES3_PG	400_UNIT3_H_CB	Open		Good	Good	Good
04/10/23 00:19:47:620	TEES3_PG	400_UNIT5_H_CB	Open		Good	Good	Good
04/10/23 00:19:45:740	TEES3_PG	400_UNIT3_H_CB	Travel		Good	Good	Good

Annexure 2

DR/EL not submitted by PG ER-2, Teesta V.



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




पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / Eastern Regional Load Despatch Centre

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**पूर्वी क्षेत्र के 220 केवी रॉगनिचू उप-केन्द्र में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event in
220 kV Rongnichu HEP 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):17-10-2023

1. Event Summary (घटना का सारांश):

At 11:13 Hrs, 220 kV Rangpo-Rongnichu-2 tripped on Y_B fault, leading to loss of evacuation path for two running units at Rongnichu as 220 kV Rangpo-Rongnichu-1 was already under emergency shutdown. Consequently, total power failed at Rongnichu S/s and around 103 MW generation loss occurred.

2. Time and Date of the Event (घटना का समय और दिनांक): 11:13 hrs of 09.10.2023

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand
Pre-Event (घटना पूर्व)	49.98	26407	22285
Post Event (घटना के बाद)	49.98	26304	22285

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

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विद्युत उत्पादन इकाइयां जो बंद हैं)	220KV-Rongnichu-Rangpo-1 was under emergency shutdown.
Weather Condition (मौसम स्थिति)	Normal weather

6. Load and Generation loss (लोड और जेनरेशन हानि): Generation loss: Around 103 MW; Load loss: NIL.

7. Duration of interruption (रूकावट की अवधि): 06:53 Hrs

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

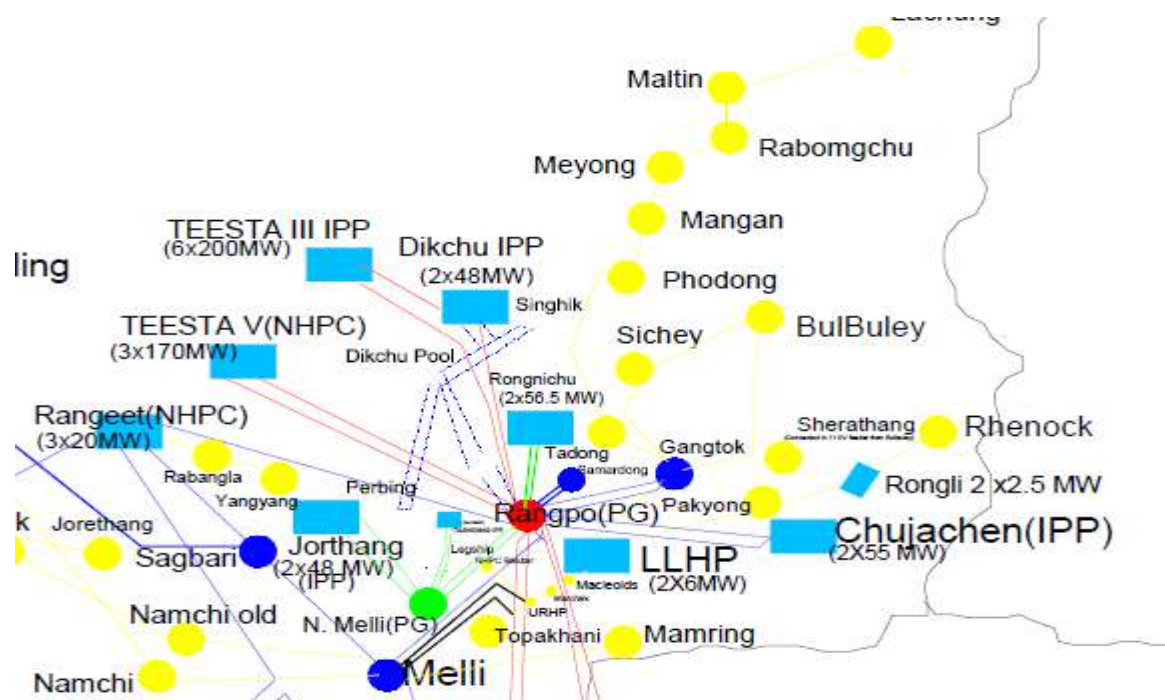


Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग)

क्र०सं०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220 kV Rangpo-Rongnichu-2	11:13:08	Rangpo: Y_B, 1.27 km, Iy=Ib=13.18 kA	-	18:17

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

- A phase-to-phase fault struck 220 kV Rangpo-Rongnichu-2 and line tripped. Both running units at Rongnichu tripped due to loss of evacuation path as 220 kV Rangpo-Rongnichu-1 was already under emergency shutdown.
- 220 kV Rangpo-Rongnichu-1 charged at 18:04 Hrs and power supply was restored.
- DR not time synchronized at Rangpo end.

PMU Snapshot:

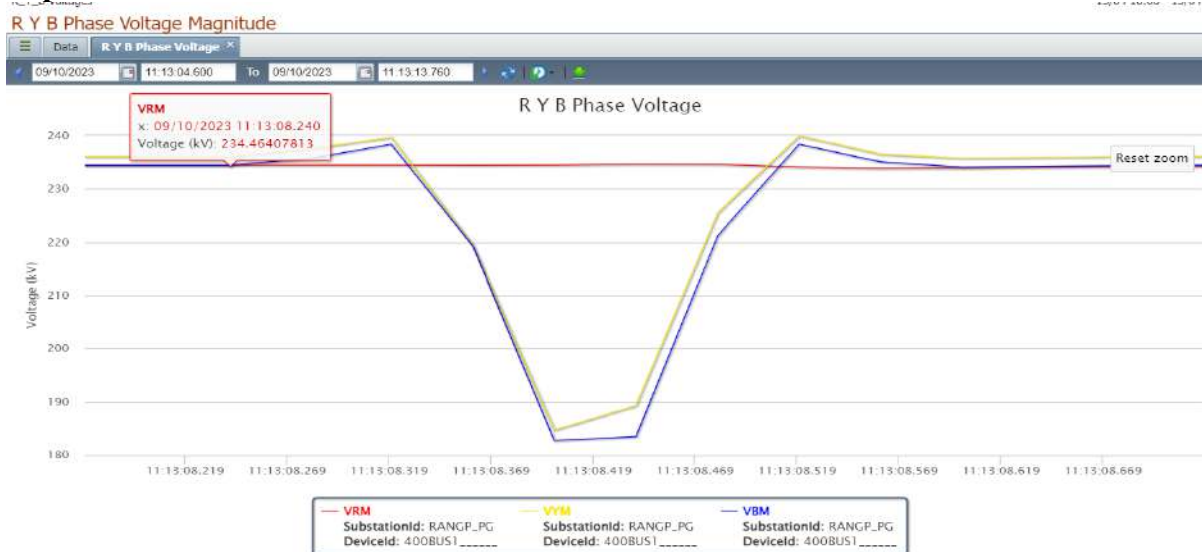


Figure 2: PMU Voltage snapshot of 400 kV Rangpo S/S

12. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या): No discrepancies observed in protection operation.

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

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

S.No.	Issues	Regulation Non-Compliance	Utilities
2.	Whether DR/EL provided within 24 Hours?	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	PG ER-2

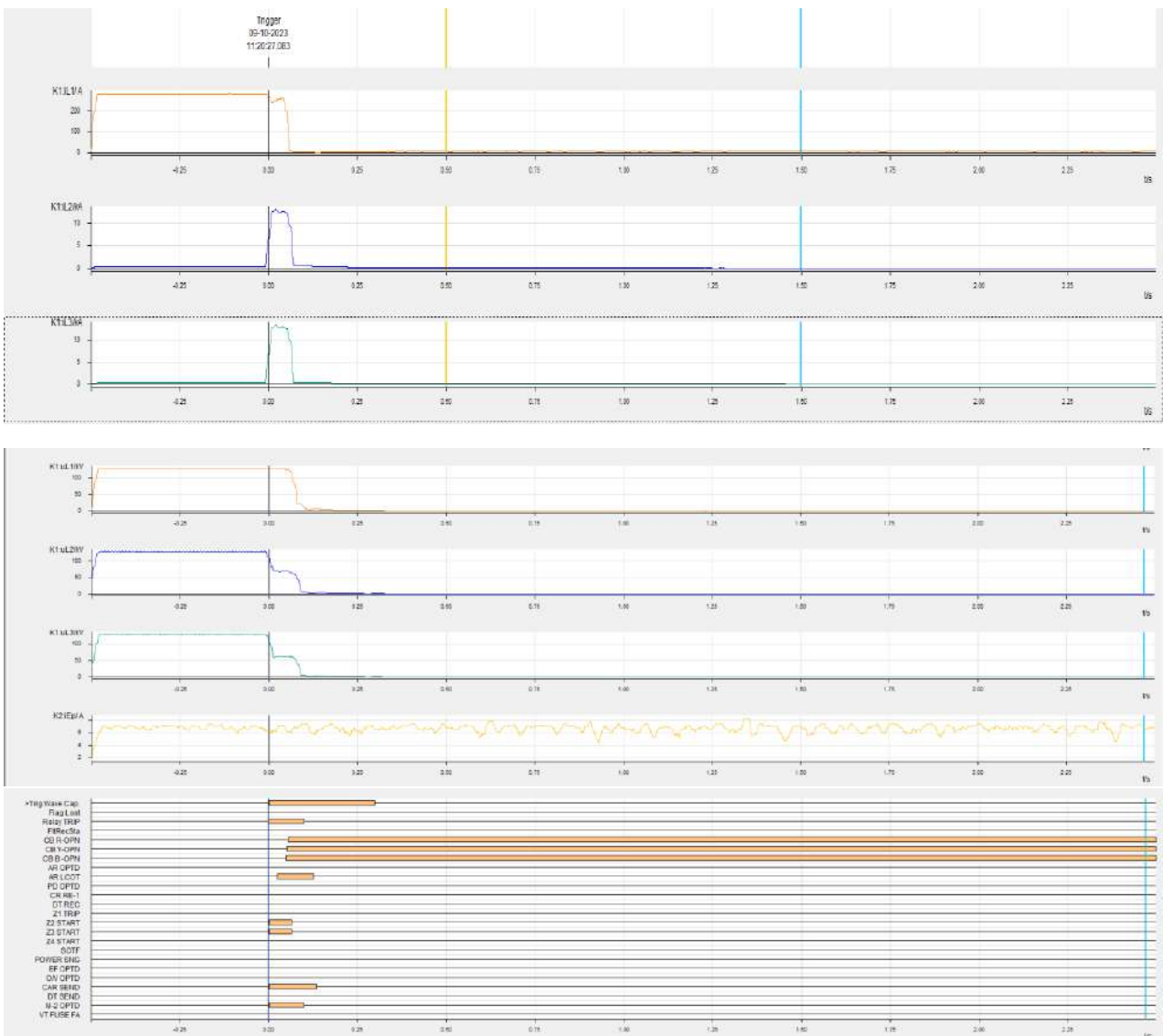
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु): Nil

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

All						
Date/Time	Station Name	Point Name	Value	Time Quality	Scan Quality	
09/10/23 11:13:08:441	RANGP_PG	220_RONGN_PG_2_CB	Open		Good	Good
09/10/23 11:13:13:046	RONGN_PG	220_stn_trf_CB	Open		Good	Good
09/10/23 11:13:13:013	RONGN_PG	220_stn_trf_CB	Travel		Good	Good
09/10/23 11:13:09:367	RONGN_PG	220_UNIT_H_2_CB	Open		Good	Good
09/10/23 11:13:09:345	RONGN_PG	220_UNIT_H_1_CB	Open		Good	Good
09/10/23 11:13:09:344	RONGN_PG	220_UNIT_H_2_CB	Travel		Good	Good
09/10/23 11:13:09:334	RONGN_PG	220_UNIT_H_1_CB	Travel		Good	Good
09/10/23 11:13:07:982	RONGN_PG	220_RANGP_PG_2_CB	Open		Good	Good
09/10/23 11:13:07:953	RONGN_PG	220_RANGP_PG_2_CB	Travel		Good	Good

Annexure 2:

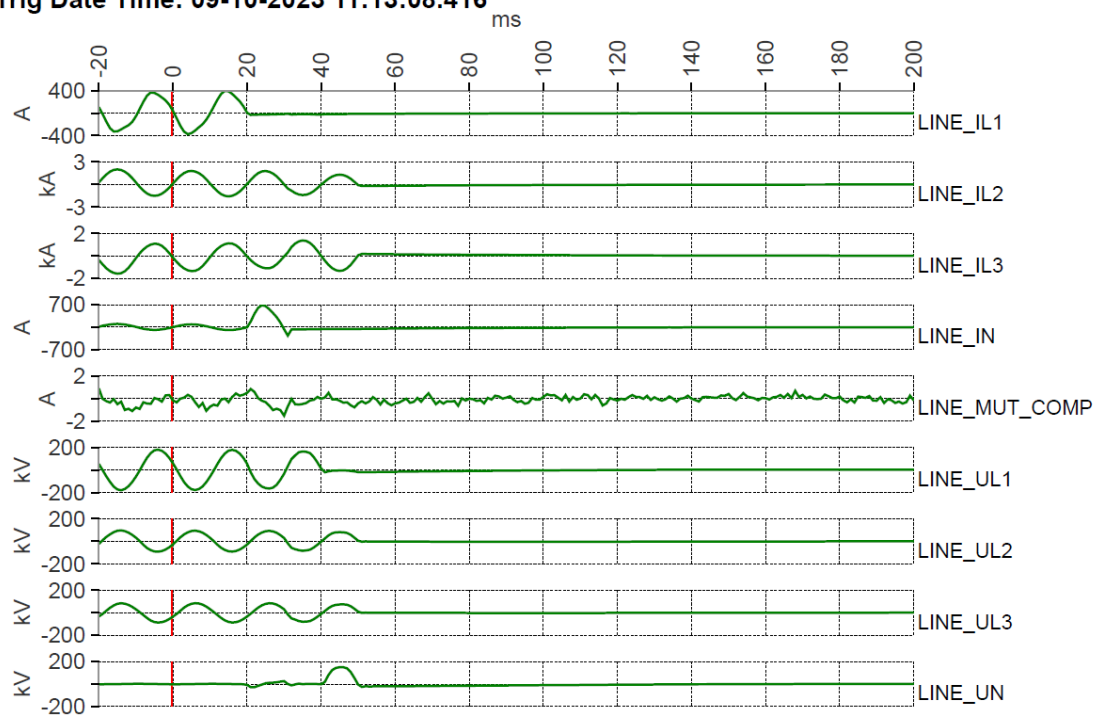
DR of 220 kV Rangpo-Rongnichu-2 (Rangpo)



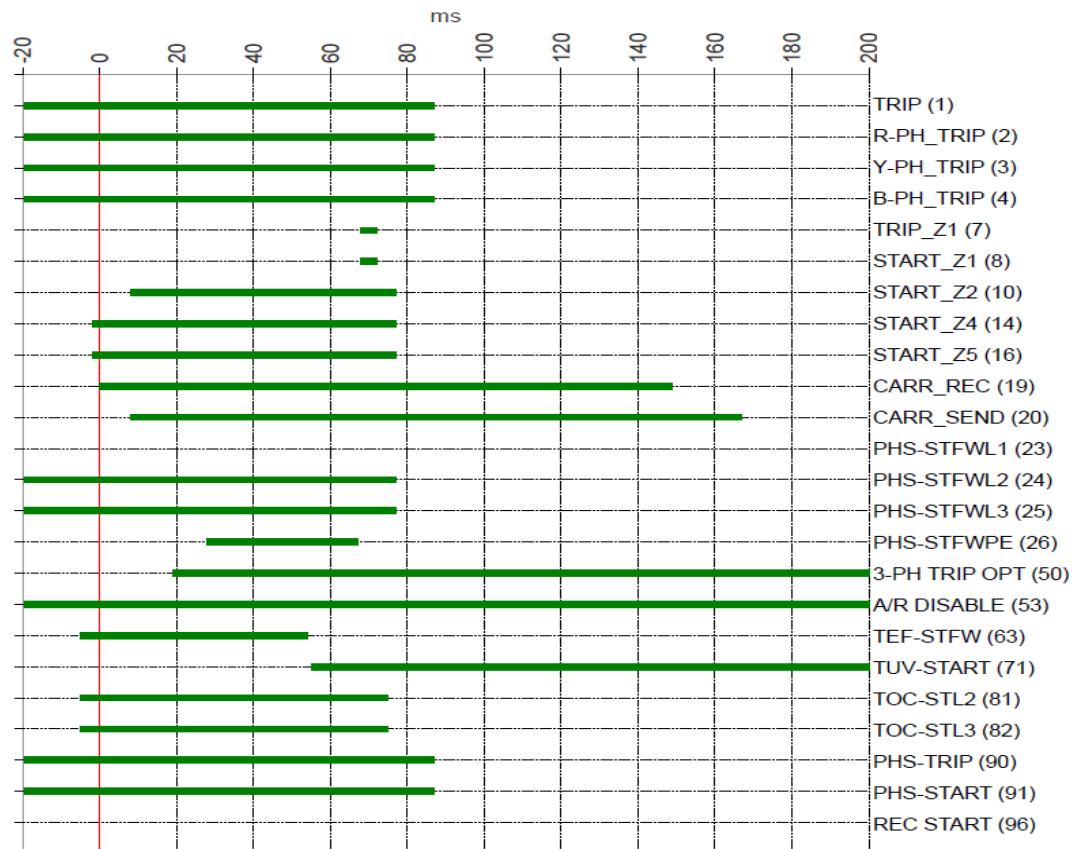
DR of 220 kV Rangpo-Rongnichu-2(Rongnichu)

Analog Time Diagram

Trig Date Time: 09-10-2023 11:13:08.416



Trig Date Time: 09-10-2023 11:13:08.416



Action Points for various utilities

An online meeting was held on 16.10.23 to discuss the Grid Disturbance that occurred at Tenughat, Govindpur, Dumka, Godda, Deoghar area on 08.09.2023 at 20:33 Hrs. Meeting was attended by participants from ERPC, ELRDC, Powergrid ER-2, JUSNL, BSPTCL, SLDC Patna.

Following action points were agreed upon which is to be undertaken by various utilities:

S. No.	Action Point	Utility
1	Replacement of defective Digital Protection coupler of 220 kV Maithon-Dumka-1. A/r may be enabled for Zone-1 without DTPC till replacement.	JUSNL
2	Rectification of DTPC issues for 220 kV Maithon-Dumka-2 at Maithon end	JUSNL, PG ER-2
3	Periodic patrolling and preventive maintenance of the line to prevent repeated tripping of 220 kV Maithon-Dumka D/c	JUSNL
4	E/f setting of 220 kV Maithon-Dumka-2 at Dumka end (May intimate the revised setting)	JUSNL
5	Increasing O/c setting value at Biharsharif end for 220 kV Biharsharif-Tenughat. O/c setting for other lines at Biharsharif also may be reviewed once.	BSPTCL
6	SPS for 220 kV Maithon-Dumka D/c (To be discussed in next OCC meeting)	JUSNL

Concerned utilities may update after making abovementioned changes.



घटना संख्या: 08-09-2023/1

दिनांक: 05-10-2023

Report on the grid event in Eastern Region (पूर्वी क्षेत्र में ग्रिड घटना पर रिपोर्ट)

Summary of the event (घटना का सारांश):

At 20:30 Hrs, 220 kV Maithon-Dumka-1 tripped due to R_N fault leading to increased loading of 220 kV Maithon-Dumka-2, which tripped at 20:33 Hrs due to R_N fault. After 12 seconds, 220 kV Tenughat-Biharsharif also tripped from Biharsharif. This led to islanding of entire Tenughat, Govindpur, Dumka, Godda, Deoghar complex with only one unit of Tenughat (140 MW generation) and 410 MW load, which did not survive, and the island collapsed immediately.

- **Date / Time of disturbance:** 08-09-2023 at 20:33 hrs
- **Event type:** GD-1
- **Systems/ Subsystems affected:** 220/132 kV Tenughat, Dumka, Govindpur, Godda, Jaisidih, Giridih S/s
- **Load and Generation loss.**
 - 140 MW generation loss reported during the event.
 - Around 410 MW load loss reported during the event at Dumka, Govindpur, Godda, Jaisidih, Giridih, Deoghar, Pakur, Rajmahal (Including Railway) by Jharkhand SLDC.

Important Transmission Line/element if out (महत्वपूर्ण संचरण लाइने जो बंद हैं):

- 220 kV Godda-Lalmatia D/c

Major elements tripped (प्रमुख ट्रिपिंग):

- 220 kV Maithon-Dumka D/c
- 220 kV Biharsharif-Tenughat
- 210 MW U#2 at Tenughat

Network across the affected area (प्रभावित क्षेत्र का नक्शा)



Figure 1: Network across the affected area

Relay indication and PMU observation (रिले संकेत और पीएमयू पर्यवेक्षण):

समय	नाम	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पीएमयू पर्यवेक्षण
20:30	220 kV Maithon-Dumka-1	Maithon: R_N, 12.1 km, 8.6 kA	Dumka: R_N, 50.94 km, 1.33 kA	Around 55 kV dip in R_ph voltage at Maithon. Fault clearance time:100 msec
20:33	220 kV Maithon-Dumka-2	Maithon: R_N, 13.4 km, 9.07 kA	Dumka: R_N	Around 50 kV dip in R_ph voltage at Maithon. Fault clearance time:100 msec
20:33	220 kV Biharsharif-Tenughat	Biharsharif: O/c St.1 (Y_ph)	Tenughat: Did not trip	No fault observed from PMU
20:33	210 MW U#2 at Tenughat	Under-frequency after islanding		

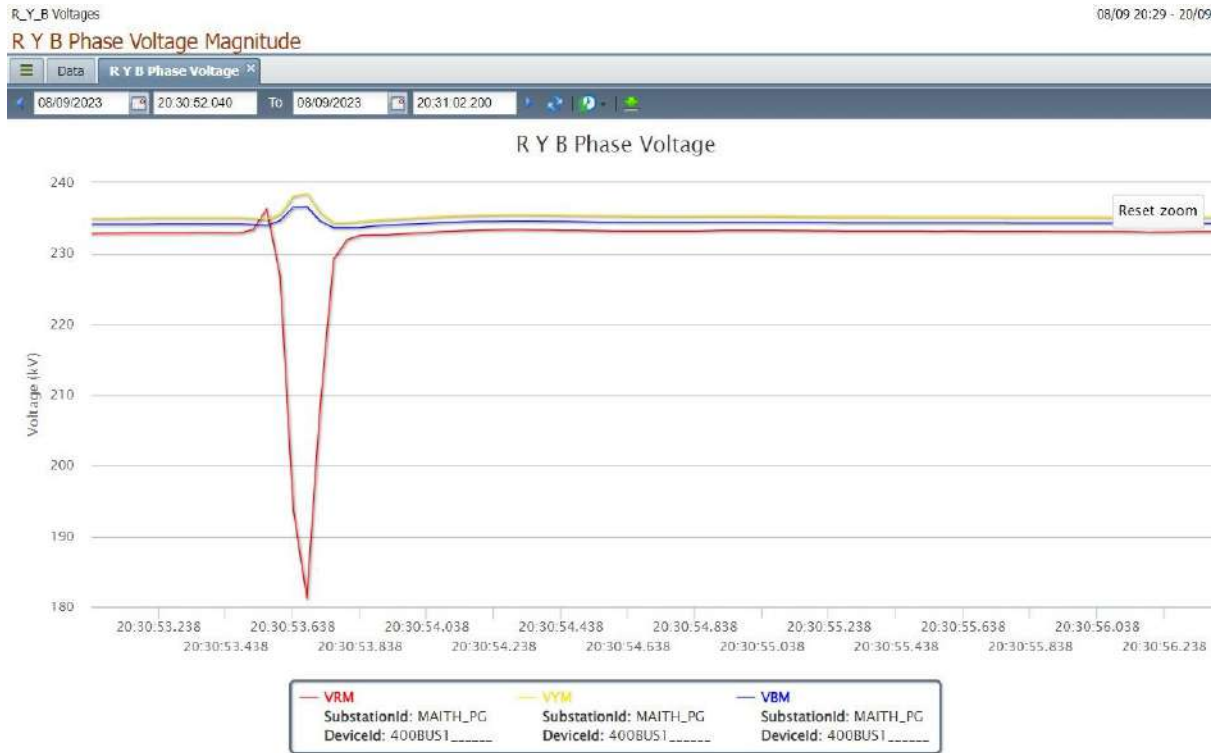


Figure 2: PMU snapshot of 400/220 kV Maithon S/s (220 kV Maithon-Dumka-1 @ 20:30)

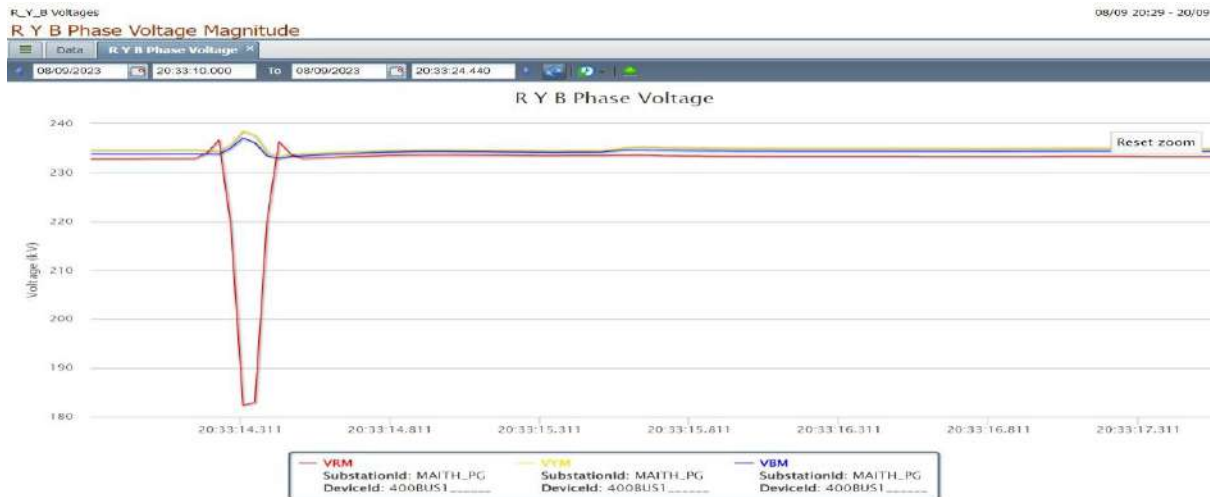


Figure 3: PMU snapshot of 400/220 kV Maithon S/s (220 kV Maithon-Dumka-2 @ 20:33)

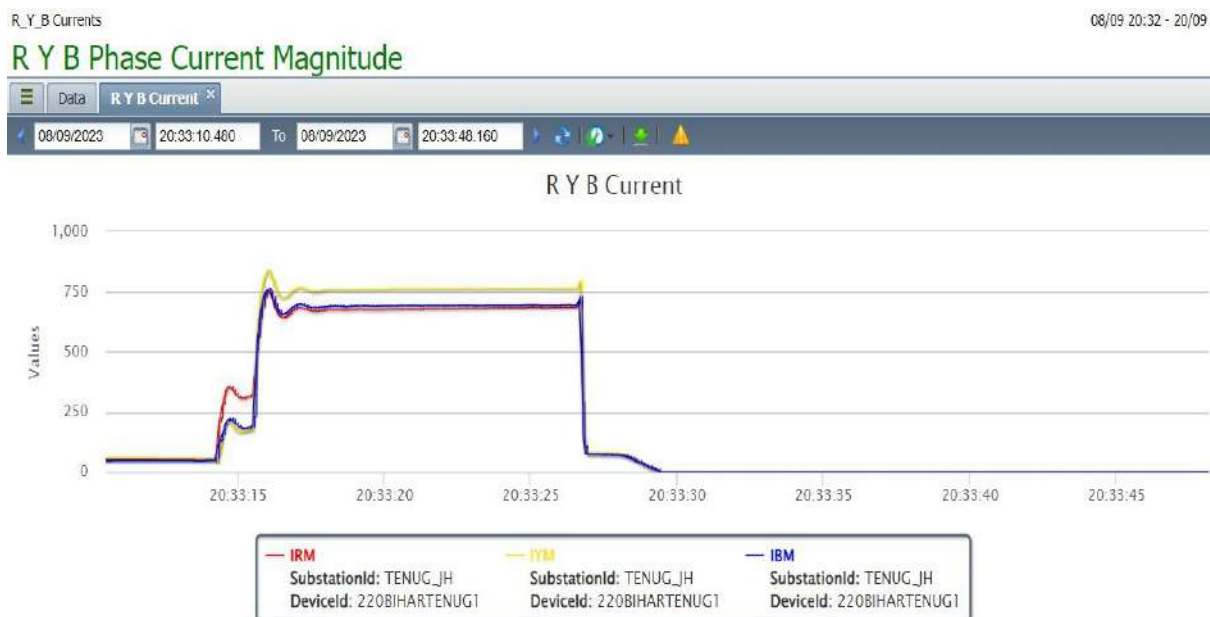


Figure 4: PMU snapshot of 220 kV Tenughat-Biharsharif @ Tenughat

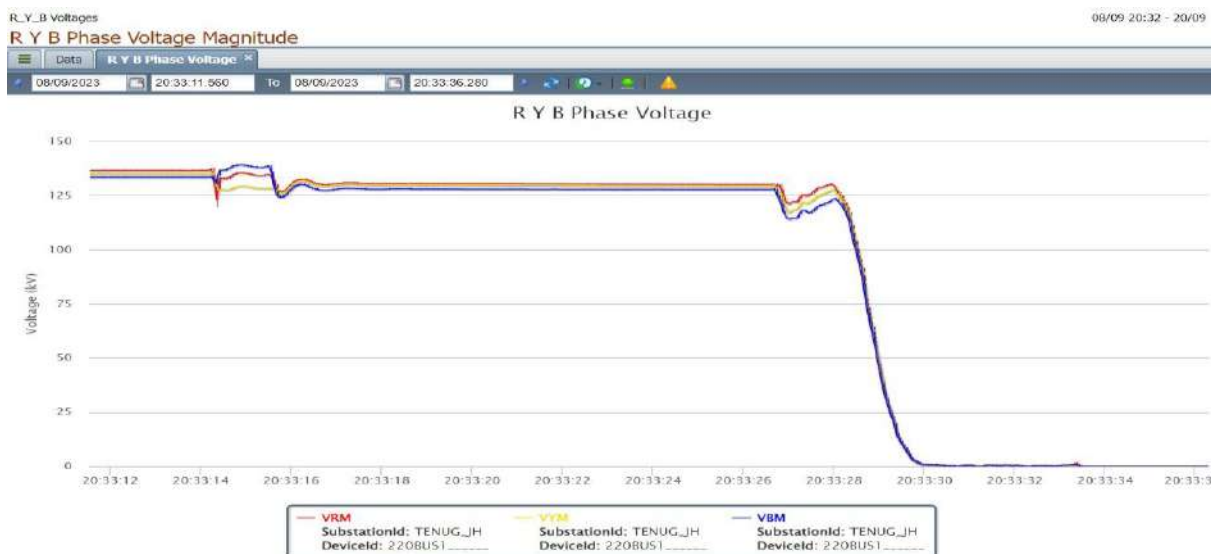


Figure 5: PMU snapshot of 220 kV Tenughat S/s

Restoration (पूर्वावस्था की प्रप्ति)

Transmission/Generation element name	Restoration time
220 kV Maithon-Dumka-1	20:57
220 kV Maithon-Dumka-2	21:08
220 kV Biharsharif-Tenughat	20:57
210 MW U#2 at Tenughat	04:55 (09.09.23)

Analysis of the event (घटना का विश्लेषण) & Protection issue (सुरक्षा समस्या):

