



Agenda
for
139th PCC Meeting

Date:26.09.2024
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

AGENDA FOR 139th PROTECTION COORDINATION SUB-COMMITTEE MEETING TO BE HELD ON 26.09.2024 AT 10:30 HRS THROUGH MS TEAMS

PART – A

ITEM NO. A.1: Confirmation of Minutes of 138th Protection Coordination sub-Committee Meeting held on 28th Aug 2024 through MS Teams.

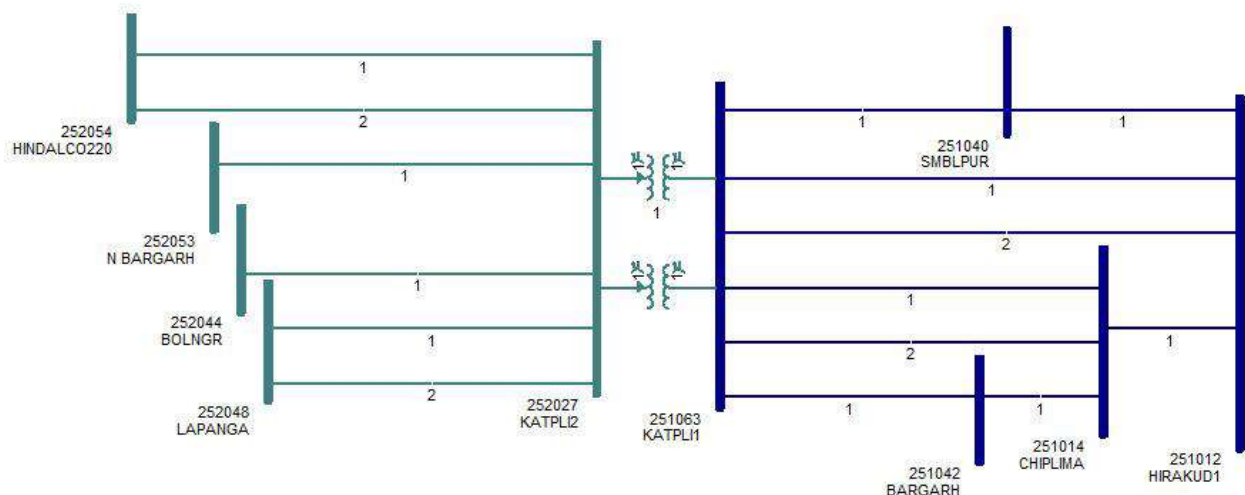
The minutes of 138th Protection Coordination sub-Committee meeting held on 28.08.2024 was circulated vide letter dated 11.09.2024.

Members may confirm the minutes of the Meeting.

PART – B

ITEM NO. B.1: Total Power failure at 220/132 kV Katapalli (OPTCL) S/s on 29.08.2024 at 06:52 Hrs

On 29.08.2024, at 06:52 Hrs, a B phase fault developed in 220 kV Katapalli-Hindalco-2 consequently line got tripped immediately from Hindalco end however, breaker at Katapalli didn't open immediately. As LBB protection is not available at Katapalli, all lines at Katapalli got tripped and total power failure occurred at 220/132 kV Katapalli, Burla, Chiplima S/s. Further, Hindalco got islanded from the system.

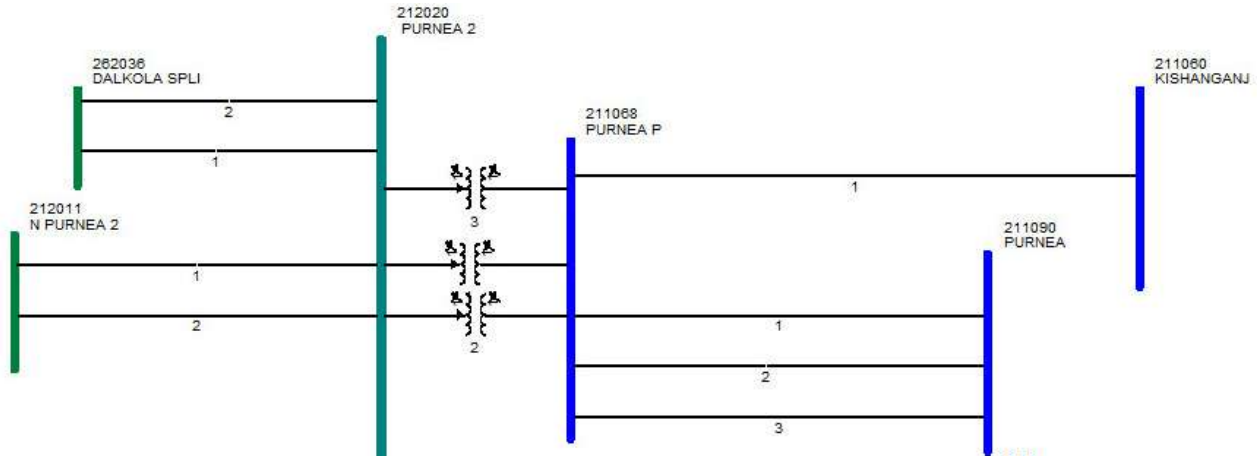


Detailed report from ERLDC is attached at **Annexure B.1.**

Load Loss: 70 MW, Gen. Loss: 290 MW
Outage Duration: 00:51 Hrs
OPTCL may explain.

ITEM NO. B.2: Total Power failure at 220/132 kV Purnea (PG) S/s on 01.08.2024 at 15:50 Hrs

On 01.08.2024, at 15:50 Hrs, 220/132 kV Purnea (PG) S/s became dead due to tripping of 220 kV New Purnea-Purnea D/c and 220 kV Gazole-Dalkhola D/c (Gazole-Dalkhola-Purnea link) during a fault in downstream of 132 kV Purnea (PG).



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

Load Loss: 110 MW
Outage Duration: 00:23 Hrs
Powergrid may explain.

ITEM NO. B.3: Total Power failure at 220 kV Darbhanga (BSPTCL) S/s on 01.08.2024 at 17:59 Hrs

On 01.08.2024, at 17:59 hrs, a fault struck B phase of 220kV Darbhanga (DMTCL) – Darbhanga - 1 closer to BSPTCL end however due to failure of opening of Circuit Breaker at Darbhanga end all other circuit connected to Darbhanga (BSPTCL) opened from remote end in Zone-2 time which led to total power failure at 220kV Darbhanga (BSPTCL) S/s.

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

Load Loss: 80 MW
Outage Duration: 00:35 Hrs
BSPTCL may explain.

ITEM NO. B.4: Total Power failure at 220 kV Arrah (PG) S/s on 09.08.2024 at 19:51 Hrs

On 09.08.2024, at 19:51 Hrs, 220 kV Bus-2 at 220/132 kV Arrah(PG) S/s got tripped during bus bar stability testing of 220 kV Bus-1 which led to total power failure at Arrah S/s.

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

Load Loss: 294 MW
Outage Duration: 00:20 Hrs
Powergrid may explain.

ITEM NO. B.5: Major grid events other than GD/GI**a) Bus tripping occurred in Eastern Region during August'24**

Element Name	Tripping Date	Reason	Utility
220KV MAIN BUS - 2 AT ARRAH(PG)	23/08/2024	Bus Bar Protection Operated at Arrah (PG) end	PG(ER-1)

Powergrid may explain.

b) Repeated tripping of transmission lines during the month of August'24

Sl.No.	Name of the Element	No. of times Tripped	Remarks	Utility
1	132KV-KAHALGAON(BSEB)-LALMATIA-1	4	Tripped on B_N fault in all instances.	BSPTCL/JUSNL
2	132KV-RIHAND-GARWAH-1	4	Tripped from Rihand end only in 2 instances.	JUSNL
3	220KV-CHUKHA-BIRPARA-1	3	Tripped due to clearance issue at around 50-60 Km span (under Bhutan Jurisdiction) (4 times A/R successful in same fault)	PG ER-II/Bhutan
4	220KV-DARBHANGA (DMTCL)-MOTIPUR-1	4	Tripped on B_N fault with A/R successful from Motipur end in 2 instances.	DMTCL/BSPTCL

Concerned utilities may explain.

c) Tripping of ICTs during the month of August'24

Sl. No	Name of the Element	Trip Date	Trip Time	Remarks	Utility
1	400KV/220KV 315 MVA ICT 2 AT BIHARSHARIF	26-08-2024	18:26	Over current Earth Fault.	PG ER-1/BSPTCL
2	400KV/220KV 315 MVA ICT 2 AT NEW DUBURI	18-08-2024	14:46	Due to CT Blast at 220 kV JSL- New Duburi-II at New Duburi	OPTCL
3	400KV/220KV 315 MVA ICT 1 AT JEERAT	05-08-2024	23:05	Bucholz Alarm (Y-Phase) appeared	WBSETCL
4	400KV/220KV 315 MVA ICT 1 AT KODERMA	04-08-2024	04:13	Pole discrepancy	DVC
5	400KV/220KV 315 MVA ICT 2 AT KODERMA	04-08-2024	04:13	Pole discrepancy	DVC
6	400KV/220KV 315 MVA ICT 1 AT BOKARO-A TPS	02-08-2024	22:39	86A Relay, PRV-1 Trip	DVC

Concerned utilities may explain.

ITEM NO. B.6: Submission of protection performance indices on monthly basis by users to RPC and RLDC for 220 kV and above lines

As per IEGC 2023 Clause 15(6), 15(7) all users shall submit protection performance indices of previous month to ERPC and ERLDC along with reasons for performance indices less than unity of individual element wise protection system to the respective RPC and action plan for corrective measures. For the month of Aug '24, BSPTCL, JUSNL, DVC, WBSETCL, DMTCL, NTPC Farkka & Jorethang HEP had submitted the same, which is attached as **Annexure B.6**.

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

Sl.no	Utility Name	May	June	July	August
1	PG-ER-1				
2	PG-ER-2				
3	PG-Odisha		YES		
4	WBSETCL/WBPDCL	YES	YES	YES	YES (20.09.24)
5	BSPTCL/ BGCL		YES		YES (19.09.24)
6	OPTCL/ OHPC				
7	DVC		YES	YES	YES (24.09.24)
8	JUSNL		YES		Yes (14.09.24)
9	Sikkim				
10	OPGC				
11	PMTL				
12	NTPC- KHSTPP		YES		
13	NTPC- FSTPP		YES	YES	YES (18.09.24)
14	NTPC-BARH		YES		
15	NTPC- TSTPP				
16	NTPC- KBUNL	YES	YES	YES	
17	NPGC		YES		
18	BRBCL		YES		
19	NTPC- DARILAPLI				
20	NTPC- NORTH KARNPUARA	YES	YES		
21	ATL				
22	APNRL				
23	CBPTCL				
24	DMTCL				YES (13.09.24)
25	ENICL				
26	Chuzachen HEP				
27	Jorethang HEP	YES	YES	YES	YES (01.09.24)
28	Tashiding Hep				
29	GMR				
30	IBEUL				
31	JITPL				
32	MPL				
33	NKTL				

34	OGPTL				
35	PMJTL				
36	Powerlink				
37	PKTCL				
38	NHPC Rangit				
39	Rongnichu HEP				
40	SPTL				

In 138th PCC Meeting, ERPC representative informed that as per IEGC 2023 Clause 15(6), 15(7) all users shall submit protection performance indices of previous month to ERPC and ERLDC along with reasons for performance indices less than unity of individual element wise protection system to the respective RPC and action plan for corrective measures however for the month of July '24, only NTPC (KBUNL), WBSETCL, BSPTCL & Jorethang HEP had submitted the same.

On enquiry from PCC regarding reason behind non submission of protection performance indices, following replies were submitted by concerned utilities –

- PG ER-1 representative replied that outage data is being shared to ERPC/ERLDC however PP indices will be submitted from Sep 2024 in coordination with PG ER-II.
- NTPC Barh representative submitted that PP indices was shared on 14th Aug 2024.
- OPTCL representative submitted that PP indices data will be shared from Sep 2024 and there is no such issue being faced in calculation of indices.
- DVC representative submitted that PP indices for month of June 2024 and July 2024 had been submitted on 27th Aug 2024 however it will be submitted timely by 10th of each month from Sep 2024. ERLDC representative replied that in PP indices for only 132 k V lines and single number of 220 k V line was given however it needs to be provided for 132, 220 & 400 k V level lines where tripping was observed. DVC representative agreed with the same.
- JUSNL representative replied that in month of Aug 2024, a greater number of visits were done by CRITL team therefore PP indices was not complied however PP indices for July 2024 and Aug 2024 will be shared by 10th Sep 2024.

Member Secretary advised ERPC representative to include all IPPs in list and provide date of receipt of indices also in list so that it can be tracked for all utilities. He requested all utilities to provide nodal officer details also so that it will be easier for ERPC to coordinate for getting these details. He also requested all SLDC representative to coordinate with their concerned utilities for getting these data.

PCC advised all utilities to submit Protection Performance Indices on timely basis otherwise issue will be highlighted to higher authority. It further advised concerned utilities to share details of nodal officer to ERPC.

Members may explain the reason for non-submission of details.

ITEM NO. B.7: Single Line Tripping Incidences in month of Aug 2024

Single line tripping incidents in the month of Aug 2024 which needs explanation from constituents of either end is attached at **Annexure B.7.**

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.

The utility wise status is given below:

Sl.no	Utility Name	Status
1	PG-ER-1 & PMTL	Received
2	PG-ER-2	Received
3	PG-Odisha	Received
4	WBSETCL	Received
5	BSPTCL	Received
6	OPTCL	Not Received
7	DVC	Received
8	JUSNL	Received
9	OPGC	Not Received
10	CESC	Received
11	NTPC	Not Received
20	NHPC	Received
21	IPP	Not Received

Utilities are requested to update completion status of audit as per the schedule along with audit report.

In 138th PCC Meeting, OPTCL representative submitted that internal protection audit plan upto Oct 2024 had been received however plan upto March 2025 will be received soon and subsequently it will be submitted to ERPC/ERLDC by 15 days.

NTPC representative submitted that plan had been submitted to NTPC Barh already accordingly internal audit is planned in Sep 2024. NTPC Barh representative was not available in the meeting.

PCC advised NTPC & IPPs to share internal protection audit plan at earliest to ERPC/ERLDC.

On enquiry from ERPC representative regarding status of internal protection audit carried out as per the proposed plan following comments were received from utilities.

- Powergrid ER- 1 representative informed that internal audit had been completed as per schedule upto July 2024 however confirmation has not been received from site for proposed audit plan for Aug 2024
- Powergrid ER- 2 representative informed that internal audit had been completed as per schedule upto Aug 2024.
- Powergrid Odisha representative was not available in the meeting.
- BSPTCL representative submitted that internal audit had been completed for Biharsharif, Gopalganj, Dehri, Bodhgaya, Khagaul and few other substations for which updated list will be shared to ERPC/ERLDC.
- JUSNL representative informed that internal audit had been completed for Chandil, Ramchandrapur, Chaibasa-I, Hatia-II, Itkhori, Govindpur, Dumka, Jasidih, Giridih etc for which updated list will be shared to ERPC/ERLDC along with proposed date for remaining S/s.
- DVC representative submitted that audit had been completed for 3 nos of S/s and it is proposed that audit will be carried out for major no of S/s in Sep 2024 subsequently report will be submitted.
- WBSETCL representative submitted that audit had been completed for 4 nos of S/s
- CESC & NHPC representative was not present in the meeting.

PCC advised concerned utilities to submit internal protection audit report for S/s where audit had been completed to ERPC/ERLDC.

JUSNL vide email dated 29.08.2024 had shared protection audit plan status along with report to ERPC

Concerned utilities may update.

ITEM NO. C.2: Third Party Protection audit of Sub stations for the Year 2024-25

As per IEGC 2023 Clause 15.2, “All users shall also conduct third party protection audit of each sub-station at 220 kV and above (132 kV and above in NER) once in five years or earlier as advised by the respective RPC.”

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

Accordingly, a list of S/s has been identified where third-party protection audit needs to be carried out:

NTPC Kahalgaon	Tenughat	Budhipadar	Darbhanga (BH)
NTPC Farakka	Chatra	Lapanga	Biharsharif (BH)
NTPC Barh	Hatia	Rengali (OPTCL)	Purnea Old (PG)
Jorethang	Garhwa	Rengali (PH)	Kishanganj (PG)
Tashiding	Chandil	Therubali	Meramundali
Ramchandrapur	Bantala (KLC)	Balimela	

As per SOP for Third Party Protection Audit prepared by NPC, Third Party Protection Audit shall be carried out by the third party designated agencies in line with the IEGC Regulations 2023 or by the audit teams constituted by RPCs with the members from other states (at least two) who opt for the RPC coordinated third party protection audit.

In 138th PCC Meeting, ERPC representative informed that as per SOP for Third Party Protection Audit prepared by NPC, Third Party Protection Audit shall be carried out by the third party designated agencies in line with the IEGC Regulations 2023 or by the audit teams constituted by RPCs with the members from other states (at least two) who opt for the RPC coordinated third party protection audit.

PCC advised all utilities to submit third party protection audit plan by one month to ERPC along with their choice to carry out protection audit either through ERPC coordinated third party protection audit or by third party designated agencies.

Member Secretary, ERPC informed that after receiving audit plan from all utilities, ERPC will communicate to concerned utilities regarding substations for which protection audit can be done through audit team of ERPC. He further proposed that ERPC Secretariat would identify critical substations in consultation with ERLDC for which the protection audit will be carried out by ERPC along with the members from ERLDC & other utilities with help of third party agencies (to be hired by ERPC).

PCC agreed with proposal made by Member Secretary, ERPC.

Members may discuss.

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

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

Members may update.


ग्रिड-इंडिया
GRID-INDIA

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

पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / Eastern Regional Load Despatch Centre

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पूर्वी क्षेत्र के 220/132 केवी काटापल्ली उप-केन्द्र में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event at 220/132 kV Katapalli S/s of Eastern Region
(To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f))
(आई ई जी सी 37.2 (एफ) के अनुपालन में)

Date(दिनांक):23-09-2024

1. Event Summary (घटना का सारांश):

At 06:52 Hrs, all 132 kV emanating lines from Burla PH tripped due to B_N fault in 132 kV Lapanga-Hirakud and 132 kV Lapanga-Burla at one particular location on double circuit tower which was cleared with a delay. This led to total generation loss at Burla S/S of around 225 MW due to loss of evacuation path.

Subsequently at 06:58 Hrs, a R_N fault struck 220kV-Katapalli-Hindalco ckt#2 which was cleared with a delay from Katapalli end. As reported, 220kV-Katapalli Hindalco ckt#1 also tripped as per Hindalco islanding scheme. Other emanating 220 kV lines from Katapalli tripped from remote end either in Zone-3 or Directional Earth fault. All 132 kV lines from Chiplima also tripped during this fault. This resulted in total power failure at 220kV Katapalli S/S and 132 kV Chiplima PH S/s. Around 70 MW load loss and 45 MW generation loss reported in Katapalli and Chiplima respectively. Power was restored at 220kV Katapalli S/S via 220kV -Katapalli – Lapanga 1 at 07:43 Hrs.

2. Time and Date of the Event (घटना का समय और दिनांक): 06:52 hrs of 29.08.2024

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

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

5. Report submitted by utility on: 19-09-2024

6. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
				Odisha	Odisha
Pre-Event (घटना पूर्व)	49.97	29822 MW	23796 MW	2890 MW	4943 MW
Post Event (घटना के बाद)	49.95	29750 MW	23726 MW	2630 MW	4873 MW

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

Important Transmission Line/Unit if under outage	NA.
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(महत्वपूर्ण संचरण लाइने/ विद्युत उत्पादन इकाइयां जो बंद है)	
Weather Condition (मौसम स्थिति)	Heavy rain with Wind reported

7. Load and Generation loss (लोड और जेनरेशन हानि): Generation loss: 225 MW (At 06:52 Hrs) and 45 MW (At 06:52 Hrs); Load loss: 70 MW (At 06:58 Hrs).

8. Duration of interruption (रुकावट की अवधि): 00:51 Hrs

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

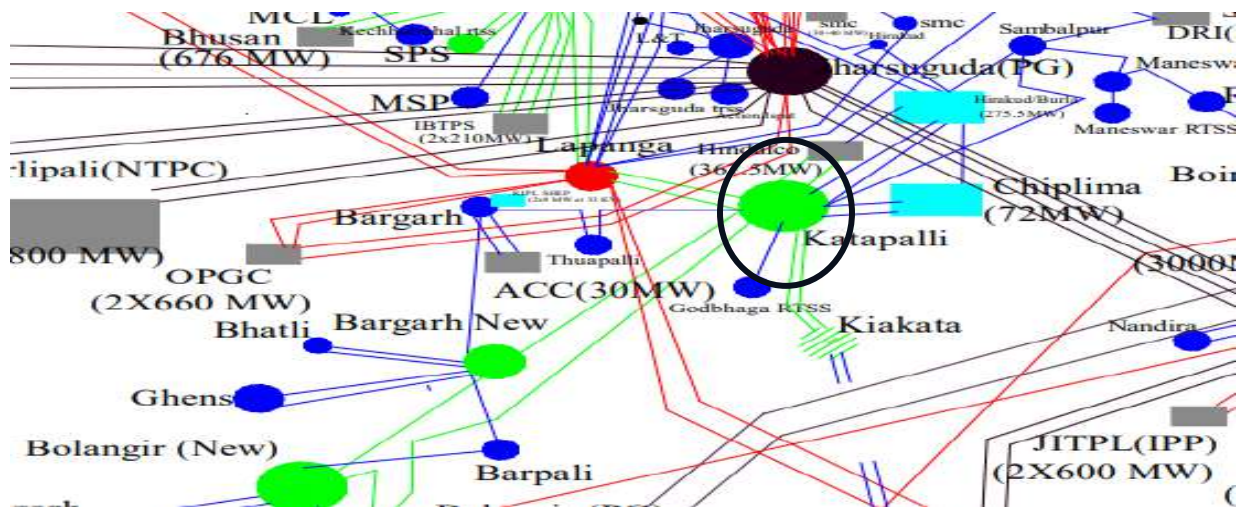


Figure 1: Network across the affected area

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

11.Major Elements Tripped (प्रमुख ट्रिपिंग):

क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	132 kV Burla -Katapalli 1	06:52	Katapalli: Didn't trip	Burla: O/c. Ia=Ib=Ic=681 A	-
2	132 kV Burla -Katapalli 2		Katapalli: Didn't trip	Burla: B_N, 20.3 km, 1.64 KA	-

3	132 kV Lapanga-Burla PH		Lapanga: O/c, E/f operated after 640 msec	Burla: B_N, Zone-1, 7.9 km, 5.52 kA	-
4	132 kV Lapanga-Hirakud PH		Lapanga: O/c, E/f, operated after 557 msec	Hirakud: B_N, Zone-1, 4.095 kA	-
5	220kV -Katapalli – Lapanga 1	06:58	Katapalli: Didn't trip	Lapanga: O/c, E/f operated after 800 msec. B_ph breaker didn't open	07:43
6	220kV -Katapalli – Lapanga 2		Katapalli: Didn't trip	Lapanga: O/c, E/f operated after 800 msec	07:43
7	220kV -Katapalli – Bargarh 1		Katapalli: Didn't trip	Bargarh: R_N, Zone-3, 1.38 kA	-
8	220kV -Katapalli – Bolangir 1		Katapalli: Didn't trip	R_N, Zone-3	08:00
9	220kV -Katapalli – Hindalco 1		Katapalli: Didn't trip	Islanded at Hindalco end with B/U & Over current (450 A).	-
10	220kV -Katapalli – Hindalco 2		Katapalli: R_N, Ir- 7.09kA, Fault duration: 737 msec. Breaker didn't open	Hindalco: Tripped in differential line protection in 70 msec in R_N fault.	-

11	132 kV – Chiplima – Katapalli 1	Katapalli: Didn't trip	Chiplima: E/f operated, In: 0.91 kA	-
12	132 kV – Chiplma – Katapalli 2	Katapalli: Didn't trip	Chiplima: E/f operated, 0.93 kA	-

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

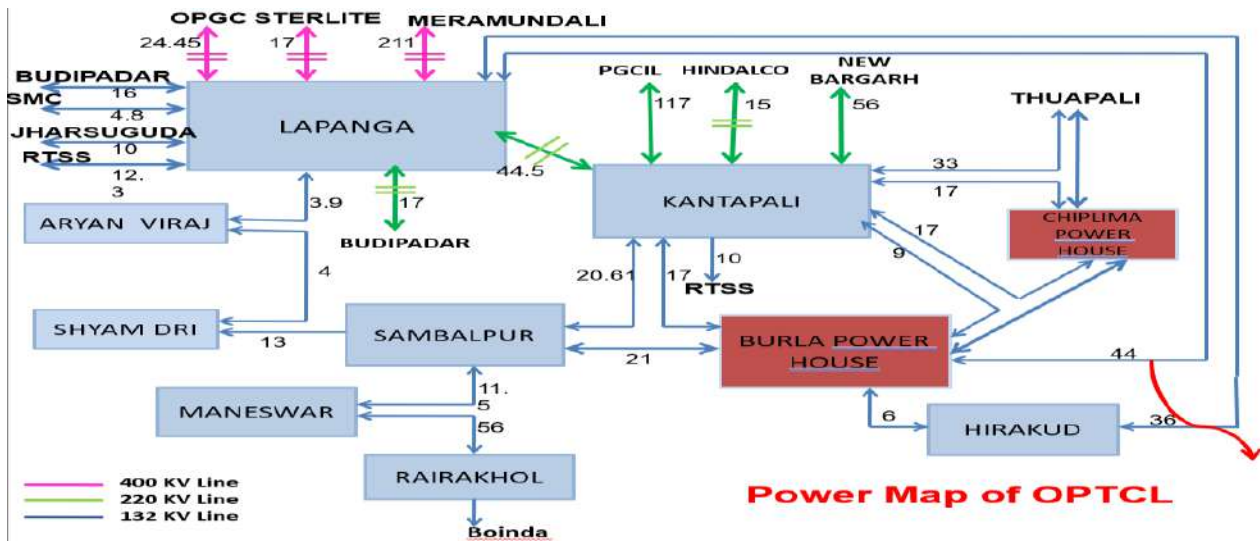


Figure 2: Odisha Network diagram (Submitted by OPTCL)

Event At 06:52 Hrs:

- At 06:52 Hrs, a fault struck B_{ph} of 132 kV Hirakud-Lapanga and 132 kV Burla-Lapanga simultaneously at a particular location on double circuit tower.
- In 132 kV Hirakud-Lapanga, line tripped immediately from Hirakud in Zone-1, however from Lapanga it was not cleared either in Zone-1 or Zone-2 rather Directional O/c and Directional E/f operated after around 640 msec.
- In 132 kV Burla-Lapanga also tripped in Zone-1 from Burla, however from Lapanga it tripped after 640 msec on Directional O/c, E/f.
- After that total power of Burla PH of around 225 MW was being evacuated through 132 kV Burla-Katapalli D/c and 132 kV Burla-Sambalpur and 132 kV Burla-Chiplima which tripped sequentially on O/c. 132 kV Burla-Chiplima tripped from Chiplima end despite flow being in reverse direction.
- Generation at Burla became zero due to loss of evacuation path.

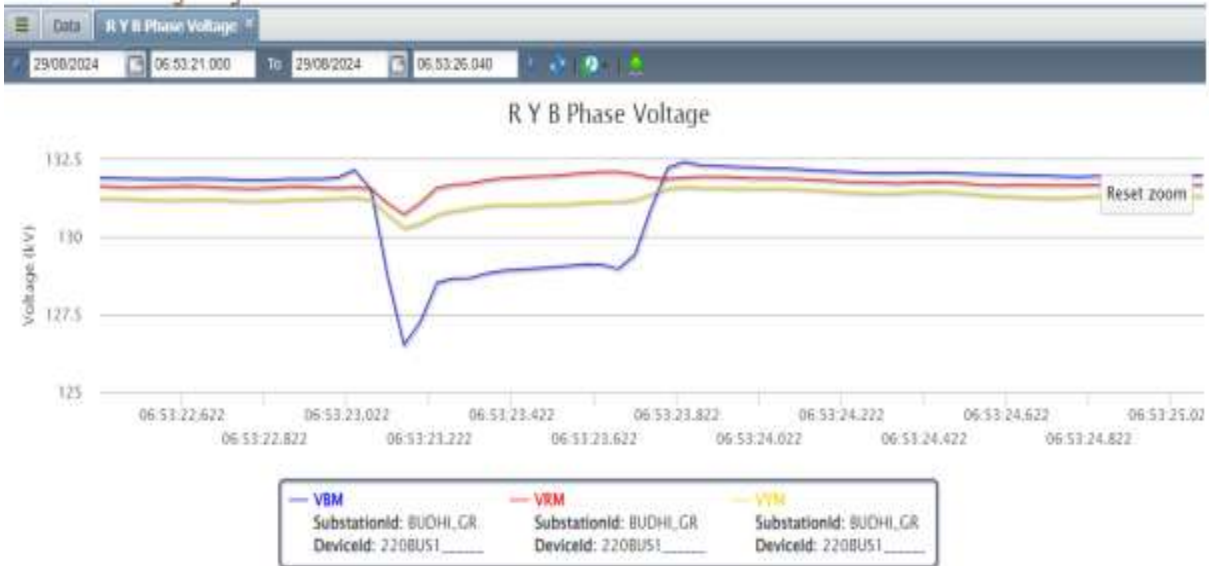


Figure 3: PMU Voltage snapshot of 220 kV Budipadar S/s

Event At 06:58 Hrs:

- At 06:58 Hrs, R_N fault struck 220 kV Katapalli-Hindalco-2. This line tripped immediately from Hindalco, however none of the protection operated at Katapalli immediately. 220 kV Katapalli-Hindalco D/c has line differential protection scheme.
- As reported, Hindalco has its islanding scheme set at 450A(O/c), 191 kV (U/V) with instantaneous islanding. Hindalco got islanded with tripping of remaining Katapalli line.
- From Katapalli end, Directional O/c operated after around 710 msec but breaker at Katapalli didn't open.
- 132 kV Katapalli-Chiplima D/c tripped in around 450 msec from Chiplima on Directional E/f, leading to total generation loss at Chiplima. Current of all three phases were almost in phase thereby increased current in neutral.
- Remaining 220 kV lines at Katapalli i.e.,
 - 220 kV Katapalli-Bolangir (PG) tripped in Zone-3 from Bolangir after 800 msec.
 - 220 kV Katapalli-Bargarh tripped in Zone-3 from Bargarh after 800 msec.
 - 220 kV Katapalli-Lapanga D/c tripped on Directional O/c and E/f after around 800 msec from Lapanga. However, B_ph of 220 kV Lapanga-Katapalli-1 didn't open at Lapanga.

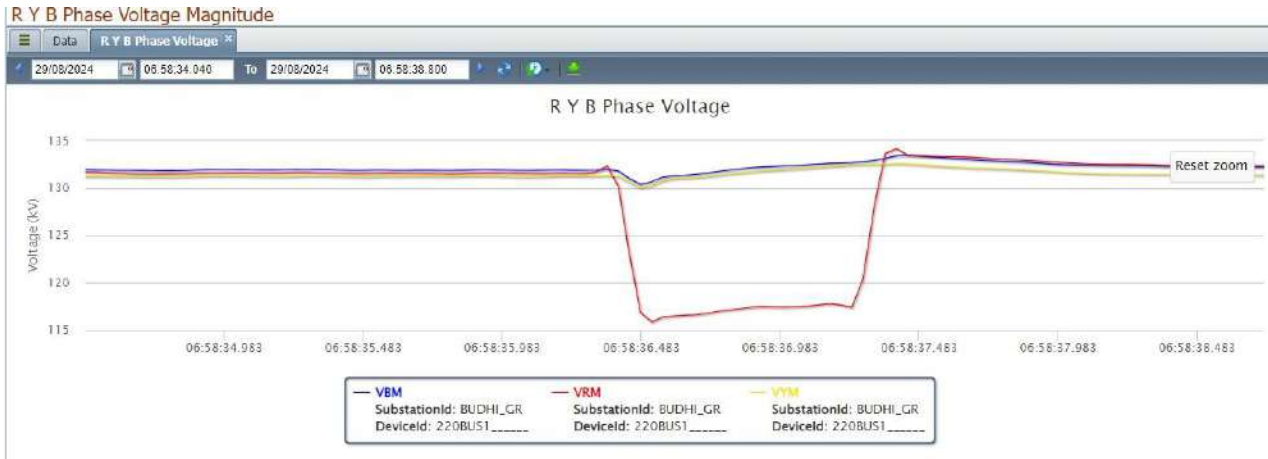


Figure 4: PMU Voltage snapshot of 220 kV Budipadar S/s

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

- 132 kV Lapanga-Burla and 132 kV Lapanga-Hirakud lines didn't trip from Lapanga end in Zone-1 or Zone-2. Later O/C and E/f operated at Lapanga after 640 msec. The reason for the same may be analyzed. O/c and E/f setting may also be reviewed.
- As reported, 132 kV Burla-Chiplima tripped from Chiplima end on O/c in reverse direction. Settings at Chiplima may be reviewed.
- O/c setting of remaining feeders from Burla i.e., Katapalli and Sambalpur may also be reviewed.
- 220 kV Katapalli-Hindalco-2 didn't trip from Katapalli despite having differential protection as Main-1 and distance protection as Main-2. Neither of the two operated. Later O/c E/f operated but at that time, breaker failed to open. LBB at Katapalli also didn't operate. Whether bus bar protection is available at Katapalli?
- A reported, islanding scheme of Hindalco has a logic of instantaneous islanding. There might be several instances of islanding in case of even transient faults in either circuit of 220 kV Hindalco-Katapalli D/c. Same may be reviewed.
- B_ph breaker of 220 kV Katapalli-Lapanga-1 didn't open at Lapanga. LBB at Lapanga didn't operate. Whether bus bar protection is available at Lapanga?
- In many 220 kV feeders O/c settings have been kept enabled despite having Main-1 and Main-2 distance protection scheme. Same may be reviewed.
- O/c E/f setting of all feeders at Chiplima, Burla need to be reviewed.
- DR of Lapanga, Katapalli, Burla, Bargarh, Chiplima are not time synchronized. DR length is also less in all feeders except distance relay of 220 kV Lapanga-Katapalli-1 at Lapanga. DR channels are not also configured properly.
- OPTCL may share the physical nature of the fault observed at the site.
- Detailed report received from OPTCL is attached at Annexure-3.