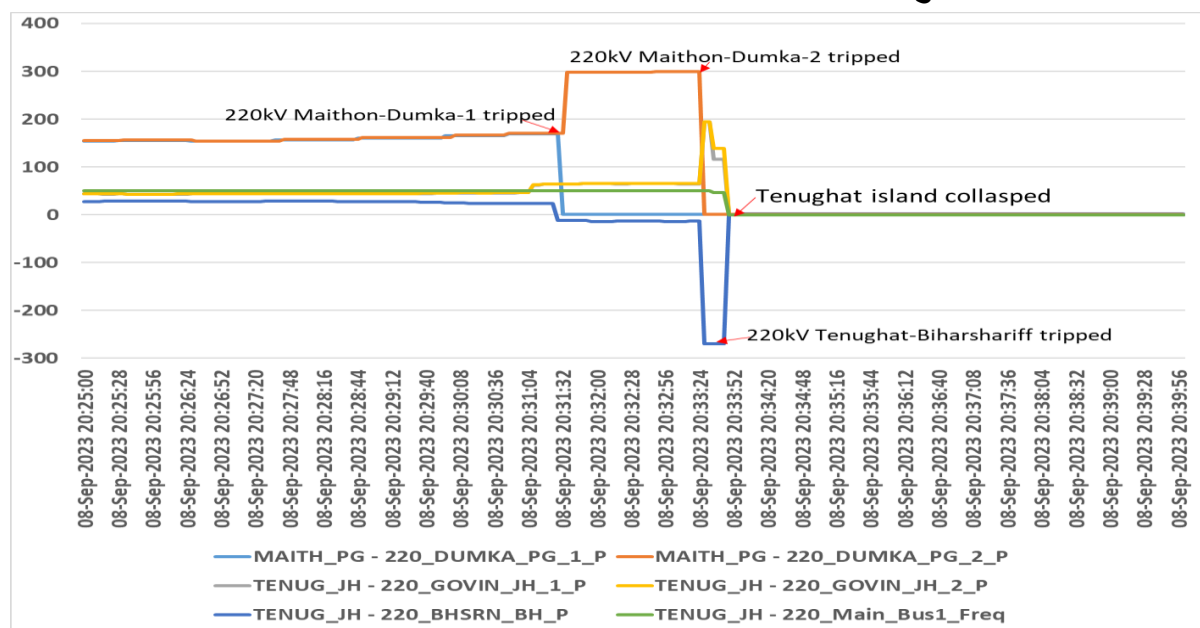
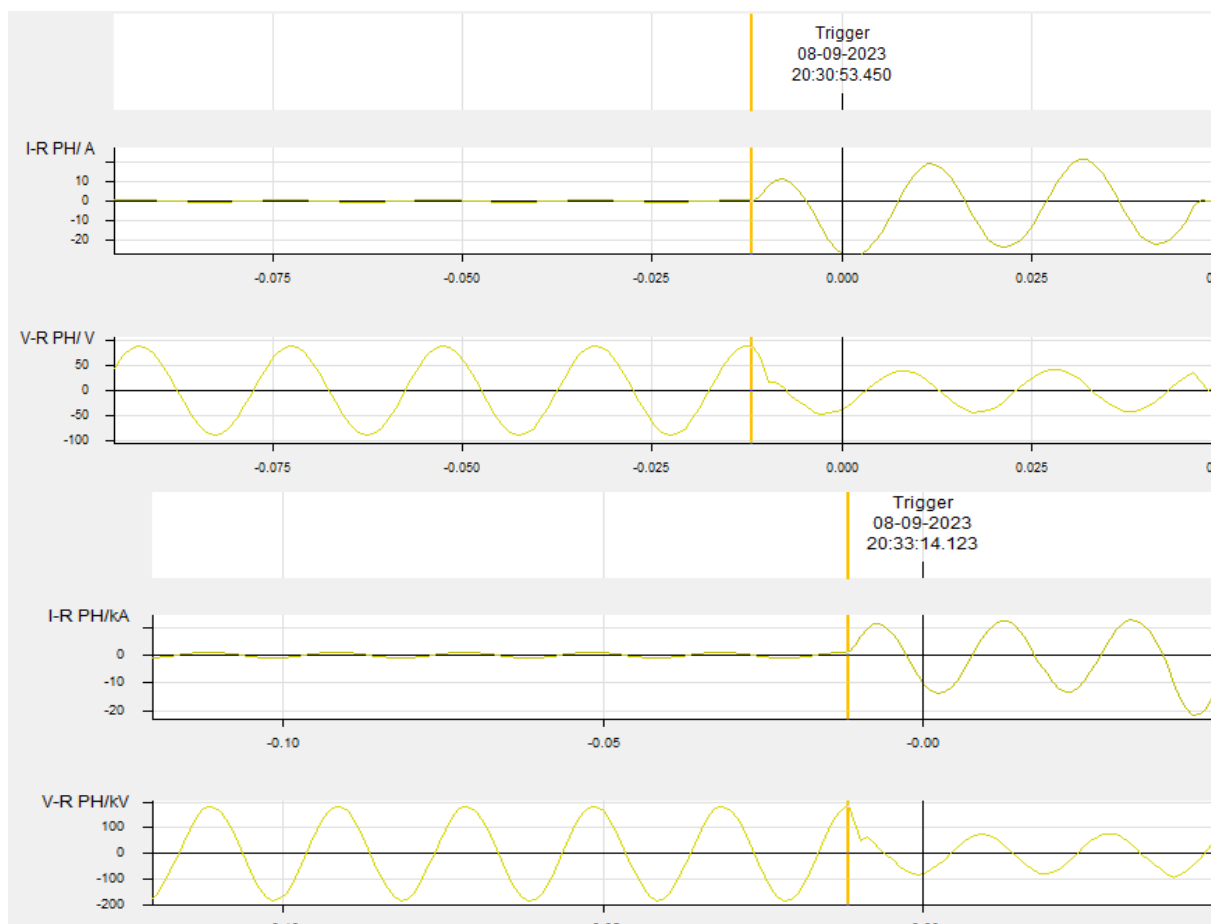


Figure 6: SCADA line flow of various lines during the event

Sequence of Events & Issues observed:

- At 20:30:53 Hrs: R_N fault struck 220 kV Maithon-Dumka-1 line. As reported, A/r was successful from Maithon end only. Nonoperation of A/r at Dumka end has been flagged many times. JUSNL may update.
- At 20:33:14 Hrs: R_N fault struck 220 kV Maithon-Dumka-2 line. A/r was successful from Dumka end. However, SOTF also initiated and three phase tripped and DT sent to Maithon end. A/r lockout immediately appeared at Maithon end after first tripping instance. **PG ER-2 may explain.** Why SOTF initiated after A/r at Dumka as current was very low? **JUSNL may explain.**
- A/R scheme at both ends may be tested completely and resolved to avoid such disturbances again , If A/R would have operated properly there would not have been such disturbance and load loss.
- Both lines tripped with same phase and same fault location and fault was of transient nature , it is suspected to be some clearance /vegetation issue's . proper ROW clearance and tree trimming to be done. **JUSNL may update.**
- Below DR attached shows that at both instances fault started at voltage peak indicating vegetation fault.



- At 20:33:27 Hrs: 220 kV Tenughat-Biharsharif tripped from Biharsharif end only on O/c Stage-1 and Tenughat with Dumka, Govindpur and other loads got islanded. O/c setting at Biharsharif end (set at 750 A) may be disabled. Reason for keeping such low O/C setting may also be explained as the line has been reconducted to HTLS. BSPTCL may update.
- At 20:33:28 Hrs: Tenughat island with 140 MW generation and around 450 MW load collapsed.
- DRs at Dumka end are not time synchronized, digital channels are also not configured properly. JUSNL may update.

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

Issues	Regulation Non-Compliance	Utility
DR/EL not provided within 24 Hours	1. IEGC 5.2 (r) 2. CEA grid Standard 15.3	PG ER-2, JUSNL, BSPTCL

Status of Reporting (रिपोर्टिंग की स्थिति):

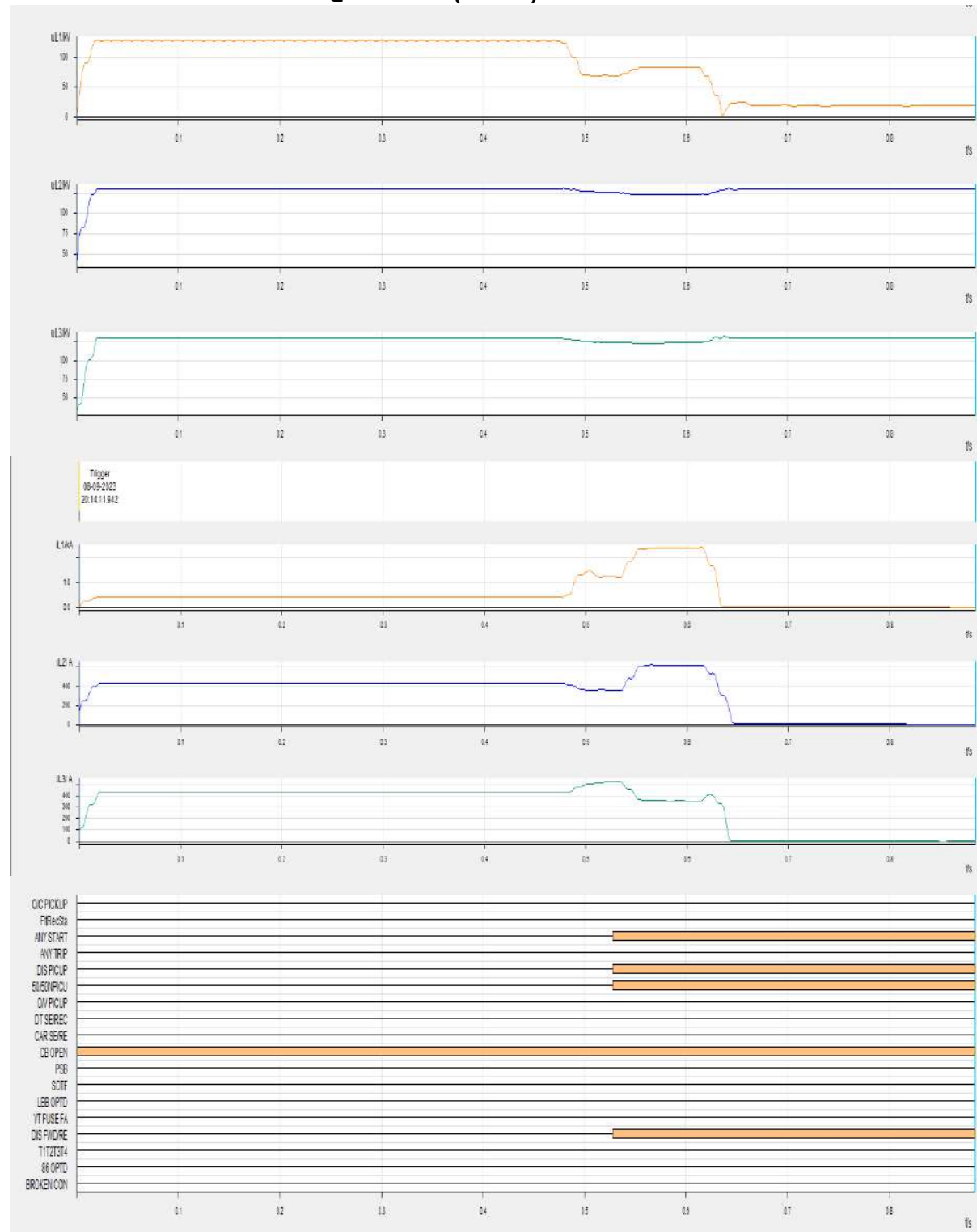
- DR/EL received from JUSNL, PG ER-2, BSPTCL.

Annexure 1: Sequence of events recorded at ERLDC SCADA data at the time of the event

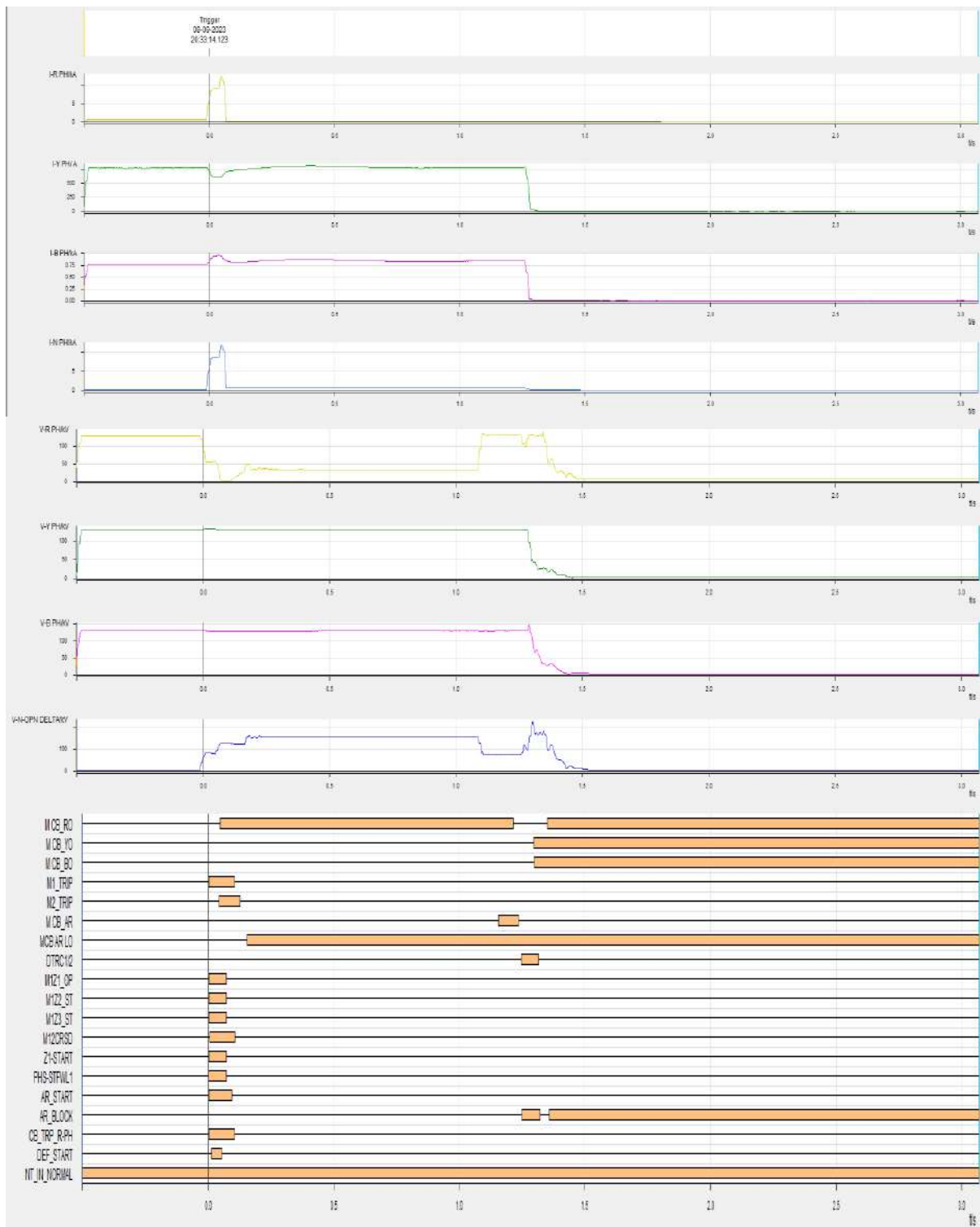
Sequence of Events not recorded at the time of event.

Annexure 2: DR recorded

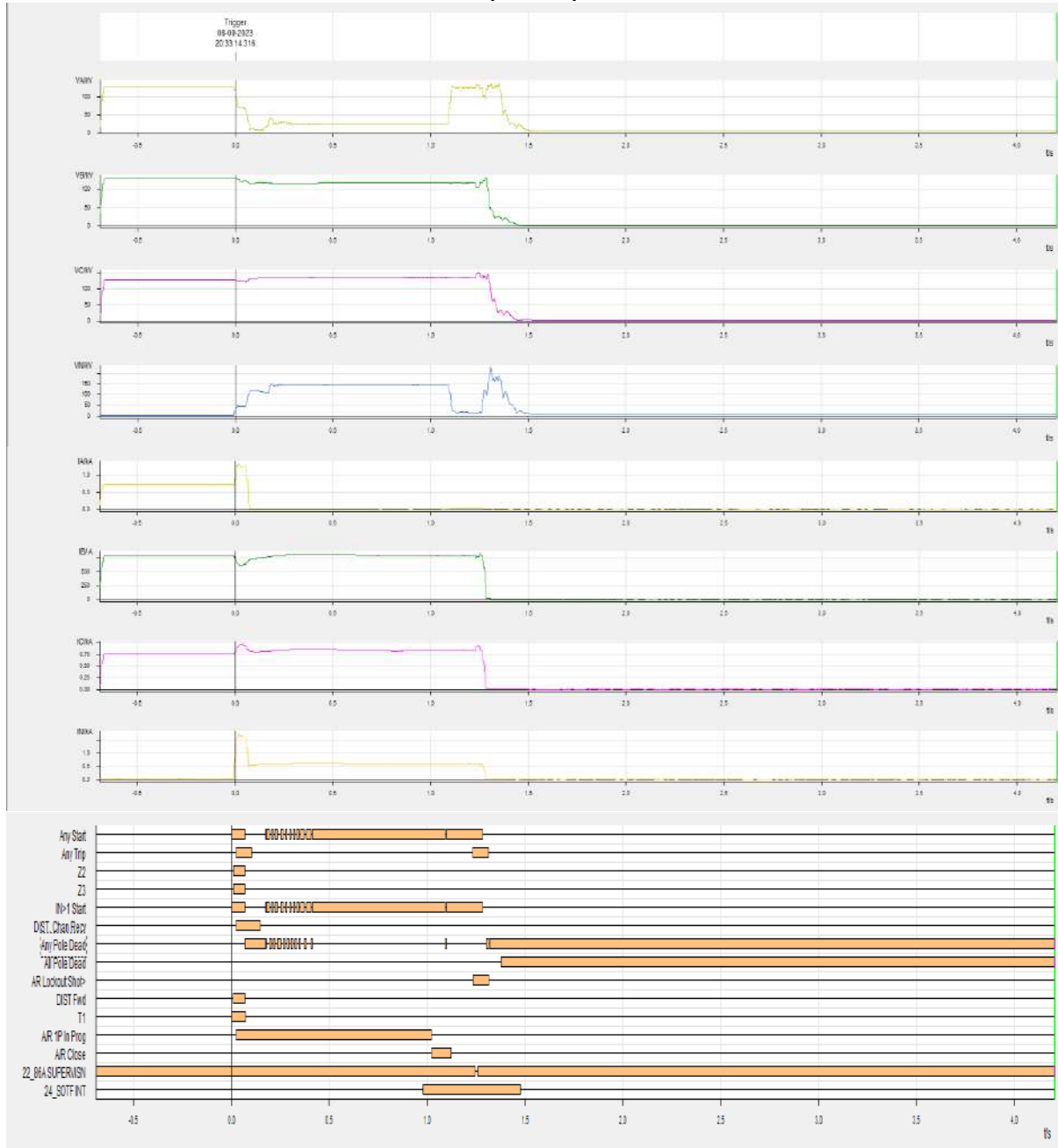
DR of 220 kV Maithon-Dumka-1 @ 20:30 Hrs (Dumka)



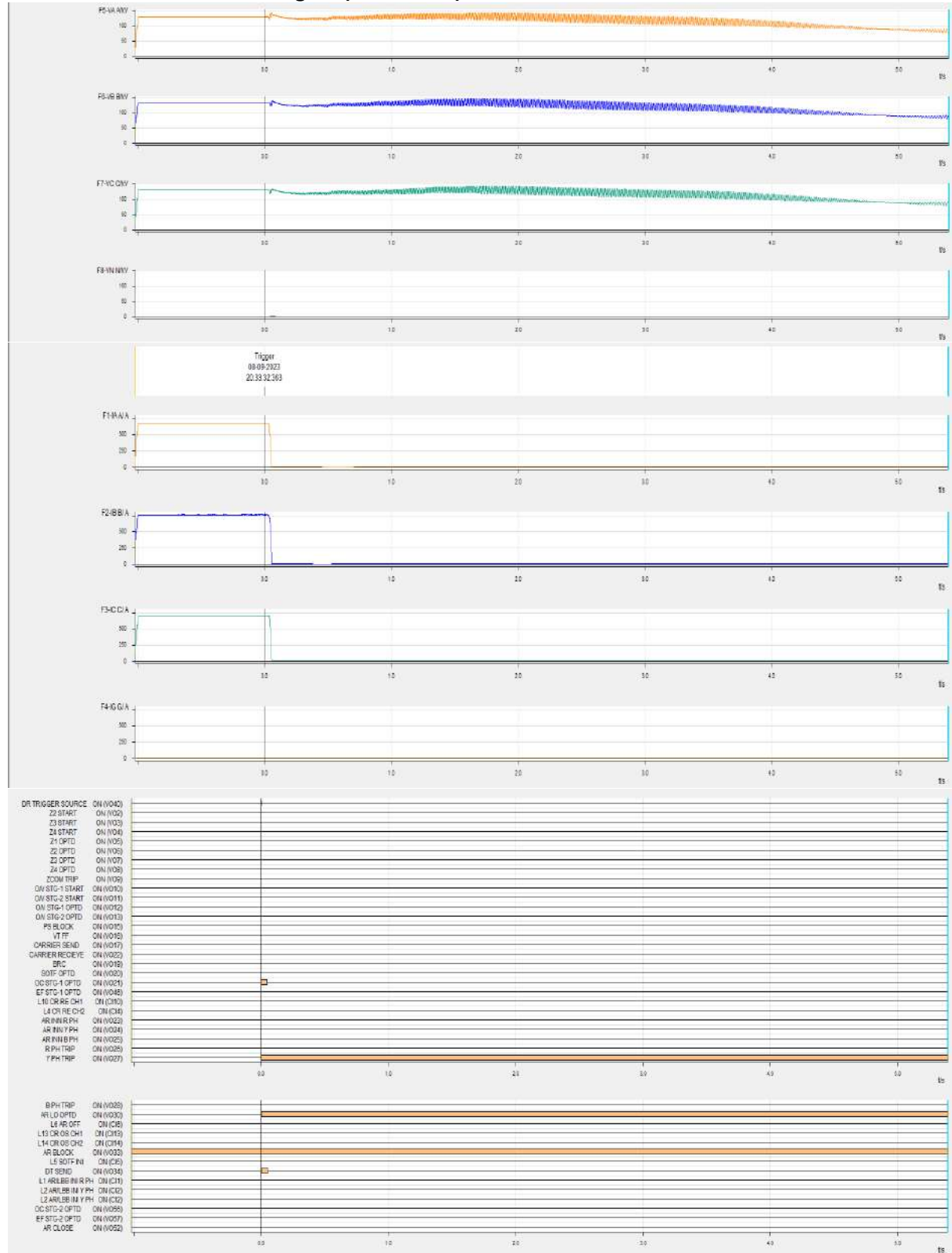
DR of 220 kV Maithon-Dumka-2 @ 20:33 Hrs (Maithon)



DR of 220 kV Maithon-Dumka-2 @ 20:33 Hrs (Dumka)



DR of 220 kV Biharsharif-Tenughat (Biharsharif)



Preliminary Report of grid event in Angul Station of Eastern Region

(To be submitted by 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): 12-Oct-2023

1. Event Summary (घटना का सारांश):

On 12th October 23, at 17:49 hrs multiple trippings occurred at Angul Station. During the incident at 765/400 kV Angul S/s, 765kV Bus 1&2, 765kV Angul-Srikakulam D/C, 765kV Angul-Jharsuguda Ckt-3&4, 765/400kV ICT-3 &4, 400kV Bus-1, 400kV Angul-GMR Ckt 2 and 400kV Angul-JITPL Ckt#1 tripped. It was reported that both 765 kV Bus & 400 kV Bus I tripped due to operation of bus bar differential protection.

2. Time and Date of the Event (घटना का समय और दिनांक): 17:50 hrs of 12th Oct 2023

3. Event Category (ग्रिड घटना का प्रकार): Grid Event (Event not under GD/GI)

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Eastern & Southern Region

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand
Pre-Event (घटना पूर्व)	49.84 Hz	29566 MW	24959 MW
Post Event (घटना के बाद)	49.86 Hz	29571 MW	25071 MW

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

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइनें/ विद्युत उत्पादन इकाइयां जो बंद हैं)	None
Weather Condition (मौसम स्थिति)	Inclement weather reported at Angul

6. Load and Generation loss (लोड और जेनरेशन हानि): No load loss happened during the event. SPS operated at JITPL to reduce generation from 1080MW to 755MW (17:48 to 18:31Hrs) to restrict overloading of single surviving 400kV Angul-JITPL line for JITPL power evacuation.

7. Duration of interruption (रूकावट की अवधि): 17:50Hrs to 18:50Hrs

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

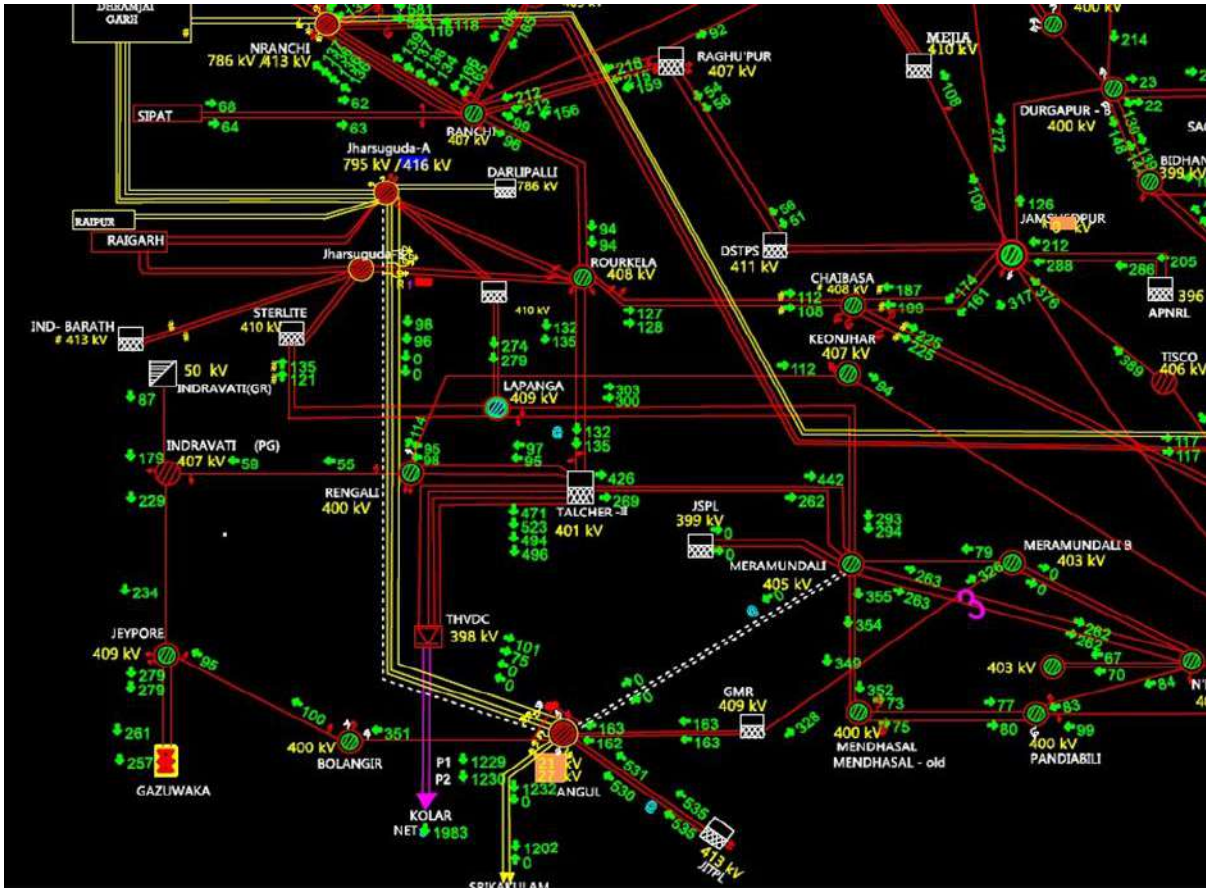


Figure 2: Network across the affected area

9. Sequence of events:

Time	Elements tripped	Remarks
17:49:13.545	765 kV Bus-2 at Angul tripped	Bus bar differential operated. Flashover in main bay of 765 kV Angul-Jharsuguda-3
17:49:13.660	400 kV GMR- Angul 2 tripped (From Angul Only)	O/V Stage 2 protection operated
17:49:13.768	330 MVar Bus reactor-1 (Connected to Bus-2) tripped	LBB protection operated (after almost 200 ms)
17:49:14.800	765 kV Angul-Srikakulam-1&2 A/R operated	A/R successfully operated through on tie bay only. B-Ph Tie CB opened at same instant of bus bar differential operation at Angul Bus 2.
17:49:14.800	765 kV Angul-Jharsuguda-3&4 A/R operated	A/R successfully operated through tie bay only. B-Ph Tie CB opened at same instant of bus bar differential operation at Angul Bus 2.
17:49:18.140	400 kV Angul-Meramundali-1 tripped (Idle charged)	O/V Stage 2 protection operated

17:49:34.167	400 kV Bus-1 at Angul tripped.	Bus bar differential operated. 400 kV Angul-JITPL-1 tripped as its dia element (400kV GMR-2) was already tripped.
17:49:34.935	400 kV Main bay of 765/400 kV ICT-3	LBB operated
17:49:38.106	765 kV Main Bus-1 at Angul tripped	Bus bar differential operated. Bay 719 (Jharsuguda-4 tie bay-of half dia) CT failed. 765kV Angul-Srikakulam D/C, 765kV Angul-Jharsuguda Ckt-3&4, 765/400kV ICT- 4 at Angul tripped. All four lines tripped from Angul only. (765 kV Angul-Jharsuguda-1 & 765/400 kV ICT-1 in same dia; 765 kV Angul- Jharsuguda-2 & 765/400 kV ICT-2 in same dia - These four elements remained charged through tie bay on 765 kV side and power flow remained intact).
17:49:43.240 & 17:49:44.240	Tripping of 765 kV Angul- Srikakulam-1&2 from Srikakulam end	After 5 & 6 seconds of tripping of 765kV Angul-Srikakulam from angul end line tripped from Srikakulam end also due to overvoltage operation.
17:50:18.148	Tripping of 765 kV Angul-Jharsuguda-3 from Jharuguda	765 kV Jharsuguda-Angul-3 tripped from Jharsuguda end due to B_N fault. O/V appeared at the same time at open end. Voltage reached 1.53 times nominal value and O/V St.2 operated. DT sent to Jharsuguda and three phase tripped.
17:50:18:148	Tripping of 765 kV Angul- Jharsuguda-4 from Jharsuguda end	During fault in line-3 at the same instance, O/V St.2 operated in this line too from open end and DT sent to remote end. It is suspected that at this instance NGR at Jharsuguda failed.

10. Event Analysis (घटना का विश्लेषण):

- **Event-1: at 17:49:13.545 hrs**

At 17:49:13.545 hrs due to flashover in main bay CT of 765 kV Angul-Jharsuguda-3, 765 KV Bus-2 bus bar differential operated which resulted in tripping of all main bays connected to Bus 2. It is reported that bus bar protection operated due to Bay 723 (Jharsuguda-3 main bay) CT flashover and failure and possible core short circuit. The snapshot of DR of Angul Bus 2 is given below. At 17:49:13.768 hrs, 330 MVar Bus reactor-1 (Connected to Bus-2) tripped due to operation of LBB protection (after 200 msec)

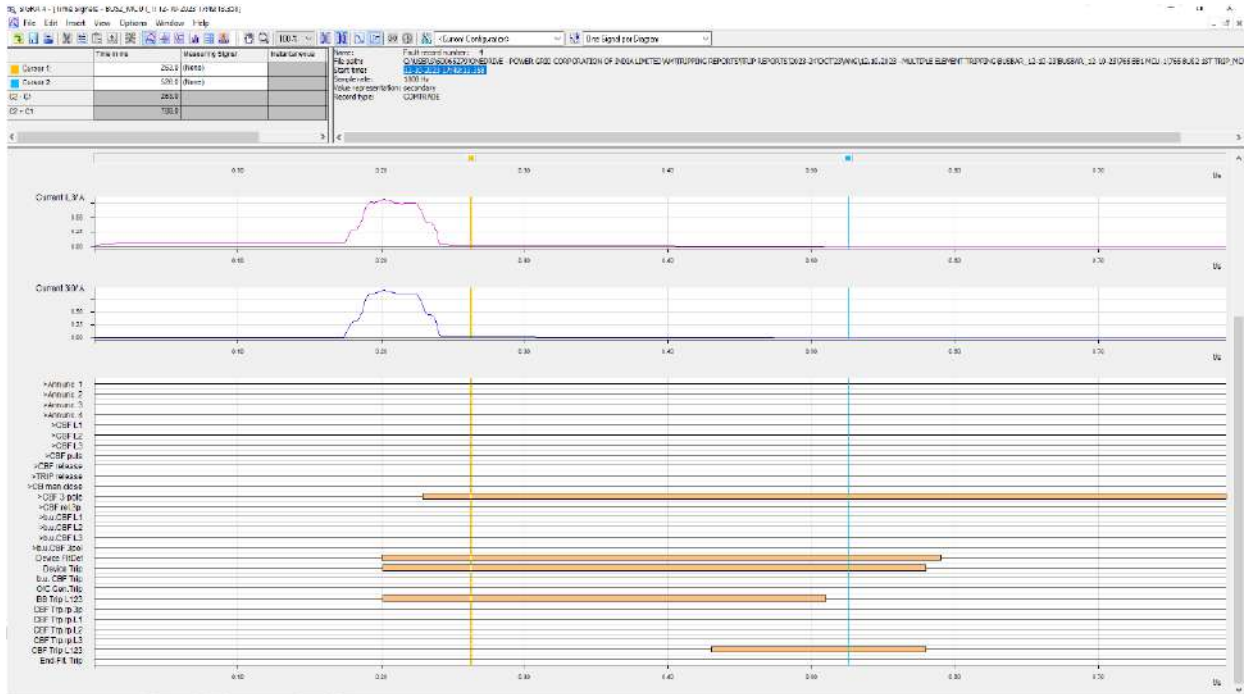


Figure 1: DR of Angul Bus 2

At the same instant at which bus bar differential operated at Angul Bus 2, B-phase Tie CB of 765 kV Angul- Srikakulam-1&2 and 765 kV Angul- Jharsuguda-3&4 also opened on indication of zone – 1 protection. All the aforesaid 765 kV lines successfully auto reclosed from Angul end after 1 second. There was no tripping at remote ends. The snapshot of DR from Angul end is given below:

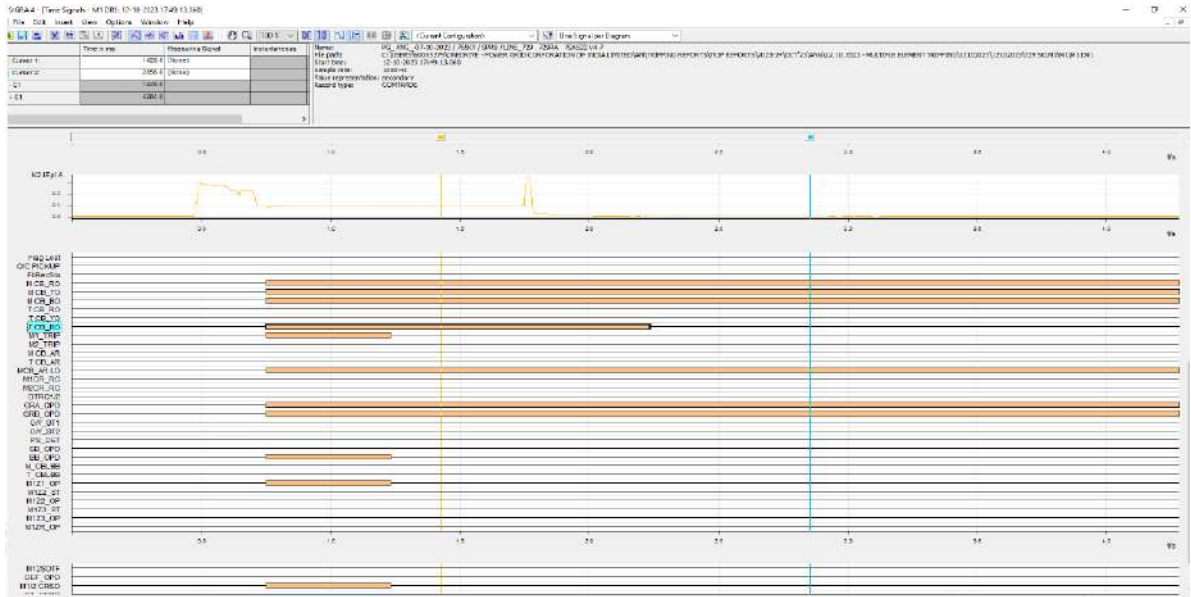


Figure 2: DR of 765Kv Angul-Srikakulam-1 A/R

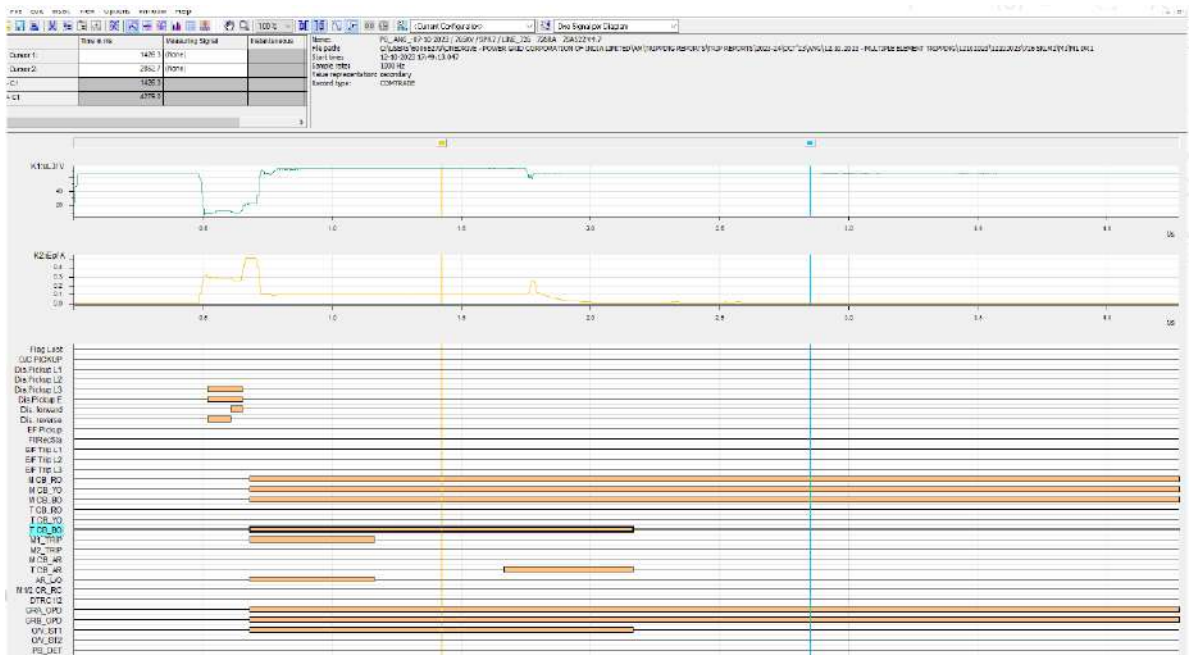


Figure 3: DR of 765Kv Angul-Srikakulam-2 A/R

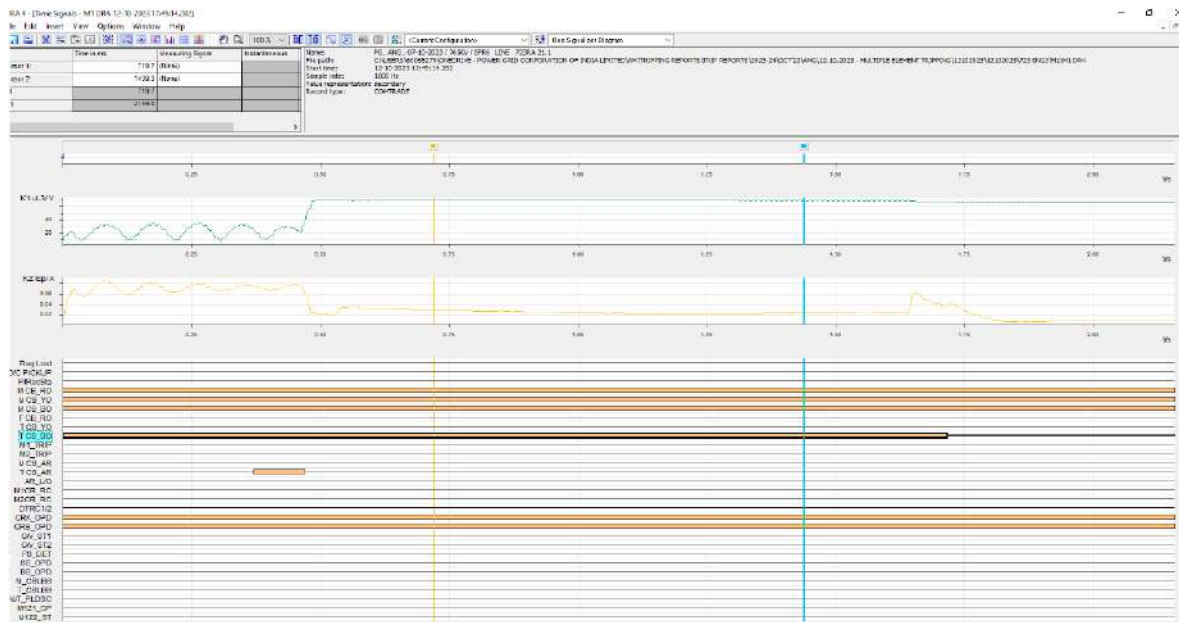


Figure 4: 765Kv Angul-Jharsuguda-3 A/R

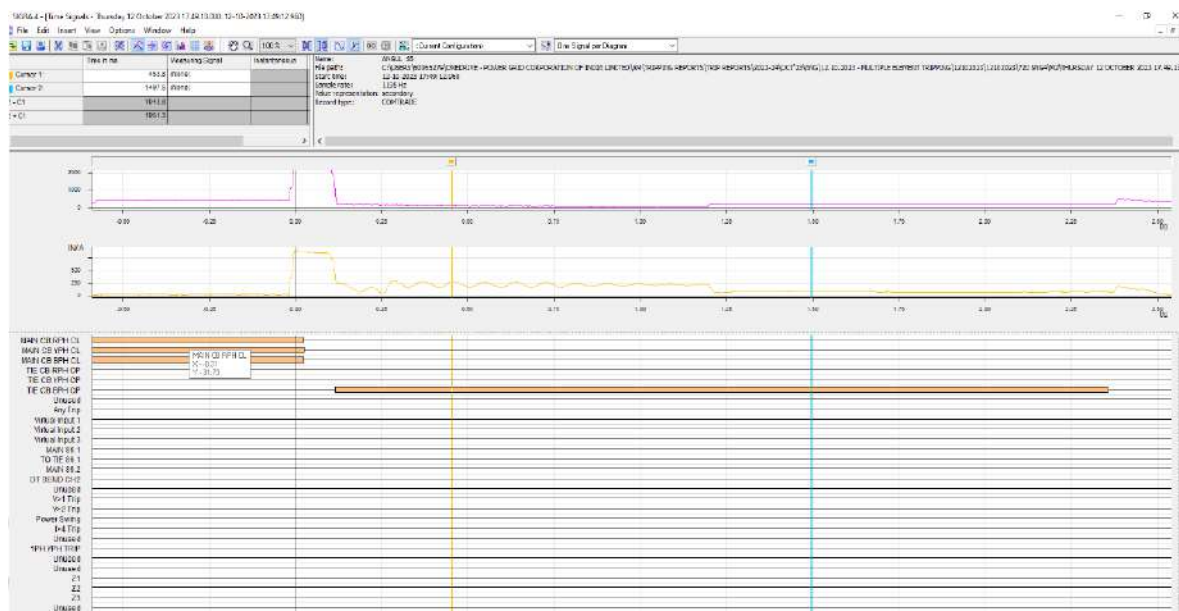


Figure 5: 765Kv Angul-Jharsuguda-4 A/R

- **Event-2: at 17:49:13.660 hrs**

At 17:49:13.545 hrs, 400 kV GMR- Angul 2 tripped from Angul end only due to operation of O/V Stage 2 protection . Distance protection also operated at Angul (Zone-1), however, O/V St.2 operated and three phase tripped at Angul. Voltage reached 1.7 times of nominal value in Y phase as attached below.

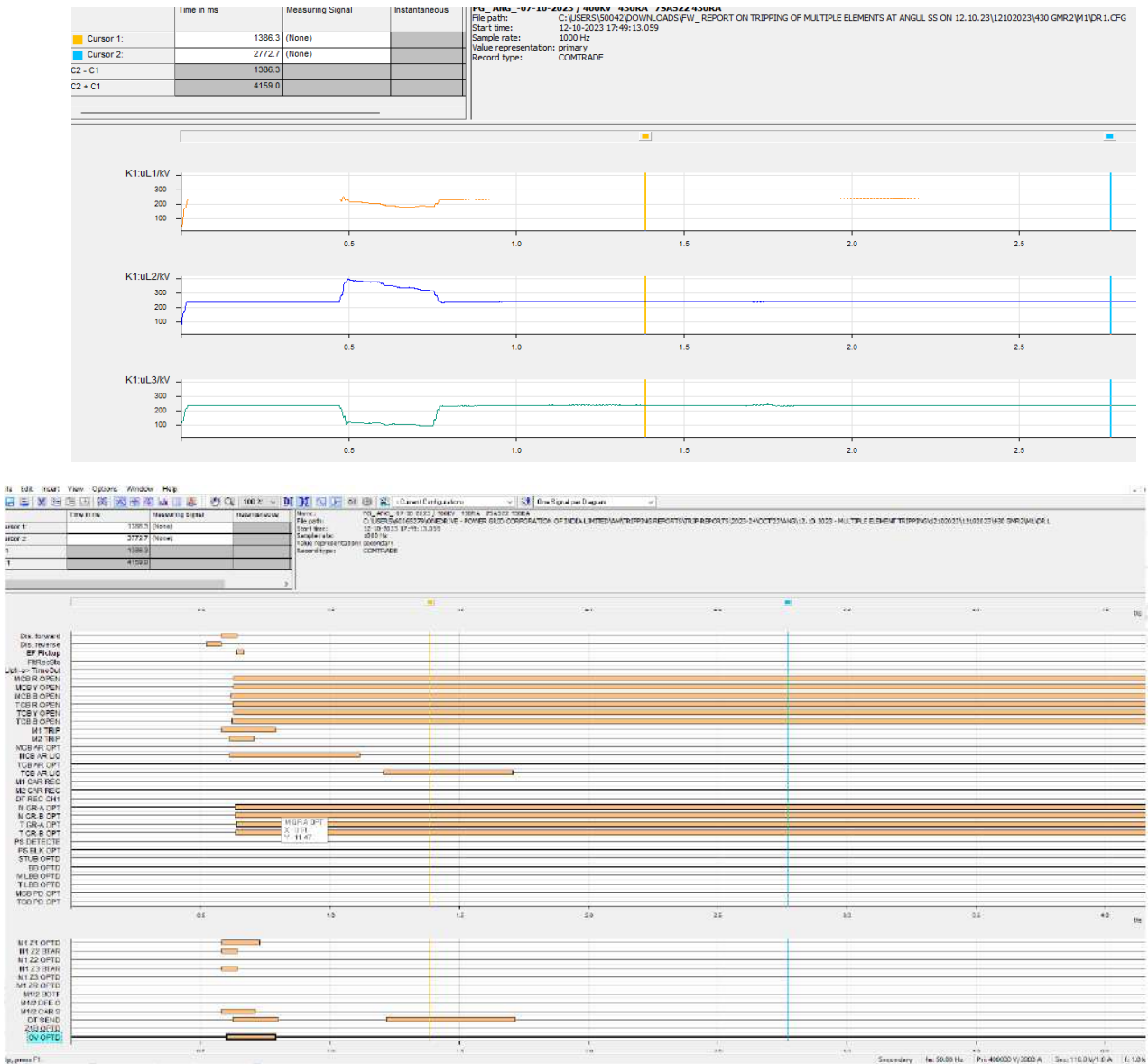


Figure 6: DR of 400 kV GMR- Angul 2 from Angul end

- **Event-3: at 17:49:34.167 hrs**

At 17:49:34.167 hrs, differential relay of 400 kV Angul Bus-1 operated resulting in tripping of all main bays connected to Bus-1. It is reported that the bus bar operated due to 413 (Main bay of 765/400 kV ICT 3 CT flashover/ failure). At the same instant, 400 kV Angul-JITPL ckt 1 also tripped as its dia element (GMR-2) already tripped at 17:49:13.660 hrs. The snapshot of DR is given below:

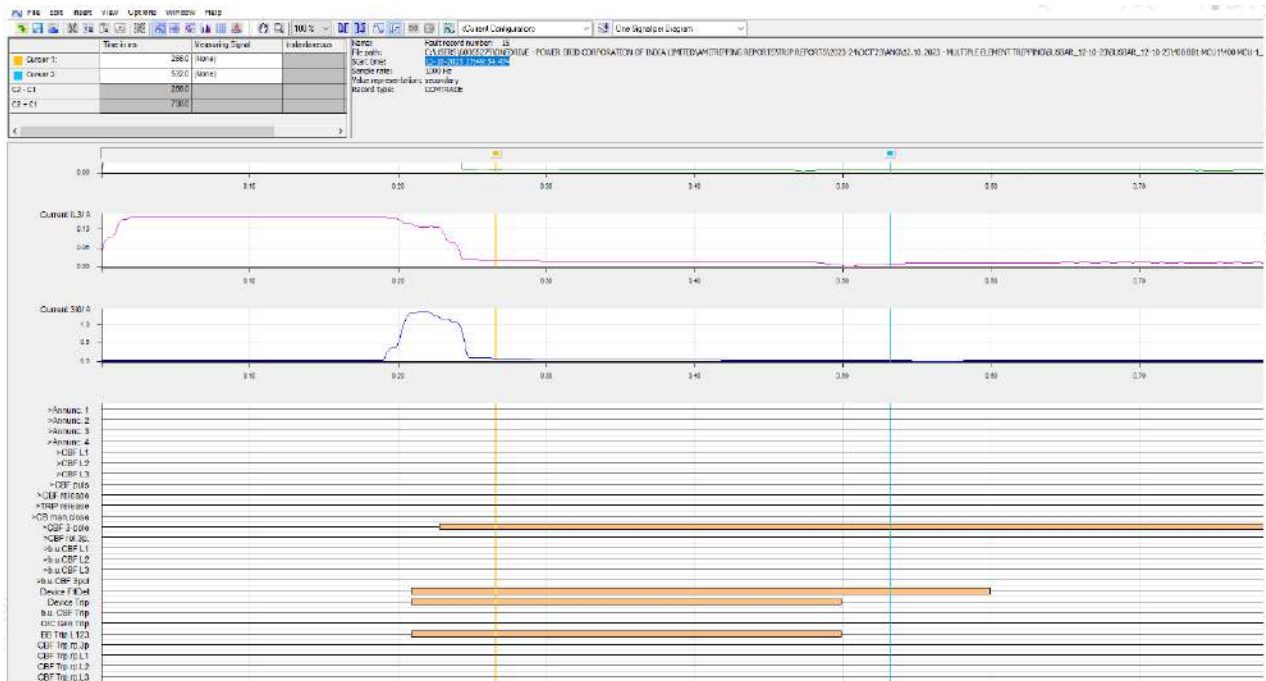


Figure 7: DR of 400 kV Angul Bus 1

• Event-4: at 17:49:38.106 hrs

At 17:49:38.106 hrs, differential relay of 765 kV Angul Bus-1 operated resulting in tripping of all main bays associated to Bus-1. It is reported that Bus Bar protection operated due to Bay 719 (Jharsuguda-4 tie bay-of half dia) CT failed.

765kV Angul-Srikakulam D/C, 765kV Angul-Jharsuguda Ckt-3&4 and 765/400kV ICT - 4 tripped. 765 kV Angul-Jharsuguda-1 & 765/400 kV ICT-1 in same dia; 765 kV Angul-Jharsuguda-2 & 765/400 kV ICT-2 were in same dia. These elements remained charged through tie bay on 765 kV side and power flow remained intact). The DR of 765 kV Angul Bus-1 is given below:

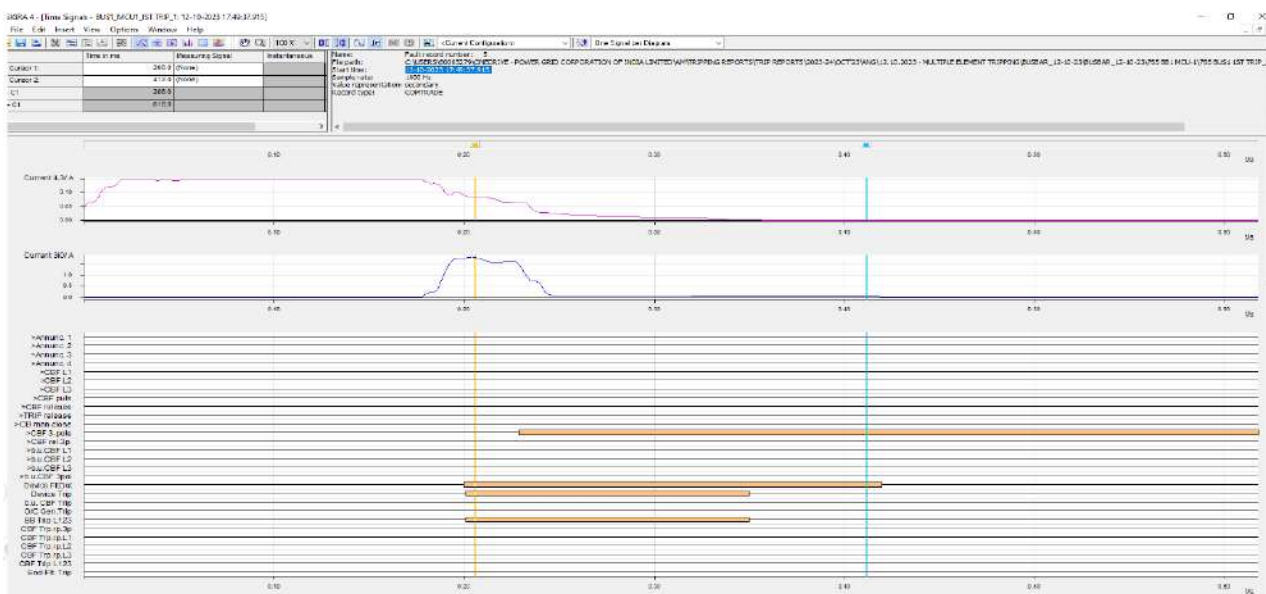


Figure 8: DR of 765 kV Angul Bus 1

- **Event-5: at 17:50:18.148 hrs**

At 17:50:18.148 Hrs, 765 kV Angul-Jharsuguda-3&4 tripped from Jharsuguda end. B_N fault appeared in Ckt-3. However, O/V St.2 appeared at open end in healthy phases in both lines during the fault and DT sent to Jharsuguda.

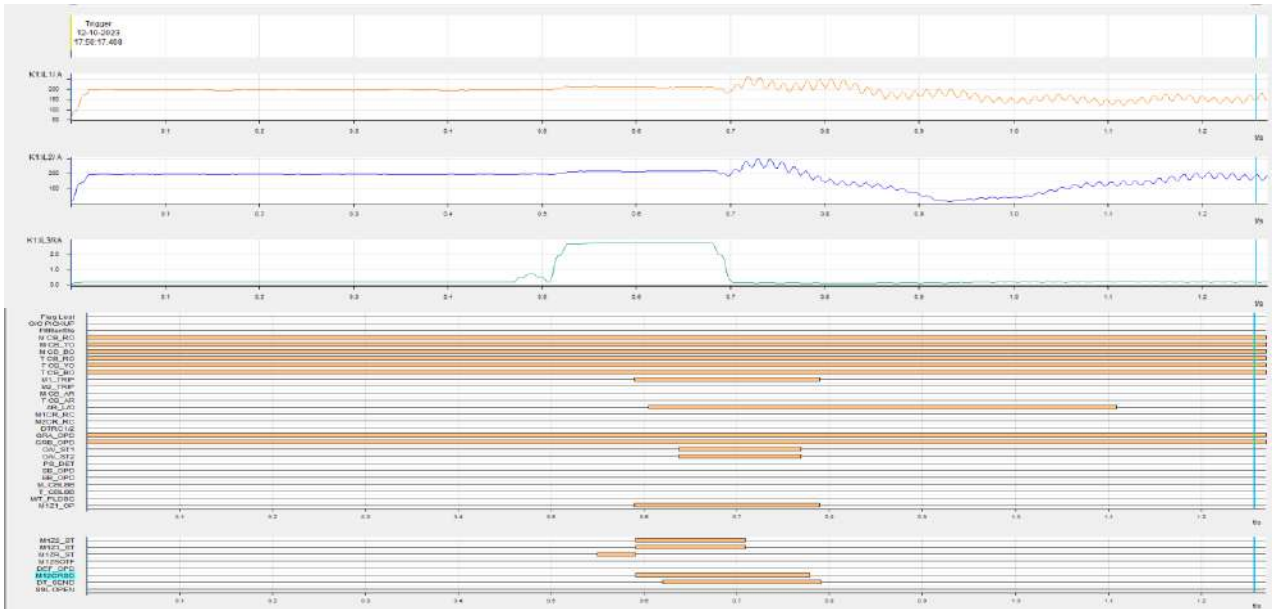


Figure 9: DR of 765 kV Angul-Jharsuguda-3

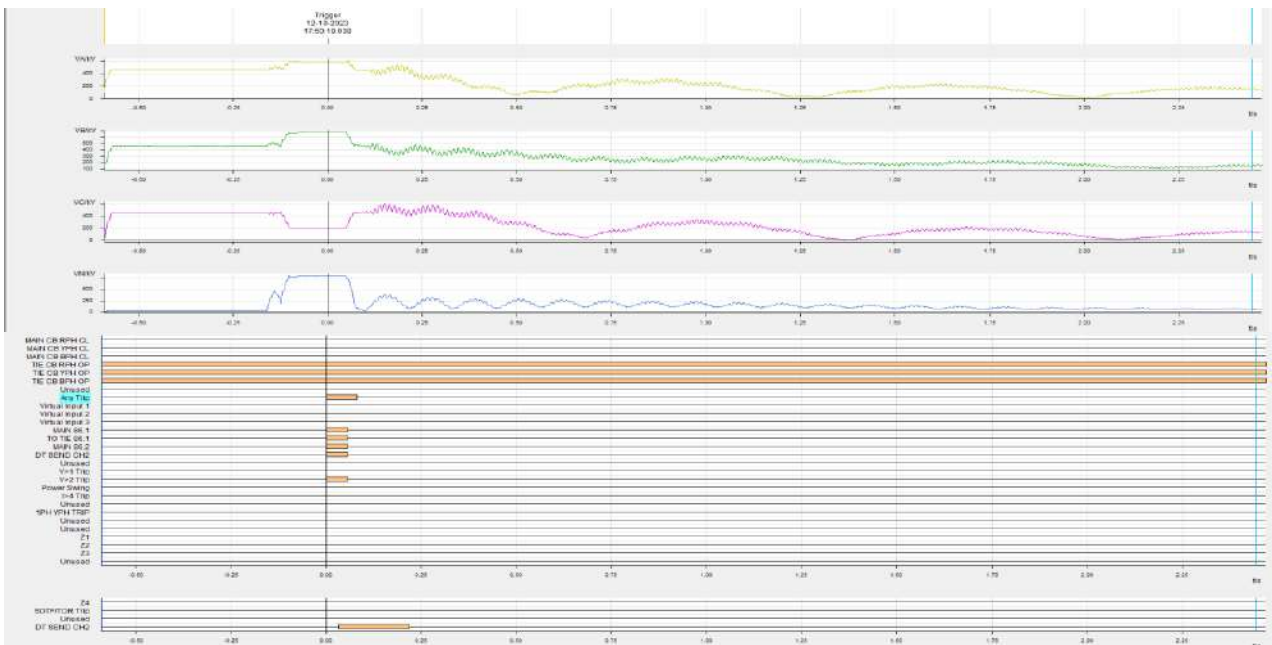
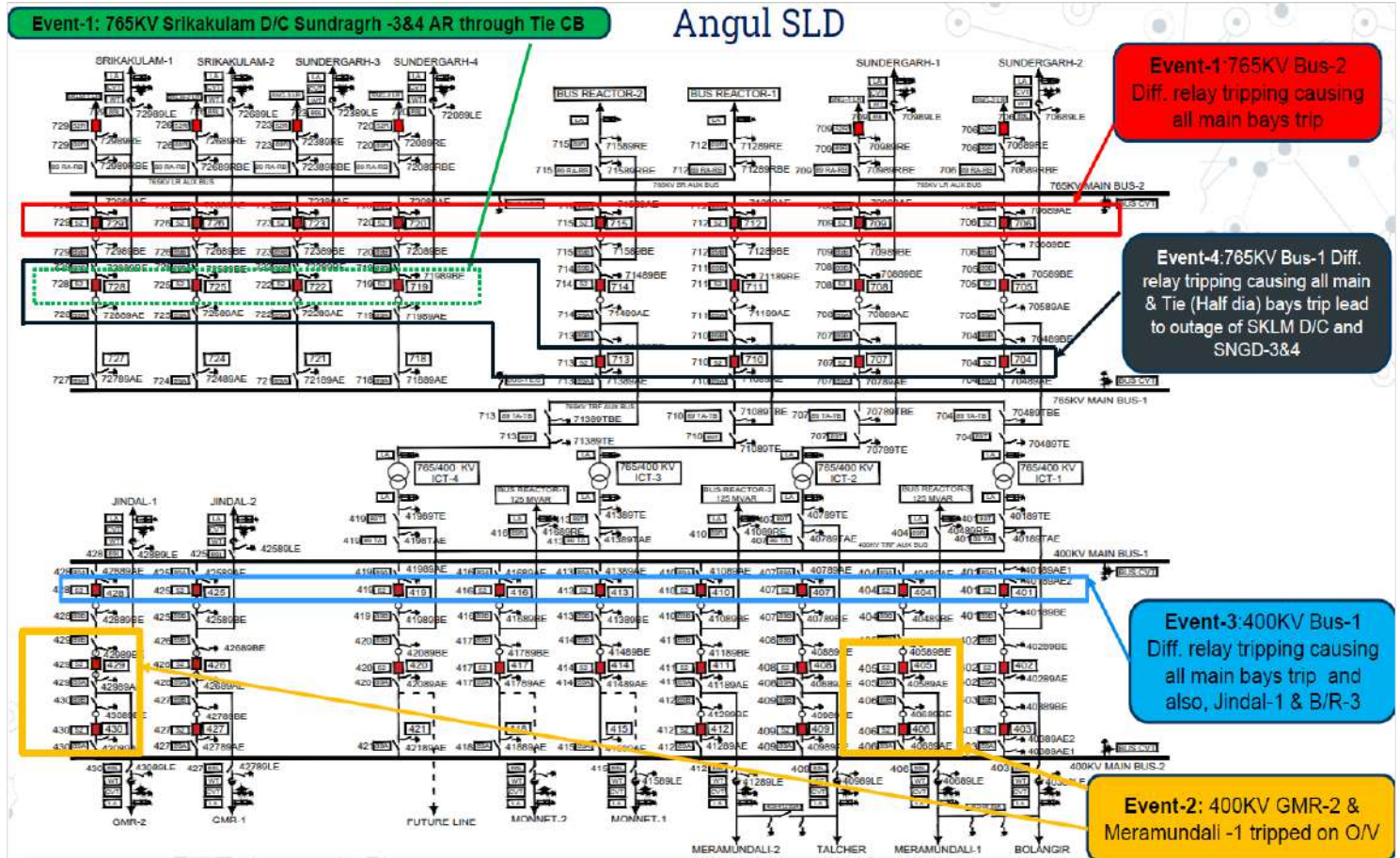


Figure 10: DR of 765 kV Angul-Jharsuguda-4

The graphical representation* of all the above four events on SLD of Angul station is given below:



(*Submitted by Powergrid)