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

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

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

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

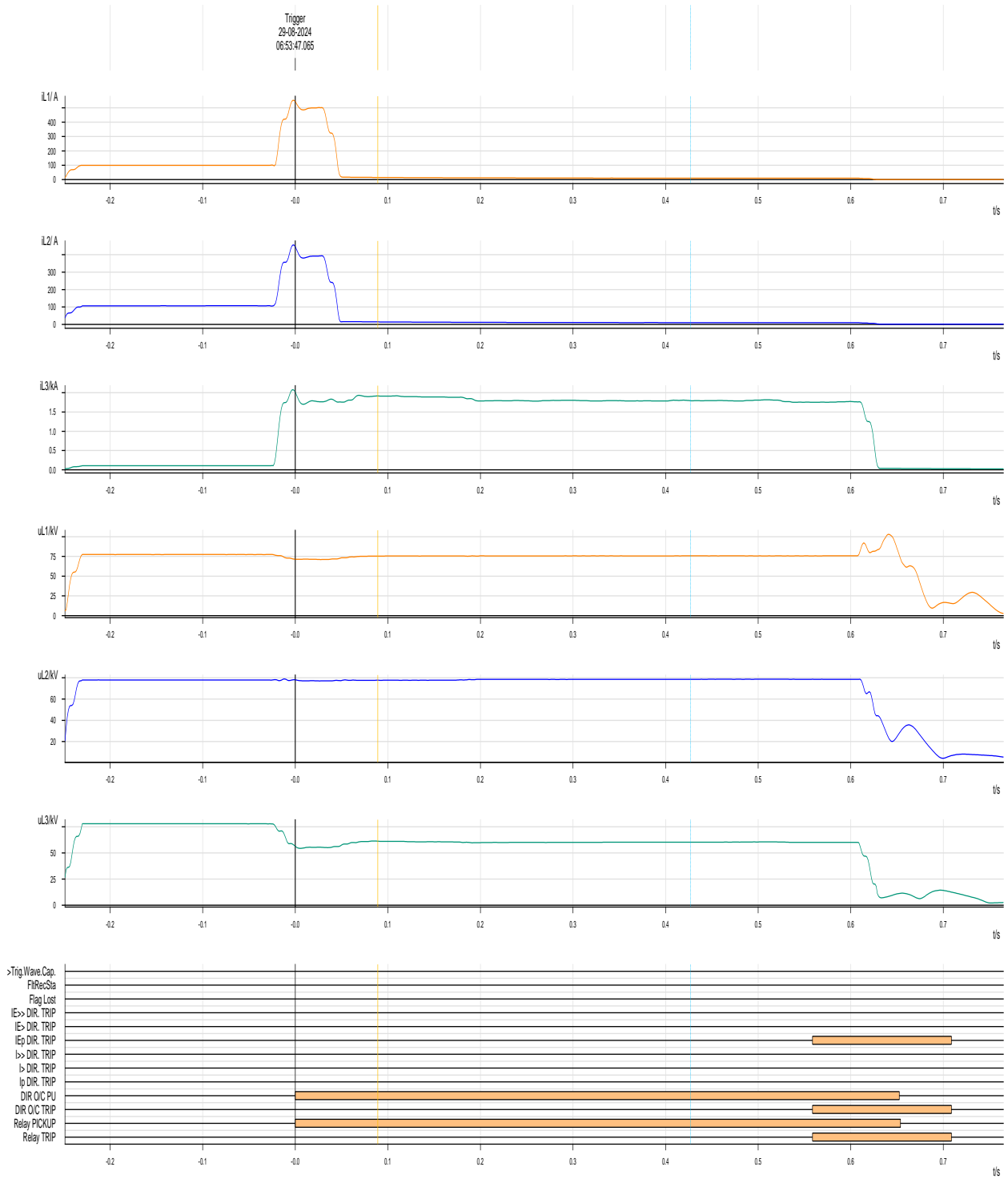
Annexure 1: (Sequence of Events-As per ERLDC SCADA)

Time	Station	Description	Status
29-08-2024 06:58:39	BOLAN_PG	220_BURLA_GR_CB	Open

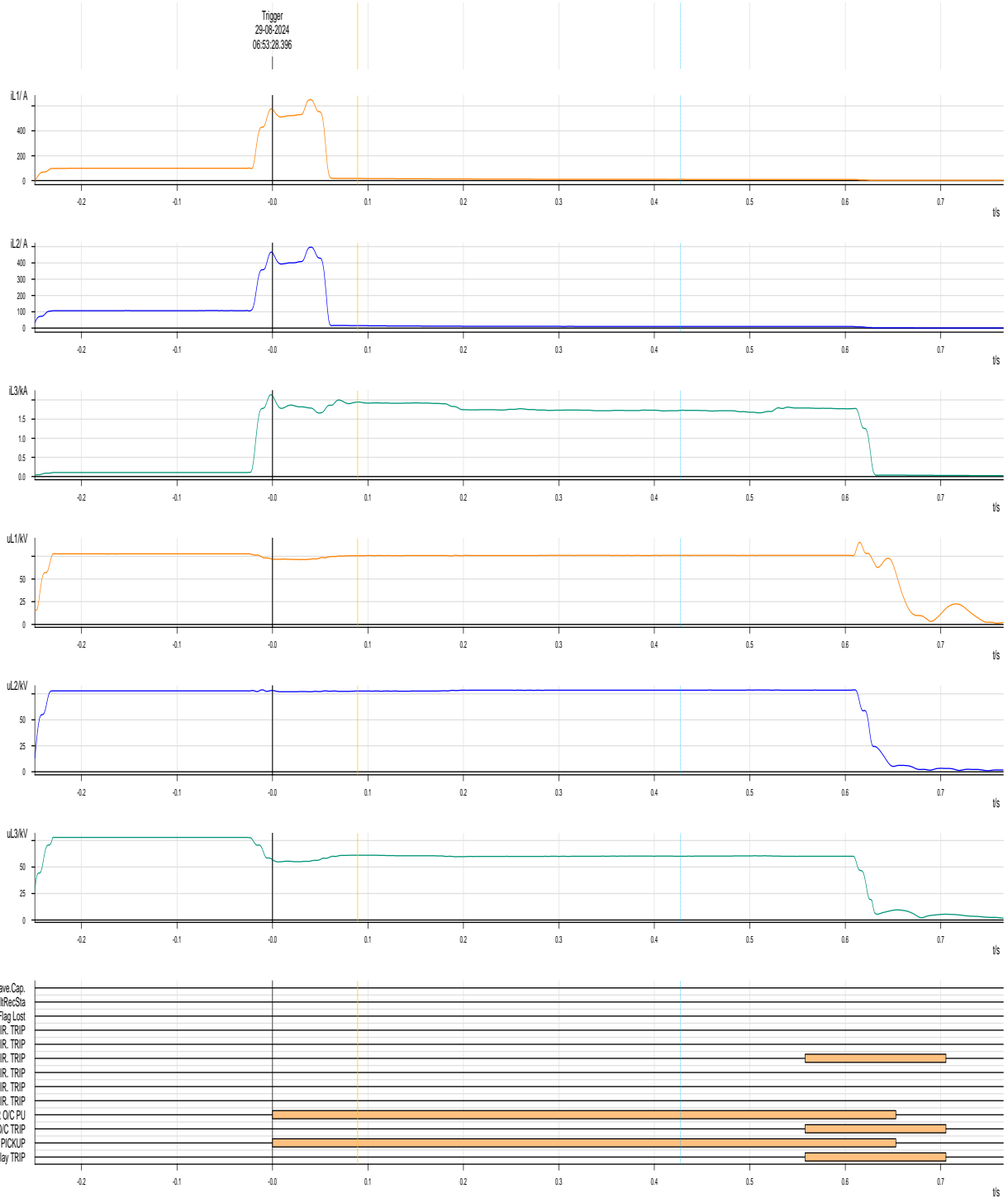
*The rest of SOE is not available at ERLDC end.

Annexure 2:

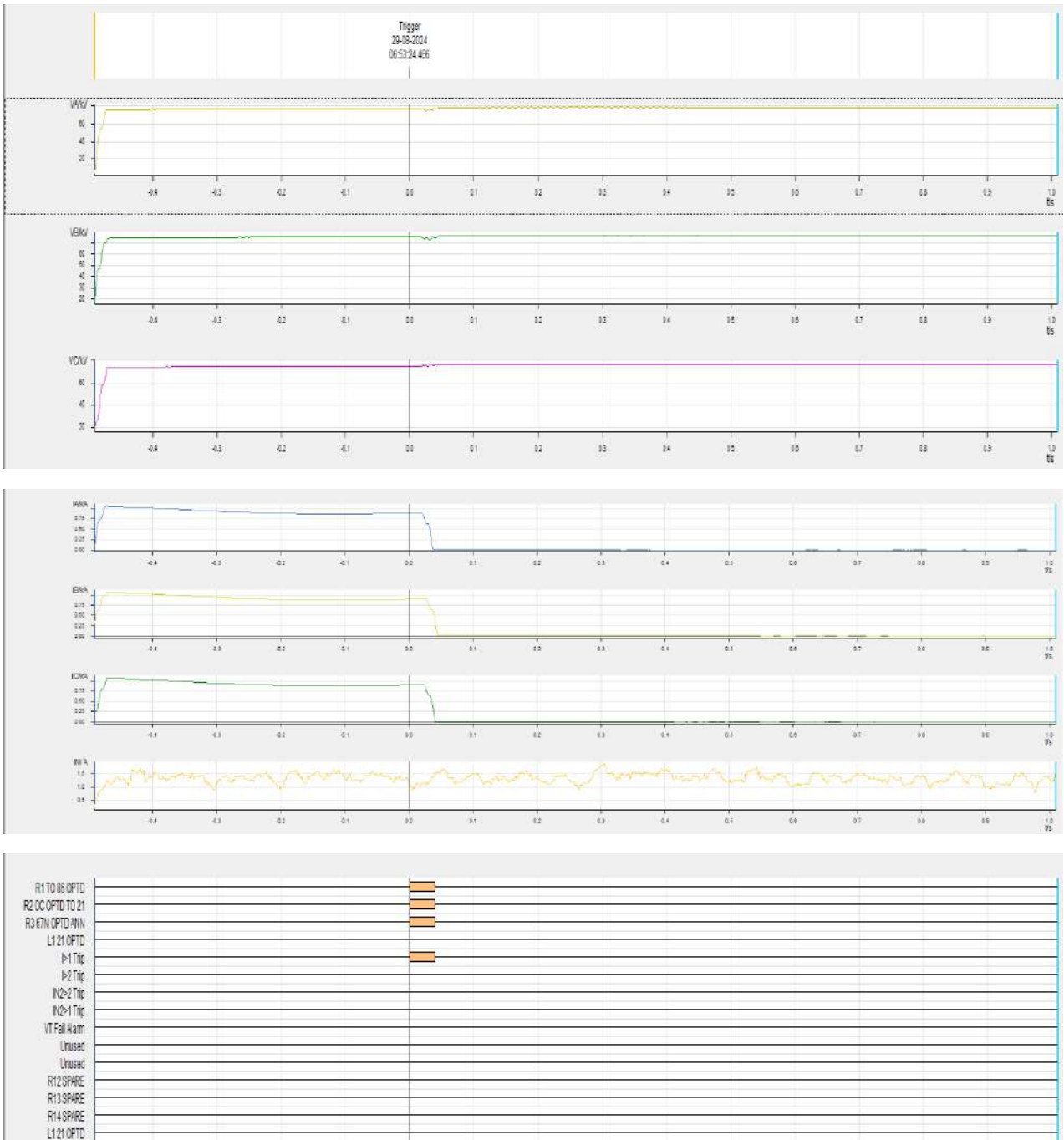
DR of 132 kV Lapanga-Hirakud (Lapanga)



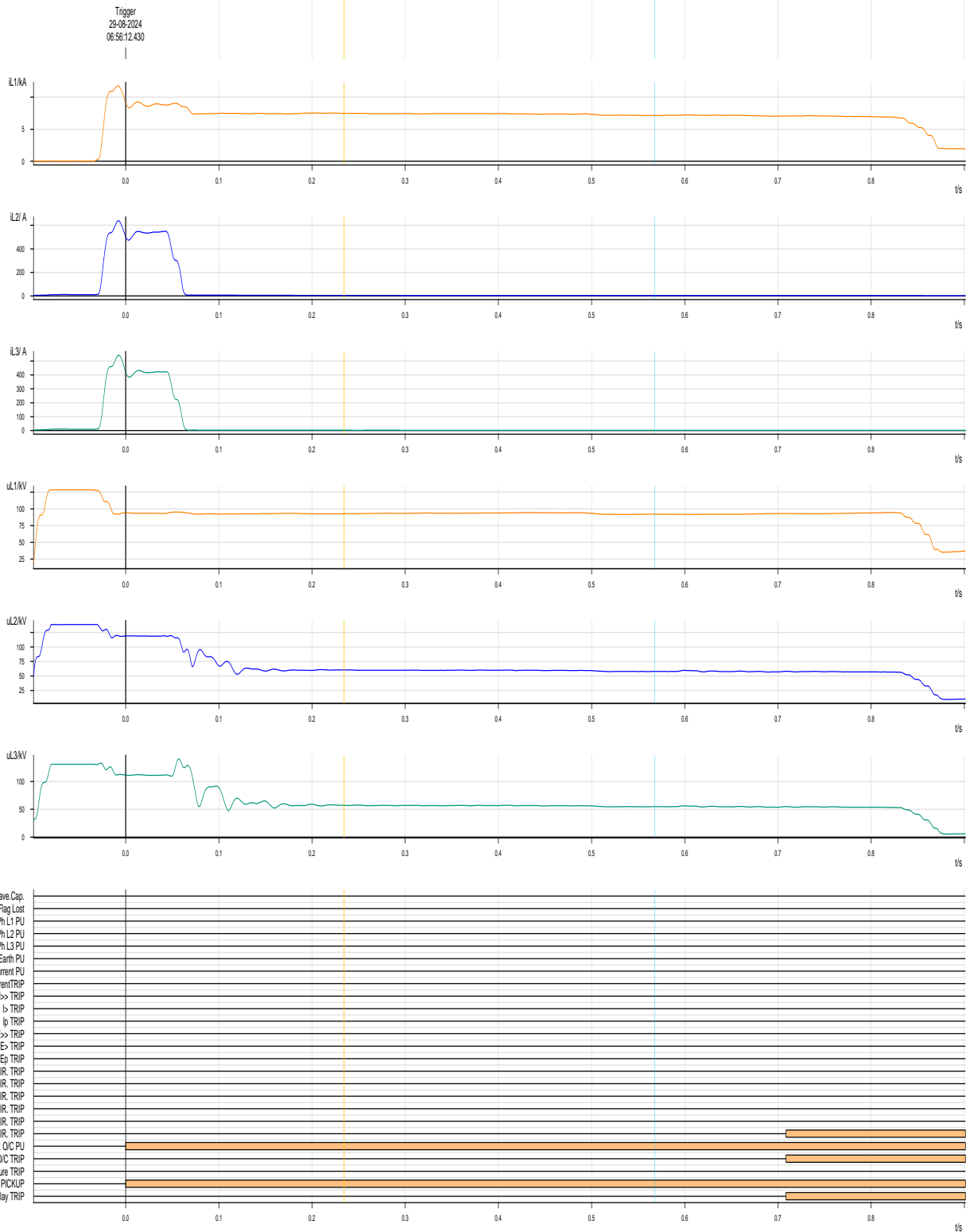
DR of 132 kV Lapanga-Burla (Lapanga)



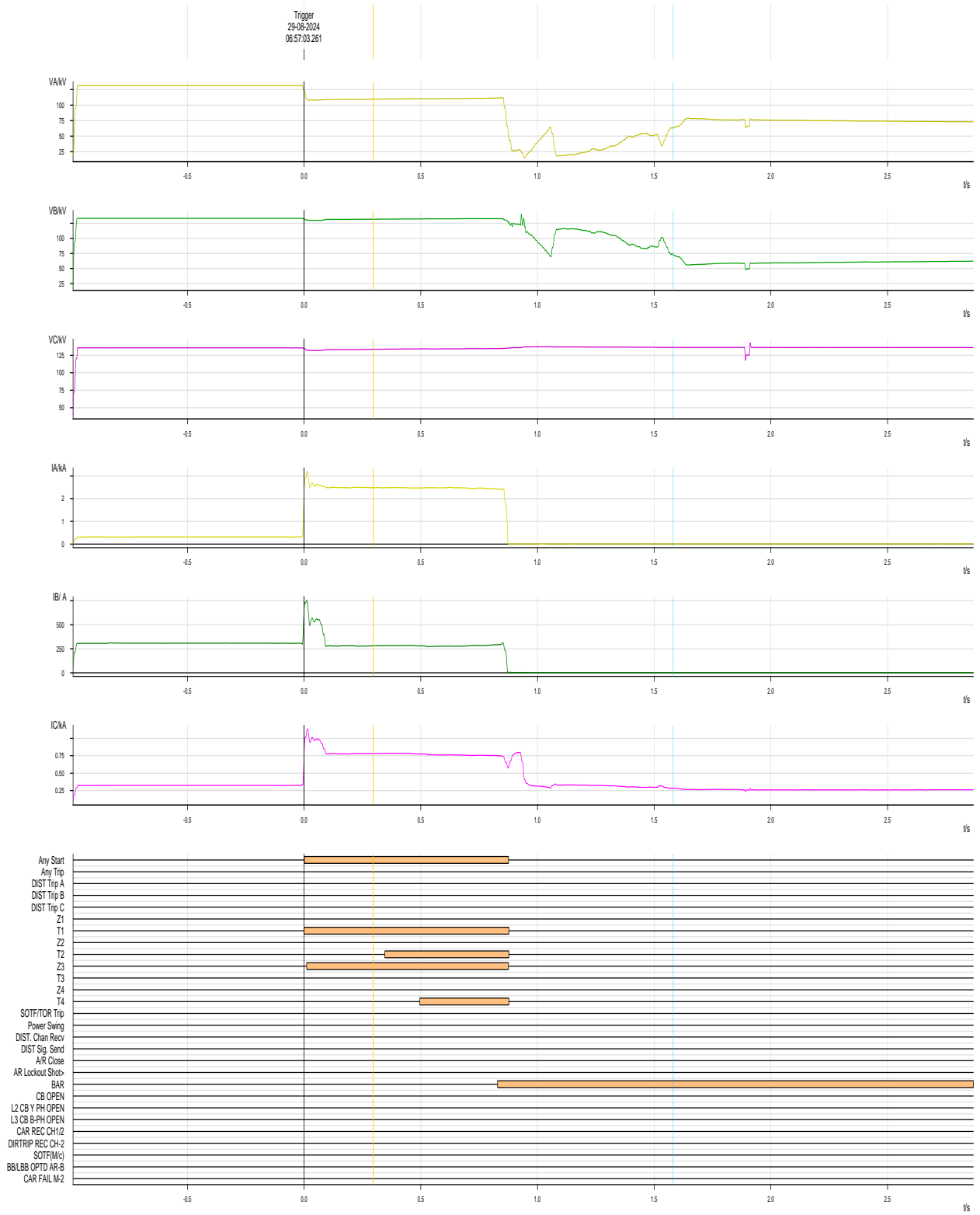
DR of 132 kV Chiplima-Burla (Chiplima)



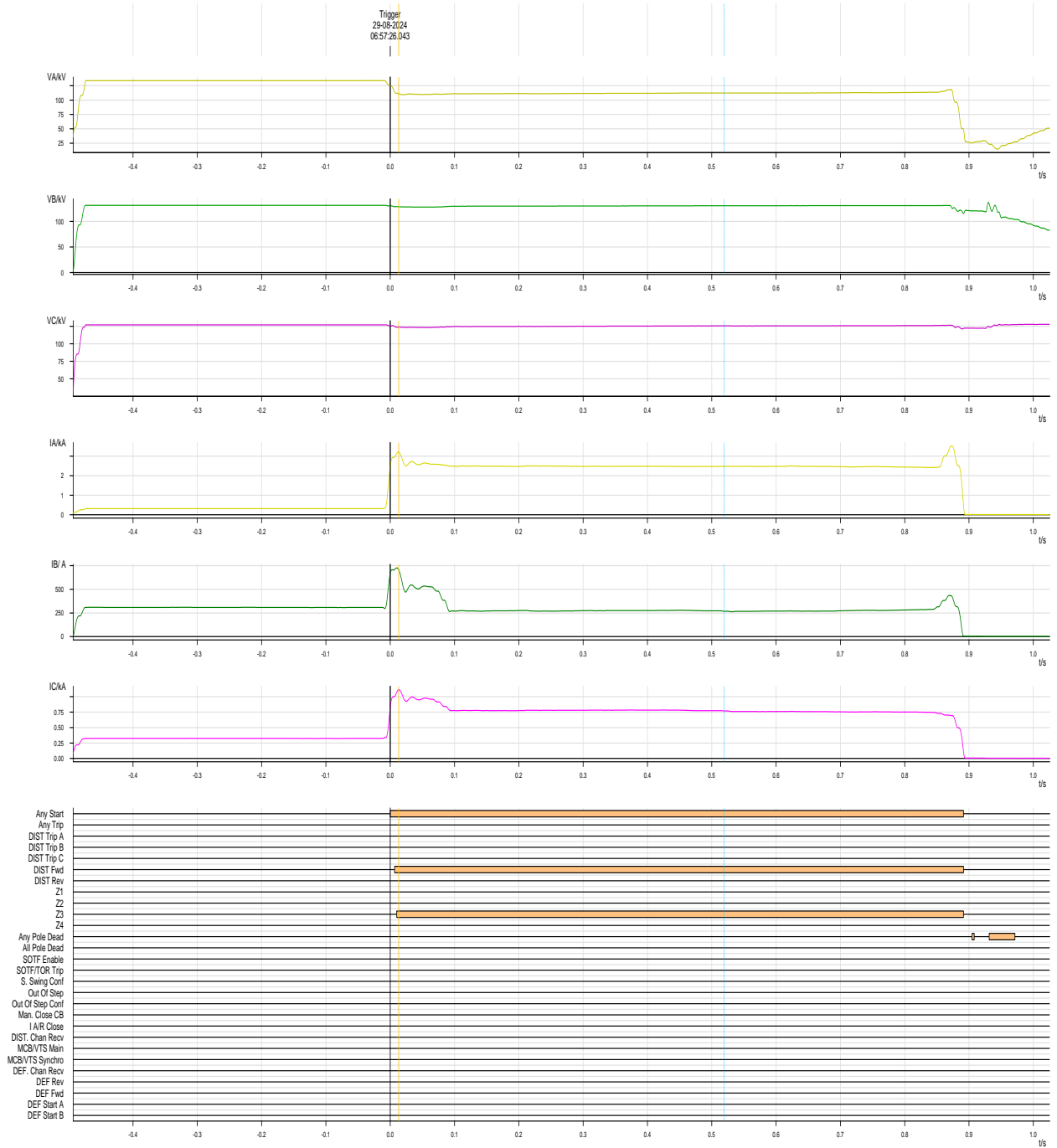
DR of 220 kV Katapalli-Hindalco-2 (Katapalli)



DR of 220 kV Katapalli-Lapanga-1 (Lapanga)



DR of 220 kV Katapalli-Lapanga-2 (Lapanga)



DR of 220 kV Katapalli-Bargarh (Bargarh)

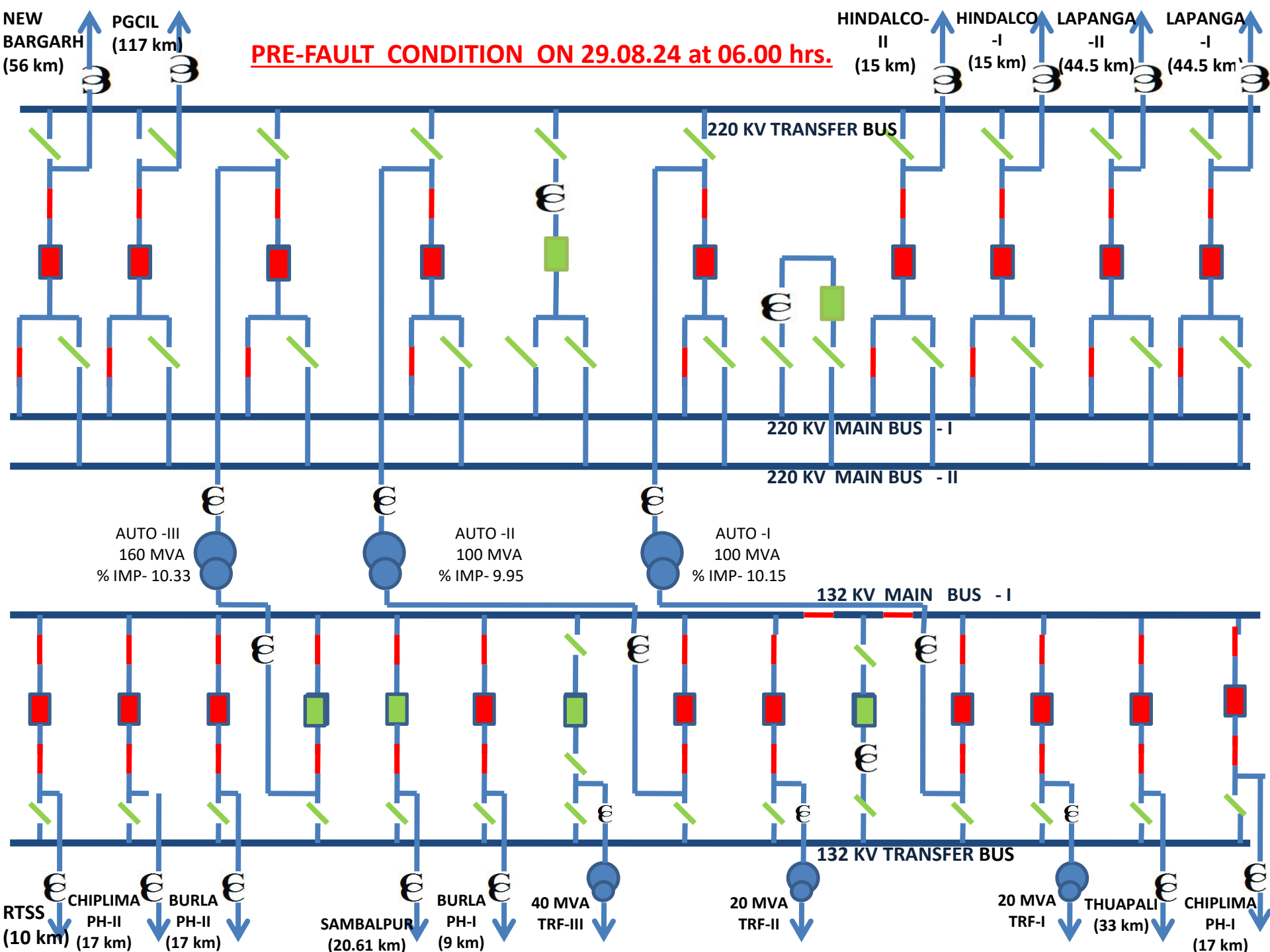


**Disturbance occurred at 220/132/33 KV Katapali GSS on
29.08.2024.**

Date 29.8.2024 ,Time- 06:52 Hrs.

Station : Katapali 220/132/33kV GSS

- 1. Total power failure occurred at 220/132/33 KV Gss, Katapali on above mentioned time stamp .**
- 2. During the event, Katapali was drawing power from Lapanga Gss(220 KV lines) , Burla PH & Chiplima PH (through 132 KV lines).**
- 3. Weather condition at katapali end : Heavy rain with Wind.**
- 4. A detail analysis has been done with the data available with OPTCL team.**



LOAD FLOW AT 06:00 Hrs for 220 KV Bus

FEEDER NAME	LOAD IN MW
220 KV LAPANGA-1	+ 49.2
220 KV LAPANGA -2	+ 49.2
220 KV HINDALCO-1	- 3
220 KV HINDALCO-2	- 3
220 KV PGCIL	- 54
220 KV NEW BARGARH	-90
220 KV AT-1	+31.6
220 KV AT-2	+31.6
220 KV AT-3	Ideal charged

LOAD FLOW AT 06:00 Hrs for 132 KV Bus

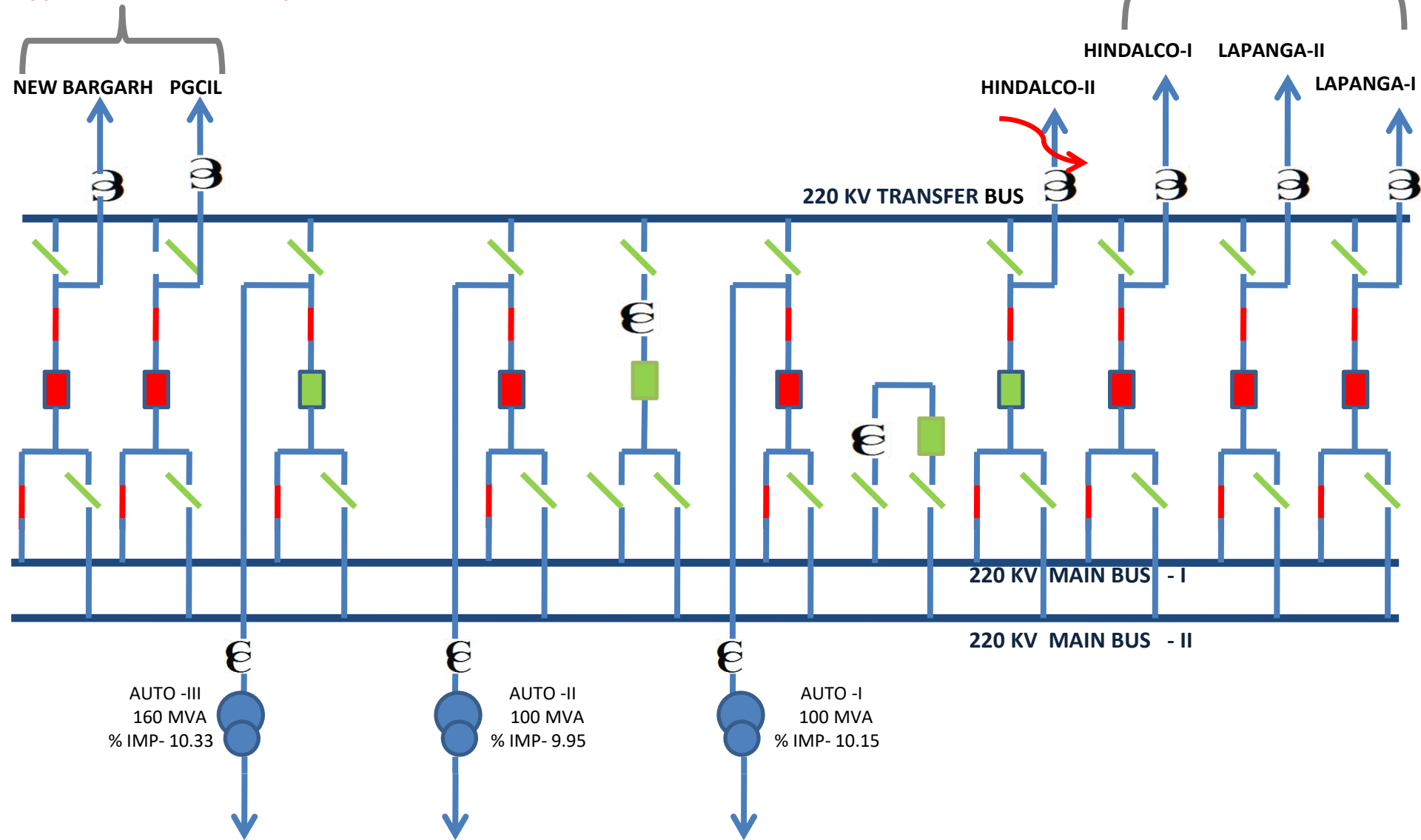
FEEDER NAME	LOAD IN MW
132 KV CHIPILIMA PH-1	+ 16
132 KV THUAPALI	-63.2
132 KV BURLA PH-1	+50.2
132 KV SAMBALPUR	Ideal charged
132 KV CHIPILIMA PH-2	+ 14
132 KV BURLA PH-2	+ 61
132 KV RTSS	5.1
132 KV Auto TFR-1	- 31.6
132 KV Auto TFR-2	- 31.6
132 KV Auto TFR-3	Not loaded
132 KV TFR-1	-6.2
132 KV TFR-2	-6.2
132 KV TFR-3	H/T

FAULT CONDITION ON 29.08.24 at 06.58 hrs

(220 KV SIDE)