PMU Plots

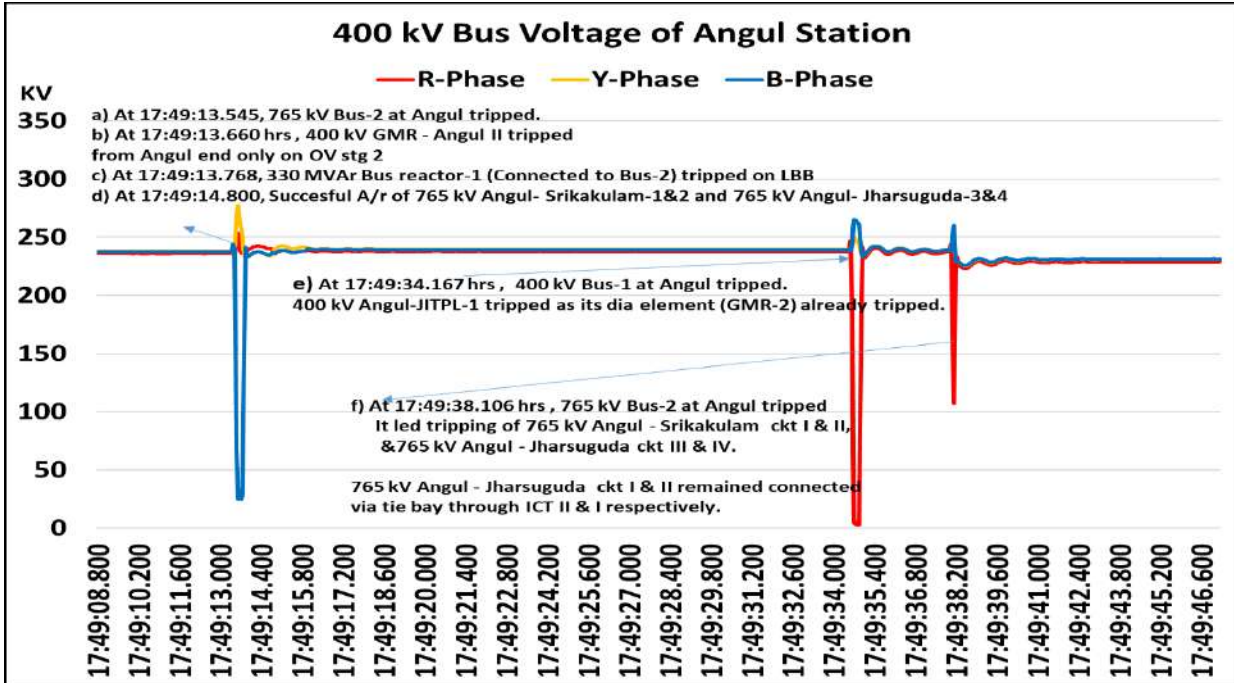


Figure 9: 3 Phase 400 kV Bus Voltage of Angul Station

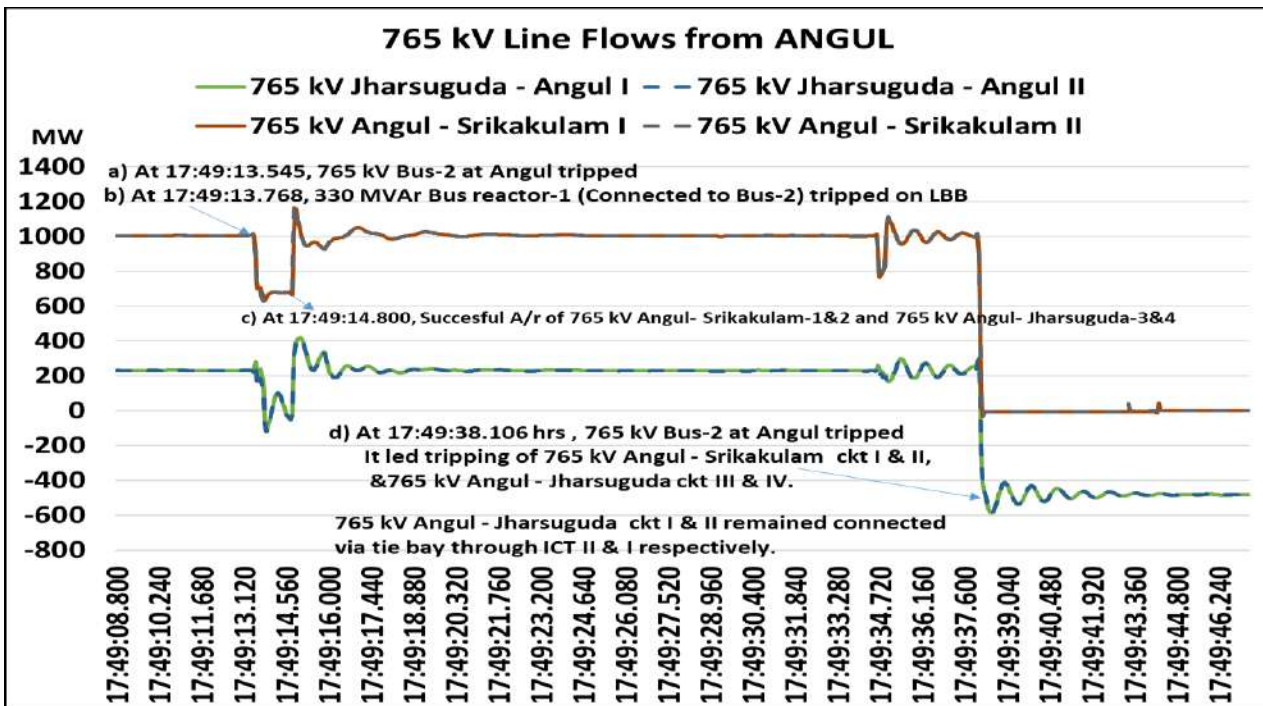


Figure 10: 765 kV Line Flows from Angul Station

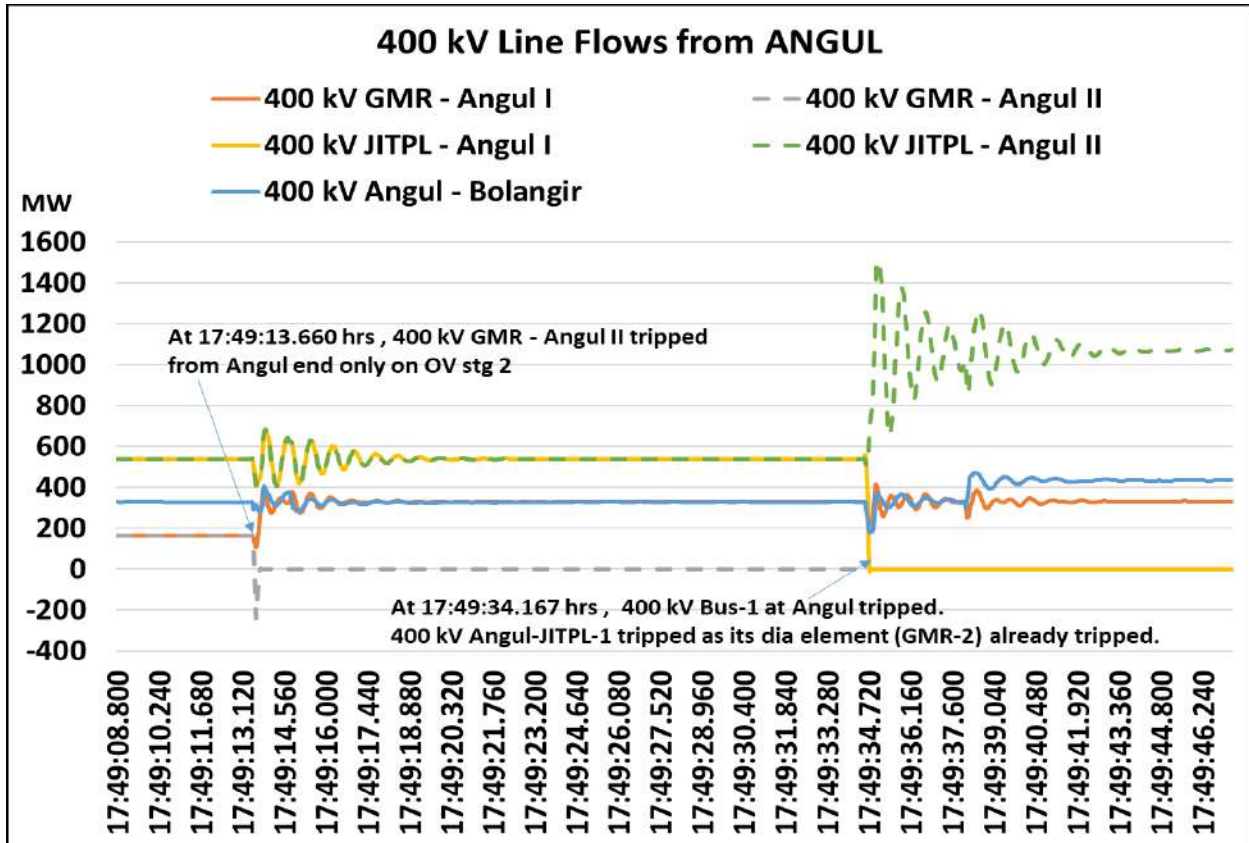


Figure 11: 400 kV Line Flows from Angul Station

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

- CT failure of Bay 723 (Jharsuguda-3 main bay), Bay 719 (Jharsuguda-4 tie bay-of half dia) & 413 (Main bay of 765/400 kV ICT 3) resulted in tripping of 765 kV Angul Bus 2, 765 kV Angul Bus 1 & 400 kV Angul Bus 1 respectively. Here, three contingencies occurred within 25 seconds.
- At the same instant at which bus bar differential operated at Angul 765 kV Bus 2, B-phase Tie CB of 765 kV Angul- Srikakulam-1&2 and 765 kV Angul- Jharsuguda-3&4 also opened on indication of zone – 1 protection. All the aforesaid 765 kV lines successfully auto reclosed after 1.5 seconds. It is very rare that all the Tie CBs opened exactly at the same instant at which main bay CBs of 765 kV Bus 2 tripped. Protection logic need to be checked here.
- Root cause analysis of simultaneous tripping of all four lines may be done. Further, all four lines tripped in Zone-1 from Angul only, there was no tripping from remote ends despite carrier send from Angul. Whether remote ends detected the fault in Zone-2 or not. **The same may be confirmed.**
- At 17:49:13.545 hrs, 400 kV GMR- Angul 2 tripped from Angul end only due to operation of O/V Stage 2 protection. Distance protection also operated at Angul (Zone-

1) whether zone-2 picked up at GMR or not ? DT was sent from Angul but line didn't trip from GMR. Whether GMR received DT? **GMRKEL may confirm.**

- Reason for such high voltage during fault, whether due to lightning fault back flashover resulted in such high voltage or some earthing issues to **be checked by PG-Odisha** .
- At 17:49:13.768 hrs, 330 MVar Bus reactor-1 (Connected to Bus-2) tripped due to operation of LBB protection (after almost 200 ms). Main bay CB need to be checked.
- At 17:49:34.167 hrs, differential relay of 400 kV Angul Bus-1 operated resulting in tripping of all main bays connected to Bus-1. It is reported that the bus bar protection operated due to 413 bay CT flashover (Main bay of 765/400 kV ICT 3).
- 400 kV Angul-JITPL-1 also tripped from JITPL end. DT sent from Angul end during bus bar tripping. Why DT sent from Angul? **PG Odisha may explain. DR of this tripping may be submitted by JITPL.**
- At 17:49:38.106 hrs, differential relay of 765 kV Angul Bus-1 operated resulting in tripping of all main bays associated with Bus-1. It is reported that bus bar protection operated due to Bay 719 (Jharsuguda-4 tie bay-of half dia) CT failed. At this instant 765kV Angul-Srikakulam D/C, 765kV Angul-Jharsuguda Ckt-3&4 and 765/400kV ICT - 4 tripped. The elements survived on 765 kV side of Angul station are 765 kV Angul-Jharsuguda-1,2 and 765/400 kV ICT-1,2 tripped in 765 kV side.
- At 17:50:18.148, 765 kV Angul-Jharsuguda-3 tripped from Jharsuguda end due to DT receipt from Angul. Zone-1 appeared at Angul end also with fault current around 2.8 kA, but as both main and tie CB were open at Angul, how this current was seen at Angul. Angul also sent carrier signal but fault was cleared after 200 msec after DT received. Why there was delayed clearance from Jharsuguda. **PG Odisha may explain.**
- At 17:50:18.148, 765 kV Angul-Jharsuguda-4 tripped from Jharsuguda end on DT receipt from Angul. NGR at Jharsuguda end failed. Reason of failure of NGR may be ascertained. NGR rating may also be intimated. Phenomena of resonance O/V may also be checked and whether existing NGR is capable to suppress such O/V. **PG Odisha may explain.**
- It is observed that, after operation of differential protection in all three instances, few breakers didn't open and later LBB operated for those bays. The reason for non-opening of breakers in the first instance may be analyzed. **PG Odisha may explain.**

12. Restoration of Elements

- **12.10.23**
 - i. 400 kV GMR-Angul-2 charged at 18:25 Hrs.
 - ii. 400 kV Angul-JITPL-1 charged at 18:32 Hrs.
 - iii. 765 kV Bus-2 charged at 18:45 Hrs but tripped again while charging 765 kV Angul-Jharsuguda-3 from Angul end on Bus bar differential.
 - iv. 765 kV Bus-2 charged again at 19:22 Hrs.

- v. 330 MVA Bus Reactor-2 charged at 19:31 Hrs.
- vi. 765 kV Angul-Srikakulam-1 charged at 19:38 Hrs.
- vii. Line reactor of 765 kV Angul-Jharsuguda-4 at Angul charged at bus reactor at 20:25 Hrs.
- viii. 765 kV Angul-Srikakulam-2 charged at 20:37 Hrs.
- ix. 400 kV Bus-1 at Angul charged at 23:11 Hrs.

13.10.23

- x. 765 kV Bus-1 charged at 12:06 Hrs.
- xi. 765 kV Angul-Jharsuguda-3 charged at 13:18 Hrs.
- xii. 765/400 kV ICT-3 charged at 13:22 Hrs.
- xiii. 330 MVA Bus Reactor-1 charged at 15:44 hrs.

15.10.23

- xiv. 765 kV Angul-Jharsuguda-4 charged at 10:39 hrs.

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	PG Odisha*, JITPL

*DR of Jharsuguda end pending



Report on Multiple element trippings at Angul on 12.10.23

Preliminary report on Multiple element trippings at Angul on 12.10.23

STATION:	765/400KV Angul S/s
Tripping event Date & Time	12/10/2023 17:49:13 hrs
Details	765KV Bus-1 & 2 and 400KV Bus-1 Tripped along with other elements during Heavy Lightning strikes in switchyard
Elements tripped	<p>765KV Bus-2- Tripped on Diff. Protection at 17:49:13:545 Hrs 400KV GMR-2:Tripped on Over voltage 400KV Bus-1 Tripped on Diff. Protection at 17:49:34:667 Hrs 400KV Jindal-1 & B/R-3: Tripped due to Complete dia outage caused by Bus-1 & GMR-1 Trip. 765KV Bus-1- Tripped on Diff. Protection at 17:49:38:106 Hrs 765KV Srikakulam-1 & 2 (Connected in Half DIA) 765KV Sundargarh -3 & 4 (Connected in Half DIA) 765KV/400KV ICT-3: Tripped due to inter trip received from 765KV B/R LBB Operation as per scheme.</p>

Event-3: 765KV Srikakulam D/C Sundrargh -3&4 AR through Tie CB

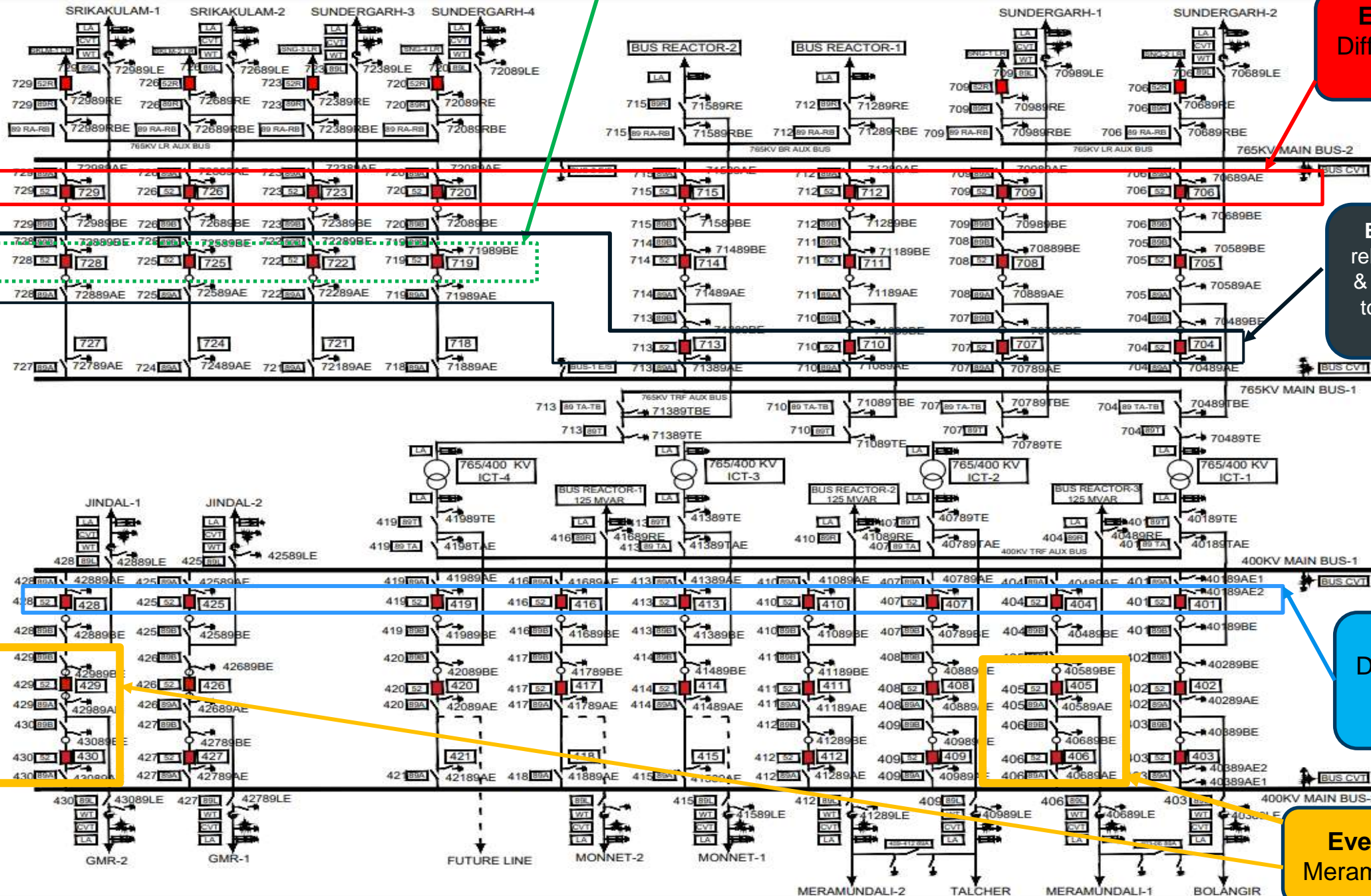
Angul SLD

Event-1: 765KV Bus-2
Diff. relay tripping causing
all main bays trip

Event-5: 765KV Bus-1 Diff.
relay tripping causing all main
& Tie (Half dia) bays trip lead
to outage of SKLM D/C and
SNGD-3&4

Event-4: 400KV Bus-1
Diff. relay tripping causing
all main bays trip and
also, Jindal-1 & B/R-3

Event-2: 400KV GMR-2 &
Meramundali -1 tripped on O/V



Sequence of Events

TIME	PROTECTION OPTD	BAY OPEN	ELEMENT OUT	REMARKS
17:49:13:545	765 BUS-2 DIFFERENTIAL OPTD	706	706 765 KV BUS BAR-2	709,712,715,720,723,726 & 729
17:49:13:768	712 LBB	711(TIE)	765 KV BR-1	
17:49:13:660	OV STG-2 OF GMR-2	430 & 429	GMR-2	
17:49:18:140	OV STG-2 OF MNDLI-1	406 & 405	MNDLI-1	
17:49:15:863	SNG-3 & 4 AR OPTD			MAIN BAYS (720,723) REMAIN OPENED BECAUSE OF BB OPTD
17:49:15:213/29	3SKLM-1 & 2 AR OPTD			MAIN BAYS (726, 729) REMAIN OPENED BECAUSE OF BB OPTD
				TIE BAYS CLOSED IN SUCCESSFUL AR OPERATION
17:49:38:106	765 BUS-1 DIFFERENTIAL OPTD	704	704 765 KV BUS BAR-1	BECAUSE OF LINE OPEN AT ANGUL END AND REMAIN HOLD AT REMOTE END OV STG-1 OPERATED AFTER 5 SEC AND DT SEND TO REMOTE END.
		707	SKLM-1	
		710	SKLM-2	
		713	SNG-3	
		719	SNG-4	
		722,725 & 728	SKLM-1 & SSKLM-2	

17:49:34:167	400 BUS-1 DIFFERENTIAL OPTD	401	401 400 KV BUS BAR-1	
		404	404 400 KV BR-3	AS 405 ALREADY OPENED.
		407		
		410		
		413		
		416		
		419		
		425		
		428	JINDAL-1	AS 429 ALREADY OPENED.
17:49:34:935		ICT-3 IV MAIN_413	ICT-3	BAY 413 LBB OPERATED THROUGH BAY UNIT-1 HENCE ICT IV TIE BAY AND HV MAIN AND TIE BAY OPENED AS PER SCHEME.
17:49:35:004		ICT-3 IV TIE_414		
17:49:35:004		ICT-3 HV MAIN_710		
17:49:14:288		ICT-3 HV TIE_711		
17:49:34:710		ICT-4 IV MAIN_419		OPERATION IS NORMAL
NOT OPENED		ICT-4 IV TIE_420		
17:49:38:147		ICT-4 HV MAIN_713		
NOT OPENED		ICT-4 HV TIE_714		

HMI: Sequence of Events of Angul S/S

EVENTS

SICAM PAS CC V7 Event list



	Date	Time	Message Group	Message Text	Value	Cause	Additional ca
353	12/10/2023	17.48.41.243	PES2	Port_08_LinkDown	CLEARED	spontaneous	no error
354	12/10/2023	17.49.13.534	712_87R TEE_7UT613	87 Blocked by ext. fault C	RAISED	spontaneous	no error
355	12/10/2023	17.49.13.536	723RA21.2	Overvoltage PROTECTION START STAGE1	RAISED	spontaneous	no error
356	12/10/2023	17.49.13.536	712_87R_1_7UT613	87 Blocked by ext. fault C	RAISED	spontaneous	no error
357	12/10/2023	17.49.13.537	430 REL 670	VT FUSE FAIL	RAISED single indi	spontaneous	no error
358	12/10/2023	17.49.13.537	712_87R TEE_7UT613	87 Blocked by ext. fault B	RAISED	spontaneous	no error
359	12/10/2023	17.49.13.537	712_87R TEE_7UT613	87 Blocked by ext. fault A	RAISED	spontaneous	no error
360	12/10/2023	17.49.13.538	712_87R_1_7UT613	87 Blocked by ext. fault B	RAISED	spontaneous	no error
361	12/10/2023	17.49.13.538	712_87R_1_7UT613	87 Blocked by ext. fault A	RAISED	spontaneous	no error
362	12/10/2023	17.49.13.541	720RA21.2	Overvoltage PROTECTION START STAGE2	RAISED	spontaneous	no error
363	12/10/2023	17.49.13.545	765 KV BB MCU1	Trip command for BUS2 (group alarm)	RAISED	spontaneous	no error
364	12/10/2023	17.49.13.545	765 KV BB MCU1	GEN TRIP phsC	RAISED	spontaneous	no error
365	12/10/2023	17.49.13.545	765 KV BB MCU1	GEN. TRIP	RAISED	spontaneous	no error
366	12/10/2023	17.49.13.545	765 KV BB MCU1	Protection/DIFF.TRIP	RAISED	spontaneous	no error
367	12/10/2023	17.49.13.545	765 KV BB MCU1	Disturb Rec/Recording.Grid fault num	4	spontaneous	no error
368	12/10/2023	17.49.13.546	430 REL 670	DISTANCE BLOCK	RAISED single indi	spontaneous	no error
369	12/10/2023	17.49.13.546	726RA_7SA522	Total.Pickup.phsB	RAISED	spontaneous	no error
370	12/10/2023	17.49.13.546	726RA_7SA522	Total.Pickup.phsA	RAISED	spontaneous	no error
371	12/10/2023	17.49.13.546	726RA_7SA522	Total.Pickup	RAISED	spontaneous	no error
372	12/10/2023	17.49.13.546	726RA_7SA522	Relay PICKUP Phase L1	RAISED	spontaneous	no error
373	12/10/2023	17.49.13.546	726RA_7SA522	Relay PICKUP	RAISED	spontaneous	no error
374	12/10/2023	17.49.13.546	726RRA_7SA522 V4.7	Uph-e> Pickup	RAISED	spontaneous	no error
375	12/10/2023	17.49.13.546	726RA_7SA522	Relay PICKUP Phase L2	RAISED	spontaneous	no error
376	12/10/2023	17.49.13.547	427 REL 670	BROKEN CONDUCTOR START	RAISED single indi	spontaneous	no error
377	12/10/2023	17.49.13.547	765 KV BB MCU2	Trip command for BUS2 (group alarm)	RAISED	spontaneous	no error
378	12/10/2023	17.49.13.547	765 KV BB MCU2	Protection/DIFF.TRIP	RAISED	spontaneous	no error
379	12/10/2023	17.49.13.547	765 KV BB MCU2	Disturb Rec/Recording.Grid fault num	46	spontaneous	no error
380	12/10/2023	17.49.13.548	707_67.1IV V4.6	67 General Pickup	RAISED	spontaneous	no error
381	12/10/2023	17.49.13.549	706 REL	ON START	RAISED	spontaneous	no error
382	12/10/2023	17.49.13.549	720RRA21.R	21 GENERAL PICKUP	RAISED	spontaneous	no error
383	12/10/2023	17.49.13.549	723RRA-21.R	Total Pickup	RAISED	spontaneous	no error
384	12/10/2023	17.49.13.549	726RRA_7SA522	Total.Pickup	RAISED	spontaneous	no error
385	12/10/2023	17.49.13.549	729RA_7SA522	Total.Pickup	RAISED	spontaneous	no error
386	12/10/2023	17.49.13.550	406 REL 670	VT FUSE FAIL	RAISED single indi	spontaneous	no error
387	12/10/2023	17.49.13.550	715_87R_1_7UT613	87 Blocked by ext. fault C	RAISED	spontaneous	no error
388	12/10/2023	17.49.13.555	706 REL	DISTANCE START L3	RAISED	spontaneous	no error
389	12/10/2023	17.49.13.555	765 KV BB MCU1	Disturb Rec/Recording.Made	CLEARED	spontaneous	no error
390	12/10/2023	17.49.13.556	765 KV BB MCU2	Disturb Rec/Recording.Made	CLEARED	spontaneous	no error
391	12/10/2023	17.49.13.557	709RRB 64R.2 7SJ804	709LR BODY PROT THRES. REACHED	RAISED single indi	spontaneous	no error
392	12/10/2023	17.49.13.558	709RRB 64R.2 7SJ804	709LR BODY PROT THRES. REACHED	CLEARED single ir	spontaneous	no error
393	12/10/2023	17.49.13.558	710_67.1IV_7SJ804	67 General Pickup	RAISED	spontaneous	no error
394	12/10/2023	17.49.13.559	704_67.1IV V4.6	67 General Pickup	RAISED	spontaneous	no error
395	12/10/2023	17.49.13.559	712_67.1IV_7SJ804	67 General Pickup	RAISED	spontaneous	no error

Sequence of Events of Angul S/S - Multi-Element tripping dt.12.10.2023

EVENTS

SICAM PAS CC V7 Event list

	Date	Time	Message Group	Message Text	Value	Cause	Additional
393	12/10/2023	17.49.13.558	710_67.1IV_7SJ804	67 General Pickup	RAISED	spontaneous	no error
394	12/10/2023	17.49.13.559	704_67.1IV V4.6	67 General Pickup	RAISED	spontaneous	no error
395	12/10/2023	17.49.13.559	713_67.1IV_7SJ804	67 General Pickup	RAISED	spontaneous	no error
396	12/10/2023	17.49.13.560	729RA_7SA522	Total.Pickup.phsB	RAISED	spontaneous	no error
397	12/10/2023	17.49.13.560	729RA_7SA522	Total.Pickup.phsA	RAISED	spontaneous	no error
398	12/10/2023	17.49.13.560	729RA_7SA522	Total.Pickup	RAISED	spontaneous	no error
399	12/10/2023	17.49.13.560	729RA_7SA522	ov stage-1 pickup	RAISED	spontaneous	no error
400	12/10/2023	17.49.13.560	729RA_7SA522	Relay PICKUP Phase L2	RAISED	spontaneous	no error
401	12/10/2023	17.49.13.560	729RA_7SA522	Relay PICKUP Phase L1	RAISED	spontaneous	no error
402	12/10/2023	17.49.13.560	729RA_7SA522	Relay PICKUP	RAISED	spontaneous	no error
403	12/10/2023	17.49.13.560	720_7SA522	RELAY GENERAL PICKUP	RAISED	spontaneous	no error
404	12/10/2023	17.49.13.560	720_7SA522	OVERVOLTAGE STAGE1 PICKUP	RAISED	spontaneous	no error
405	12/10/2023	17.49.13.560	720_7SA522	RELAY GENERAL PICKUP	RAISED	spontaneous	no error
406	12/10/2023	17.49.13.560	723_7SA522	RELAY GENERAL PICKUP	RAISED	spontaneous	no error
407	12/10/2023	17.49.13.560	723_7SA522	OVERVOLTAGE STAGE1 PICKUP	RAISED	spontaneous	no error
408	12/10/2023	17.49.13.562	406 REL 670	DISTANCE BLOCK	RAISED single indi	spontaneous	no error
409	12/10/2023	17.49.13.566	726RA_7SA522	Total.Pickup.phsC	RAISED	spontaneous	no error
410	12/10/2023	17.49.13.566	726RA_7SA522	Relay PICKUP Earth	RAISED	spontaneous	no error
411	12/10/2023	17.49.13.566	726RA_7SA522	Relay PICKUP Phase L3	RAISED	spontaneous	no error
412	12/10/2023	17.49.13.566	726RA_7SA522	Dist general.Pickup.phsC	RAISED	spontaneous	no error
413	12/10/2023	17.49.13.566	726RA_7SA522	Dist general.Pickup	RAISED	spontaneous	no error
414	12/10/2023	17.49.13.567	430 REL 670	VT FUSE FAIL	CLEARED single ir	spontaneous	no error
415	12/10/2023	17.49.13.567	726RRA_7SA522 V4.7	Distance Pickup Z5	RAISED	spontaneous	no error
416	12/10/2023	17.49.13.569	706_6MD663 V4.8	Auto recloser is NOT ready	RAISED	spontaneous	no error
417	12/10/2023	17.49.13.569	706RB LINE BCU 6MD663	Control/CBYGGIO1.52_Y_PHASE	bad state	spontaneous	no error
418	12/10/2023	17.49.13.569	706RB LINE BCU 6MD663	Control/CBRGGIO1.52_R_PHASE	bad state	spontaneous	no error
419	12/10/2023	17.49.13.569	723 BCU	86.1 Reset	RAISED	spontaneous	no error
420	12/10/2023	17.49.13.569	723 BCU	86.2 Reset	RAISED	spontaneous	no error
421	12/10/2023	17.49.13.569	720 BCU	720 CB RPH POSITION	interm. state	spontaneous	no error
422	12/10/2023	17.49.13.570	709RB LINE BCU 6MD663	CB-52 Y-PH STATUS	bad state	spontaneous	no error
423	12/10/2023	17.49.13.570	723 BCU	86.1 Optd	RAISED	spontaneous	no error
424	12/10/2023	17.49.13.570	723 BCU	86.2 TRIP RELAY Optd	RAISED	spontaneous	no error
425	12/10/2023	17.49.13.570	720 BCU	86.2 Optd	RAISED	spontaneous	no error
426	12/10/2023	17.49.13.570	720 BCU	86.1 Optd	RAISED	spontaneous	no error
427	12/10/2023	17.49.13.570	720 BCU	720 CB BPH POSITION	interm. state	spontaneous	no error
428	12/10/2023	17.49.13.571	715_BCU-1_6MD663	CB Y-PHASE	bad state	spontaneous	no error
429	12/10/2023	17.49.13.571	709RB LINE BCU 6MD663	CB-52 R-PH STATUS	bad state	spontaneous	no error
430	12/10/2023	17.49.13.571	712_BCU-1_6MD663	CB Y-PHASE STATUS	bad state	spontaneous	no error
431	12/10/2023	17.49.13.571	720 BCU	720 CB YPH POSITION	interm. state	spontaneous	no error
432	12/10/2023	17.49.13.572	715_BCU-1_6MD663	Control/CBRGGIO1.CB R-PHASE	bad state	spontaneous	no error
433	12/10/2023	17.49.13.572	706RB LINE BCU 6MD663	Control/CBBGGIO1.52_B_PHASE	bad state	spontaneous	no error
434	12/10/2023	17.49.13.572	709RB LINE BCU 6MD663	CB-52 B-PH STATUS	bad state	spontaneous	no error
435	12/10/2023	17.49.13.572	712_BCU-1_6MD663	CB B-PHASE STATUS	bad state	spontaneous	no error