Tripped at remote end only

Tripped at remote end only

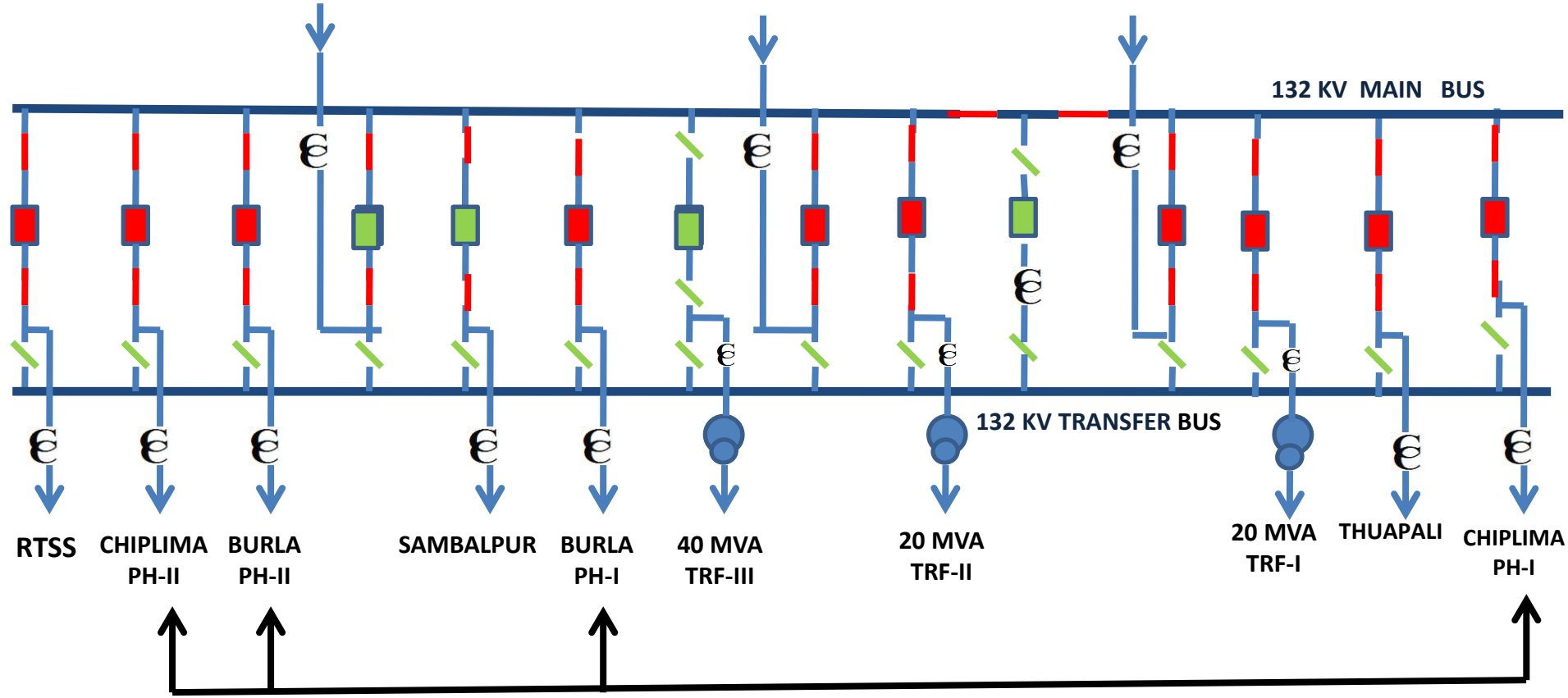


(132 KV SIDE)

132 KV side of
Auto -III

132 KV side of
Auto -II

132 KV side of
Auto -I



Tripped at remote end only

FAULT CONDITION ON 29.08.24 at 06.52 hrs

POST FAULT STATUS OF FEEDERS

FEEDER NAME	BREAKER STATUS
220 KV LAPANGA-1	Tripped at Lapanga end
220 KV LAPANGA -2	Tripped at Lapanga end
220 KV HINDALCO-1	Tripped at Hindalco end
220 KV HINDALCO-2	Tripped at both ends
220 KV PGCIL	Tripped at PGCIL end
220 KV NEW BARGARH	Tripped at New Bargarh end
220 KV AT-1	Did not trip
220 KV AT-2	Did not trip
220 KV AT-3	Ideal charged condition
132 KV CHIPILIMA PH-1	Tripped at Chipilima end
132 KV BURLA PH-1	Tripped at Burla PH end
132 KV CHIPILIMA PH-2	Tripped at Chipilima end
132 KV BURLA PH-2	Tripped at Burla PH end
132 KV RTSS	Did not trip
132 KV THUAPALI	Did not trip
132 KV SAMBALPUR	Was in Ideal charged condition from Sambalpur End

RELAY DATA

FEEDER NAME	LOCAL END	REMOTE END
220 KV LAPANGA-I	Did not tripped at Katapali end.	Distance relay Zone : 3 Picked Up Fault loop: R ph –Gnd Fault distance: 95 km Fault current: IR=2.4 kA, IY=0.289kA, IB=0.931 kA B/U Dir. E/F Optd with In= 1.5 Kamp (796 mSec).
220 KV LAPANGA –II	Did not tripped at Katapali end.	Distance relay Zone : 3 Picked Up Fault loop: R ph –Gnd Fault distance: 95 km Fault current: IR=2.4 kA, IY=0.289kA, IB=0.931 kA B/U Dir. E/F Optd with In= 1.0 Kamp (835 mSec).
220 KV HINDALCO-I	Did not tripped at Katapali end.	Islanded at Hindalco end with B/U & Undervoltage Setting.
220 KV HINDALCO-II	Back up operated IR=7.09kA, IY= 533A, IB=426.07A Fault duration: 737 ms	Tripped in differential line protection in 70 mSec.
220 KV PGCIL	Did not tripped at Katapali end.	DP operated Zone : 3 R-N Fault distance: 191 KM time > 800 mSec
220 KV NEW BARGARH	Did not tripped at Katapali end.	Fault current: Dir. E/f tripped. IR=1.38 kA, IY=0.450kA, IB=0.090 kA

FEEDER NAME	LOCAL END	REMOTE END
132 KV CHIPLIMA-I	Did not tripped at Katapali end.	Back up relay operated (Non directional) IN2>1 optd. Fault current: IR=509.213 A, IY=217.103 A, IB=181.168 A, IN=1.269A Duration : 55 mSec
132 KV CHIPLIMA-II	Did not tripped at Katapali end.	Back up relay operated (Non directional) IN2>1 optd. Fault current: IR=478.955 A, IY=232.689 A, IB=142.278 A, IN=2.045A Fault duration : 56 mSec
132 KV BURLA PH –I	Did not tripped at Katapali end.	Dir O/C OPTD. Fault current: IA: 681.7 A IB: 681.7 A IC: 692.2 A FD: 0.1 sec
132 KV BURLA PH -II	Did not tripped at Katapali end.	Fault location: -20.3 km C-N Fault current: 1.64 KA

Analysis of Fault:

1. Sequence of Tripping :

At 06.52 hrs :

- a. 132 KV Katapali-Burla PH-II has tripped first at remote end only with Distance relay optd.
- b. 132 KV Katapali-Burla PH-I has tripped at remote end only with O/C dir. Optd.
- c. Both 132 KV Katapali-Chiplima ckts has tripped at remote end with Non-directional E/f optd.

All above faults have recorded fault current in B-Ph.

d. After analyzing the power map of this region it is evident that fault was in between 132 Hirakud GIS to Lapanga Gss DC line .The DR data of other associated ckts are attached for reference.

2. As fault current of both 132 KV and 220 KV are different w.r.t Phases & time stamp also different , it is suspected that after 132 KV disturbance, line fault occurred in 220 KV system as explained below.

Analysis Continues..

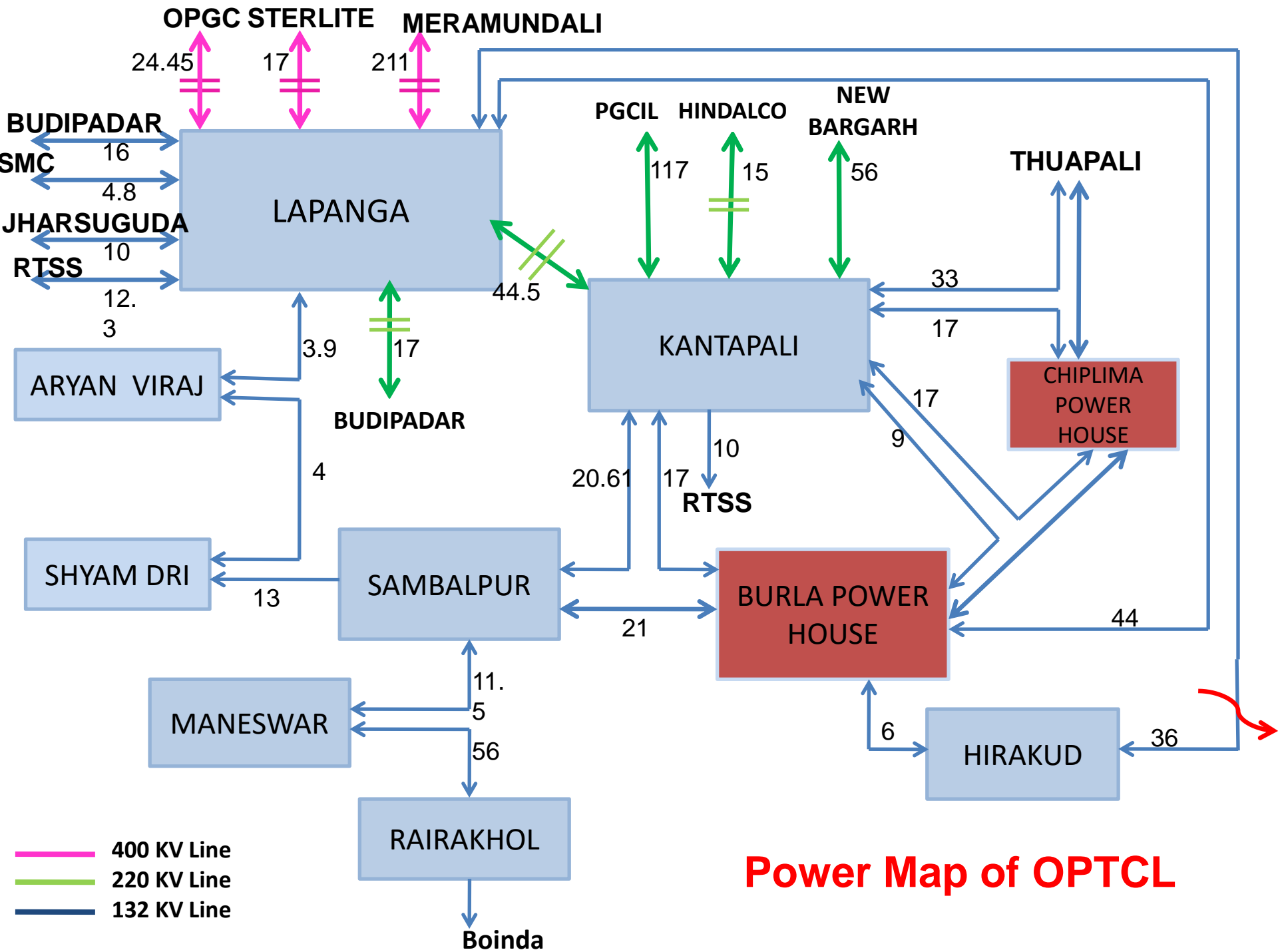
At 06.58 hrs :

3. Rph – gnd fault occurred in 220 KV Katapali – Hindalco-II line for which breaker at Hindalco end tripped in differential line protection (less than 100 mSec.) and breaker at Katapali end tripped with Back up protection in 737 ms (according to IDMT characteristic). As line differential is also present at Katapali end , it should have been also operated at katapali end but no tripping with the line differential rather tripped with O/C as explained.
4. Hindalco ckt – I tripped at remote end (islanding mode to isolate its system from fault). Setting for islanding at Hindalco is U/V with O/C (450 Amp)
5. 220 KV PGCIL tripped at remote end only (being the source) in Z-3 (as Z-3 timing is kept at 800 ms for PGCIL feeder).
6. 220 KV New Bargarh tripped at remote end only with Zone 3 .
7. Thus Total power failure occurred at Katapali End.

Relay details of 132KV Lapanga-Burla PH and 132 KV Lapanga – Hirakud feeders :

FEEDER NAME	AT LAPANGA END	AT BURLA PH END
132 KV LAPANGA – BURLA PH	Back up overcurrent Trip with DP picked up Fault distance- 80.2 km Fault loop: B ph –E IEp Dir trip win 559 mSec.	Distance relay operated Zone : 1 Fault loop: B ph –Gnd Fault distance: 7.9 km Fault current,If = 13.81 Inom

FEEDER NAME	AT LAPANGA END	AT HIRAKUD END
132 KV LAPANGA – HIRAKUD	Back up relay operated Fault current: IR=0.01 kA, IY=0.01kA, IB=1.76 kA IEp Dir trip win 557 mSec.	Distance relay operated Zone : 1 Fault loop: B ph –Gnd Fault duration: 55 ms Fault current: IR=550.928 A, IY=443.359A, IB=4.095 kA , IN=5.067 kA



Power Map of OPTCL

Remedial Actions:

1. Settings to be reviewed for ckts at Chiplima & Burla PH end along with CT star point (which side of CT is earthed in 2ndary).
2. Relay testing done for both the 220 KV Hindalco ckts at Katapali end.No abnormality observed.
3. Relay testing to be done for 220 KV Lapanga 01 & 02 at Katapali end for any abnormal tripping with respect to ERPC guidelines.
4. Relay testing at new Bargarh end to be done for any abnormal tripping.


ग्रिड-इंडिया
GRID-INDIA

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

पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / Eastern Regional Load Despatch Centre

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

**पूर्वी क्षेत्र के 220/132 केवी पूर्णिया उप-केन्द्र में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event at
 220/132 kV Purnea S/s of Eastern Region
 (To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss
 Event as per IEGC section 37.2 (f)
 (आई ई जी सी 37.2 (एफ) के अनुपालन में)**

Date(दिनांक):20-08-2024

1. Event Summary (घटना का सारांश):

At 15:50 Hrs on 01.08.2024, 220/132 kV Purnea (PG) S/s became dead due to tripping of 220 kV New Purnea-Purnea D/c and 220 kV Gazole-Dalkhola D/c (Gazole-Dalkhola-Purnea link) during a fault in downstream of 132 kV Purnea (PG). Load loss of around 110 MW occurred at Purnea.

2. Time and Date of the Event (घटना का समय और दिनांक): 15:50 hrs of 01.08.2024

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
				Bihar	Bihar
Pre-Event (घटना पूर्व)	49.94	26029 MW	22769 MW	463 MW	5352 MW
Post Event (घटना के बाद)	49.94	26024 MW	22659 MW	463 MW	5242 MW

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

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विद्युत उत्पादन इकाइयां जो बंद है)	220 kV Bus Coupler at Dalkhola was in open condition.
Weather Condition (मौसम स्थिति)	Inclement Weather Condition reported

6. Load and Generation loss (लोड और जेनरेशन हानि): Generation loss: NIL; Load loss: 110 MW.

7. Duration of interruption (रूकावट की अवधि): 00:23 Hrs

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

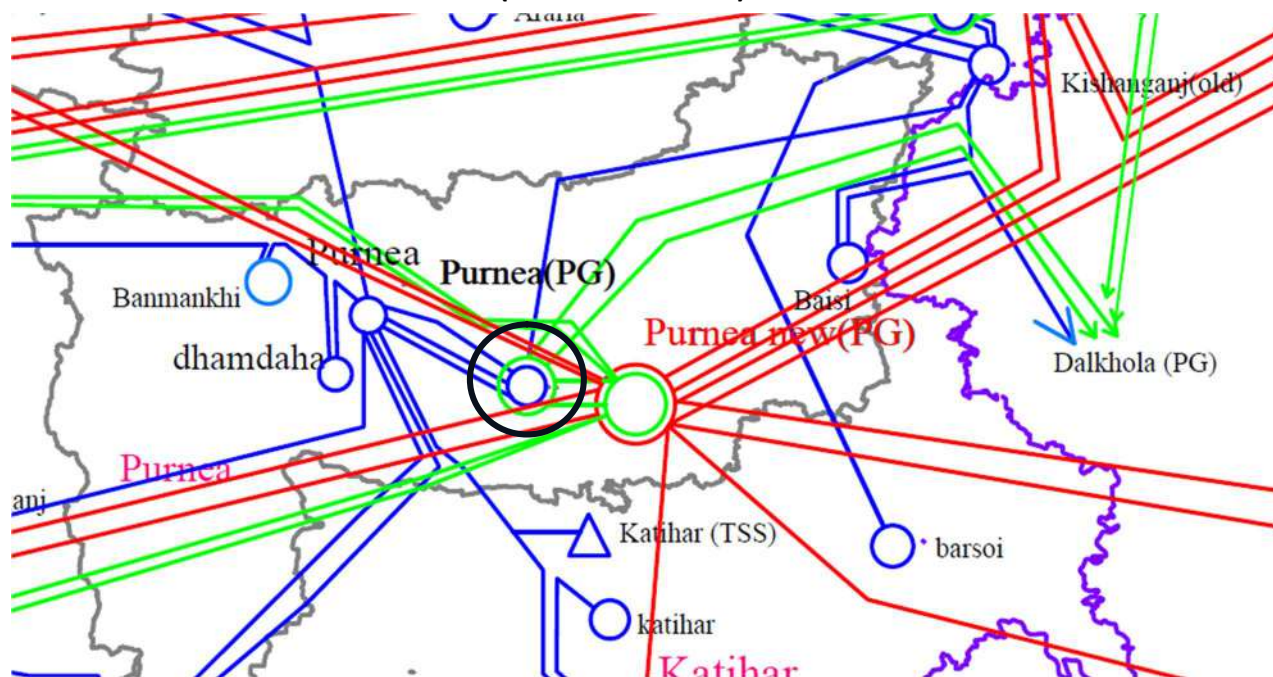


Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग):

क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220kV New Purnea-Purnea D/c	15:50:21.787	New Purnea: Back up O/c, E/f, Ib: 2.9 kA	Purnea: Didn't trip	16:13
2	132 kV Purnea(PG)-Purnea-2,3	15:50:22.890	Purnea (PG), B_N, Zone-3	Purnea: Didn't trip	17:00/17:06
3	220 kV Gazole-Dalkhola D/c	15:50:23.010	Gazole: B_N, Zone-3, Ib: 1.06 kA	Dalkhola: Didn't trip	17:12/17:15

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

- There was multiple tripping in the downstream of 132 kV Purnea S/s of Bihar between 15:40 Hrs-15:50 Hrs.

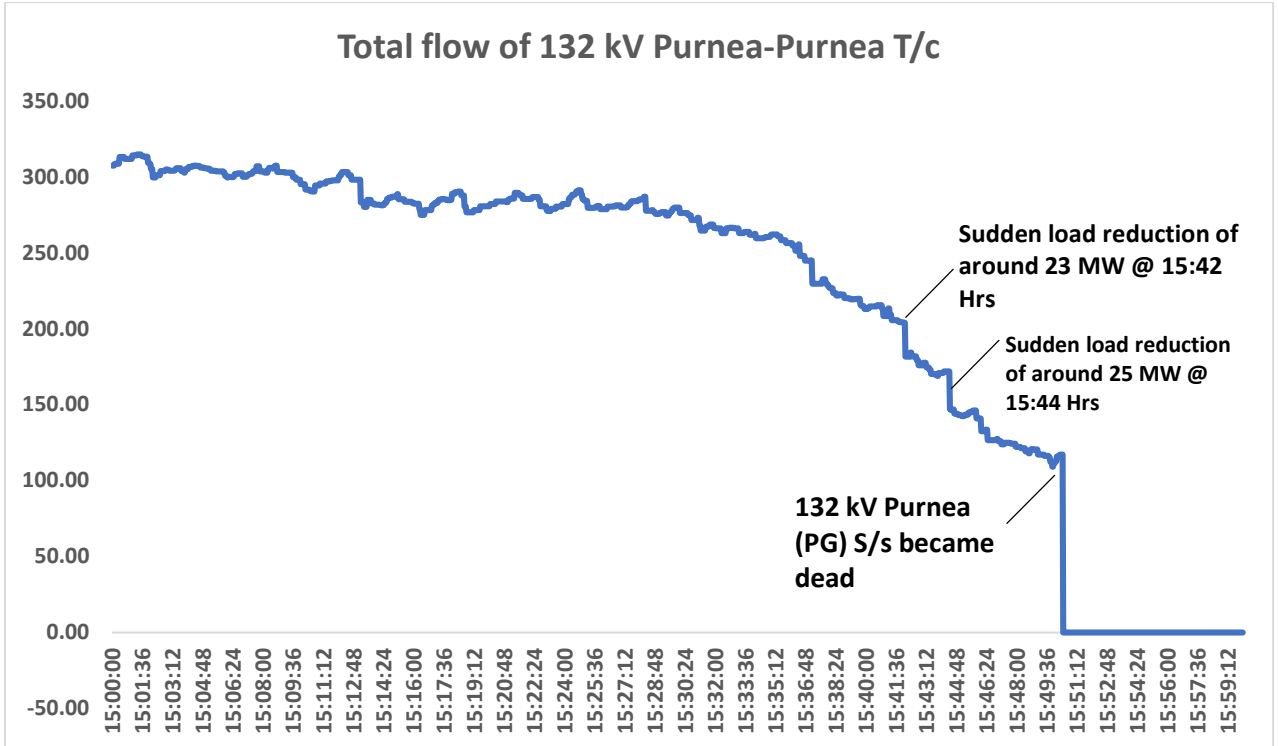


Fig 2: SCADA flow of 132 kV Purnea-Purnea T/c

- At 15:50:21.787 Hrs (**T+0**), a B_N fault struck in the downstream of 132 kV Purnea S/s. Due to paucity of PMU visibility and sufficient data, the exact location of fault couldn't be ascertained.
- At 15:50:22.141 Hrs (**T+350 msec**), 220 kV New Purnea-Purnea D/c tripped due to back Up O/c and E/f fault from New Purnea end.
- After tripping of 220 kV New Purnea-Purnea D/c, 220 kV Gazole-Dalkhola D/c started feeding the fault through 220 kV Gazole-Dalkhola-Purnea link.
- At 15:50:22.890 Hrs (**T+1150 msec**), 132 kV Purnea-Purnea-2 tripped from PG end in Zone-3.
- At 15:50:22.890 Hrs (**T+1150 msec**), 132 kV Purnea-Purnea-3 tripped from PG end in Zone-3. Back Up O/c and E/f protection also operated.
- At 15:50:23.010 Hrs (**T+1270 msec**), 220 kV Gazole-Dalkhola D/c tripped from Gazole end in Zone-3. Zone-3 at Gazole picked up after tripping of 220 kV New Purnea-Purnea D/c. This led to loss of supply at 132 kV Purnea (PG) S/s.

- 132 kV Purnea-Purnea-1 didn't trip from either end as in between Zone-3 dropped for around 120 msec and picked again. However, Back Up O/c Picked at Purnea (Bihar) at **T+1060 msec**. Direction of B_ph current also reversed at Purnea (R_Y_B convention).

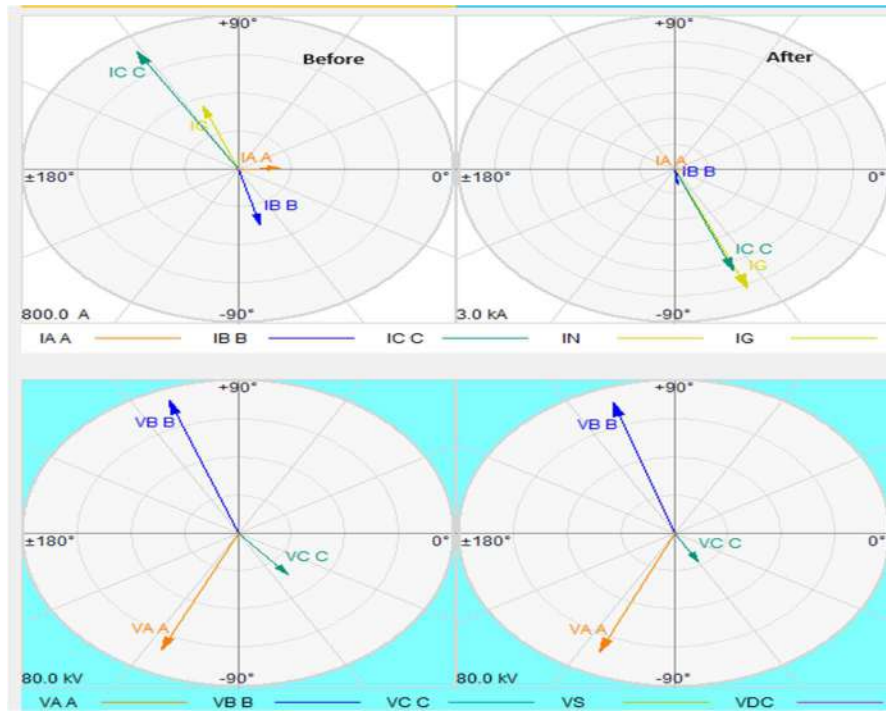


Fig 3: DR snapshot of 132 kV Prunea-Purnea-1 (Bihar end)

- This suggests that at this instance, fault developed in 132 kV Purnea-Purnea-1. All three 132 kV Purnea-Purnea feeders have differential protection scheme. Why differential protection didn't operate?

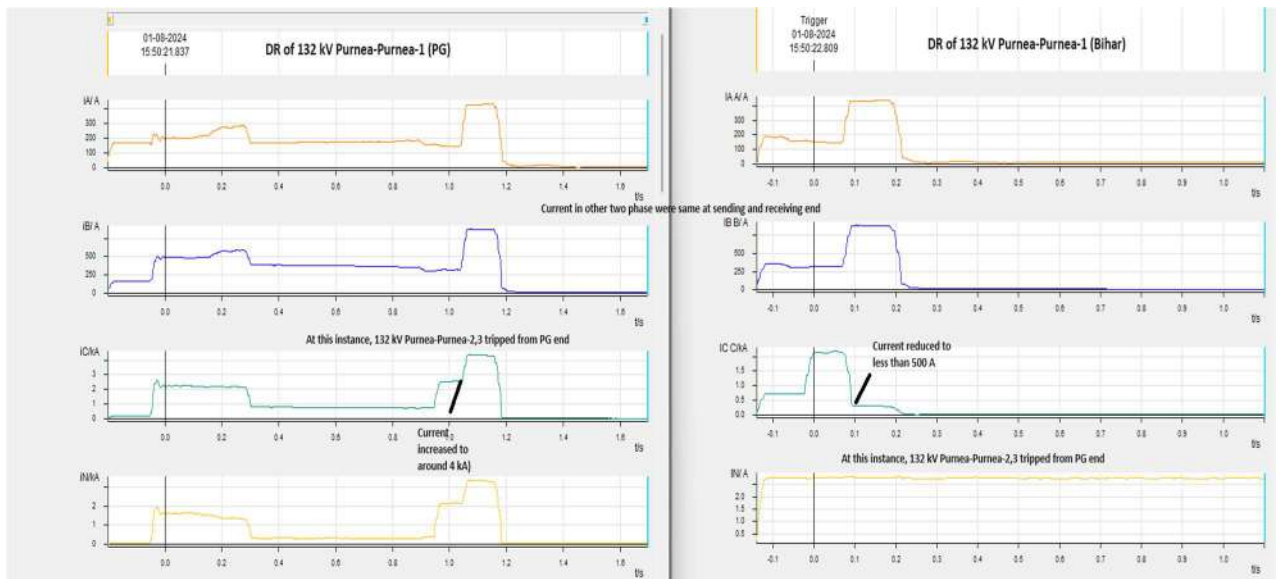


Fig 4: DR snapshot of 132 kV Prunea-Purnea-1 (Both ends)

- However, prior to the suspected fault in 132 kV Purnea-Purnea-1, DRs are suggestive of fault in 132 kV Purnea (Bihar) S/s.
- It was also seen that there were different fault currents in each circuit of 132 kV Purnea-Purnea T/c with 132 kV Purnea-Purnea-2 having highest fault current of around 7 kA in the beginning. This is because at Purnea (PG) bus configuration is as below:

Bus-1: 220/132 kV ICT-1, Purnea-1, Purnea-3

Bus-2: 220/132 kV ICT-2,3 and Purnea-2

- It is gathered that just at the beginning of fault 132 kV Bus coupler might have also tripped.
- Report received from Power Grid ER-1 is attached at Annexure 3

PMU Snapshot:

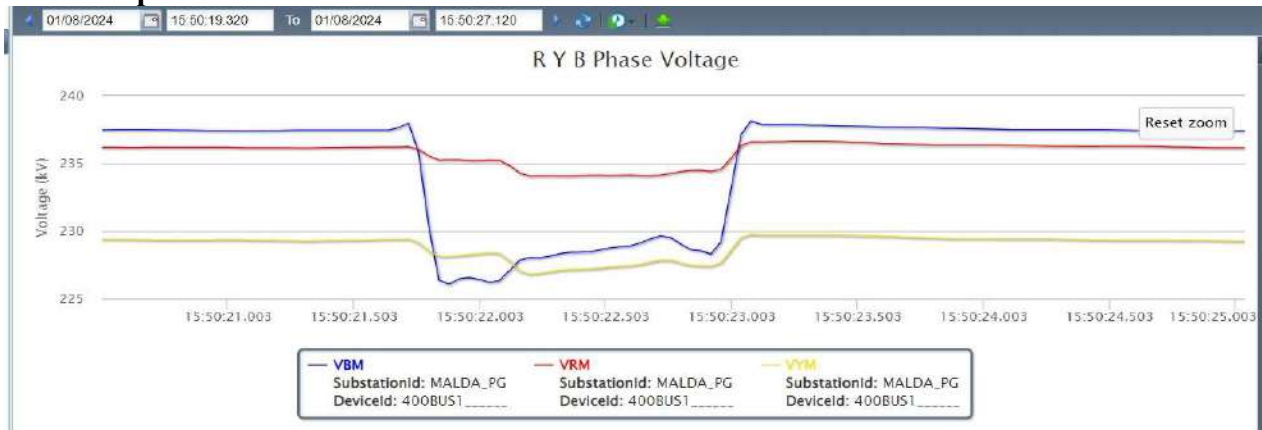


Figure 2: PMU Voltage snapshot of 400/220 kV New Purnea S/S

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

- Tripping of 220 kV New Purnea-Purnea D/c on back up O/c and E/f was not desirable. Its setting may be reviewed and co-ordinated with Back Up O/c setting of 220/132 kV ICTs. **PG may review the settings.**
- Zone-3 setting of 220 KV Gazole-Dalkhola also needs to be co-ordinated with 220 kV Dalkhola-Purnea and 220/132 kV ICTs at Purnea. **WBSETCL/PG may co-ordinate.**
- 132 kV Purnea-Purnea T/c have differential protection with distance protection as back up then distance protection should not have operated/picked up at Purnea (PG) end if differential protection was in healthy state. **PG/BSPTCL may check and confirm.**
- Differential protection didn't operate in 132 kV Purnea-Purnea-1. **PG/BSPTCL may check and confirm.**

- DR of 132 kV Purnea-Purnea-3 is not time synchronized at PG end. **PG to take necessary action.**

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	BSPTCL, PG ER-1, WBSETCL

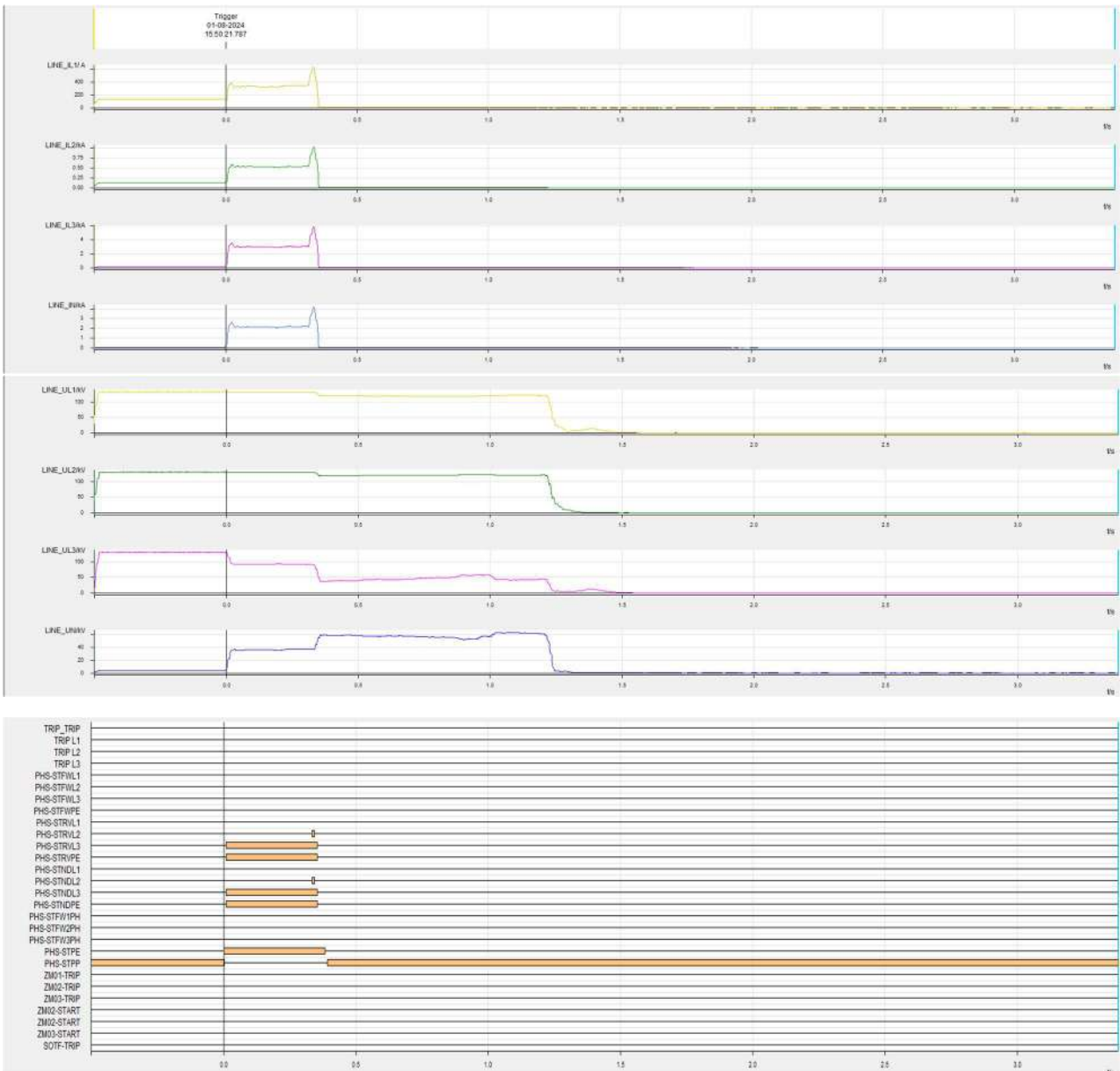
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु): Nil

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

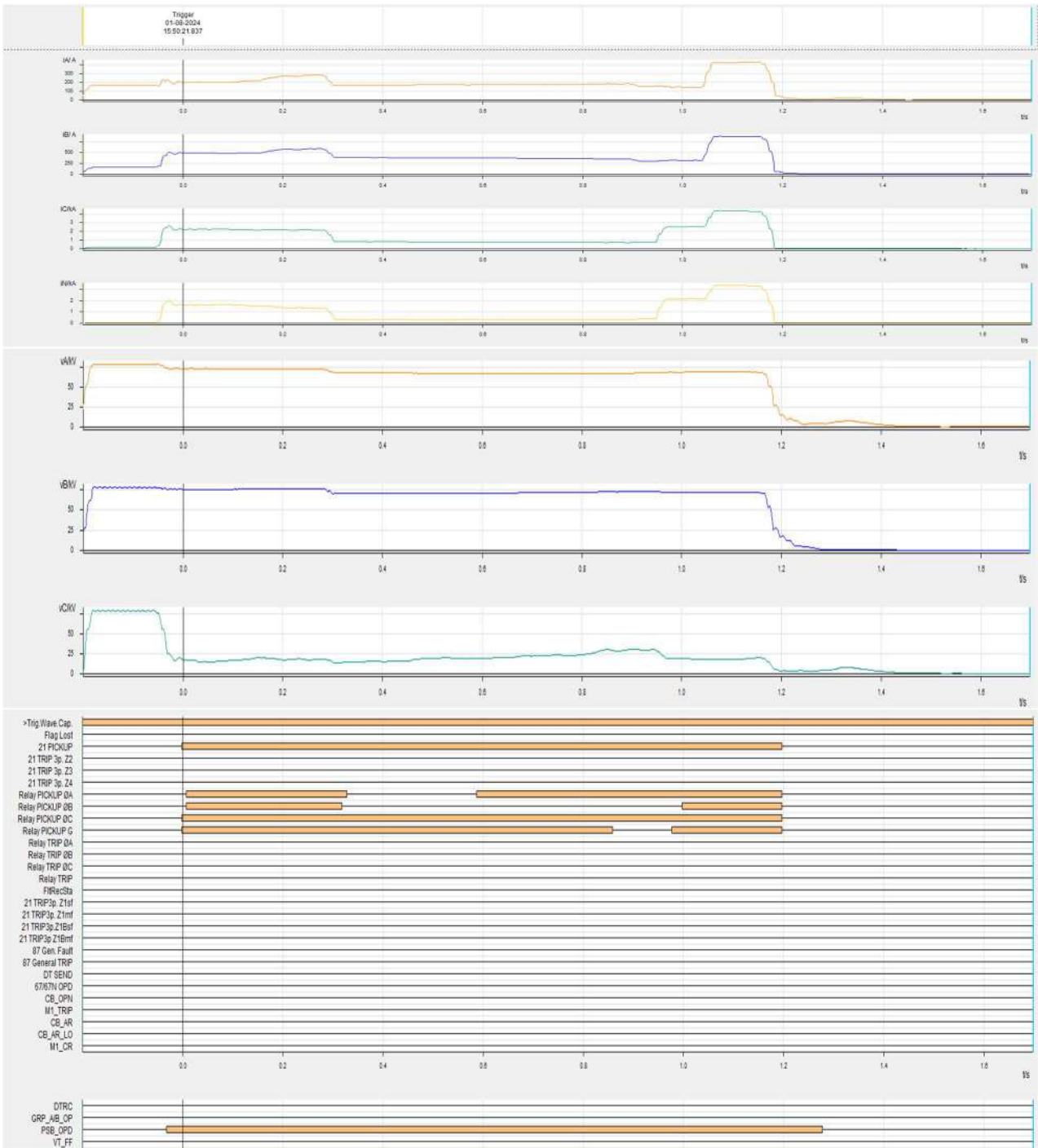
TIMESTAMP	STATION	DESCRIPTION	STATUS
15:50:22.108	NEW_PURNEA	220_PURNE_PG_2_CB	Open
15:50:22.129	NEW_PURNEA	220_PURNE_PG_1_CB	Open
15:50:22.897	PURNE_PG	132_PURNN_BH_2_CB	Open
15:50:22.898	PURNE_PG	132_PURNN_BH_3_CB	Open

Annexure 2:

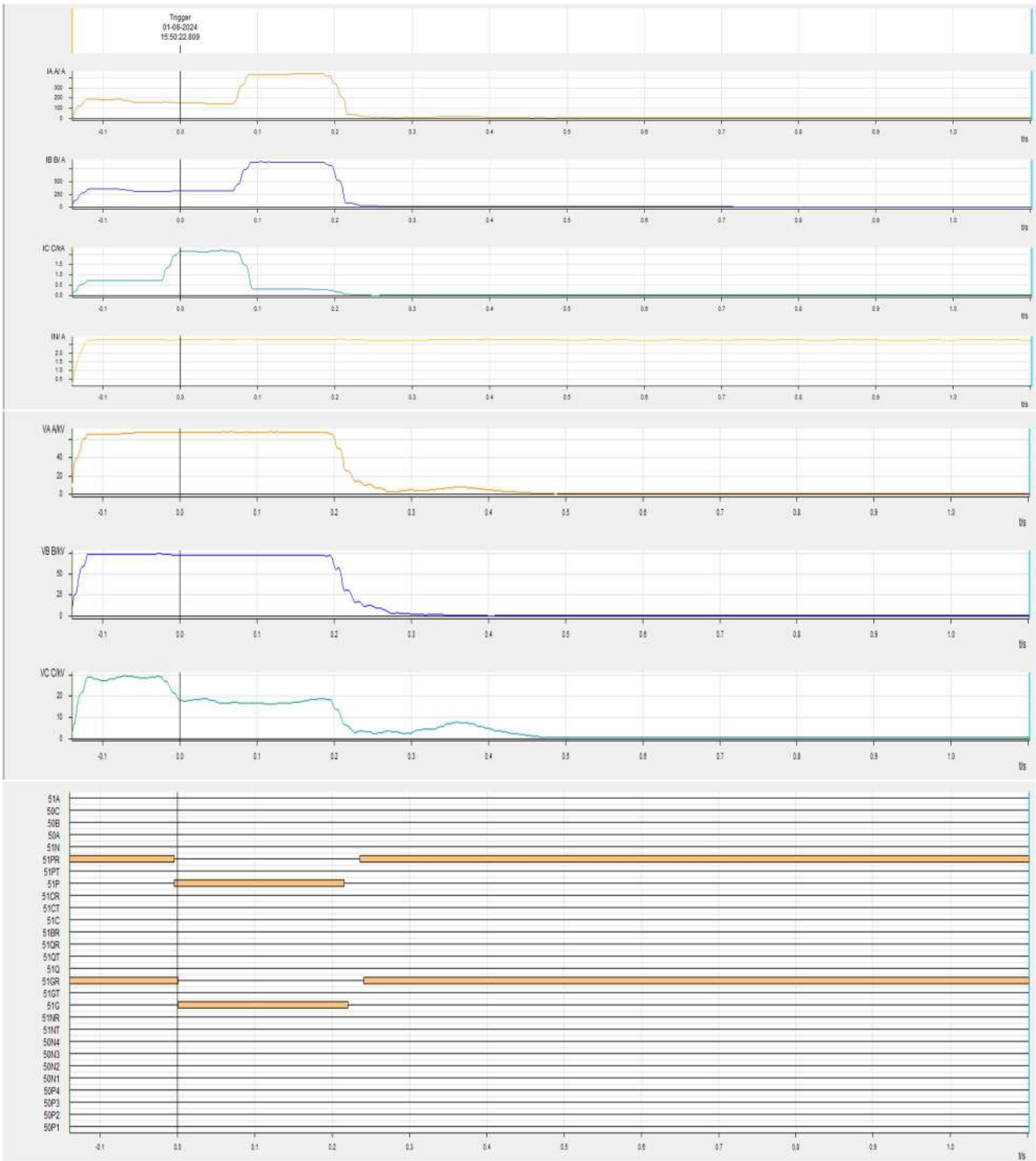
DR of 220 kV New Purnea-Purnea-1 (New Purnea)



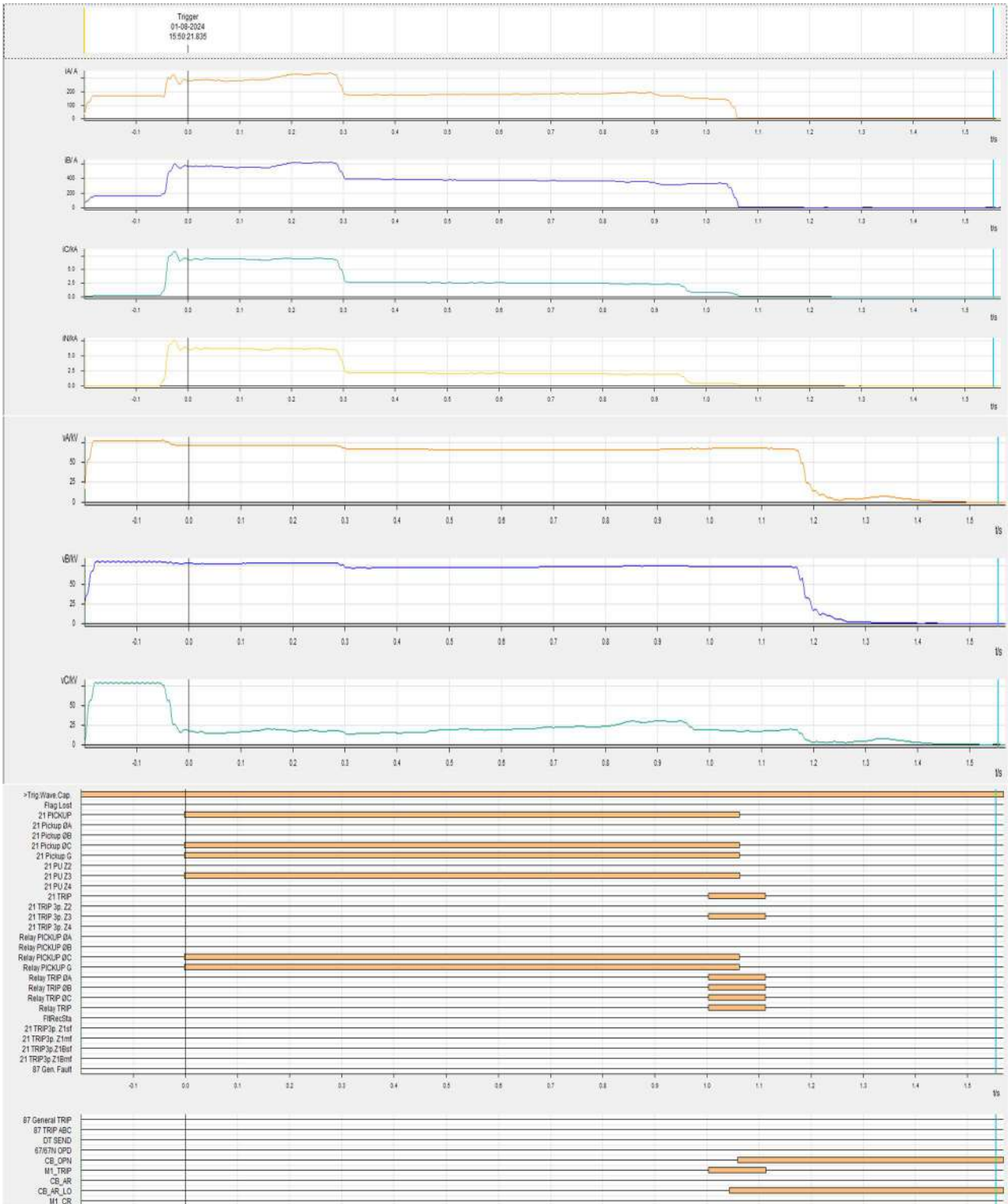
DR of 132 kV Purnea-Purnea-1 (PG)



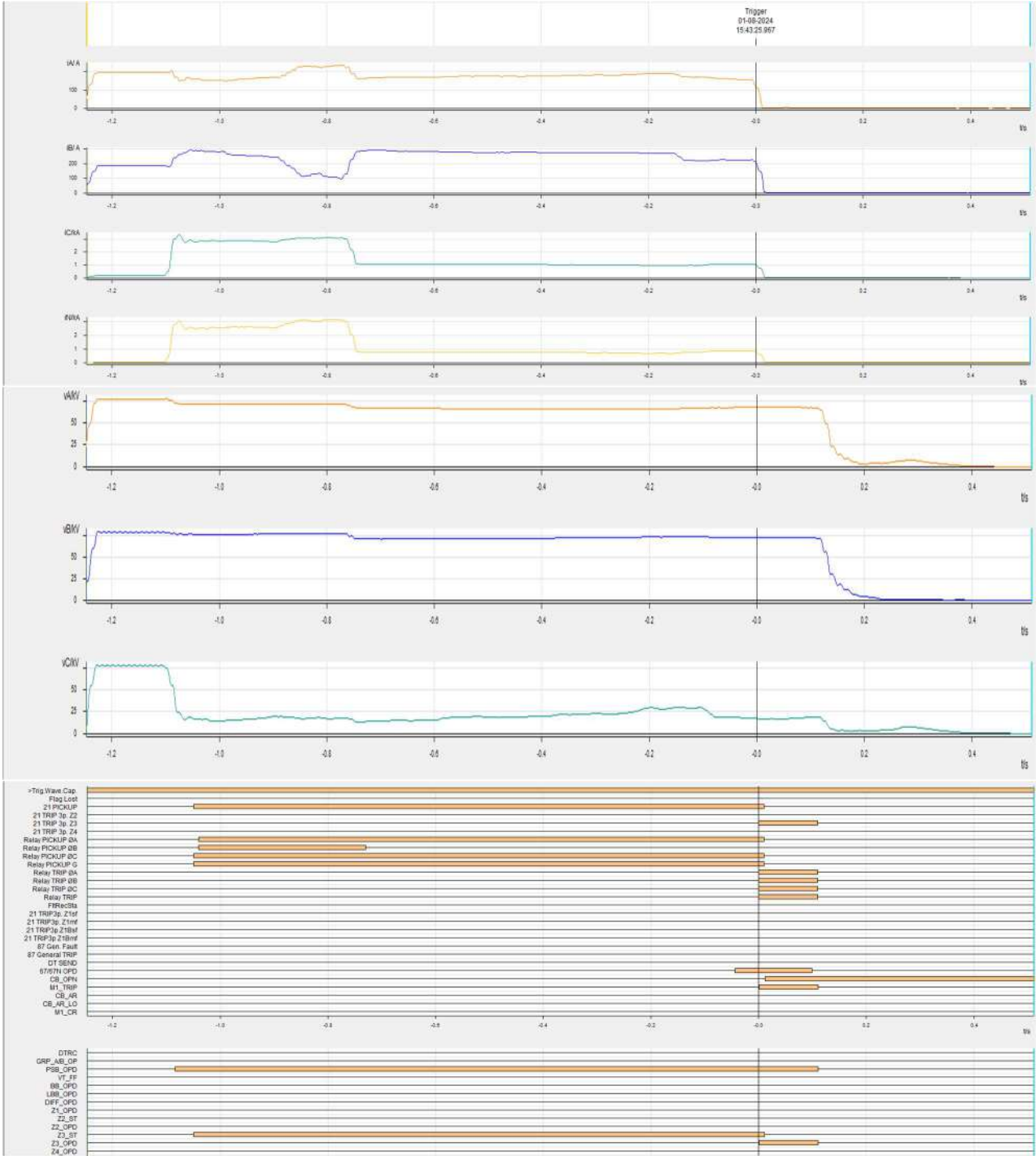
DR of 132 kV Purnea-Purnea-1 (BSPTCL)



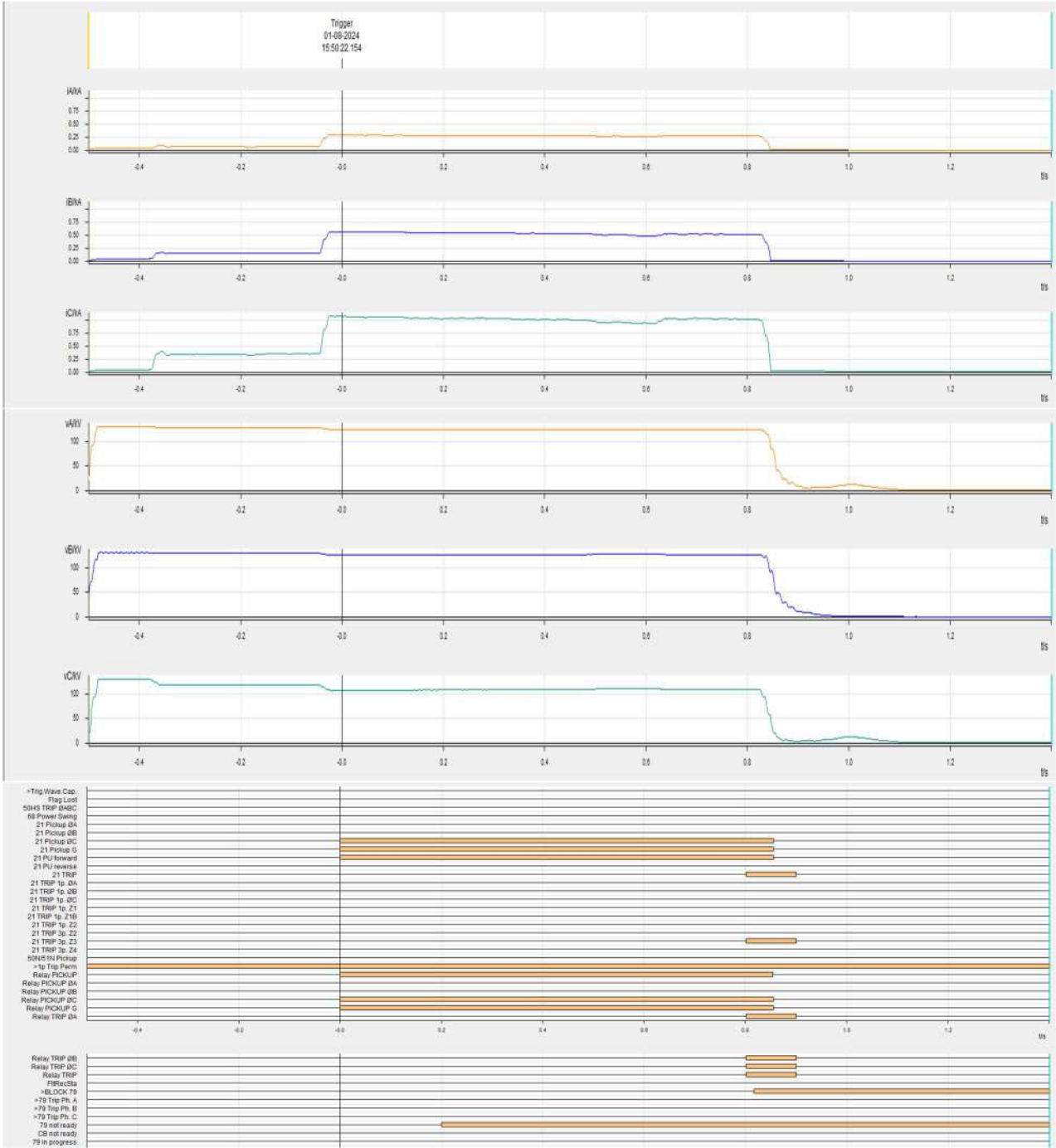
DR of 132 kV Purnea-Purnea-2 (PG)



DR of 132 kV Purnea-Purnea-3 (PG)



DR of 220 kV Gazole-Dalkhola-1 (Gazole)

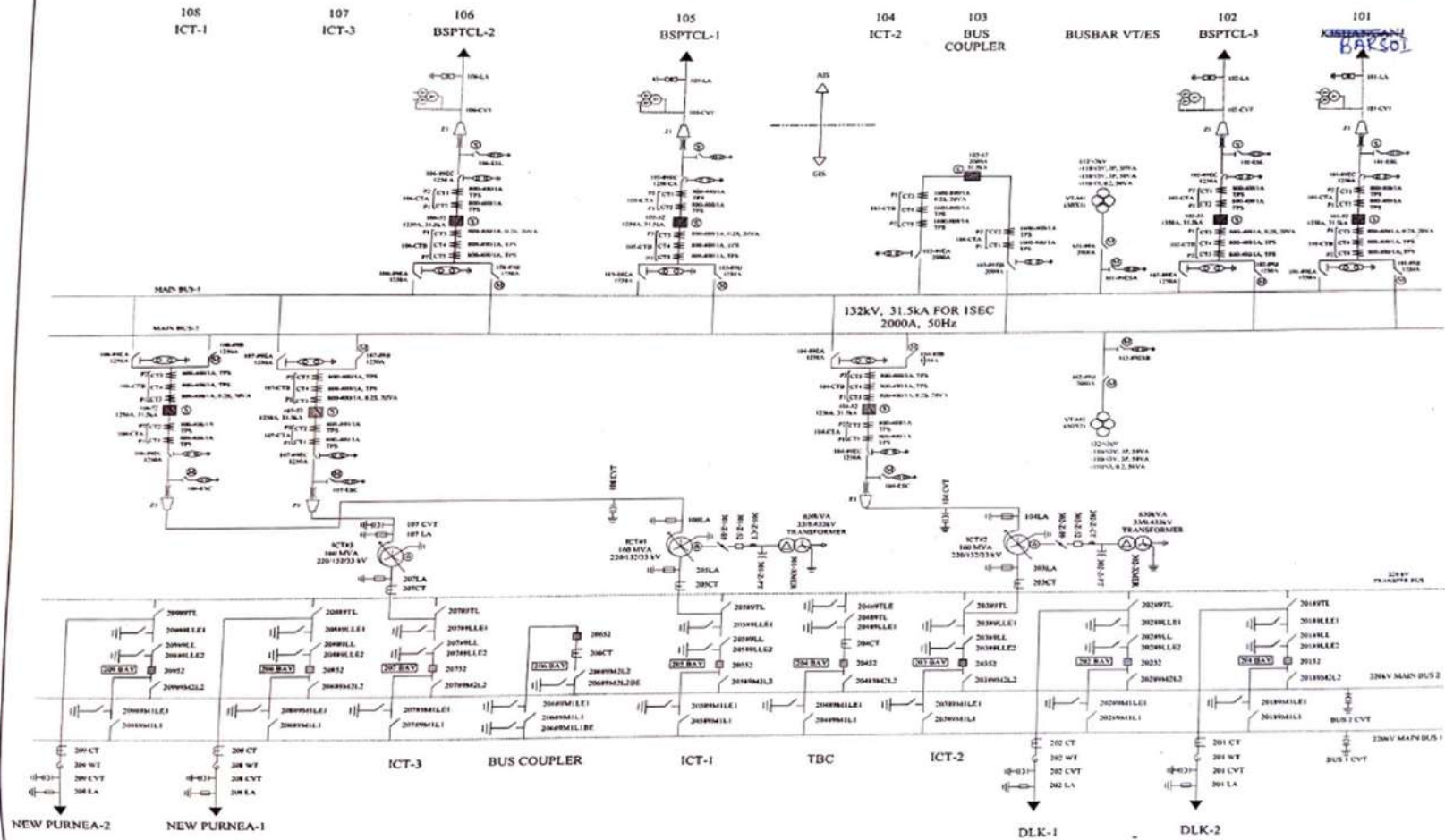


Report on Tripping of Multiple Feeders at 220/132kV Purnea SS on 01.08.24 at 15:50 Hrs



पावरग्रिड
POWERGRID

POWER GRID CORPORATION OF INDIA LIMITED
SINGLE LINE DIAGRAM, 220/132kV PURNEA
SUB-STATION, ER-1 BIHAR



Sequence of Events

220kV Purnea – Purnea -2 Line – Tripped only at New Purnea End at 15:50:21:940 Hrs
Due to Backup O/C & E/F Optd

220kV Purnea – Purnea -1 Line – Tripped only at New Purnea End at 15:50:21:960 Hrs
Due to Backup O/C & E/F Optd

132kV Purnea- Purnea-2 Line- Tripped at Purnea End at 15:50:22:897 Hrs due to Zone 3
Protn Optd

132kV Purnea- Purnea-3 Line- Tripped at Purnea End at 15:50:22:898 Hrs due to Zone 3
Protn Optd and Backup O/C & E/F Protn Optd.

Other Events

132kV Purnea- Purnea-1 : Backup O/C & E/F Protn Pickup

220kV Purnea- Dalkhola-1 Line – Not Tripped at Purnea End

220kV Purnea- Dalkhola -2 Line – Not Tripped at Purnea End

220/132kV ICT-1 /2 /3 – Not Tripped at Purnea End

220kV Dalkhola- Gazole – Tripped from Gazole End (Purnea- Dalkhola- Gazole)

Since all the sources got tripped, both the 220kV Bus Voltages at Purnea become dead.

As information received from BSPTCL, actual fault was occurred in 33 kV downstream feeder of 132 kV Purnea (BSPTCL) End due uprooting of Pole and the fault was not cleared from their end. Further fault was also reported in 132kV Purnea-Triveniganj Line.

Due to continues feeding of fault current from Upstream level i.e., 220kV Purnea, 220kV New Purnea and 220kV Gazole (WB) was operated by Backup Protections.

220 kV Bus at Purnea was charged at 16:13 Hrs.

Tripping of 220kV Purnea- New Purnea-1 & 2 Lines at New Purnea End

Main : Line Differential ABB Make RED670 - Not operated

Both the Lines were tripped due to Backup O/C & E/F Relay operated (Backup)

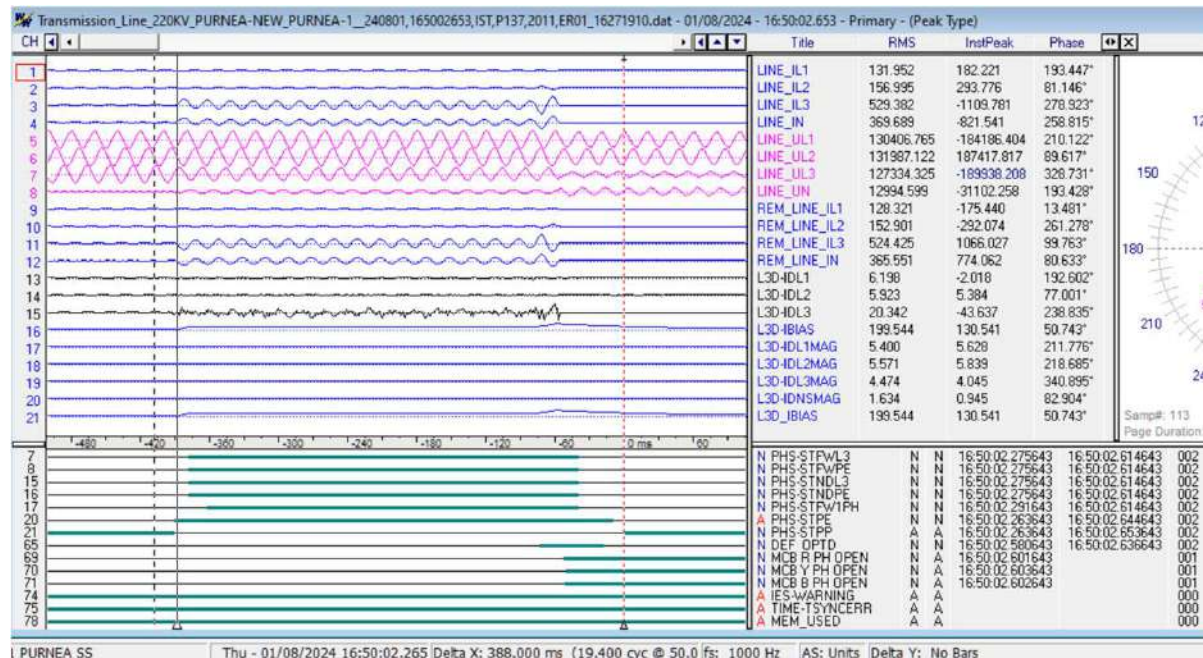
Make & Model: Alstom CDD Type

Settings: O/C – Pickup – 1A (800/1), TMS – 0.05 Sec,

E/F – Pickup – 0.2A , TMS- 0.15 Sec

Fault Current: Line-1 – 2.9kA , Line -2 – 2.9kA

Calculate Time - **0.352 Sec** , Actual Operated Time - **0.332 Sec** from New Purnea End. Further the line was in charged condition from Purnea End.



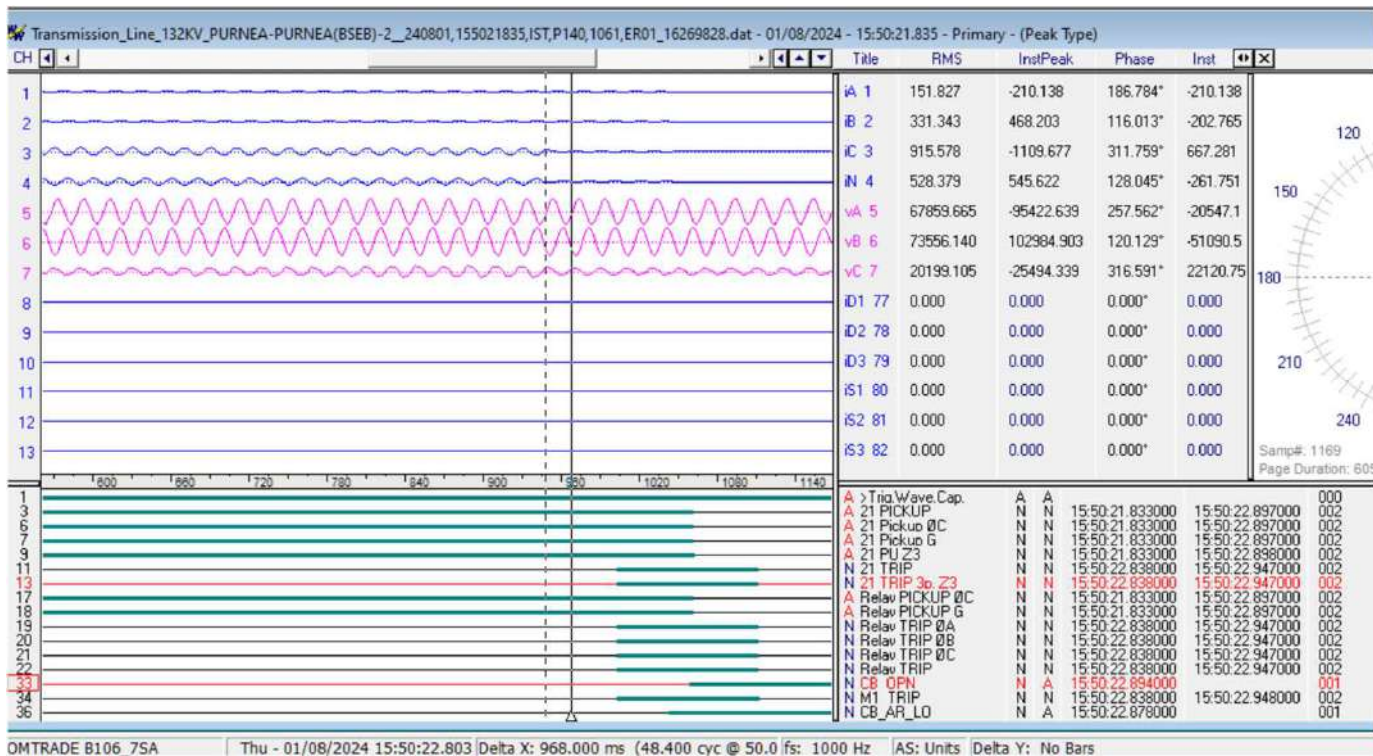
Tripping of 132kV Purnea- Purnea- 2 Line at Purnea End

Purnea-2 Line was tripped due to Zone -3 Protn Optd in Main Line Differential Relay.

Fault Current: 0.79kA, Fault Distance- 5.3kM. Zone-3 Settings: 1.0 Sec and optd time: **1.01 Sec**

Also, it is observed that Backup O/C & E/F Protection got picked up.

As per DR Observation, Initially the fault was detected as 7.0kA and after the tripping of 220kV Purnea – New Purnea 1 & 2 Line after 0.3 Sec the fault current reduced to 2.6kA.



Tripping of 132kV Purnea- Purnea- 3 Line at Purnea End

Purnea-3 Line was tripped due to Zone -3 Protn Operated in Line Differential Relay (Main) and Backup O/C & E/F Protection (Backup)

Main-1: Fault Current: 0.84kA, Fault Distance- 81.8kM.

Zone-3 Settings: 1.0 Sec and operated time: 1.05 Sec

Backup Protection: Fault Current: 1.06kA, (Setting: 67N- Pickup- 0.2A, TMS- 0.3 Sec)

E/F Calculated Time: 1.02 Sec and Operated Time: 1.08 Sec.

As per DR Observation, Initially the fault current was detected as 2.3kA and after the tripping of 220kV Purnea – New purnea 1 & 2 Line after 0.3 Sec the fault current changed to 0.7KA.

Major Observation and Conclusion

The Actual fault was occurred in 132kV & 33kV Feeder at downstream of 132kV Purnea BSPTCL end and the fault was not cleared.

As the fault current was continuously fed from the sources, 220kV Purnea- New Purnea 1 &2 lines Backup O/C & E/F protection operated as per settings adopted.

The Fault was also detected in 132kV Purnea – Purnea 1,2,3 Lines, Only 2 & 3 Ckts are tripped and Ckt 1 was under picked up condition. Meanwhile 220kV Purnea- Dalkhola also tripped (already one source was tripped and only Dalkhola source was available) by 1.2 Sec the Ckt -1 E/F Protection got Reset.

Once the all sources (New Purnea and Dalkhola) of 220kV Purnea tripped from upstream level led to entire Bus outage at 220kV Purnea Station.