Sequence of Events of Angul S/S - Multi-Element tripping dt.12.10.2023

EVENTS							
SICAM PAS CC V7 Event list							
	Date	Time	Message Group	Message Text	Value	Cause	Additional c
432	12/10/2023	17.49.13.572	715_BCU-1_6MD663	Control/CBRGGIO1 CB R-PHASE	bad state	spontaneous	no error
433	12/10/2023	17.49.13.572	706RB LINE BCU 6MD663	Control/CBBGGIO1.52_B_PHASE	bad state	spontaneous	no error
434	12/10/2023	17.49.13.572	709RB LINE BCU 6MD663	CB-52 B-PH STATUS	bad state	spontaneous	no error
435	12/10/2023	17.49.13.572	712_BCU-1_6MD663	CB R-PHASE STATUS	bad state	spontaneous	no error
436	12/10/2023	17.49.13.572	723 BCU	AR BLOCK	RAISED	spontaneous	no error
437	12/10/2023	17.49.13.572	720 BCU	720 CB CMD	interm. state	spontaneous	no error
438	12/10/2023	17.49.13.572	720RB BCU	CB STATUS	interm. state	spontaneous	no error
439	12/10/2023	17.49.13.572	720 BCU	AR BLOCK	RAISED	spontaneous	no error
440	12/10/2023	17.49.13.572	430 7SA522	MAIN-1 Distance to fault	10	spontaneous	no error
441	12/10/2023	17.49.13.573	706RB LINE BCU 6MD663	86.2 TRIP RELAY OPTD	RAISED single indi	spontaneous	no error
442	12/10/2023	17.49.13.573	729RB_BCU	86.2 TRIP RELAY Optd	RAISED	spontaneous	no error
443	12/10/2023	17.49.13.573	729RB_BCU	86.1TRIP RELAY Optd	RAISED	spontaneous	no error
444	12/10/2023	17.49.13.573	709RRB 64R.2 7SJ804	709LR BODY PROT THRES. REACHED	RAISED single indi	spontaneous	no error
445	12/10/2023	17.49.13.573	720RA21.2	MAIN CB RPH CLOSE	CLEARED	spontaneous	no error
446	12/10/2023	17.49.13.573	720RA21.2	MAIN CB BPH CLOSE	CLEARED	spontaneous	no error
447	12/10/2023	17.49.13.574	715_BCU-1_6MD663	CB B-PHASE	bad state double in	spontaneous	no error
448	12/10/2023	17.49.13.574	715_BCU-1_6MD663	86.2 OPTD	RAISED single indi	spontaneous	no error
449	12/10/2023	17.49.13.574	715_BCU-1_6MD663	86.1 OPTD	RAISED single indi	spontaneous	no error
450	12/10/2023	17.49.13.574	706RB LINE BCU 6MD663	86.1 TRIP RELAY OPTD	RAISED single indi	spontaneous	no error
451	12/10/2023	17.49.13.574	709RB LINE BCU 6MD663	86.1 TRIP RELAY OPTD	RAISED single indi	spontaneous	no error
452	12/10/2023	17.49.13.574	729RB_BCU	CB Y_1.Position	bad state	spontaneous	no error
453	12/10/2023	17.49.13.574	729RB_BCU	CB R_1.Position	bad state	spontaneous	no error
454	12/10/2023	17.49.13.574	726RB_BCU	CB Y-PH OC_1.Position	bad state	spontaneous	no error
455	12/10/2023	17.49.13.574	726RB_BCU	AR BLOCK	RAISED	spontaneous	no error
456	12/10/2023	17.49.13.574	726RB_BCU	86.1 OPERATED	RAISED	spontaneous	no error
457	12/10/2023	17.49.13.574	726RB_BCU	CB Auto recloser is NOT ready	RAISED	spontaneous	no error
458	12/10/2023	17.49.13.574	712_BCU-1_6MD663	86.1 OPTD	RAISED single indi	spontaneous	no error
459	12/10/2023	17.49.13.575	709RB LINE BCU 6MD663	86.2 TRIP RELAY OPTD	RAISED single indi	spontaneous	no error
460	12/10/2023	17.49.13.575	729RB_BCU	CB B_1.Position	bad state	spontaneous	no error
461	12/10/2023	17.49.13.575	726RB_BCU	CB52OC_1.Position	bad state	feed back	no error
462	12/10/2023	17.49.13.575	726RB_BCU	86.2 OPERATED	RAISED	spontaneous	no error
463	12/10/2023	17.49.13.575	720RA21.2	MAIN CB YPH CLOSE	CLEARED	spontaneous	no error
464	12/10/2023	17.49.13.575	712_BCU-1_6MD663	86.2 OPTD	RAISED single indi	spontaneous	no error
465	12/10/2023	17.49.13.575	712_BCU-1_6MD663	CB B-PHASE STATUS	bad state	spontaneous	no error
466	12/10/2023	17.49.13.575	723RA21.1	Relay PICKUP Phase L3	RAISED	spontaneous	no error
467	12/10/2023	17.49.13.575	720 7SA522	Zone Z5.START	RAISED	spontaneous	no error
468	12/10/2023	17.49.13.575	720 7SA522	Zone Z4 START	RAISED	spontaneous	no error
469	12/10/2023	17.49.13.575	723RA21.1	Relay PICKUP Phase L3	RAISED	spontaneous	no error
470	12/10/2023	17.49.13.576	430 REL 670	DISTANCE BLOCK	CLEARED single in	spontaneous	no error
471	12/10/2023	17.49.13.576	723 7SA522	Zone Z5 START	RAISED	spontaneous	no error
472	12/10/2023	17.49.13.577	726RB_BCU	CB R-PH OC_1.Position	bad state	spontaneous	no error
473	12/10/2023	17.49.13.578	729RB_BCU	CB52_1.Position	bad state	feed back	no error
474	12/10/2023	17.49.13.579	720RB_BCU	AR BLOCK	RAISED	spontaneous	no error

Sequence of Events of Angul S/S - Multi-Element tripping dt.12.10.2023

<div> <div> Alarms Alarms_GI Events Trends Reports DASHBOARD LEGEND HOTSPOT </div> </div>									
EVENTS									
SICAM PAS CC V7 Event list									
	Date	Time	Message Group	Message Text	Value	Cause	Additional cause		
471	12/10/2023	17.49.13.576	723 7SA522	Zone Z5 START	RAISED	spontaneous	no error		
472	12/10/2023	17.49.13.577	726RB_BCU	CB R-PH OC_1.Position	bad state	spontaneous	no error		
473	12/10/2023	17.49.13.578	729RB_BCU	CB52_1.Position	bad state	feed back	no error		
474	12/10/2023	17.49.13.578	729RB_BCU	AR BLOCK	RAISED	spontaneous	no error		
475	12/10/2023	17.49.13.578	729RB_BCU	Auto recloser is NOT ready	RAISED	spontaneous	no error		
476	12/10/2023	17.49.13.578	720 BCU	720 CB YPH POSITION	RAISED	spontaneous	no error		
477	12/10/2023	17.49.13.579	427 7SA522	Protection/Dist general.Pickup.phsC.backward	ON	spontaneous	no error		
478	12/10/2023	17.49.13.579	427 7SA522	Protection/Dist general.Pickup.phsC.unknown	RAISED	spontaneous	no error		
479	12/10/2023	17.49.13.579	427 7SA522	Protection/Dist general.Pickup.phsC	CLEARED	spontaneous	no error		
480	12/10/2023	17.49.13.579	427 7SA522	Protection/Dist general.Pickup.neut	RAISED	spontaneous	no error		
481	12/10/2023	17.49.13.579	427 7SA522	Protection/Dist general.Pickup.backward	RAISED	spontaneous	no error		
482	12/10/2023	17.49.13.579	427 7SA522	Protection/Dist general.Pickup.unknown	RAISED	spontaneous	no error		
483	12/10/2023	17.49.13.579	427 7SA522	Dist general.Pickup	CLEARED	spontaneous	no error		
484	12/10/2023	17.49.13.579	709RRB 64R 2 7SJ804	709LR BODY PROT THRES. REACHED	RAISED	spontaneous	no error		
485	12/10/2023	17.49.13.579	720 BCU	720 CB BPH POSITION	CLEARED single in	spontaneous	no error		
486	12/10/2023	17.49.13.580	4037SA522	Zone Z5.Pickup	ON	spontaneous	no error		
487	12/10/2023	17.49.13.580	720 BCU	720 CB RPH POSITION	RAISED	spontaneous	no error		
488	12/10/2023	17.49.13.581	726RB_BCU	CB B-PH OC_1.Position	ON	spontaneous	no error		
489	12/10/2023	17.49.13.582	720 BCU	720 CB CMD	bad state	spontaneous	no error		
490	12/10/2023	17.49.13.582	720RB_BCU	CB STATUS	ON	spontaneous	no error		
491	12/10/2023	17.49.13.583	723RA 21.1	AR BLOCK	RAISED	spontaneous	no error		
492	12/10/2023	17.49.13.584	709RRA_7SA522 V4.7	21 Picked up FORWARD	RAISED	spontaneous	no error		
493	12/10/2023	17.49.13.584	720RA 21.1	AR BLOCK	RAISED	spontaneous	no error		
494	12/10/2023	17.49.13.584	720 BCU	720 CB BPH POSITION	interm. state	spontaneous	no error		
495	12/10/2023	17.49.13.584	720 BCU	720 CB YPH POSITION	interm. state	spontaneous	no error		
496	12/10/2023	17.49.13.584	720 BCU	720 CB RPH POSITION	interm. state	spontaneous	no error		
497	12/10/2023	17.49.13.585	715_BCU-1_6MD663	CB Y-PHASE	OFF	spontaneous	no error		
498	12/10/2023	17.49.13.586	706RB LINE BCU 6MD663	Control/CBYGGIO1.52_Y_PHASE	OFF	spontaneous	no error		
499	12/10/2023	17.49.13.586	706RB LINE BCU 6MD663	Control/CBBGGIO1.52_B_PHASE	OFF	spontaneous	no error		
500	12/10/2023	17.49.13.586	723 BCU	Circuit break Position	interm. state	spontaneous	no error		
501	12/10/2023	17.49.13.586	723 BCU	723 CB CMD	interm. state	spontaneous	no error		
502	12/10/2023	17.49.13.586	720 BCU	720 CB CMD	interm. state	spontaneous	no error		
503	12/10/2023	17.49.13.586	720RB_BCU	CB STATUS	interm. state	spontaneous	no error		
504	12/10/2023	17.49.13.587	706RB LINE BCU 6MD663	Control/CBRGGIO1.52_R_PHASE	OFF	spontaneous	no error		
505	12/10/2023	17.49.13.587	706RA 21.1 7SA522	MAIN CB Y-PHASE OPEN	RAISED single indi	spontaneous	no error		
506	12/10/2023	17.49.13.587	706RA 21.1 7SA522	MAIN CB B-PHASE OPEN	RAISED single indi	spontaneous	no error		
507	12/10/2023	17.49.13.587	715_BCU-1_6MD663	CB B-PHASE	OFF double indicat	spontaneous	no error		
508	12/10/2023	17.49.13.587	712_BCU-1_6MD663	CB R-PHASE STATUS	OFF	spontaneous	no error		
509	12/10/2023	17.49.13.588	709RB LINE BCU 6MD663	CB-52 Y-PH STATUS	OFF	spontaneous	no error		
510	12/10/2023	17.49.13.588	709RB LINE BCU 6MD663	CB-52 R-PH STATUS	OFF	spontaneous	no error		
511	12/10/2023	17.49.13.588	729RB_BCU	CB B_1.Position	OFF	spontaneous	no error		
512	12/10/2023	17.49.13.588	729RB_BCU	MAIN CB B OPEN	RAISED	spontaneous	no error		
513	12/10/2023	17.49.13.588	706RA 21.1 7SA522	MAIN CB R PHASE OPEN	RAISED single indi	spontaneous	no error		

Sequence of Events of Angul S/S - Multi-Element tripping dt.12.10.2023

EVENTS

SICAM PAS CC V7 Event list

	Date	Time	Message Group	Message Text	Value	Cause	Additional cat
509	12/10/2023	17.49.13.588	709RB LINE BCU 6MD663	CB-52 Y-PH STATUS	OFF	spontaneous	no error
510	12/10/2023	17.49.13.588	709RB LINE BCU 6MD663	CB-52 R-PH STATUS	OFF	spontaneous	no error
511	12/10/2023	17.49.13.588	729RB_BCU	CB B_1.Position	OFF	spontaneous	no error
512	12/10/2023	17.49.13.588	729RB_BCU	MAIN_CB_B_OPEN	RAISED	spontaneous	no error
513	12/10/2023	17.49.13.588	706RA21.1 7SA522	MAIN CB R-PHASE OPEN	RAISED single indi	spontaneous	no error
514	12/10/2023	17.49.13.588	709RA21.1 7SA522	MAIN CB R-PHASE OPEN	RAISED single indi	spontaneous	no error
515	12/10/2023	17.49.13.588	709RA21.1 7SA522	MAIN CB Y-PHASE OPEN	RAISED single indi	spontaneous	no error
516	12/10/2023	17.49.13.588	712_BCU-1_6MD663	CB Y-PHASE STATUS	OFF	spontaneous	no error
517	12/10/2023	17.49.13.588	723 BCU	Circuit break Position	ON	spontaneous	no error
518	12/10/2023	17.49.13.589	709RB LINE BCU 6MD663	CB-52 B-PH STATUS	OFF	spontaneous	no error
519	12/10/2023	17.49.13.589	709RA21.1 7SA522	MAIN CB B-PHASE OPEN	RAISED single indi	spontaneous	no error
520	12/10/2023	17.49.13.589	715_BCU-1_6MD663	Control/CBRGGIO1.CB R-PHASE	OFF	spontaneous	no error
521	12/10/2023	17.49.13.589	723 BCU	723 CB CMD	ON	spontaneous	no error
522	12/10/2023	17.49.13.590	729RA_7SA522	M1 YPHOPEN	RAISED	spontaneous	no error
523	12/10/2023	17.49.13.590	729RB_BCU	CB R_1.Position	OFF	spontaneous	no error
524	12/10/2023	17.49.13.590	729RB_BCU	MAIN_CB_R_OPEN	RAISED	spontaneous	no error
525	12/10/2023	17.49.13.590	723RA21.1	M1 RPH OPEN	RAISED	spontaneous	no error
526	12/10/2023	17.49.13.590	712_BCU-1_6MD663	CB B-PHASE STATUS	OFF	spontaneous	no error
527	12/10/2023	17.49.13.591	729RA_7SA522	M1 BPHOPEN	RAISED	spontaneous	no error
528	12/10/2023	17.49.13.591	729RB_BCU	CB Y_1.Position	OFF	spontaneous	no error
529	12/10/2023	17.49.13.591	729RB_BCU	MAIN_CB_Y_OPEN	RAISED	spontaneous	no error
530	12/10/2023	17.49.13.591	720 BCU	720 CB BPH POSITION	OFF	spontaneous	no error
531	12/10/2023	17.49.13.592	723 BCU	Circuit break Position	OFF	spontaneous	no error
532	12/10/2023	17.49.13.592	723 BCU	723 CB CMD	OFF	spontaneous	no error
533	12/10/2023	17.49.13.592	720 BCU	720 CB RPH POSITION	OFF	spontaneous	no error
534	12/10/2023	17.49.13.593	729RA_7SA522	NO VOLT IN LINE	RAISED	spontaneous	no error
535	12/10/2023	17.49.13.593	729RA_7SA522	M1 RPHOPEN	RAISED	spontaneous	no error
536	12/10/2023	17.49.13.593	723RA21.1	M1 YPH OPEN	RAISED	spontaneous	no error
537	12/10/2023	17.49.13.593	723RA21.1	M1 BPH OPEN	RAISED	spontaneous	no error
538	12/10/2023	17.49.13.593	729RA_7SA522	NO VOLT IN LINE	CLEARED	spontaneous	no error
539	12/10/2023	17.49.13.593	726RB_BCU	CB Y-PH OC_1.Position	OFF	spontaneous	no error
540	12/10/2023	17.49.13.593	726RB_BCU	MAIN CB Y OPEN	RAISED	spontaneous	no error
541	12/10/2023	17.49.13.593	709RRB 64R 2 7SJ804	709LR BODY PROT THRES. REACHED	RAISED single indi	spontaneous	no error
542	12/10/2023	17.49.13.593	723 BCU	INTERLOCK 89B Open	RAISED	spontaneous	no error
543	12/10/2023	17.49.13.593	723 BCU	INTERLOCK 89A CLOSE	RAISED	spontaneous	no error
544	12/10/2023	17.49.13.593	723 BCU	INTERLOCK 89B CLOSE	RAISED	spontaneous	no error
545	12/10/2023	17.49.13.593	723 BCU	INTERLOCK 89A OPEN	RAISED	spontaneous	no error
546	12/10/2023	17.49.13.595	726RB_BCU	CB R-PH OC_1.Position	OFF	spontaneous	no error
547	12/10/2023	17.49.13.595	726RB_BCU	MAIN CB R OPEN	RAISED	spontaneous	no error
548	12/10/2023	17.49.13.596	726RB_BCU	CB B-PH OC_1.Position	OFF	spontaneous	no error
549	12/10/2023	17.49.13.596	726RB_BCU	MAIN CB B OPEN	RAISED	spontaneous	no error
550	12/10/2023	17.49.13.596	726RA_7SA522	MAIN 1 R PH OPEN	RAISED	spontaneous	no error

765KV Bus-2 DR

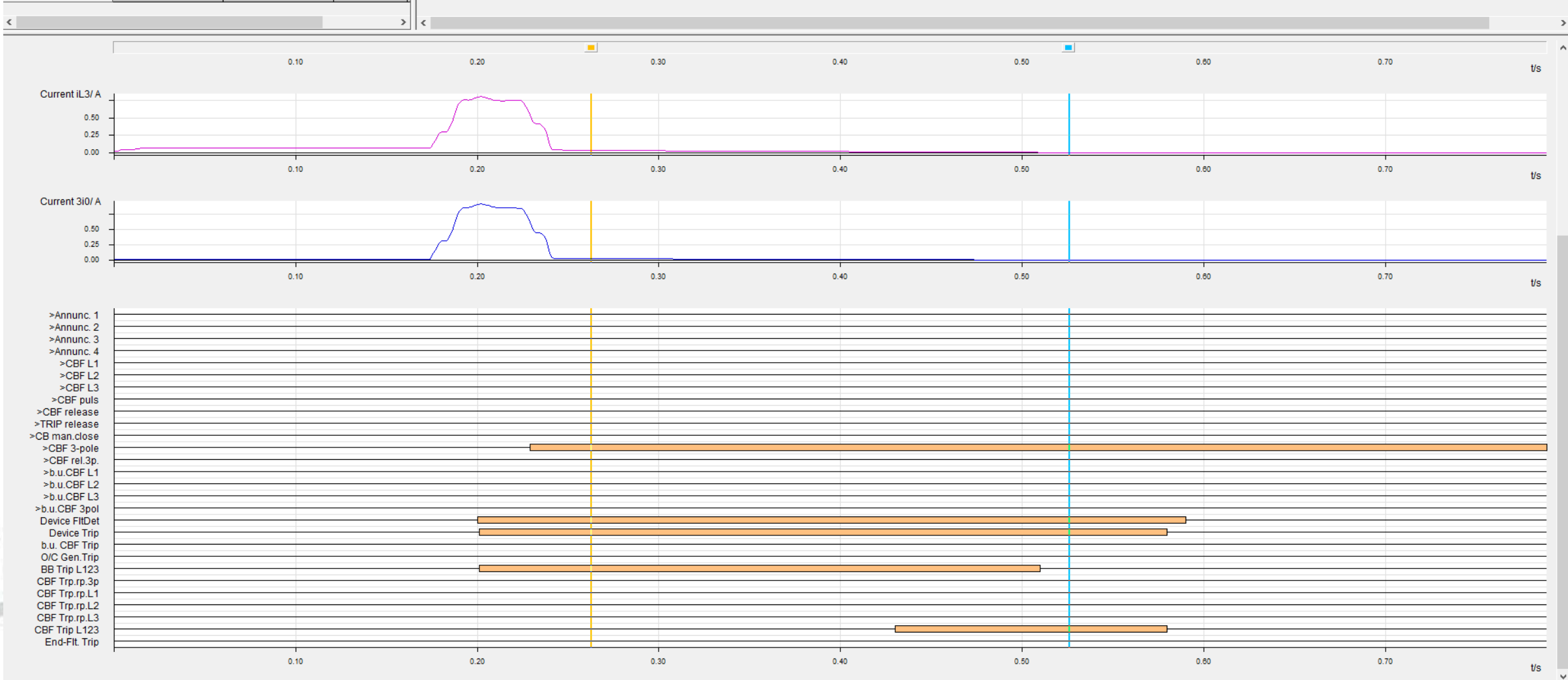
SIGRA 4 - [Time Signals - BUS2_MCU1_I: 12-10-2023 17:49:13.358]

File Edit Insert View Options Window Help

100% <Current Configuration> One Signal per Diagram

	Time in ms	Measuring Signal	Instantaneous
Cursor 1:	263.0	(None)	
Cursor 2:	526.0	(None)	
C2 - C1	263.0		
C2 + C1	789.0		

Name: Fault record number: 4
File path: C:\USERS\60065279\ONEDRIVE - POWER GRID CORPORATION OF INDIA LIMITED\AM\TRIPPING REPORTS\TRIP REPORTS\2023-24\OCT'23\ANG\12.10.2023 - MULTIPLE ELEMENT TRIPPING\BUSBAR_12-10-23\BUSBAR_12-10-23\765 BB1 MCU-1\765 BUS2 1ST TRIP_MCU1_I_12-10-2023 17:49:13.358
Start time: 12-10-2023 17:49:13.358
Sample rate: 1000 Hz
Value representation: secondary
Record type: COMTRADE



765KV Bus-1 DR

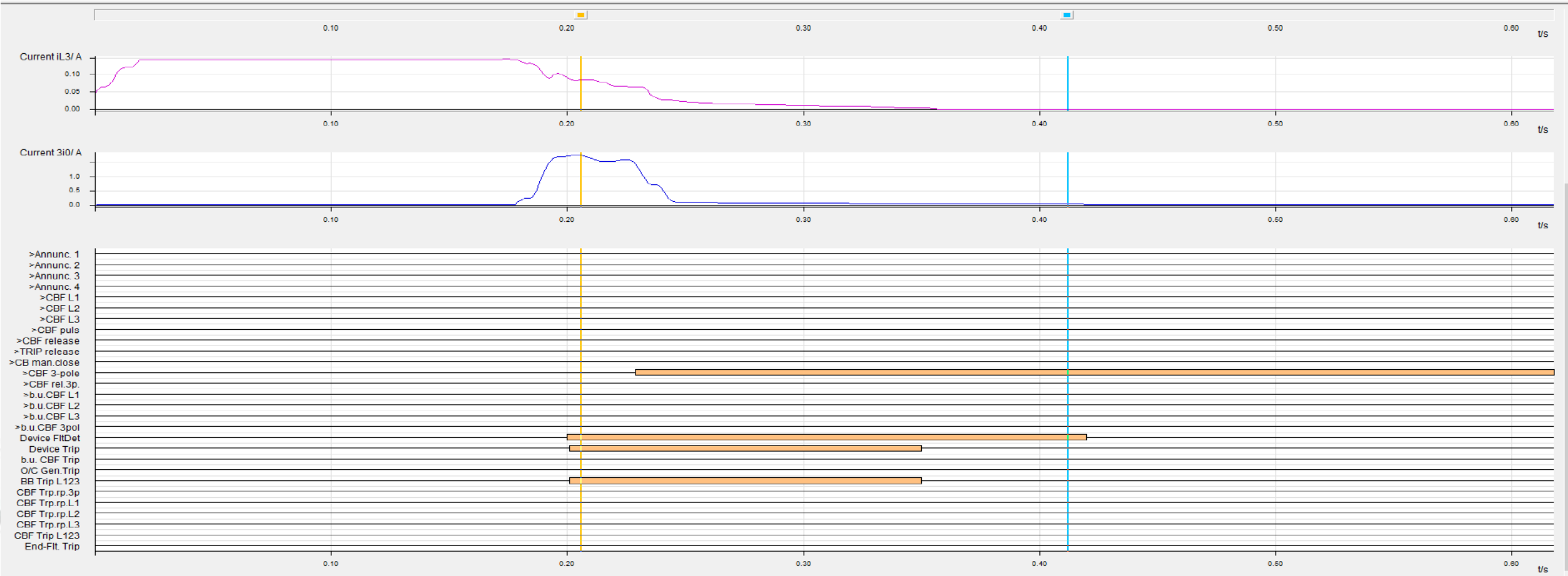
5IGRA 4 - [Time Signals - BUS1_MCU1_1ST TRIP_1: 12-10-2023 17:49:37.915]

File Edit Insert View Options Window Help

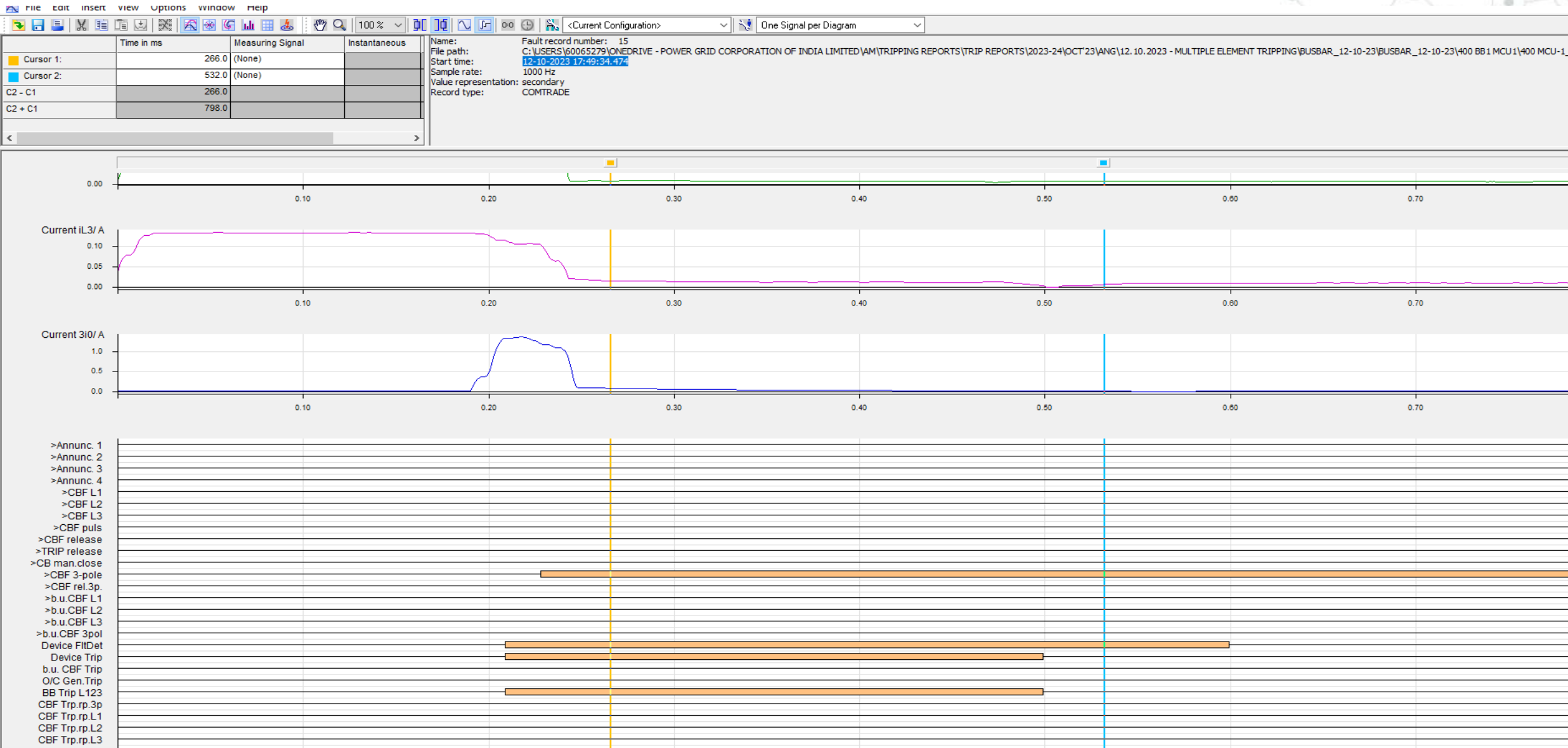
100 % <Current Configuration> One Signal per Diagram

	Time in ms	Measuring Signal	Instantaneous
Cursor 1:	206.0	(None)	
Cursor 2:	412.0	(None)	
C1	206.0		
C1	618.0		

Name: Fault record number: 5
File path: C:\USERS\60065279\ONEDRIVE - POWER GRID CORPORATION OF INDIA LIMITED\AM\TRIPPING REPORTS\TRIP REPORTS\2023-24\OCT'23\ANG\12.10.2023 - MULTIPLE ELEMENT TRIPPING\BUSBAR_12-10-23\BUSBAR_12-10-23\765 BB1 MCU-1\765 BUS1 1ST TRIP_1
Start time: 12-10-2023 17:49:37.915
Sample rate: 1000 Hz
Value representation: secondary
Record type: COMTRADE



400KV Bus-1 DR



765Kv Angul-Srikakulam-1 A/R

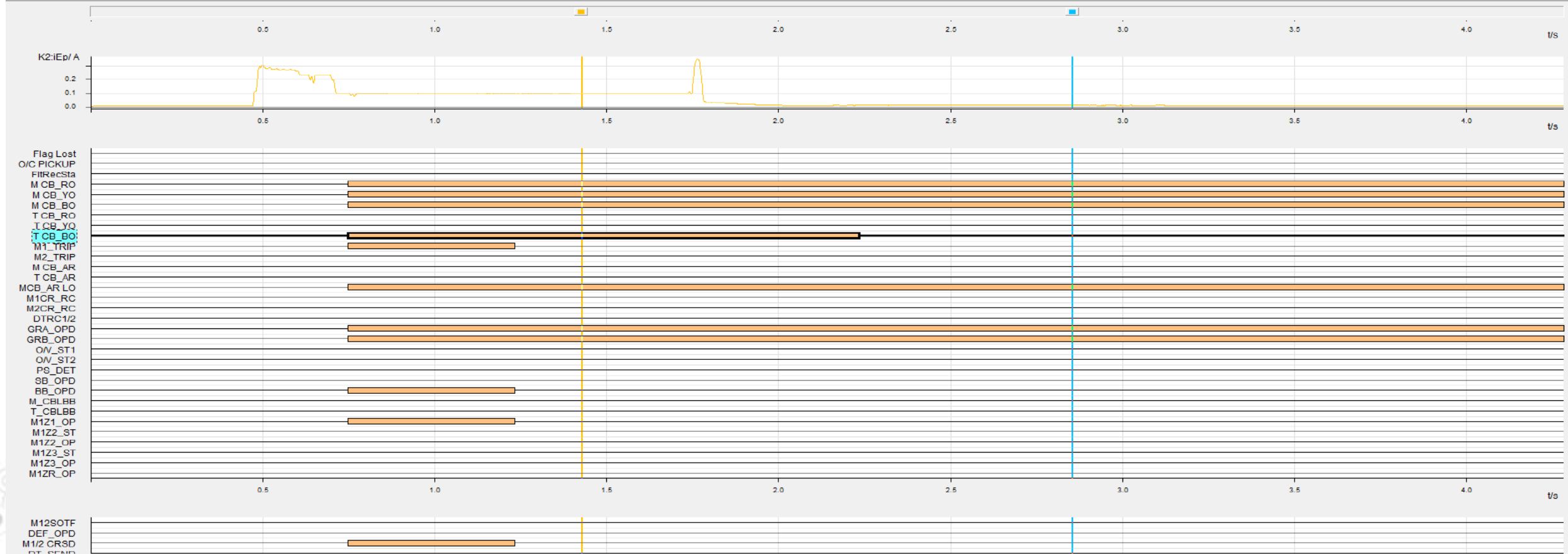
SIGRA 4 - [Time Signals - M1 DR1: 12-10-2023 17:49:13.060]

File Edit Insert View Options Window Help

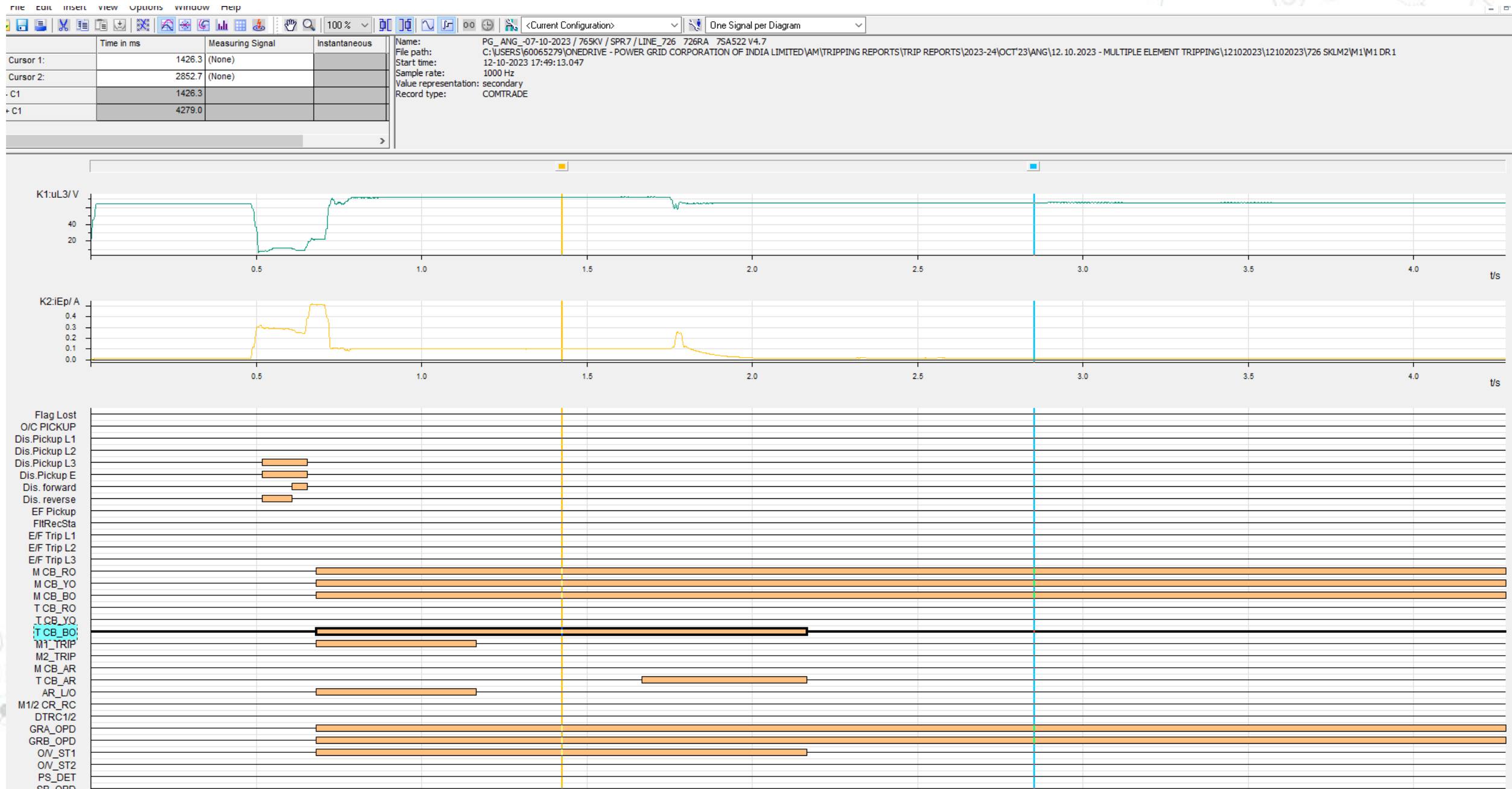
100 % <Current Configuration> One Signal per Diagram

	Time in ms	Measuring Signal	Instantaneous
Cursor 1:	1428.0	(None)	
Cursor 2:	2856.0	(None)	
- C1	1428.0		
+ C1	4284.0		

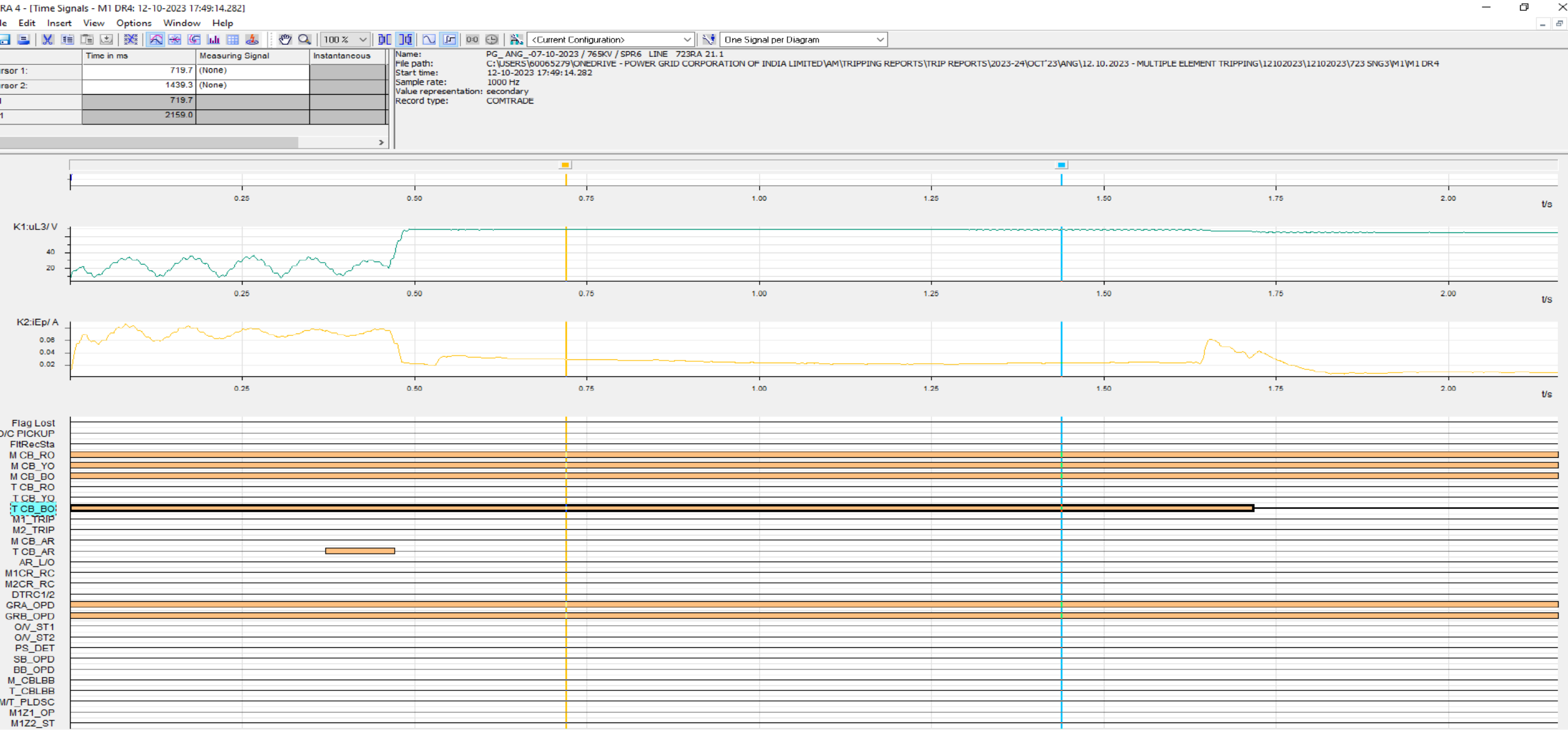
Name: PG_ANG-07-10-2023 / 765KV / SPR8 / LINE_729 729RA 75A522 V4.7
File path: C:\USERS\60065279\ONE DRIVE - POWER GRID CORPORATION OF INDIA LIMITED\AM\TRIPPING REPORTS\TRIP REPORTS\2023-24\OCT'23\ANG\12.10.2023 - MULTIPLE ELEMENT TRIPPING\12102023\12102023\729 SKLM1\W1\DR1
Start time: 12-10-2023 17:49:13.060
Sample rate: 1000 Hz
Value representation: secondary
Record type: COMTRADE



765Kv Angul-Srikakulam-2 A/R



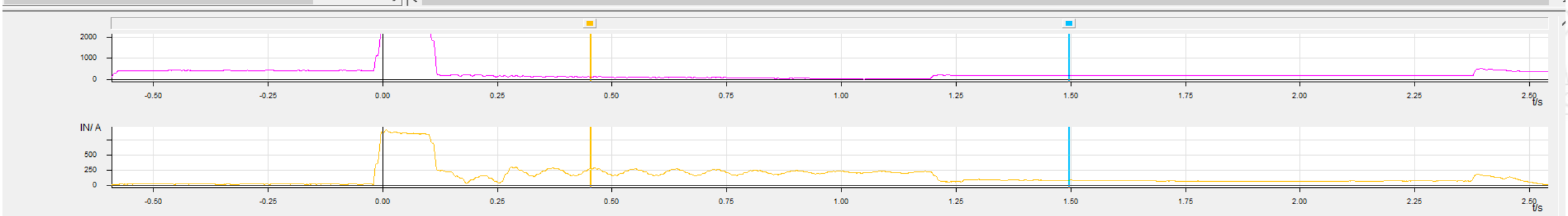
765Kv Angul-Sundargarh-3 A/R



—  

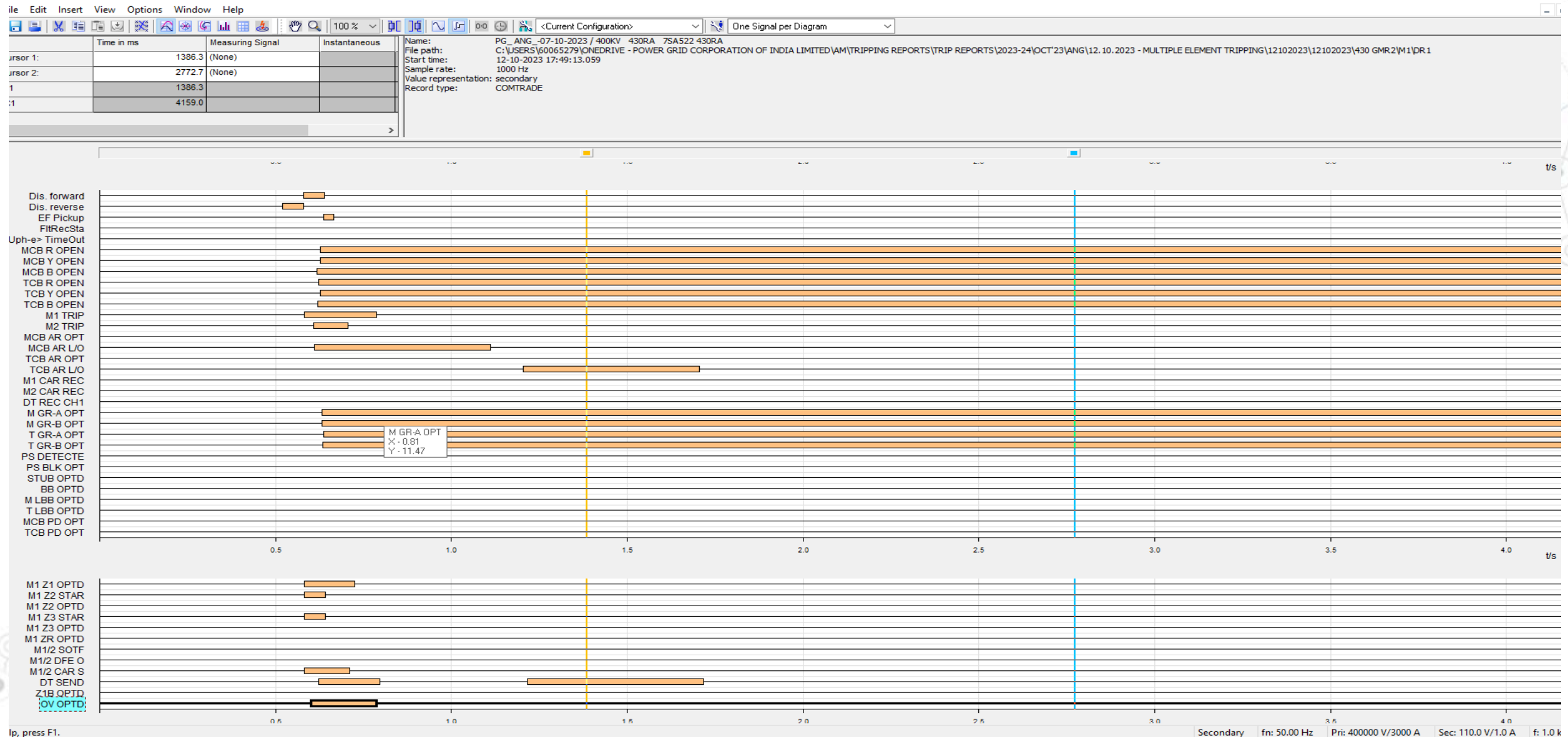
File Edit Insert View Options Window Help

Name:	ANGUL SS
File path:	C:\USERS\60065279\ONE DRIVE - POWER GRID CORPORATION OF INDIA LIMITED\AM\TRIPPING REPORTS\TRIP REPORTS\2023-24\OCT'23\ANG\12.10.2023 - MULTIPLE ELEMENT TRIPPING\12102023\12102023\720 SNG4\M2\THURSDAY 12 OCTOBER 2023 17.49.13
Start time:	12-10-2023 17:49:12.960
Sample rate:	1195 Hz
Value representation:	secondary
Record type:	COMTRADE

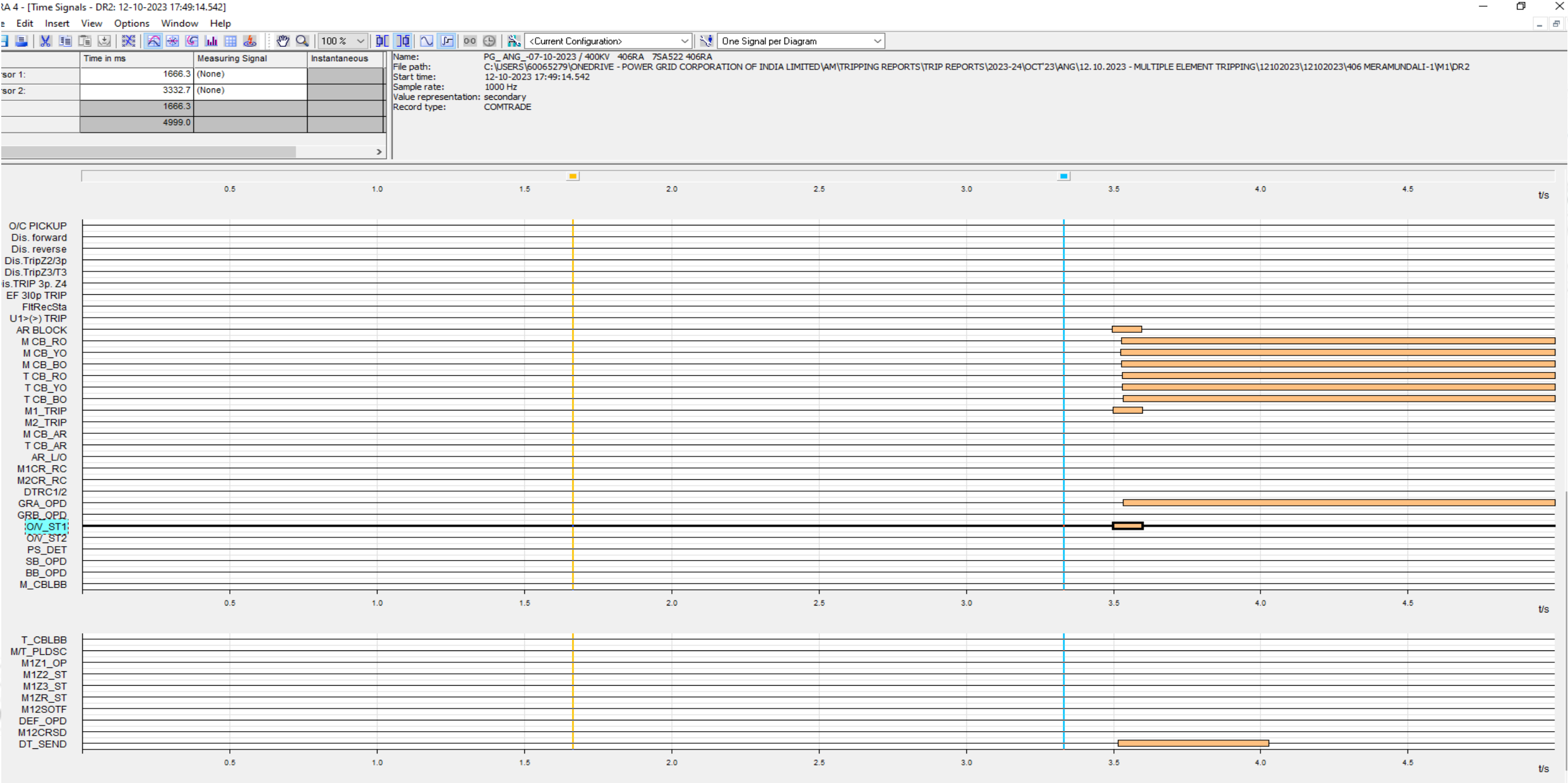


Input	Percentage (%)
MAIN CB RPH CL	31.73
MAIN CB YPH CL	31.73
MAIN CB BPH CL	31.73
TIE CB RPH OP	0
TIE CB YPH OP	0
TIE CB BPH OP	0
Unused	0
Any Trip	0
Virtual Input 1	0
Virtual Input 2	0
Virtual Input 3	0
MAIN 86.1	0
TO TIE 86.1	0
MAIN 86.2	0
DT SEND CH2	0
Unused	0
V>1 Trip	0
V>2 Trip	0
Power Swing	0
I>4 Trip	0
Unused	0
1PH YPH TRIP	0
Unused	0
Unused	0
Z1	0
Z2	0
Z3	0
Unused	0

400KV Angul-GMR-2 OV Optd.



400KV Angul-Meramundali-1 OV Optd.



Sequence of Restoration:

S. No.	TIME (hrs)	NAME OF Elements/Lines
01	18:25	400 KV ANGUL-GMR-2 LINE
02	18:32	400 KV angul-JITPL-1– IVT S/C LINE
03	18:45	765 kV BUS-II
04	19:11	765 kV Angul-Sundergarh-4 charged but did not hold again tripped due to o/V stg-1 and 765 kV BUS-2 also tripped
05	19:22	765kV BUS-II Charged
06	19:38	765 kV Angul-Srikakulam-1
07	20:25	240MVAR L/R of Angul-Sundergarg-4 charged as a bus reactor
08	20:37	Angul-Srikakulam-2
09	21:50	765kV BUS-1 charged but tripped again
10	23:11	400kV BUS-1
11	23:25	400kV 125 MVAR B/R-3
12	23:33	400kV Angul-Meramundali-1
765Kv BUS-1 is out of service		
765 kV Angul-Sundergarh-3 is out of service		
765 kV Angul-Sundergarh-4 is out of service		
ICT-3 is out of service, 765KV B/R-1 out of service		

Flash over in secondary JB boxes of CT & Other equipment during severe lightning.





Preliminary Analysis:

- ◎ Flash over marks in secondary junction boxes observed in three CTs (723,413 & 719) which are associated with bus trippings. Detailed testing of CTs is under way and bays are out of service now for the detailed checking.
- ◎ Further, detailed analysis of substation Direct stroke lightning protection (DSLPP) plan needs to be studied for possible effect of lightning on substation equipment.
- ◎ Detailed report with further findings will be shared shortly.

S.No.	Element Name	Tripping Date	Tripping Time	Reason	Revival Date	Revival Time
1	220KV-DARBHANGA(DMTCL)-LAUKAHI-2	26-10-2023	01:30	DARBHANGA: B-N, 71KM, 0.7KA, LAUKAHI: B-N, 18.74Km,0.23KA	26-10-2023	02:23
2		10-10-2023	12:46	Tripped from Laukahi end LAUKAHI: Y_B, Iy=0.94 KA, Ib=0.95 KA	10-10-2023	14:31
3		06-10-2023	19:10	Dharbhanga: A/R successful, R ph, 4.47 kA, 27.3 km Laukahi: Z-1, R-N, 2kA, 50km	06-10-2023	19:46
4		27-09-2023	12:09	Drabhanga: B-Ph, 20 km, 9.6kA, Z-I, A/R Successful Laukhai: zone -1 distance 60.32Km,IA-57.36A,IB-62.38A,IC-1.009KA.	27-09-2023	12:35
5		13-09-2023	22:30	Tripped from DMTCL end	14-09-2023	01:24
6		06-09-2023	19:11	Tripped only from Laukhi end.	06-09-2023	20:23
7		02-09-2023	21:07	LAUKAHI: zone -1, distance- 50.28Km, R_E, fault current R-phase 2.076 KA	02-09-2023	22:10
8		21-08-2023	21:01	Darbhanga:Y-N fault,Zone-1,FD-54.79kM; Laukahi: Y-N, 3.34kA, 31.57km	21-08-2023	23:18
9		16-08-2023	19:53	Darbhanga - R_N , FD - 28 km , FC - 4.751 KA laukai - R_N , FD - 57 km , FC - 2.079 KA A/R successful	16-08-2023	21:45

10		14-08-2023	03:52	Darbhanga: A/R succesfull Laukahi: Distance 26.19km , Ir=4.026 KA, R- N fault	14-08-2023	20:08
11		13-08-2023	18:19	DARBHANGA: R_N, FC- 2.20 KA, FD-66 KM, Z-1, A/R SUCCESSFUL LAUKAHI: zone -1 distance 19.78Km, fault current in R-phase 4485A.	13-08-2023	19:07
12		13-08-2023	02:27	Darbhanga: A/R successful, Z-I, Y-Ph, 66.28km,2.463kA laukhai: zone -1 distance 22.95 Km , over current fault current Y-phase 4.256kA	13-08-2023	03:01
13		12-08-2023	03:50	Laukahi : Z-1, R-ph, 30 km, 3.283 kA Darbhanga : A/R Successful, Z-1, R-ph, 2.65 kA, 7.5 km	12-08-2023	04:30
14		09-08-2023	19:33	Darbhanga: A/R succesful, R-N, Z-1, Fd= 27.2 km, Ir = 4.57 KA Laukahi: R-N Fault, Z-1, Fd= 49.45km, fc= 2.183 KA	09-08-2023	20:22
15		08-08-2023	00:40	DMTCL: B-N, 2.75kA, 52.1km, A/R successful	08-08-2023	01:34
16	220KV- DARBHANGA(DMTCL)- LAUKAHI-1	10-10-2023	12:46	Tripped from Laukahi end LAUKAHI: Y_B, ly=0.93 KA, Ib=0.96 KA	10-10-2023	14:31
17		10-10-2023	12:46	Tripped from Laukahi end LAUKAHI: Y_B, ly=0.93 KA, Ib=0.96 KA	10-10-2023	14:31

18		18-09-2023	11:50	Darbhanga - Y_B Fault , FD - 9.7 km , FC - IY - 10.94 KA , IB - 10.84 KA Laukahi - FD- 76.09Km FC - Y-B-phase, Ib-1.694 KA, Iy-1.570kA	18-09-2023	12:50
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List of important transmission lines in ER which tripped in September-2023

Sl. No.	LINE NAME	TRIP DATE	TRIP TIME	RESTORATION DATE	RESTORATION TIME	Relay Indication LOCAL END	Relay Indication REMOTE END	Reason	Fault Clearance time in msec	Remarks	DR Configuration Discrepancy	DR/EL RECEIVED FROM LOCAL END	DR/EL RECEIVED FROM REMOTE END
1	220KV NEW PURNEA-MADHEPURA-1	01-09-2023	11:07	02-09-2023	20:10	New Purnea: Y_ph CT burst		Y-B	100	Phase to phase fault	CB digital signal not configured in new Purnea end DR	Yes	No
2	220KV NEW TOWN(AA-III)-RAJARHAT-2	01-09-2023	11:35	01-09-2023	13:27	New town: B_E, 5.45 km, 13 kA	Rajarhat:B_E, 1.44 km, 16.54 kA	B-Earth	100	A/r failed after 1 second		No	Yes

3	220KV DEHRI-GAYA-2	01-09-2023	12:18	01-09-2023	12:44	Dehri: B_E, 69.07 km, 0.644 kA	Gaya: B_E, 44.05 km, 8.87 kA	B-Earth	100	A/r successful but tripped again within reclaim time	Dehri end DR not time synchronized	Yes	Yes
4	400KV SAHARSA-DARBHANGA (DMTCL)-1	01-09-2023	12:18	01-09-2023	12:59	Saharsa: R_E, Zone-1, 8.2 km, 10.2 kA	Darbhanga: R_E, Zone-2, 4 kA	R-Earth	100	A/r failed after 1 second	Saharsha end main 2 DR not time synchronized	Yes	No
5	220KV CHUKHA-BIRPARA-1	01-09-2023	14:50	02-09-2023	15:59		Birpara: Y_B, 52.6 km, Iy= 3.033 kA, Ib= 3.053 kA	Y-B	100	Phase to phase fault		No	Yes
6	220KV KATAPALLI-BOLANGIR(PG)-1	02-09-2023	11:32	02-09-2023	11:56	Katapalli: R_N, Zone-2, 1.7 kA	Bolangir: Didn't trip	R-Earth	650	Tripped in Zone-2 from Katapalli. Whether A/r operated at Bolangir? PG Odisha may explain.		Yes	No

7	220KV BOLANGIR(PG)- BOLANGIR(GRIDCO)- 2	02-09-2023	11:34	02-09-2023	12:08	Bolangir: R_N, 6.16 kA	Bolangir: E/F	R- Earth	300	As per DR, fault cleared from PG end after 300 msec in Zone-1. A/r signal got high at PG end but no A/r attempted. PG Odisha may explain.	Main 2 DR not time synchronized in Bolangir(PG)	Yes	No
8	400KV MENDHASAL- PANDIABILI-2	02-09-2023	16:51	02-09-2023	16:19	Mendhasal: Y_N, Zone-1, 6.78 kA	Pandiabili: Didn't trip	Y- Earth	100	A/r successful from Pandiabilli. No A/r attempt at Mendhasal, other two phase tripped after 1 sec. OPTCL may explain.		No	Yes
9	400KV JEYPORE- GAJUWAKA-2	02-09-2023	16:57	03-09-2023	11:14	Jeypore: B_N, 111.2 km, 1.18 kA	Gajuwaka: B_N, 57.3 km, 1.39 kA	B- Earth	100	A/r failed after 1 second		Yes	No

10	220KV PATNA-KHAGAU-1	02-09-2023	17:07	02-09-2023	17:33	Patna: R_N, 4.236 km, 18.288 kA	Khagaul: Didn't trip	R-Earth	100	A/r successful from Khagaul only. Other two phase at Patna tripped on PD after 2.25 seconds	CB status channel not mapped properly at Patna. DR length less and not time synchronized at Khagaul	Yes	Yes
11	400KV LAPANGA-STERLITE-2	02-09-2023	19:29	02-09-2023	20:43	Lapanga: R_N, Zone-1, 10.76 km, 11.34 kA	Sterlite: R_N, 13.07 km, 2.722 kA	R-Earth	100	A/r successful from Sterlite only. No A/r attempt at Lapanga, other two phase tripped later on PD.		Yes	No
12	220KV DARBHANGA(DMTC L)-LAUKAHI-2	02-09-2023	21:07	02-09-2023	22:10		Laukahi: R_E, Zone-1, 50.28 km, 2.076 kA	R-Earth	800	A/r successful from Darbhanga. Three phase tripping at Laukahi	CB digital channels not seen in laukahi end DR	No	Yes

13	220KV JODA- RAMCHANDRAPUR-1	03-09-2023	03:50	03-09-2023	04:36	Joda:Y_E, Zone-2, 116.6 km, 1.32 kA	Ramchandarpur: Y_E, Zone-1, 10.2 km, 9.45 kA	Y- Earth	400	Tripped in Zone-2 from Joda, carrier not received. Three phase tripping at Ramchandrapu r		Yes	Yes
14	220KV RANCHI- MTPS(DVC)-1	03-09-2023	12:56	03-09-2023	14:23	Ranchi:R_N, 187 km, 0.971 kA	Mejia: R_N, Zone-1, 53.52 km, 3.077 kA	R- Earth	100	A/r successful from Ranchi. A/r kept disabled at Mejia	Mejia end Dr having insufficient length	Yes	Yes
15	400KV LAPANGA- STERLITE-2	03-09-2023	14:26	03-09-2023	17:14	Lapanga: R_N, Zone-1, 10.67 km, 11.02 kA	Sterlite: R_N, 2.95 km, 3.5 kA	R- Earth	100	A/r successful from Sterlite only. Other two phase at Lapanga tripped on PD		Yes	No
16	220KV BUDHIPADAR- RAIGARH-1	03-09-2023	15:08	03-09-2023	16:38	Budhipadar: Didn't trip	Raigarh: R_E, 9.5 km, 11.67 kA	R- Earth	100	Three phase A/r enabled at Budhipadar.	DR length less at Budhipadar	Yes	No

17	220KV KARAMNASHA (NEW)-PUSAULI-1	04-09-2023	04:16	13-09-2023	22:55	Sasaram:Y_E, 4.53 km 13.8 kA		Y- Earth	100	A/r failed after 1 second from Pusauli. Other two phase at karamnasha tripped on PD after 2.5 seconds		No	Yes
18	400KV SAHARSA- DARBHANGA (DMTCL)-2	04-09-2023	13:09	04-09-2023	16:13	Saharsa: DT received	Darbhanga: Didn't trip	No fault	NA	No fault in line, PMTL/DMTCL may explain		No	No
19	400KV LAPANGA- STERLITE-2	04-09-2023	14:19	06-09-2023	16:22		Sterlite: R_N, Zone-1, 2.95 km, 32 kA	R- Earth	100	A/r successful from Sterlite only. Other two phase at Lapanga tripped on PD		Yes	No
20	400KV BIDHANNAGAR- NEW CHANDITALA- 1	04-09-2023	14:59	04-09-2023	15:48	Bidhannagar: B_N, Zone-1, 97.8 km	New Chandi: B_N, Zone-1, 36.31 km, 7.92 kA	B- Earth	100	Three phase tripping for single phase fault		Yes	No

21	400KV JEERAT- BAKRESWAR-1	05-09-2023	15:33	06-09-2023	06:59	Jeerat: R_N, Zone-2, 156.6 km, 2.72 kA	Bakreswar: R_N, Zone-1, 15.52 km, 6.96 kA	R-Earth	100	A/r failed after 1 second		Yes	Yes
22	400KV ALIPURDUAR (PG)- PUNASANGCHUN-JIGMELING-2	06-09-2023	17:12	06-09-2023	18:56	Alipurduar: B_E, Zone-2, 212.3 km, 2 kA	Jigmelling: B_E, Zone-1, 105.3 km, 1.6 kA	B-Earth	1100	Resistive fault. Tripped in Zone-2 from Alipurduar. No carrier received		Yes	NA
23	220KV DARBHANGA(DMTC L)-LAUKAHI-2	06-09-2023	19:11	06-09-2023	20:23		Laukahi:R_N, 3.74 kA	R-Earth	100	A/r successful at Darbhanga. Three phase tripping at Laukahi	CB digital signals not mapped in DR of laukahi	No	Yes
24	400KV NEW PPSP- NEW RANCHI-2	07-09-2023	15:32	07-09-2023	19:30	New PPSP: DT received		No fault	NA	No fault observed from PMU. DC Earth fault reported at New Ranchi. PG ER-1 may explain.		Yes	No

25	400KV JHARSUGUDA- ROURKELA-3	07-09-2023	18:13	07-09-2023	18:50	Jharsuguda: DT received		No fault	NA	No fault observed from PMU. PG Odisha may explain.		Yes	No
26	400KV PPSP- BIDHANNAGAR-2	07-09-2023	21:28	08-09-2023	21:53		Bidhannagar: Y_E, Zone-1, 31.21 km, 7.37 kA	Y- Earth	100	A/r kept disabled as per OEM advise		No	Yes
27	220KV RENGALI(PH)- TSTPP-1	08-09-2023	14:39	08-09-2023	20:42	Rengali: B_N, Zone-1, 11.2 km, 7 kA	TSTPP: B_N, Zone-1, 15.5 km, 6.16 kA	B- Earth	100	A/r couldn't be ascertained from PMU. OHPC/NTPC may confirm	Unable to open TSTPP end DR	No	Yes
28	220KV RANCHI- MTPS(DVC)-1	08-09-2023	21:00	08-09-2023	22:36	Ranchi: R_N, Zone- 1, 66.54 km, 2.45 kA. A/r successful	Mejia: R_N, Zone-1, 145.5 km, 1.14 kA	R- Earth	100	from Ranchi. A/r kept		Yes	Yes
29	400KV GMR-ANGUL- 1	10-09-2023	12:19	10-09-2023	15:50		Angul: B_N, Zone-1, 15 km, 11.4 kA	B- Earth	100	A/r failed after 1 second		No	Yes