It is proposed that the settings of O/C and E/F Fault Protection in 132kV Purnea- Purnea (BSPTCL) feeders may be advanced and 220kV Purnea – New Purnea Feeders may be increased to provide the downstream level to clear the fault.



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GRID-INDIA

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

पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / Eastern Regional Load Despatch Centre

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




पूर्वी क्षेत्र के 220/132 केवी दरभंगा उप-केन्द्र में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event at 220/132 kV Darbhanga S/s of Eastern Region
(To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f))
(आई ई जी सी 37.2 (एफ) के अनुपालन में)

Date(दिनांक):16-08-2024

1. Event Summary (घटना का सारांश):

At 17:59 hrs on 01.08.2024, a fault stuck B phase of 220kV Darbhanga (DMTCL) – Darbhanga -1 closer to BSPTCL end. Due to failure of opening of Circuit Breaker at Darbhanga end all other circuit connected to Darbhanga (BSPTCL) opened from remote end in Zone-2 time which led to total power failure at 220kV Darbhanga (BSPTCL) S/s. Total load loss of around 80 MW was reported. Power was extended through 220 kV Darbhanga – Mushari–2.

2. Time and Date of the Event (घटना का समय और दिनांक): 17:59 hrs of 01.08.2024

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

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

5. Report submitted by Utility on: 13-08-2024

6. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
				Bihar	Bihar
Pre-Event (घटना पूर्व)	50.18 Hz	28309 MW	22666 MW	413 MW	4922 MW
Post Event (घटना के बाद)	50.18 Hz	28309 MW	22586 MW	413 MW	4842 MW

**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)	NA
Weather Condition (मौसम स्थिति)	Inclement weather reported

7. Load and Generation loss (लोड और जेनरेशन हानि): Generation loss: NIL; Load loss: 80 MW.

8. Duration of interruption (रूकावट की अवधि): 00:35 Hrs

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

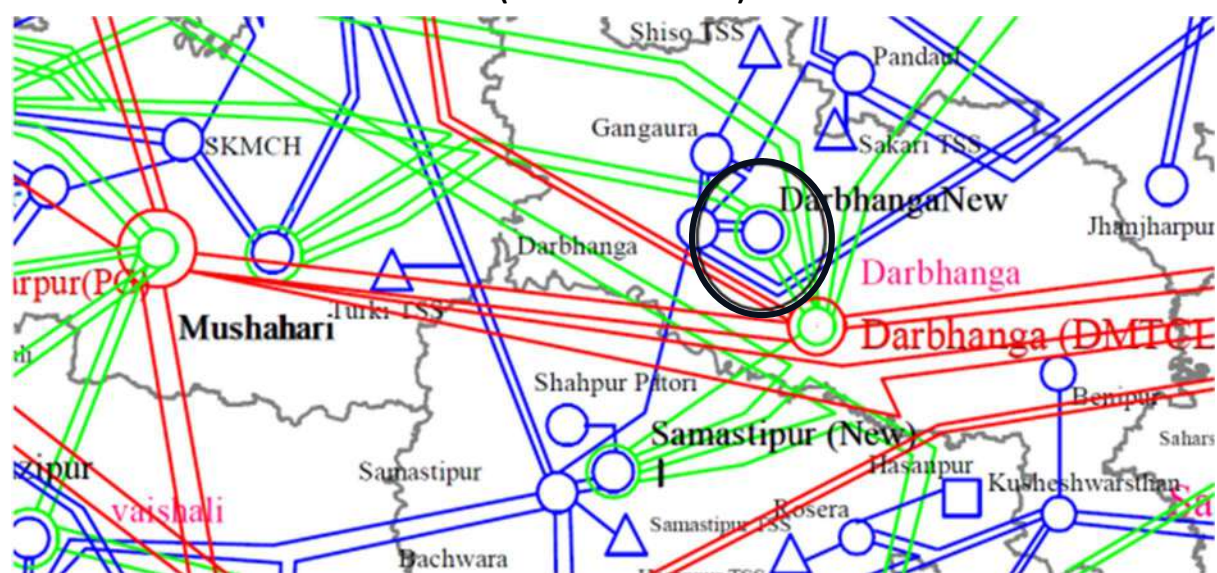


Figure 1: Network across the affected area

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

11. Major Elements Tripped (प्रमुख ट्रिपिंग)

क्र०सं०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220kV Darbhanga-Darbhanga (DMTCL)-1	17:59	Darbhanga: B_N, Zone-1, FC- 8.751 kA; Breaker didn't open	DMTCL – B_N, Z-2, FD-3.26 KM, FC-7.8 KA	20:49
2	220kV Darbhanga-Darbhanga (DMTCL)-2		Darbhanga : B_N, Zone-4, didn't trip	DMTCL – B_N, Z-2, FD-4.42 KM, FC- 6.2 KA	20:40
3	220 kV Darbhanga-Mushari-1		-	Mushari -B_N, Zone-2, 2.51 KA	18:45
4	220 kV Darbhanga-Mushari-2		Darbhanga: B_N, Zone-4, 1.6 kA	Mushari -B_N, Zone-2, FC – 1.2 KA	18:34

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

- At 17:59 Hrs a B_N fault struck 220kV Darbhanga (DMTCL)–Darbhanga -1 which was sensed in Zone 1 at Darbhanga (BSPTCL) end as per Event Recorder, but circuit breaker did not open at Darbhanga (BSPTCL), While at DMTCL end fault was sensed in Zone -2.
- At BSPTCL end, Zone-4 picked up momentarily in 220 kV Darbhanga (DMTCL)-Darbhanga-2 and then DEF Rev picked up. Since bus bar protection is not available at BSPTCL end. Zone-4 time delay was kept at 250 msec. Still breaker didn't open as Zone-4 remained high for less than 50 msec.
- Since the fault wasn't cleared from BSPTCL end, all connected circuits at the 220kV Darbhanga (BSPTCL) tripped from remote end in Zone-2 time delay of around 400 msec to clear the fault, resulting in total power failure of 220 kV Darbhanga (BSPTCL) leading to a Load loss of 80 MW.
- At 18:34 Hrs, Power was extended through 220 kV Darbhanga-Mushari-2.

PMU Snapshot:

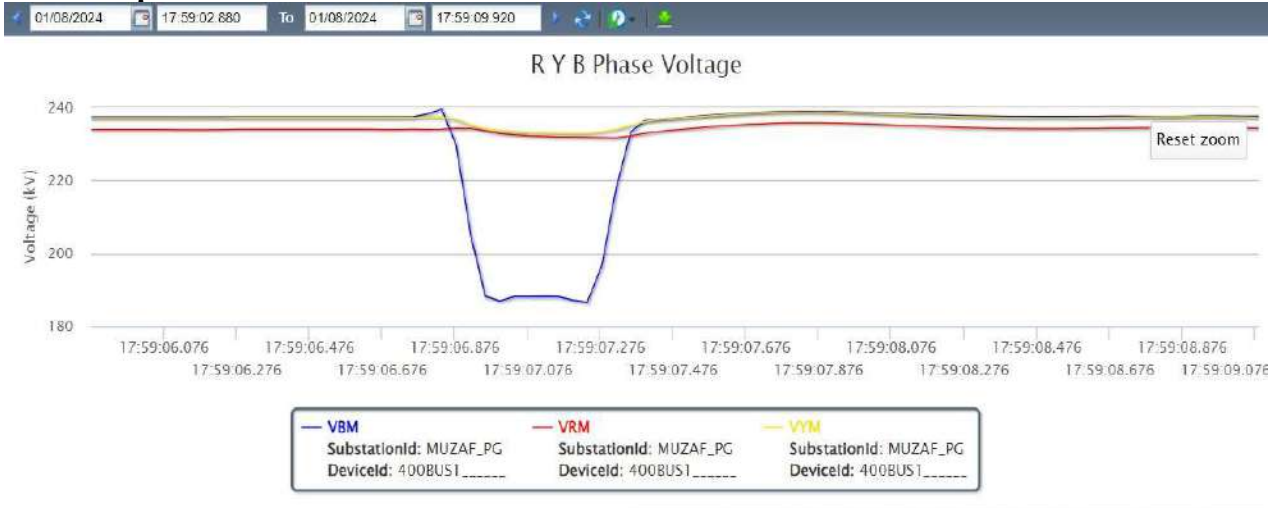


Figure 2: PMU Voltage snapshot of 400/220 kV Muzaffarpur S/S

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

- Even though the fault was detected in Zone 1 at the Darbhanga end, the Circuit Breaker failed to trip (operate) to clear the fault. Carrier signal was also not sent to remote end and line from DMTCL end in Zone-2. Reason for non-opening of breaker and carrier signal not being sent from BSPTCL end may be analyzed.

- In 220 kV Darbhanga (DMTCL)-Darbhanga-2, fault was seen in reverse Zone-4 for around 50 msec only. Later DEF (rev) picked up. The reason for Drop of Zone-4 may be investigated and reverse DEF may be disabled.
- DR channels are not configured properly at BSPTCL end, even when the fault was recorded in Zone 1, the corresponding signal did not trigger (become high).
- DRs at Darbhanga (BH) are not time synchronized.

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

15. 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	BSPTCL

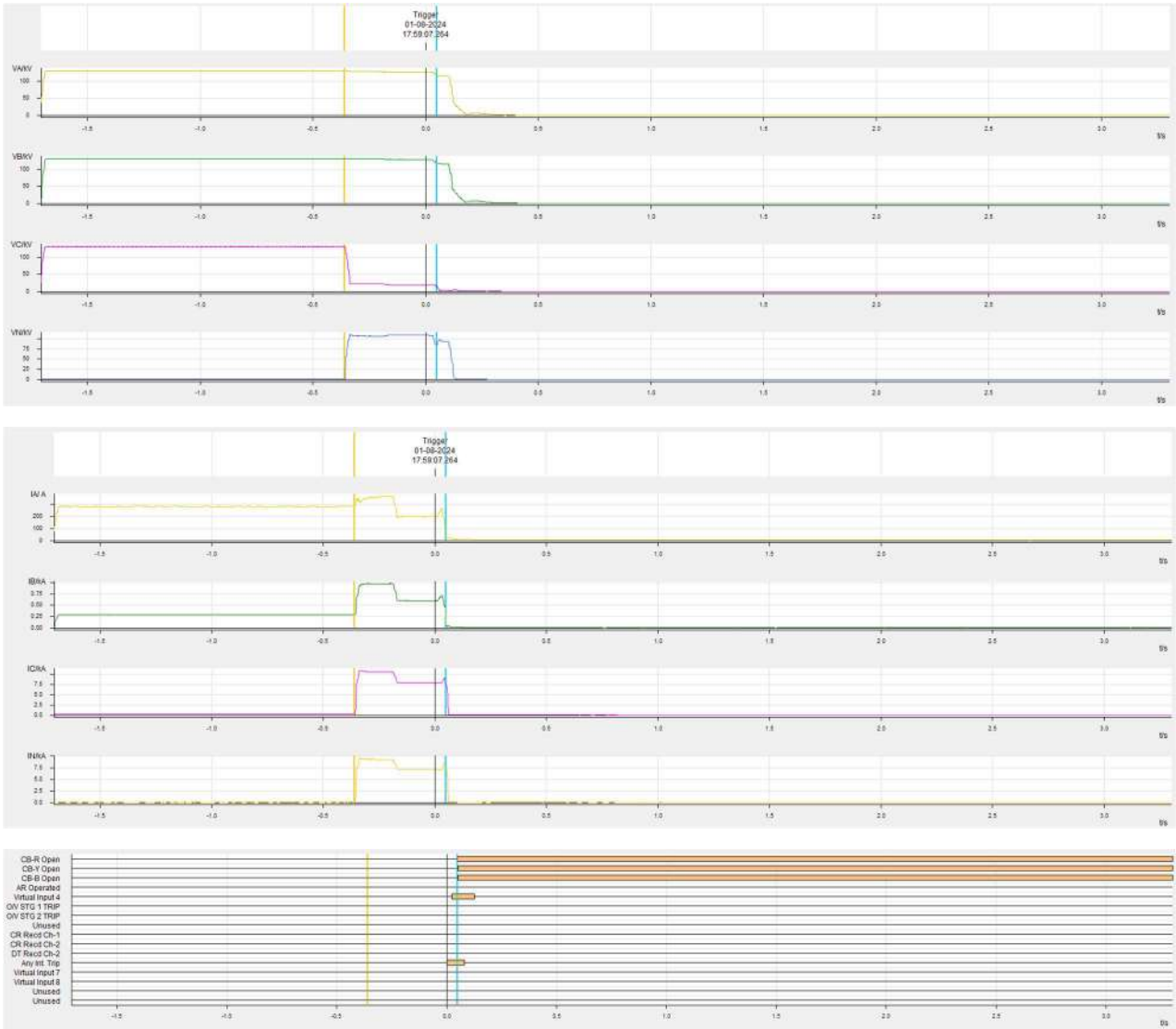
16. Key Lessons Learnt (प्रमुख अधिगम बिंदु): Nil

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

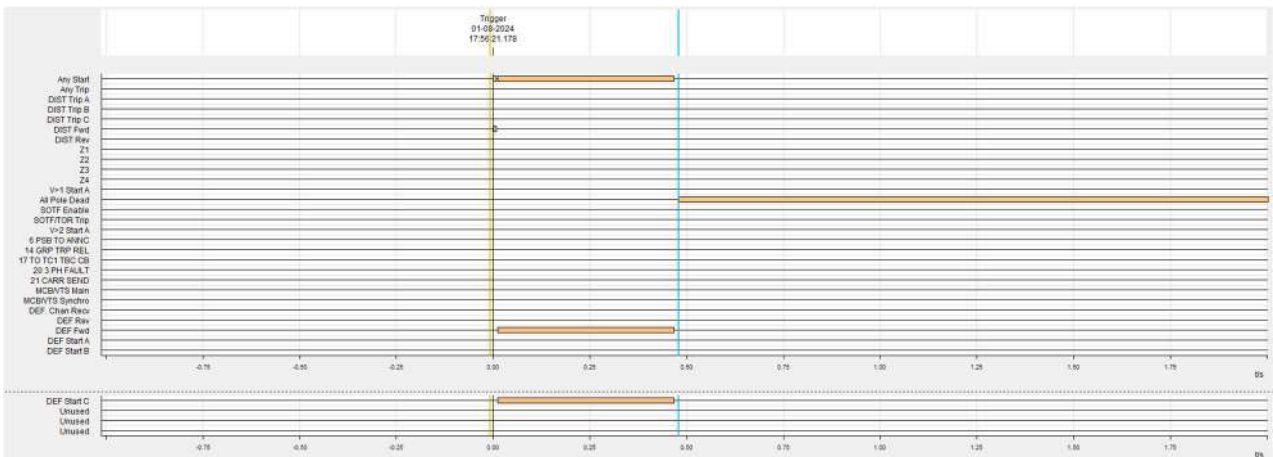
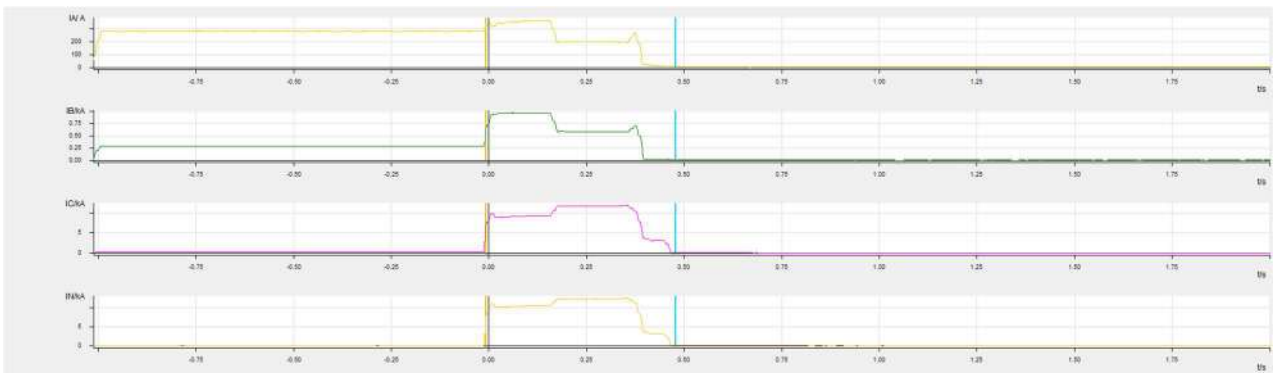
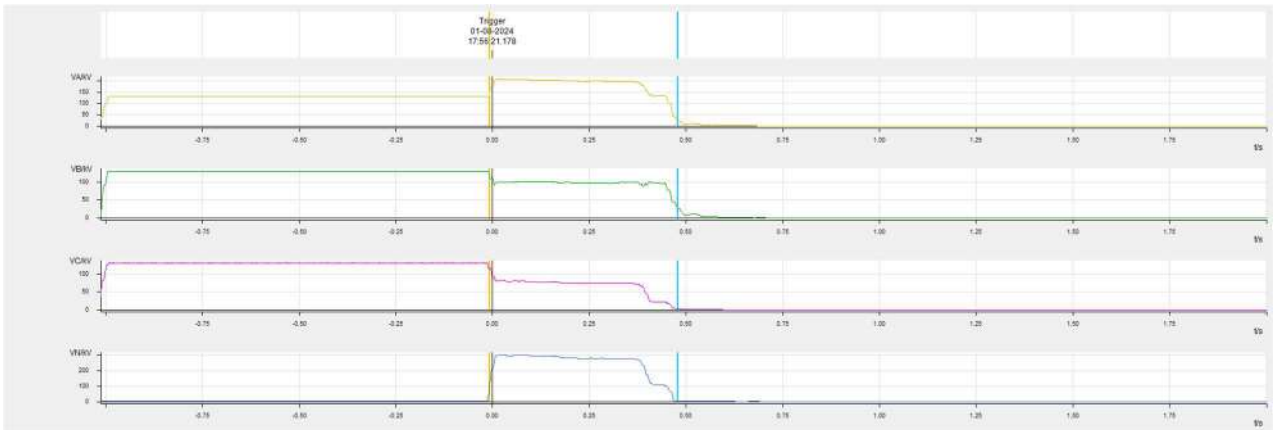
Time	Station	Description	Status
17:59:07.316	DARBH_DMTCL	220_DARB2_BH_2_CB	Open
17:59:07.317	DARBH_DMTCL	220_DARB2_BH_1_CB	Open

Annexure 2:

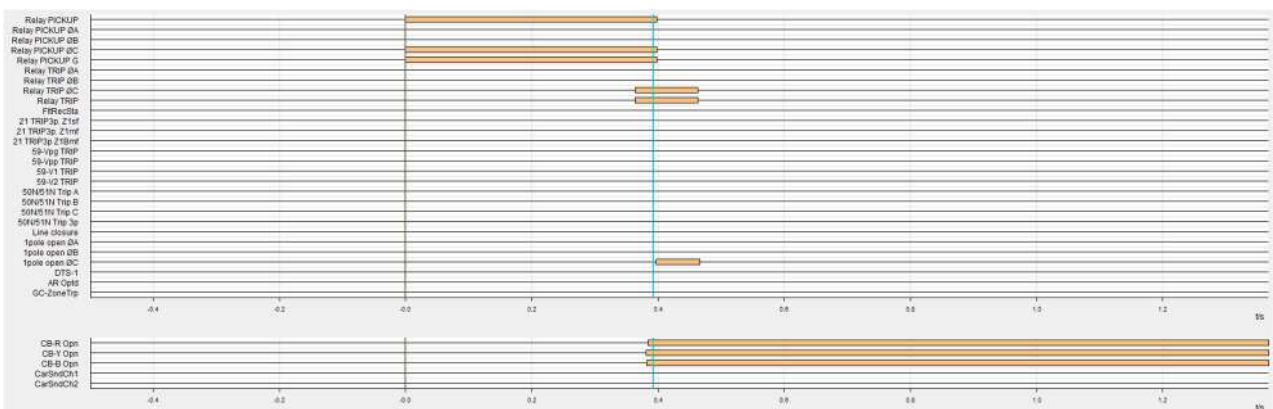
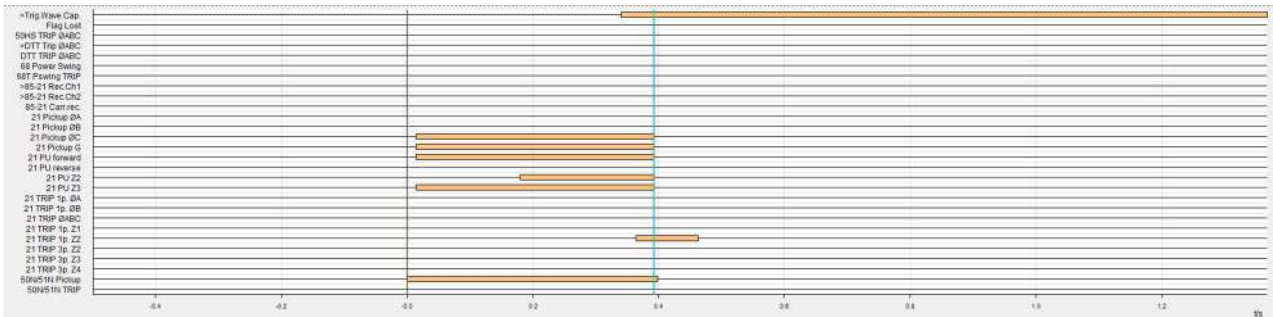
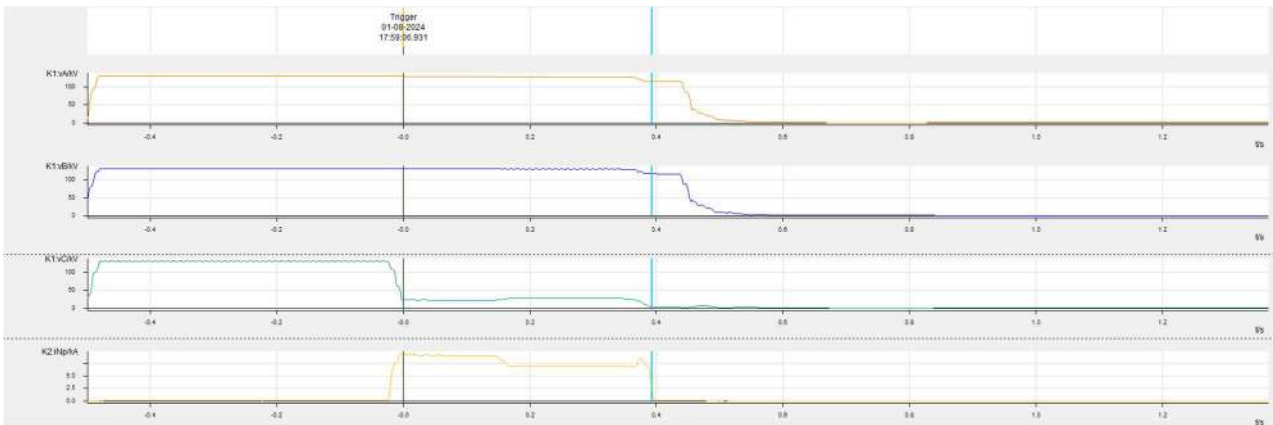
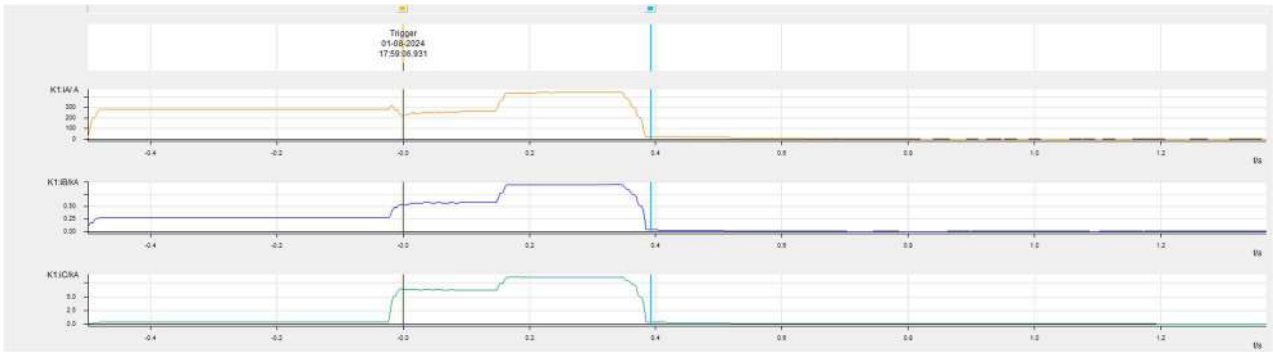
DR of 220 kV Darbhanga – DMTCL -ckt 1 (DMTCL)



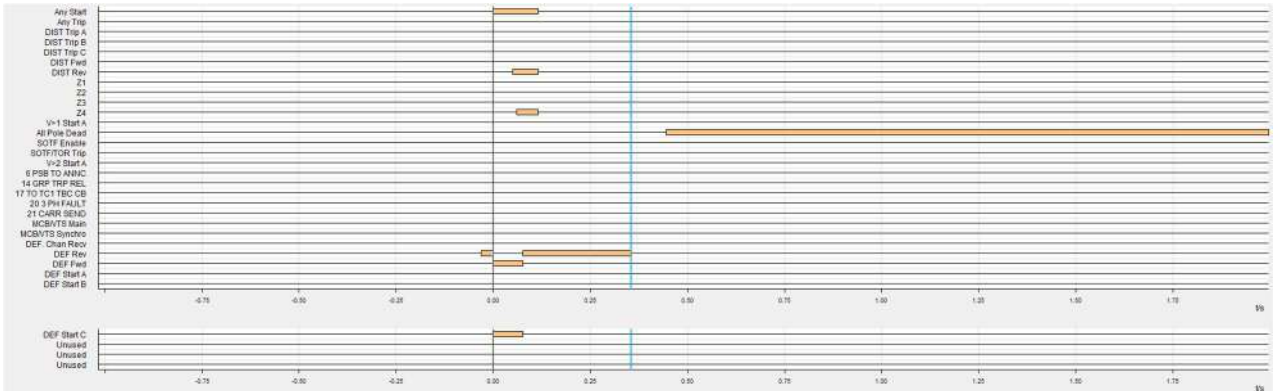
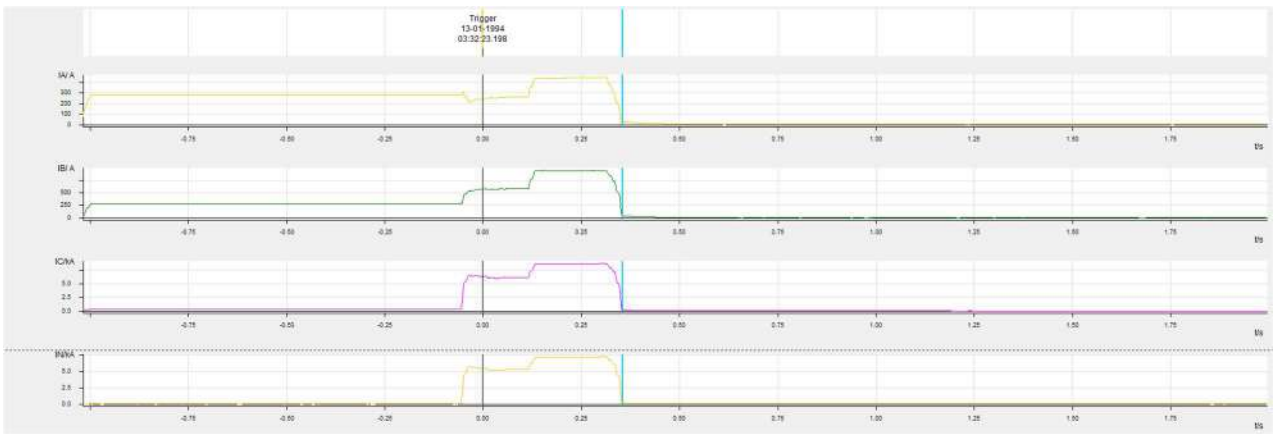
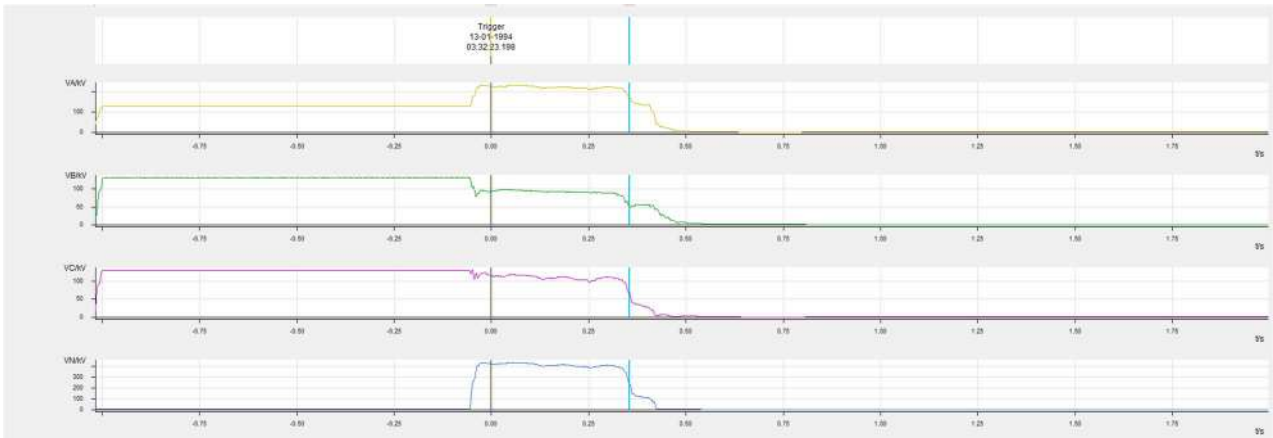
DR of 220 kV Darbhanga – DMTCL -ckt 1 (Darbhanga)



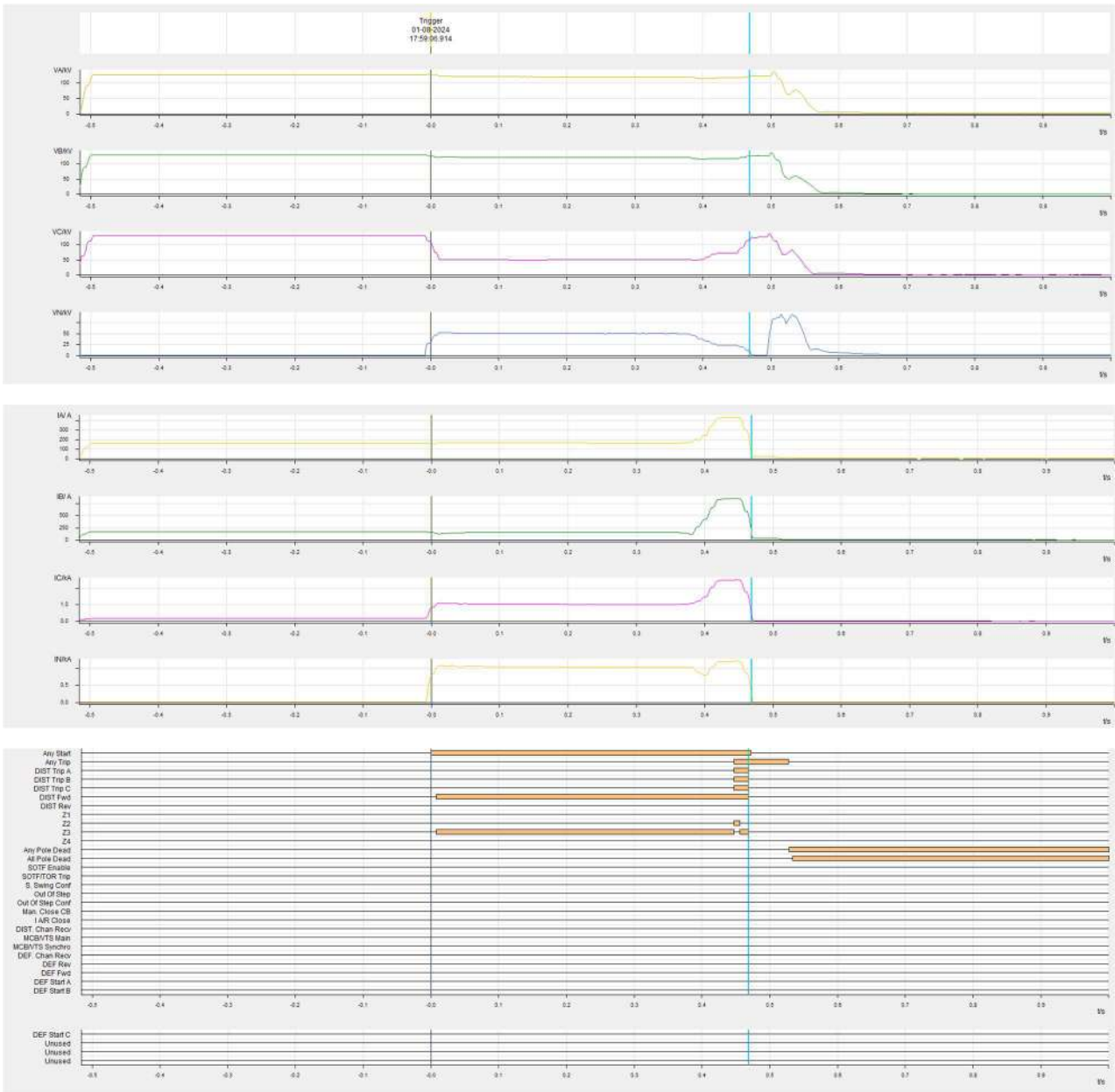
DR of 220 kV Darbhanga – DMTCL -ckt 2 (DMTCL)