30	220KV DARBHANGA (DMTCL)-MOTIPUR-1	12-09-2023	04:21	12-09-2023	04:44	DMTCL:R_E, Zone-1, 43 km, 3.33 kA		R- Earth	100	A/r successful from Motipur only.		No	Yes
31	220KV DARBHANGA (DMTCL)-MOTIPUR-1	12-09-2023	13:54	12-09-2023	19:50	Darbhang: Y_N , 55 km, 2.2 kA		Y- Earth	100	A/r couldn't be ascertained from PMU. BSPTCL/DMT CL may confirm		No	Yes
32	220KV DARBHANGA (DMTCL)-MOTIPUR-2	12-09-2023	13:54	12-09-2023	14:18	Darbhang:R_N, 78 km, 0.8 kA		R- Earth	100	A/r couldn't be ascertained from PMU. BSPTCL/DMT CL may confirm		No	Yes
33	220KV PARULIA- PARULIA(PG)-2	12-09-2023	15:45	12-09-2023	16:32		Parulia (PG): Didn't trip	No fault	NA	No fault observed from PMU. DVC may explain.		Yes	NA
34	220KV MAITHON- DUMKA-2	13-09-2023	14:08	13-09-2023	14:50	Maithon:R_N, 31 km, 6.06 kA		R- Earth	100	A/r successful from Maithon only	individual CB digital signal not configured in Dumka end DR	Yes	Yes

35	400KV PPSP-BIDHANNAGAR-1	13-09-2023	15:31	13-09-2023	16:08	PPSP:R_N, Zone-1, 155.7 km	Durgapur:R_N, Zone-1, 44.05 km, 5.231 kA	R-Earth	100	A/r kept disabled as per OEM advise	CB digital channels missing in Bidhannagar DR	No	Yes
36	220KV RENGALI(PH)-TSTPP-1	13-09-2023	20:17	14-09-2023	19:19	Rengali:B_N, Zone-1, 19.06 km,5.73 kA	Talcher:B_N,Zone-2, 20 km,5.73 kA	B-Earth	500	Tripped in Zone-2 time from TSTPP		No	Yes
37	220KV DARBHANGA(DMTCL)-LAUKAHI-2	13-09-2023	22:30	14-09-2023	01:24	DMTCL: Tripped		No fault	NA	DMTCL may explain		No	No
38	220KV CHANDIL-RANCHI-1	14-09-2023	20:46	14-09-2023	21:01	Chandil:R_N, 50 km,2.29 kA	Ranchi:R_N, 30 km,4.8 kA	R-Earth	100	A/r successful from Ranchi only	DR length less at Chandil	Yes	Yes

39	220KV ALIPURDUAR (PG)-SALAKATI-2	15-09-2023	11:06	15-09-2023	12:13	Alipurdaur: R_N, 36.2 km, 1.9 kA	Salakati:R_N, 93 km, 1.9 kA	R-Earth	100	A/r not attempted at Alipurduar and other two phase tripped after 1.5 seconds. A/r successful from Salakati, however tripped again within reclaim time.	Yes	NA
40	765KV GAYA-VARANASI-2	15-09-2023	20:00	15-09-2023	23:27	Gaya: Y_N, Zone-1, 175.19 km, 3.51 kA	Varanasi: Y_N, 79 km, 6.7 kA	Y-Earth	100	No A/r attempt from Gaya. Other two phase tripped after 2.5 seconds on PD	Yes	NA
41	220KV RENGALI(PG)-RENGALI-1	17-09-2023	08:06	17-09-2023	09:39	REngali(PG): Didn't trip	REngali: R_N, 0.456 kA	No fault	NA	OPTCL may explain.	NA	No

42	220KV CHANDAUTI (PMTL)-SONENAGAR-2	17-09-2023	12:19	17-09-2023	12:54	Chandauti:B_N, 55.57 km, 2.12 kA	Sonenagar:B_N, Zone-1, 40.47 km, 1.251 kA	B-Earth	1580	Resistive fault. Tripped after fault was sensed by distance relay. A/r failed after 1 second		Yes	No
43	220KV MUZAFFARPUR(PG)-AMNOUR-2	17-09-2023	18:42	17-09-2023	19:43	Muzaffarpur: R_N, 7.78 km, 12.57 kA	Amnour:R_N, 42.4 km, 1.45 kA	R-Earth	100	Three phase tripping for single phase fault.		Yes	No
44	220KV DARBHANGA(DMTC L)-LAUKAHI-1	18-09-2023	11:50	18-09-2023	12:50	Darbhangha: Y_B, 9.7 km, Iy=10.954 kA, Ib=10.84 kA	Laukahi:Y_B, Ib=1.694 kA, Iy=1.570 kA	Y-B	100	Phase to phase fault		No	Yes
45	220KV HAZIPUR-MUZAFFARPUR-1	18-09-2023	14:00	18-09-2023	14:45	Hazipur:B_N, Zone-1, 4.37 kA	Muzaffarpur:B_N, Zone-1, 34.6 km, 4.28 kA	B-Earth	100	Three phase tripping for single phase fault.	DR channels not configured properly at Muzaffarpur end	No	Yes
46	400KV KISHANGANJ(PG)-SAHARSA-2	18-09-2023	16:28	18-09-2023	16:44	Kishanganj: B_N, 97 km, 4.19 kA	Saharsa:B_N, 92 km, 3.6 kA	B-Earth	100	A/r failed after 1 second		Yes	Yes

47	220KV RENGALI(PG)- RENGALI(GRIDCO)-1	19-09-2023	02:27	19-09-2023	07:47	Rengali: Didn't trip	Rengali: O/c E/f operated	No fault	NA	No fault in line. OPTCL may explain		No	Yes
48	400KV LAPANGA- STERLITE-2	19-09-2023	13:12	19-09-2023	19:42	Lapanga: R_N, Zone-1, 4.3 km, 28 kA	Sterlite: R_N, Zone-1, 14 km, 9.64 kA	R- Earth	100	A/r failed after 1 second		Yes	No
49	220KV RANCHI- MTPS(DVC)-1	20-09-2023	16:41	20-09-2023	17:37	Ranchi:Y_N, 184.62 km, 1.13 kA	Mejia: Y_N, Zone-1, 58.33 km, 2.88 kA	Y- Earth	100	A/r successful from Ranchi. A/r kept disabled at Mejia		Yes	No
50	400KV CHANDWA- NORTH KARANPURA-2	21-09-2023	05:05	21-09-2023	06:56	Chandwa:Didn't trip	North Karanpura: B_Y, Zone-3	No fault	NA	North Karanpura sensed fault in Zone-3 yet line tripped immediately. U#1 at north Karnpura also tripped at the same time on generator diffenretial. NKSTPP may explain.		Yes	Yes

51	400KV GAYA-CHANDWA-1	21-09-2023	05:05	21-09-2023	06:12	Gaya: Y_B_N , Zone-2, 117 km, Iy: 6.05 kA, Ib: 7.34 kA	Chandwa: Y_N, Zone-1, 0.2 km, 21 kA	Y-B-Earth	100	Chandwa end sensed single phase fault in Y_ph and A/r was successful. Gaya sensed phase to phase fault and three phase tripped.		Yes	Yes
52	400KV GAYA-CHANDWA-2	21-09-2023	05:05	21-09-2023	06:11	Gaya: B_N, Zone-2, 117 km, 5.7 kA	Chandwa: B_N, Zone-1, 5.9 km, 20 kA	Y-B-Earth	100	Chandwa end sensed single phase fault in B_ph and A/r was successful. Gaya sensed phase to phase fault and three phase tripped.		Yes	Yes
53	220KV RANCHI-RAMGARH-1	21-09-2023	08:28	21-09-2023	14:02	Ranchi: R_Y_B, 94.5 km, Ir=3.1 kA, Iy= 3.7 kA, Ib= 2.5 kA	Ramgarh:R_Y_B, 11.7 km, Ir= 3.3 kA, Iy= 3.5 kA, Ib= 2.1 kA	R-Y-B-Earth	100	Three phase fault. DVC may share findings.		No	No

54	400KV NEW RANCHI-PATRATU-2	21-09-2023	17:27	21-09-2023	18:20	New Ranchi: R_N, Zone-2, 48.99 km., 5.06 kA	Patratu: R_N, Zone-1, A/r successful	R-Earth	400	Tripped in Zone-2 from New Ranchi. No carrier received.		Yes	Yes
55	400KV MEERAMUNDALI-TSTPP-2	21-09-2023	18:30	21-09-2023	19:35	Meeramundali: R_N, 24.4 km, 9.19 kA	TSTPP: R_N, Zone-1, 39.7 km, 7.37 kA	R-Earth	800	A/r successful from Talcher. At meramundali, distance protection not operated, tripped on DEF. OPTCL may explain.	DR of another instance uploaded by NTPC. DR length less at Meramundali	Yes	No
56	220KV RENGALI(PG)-RENGALI(GRIDCO)-1	22-09-2023	10:05	22-09-2023	13:30	Rengali: Didn't trip	Rengali: O/c E/f operated	No fault	NA	No fault in line. OPTCL may explain		NA	No
57	400KV JAMSHEDPUR-ANDAL-2	22-09-2023	22:27	23-09-2023	00:11	Jamshedpur: Y_N, 133 km, 2.48 kA		Y-Earth	100	A/r successful from Jamshedpur only. DVC may explain.		Yes	No

58	220KV BARIPADA-BALASORE-2	23-09-2023	10:50	23-09-2023	12:26	Baripada: Didn't trip	Balasore: CB lockout due to low SF6 gas in R_Ph. LBB operated	No fault	NA	OPTCL may explain.		NA	No
59	220KV JODA-RAMCHANDRAPUR-1	23-09-2023	11:06	23-09-2023	12:04	Joda:B_N, Zone-1, 3.5 km, 4.3 kA	Ramchandarpur: B_N, Zone-2, 126 km, 1.69 kA	B-Earth	450	Tripped in Zone-2 time from Ramchandrapur. A/r attempt failed from Joda after 1 second. No carrier received at Ramchandrapur.		Yes	Yes
60	220KV JODA-RAMCHANDRAPUR-1	24-09-2023	06:30	24-09-2023	16:31	Joda:Y_N, Zone-1, 2.28 km, 6.12 kA	Ramchandarpur: Y_B, 140.1 km	Y-B-Earth	350	Tripped in Zone-2 from Ramchandrapur. No carrier received at Ramchandrapur.		No	Yes

61	765KV GAYA- VARANASI-1	24-09-2023	08:56	24-09-2023	10:53	Gaya: O/V St.1		O/V	NA	O/V St.1 operated at Gaya. As per PMU, voltage reached around 801 kV. O/v setting may be reviewed.		Yes	NA
62	220KV RENGALI(PG)- RENGALI(GRIDCO)-1	25-09-2023	07:12	25-09-2023	08:14	Rengali (PG): Didn't trip	Rengali: O/c E/f operated	No fault	NA	No fault in line. OPTCL may explain		No	No
63	20KV-RENGALI(PG)- RENGALI(GRIDCO)-1	25-09-2023	13:22	25-09-2023	14:09	Rengali (PG): Didn't trip	Rengali: O/c E/f operated	No fault	NA	No fault in line. OPTCL may explain		No	No
64	220KV BUDHIPADAR- RAIGARH-1	25-09-2023	13:34	25-09-2023	20:20	Budhipadar:R_N, Zone-2, 25 km, 9.6 kA		R- Earth	400	Tripped in Zone-2 from Budhipadar		No	No

65	220KV BOLANGIR(PG)- BOLANGIR(GRIDCO)- 2	25-09-2023	17:34	25-09-2023	18:36	Bolangir (PG): Didn't trip	Bolangir:R_N, 0.847 kA, Backup overcurrent relay	R- Earth	800	Tripped after 800 msec. As per PMU, it seems line tripped for fault in some another line. O/c setting at OPTCL end may be reviewed.	No	No
66	220KV RANCHI- MTPS(DVC)-1	25-09-2023	19:42	25-09-2023	21:38	Ranchi:R_N, Zone- 1, 57.7 km, 2.8 kA	MTPS: R_N, Zone-1, 161.7 km, 1.21 kA	R- Earth	100	A/r successful from Ranchi. A/r kept disabled at Mejia	No	No
67	220KV SUBHASHGRAM(PG)- SUBHASHGRAM(WB)- 1	26-09-2023	03:41	26-09-2023	04:08	Subhashgram(PG): Didn't trip	Subhashgram(WB): Master trip relay operated while shifting to TBC	No fault	NA	WBSETCL may explain.	NA	No

68	400KV INDRAVATI(PG)- INDRAVATI(GR)-1	26-09-2023	11:01	26-09-2023	11:32	Indravati:B_N, 2.15 kA	Indravati(GR): Didn't trip	B- Earth	400	As per PMU, line tripped in Zone-2 time from PG end. Whether fault was in this line or adjacent one, PG Odisha may explain.	No	No
69	220KV SAHARSA(PMTL)- BEGUSARAI-1	27-09-2023	06:02	27-09-2023	09:54	Saharsa: Didn't trip	Begusarai: tripped	No fault	NA	Fault in downstream in 220 kV Begusarai. Samastipur-2.	No	Yes
70	220KV SAHARSA(PMTL)- BEGUSARAI-2	27-09-2023	06:02	27-09-2023	09:54	Saharsa: Didn't trip	Begusarai: tripped	No fault	NA	Both lines tripped from Begusarai in Zone-4 immediately. BSPTCL may explain.	No	Yes
71	220KV DARBHANGA(DMTC L)-LAUKAHI-2	27-09-2023	12:09	27-09-2023	12:35	Darbhanga:B_N, Zone-1, 20 km, 9.6 kA	Laukhai: B_N, Zone- 1, 60.32 km, 1.009 kA	B- Earth	100	A/r successful from Darbhanga after 650 msec. Three phase tripping at Laukahi.	No	Yes

72	220KV TENUGHAT-BIHARSARIFF-1	27-09-2023	12:24	27-09-2023	19:22	Tenughat: Y_N, Zone-1, 34.5 km	Biharsariff: Y_N, Zone-1, 126 km, 1.114 kA	Y-Earth	100	Three phase tripping for single phase fault.		No	No
73	220KV KARAMNASHA (NEW)-SAHUPURI-1	27-09-2023	14:02	27-09-2023	15:31	Karamnasha: O/c operated		No fault	NA	As per PMU, no fault in line. Why O/c setting kept at Karamnasha end. BSPTCL may explain.		No	No
74	220KV RANCHI-MTPS(DVC)-1	27-09-2023	23:20	28-09-2023	00:31	Ranchi: R_N, 1.53 km, 1.086 kA	Mejia: R_N, Zone-1, 46.29 km, 3.52 kA	R-Earth	100	A/r successful from Ranchi. A/r kept disabled at Mejia		Yes	No
75	220KV NEW PURNEA-MADHEPURA-1	28-09-2023	10:30	28-09-2023	11:16	New purena: Y_B, 45 km, Iy= 4.44 kA, Ib= 4.35 kA	Madhepura: Y_B, 49 km, Iy= 3.11 kA, Ib= 3.2 kA	Y-B	100	Phase to phase fault		No	No

76	400KV PPSP-BIDHANNAGAR-2	28-09-2023	14:20	28-09-2023	14:35	PPSP: B_N, Zone-1, 60.3 km	Bidhanagar: B_N, Zone-1, 125.4 km, 1.25 kA	B-Earth	100	A/r kept disabled as per OEM advise		No	No
77	400KV PPSP-BIDHANNAGAR-1	28-09-2023	14:44	28-09-2023	15:37	PPSP: R_N, Zone-1, 57.7 km, 3.18 kA	Bidhannagr:R_N, Zone-1, 127.4 km, 1.25 kA	R-Earth	100	A/r kept disabled as per OEM advise		No	No
78	400KV PPSP-BIDHANNAGAR-2	28-09-2023	15:50	28-09-2023	23:00	PPSP:B_N, Zone-1, 158.9 km	Bidhanagar: B_N, Zone-1, 22.9 km, 8.4 kA	B-Earth	100	A/r kept disabled as per OEM advise		No	No
79	220KV RENGALI(PG)-RENGALI(GRIDCO)-1	29-09-2023	08:16	29-09-2023	09:13	Rengali(PG): Didn't trip	Rengali: O/c E/f operated	No fault	NA	No fault in line. OPTCL may explain		NA	No
80	220KV SITAMARHI-RAXAUL-2	29-09-2023	12:07	29-09-2023	13:16	Sitamarhi: B_N, 10.16 km, 9.49 kA	Raxaul: B_N, 52 km, 2.6 kA	B-Earth	100	Three phase tripping for single phase fault. No A/r observed from either end.		Yes	Yes

81	400KV GOKARNA-SAGARDIGHI-1	29-09-2023	17:28	29-09-2023	18:27	Gokarna: B_N, 17.28 km, 10.06 kA	Sagardighi: B_N, 24.5 km, 2.459 kA	B-Earth	100	A/r successful. Tripped again within reclaim time		No	Yes
82	400KV GOKARANA-SAGARDIGHI-2	29-09-2023	17:28	29-09-2023	18:28	Gokarna: B_N, 16.14 km, 10.05 kA	Sagardighi: B_N, 31.61 km, 11.14 kA	B-Earth	100	A/r failed after 1 second. DT received at Sagardighi during failed A/r attempt		No	Yes
83	220KV BARIPADA-BALASORE-1	29-09-2023	20:30	29-09-2023	21:15	Baripada: R_N, 25.25 km, 4.893 kA	Balasore: R_N, A/r successful	R-Earth	100	A/r successful from Balasore end only. No A/r attempt from Baripada end. PG Odisha may explain.		No	No
84	220 KV RANCHI-CHANDIL-1	29-09-2023	22:43	29-09-2023	22:55	Ranchi: R_N, 14.8 km, 4.32 kA		R-Earth	400	Tripped in Zone-2 from Ranchi. No carrier received.		Yes	No

85	220KV SITAMARHI-MOTIPUR-1	30-09-2023	12:22	30-09-2023	13:59	Sitamarhi: Y_B, 52.1 km, 1.54 kA		Y_B	800	Tripped in Zone-3 from Sitamarhi, suggestive of downstream fault which was not cleared. No tripping at Motipur. BSPTCL may explain		Yes	Yes
86	220KV SITAMARHI-MOTIPUR-2	30-09-2023	12:22	30-09-2023	14:23	Sitamarhi: Y_B, 52.1 km, 3.53 kA		Y_B	800			Yes	Yes
87	220KV MUZAFFARPUR-HAZIPUR-2	30-09-2023	13:05	30-09-2023	17:04	Muzaffarpur: B_N, 24 km, 5.76 kA	Hazipur: B_N, 34 km, 2.9 kA	B-Earth	100	No A/r observed from PMU data.	DR channels not configured properly at Muzaffarpur end	Yes	No
88	400KV PPSP-BIDHANNAGAR-1	30-09-2023	13:08	30-09-2023	13:31	PPSP: B_N, 69.8 km, 2.14 kA	Bidhannagar: B_N, 127.32 km, 2.658 kA	B-Earth	100	A/r kept disabled as per OEM advise		No	No
89	220KV BUDHIPADAR-RAIGARH-1	30-09-2023	19:43	01-10-2023	10:51	Budhipadar: R_N, 68 km, 2.4 kA	Raigarh: R_N, 10 km, 10.14 kA	R-Earth	400	Tripped in Zone-2 from Budhipadar		No	NA

List of important transmission lines in ER which tripped in October-2023

Sl. No.	LINE NAME	TRIP DATE	TRIP TIME	RESTORATION DATE	RESTORATION TIME	Relay Indication LOCAL END	Relay Indication REMOTE END	Reason	Fault Clearance time in msec	Remarks	DR Configuration on Discrepancy	DR/EL RECEIVED FROM LOCAL END	DR/EL RECEIVED FROM REMOTE END
1	220KV JODA-RAMCHANDRAPUR-1	01-10-2023	04:38	01-10-2023	12:30		220 kV Main Bus-1 PT burst at Ramchandrapur	R-Y-B-Earth	300	Initially fault in B_ph only which was sensed in reverse direction at Ramchandrapur. Later three phase fault in forward direction and all three phase tripped.		No	Yes
2	220KV MUZAFFARPUR(PG)-HAZIPUR-2	01-10-2023	09:55	01-10-2023	11:03	Muzaffarpur: B_E, Zone-1, 39.96 km, 3.6 kA	Hazipur: B_N, Zone-1, 13.7 km	B-Earth	100	A/r not ascertained from PMU data		No	No

3	400KV GMR-ANGUL-2	01-10-2023	11:28	01-10-2023	12:33	GMR: B_N, Zone-1, 19.54 km, 10 kA, A/r unsuccessful	Angul: B_N, 25.7 km, 10.41 kA	B- Ear th	100	A/r failed after 1 second		No	Yes
4	220KV TTPS-TSTPP-1	01-10-2023	18:58	01-10-2023	20:15	TTPS:Y_B, Zone-1, 22.17 km, Iy=5.54 kA, Ib= 5.54 kA	TSTPP: Y_B, Zone-1, 12.1 km, Iy= 1.39 kA, Ib= 1.39 kA	Y- B	100	Phase to phase fault	Unable to open TSTPP DR file	No	Yes
5	400KV ROURKELA- JHARSUGUDA-4	02-10-2023	15:26	02-10-2023	16:55	Rourkela: R_B, Zone- 1, 65.38 km, Ir= 7.25 kA, Ib= 7.35 kA	Jharsuguda: R_B, 63.2 km, Ir= 7.8 kA, Ib= 7.72 kA	R- B- Ear th	100	Phase to phase fault		Yes	Yes
6	220KV BUDHIPADAR- RAIGARH-1	02-10-2023	18:34	03-10-2023	23:55	Budhipadar: R_N, 60.8 km, 2.39 kA		R- Ear th	400	Tripped in Zone-2 from Budhipadar		Yes	NA
7	400KV BIHARSARIFF(PG)- VARANASI-1	02-10-2023	19:38	02-10-2023	20:21	Biharshariff: Y_N, 101.629 km, 3.70 kA		Y- Ear th	100	A/r failed after 1 second		Yes	NA

8	400KV ALIPURDUAR (PG)-PUNASANGCHUN-JIGMELING-2	03-10-2023	02:43	03-10-2023	04:02	Alipurdaur: R_N, 25.67 km, 8.9 kA, A/r successful	Bhutan : R_N, 174 km, 1.32 kA	R-Earth	100	A/r successful from Alipurduar only. Three phase tripping at Jigmelling		Yes	NA
9	400KV NEW JEERAT-SUBHASGRAM(PG)-2	03-10-2023	11:48	03-10-2023	20:58	New Jeerat: B_N, Zone-1, 45.80 km, 5.43 kA	Subhasgram: B_N, Zone-1, 62.4 km, 4.9 kA	B-Earth	100	A/r failed after 1 second		Yes	Yes
10	220KV KHAGARIA-NEW PURNEA-2	04-10-2023	20:23				New Purnea: Y_B, 19 km, Iy= 8.08 kA, Ib= 8 kA	Y-B	100	Phase to phase fault		No	No
11	400KV BAHARAMPUR-BHERAMARA-4	05-10-2023	00:01	05-10-2023	18:57	Baharampur: Y_E, Zone-1, 63 km, 4.8 kA		Y-Earth	100	A/r failed after 1 second		Yes	NA
12	220KV PANDIABILI-PRATAPSASAN-2	06-10-2023	09:28	06-10-2023	10:30	Pandiabili: R_N, 29 km, 4.2 kA, A/r successful	Pratapsasan: R_N, 14 km, 3 kA	R-Earth	100	A/r successful from Pandiabili only. OPTCL may explain.		No	No
13	220KV BUDHIPADAR-KORBA-2	06-10-2023	16:14	06-10-2023	20:09	Budhipadar: 220 kV Bus-2 tripped		B-Earth	100	OPTCL may explain.	DR not time synchronized	Yes	NA

14	220KV DARBHANGA(DMTCL)- LAUKAHI-2	06-10-2023	19:10	06-10-2023	19:46	Darbhangha: R_N, 27.3 km, 4.47 kA, A/r successful	Laukahi: R_N, Zone-1, 50 km, 2 kA	R- Ear th	100	A/r successfyl from Darbhangha only		No	Yes
15	220KV JODA- RAMCHANDRAPUR-1	07-10-2023	07:58	07-10-2023	08:41	Joda: Y_N, 3.4 km, 5.7 kA, A/r successful	Ramchandarp ur: Y_N, 123.1 km, 1.74 kA	Y- Ear th	400	Tripped in Zone-2 from Ramchandrapur		Yes	Yes
16	220KV JODA- RAMCHANDRAPUR-1	07-10-2023	12:12	07-10-2023	13:20	Joda: Y_N, Zone-1, 92 km, 1.32 kA	Ramchandarp ur: Y_N, Zone-1, 39.9 km, 2.76 kA	Y- Ear th	100	Three phase tripping at Ramchandrapur. A/r failed after 1 second from Joda.	Did not time synchroni zed and digital channels not configure d properly	Yes	Yes
17	220KV KARAMNASHA (NEW)-PUSAULI-1	07-10-2023	13:57	07-10-2023	15:20	Karamnasa: B_N, 7.45 km, 1.27 kA	Pusauli: B_N, 16.7 km, 6.5 kA	B- Ear th	100	A/r failed after 1 second		No	Yes
18	220KV ROURKELA- TARKERA-2	07-10-2023	15:27	07-10-2023	19:52		Tarkera: B_N, 16.9 kA	B- Ear th	100	A/r failed after 1 second. Jumper snapped at loc.2		No	Yes

19	220KV RENGALI(PG)-RENGALI(GRIDCO)-1	07-10-2023	18:43	07-10-2023	19:25		Rengali(Grid co): Tripped	No fault	NA	No fault observed from PMU. OPTCL may explain		No	No
20	220KV NEW PURNEA-MADHEPURA-1	08-10-2023	09:56	08-10-2023	11:23	New purnea: B_N, 65 km, 2.52 kA	Madhepura: B_N, Zone-1, 35.7 km, 2.25 kA	B-Earth	100	A/r not ascertained from PMU data	DR length less at New Purnea	Yes	No
21	220KV RONGNICHU-RANGPO-2	09-10-2023	11:13	09-10-2023	18:17		Rangpo: Y_B, 13.183 km, 1.27 kA	Y-B	100	Phase to phase fault		Yes	Yes
22	400KV MEERAMUNDALI-TSTPP-2	09-10-2023	13:48	09-10-2023	14:52	Meramundali: B_N, Zone-1, 30.5 km, 6.9 kA	TSTPP: B_N, Zone-1, 37.18 km, 8.61 kA, A/r unsuccessful	B-Earth	100	A/r failed after 1 second		Yes	Yes
23	220KV DARBHANGA(DMTCL)-LAUKAHI-1	10-10-2023	12:46	10-10-2023	14:31		Laukahi: Y_B, Iy = 0.93 kA, Ib= 0.96 kA	Y-B	100	Phase to phase fault		No	Yes
24	220KV DARBHANGA(DMTCL)-LAUKAHI-2	10-10-2023	12:46	10-10-2023	14:31		Laukahi: Y_B, Iy = 0.94 kA, Ib= 0.95 kA	Y-B	100	Phase to phase fault		No	Yes
25	220KV BUDHIPADAR-RAIGARH-1	11-10-2023	12:13	11-10-2023	13:15	Budhipadar: B_E, 54.5 km, 2.74 kA, A/r successful	Raigarh: B_E, 27.072 km, 4.478 kA	B-Earth	100	Three phase A/r at Budhipadar.		Yes	No

26	400KV MEERAMUNDALI- TSTPP-2	11-10-2023	12:46	11-10-2023	21:45	Meeramunda li: B_E, Zone-1, 28.1 km, 6.51 kA, A/r unsuccessful	TSTPP:B_E, 142.08 km, 7.142 kA	B- Ear th	100	A/r successful after 1 second. Tripped again within reclaim time		Yes	Yes
27	220KV KARAMNASHA (NEW)-PUSAULI-1	12-10-2023	12:32	12-10-2023	13:54	Karmnasha: B_N, 15.17 km, 2.304 kA	Pusauli: B_N, 8.22 km, 9.588 kA, A/r successful	B- Ear th	100	A/r successful from Sasaram only. Other two phase tripped after 1.7 seconds from Karamnasha		No	Yes
28	765KV NEW RANCHI- DHARAMJAIGARH-2	12-10-2023	14:56	12-10-2023	19:55	New Ranchi: B_N, 342.27 km, 2.73 kA	Dharamjaigar h: B_N, 59.654 km, 8.158 kA	B- Ear th	100	A/r failed after 1 second		No	No
29	220KV TENUGHAT- BIHARSARIFF-1	13-10-2023	08:58	13-10-2023	09:45	Tenughat: R_N, Zone- 2, 55.37 km	Biharshariff: R_N, Zone-1, 1.15 kA	R- Ear th	100	Three phase tripping for single phase fault		No	No
30	400KV BINAGURI-NEW PURNEA-1	14-10-2023	12:21	14-10-2023	13:12	Binaguri: Y_N, 17.35 km, 8.133 kA	New Purnea: Y_N, 105.4 km, 1.9 kA, A/r successful	Y- Ear th	100	A/r failed after 1 second from both ends. However, tie bay at New Purnea attempted A/r after failure of main bay A/r and this time A/r was successful.		Yes	Yes

31	220KV DARBHANGA (DMTCL)-MOTIPUR-1	15-10-2023	04:58	15-10-2023	05:26	Darbhangha: B_N, Zone-1, 25.1 km, 4.83 kA	Motipur: B_N, Zone-1, A/r successful	B-Earth	100	A/r successful from Motipur only. Three phase tripping at Darbhanga	No	Yes
32	220KV BINAGURI-BIRPARA-2	17-10-2023	17:25	18-10-2023	01:39	Binaguri: Y_B, Zone-1, 46.13 km, Iy= 3.8 kA, Ib= 4.2 kA	Birpara: Y_B, Zone-1, 27.74 km, Iy= 3.6 kA, Ib= 6.06 kA	Y-B-Earth	100	Phase to phase fault. TOP(B) Ph Conductor Broken and snapped in the span Tower no-85-86 near tower no-86	Yes	Yes
33	220KV BIRPARA-MALBASE-1	18-10-2023	15:50	18-10-2023	16:38		220 kV Bus tripped at Malbase	No fault	NA	No fault observed from PMU.	No	NA
34	220KV BARIPADA-BALASORE-1	19-10-2023	10:35	19-10-2023	11:11	Baripada: DT received	Balasore: Didn't trip	No fault	NA	No fault observed from PMU. OPTCL may explain	No	No
35	400KV PPSP-BIDHANNAGAR-2	20-10-2023	11:24	20-10-2023	11:58	PPSP: B_N, Zone-1, 170.3 km	Bidhanagar: B_N, Zone-1, 20.2 km, 4.54 kA	B-Earth	100	A/r disabled as per OEM advise	No	No

36	220KV KARAMNASHA (NEW)-SAHUPURI-1	21-10-2023	09:58	21-10-2023	12:10		Sahupuri: Y_N, Zone-1, 35.2 km, 1.48 kA	Y- Ear th	100	A/r not ascertained from PMU data		No	NA
37	400KV NEW PURNEA- BIHARSARIF(PG)-2	22-10-2023	23:49	23-10-2023	00:42	New Purnea: DT received		No fau lt	NA	No fault observed from PMU. PG ER- 1 may explain.		No	No
38	400KV TENUGHAT- PVUNL-1	24-10-2023	09:25	24-10-2023	10:27	Tenughat: R_N, 73.4 km, 1.36 kA		R- Ear th	100	A/r couldn't be ascertained from PMU data		No	No
39	220KV NEW PURNEA- MADHEPURA-1	24-10-2023	10:04	24-10-2023	10:50	New Purnea: B_N, 21.87 km, 4.72 kA	Madhepura: B_N, Zone-1, 74.2 km, 1.96 kA	B- Ear th	650	Resistive fault. A/r not ascertained from PMU data		No	No
40	400KV PPSP- BIDHANNAGAR-2	24-10-2023	12:54	25-10-2023	02:47	PPSP: B_N, 123.9 km	Bidhanagar: B_N, 49.7 km, 5.137 kA	B- Ear th	100	A/r disabled as per OEM advise		No	No
41	220KV KHAGARIA-NEW PURNEA-1	25-10-2023	13:35	25-10-2023	14:20	Khagaria: Y_N, Zone- 1, 76.86 km, 1.644 kA	Purnea: Y_N, 13.8 km, 3.5 kA	Y- Ear th	100	Initially fault in B_ph. After 300 msec, fault struck Y_ph and all three phase tripped.		Yes	No