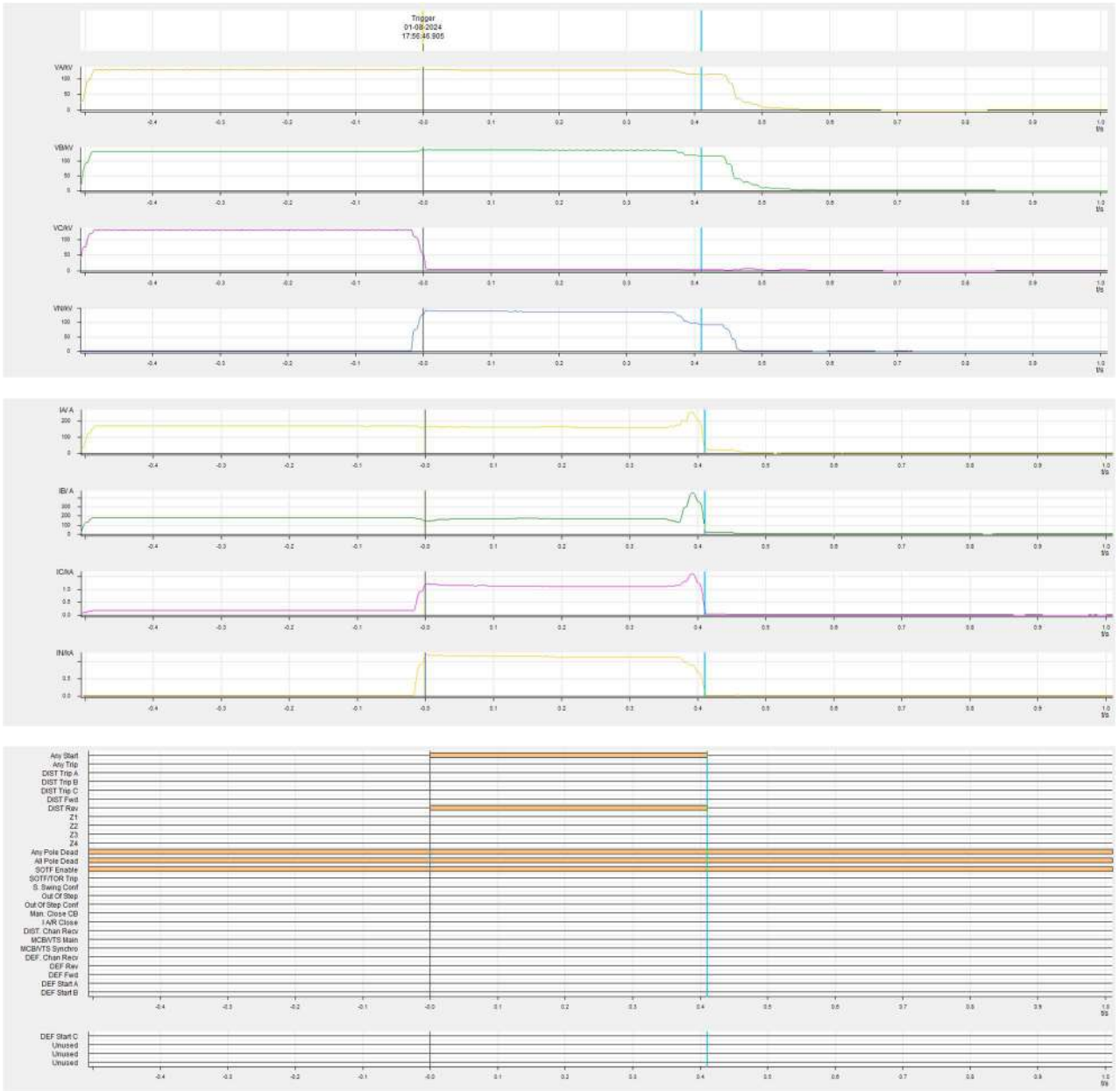
DR of 220 kV Darbhanga – DMTCL -ckt 2 (Darbhanga)



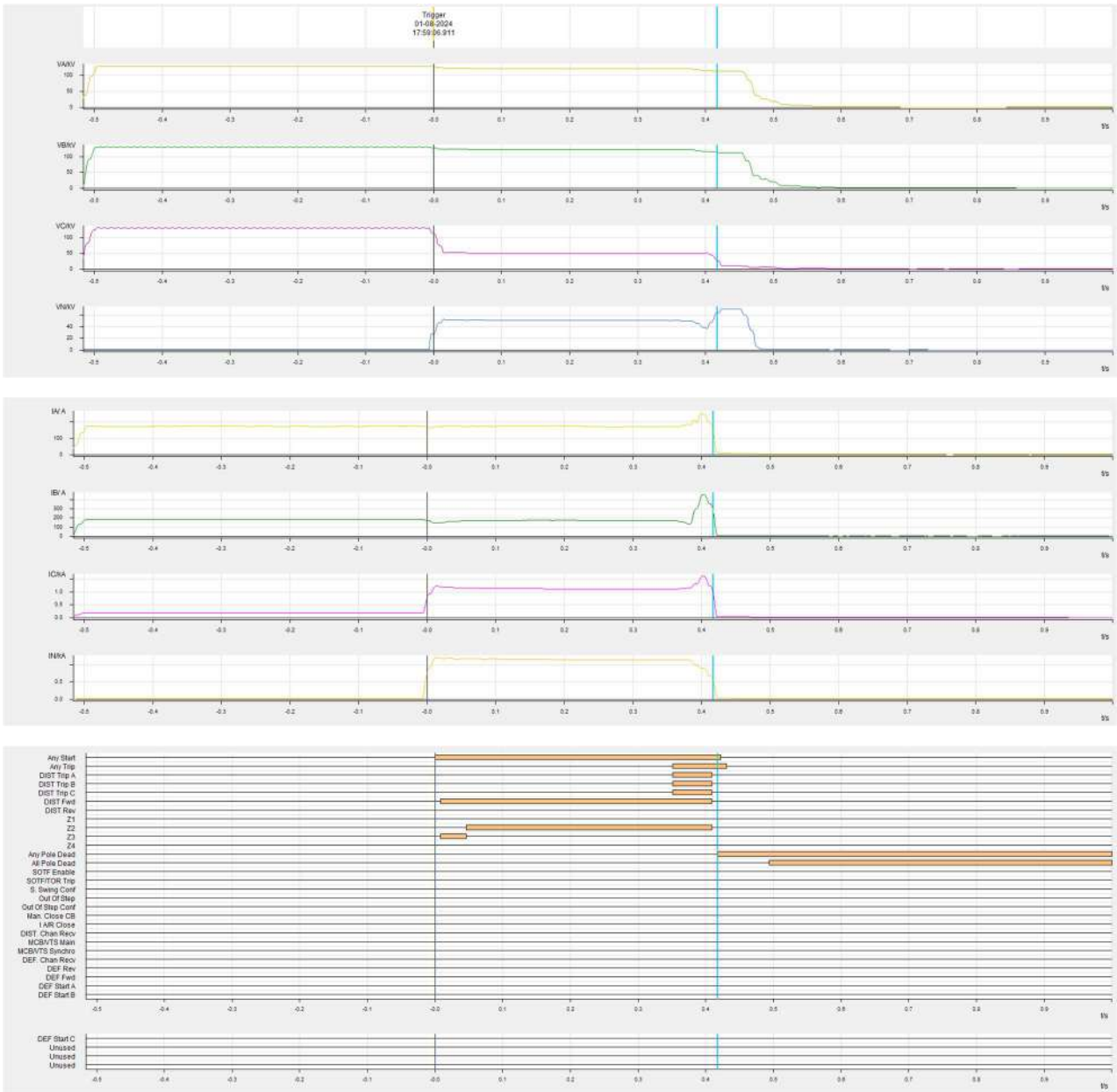
DR of 220 kV Darbhanga-Mushari-1 (Mushari)



DR of 220 kV Darbhanga-Mushari-2 (Darbhanga)



DR of 220 kV Darbhanga-Mushari-2 (Mushari)




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ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
 (भारत सरकार का उद्यम)
GRID CONTROLLER OF INDIA LIMITED
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पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / Eastern Regional Load Despatch Centre

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

**पूर्वी क्षेत्र के 220/132 केवी आरा उप-केन्द्र में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event at
 220/132 kV Arrah S/s of Eastern Region
 (To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss
 Event as per IEGC section 37.2 (f))
 (आई ई जी सी 37.2 (एफ) के अनुपालन में)**

Date(दिनांक):23-08-2024

1. Event Summary (घटना का सारांश):

At 19:51 Hrs on 09.08.2024, 220 kV Bus-2 at 220/132 kV Arrah S/s tripped during bus bar stability testing of 220 kV Bus-1. This led to total power failure at Arrah S/s. Load loss of 294 MW reported at Arrah and Dumraon which was radially fed through Arrah S/s. 220 kV Bus-2 at Arrah was charged via Nadokhar lines at 20:11Hrs and power extended to Arrah and Dumraon.

2. Time and Date of the Event (घटना का समय और दिनांक): 19:51 hrs of 09.08.2024

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
				Bihar	Bihar
Pre-Event (घटना पूर्व)	49.99 Hz	31443 MW	26690 MW	462 MW	6716 MW
Post Event (घटना के बाद)	49.99 Hz	31443 MW	26396 MW	462 MW	6422 MW

**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)	1. 220 kV Main Bus-1 at Arrah (under s/d for bus bar stability test) 2. 220 kV Pusauli-Nadokhar-2(Under s/d for reconductoring) 3. 220 kV Nadokhar-Dumraon D/c opened to control loading of 220 kV Pusauli-Nadokhar-1
Weather Condition (मौसम स्थिति)	Normal weather

6. Load and Generation loss (लोड और जेनरेशन हानि): Generation loss: NIL; Load loss: 294 MW

7. Duration of interruption (रूकावट की अवधि): 00:20 Hrs

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

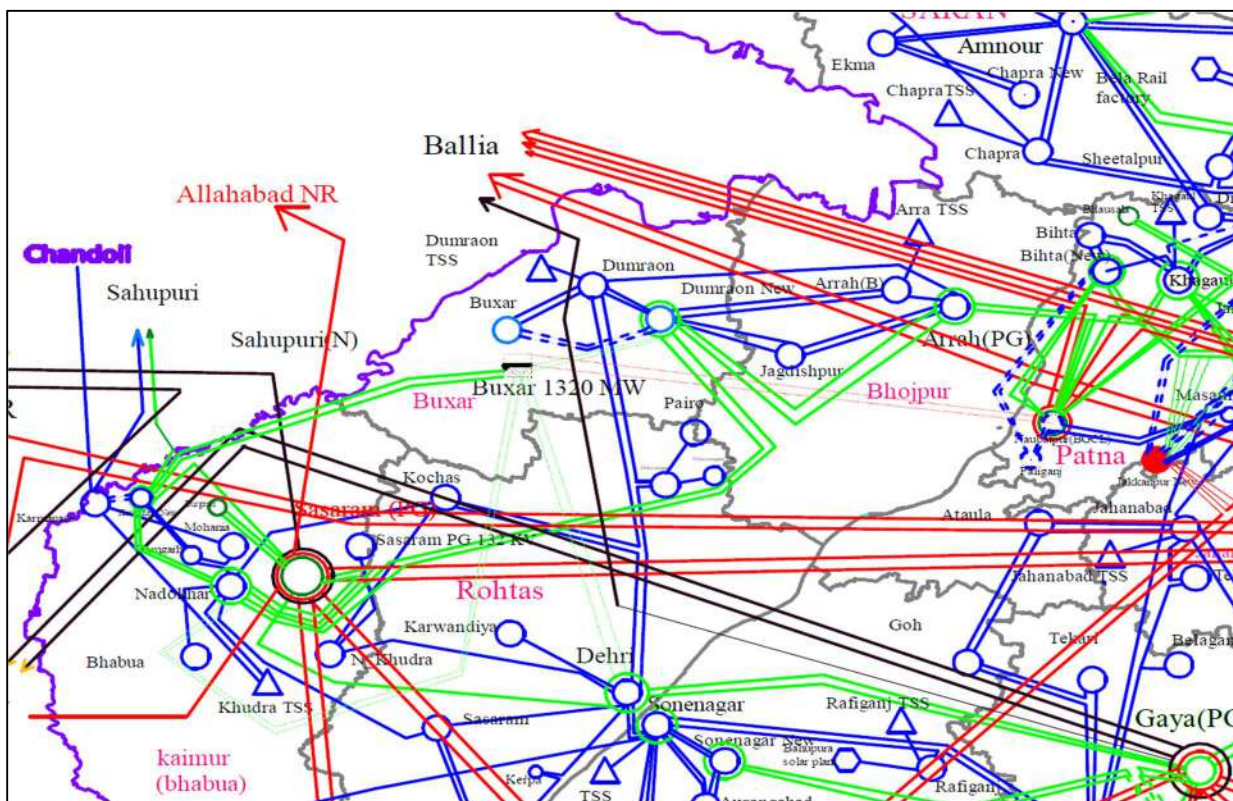


Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग):

क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220 kV Bus-2 at Arrah		Bus bar protection operated		20:11
2	220 kV Arrah-Naubatpur D/c	19:51:35	Arrah: Bus bar protection operated	-	20:11/20:35
3	220 kV Arrah-Dumraon D/c			-	20:41/20:40

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

- 220 kV Main Bus-1 at Arrah was under shutdown for bus bar stability test. During testing, bus bar protection of 220 kV Bus-2 operated which led to total supply failure at Arrah.
- Dumraon was fed radially through 220 kV Arrah-Dumraon as 220 kV Dumraon-Nadokhar was kept open to reduce loading of 220 kV Pusauli-Nadokhar-1.

PMU Snapshot:



Figure 2: PMU Voltage snapshot of 400/220 kV Patna S/S

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

- There was no physical fault. Reason of operation of bus bar protection of 220 kV Bus-2 at Arrah while performing bus bar stability test of 220 kV Bus-1 may be submitted.

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

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

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

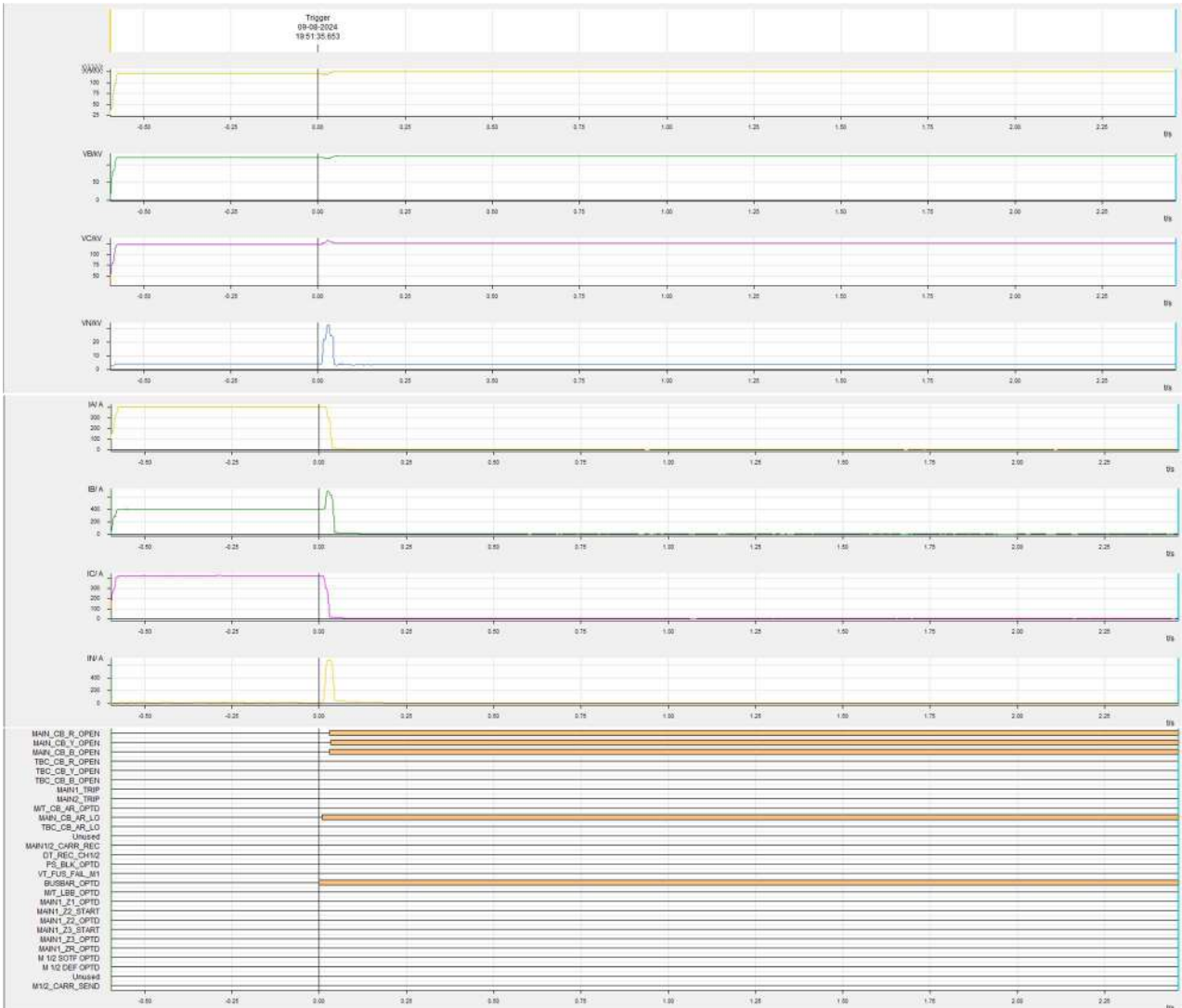
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु): Nil

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

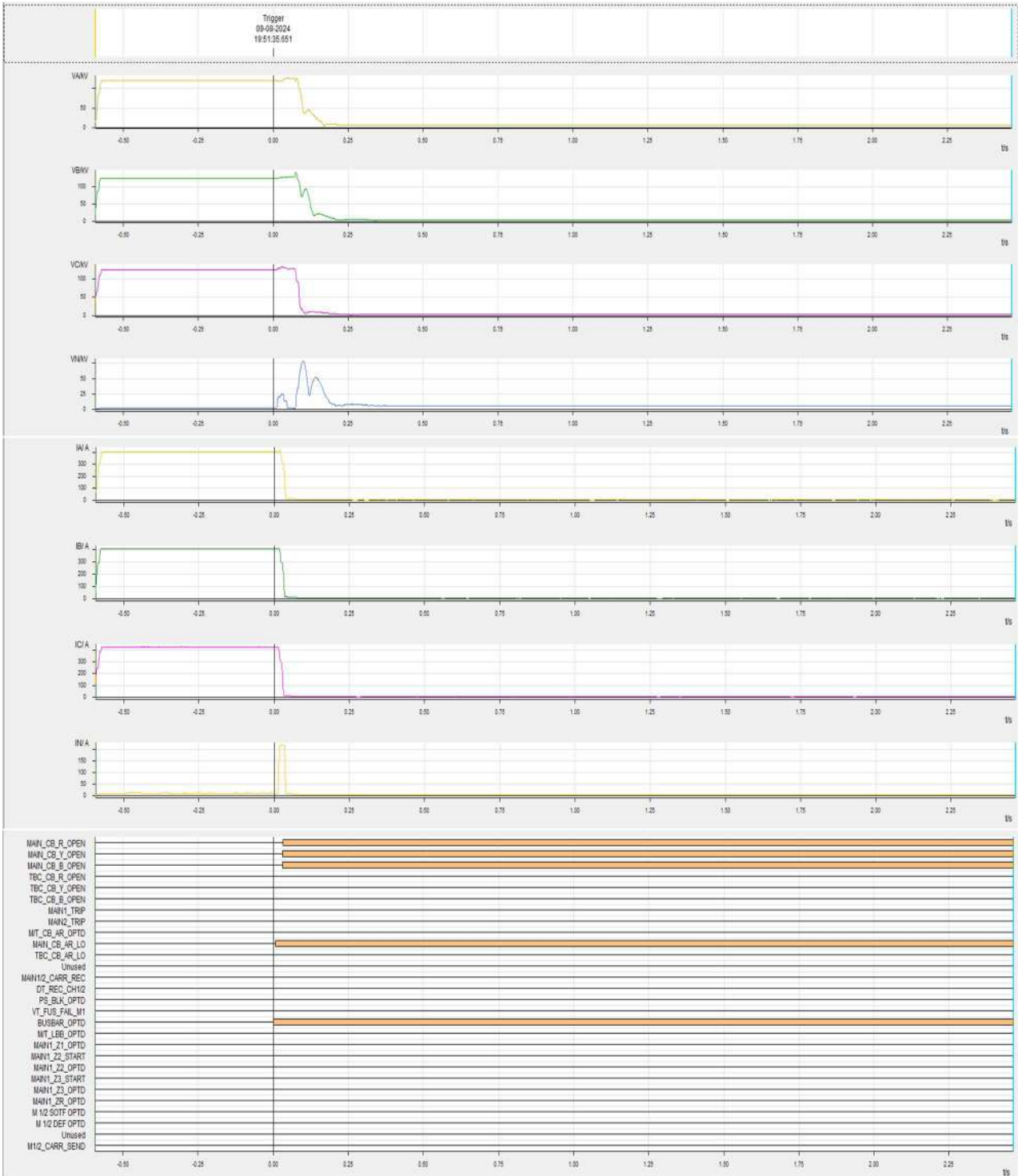
Time	Station	Description	Status
19:51:35.677	ARRAH_PG	220_ICT2_CB	Open
19:51:35.678	ARRAH_PG	220_DUMRA_BG_1_CB	Open
19:51:35.678	ARRAH_PG	220_Transfer_BC_CB	Open
19:51:35.678	ARRAH_PG	220_ICT1_CB	Open
19:51:35.680	ARRAH_PG	220_DUMRA_BG_2_CB	Open
19:51:35.680	ARRAH_PG	220_NAUBA_BH_2_CB	Open
19:51:35.682	ARRAH_PG	220_NAUBA_BH_1_CB	Open
19:51:35.690	ARRAH_PG	132_ICT2_CB	Open
19:51:35.691	ARRAH_PG	132_ICT1_CB	Open
19:51:35.693	ARRAH_PG	220_ICT3_CB	Open
19:51:35.706	ARRAH_PG	132_ICT3_CB	Open

Annexure 2:

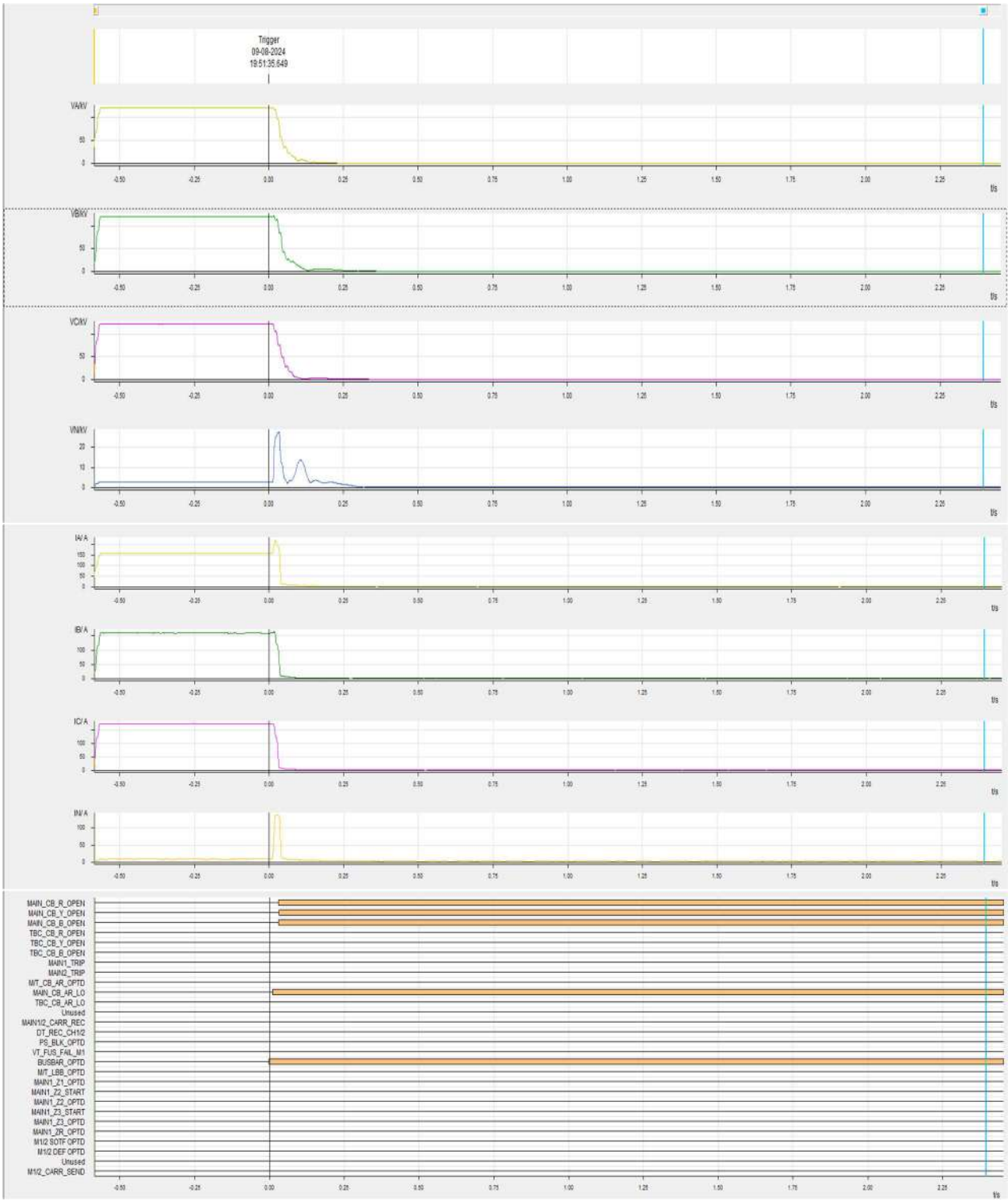
DR of 220 kV Arrah-Naubatpur-1 (Arrah)



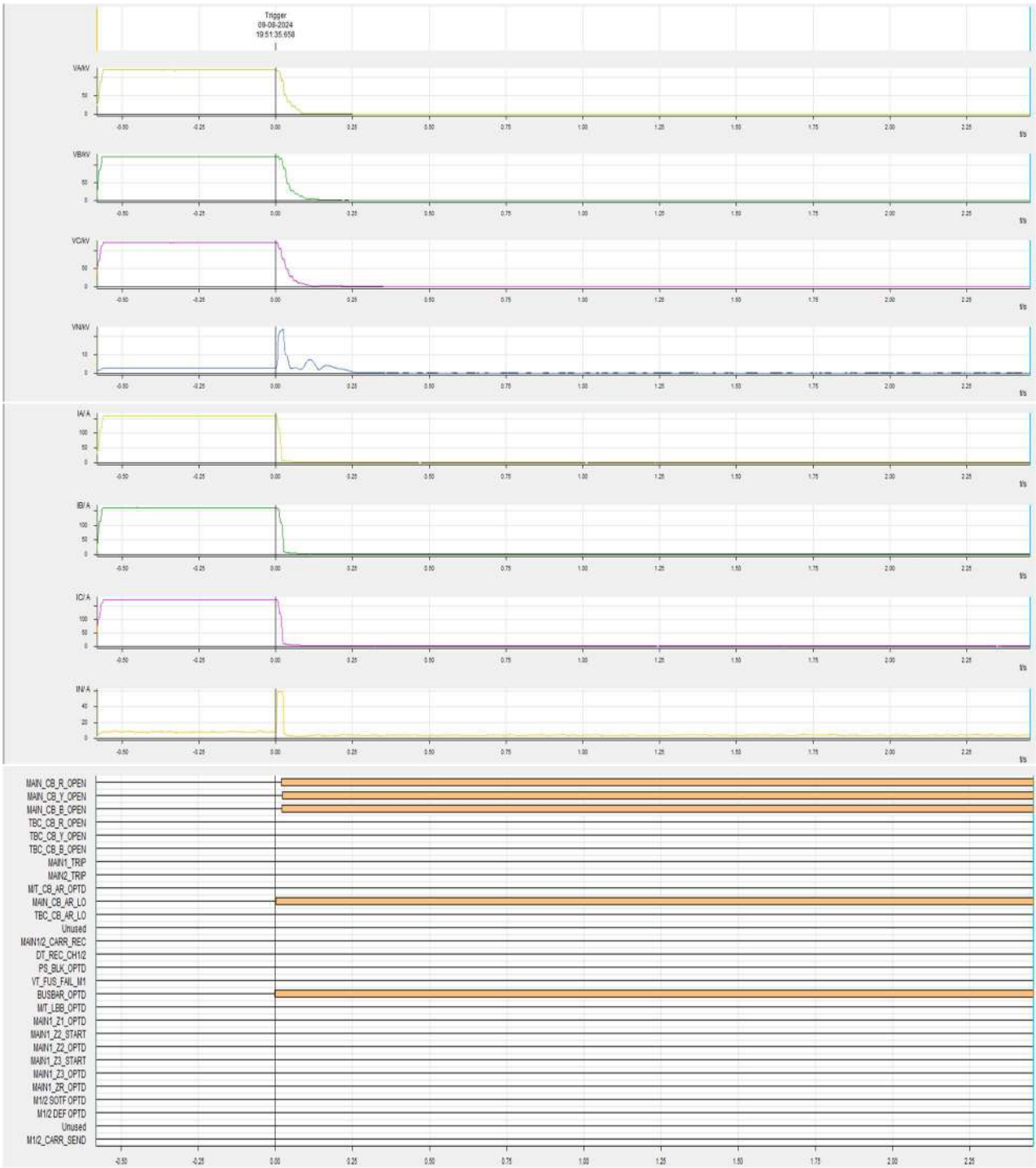
DR of 220 kV Arrah-Naubatpur-2 (Arrah)



DR of 220 kV Arrah-Dumraon-1 (Arrah)



DR of 220 kV Arrah-Dumraon-2 (Arrah)



Protection Performance Indices for the month of August'24																	
S. No.	Name of the element	Tripping Date	Tripping Time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc		Nu		Nf		Dependability index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf))	Remarks (Reason for performance indices less than 1)
						End A	End B	End A	End B	End A	End B	End A	End B				
1	220KV-NEW PURNEA-MADHEPURA-2	01-08-2024	11:34	01-08-2024	13:09:00	A/R from Purnea end	B-N,Zone-2	1	0	0	1	0	1	New Purnea-1 madhepura-0	New Purnea-1 madhepura-0	New Purnea-1 madhepura-0	PLCC issue will be rectified after getting shutdown
2	220KV-MUZAFFARPUR-HAJIPUR-1	01-08-2024	18:44	01-08-2024	19:51	Y-B, lf-10.36 KA, 11.6KM	Y-B Phase fault,lf-2.7KA,36km	1	1	0	0	0	0	1	1	1	
3	220KV-DARBHANGA(DMTCL)-LAUKAHI-1	02-08-2024	20:40	04-08-2024	21:04		Laukahi-Y & B phase,ly-4.405KA,lb-4.427KAfault		0		1		1	0	0	0	PLCC issue at GSS Laukahi
4	220KV-DARBHANGA (DMTCL)-MOTIPUR-2	06-08-2024	03:30	06-08-2024					0		1		0	0	0	0	Cable of SF6 Pressure switch got damaged and it created short circuit
5	220KV-SAHARSA(PMTL)-KHAGARIA(NEW)-2	06-08-2024	17:53	06-08-2024		A/R from Khagaria end	Khagria new-A/r success,Z1,R phase,		1		0		0	1	1	1	carrier send from Khagaria new end.
6	220KV-DARBHANGA (DMTCL)-MOTIPUR-1	07-08-2024	16:51	07-08-2024	17:39		Motipur-Dist Protection relay optd, Z-1, Fault distance			1			0	1	1	1	Phase to phase Fault
7	220KV-TENUGHAT-BIHARSARIF-1	09-08-2024	21:46	09-08-2024	22:37		Biharsharif Z-1 R-N 1.8 kA 55.43 km		0		0		1	0	0	0	PLCC Panel erected at BSF end while PLCC not available at TTPS end Hence
8	220KV-KHAGARIA-NEW PURNEA-1	11-08-2024	01:14	11-08-2024	01:38		Khagaria -Z1,B-N New Purnea-Z2,BN,2.53KA,8 3.7KM	1	0	0	0	0	1	Khagaria-1 New Purnea-0	Khagaria-1 New Purnea-0	Khagaria-1 New Purnea-0	PLCC issue will be rectified after getting shutdown
9	220KV-DARBHANGA (DMTCL)-MOTIPUR-1	11-08-2024	09:51	11-08-2024	10:34		Motipur-Dist Protection relay optd, Z-1, Fault distance			1			0	1	1	1	A/R Successful at Motipur end
10	220KV-BIHARSARIF-TTPS-1	14-08-2024	14:18	14-08-2024	14:50		Biharsharif- b_N,		0		0		1	0	0	0	PLCC Panel erected at BSF end while PLCC not available at TTPS end Hence