42	220KV DARBHANGA(DMTCL)- LAUKAHI-2	26-10-2023	01:30	26-10-2023	02:23	Darbhangha: B_N, 71 km, 0.7 kA	Laukahi: B_N, 18.74 km, 0.23 kA	B- Ear th	100	A/r not ascertained from PMU data		No	No
43	400KV PPSP- BIDHANNAGAR-2	28-10-2023	11:59	28-10-2023	12:16	PPSP: B_N, Zone-1, 173 km	Bidhannagar: B_N, Zone-1, 17 km, 8.67 kA	B- Ear th	100	A/r disabled as per OEM advise		No	No
44	765KV FATEHPUR- PUSAULI-1	28-10-2023	23:53	29-10-2023	02:47		Sasaram: M1: 328 km, 1.4 kA, M2: 337.6 km, 1.388 kA	R- Ear th	100	A/r failed after 1 second		No	No
45	400KV MUZAFFARPUR(PG)- DHALKEBAR-1	30-10-2023	02:57	30-10-2023	03:58	Muzaffarpur: R_N,Zone-1, 91.81 km, 3.43 kA		R- Ear th	100	A/r failed after 1 second		No	NA
46	400KV NEW PPSP-NEW RANCHI-1	30-10-2023	10:29	30-10-2023	11:09	New PPSP: DT received		No fau lt	NA	PG/WBSETCL may explain.		No	No

47	400KV NEW PPSP-NEW RANCHI-2	30-10-2023	10:38	30-10-2023	11:14	New PPSP: DT received		No fau lt	NA	PG/WBSETCL may explain.		No	No
48	220KV BINAGURI- BIRPARA-2	30-10-2023	17:50	31-10-2023	03:04	Binaguri: Y_B_N, 36.08 km, Iy= 4.09 kA, Ib= 6.873 kA	Birpara: Y_B_N, Iy= 2.183 kA, Ib= 13.861 kA	Y- Ear th	100	After 500 msec, phase to phase fault struck remaining two phases. After 1 second of first fault, A/r attempted and three phase tripped due to persisiting fault in all three phases. Conductor snapped between tower loc. no. 128 & 129		No	No
49	220KV RANCHI- MTPS(DVC)-1	31-10-2023	04:38	31-10-2023	06:15	Ranchi: R_N, Zone- 1, 185 km, 1.14 kA, A/r successful	MTPS: R_N, Zone-1, 55.3 km	R- Ear th	100	A/r disabled at Mejia.		No	No

Annexure C.2

SL NO	MONTH	UTILITY	ELEMENT	DETAILS OF ELEMENT	REMARKS
1	OCC_JAN_2023	OPTCL	B/R	400 kV 125 MVAR Bus Reactor at Mendhasal GSS	PDMS AND PSCT DONE
2	OCC_JAN_2023	OPTCL	T/L	125kva bus reactorat Mendhasal	PDMS AND PSCT DONE
3	OCC_JAN_2023	OPTCL	ICT	132/33kV 20MVA Power TRF-1 AT Lapanga	PDMS AND PSCT DONE
4	OCC_JAN_2023	OPTCL	ICT	132/33kV 20MVA Power TRF-II ATGIS Hinjili	PDMS AND PSCT DONE
5	OCC_JAN_2023	OPTCL	T/L	RE-GENERATION 132kV BALASORE ALLOY PLANT 220/132/33kV BALASORE	Data required
6	OCC_JAN_2023	OPTCL	ICT	RE-ENERGIZATION 1*25MW TURBO GENARATOR AT M/S MSP METALICS LTD JHARSUGUDA OPTCL SYSTEM AT 132kV MSP FEEDER FROM 220/132/33kV GSS,BUDHIPADAR	Data required
7	OCC_JAN_2023	OPTCL	ICT	RE-ENERGIZATION OF 220/132kV 100MVA AUTO TRF-III AT MERAMUNDALI	Data required
8	OCC_FEB_2023	OPTCL	T/L	132/33kV 20MVA Power TRF-1 AT ASKA NEW	PDMS AND PSCT DONE
9	OCC_FEB_2023	OPTCL	T/L	132kV Barbil-Kamanda line	PDMS AND PSCT DONE
10	OCC_FEB_2023	OPTCL	T/L	132kV Switching station kutra 132kV along with LILO of kuchinda rajgangpur s/c line to kutra	PDMS AND PSCT DONE
11	OCC_FEB_2023	OPTCL	T/L	132kV Kutra m/s shiva cement s/c line	Data required
12	OCC_FEB_2023	OPTCL	T/L	132/33kV 20MVA Power TRF-1 AT 132/33 kV,GSS,CHANDIPUR	PDMS AND PSCT DONE
13	OCC_FEB_2023	OPTCL	T/L	132kV Switching station near M/s Ultrateh Cement ltd at Khamarnuagaon,Khuntuni,132kV LILO arrangement from Arati steel -TS alloys line	Data required
14	OCC_FEB_2023	OPTCL	T/L	12.5 MW Solar power plant at 33kV Level in 132/33kV witchyard M/S ARBEL having connectivity at 132kV With LILO switching station SAINTALA	Data required
15	OCC_FEB_2023	OPTCL	T/L	220kV Switchyard at 220/132/33kV GSS,BAMRA having LILO connectivity 220kV Budhipadar-Tarkera ckt-II& CKT-I	Data required
16	OCC_FEB_2023	OPTCL	T/L	220/132kV160MVA Power Auto TRF-1 AT 220/132/33 kV,GSS,BAMRA	PDMS AND PSCT DONE
17	OCC_FEB_2023	OPTCL	T/L	220/132kV160MVA Power Auto TRF-2 AT 220/132/33 kV,GSS,KURAMUNDA	PDMS AND PSCT DONE
18	OCC_FEB_2023	OPTCL	T/L	220/132kV 40MVA Power Auto TRF-1 AT 220/132/33 kV,GSS,KURAMUNDA	PDMS AND PSCT DONE
19	OCC_FEB_2023	OPTCL	T/L	Synchronization(re-energization 19.5MW TG-1 OF CGP of m/s ninl Duburi with OPTCL network,220/132/33kV GSS 220kV DUBURI OLD-NINL FEEDER	Data required
20	OCC_MAR_2023	OPTCL	T/L	400 kV GMR - Meramundali-B S/C Line after LILO work of 400 kV GMR - Meramundali-A Line at Meramundali-B SS	PDMS AND PSCT DONE
21	OCC_MAR_2023	OPTCL	T/L	132kV 2 PH S/C LINE,132kV GSS,KAMAKHYANAGAR FOR EXTENTION OF P/S TO RTSS KAMAKHYANAGAR	Data required
22	OCC_MAR_2023	OPTCL	T/L	400kV GMR-MERAMUNDALI-B SC LINE & MERAMUNDALI-B TO MERAMUNDALI-A LINE AFTER LILO OF GMR-MERAMUNDALI-A SC LINE MERAMUNDALI-B GIS	PDMS AND PSCT DONE
23	OCC_MAR_2023	OPTCL	ICT	132/33kV 20MVA POWER TR NO-2 AND 1 132kV FEEDER BAY GSS BIRMAHARAJPUR	Data required
24	OCC_APR_2023	OPTCL	ICT	400KV MAIN BAY OF 400KV/220kV 315 MVA ICT-3 AT KALINGANAGAR	DATA REQUIRED
25	OCC_APR_2023	OPTCL	T/L	132kV 2 PH S/C LINE,DC TOWER FROM M/S JABAMAYEE FERRO ALLOY STATION-TO SUKINDA LINE	DATA REQUIRED
26	OCC_APR_2023	OPTCL	T/L	1*25MW TG#2 OF 132kV RUNGTA MINE LTD DHENKANAL STEEL PLANT WITH OPTCL SYSTEM THROUGH MERAMUNDALI-RML DSP LINE FEEDER	DATA REQUIRED
27	OCC_APR_2023	OPTCL			DATA REQUIRED
28	OCC_APR_2023	OPTCL	ICT	400/220kV ICT-III AT BRPS TATA STEEL KALINGANAGAR	DATA REQUIRED
29	OCC_APR_2023	OPTCL	T/L	132kV BHATLI-BARGARH BAY AT 220/132/33kV	DATA REQUIRED
30	OCC_APR_2023	OPTCL	T/L	33kV GEDCOL-BOLANGIR NEWBAY AT 220/132/33kV AT BOLANGIR	DATA REQUIRED
31	OCC_APR_2023	OPTCL	ICT	400/220kV 315MVA ICT-1 AT INDRAVATI	DATA REQUIRED
32	OCC_MAY_2023	OPTCL	T/L	SYNCHRONIZATION OF 2MW GEDCOL SOLAR PV PLANT HAVING 33kV CONNECTIVITY AT 220/132/33kV,GSS BOLANGIR NEW FOR 2MW SOLAR PV PLANT	DATA REQUIRED
33	OCC_MAY_2023	OPTCL	T/L	220kV LILO LINE LOC NO 227 OF EXITING 220kV NEW DUBURI-BALASORE LINE UPTO GANTRY OF 220/132/33kV GRID S/S DHARMA	DATA REQUIRED
34	OCC_MAY_2023	OPTCL	T/L	SYNCHRONIZATION OF 3.64MW SOLAR PV PLANT HAVING 11kV LEVEL CONNECTIVITY AT 132/33kV,SWITCHYARD OF M/S SHREE CEMENT LTD CONNECTED WITH KHUNTUNI-SHREE	DATA REQUIRED
35	OCC_MAY_2023	OPTCL	ICT	220/33kV GSS,KANTABADA LILO CONNECTIVITY FROM LOC NO 453 AND 455 OF 220kV CHANDAKA-MENDASHAL CKT-III ALONG WITH 02 NOS OF 220/33 Kv 63mva power trf	DATA REQUIRED
36	OCC_MAY_2023	OPTCL	T/L	SYNCHRONIZATION OF 30MW THERMAL UNIT OF M/S JAGANNATH STEEL AND POWER KEONJHAR WITH OPTCL SYSTEM	DATA REQUIRED
37	OCC_MAY_2023	OPTCL	T/L	33kV SOLAR BAY EXTENSION AT 132/33kV AT BARIPADA	DATA REQUIRED
38	OCC_MAY_2023	OPTCL	T/L	132/33kV GSS,BORIGUMA LILO CONNECTIVITY OF 132kV JAYANAGAR-TENTULKHANTI CKT-2(132kV JAYANAGAR-NABARANGPUR LINE	DATA REQUIRED
39	OCC_MAY_2023	OPTCL	T/L	132/33kV 40MVA POWER TRANSFORMER -2 AT ROURKELA	DATA REQUIRED
40	OCC_MAY_2023	OPTCL	T/L	132kV BRAJARAJNAGAR-LAKHANPUR DC LINE& 132kV LAKHANPUR GSS(5NOS 132kV,132kV TRANSFORMER1&2 20MVA	DATA REQUIRED
41	OCC_JULY_2023	OPTCL	T/L	220/132/33kV 132kV GUNUPUR-RTSS LINE	DATA REQUIRED
42	OCC_JULY_2023	OPTCL	ICT	220/132/33kV GSS,40MVA TR-II AT DHARMA	DATA REQUIRED
43	OCC_JULY_2023	OPTCL	T/L	132kV BHAWANIPATNA-RTSS LINE-II	DATA REQUIRED
44	OCC_JULY_2023	OPTCL	T/L	132/33kV BUDHIPADAR-LAKHANPUR LINE AND BRAJARAJNAGAR-JORABAGA MCL AT LILO ARRANGMENT BUDHIPADAR-JORABAGA MCLCKT-II AND LAKHANPUR-BRAJARAJNAGAR	DATA REQUIRED

SL NO	MONTH	UTILITY	ELEMENT	DETAILS OF ELEMENT	REMARKS
1	OCC_JAN_2023	BSPTCL	T/L	220 kV Patna (PG) - Sipara (BSPTCL) D/C Line after reconducting	PDMS AND PSCT DONE
2	OCC_JAN_2023	BSPTCL	T/L	132kV Ganwara-Pandaul line(reconducting)	PDMS AND PSCT DONE AT GANGWARA END
3	OCC_JAN_2023	BSPTCL	T/L	132kV Darbhanga-samastipur line(reconducting)	PDMS AND PSCT DONE AT DARBHANGA END
4	OCC_JAN_2023	BSPTCL	T/L	132kV Dumraon-Bikramganj line(reconducting)	In 132kV Dumraon Bikramganj line reconductoring t
5	OCC_JAN_2024	BSPTCL	T/L	220kV Samastipur(New ujiyarpur)-DMTCL(Darbhang)	PDMS AND PSCT DONE
6	OCC_MAR_2023	BSPTCL	T/L	220kV BIHARSARIFF-TTPS S/C(RECONDUCTING)	Data required
7	OCC_MAR_2023	BSPTCL	T/L	132kV SONENAGAR(OLD)-NAGARUNTARI TSS,SCTL(RECONDUCTING)	Data required
8	OCC_MAR_2023	BSPTCL	T/L	132kV RAJGIR ASTHAWAN CKT1&2	Data required
9	OCC_APR_2023	BSPTCL	T/L	220 kV Sitamarhi (PMTL) - Raxaul Line 1 along with associated bays at Raxaul end	DATA REQUIRED
10	OCC_APR_2023	BSPTCL	T/L	220 kV Sitamarhi (PMTL) - Raxaul Line 2 along with associated bays at Raxaul end	DATA REQUIRED
11	OCC_APR_2023	BSPTCL	T/L	220kV BEGUSRAI-BARAUNI BTPS LINE 1&2	DATA REQUIRED
12	OCC_APR_2023	BSPTCL	T/L	132KV BARIPAHARI-HARNAUT LINE	DATA REQUIRED
13	OCC_APR_2023	BSPTCL	T/L	132KV CHHAPRA-EKMA LINE 1&2	DATA REQUIRED
14	OCC_APR_2023	BSPTCL	ICT	100MVA ICT-2 AT BHUSAULA GSS 220/33kV	DATA REQUIRED
15	OCC_APR_2023	BSPTCL	T/L	132kV MADHUPURA-SAPPAUL LINE	DATA REQUIRED
16	OCC_MAY_2023	BSPTCL	T/L	220 kV Muzzafarpur(PG) - Amnour(BSPTCL)LINE2	DATA REQUIRED
17	OCC_MAY_2023	BSPTCL	T/L	132kV BARUIPUR-SERAKOL LINE AT SERAKOL	Data required
18	OCC_JUNE_2023	BSPTCL	T/L	400/220kV 500MVA ICT 3 at Ranchi SS	Data required
19	OCC_JUNE_2023	BSPTCL	T/L	132 kV Kataiya (BSPTCL) -Kushaha (Nepal) circuit 3 along with associated bay number 113 at Kataiya end	Data required
20	OCC_JUNE_2023	BSPTCL	T/L	220kV RAXUAL-GOPALGANJ LINE1&2	Data required
21	OCC_AUG_2023	BSPTCL	T/L	132kV D/C LINE 132/33kV GSS BRAJARAJNAGA-BELPAHAR RTSS CKT-1&	Data required
22	OCC_SEP_2023	BSPTCL	T/L	132kV RAXAUL-PARWANIPUR 1&2	Data required
23	OCC_SEP_2023	BSPTCL	ICT	132/33kV 50MVA ICT-2 AT PHULPARAS	Data required
24	OCC_SEP_2023	BSPTCL	ICT	132/33kV 50MVA ICT-3 AT HULSAGANJ	Data required
25	OCC_SEP_2023	BSPTCL	T/L	132kV BIRAPARA-KAMAKHYAGURI LINE	Data required
26	OCC_SEP_2023	BSPTCL	T/L	132kV ULUBERIA-BAGNAN LINE	Data required
27	OCC_SEP_2023	BSPTCL	T/L	132kV KAKDWEET-RAMGANGA LINE 1&2 ,B/C	Data required
					Data required

SL NO	MONTH	UTILITY	ELEMENT	DETAILS OF ELEMENT	REMARKS
1	OCC_DEC_2022	BGCL	ICT	400KV MAIN BAY OF 400KV/220KV/132kv/33kv 500 MVA ICT 2 AT JAKKANPUR JIS	PDMS AND PSCT DONE
2	OCC_JAN_2023	BGCL	T/L	220kv JAKKANPUR NEW(BGCL)-KHAGAU(BSPTCL)	PDMS AND PSCT DONE AT JAKKANPUR END AND DATA REQUIRED KHAGAU END
3	OCC_JAN_2023	BGCL	T/L	220kv JAKKANPUR NEW(BGCL)-SIPARA(BSPTCL)	PDMS AND PSCT DONE AT JAKKANPUR END AND DATA REQUIRED KHAGAU END
4	OCC_MAR_2023	BGCL	ICT-1	400/220/33kv ICT 1 500MVA at Naubatpur SS	Data required
5	OCC_MAR_2023	BGCL	ICT	500MVA ICT-1 400/220/132/33kv ,NAUBATPUR	Data required
6	OCC_MAR_2023	BGCL	T/L	132kv KHAGAU-BIHITA NEW(BGCL) S/L	PDMS AND PSCT DONE
7	OCC_MAR_2023	BGCL	T/L	132kvBIHITA NEW(BGCL)-DIGHA(BSPTCL)	PDMS AND PSCT DONE
8	OCC_JUNE_2023	BGCL	T/L	220kv MUJAFFARPUR-AMNOUR1&2	Data required
9	OCC_JUNE_2023	BGCL	T/L	220kVDIGHA-AMNOUR1&2	Data required

SL NO	MONTH	UTILITY	ELEMEN	DETAILS OF ELEMENT	REMARKS
1	OCC_NOV_2022	JUSNL	T/L	400KV MAIN BAY OF LATEHAR(JUSNL)-1 AT CHANDWA(PG)	PDMS AND PSCT DONE AT CHANDWA END AND DATA REQUIRED AT LATEHAR END
2	OCC_NOV_2022	JUSNL	T/L	400KV MAIN BAY OF LATEHAR(JUSNL)-2 AT CHANDWA(PG)	PDMS AND PSCT DONE AT CHANDWA END AND DATA REQUIRED AT LATEHAR END
3	OCC_JAN_2023	JUSNL	T/L	400 kV Chandwa (PG) - Latehar (JUSNL) D/C Line	PDMS AND PSCT DONE AT CHANDWA END AND LATEHAR END DATA REQUIRED
4	OCC_AUG_2023	JUSNL	T/L	400 kV Tenughat – Patratu S/C Line anti-theft charging from Tenughat end [upto 64 kms] (upto Patratu gantry)	DATA REQUIRED

SL NO	MONTH	UTILITY	ELEMEN	DETAILS OF ELEMENT	REMARKS
1	OCC_DEC_2022	PGCIL	ICT	400KV MAIN BAY OF 400KV/220KV/33kV 315 MVA ICT 2 AT DURGAPUR SS	PDMS AND PSCT DONE
2	OCC_JAN_2023	PGCIL	T/L	PG-Patna-Gaurichak TL CKT-2(reconducting)	DATA REQUIRED
3	OCC_JAN_2023	PGCIL	T/L	PG-Patna-Gaurichak TL CKT-1(reconducting)	DATA REQUIRED
4	OCC_FEB_2023	PGCIL	T/L	220 kV Pusauli (PG) - Durgauti (IR) D/C Line	Data required in both end
5	OCC_APR_2023	POWERCO	T/L	132 kV Ranpo (PG) - Samardong (EPD, Sikkim) Line 1	PDMS AND PSCT DONE AT RANGPO END
6	OCC_APR_2023	POWERCO	T/L	133 kV Ranpo (PG) - Samardong (EPD, Sikkim) Line 2	PDMS AND PSCT DONE AT RANGPO END
7	OCC_APR_2023	POWERCO	T/L	220 kV Pusauli (PG) - Durgauti (IR) D/C Line2	DATA REQUIRED
8	OCC_MAY_2023	POWERCO	T/L	220 kV Pusauli (PG) -Durgauti Line 2	DATA REQUIRED
9	OCC_AUG_2023	PGCIL	T/L	400 kV Sitamarhi (PGCIL) -Dhalkebar (Nepal) Line 1 &2	DATA REQUIRED
10	OCC_AUG_2023	PGCIL	T/L	400 kV Maithon (PGCIL) -Maithon RB (MPL) Line 1&2	DATA REQUIRED

SL NO	MONTH	UTILITY	ELEMEN	DETAILS OF ELEMENT	REMARKS
1	OCC_NOV_2022	NTPC (North Karanpura)		660MW New Generating Unit charged a Tandwa,Jharkhand	DATA REQUIRED
2	OCC_NOV_2022	NTPC (North Karanpura)	ICT	400KV MAIN BAY OF 400KV/11.50KV 315 MVA ST-3 AT NORTH KARANPURA	PDMS AND PSCT DONE
3	OCC_NOV_2022	NTPC (North Karanpura)	GT-1	400KV MAIN BAY OF 400KV/21KV 265 MVA GT-1 AT NORTH KARANPURA	PDMS AND PSCT DONE
4	OCC_NOV_2022	NKTL	T/L	400 kV North Karanpura(NTPC)- Chandwa(PG) Transmission Line -1	PDMS AND PSCT DONE AT NORTH KARANPURA END AND DATA REQUIRED CHANDWA END
5	OCC_NOV_2022	NKTL	T/L	400 kV North Karanpura(NTPC)- Chandwa(PG) Transmission Line 2	PDMS AND PSCT DONE AT NORTH KARANPURA END AND DATA REQUIRED CHANDWA END
6	OCC_JAN_2023	NTPC	T/L	Main Bays of 400 kV Gaya D/C Line at NTPC sitchyard	NOT CHARGED
7	OCC_MAR_2023	NTPC		NTPC Barh Stage Unit #2, 24 kV, 660 MW is yet to be synchronized	Data required
8	OCC_MAR_2023	NTPC	GT(3*26	400kv GT#2 of NTPC Barh	Data required
9	OCC_APR_2023	NTPC	GT	NTPC Barh Stage 1 Unit #2 660MW	DATA REQUIRED
10	OCC_AUG_2023	NTPC	T/L	33 kV Darlipalli (NTPC) - Dulanga CMP Line 2	PDMS AND PSCT DONE

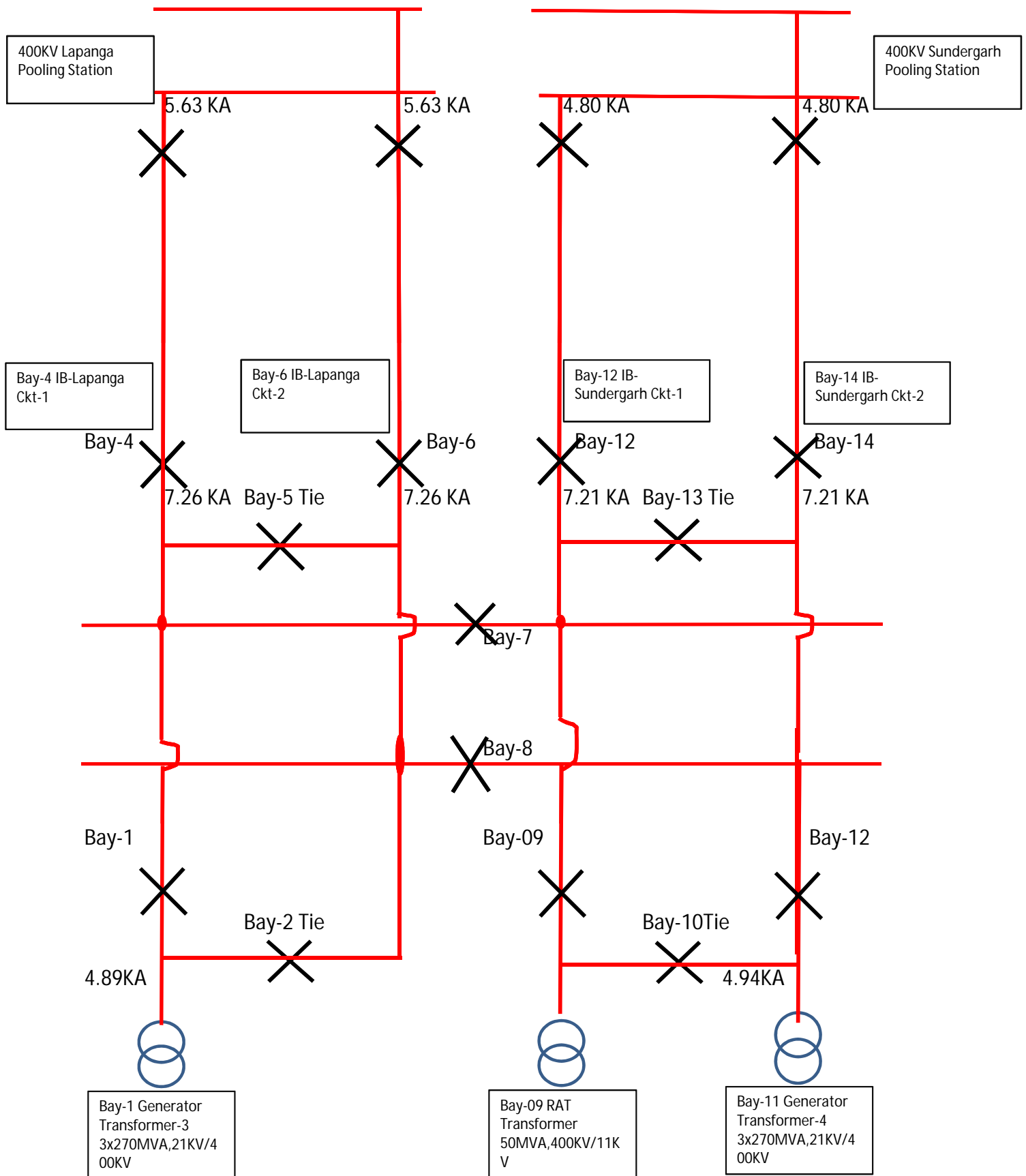
SL NO	MONTH	UTILITY	ELEMEN	DETAILS OF ELEMENT	REMARKS
1	OCC_JUNE_2023	WBSETC	B/R	400 kV 125 MVAR BusReactor at Gokarna SS	PDMS AND PSCT DONE
2	OCC_SEP_2023	WBSETC	ICT	400/220/33 315MVA ICT-3 AT GOKARNA S/S	PDMS AND PSCT DONE

SI No.	Name of the incidence	PCC Recommendation	Latest status
129th PCC Meeting			
1.	Disturbance at 220/132 kV Motipur (BSPTCL) S/s on 15.08.2023 at 14:31 Hrs	ERLDC representative suggested that modification in the busbar protection logic to be explored to avoid such instances so that when there is floating Isolator status or when it is showing connection with both buses, last known status of the isolator or current measurements may be used to ascertain the actual status of the isolator. PCC advised BSPTCL to explore the scheme modification as suggested by ERLDC.	
2.	Disturbance at 400 kV APNRL S/s on 17.08.2023 at 12:18 Hrs	PCC advised APNRL following: <ol style="list-style-type: none"> 1. to disable overcurrent protection in 400 kV APNRL-Jamshedpur lines 2. to implement DEF protection for 400 kV APNRL-Jamshedpur D/C at APNRL end with differential protection being the primary protection and the same may be coordinated with Jamshedpur end. 3. to revise earth fault protection settings of GT at APNRL end in coordination with DEF settings of outgoing feeders at APNRL. 	
3.	Disturbance at 220 kV Budhipadar(OPTCL) S/s and 220 kV Ib-TPS(OPGC) S/s on 29.07.2023 at 19:13 Hrs	PCC advised OPTCL to rectify autorecloser issues of the connected lines to Budhipadar and take necessary action for ensuring the system healthy all the time.	
128th PCC Meeting			

4.	Disturbance at 400 kV Lapanga (OPTCL) S/s and 400 kV OPGC S/s on 10.06.2023 at 17:27 Hrs	<p>PCC advised OPTCL following:</p> <ul style="list-style-type: none"> ➤ to test auto-reclose and CB at Lapanga end for 400 kV Meramundali- Lapanga-1 the earliest. ➤ to test both main-1 & main-2 relay at Lapanga end for Meramundali line. ➤ the carried aided tripping scheme of 400 kV Meramundali-Lapanga -2 at Lapanga end may be checked. ➤ to review O/C and DEF protection settings of ICTs at Lapanga end. <p>PCC advised OPGC to review DEF settings and it need to be coordinated with Jharsuguda (Powergrid) as well as Lapanga end. OPGC was also to review SEF settings at unit 4.</p> <p>OPGC vide email dated 12th Aug 2023 had shared proposed settings for neutral earth fault protection which is attached at Annexure C.3.4.</p>	<p><i>OPTCL representative informed that auto-reclose and CB had been checked for 400 kV Meramundali-Lapanga-1 and 2 during which BCU of main breaker is found to be faulty therefore BCU contact with main breaker had been disabled and it has been kept direct with relay at present.</i></p> <p><i>He also informed that PLCC and carrier had been checked and found healthy.</i></p> <p><i>Regarding review of O/C and DEF protection setting of ICTs, OPTCL representative replied that settings was checked and found to be in order. PCC advised to carry out CT saturation testing.</i></p> <p><i>PCC informed that proposed settings from OPGC is in order for neutral earth fault protection and the same may be implemented after getting necessary feedback from Powergrid.</i></p>
5.	Disturbance at 400 kV Teesta III S/s and 400 kV Dikchu S/s on 28.06.2023 at 02:28 Hrs	<p>After detailed deliberation, the following was decided;</p> <ul style="list-style-type: none"> ➤ Dikchu HEP to coordinate relay time settings of 400/132 kV ICT with IDMT time settings of line in consultation with ERPC/ERLDC so that in case of any fault in line, ICT and units should not trip before line. 	<p><u>129th PCC:</u></p> <p><i>PRDC representative informed that they had kept pickup of 10 % settings for lines that are acting as evacuation path for units however for other lines not acting as evacuation path to units, settings had been kept at</i></p>

		<ul style="list-style-type: none"> ➤ SUL to disable overcurrent protection in outgoing lines at Teesta-III end. ➤ PRDC to review settings for DEF relay in Sikkim complex with reduced pick-up settings of 300 A or any suitable value and the report need to be submitted before next PCC meeting 	<p><i>pickup of 20 % only. She enquired views of Powergrid regarding same for which Powergrid representative replied that pickup settings of 10% can be kept for DEF protection.</i></p> <p><i>PCC advised PRDC that reduced DEF settings at 10% might be kept for other feeders also and revised study may be shared to ERPC/ERLDC.</i></p>
125th PCC Meeting			
6.	Repeated Line tripping of 220 kV Ramchandrapur - Joda in April 2023	Regarding status of commissioning of DTPC in the line, PCC advised the matter may be taken with their telecom wing for early commissioning of the same.	<p><i>JUSNL representative informed that work order for commissioning of DTPC in the line will be issued shortly and it is expected that work will be completed by July 2023.</i></p> <p><i>In 129th PCC meeting, JUSNL representative informed that there is no further update to this however they are planning to implement DTPC at earliest.</i></p>

Short circuit study for Single line to earth fault



Neutral Earth fault setting of Line feeder based on fault contribution to remote end SLG fault case

1 OPGC Lapanga Feeder

Maximum fault current contribution by OPGC feeder is 5.63 KA for SLG fault at Lapanga Bus

TMS of Neutral earth fault setting should be selected such that operating time will be more then Zone-3 time + 100ms

PMS =0.1

Operating time 1.1 sec

Operating Charactersitic -SI

Fault current = 5.63 KA

Calculated TMS =0.5424

2 OPGC Sundergarh Feeder

Maximum fault current contribution by OPGC feeder is 4.8 KA for SLG fault at Sundergarh PGCIL Bus

TMS of Neutral earth fault setting should be selected such that operating time will be more then Zone-3 time + 100ms

PMS =0.1

Operating time 1.1 sec

Operating Charactersitic -SI

Fault current = 4.80 KA

Calculated TMS = 0.5157

3 Lapanga OPGC Feeder

Maximum fault current contribution by Lapanga feeder is 7.26 KA for SLG fault at OPGC Bus

TMS of Neutral earth fault setting should be selected such that operating time will be more then Zone-3 time + 100ms

PMS =0.1

Operating time 1.1 sec

Operating Charactersitic -SI

Fault current = 7.26 KA

Calculated TMS = 0.5854

4 Sundergarh PGCIL OPGC Feeder

Maximum fault current contribution by OPGC feeder is 7.21 KA for SLG fault at OPGC Bus

TMS of Neutral earth fault setting should be selected such that operating time will be more then Zone-3 time + 100ms

PMS =0.1

Operating time 1.1 sec

Operating Charactersitic -SI

Fault current = 7.21 KA

Calculated TMS = 0.5841

Present Setting	PMS	TMS	Curve	CTR
OPGC Lapanga feeder	0.2	0.25	SI	2000/1
OPGC PGCIL feeder	0.2	0.25	SI	2000/1
PGCIL End	0.1	0.51	SI	2000/1
Lapanga End	0.2	0.38	SI	2000/1
GT Standby EF	0.1	7	Def	1250/1
Proposed Setting	PMS	TMS	Curve	CTR
OPGC Lapanga feeder	0.1	0.54	SI	2000/1
OPGC PGCIL feeder	0.1	0.51	SI	2000/1
PGCIL End	0.1	0.58	SI	2000/1
Lapanga End	0.1	0.58	SI	2000/1
GT Standby EF	0.16	1	SI	1250/1