11	220KV-TENUGHAT-BIHARSARIFF-1	15-08-2024	10:39	15-08-2024	11:13		Biharsharif-B-N,1.766KA,Z-1 58.7km		0	0	1	0	0	0	0	0	0	PLCC Panel erected at BSF end while PLCC not available at TTPS end Hence
12	220KV-KHAGARIA-NEW PURNEA-1	15-08-2024	12:56	15-08-2024	13:21	Khagaria-Z1,AR success	New Purnea-Z2,BN,2.3KA,85.9KM	1	0	0	0	0	1	Khagaria-1 New Purnea-0	Khagaria-1 New Purnea-0	Khagaria-1 New Purnea-0	1	PLCC issue will be rectified after getting shutdown
13	220KV-SAHARSA(PMTL)-KHAGARIA(NEW)-1	16-08-2024	05:05	17-08-2024	01:52	Khagaria-z1, RN,26KM			1	0	0	0	1		1	1		
14	220KV-SAHARSA(PMTL)-KHAGARIA(NEW)-1	17-08-2024	01:53	18-08-2024	19:23	Khagaria-z1, BN,66KM			1	0	0	0	1		1	1		
15	220KV-DARBHANGA (DMTCL)-MOTIPUR-1	18-08-2024	10:06	18-08-2024	10:55		Motipur-Dist Protection relay optd, Z-1, Fault distance		1	0	0	0	1		1	1		Phase to phase fault
16	220KV-DARBHANGA (DMTCL)- MOTIPUR-2	22-08-2024	13:23	22-08-2024	14:04		Motipur-Dist Protection relay optd, Z-1, Fault distance		1	0	0	0	1		1	1		Phase to phase fault
17	220KV-RAXAUL-SITAMARHI-2	22-08-2024	14:30	22-08-2024	16:00		Raxaul-Dist Protection relay optd, Z-1, Fault distance		1	0	0	0	1		1	1		Phase to phase fault
18	220KV-DEHRI-GAYA-2	24-08-2024	11:34	24-08-2024	16:51	Dehri-Z1,BN,60KM		1	0	0	0	0	1		1	1		
19	220KV-KARAMNASHA (NEW)-SAHUPURI-1	28-08-2024	05:16	28-08-2024	07:54		Karmnasa end-Distance protection relay optd,Z-3,		1	0	0	0	1		1	1		Due to fault of Sahupuri end
20	220KV-DARBHANGA (DMTCL)-MOTIPUR-1	30-08-2024	13:27	30-08-2024	13:51		Motipur-Dist Protection relay optd, Z-1, Fault distance		1	0	0	0	1		1	1		A/R Successful at Motipur end
21	220KV-DARBHANGA(DMTCL)-LAUKAHI-1	30-08-2024	15:07	30-08-2024	17:55		Y-B-N Fault,Ia-142.6A,Ib-2.070KA,Ic-2.225KA,Fault		0	1	1	0	0		0	0		PLCC issue at GSS Laukahi

Protection Performance Indices for the month of AUGUST '24 (In compliance of Clause 15(6) of IEGC 2023)

S. No.	Name of the element	Tripping Date	Tripping Time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc		Nu		Nf		Dependability index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf))	Remarks (Reason for performance indices less than 1)
						End A	End B	End A	End B	End A	End B						
1	220 kV Maithon (RNP) - Dumka II- 2	08-08-2024	23:43	08-08-2024	00:05	Didn't tripped.	Tripped from Dumka end only. Maloperation of tripping circuit.	0	0	1	0	0	0	#DIV/0!	0	0	R ph and Y ph tripped spuriously due to maloperation of tripping circuit & B ph tripped on PD.
2	220 kV Lathehar - Chatra_Itkhori-2	12.08.2024	12:27	12.08.2024	13:28	BN, Z1, Ib-1.55 kA	BN, Z1, Ib- 483.6 A	1	1	0	0	1	1	0.5	1	0.5	A/R circuit is unhealthy.
3	220 kV Lathehar - Chatra_Itkhori-2	13.08.2024	11:01	13.08.2024	12:06	YB, Z1, Iy-1.54 kA, Ib-1.50 kA	YB, Z1, 48.66 km, Iy- 772.8 A, Ib- 801.6 A	1	1	0	0	0	0	1	1	1	
4	220 kV Chaibasa (PG) - Chaibasa - 01	15-08-2024	16:51	15-08-2024	19:24	DT received	Maloperation of SF6 CT at Chaibasa (JUSNL) end	0	0	1	0	0	0	#DIV/0!	0	0	Due to low SF6 gas of CT (B phase)
5	220 KV DALTONGANJ - CHATRA -1	16-08-2024	13:28	16-08-2024	14:22	Z-1, 37.13 km, B-N fault, IB-0.252 kA	BN fault, Z1, IB - 0.923 kA	1	0	0	1	0	0	0.5	1	0.50	No A/R attempt taken at chatra end and remaining phases trip on PD after 2.5 sec , while A/r Successful at Daltonguni end
6	220 kV Maithon (RNP) - Dumka II- 1	17-08-2024	10:52	17-08-2024	11:30	B_N, 4.29 kA, 8.8 Km	B_N, 1.16 kA, 58.32 Km. A/R Successful.	1	0	0	0	0	0	1	1	1	

7	220 kV Maithon (RNP) - Dumka II- 1	22-08-2024	20:16	22-08-2024	20:57	R_N, 2.3 kA, 56km (A/R Successful)	R_N, Z1, 3.32 km, Ir - 4.37 kA		1		0		1	0.5	1	0.5	3 Ph tripping for single phase fault. Carrier is unhealthy.
8	220 kV Maithon (RNP) - Dumka II- 2	25-08-2024	00:26	25-08-2024	10:06	B-N, 2.96 kA, 69.2km	B-N, Z1, Ib-5.2 kA, 1.77 Km. A/R Successful.		1		0		0	1	1	1	
9	220 kV Hatia II – Patratu - 01	27-08-2024	17:40			YN, Z1, 17.9 km, 2.78 kA	YN, Z1, 2.33 kA, A/R Successful.	1	1	0	0	1	0	0.50	1.00	0.50	DTPC not installed at Hatia II end. DTPC installation work is under process.
10	220 kV Hatia II – Patratu - 02	27-08-2024	17:40			YBN, Z1, 22.5 km, IY- 2.96 kA, IB- 4.17 kA	YBN, Z1, 14.73 km, IY- 2.42 kA, IB- 4.13 kA	1	1	0	0	0	0	1	1	1	

SL NO.	VOLTAGE LEVEL	LINE NUMBER AND LINE LENGTH	S/D,B/D,TRIP, AUTO RECLOSE	INITIALISATION TIME	NORMALISATION TIME	OUTAGE HOUR	OUTAGE DESCRIPTION WITH RELAY INDICATION AND PLCC COUNTER READING	PRELIMINARY FINDINGS	ACTION TAKEN/REMEDIAL ACTION	WEATHER CONDITION	
1	132 KV	L#71 (Mosaboni-Kharagpur) Line Length: 95.2km	Mosaboni End End :Trip Kharagpur End End: Trip	09.08.24, 16:19hrs	09.08.24, 16:33hrs	00:14:00	<p>MOSABONI END Protection Operated: Distance</p> <p>protection Zone-2 start,Directional Earth Fault trip Bay Position:Normal Fault in Phase:R-Phase 12.68 % of FLI Fault Loop:A-N Fault Distance:124.1 KM Fault Duration: 762.1 mS Auxiliary Relay: 86 Operated Relay Trip Time: 79.87 mS Autoreclose Status:Lockout Fault Resistance: 4.386 Ω</p> <p>Carrier Status: Carrier Switch-IN,Carrier Healthy, Fault Current:IR= 768 AL-69.1°,IY=107.72AL-84.7°, IB=53.596AL-109.7°, IN=620.24AL-64.6 °. Voltage during Fault :VRN=57.169KV-0.9°, VYN=78.762KV-116.3°, VBN=76.144 KV-123.3 °, *VN=20.369KV-162.7°. PLCC COUNTER READING : Before Fault: TX= 205 RX= 232 After Fault: TX= 205 RX= 232 REMARKS: (i)PLCC Counter readings :Counter not advanced</p>	<p>KHARAGPUR END Protection Operated: Distance Protection Zone-1 Operated</p> <p>Bay Position:Normal Fault in Phase:Phase Fault Distance: 13.88KM Fault Loop:A-N Auxiliary Relay: Operated Autoreclose Status:Lockout Fault Resistance: 5.269Ω Carrier Status: Carrier Switch-IN,Carrier Healthy, Fault Current:IR= 628.1A,IY=139.3A, IB=71.33A., Voltage during Fault :VRN=9.573KV , VYN=90.3KV , VBN= 85.27KV, PLCC COUNTER READING : Before Fault: TX=1009 RX=1130 After Fault: TX=1011(1009+2) RX= 1130 REMARKS: (i)PLCC Counter readings :OK REMARKS: (i)PLCC Counter advancement: ok</p>	<p>MOSABONI END: 15:37:59:775.3:Distance protection Zone-1 Trip and carrier signal sent 15:37:59:850:Directional Overcurrent(I=1) sTARTS. 15:38:00:078.3: Breaker all three pole opened after 74.7 ms of Zone-1 Trip. 15:38:00:078.3: Breaker all three pole autoreclosed after 302.9 ms of Zone-1 Trip(after dead time of 300 ms) PRELIMINARY FINDINGS:</p>	<p>REMEDIAL ACTION REQUIRED: From Fault current and voltage angles line seem to be tripped in Back flashover</p>	<p>Heavily stormy with rain and thunder at the time of tripping.</p>
2	132 KV	L#72 (Mosaboni-Kharagpur) Line Length: 95.2km	Mosaboni End End :Trip Kharagpur End End: Trip	09.08.24, 16:19hrs	09.08.24, 16:27hrs	00:08:00	<p>MOSABONI END Protection Operated: Distance</p> <p>protection Zone-2 start,Directional Earth Fault trip Bay Position:Normal Fault in Phase:R-Phase 12.68 % of FLI Fault Loop:A-N Fault Distance:124.4 KM Fault Duration: 762.1 mS Auxiliary Relay: 86 Operated Relay Trip Time: 79.87 mS Autoreclose Status:Lockout Fault Resistance: 4.386 Ω</p> <p>Carrier Status: Carrier Switch-IN,Carrier Healthy, Fault Current:IR= 675.3 AL-79.0°,IY=44.017AL-18.2°, IB=46.271AL-165.7°, IN=699.6AL-79.7°. Voltage during Fault :VRN=57.169KV-0.9°, VYN=78.762KV-116.3°, VBN=76.144 KV-123.3 °, *VN=20.369KV-162.7°. PLCC COUNTER READING : Before Fault: TX= 164 RX= 149 After Fault: TX=164 RX= 149 REMARKS: (i)PLCC Counter readings :Counter not advanced</p>	<p>KHARAGPUR END Protection Operated:</p> <p>Bay Position:Normal Fault in Phase:Phase Fault Distance: 16.42KM(% of FLI) Fault Loop:A-N Auxiliary Relay: Operated Autoreclose Status:Lockout Fault Resistance: 7.963Ω Carrier Status: Carrier Switch-IN,Carrier Healthy, Fault Current:IR= 518A,IY=137.1A, IB=70.15A, Voltage during Fault :VRN=9.611KV , VYN=92.17KV , VBN= 86.59KV, PLCC COUNTER READING : Before Fault: TX=887 RX=1188 After Fault: TX=889(887+2) RX= 1188 REMARKS: (i)PLCC Counter advancement: ok</p>	<p>From Fault current and voltage angles line seem to be tripped in Back flashover</p>	<p>REMEDIAL ACTION REQUIRED: From Fault current and voltage angles line seem to be tripped in Back flashover</p>	<p>Heavily stormy with rain and thunder at the time of tripping.</p>
3	220 KV	Line#39(Jamshedpur-Purulia) Line Length: 87 km	Jamshedpur End :Autoreclose PuruliaEnd :Autoreclose	09.08.24, 19:18hrs	Instantaneous	00:00:00	<p>JAMSHEDPUR END Protection Operated:Distance Bay</p> <p>Protection Zone-1 Operated, Position:Normal Fault in Phase:Phase Red Phase Fault Distance: 46.4 KM(53.33 % of FLI) Fault Loop:A-G Auxiliary Relay: Operated :186R,286R Autoreclose Status:Autoreclose Successful Carrier Status: Carrier Switch-IN,Carrier Healthy, Pre Fault Current:IR= 15.36 AL-92.9°,IY =14.933AL-24.8 ° , IB=24.762 AL-121.7°, IN= 0.1882AL-104.4 °. Voltage before Fault :VRN=77.212KV-90.0°, VYN=77.455KV-30.1°, VBN=77.263 KV-150.2 °, *VN=7.2826KV-139.9 °. Fault Current:IR= 2531.8AL-21.2°,IY=19.425AL-56.0 ° , IB=20.291AL-110.2°, IN=AL °. Voltage during Fault :VRN=71.279KV-88.7°, VYN=76.194KV-33.0°, VBN= 75.397KV-151.7 °, *VN=11.449KV-157.0°. PLCC COUNTER READING : Before Fault: TX=14 RX=53 After Fault: TX=15(14+1) RX=54(53+1) REMARKS: (i)PLCC Counter readings :OK</p>	<p>PURULIA END Protection Operated:Distance Protection Zone-1 Operated,Directional Over Current Starts(I=1),Directional Earth Fault Starts(IN=1)</p> <p>Bay Position:Normal Fault in Phase:Blue:Phase Fault Distance:43.5 KM(96.67 % of FLI) Fault Loop:C-N Auxiliary Relay: Operated:94 Autoreclose Status:Autoreclose Successful Carrier Status: Carrier Switch-IN,Carrier Healthy, Fault Current:IR= 1447.5AL-28.6°,IY=6.9869AL-6.7 ° , IB=25.526AL-27.7°, IN=1479.6AL-28.6 °. Voltage during Fault :VRN=45.896KV-36.9°, VYN=84.949KV-86°, VBN=81.356KV-166.8 °, *VN=53.188KV-133.5°. PLCC COUNTER READING : Before Fault: CH-I,CODE-I:TX=53 RX=41 After Fault: CH-I,CODE-I:TX=54(53+1) RX=42(41+1) REMARKS: (i)PLCC Counter advancement: ok</p>	<p>GIRIDIH END: 19:18:04:043: Distance Protection Zone-1 Operated 19:18:04:068.5: Carrier received and 2-Com Operated 19:18:04:127.2: Breaker all three [pole opened after 83.7 ms 19:18:05:073: Line autoreclosed after 1047 ms at PRELIMINARY FINDING:</p>	<p>REMEDIAL ACTION REQUIRED:</p>	<p>Heavily stormy with rain and thunder at the time of tripping.</p>
4	220 KV	Line#40(Jamshedpur-Purulia) Line Length: 87 km	Jamshedpur End :Autoreclose PuruliaEnd :Autoreclose	09.08.24, 16:54hrs	Instantaneous	00:00:00	<p>JAMSHEDPUR END Protection Operated:Distance Bay</p> <p>Protection Zone-1 Operated, Position:Normal Fault in Phase:Red-Phase Fault Distance: 64.2KM(% of FLI) Fault Loop:A-G Auxiliary Relay Operated:186 R,286R Autoreclose Status:Autoreclose Successful Carrier Status: Carrier Switch-IN,Carrier Healthy, Fault Current:IR= 1593.7 AL-156.7°,IY=59.926AL-28.4 ° , IB=27.4AL-84.9°, IN=1071.4AL-70.6 °. Voltage during Fault :VRN=71.926KV-90.6°, VYN=76.599KV-150.9°, VBN=76.457 KV-29.2 °, *VN=0.007KV-4.4°. PLCC COUNTER READING : Before Fault: CIRCUIT-I TX= 20 RX=40 CIRCUIT-I TX=21(20+1) RX=41(40+1) REMARKS: (i)PLCC Counter readings :OK</p>	<p>PURULIA END Protection Operated:Distance Protection Zone-1 Operated,Directional Over Current Starts(I=1),Directional Earth Fault Starts(IN=1)</p> <p>Bay Position:Normal Fault in Phase:Blue:Phase Fault Distance:43.5 KM(96.67 % of FLI) Fault Loop:C-N Auxiliary Relay: Operated Autoreclose Status:Lockout Fault Resistance: Ω Carrier Status: Carrier Switch-IN,Carrier Healthy, Pre Fault Current:IR= 17.7AL-146.6°,IY=27.999AL-61.5 ° , IB=15.251AL-84.6°, IN=0AL-47.7 °. Voltage before Fault :VRN=77.405KV-174.4°, VYN=78.406KV-65.6°, VBN= 78.170KV-54.7 °, *VN=0.5570KV-10.5°. Fault Current:IR= 1841.5AL-121.9°,IY=60.768AL-96.2°, IB=16.482AL-132.1°, IN=1913AL-121.2 °. Voltage during Fault :VRN=39.876KV-174.8°, VYN=89.077KV-63.0°, VBN=83.967KV-40.5 °, *VN=67.960KV-18.2°. PLCC COUNTER READING : Before Fault: CIRCUIT-I TX= 41 RX=20 CIRCUIT-I TX=42(40+1) RX=21(20+1)</p>	<p>09/08/24....At Purulia end...L#39&40 Be-Tx-53/41..Rx-25/20 After..Tx-54/42....Rx-26/21</p>	<p>REMEDIAL ACTION REQUIRED:</p>	<p>Heavily stormy with rain and thunder at the time of tripping.</p>

5	220 KV	Line#215(Jamshedpur-Jindal) Line Length:134.7 km	Jamshedpur End :Trip Jindal End:Trip	09.08.24.12:48hrs	09.08.24.13:50hrs	0.04306	<p>JAMSHEDPUR END Protection Operated:Distance</p> <p>Protection Zone-1 Operated,Directional Over Current Starts(>1),Directional Earth Fault Starts(IN>1)</p> <p>Bay Position:Normal</p> <p>Fault in Phase:Y-Phase Fault Distance:11 KM</p> <p>8.17 % of FLL Fault Loop:B-N</p> <p>Auxiliary Relay: 86 L/O Operated</p> <p>Autoreclose Status:Autoreclose Lockout Operated Fault</p> <p>Resistance: Ω</p> <p>Carrier Status: Carrier Switch-IN,Carrier Healthy,</p> <p>Pre Fault Current:IR= 42.908AL-164.4°,IY =48.25AL 70.4 ° , IB= 44.186AL-53.2°, IN=0.1 AL-120.8 °.</p> <p>Voltage before Fault : VRN=131.69KVL-166.5° , VYN=132.3KVL 73.5° , VBN=132.41 KVL-46.7° ,VN=0.012KVL-38.7° .</p> <p>Fault Current:IR= 105.59 AL-3.3°,IY=2832.8AL-5.6 ° , IB=232.95AL2.6°, IN=2093.3AL-37.3 °.</p> <p>Voltage during Fault :VRN=128.02KVL-178.3° , VYN=97.195KVL 32.1° , VBN=141.49 KVL-64.0° ,VN=74.287KVL-89.1°.</p> <p>PLCC COUNTER READING :</p> <p>CIRCUIT-I TX=11 RX=00 Before Fault: After Fault:</p> <p>CIRCUIT-I TX= 13(11+2) RX=00</p> <p>(I)PLCC Counter readings :OK</p>	<p>JINDAL END JINDAL END FAULT DATA NOT AVAILABLE</p> <p>REMARKS: PLCC COUNTER READING : Before Fault: CIRCUIT-I TX=05 After Fault: CIRCUIT-I TX= 14(12+2) (I)PLCC Counter readings :OK</p>	From the fault current and Voltage magnitude (72.9 degree) It is found that line fault impedance angle is approximately equal to line impedance angle (approx 78 degree). Fault is seem to be non resistive nature ,it can be concluded that Line might have autoreclosed due to Back Flah over as on the day of	Heavily stormy with rain and thunder at the time of tripping.	
6	132 KV	Line#68(Jamshedpur-Jindal) Line Length: 1.6 km	Kalyaneswari End :Trip MHS End:Trip	10.08.24.06:11hrs	10.08.24.06:11hrs	00:00:00	<p>KALYANESWARI END Protection</p> <p>Operated:Distance Protection Zone-1 Operated</p> <p>Bay Position:Normal</p> <p>Fault in Phase:B-Phase Fault Distance:11 KM</p> <p>8.17 % of FLL Fault Loop:B-N</p> <p>Auxiliary Relay: 86 L/O Operated</p> <p>Autoreclose Status:Autoreclose Lockout Operated Fault</p> <p>Resistance: Ω</p> <p>Carrier Status: Carrier Switch-IN,Carrier Healthy,</p> <p>Pre Fault Current:IR= 407.3AL 66.6°,IY =355.6AL-50.9 ° , IB= 401.7AL-167.5°, IN=0.185 AL 35.2 °.</p> <p>Voltage before Fault : VRN=78.106KVL 78.3° , VYN=78.736KVL-41.4° , VBN= 78.779KVL-162.0° ,VN=0.007KVL-130.1 °.</p> <p>Fault Current:IR= 521.3AL 72.1°,IY =336.3AL-55.3 ° , IB=6172.5 AL 119.3°, IN= 3395.4AL-82.2° .</p> <p>Voltage during Fault VRN=78.787KVL 84.6° , VYN=70.418KVL-42.8° , VBN= 11.75KV L 139.7° ,VN=15.175KVL-99.3 °.</p> <p>PLCC COUNTER READING : Differential protection was block due to Communication Fail</p> <p>REMARKS:</p> <p>(I)PLCC Counter readings :OK</p>	<p>MHS END</p> <p>REMARKS: MHS END NO TRIPPING</p>	R & B ph LA, CVT of LH16 found bursted at MHS .Line Tripped in Zone-1 due to communication fail	REMEDIAL ACTION REQUIRED:	Heavily stormy with rain and thunder at the time of tripping.
7	132 KV	Line#69(Jamshedpur-Jindal) Line Length: 1.6 km	Kalyaneswari End :Trip MHS End:Trip	10.08.24.06:11hrs	10.08.24.06:11hrs	00:00:00	<p>KALYANESWARI END Protection</p> <p>Operated:Distance Protection Zone-1 Operated</p> <p>Bay Position:Normal</p> <p>Fault in Phase:B-Phase Fault Distance:11 KM</p> <p>8.17 % of FLL Fault Loop:B-N</p> <p>Auxiliary Relay: 86 L/O Operated</p> <p>Autoreclose Status:Autoreclose Lockout Operated Fault</p> <p>Resistance: Ω</p> <p>Carrier Status: Carrier Switch-IN,Carrier Healthy,</p> <p>Pre Fault Current:IR= 407.3AL 66.6°,IY =355.6AL-50.9 ° , IB= 401.7AL-167.5°, IN=0.185 AL 35.2 °.</p> <p>Voltage before Fault : VRN=78.106KVL 78.3° , VYN=78.736KVL-41.4° , VBN= 78.779KVL-162.0° ,VN=0.007KVL-130.1 °.</p> <p>Fault Current:IR= 521.3AL 72.1°,IY =336.3AL-55.3 ° , IB=6172.5 AL 119.3°, IN= 3395.4AL-82.2° .</p> <p>Voltage during Fault VRN=78.787KVL 84.6° , VYN=70.418KVL-42.8° , VBN= 11.75KV L 139.7° ,VN=15.175KVL-99.3 °.</p> <p>PLCC COUNTER READING : Differential protection was block due to Communication Fail</p> <p>REMARKS:</p> <p>(I)PLCC Counter readings :OK</p>	<p>MHS END</p> <p>REMARKS: MHS END NO TRIPPING</p>	R & B ph LA, CVT of LH16 found bursted at MHS .Line Tripped in Zone-1 due to communication fail	REMEDIAL ACTION REQUIRED:	Heavily stormy with rain and thunder at the time of tripping.
8	132 KV	Line#16(Kumardubhi-MHS) Line Length: 4.8 km	Kumardubhi End :Trip MHS End:Trip	10.08.24.05:59hrs			<p>KUMARDUBHI END Protection Operated:Directional</p> <p>Earth Fault Trip Bay Position:Normal</p> <p>Fault in Phase:B-Phase Fault Distance: KM</p> <p>Fault Loop:B-N</p> <p>Auxiliary Relay: 86 L/O Operated</p> <p>Autoreclose Status:Autoreclose Lockout Operated Fault</p> <p>Resistance: Ω</p> <p>Carrier Status: Carrier Switch-IN,Carrier Healthy,</p> <p>Fault Current:IR=272.74 AL 119.3°,IY =222.32AL-2.9 ° , IB= 117.3AL 4.2°, IN=312.3AL 48.9° .</p> <p>Voltage during Fault VRN=77.43KVL-52.7° , VYN=78.079KVL-173.3° , VBN=76.377KV L 65.4° ,VN=1.68KV L-47.4° .</p> <p>PLCC COUNTER READING :</p> <p>REMARKS:</p> <p>(I)PLCC Counter readings :OK</p>	<p>MHS END</p> <p>MHS END NO TRIPPING</p> <p>Protection Operated:Directional</p> <p>Earth Fault starts Bay Position:Normal</p> <p>Fault in Phase:Blue-Phase Fault Loop:C-N</p> <p>Auxiliary Relay: NA</p> <p>Autoreclose Status:ANA</p> <p>Carrier Status: Carrier Switch-IN,Carrier Healthy,</p> <p>Fault Current:IR= 271.91AL 70.6°,IY =351.22AL-50.3 ° , IB= 0.3454AL 147.8°, IN=315.01AL-2.4° .</p> <p>Voltage during Fault VRN=77.942KVL 79.2° , VYN=78.430KVL-41.1° , VBN=78.102KV L-161° ,VN=0.454KVL-114.1° .</p>		REMEDIAL ACTION REQUIRED:	Heavily stormy with rain and thunder at the time of tripping.
			Kumardub				<p>KUMARDUBHI END Protection Operated:Distance</p> <p>protection Trip</p> <p>Fault in Phase:Blue-Phase Fault Distance:KM</p> <p>Fault Loop:C-N</p> <p>Auxiliary Relay: 86 L/O Operated</p> <p>Autoreclose Status:</p>	<p>MHS END</p> <p>Protection Operated:Distance protection Zone-1 trip</p> <p>Bay Position:Normal</p> <p>Fault in Phase:Blue-Phase Fault Loop:C-N</p> <p>Distance:0.079 KM</p> <p>Auxiliary Relay: 86 L/O Operated</p>			Heavily stormy with

9	132 KV	Line#10(MHS- Dubhi-MHS) Line Length: 4.8 km	hi End :Trip MHS End:Trip	10.08.24. .06:11hrs	10.08.24. 06:11hrs	00:00:00	Carrier Status: Carrier Switch-IN,Carrier Healthy, Fault Current:IR=1.909 AL-169.5°,IY =2.31AL -102.7° , IB= 4626.6AL 49.1°, IN=4623.1AL 49.1° . Voltage during Fault VRN=70.478KV L 10.4° , VYN=68.013KV L -123.7° , VBN=20.216KV L 113.1°,VN=34.599KV L -46.9° . PLCC COUNTER READING : REMARKS: (I)PLCC Counter readings :OK	Autoreclose Status:Lockout Carrier Status: Carrier Switch-IN,Carrier Healthy, Fault Current:IR=215.62 AL 0.7°,IY =540.62AL -90.5° , IB= 21919AL 80.5°, IN=21425AL 79.7° . Voltage during Fault VRN=71.652KV L 40.1° , VYN=77.759KV L -86.9° , VBN=3.4792KV L 96.9°,VN=64.914KV L -25.6° .	Fault Resistance: Ω	R & B ph LA, CVT of L#16 found bursted at MHS	REMEDIAL ACTION REQUIRED:	stormy with rain and thunder at the time of tripping.	
10	132 KV	Line#17(MHS- PHS) Line Length: 14.5 km	PHS End :Trip MHS End:Trip	10.08.24. .07:10hrs	10.08.24. 10:50hrs	00:03:40	MHS END REMARKS: (I)PLCC Counter readings :OK	PHS END Protection Operated:Directional Earth Fault Trip Bay Position:Normal Fault in Phase:Blue-Phase Fault Loop:C-N Auxiliary Relay: 86 L/O Operated Autoreclose Status:Lockout Carrier Status: Carrier Switch-IN,Carrier Healthy, Fault Current:IR=406.6 AL 107.9°,IY =373.79AL -2.2° , IB= 3.0132AL 153.4°, IN=447.37AL 56.6° . Voltage during Fault VRN=74.824KV L -63.8° , VYN=78.423KV L 175.8° , VBN=76.364KV L 51.2°,VN=3.23KV L -35.6° .	Fault Distance:KM	Jumper opened at loc. 15,	REMEDIAL ACTION REQUIRED:	Heavily stormy with rain and thunder at the time of tripping.	
							NUMBER OF CORRECT OPERATION	NC			10		
							NUMBER OF FAILURE	Nf			0		
							NUMBER OF UNWANTED OPERATION	Nu			0		
							NUMBER OF INCORRECT OPERATION	Ni			0		
							Dependibility Index	D= Nc / (Nc+Nf)			1		
							Security Index	S= Nc / (Nc + Nu)			1		
							Reliability Index	R= Nc / (Nc + Ni)			1		

Jorethang Loop Hydro Electric Project 2 X 28 MW

Protection Performance Indices for the AUGUST-2024 (In compliance of Clause 15(6) of IEGC 2023)

Sl. No.	Name of the element	Tripping Date	Tripping Time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc		Nu		Nf		Dependability index ($Nc/(Nc+Nf)$)	Security Index ($Nc/(Nc+Nu)$)	Reliability Index ($Nc/(Nc+Nu+Nf)$)	Remarks (Reason for performance indices less than 1)	Analysis of the event
						End A	End B	End A	End B	End A	End B	End A	End B					
1	220KV Jorethang- New Melli Line-1																NO TRIPING	
2	220KV Jorethang- New Melli Line-2																NO TRIPING	

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

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

Nu - is the number of unwanted operations.

Annexure B.7

List of important transmission lines in ER which tripped in August-2024														
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 END -1	DR Configuration Discrepancy - END -2	DR/EL RECEIVED FROM LOCAL END	DR/EL RECEIVED FROM REMOTE END
1	220KV-RANGPO-NEW MELLI-1	01-08-2024	08:52	03-08-2024	20:25	Rangpo end- Y_N, Z-1, FD-19.9 km, FC-9.86 kA ,	New Melli: Y_N, Z-1, FD-1.69 km, FC-2.19 kA. Conductor snapping reported between Loc 43-44	R_N	100 msec	No A/R attempt taken at Rangpo end while A/R failed at New melli end , Powergrid may explain			DR of New melli uploaded	YES
2	220KV-NEW PURNEA-MADHEPURA-2	01-08-2024	11:34	01-08-2024	13:09	New Purnea: B_N, 5.16 kA, 7.1 Km	Madhepura - B_N	B_N	400 msec	Tripped in Zone -2 at Madhepura end while A/R successful at New Purnea , , BSPTCL may explain		DR is not Time Synchronized & The Time need to increase to 3 sec in DR	NO	YES
3	220KV-PATNA-KHAGAUL-2	01-08-2024	13:19	01-08-2024	14:23	Patna: R_N, 25.24 kA, 5.69 Km		R_N	100 msec	A/R successful from Patna end but 3 phase tripped from Khagaul end for single phase fault , BSPTCL may explain .			YES	NO
4	400KV-KODERMA-BOKARO-1	01-08-2024	14:03	01-08-2024	15:24	Koderma: B_N, 3.47 kA ,91.9 Km		B_N	100 msec	A/R Successful from Bokaro end , while A/R attempt not taken at Koderma end and other 2 phases tripped from koderma on PD. DVC may explain		The Time need to increase to 3 sec in DR	YES	NO

5	400KV-BINAGURI-BONGAIGAON-2	01-08-2024	14:31	01-08-2024	18:20	Binaguri : B-N, 4.4 kA, 77 km	Bongaigaon: B-N, 176.4 Km.	B_N	100 msec	A/R Successful Tripped again within recalarm time at Binaguri. At Bongaigaon end, A.r not attempted and other 2 phases tripped after 3 sec on PD			YES	-
6	400KV-BINAGURI-TALA-1	01-08-2024	14:44	01-08-2024	15:28	Binaguri: DT Received	Tala: B_N, 2.4 kA, 30.4km	B_N	400 msec	At Binaguri, Zone-3 picked up, however DT received from remote and all three phase tripped .	DR is not Time Synchroni zed		YES	-
7	400KV-RANCHI-RAGHUNATHPUR-1	01-08-2024	15:25	01-08-2024	16:46	Ranchi: Y_B_N , Y-9.3 kA, B- 8.7 kA, 54.8 Km	Raghunathpur: Y_B_N, Y: 4.41 kA, B: 4.40 kA 104.33 Km	Y_B_N	100 msec	Phase to phase fault			YES	YES
8	220KV-MUZAFFARPUR-HAJIPUR-1	01-08-2024	18:44	01-08-2024	19:51	Muzaffarpur: Y-B, 10.36 kA, 11.6 Km	Hajipur: Y-B, Ib: 2.7 kA, 36 Km	Y_B_N	100 msec	Phase to phase fault			NO	NO
9	220KV-RAJARHAT-BARASAT-1	02-08-2024	13:01	02-08-2024	13:23	Rajarhat: B_N, 8.61 kA, 5.29 Km	Barasat: B_N, 6.33 kA, 16.92 Km	B_N	100 msec	After B_ph tripping from Rajarhat DT was sent to remote end resulting in three phase tripping from both ends. Powergrid may explain			YES	NO
10	220KV-DARBHANGA(DMTCL)-LAUKAHI-1	02-08-2024	20:40	04-08-2024	21:04	Darbhangha (DMTCL): Y-B, Iy: 3.26 kA, Ib: 3.24kA, 63.5 Km	Laukahi : Y_B, Iy-4.405, kA, Ib- 4.427 kA, 22.02 Km	Y_B	100 msec	Phase to phase fault		DR is not Time Synchroni zed	YES	YES

11	220KV-MAITHON-DHANBAD-1	03-08-2024	18:36	03-08-2024	19:03	Maithon: R_N, 5.3 kA, 26.5 km		R_N	100 msec	A/r successful from Dhanbad only while 3 phase tripped from maithon end. PG ER-2 may explain.	DR is not Synchronized		YES	YES
12	400KV-FSTPP-KHSTPP-2	04-08-2024	01:16	10-08-2024	19:08	DT Received at Farakka end		No fault	NA	No fault observed in Line. NTPC may explain			NO	NO
13	400KV-DURGAPUR-KAHALGAON-1	05-08-2024	10:23	05-08-2024	11:24	DT Received at Durgapur end		No fault	NA	No fault observed in Line Powergrid & NTPC may explain			NO	NO
14	400KV-BINAGURI-TALA-4	05-08-2024	12:56	08-08-2024	18:42	Binaguri: B_N, 3.04 kA, 128.39 km	Tala: B_N, 49.2 km	B_N	100 msec	A/R Failed after 1 sec			YES	YES
15	400KV-PPSP-BIDHANNAGAR-2	05-08-2024	23:15	06-08-2024	00:29	PPSP : Y-N, 134.5 Km	Durgapur : Y-N, 7.087 kA, 32.75 Km	Y_N	100 msec	A/r kept disabled as per OEM advise			NO	NO
16	220KV-DARBHANGA (DMTCL)-MOTIPUR-2	06-08-2024	03:30	06-08-2024	09:04		Tripped from Motipur End	No fault	NA	No fault observed in line. Line tripped from motipur only. BSPTCL may explain			NO	NO

17	400KV-PPSP-BIDHANNAGAR-1	06-08-2024	12:32	06-08-2024	12:47	PPSP: B-N, 32.8 Km	Bidhannagar: B-N, 2.97 kA, 112.3 Km	B_N	100 msec	A/r kept disabled as per OEM advise			NO	NO
18	400KV-RANCHI-RAGHUNATHPUR-3	06-08-2024	16:06	06-08-2024	19:35	Ranchi:Y-N, 3.8 kA, 164 Km	Raghunathpur: Y_N, 1.62 kA, 10.89 Km	Y_N	100 msec	A/R successful at Ranchi end while 3 phase tripped at Raghunathpur end		The Time need to increase to 3 sec in DR	YES	YES
19	220KV-SAHARSA(PMTL)-KHAGARIA(NEW)-2	06-08-2024	17:53	06-08-2024	19:51	Saharsa: R-N, 2.28 kA, 73.1 km		R_N	400 msec	Tripped in zone 2 - PMTL /BSPTCL may explain			wrong DR updated	NO
20	400KV-JEERAT-SAGARDIGHI-1	07-08-2024	01:29	07-08-2024	02:29	Jeerat - Line did not tripped	Sagardighi - Master trip operated	No fault	NA	No fault observed in PMU. WBPDCCL may explain			NO	NO
21	400KV-JHARSUGUDA-RAIGARH-3	07-08-2024	08:45	08-08-2024	16:01	Jharsuguda : Y-N, 14 kA, 15.6 Km		Y_N	100 msec	A/R failed after 1 sec			NO	-
22	220KV-DARBHANGA(DMTCL)-MOTIPUR-1	07-08-2024	16:51	07-08-2024	17:39	Darbhanga: Y_B, Iy-2.92kA, Ib-2.93 kA, 71.3 Km	Motipur: Y_B, Iy -5.034 kA, Ib-5.007 kA, 34.53 km	Y_B	100 msec	Phase to phase fault			NO	YES

23	400KV-MEERAMUNDALI-JSPL-2	08-08-2024	10:07	08-08-2024	16:46	Meeramundali: B_N, 16.83 kA		B_N	400 MSEC	Line Tripped in Zone 2 from JSPL end while B phase tripped in zone 1 from meeramundali end , OPTCL / JSPL may explain	The Time need to increase to 3 sec in DR		YES	NO
24	220KV-JSPL-JAMSHEDPUR(DVC)-1	09-08-2024	12:47	09-08-2024	13:50	JSPL :Y_N, 151.8 Km	Jamshedpur :Y_N, 3.632 kA, 11 km	Y_N	100 msec	At Jamshedpur end Initial fault in Y phase but R & Y phase both tripped , even after that A/R attempt taken at jamshedpur end , DVC may explain			NO	YES
25	400KV-JEERAT-SAGARDIGHI-1	09-08-2024	12:48	09-08-2024	13:30	Jeerat - Line did not tripped	Tripped only from Sagardighi end, 86A,86B operated	No fault	NA	No fault observed in line WBPDCCL may explain			NO	NO
26	220KV-TENUGHAT-BIHARSARIFF-1	09-08-2024	21:46	09-08-2024	22:37	TENUGHAT : R_N, 1.103 kA	Biharsariff : R_N, 1.8 kA	R_N	100 msec	3 Phase tripping for single phase fault , BSPTCL & TVNL may explain	DR is not time synchronized at Biharsariff end		NO	YES
27	400KV-MEERAMUNDALI-JSPL-2	10-08-2024	11:20	10-08-2024	15:39	Meramundali: B-N, Ib: 17.4 kA	JSPL : B-N, Ib: 0.14 kA	B_N	100 msec	Tripped in zone - 2 from JSPL end while auto recloser fail after 1 sec from meramundali end . OPTCL/JSPL may explain	The Time need to increase to 3 sec in DR		YES	NO
28	220KV-SUBHASGRAM(PG)-NEW TOWN-1	10-08-2024	11:25	10-08-2024	11:49	Subhasgram: Y_N, 10.97 kA, 1.26 Km		Y_N	100 msec	3 phase tripping for single phase fault powergrid and wbsctel may explain			COULD NOT BE DOWNLQA	NO

29	220KV-KHAGARIA-NEW PURNEA-1	11-08-2024	01:14	11-08-2024	01:38		New Purnea: B-N, IB :2.53 kA, 83.7 km	B_N	400 msec	Tripped in zone 2 from New Purnea end , BSPTCL & powergrid may explain		The Time need to increase to 3 sec in DR	NO	YES
30	400KV-PUSAULI(PG)-NABINAGAR(BRBCL)-2	11-08-2024	06:34	11-08-2024	07:41	Pusauli: DT received	BRBCL: R_N	No fault	NA	No fault observed in PMU DT receipt at Pusauli , NTPC may explain			YES	NO
31	400KV-GORAKHPUR-MOTIHARI-2	11-08-2024	07:39	11-08-2024	17:24	Gorakhpur : Y-N, 4.423 kA, 25.961 Km	Motihari : Y_N, 3.72 kA, 85.2 Km	Y_N	100 msec	A/R Failed after 1 sec			-	YES
32	220KV-DARBHANGA (DMTCL)-MOTIPUR-1	11-08-2024	09:51	11-08-2024	10:34	Darbhangha: B_N, 1.82 kA, 87.8 Km	Motipur : B_N, 0.38 kA	B_N	100 msec	A/R Successful from Motipur end , DMTCL may explain whether A/R was failed from there end or no attempt was taken at Darbhanga end as the same can not be determined due to short duration of DR	The Time need to increase to 3 sec in DR		YES	YES
33	220KV-MAITHON(PG)-DUMKA-2	11-08-2024	23:43	12-08-2024	00:05		Tripped from Dumka end only	No fault	NA	No fault observed in line , tripped from dumka end only , JUSNL may explain		DR is not time synchronized at Dumka end	NO	YES
34	220KV-NEW TOWN(AA-III)-SUBHASGRAM(PG)-1	13-08-2024	11:10	13-08-2024	19:12	New Town: R-N, 8.5 kA, 8.85 km	Subhasgram: R-N, 9.7 km, 12.17 kA	R_N	100 msec	A/R failed after 1 second		DR is not time synchronized at New town end	COULD NOT BE DOWNLQA	YES

35	220KV-RANCHI-MTPS(DVC)-1	13-08-2024	21:44	13-08-2024	22:40	Ranchi : Y-N, 1.88 kA, 80.52 km	Mejia: Y_N, 0.83 kA, 221.38 Km	Y_N	100 msec	A/r Successful at ranchi end while A/r kept disabled at mejia end			YES	NO
36	220KV-BIHARSARIFF-TTPS-1	14-08-2024	14:18	14-08-2024	14:50	Biharsariff: B-N, 127 km	TTPS: B-N, 590 A, 34 km	B_N	500 msec	O/C , Earh fault operated at Biharsariff end and DT send to Tenughat end			YES	NO
37	400KV-ALIPURDUAR (PG)-PUNASANGCHUN-JIGMELING-2	14-08-2024	15:09	14-08-2024	15:50		Jigmelling: B_N, 1.34 kA, 96.2 km	B_N	400 msec	High Resistive fault , Line trip from Alipurduar on DT receipt			YES	-
38	220KV-TENUGHAT-BIHARSARIFF-1	15-08-2024	10:39	15-08-2024	11:13	Tenughat: B_N, 119.4 km, 373.3 A	Biharshariff : B_N, 1.766 kA, 58.7 km	B_N	100 msec	3 Phase tripping for single phase fault , BSPTCL & TVNL may explain		DR is not time synchronized at Biharsariff end	NO	YES
39	220KV-KHAGARIA-NEW PURNEA-1	15-08-2024	12:56	15-08-2024	13:21	New Purnea: B-N, 2.31 kA, 85.9 Km	Khagaria: A/R SUCCESSFUL	B_N	100 msec	Tripped in zone 2 from New Purnea end , BSPTCL & powergrid may explain		The Time need to increase to 3 sec in DR	NO	YES
40	400KV-NEW PPSP-NEW RANCHI-1	15-08-2024	15:11	15-08-2024	15:52	New PPSP : B-N, 1.966 kA, 96.82 km	New Ranchi: B_N, 6.15kA, 36.7 Km	B_N	100 msec	A/R failed at PPSP end while A/r was Successful at ranchi end , WBSETCL may explain			NO	YES

41	220KV- CHAIBASA(PG)- CHAIBASA(JUSNL)-1	15-08-2024	16:51	15-08-2024	19:24	Chaibasa (PG): DT received, Maloperation of SF6 CT at Chaibasa (JUSNL) end		No fault	NA	NO Fault observed in PMU , DT received at Chaibasa (PG) JUSNL may explain	DR is not time synchroniz ed at Biharsariff end	NO	YES
42	220KV- SAHARSA(PMTL)- KHAGARIA(NEW)-1	16-08-2024	05:05	17-08-2024	01:52	Saharsa: R-N, 41.1 km	Khagaria: R_N, 3.027 kA, 26 km	R_N	100 msec	A/R Failed after 1 sec		NO	NO
43	220KV-DALTONGANJ- CHATRA-1	16-08-2024	13:28	16-08-2024	14:22	Z-1, 37.13 km, B- N fault, IB=0.252 kA	B-N fault, IB=0.108 kA	B_N	100 msec	No A/R attempt taken at chatra end and remaining phases trip on PD after 2.5 sec , while A/r Successful at Daltongunj end . JUSNL may explain	DR is not time synchroniz ed at Chatra end	NO	YES
44	220KV- SAHARSA(PMTL)- KHAGARIA(NEW)-1	17-08-2024	01:53	18-08-2024	19:23	Saharsa: B- N,4.1km, 12.9kA	Khagaria: B-N, 1.93kA, 66 km	B_N	100 msec	A/R Failed after 1 sec		YES	NO
45	400KV-NEW JEERAT- SUBHASGRAM(PG)-1	17-08-2024	03:51	17-08-2024	17:34	New Jeerat : B-N, 3.6 kA, 6.3 km	Subhasgram : B- N, 12.16 kA, 13km	B_N	100 msec	A/R Failed after 1 sec		YES	YES
46	220KV-MAITHON(PG)- DUMKA-1	17-08-2024	10:52	17-08-2024	11:30	Maithon : B_N, 4.29 kA ,8.8 Km	Dumka : B_N, 1.16 kA, 58.32 Km	B_N	100 msec	3 phase tripping from Maithon end for single phase fault. A/R Failed after 1 sec at Dumka. JUSNL & powergrid may explain		YES	YES

47	220KV-BIDHANNAGAR-WARIA-2	17-08-2024	12:59	17-08-2024	16:39	Waria : B_N, 7.73 kA, 5.41 Km,		B_N	100 msec	A/R Failed after 1 sec			NO	NO
48	400KV-ALIPURDUAR (PG)-PUNASANGCHUN-2	17-08-2024	14:58	17-08-2024	15:45	Alipurduar: DT received		B_N	100 msec	Initially on B_N fault B phase tripped from both end subsequent remaining 2 phases also tripped from both end . At Alipurduar end R & Y phase was tripped on DT receipt while at Punasangchun end after tripping of all phases 3			YES	-
49	400KV-MEERAMUNDALI-NEW DUBURI-2	17-08-2024	15:05	17-08-2024	17:50	Meramunduli: R_N, 6.86 kA, 2460 Km	New Duburi: R_N, 4.72 kA, 58.6 Km	R_N	100 msec	A/R Failed after 1 sec	The Time need to increase to 3 sec in DR		YES	NO
50	400KV-SAHARSA-DARBHANGA (DMTCL)-1	18-08-2024	01:34	18-08-2024	01:43	Saharsa: A/R successful	DMTCL: Y-N, Iy: 10.42 kA, 12.1 km	Y_N	100 msec	3 Phase tripping for single phase fault at Darbhanga end while A/r Successful at Saharsa end . DMTCL may explain			YES	NO
51	220KV-DARBHANGA (DMTCL)-MOTIPUR-1	18-08-2024	10:06	18-08-2024	11:05	Darbhanga(DMTC L): Y_B, Iy-2.91 kA, Ib-2.89 kA, 72 Km	Motipur : Y_B, Iy : 5.228 kA, Ib: 5.217 kA, 34.55 Km	Y_B	100 msec	Phase to phase fault			NO	YES
52	220KV-CHUKHA-BIRPARA-1	19-08-2024	21:13	21-08-2024	18:05		Birpara : Y_N, 2.30 kA, 52.4 Km (A/r Successful 4 times at 20:52 Hrs, 20:53 Hrs, 20:54 Hrs and 20:56 Hrs)	Y_N	100 msec	3 Phase tripping for single phase fault at Birpara end while A/r Successful at Chuka end . Powergrid may explain			YES	YES

53	765KV-JHARSUGUDA-RAIPUR PS (DURG)-2	20-08-2024	03:12	20-08-2024	05:26	Jharsuguda: Y_N, 11.69 kA, 55.7 km	Raipur: Y_N, 3.8 kA, 248.3 Km	Y_N	100 msec	A/R Failed after 1 sec			NO	-
54	400KV-NEW PPSP-ARAMBAGH-1	21-08-2024	12:30	21-08-2024	13:02	PPSP : Y_N , 118.3 km, 2.596 kA	Arambagh: Y_N, 3.19 kA, 94.4 Km	Y_N	100 msec	A/r Successful , Tripped in reclaim time			NO	YES
55	765KV-JHARSUGUDA-RAIPUR PS (DURG)-2	22-08-2024	01:46	22-08-2024	03:22	Jharsuguda : B_N, 118.41 km, 6.115 kA	Raipur : B_N, 167.44 km, 4.26 kA	B_N	100 msec	A/R Failed after 1 sec			NO	-
56	400KV-GOKARNA-NEW CHANDITALA-1	22-08-2024	10:38	22-08-2024	10:53	Gokarna : Y_N, 114 km	New Chanditala: Y_N, 2.8 kA, 61.7 km	Y_N	100 msec	A/R Failed after 1 sec			YES	YES
57	220KV-DARBHANGA (DMTCL)-MOTIPUR-2	22-08-2024	13:23	22-08-2024	14:04	Darbhanga: Y-B, Iy=4.73 kA, IB=4.73 kA, 40km	Motipur:Y-B, Iy-3.092 kA	Y_B	100 msec	Phase to phase fault			NO	YES
58	220KV-RAXAUL-SITAMARHI-2	22-08-2024	14:30	22-08-2024	16:00		Sitamarhi: Y_B, 6 kA, 34.3 km	Y_B	100 msec	Phase to phase fault			YES	NO

59	220KV-MAITHON(PG)-DUMKA-1	22-08-2024	20:16	22-08-2024	20:57	Maithon: R_N, 2.3 kA, 56km (A/R Successful)	Dumka: R_N, 3.32 km, Ir= 4.37 kA	R_N	100 msec	3 phase tripping from Dumka end for single phase fault ,A/R successful at maithon end , JUSNL may explain	DR is not time synchronized at Maithon end end		YES	YES
60	220KV-CHUKHA-BIRPARA-1	23-08-2024	09:42	25-08-2024	17:49	Chukha: Y_B	Birpara: Y_B, Ib- 2.71 kA, Iy-2.66 kA, 56.7 Km	Y_B_N	100 msec	Phase to phase fault			YES	NO
61	220KV-ARRAH (PG)-Dumraon New-2	23-08-2024	12:09	23-08-2024	17:15	Tripped due to Main Bus #2 tripping		Y_N	100 msec	Trip on Bus bar protection , Rason for bus bar protection operation may be share by powergrid			YES	NO
62	220KV-ARRAH (PG)-NAUBATPUR(BH)-2	23-08-2024	12:09	23-08-2024	16:46	Tripped due to Main Bus #2 tripping		Y_N	100 msec	Trip on Bus bar protection , Rason for bus bar protection operation may be share by powergrid			YES	YES
63	400KV-BAHARAMPUR-BHERAMARA-2	23-08-2024	13:53	23-08-2024	17:52		DT receive (channel-1) from the remote end. Only the Bheramara end circuit breaker tripped.	NO FAULT	NA	Trip only at Bheramara end on DT			NO	NO
64	220KV-DEHRI-GAYA-2	24-08-2024	11:34	24-08-2024	16:51	Dehri : B_N, 1.290 kA, 60.6 Km	Gaya: B_N, 4.4 kA, 31 Km	B_N	100 msec	A/R Failed after 1 sec			YES	NO

65	220KV-RAJARHAT-BARASAT-2	24-08-2024	23:49	25-08-2024	17:13	Rajarhat : Y-N, 7.70 kA, 11.706 km	Barasat: Y_N, 8.75 kA, 6.2 Km	Y_N	100 msec	A/R Failed after 1 sec at Rajarhat while No A/R attempt taken at Barasat end , WBSETCL may explain			YES	NO
66	220KV-MAITHON(PG)- DUMKA-2	25-08-2024	00:26	25-08-2024	10:06	MAITHON: B-N, 2.96 kA, 69.2km	DUMKA:-B-N, 1b-5.2 kA, 1.77 Km	B_N	500 msec	Tripped in Zone 2 from Maithon end , JUSNL & powergrid may explain	The Time need to increase to 3 sec in DR		YES	YES
67	220KV-MAITHON- DHANBAD-1	25-08-2024	11:47	25-08-2024	12:17	Maithon : B_N, 3.12 kA, 46.6 km		B_N	100 msec	3 phase tripping for single phase fault at Maithon end while A/r Successful at Dhanbad end , power grid may explain			YES	NO
68	400KV-KHSTPP- LAKHISARAI-1	26-08-2024	12:07	26-08-2024	16:51		Lakhisarai : 50 MVAr kAhalgaon Line Reactor-1 along with Line got tripped on REF.	NO FAULT	NA	No fault observed as per PMU , powergrid may explain			NO	YES
69	400KV-JEYPORE- GAJUWAKA-2	27-08-2024	13:37	27-08-2024	15:05	Jeypore: Y_N, 1.98 kA, 161 Km		Y_N	100 msec	A/R Failed after 1 sec			NO	NO
70	220KV- KARAMNASHA (NEW)-SAHUPURI-1	28-08-2024	05:16	28-08-2024	07:54			Karamnasha : Zone-3, Master trip 86	500 MSEC	Tripped in Zone 2 from Karamnasha end			NO	NO

71	220KV-CHUKHA-BIRPARA-1	28-08-2024	07:45	30-08-2024	16:11		Birpara: Y-B, Iy-2.87 kA, Ib-2.9 kA, 57 km	Y_B_N	100 msec	Phase to phase fault	DR is not time synchronized at Chuka end		YES	NO
72	400KV-BIDHANNAGAR-NEW CHANDITALA-1	28-08-2024	10:35	28-08-2024	10:59	Bidhannagar: R-N, 6.38 kA, 28.8 km	New Chanditala: R_N, 3.116 kA, 105.57 km	R_N	100 msec	A/r kept in non-auto mode for OPGW work			NO	YES
73	220KV-RENGALI(PH)-TSTPP-1	29-08-2024	12:57	29-08-2024	16:39	Rengali (PH):- R-N, IR: 4.06 kA, 28.41 km	TSTPP:- R-N, IR-16.87 kA, 0.9 km	R_N	400 msec	Tripped in zone 2 from Rengali end OHPC may explain			NO	NO
74	400KV-MERAMUNDALI-LAPANGA-2	29-08-2024	14:03	29-08-2024	16:59	Meeramundali : Y-N, Iy= 5.12 kA, 40.9 Km	Lapanga: Y_N, Iy= 3.04 kA, 131.1 Km	Y_N	100 msec	A/R Failed after 1 sec			YES	YES
75	400KV-ANGUL-JITPL-1	29-08-2024	14:23	29-08-2024	15:14	Angul: R-Y, 10 kA, 26.5 km	JITPL: R_Y, Ir-5.12 kA, Iy-4.31 kA, 38.6 km	R_Y_N	100 msec	Phase to phase fault			NO	NO
76	400KV-JEERAT-BAKRESWAR-1	30-08-2024	10:19	30-08-2024	10:45	Jeerat: R-N, 2.67kA, 148 km	Bakreswar: R-N, 5.34 kA, 29.89 km	R_N	500 msec	Tripped in Zone 2 from Jeerat end , WBSETCL & WBPDCCL may explain			NO	NO

77	220KV-DARBHANGA (DMTCL)-MOTIPUR-1	30-08-2024	13:27	30-08-2024	13:51	Darbhanga: B-N, 1.74 kA, 68.3 km	Motipur: B-N, 8.7km (A/R successful)	B_N	100 msec	3 phase tripping for single phase fault , BSPTCL & DMTCL may explain	The Time need to increase to 3 sec in DR		YES	NO
78	220KV-DARBHANGA(DMTCL)-LAUKAHI-1	30-08-2024	15:07	30-08-2024	17:55	Darbhanga: Y-B, Iy=7.59 kA, Ib=7.42 kA, 20.7 km		Y_B_N	100 msec	Phase to phase fault			NO	NO
79	220KV-CHUKHA-BIRPARA-1	30-08-2024	16:31	01-09-2024	18:11		BIRPARA : R-Y, Ir=2.97 kA, IY=3.54 kA, 58.2 Km	R_Y_N	100 msec	Initial R_N fault which evolves as phase to phase fault during A/R			NO	YES
80	400KV-BINAGURI-TALA-1	31-08-2024	15:59				Tala: B_N, Ib: 5.0 kA, 6.7 km	B_N	100 msec	A/R Failed after 1 sec			YES	NO

SI No.	Name of the incidence	PCC Recommendation	Latest status
138th PCC Meeting			
1.	Disturbance at 220 kV Bokaro (DVC) S/s on 20.07.2024 at 19:38 Hrs	<p>DVC representative replied that old MOCB breaker is present at BTPS B which failed to open during the disturbance therefore it is planned to replace all old MOCB breaker by Sep 2024.</p> <p>DVC representative informed that at present there is no independent set of batteries however during renovation work at CTPS & BTPS-B, two independent set of batteries will be installed.</p> <p>PCC opined that for DR recording, there should be independent supply system so that in case of total power failure at substation DR should be captured for which DVC was advised to comply same.</p> <p>PCC advised all utilities to submit their observation regarding DR retrieving feature for relays of different make being used by them in case of DC supply failure to ERPC/ERLDC.</p> <p>PCC advised DVC representative to replace the Old High Impedance Bus bar scheme with low impedance Bus Bar Scheme for enhancing the stability of the protection as per IEGC guideline.</p> <p>PCC advised DVC representative to share status of renovation/upgradation work to ERPC/ERLDC on periodic basis.</p>	

		DVC representative replied that DC system will be rectified along with enabling of bus bar protection by 10 th Sep 2024.	
2.	Total Power Failure at 220 kV Chatra (JUSNL) S/s on 08.07.2024 at 13:10 Hrs.	<p>On enquiry from PCC regarding non operation of relays at Chatra end, JUSNL representative replied that fault had not been captured in DR. He further added that testing of relay is planned in first week of Sep 2024. He also informed that at present, only single relay is present and procurement of main 2 relay is already done and it is expected that it will be installed by 30th Aug 2024.</p> <p>PCC advised JUSNL representative to test distance protection & DEF protection relays at Chatra end along with review of DEF settings & distance protection settings and submit report to ERPC/ERLDC. It further advised JUSNL representative to check DR triggering criteria for relays and revise it as per ERPC guidelines.</p>	
3.	Repeated tripping of 220KV RANCHI-MEJIA (MTPS)-1	PCC advised ERLDC representative to share scheme details along with case description where such scheme had been implemented to DVC and Powergrid so that this can be internally discussed with higher authorities of DVC as well Powergrid jointly and scheme can be implemented after receiving due approval.	

4.	Repeated tripping of 400KV LAPANGA-STERLITE-2	On enquiry from PCC regarding reason behind non operation of auto-recloser, Sterlite representative submitted that issue will be checked and report for A/r will be shared to ERPC/ERLDC along with insulator replacement report by 2 days.	
5.	Tripping of ICTs during the month of July'24	PCC advised all utilities to share preventive practices that are followed by them to avoid maloperation of mechanical relays associated with ICTs to ERPC/ERLDC so that these practices can be compiled and guidelines can be prepared.	
6.	Mock Testing of SPS	<p>ERLDC representative further added that SPS mock test for JITPL is planned on 30th Aug 2024.</p> <p>Regarding SPS testing for 220 kV EMSS-Shubhasgram D/C, ERLDC representative informed that as per CESC, loading had not been decreased till date to carry out testing however as soon as loading of lines will be reduced, Mock test of SPS will be carried out.</p> <p>PCC advised Powergrid representative to submit report for testing of SPS at Rajarhat to ERPC/ERLDC</p>	
137th PCC Meeting			

7.	<p>Disturbance at 220 kV Budhipadar(OPTCL) S/s and 220 kV Ib-TPS (OPGC) S/s on 05.06.2024 at 04:11 Hrs</p>	<p>PCC advised SLDC Odisha to coordinate with CPPs and share islanding scheme details to ERPC/ERLDC.</p> <p>OPTCL representative replied that due to non availability of shutdown & testing kit, testing of auto-recloser was not done however it is expected to be completed within 10 days and report will be shared to ERPC/ERLDC.</p> <p>PCC advised OPTCL to test relays at earliest and submit observation to ERPC/ERLDC.</p> <p>PCC advised OPTCL to conduct testing of breaker also and submit observation to ERPC/ERLDC.</p> <p>PCC advised OPTCL representative to review zone 3 time & reach settings of relay at Budhipadar end for 132 k V Budhipadar- Lapanga.</p> <p>PCC advised OPTCL representative to increase in DR length to 3 seconds.</p> <p>It further advised OPTCL representative to prepare annual maintenance plan and outage plan of each S/s and share to ERPC/ERLDC.</p>	<p><i>OPTCL representative had shared tentative program of checking and testing of 220 kV feeders vide email dated 2nd Aug 2024.</i></p> <p><i>OPTCL representative replied that testing had been completed for 5 bays as per below schedule-</i></p> <ul style="list-style-type: none"> <i>• Testing of relay and breaker for IBTPS-3 on 1st Aug 2024</i> <i>• Testing of relay for IBTPS-4 on 6th Aug 2024</i> <i>• Testing of relay and breaker for IBTPS-2 on 13th Aug 2024</i> <i>• Testing of relay and breaker for IBTPS-1 on 23rd Aug 2024</i> <i>• Testing of bus coupler on 27th Aug 2024</i> <p><i>He further added that report had been shared to ERPC/ERLDC regarding issues observed during testing.</i></p> <p><i>He informed that testing for Korba-1 and Raigarh is planned in 4th and 5th Sep 2024.</i></p> <p><i>ERPC representative enquired OPTCL representative about review of zone 3 time and reach settings of relay at Budhipadar end for 132 k V Budhipadar- Lapanga. for which OPTCL representative replied that zone 3 time settings was set to 1 second with reach settings of 150 % of line length however it is being reviewed as 120 % of (line length + adjacent longest line length).</i></p>
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			<p><i>Regarding DR length, OPTCL representative replied that it had been increased to 3 seconds for ALSTOM make relays however for Siemens relays they are facing difficulty.</i></p> <p><i>Regarding testing of auto-recloser he informed that testing had been completed.</i></p> <p><i>PCC advised OPTCL representative to share further plan of testing with ERPC/ERLDC.</i></p>
8.	Disturbance at 400 kV Meeramundali B (OPTCL) S/ s and 400 kV GMR S/s on 20.06.2024 at 19:18 Hrs	PCC advised OPTCL & GMR to carry out testing of the carrier communication jointly and submit observation to ERPC/ERLDC.	<i>OPTCL representative informed that testing of carrier communication had not been done due to non availability of shutdown of GMR unit.</i>
9.	Repeated tripping of 400kV-KHSTPP-BARH-1	<p>She further informed that shutdown of bus 2 is also planned on 31st July 2024 to revive tie bay for Banka -1 as Barh and Banka are in same tie subsequently no issue will occur further.</p> <p>ERLDC representative further enquired that auto-reclose is not getting successful from their end for barh circuit -2 for which she replied that issue will be checked in planned shutdown of line.</p> <p>NTPC representative replied that they are planning to replace faulty relays by Oct 2024 subsequently these issues will be resolved.</p> <p>PCC advised NTPC representative to resolve auto-recloser & DR issue at earliest</p>	<i>NTPC representative was not available in the meeting.</i>

10.	SPS Scheme for 220 k V Maithon Dumka D/C	PCC advised JUSNL representative to share details of feeder identified for providing load relief of 160 MW to ERPC/ERLDC within a week.	<p><i>JUSNL representative informed that feeders had been identified for providing load relief in which Godda feeder can provide load relief of 40 MW and Pakur feeder can provide relief of 100 MW.</i></p> <p><i>ERLDC representative replied that whether it is possible to segregate load relief of 100 MW of Pakur feeder in two stages for providing relief of 80 MW in stage 1 and stage 2 for which JUSNL representative replied that both lines of Pakur feeder has average load for 50 MW.</i></p> <p><i>PCC advised JUSNL representative to share complete load relief feeder details with ERPC/ERLDC so that SPS can be reviewed accordingly.</i></p> <p><i>JUSNL representative further added that PLCC for Godda end is not healthy however from local end feeder can be tripped therefore carrier is not required.</i></p> <p><i>JUSNL representative further enquired ERLDC representative whether SPS can be set up on downstream S/s like 220 k V Jasidih S/s i.e. not at Dumka end for which ERLDC representative replied that SPS can be implemented at downstream S/s however signal needs to be extended and</i></p>

			<p><i>communication(PLCC/OPGW) should be healthy.</i></p> <p><i>PCC advised JUSNL representative to explore possibilities for SPS implementation considering downstream S/s also with healthiness of communication system so that SPS can function effectively and share identified feeders details along with proposed SPS site and healthiness of communication system details to ERPC/ERLDC.</i></p> <p><i>ERPC representative requested Powergrid representative to help JUSNL in technical issues in implementing SPS.</i></p>
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11.	Disturbance at 765/400 kV Jharsuguda (Powergrid) S/s and tripping of units at Darlipalli STPP (NTPC) and OPGC on 21.05.2024 at 17:02 Hrs	<p>NTPC representative replied that already team is deployed for reviewing settings and OEM support is also required for review of these settings for which communication is already made with OEM and updates will be shared with ERPC/ERLDC.</p> <p>PCC advised OPGC representative to coordinate with OEM (M/s BHEL and M/s Siemens) to review LSR settings (slope, time delay etc) and update status to ERPC/ERLDC.</p> <p>PCC further advised to share slope of LSR ramp settings and protection scheme to ERPC/ERLDC.</p>	<p><i>No representative was present from NTPC Darlipalli.</i></p> <p><i>No representative was present from OPGC.</i></p>
12.	Disturbance at 400 kV Haldia (HEL) S/s on 29.05.2024 at 12:38 Hrs	PCC advised Powergrid representative to coordinate with OEM in order to find root cause	<i>Powergrid representative informed that already matter was communicated to OEM</i>

		<p>behind tripping of zone 2 fault in zone 1 and share the analysis received from OEM to ERPC/ERLDC. PCC further advised PG representative to share DR of the event to ERPC/ERLDC.</p> <p>PCC advised HEL representative to coordinate with OEM in order to find reason behind operation of DEF protection.</p>	<p><i>M/s GE however no comments had been received.</i></p> <p><i>HEL representative was not available in the meeting.</i></p> <p><i>HEL representative replied that issue for DEF operation during the disturbance was discussed with OEM however no comments had been received.</i></p> <p><i>PCC advised Powergrid and HEL representative to coordinate with respective OEM and share details to ERPC/ERLDC at earliest.</i></p> <p><i>In 138th PCC Meeting, No representative was present from HEL.</i></p>
13.	<p>Disturbance at 220 kV Tenughat (TVNL) S/s on 29.05.2024 at 12:57 Hrs</p>	<p>PCC advised JUSNL representative to rectify auto-reclose issue at Govindpur end by next week and intimate to ERPC/ERLDC.</p> <p>TVNL representative informed that settings at their end had been implemented by CRITL, JUSNL team and he further assured that O/C E/F settings will be revised at the earliest after consultation with CRITL, JUSNL team.</p> <p>PCC advised CRITL, JUSNL team to test auto-reclose and carrier at both Govindpur as well as Tenughat end.</p>	<p><i>In 138th PCC, JUSNL representative informed that work order for auto-reclose had been placed for Govindpur end and will be done for Tenughat end and Dumka end soon.</i></p>
135 th PCC Meeting			

14.	Total Power Failure at 220 kV Chatra (JUSNL) S/s on 06.04.2024 at 14:05 Hrs	<p>JUSNL was advised following:</p> <ul style="list-style-type: none"> ➤ Disturbance Recorders of all the relays at Chatra end may be reconfigured as per the PCC guidelines and compliance of the same shall be intimated to ERLDC/ERPC at the earliest. ➤ The relays at Chatra end may be tested for their healthiness in phased manner. ➤ Submit the event analysis report after site visit of CRITL team 	<p><i>In 138th PCC, JUSNL representative submitted that material had been received at site & relay implementation will be done by first week of Sep 2024.</i></p>
15.	Total Power Failure at 220 kV Pratapsasan (OPTCL)S/s on 23.04.2024 at 14:22 Hrs	<p>PCC opined that blocking of isolator and CB status should not cause busbar relay operation and suggested that this event of mal-operation of busbar relay shall be consulted with relay OEM and logic of busbar relay may be reviewed. PCC advised the issue may be resolved within a month.</p>	<p><i>In 138th PCC, OPTCL representative replied that communication had been already made with OEM however no response had been received from OEM.</i></p> <p><i>PCC advised OPTCL representative to share update to ERPC/ERLDC after communicating with OEM.</i></p>
133rd PCC Meeting			
16.	Review of SPS at Sterlite (Vedanta)	<p>SLDC Odisha representative informed that the meeting to discuss the modalities of implementation of proposed SPS scheme will be convened within a week.</p>	<p><i>In 138th PCC, SLDC representative replied that as per discussion held with Vedanta, SPS scheme will be implemented by end of Sep 2024.</i></p>