

Agenda for 141st PCC Meeting

Date:28.11.2024 Eastern Regional Power Committee 14, Golf Club Road, Tollygunge Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

AGENDA FOR 141st PROTECTION COORDINATION SUB-COMMITTEE MEETING TO BE HELD ON 28th NOV 2024 AT 10:30 HRS THROUGH MS TEAMS

<u> PART – A</u>

ITEM NO. A.1: Confirmation of Minutes of 140th Protection Coordination sub-Committee Meeting held on 24th Oct 2024 through MS Teams.

The minutes of 140th Protection Coordination sub-Committee meeting held on 24.10.2024 was circulated vide letter dated 30.10.2024.

Members may confirm the minutes of the Meeting.

<u> PART – B</u>

ITEM NO. B.1: Repeated disturbance at 220 kV Balimela (OPTCL) S/s and 220 kV Balimela(PH)(OHPC) S/s

B.1.1 Total Power failure at 220 kV Balimela (OPTCL) S/s and 220 kV Balimela(PH)(OHPC) S/s on 05.10.2024 at 19:03 Hrs

On 5th Oct 2024, at 19:03 Hrs 220kV-Balimela PH-Jayanagar-1 & 2 tripped on B phase fault simultaneously, consequently entire generation of Balimela PH was evacuated through single line 220kV-Balimela-Jeynagar circuit 3(via Gobindapally) subsequently 220 kV Gobindapally-Jayangar tripped on O/c protection which led to islanding of generation at Balimela PH (430 MW) and 20 MW load at Balimela S/s.

Unit 2,3,4 at Balimela PH tripped on BackUp impedance protection and Unit 5,6,7,8 remained on House load operation but could not sustain. Later at 19:06 Hrs, all 4 units were hand tripped and total power failure occurred at Balimela PH and Baliemla S/s.



Detailed report from ERLDC is attached at **Annexure B.1.1**.

Load Loss: 20 MW, Gen. Loss: 430 MW Outage Duration: 00:31 Hrs OPTCL and OHPC may explain.

B.1.2 Total Power failure at 220 kV Balimela (OPTCL) S/s and 220 kV Balimela(PH)(OHPC) S/s on 30.10.2024 at 09:05 Hrs

On 30th Oct 2024, at 09:05 Hrs bus fault occurred at 220kV Main Bus 2 at Balimela S/s which leads to tripping of all emanating line and all running units at Balimela resulting in total power failure at Balimela S/s.

Detailed report from ERLDC is attached at Annexure B.1.2.

Load Loss: 20 MW, Gen. Loss: 290 MW Outage Duration: 00:16 Hrs OPTCL and OHPC may explain.

ITEM NO. B.2: Repeated disturbance at 220 kV Dumka (JUSNL) S/s, 220 kV Jasidih(JUSNL) S/s, 220 kV Giridih(JUSNL) S/s, 220 kV Govindpur(JUSNL) S/s, 220 kV Godda(JUSNL) S/s & 220 kV Tenughat (TVNL) S/s

B.2.1 Total Power failure at 220 kV Dumka (JUSNL) S/s, 220 kV Jasidih(JUSNL) S/s, 220 kV Giridih(JUSNL) S/s, 220 kV Govindpur(JUSNL) S/s, 220 kV Godda(JUSNL) S/s & 220 kV Tenughat (TVNL) S/s on 29.10.2024 at 17:50 Hrs

On 29th Oct 2024 at 17:50 Hrs, Loading of 220kV-Maithon Dumka D/c touched 210 MW which triggered SPS at Dumka S/s. Tripping command generated for tripping of Pakur load as per Dumka SPS, however due to mal operation of SPS at Dumka, one tripping command got extended for 220 kV Maithon - Dumka D/C line simultaneously which got tripped at 17:50 hrs which led to over loading of 220kV-Tenughat TPS- Biharsarif-1, which also tripped on over current from Biharsariff end. As a result, a complete power outage occurred at 220 kV Dumka, 220 kV Govindpur, 220 kV Jasidih,220kVGiridih,220kVTenughat,220kVGodda.



Detailed report from ERLDC is attached at Annexure B.2.1.

Load Loss: 560 MW, Gen. Loss: 140 MW Outage Duration: 00:15 Hrs JUSNL, TVNL, BSPTCL and Powergrid may explain.

B.2.2 Total Power failure at 220 kV Dumka (JUSNL) S/s, 220 kV Jasidih(JUSNL) S/s, 220 kV Giridih(JUSNL) S/s, 220 kV Govindpur(JUSNL) S/s, 220 kV Godda(JUSNL) S/s & 220 kV Tenughat (TVNL) S/s on 30.10.2024 at 10:55 Hrs

On 30th Oct 2024 at 10:55Hrs, 220kV-Maithon-Dumka -2 tripped on B phase fault during which A/r attempt got failed as fault was persisting in nature. Prior to fault loading in each line was around 180 MW. After tripping of circuit 2, flow in 220kV-Maithon-Dumka-1 went beyond 305 MW (800 A) consequently SPS operated and 220 kV Maithon-Dumka-1 also tripped after 4 second as SPS current setting of 220kV-Maithon Dumka D/C was changed after disturbance on 29.10.2024 .Thereafter, 220 kV Tenughat Biharsariff tripped on overcurrent from Biharsariff end which result in islanding of Tenughat Unit which collapsed due to load generation unbalance resulting in total power failure at 220 kV Dumka, 220 kV Govindpur, 220 kV Jasidih, 220 kV Giridih, 220 kV Tenughat, 220 kV Godda.

Detailed report from ERLDC is attached at Annexure B.2.2.

Load Loss: 510 MW, Gen. Loss: 145 MW Outage Duration: 00:20 Hrs JUSNL, TVNL, BSPTCL and Powergrid may explain.

ITEM NO. B.3: Total Power failure at 220 kV Bargarh (OPTCL) S/s on 10.10.2024 at 19:04 Hrs

On 10.10.2024, at 19:04 Hrs, 220kV- Bargarh New-Katapalli tripped on over current from Bargarh end consequently Bargarh New was radially fed from Katapalli and 220 kV Bolangir (GR)-Bargarh New was kept open to control loading of 220 kV Bolangir (PG)– Bolangir (GR) D/C subsequently, total power failure occurred at Bargarh New S/s.



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

Load Loss: 190 MW Outage Duration: 00:06 Hrs OPTCL may explain.

ITEM NO. B.4: Disturbance at 220 kV Jorethang HEP S/s on 17.10.2024 at 10:19 Hrs

On 17th Oct 2024, at 10:19 Hrs 220kV-Jorethang-New Melli-1 tripped on B phase to earth fault. Prior to incident Jorethang Generation was radially connected to New Melli due to breakdown of 220kV-Jorethang-New Melli-2 therefore total generation loss of 82 MW occurred at Jorethang S/s.

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

Gen. Loss: 82 MW Outage Duration: 00:09 Hrs Jorethang HEP may explain.

ITEM NO. B.5: Total Power failure at 220 kV Ramchandrapur (JUSNL) S/s on 22.10.2024 at 05:08 Hrs

On 22nd Oct 2024 at 05:08 hrs, B phase PT of 220 kV Ramchandrapur Bus-2 got blast which caused tripping of 220 kV Bus-2 at Ramchandrapur S/s. Further, 220 kV Bus-1 at Ramchandrapur also tripped at the same time causing total power failure at 220kV Ramchandrapur S/s.



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

Load Loss: 319 MW Outage Duration: 01:22 Hrs JUSNL may explain.

ITEM NO. B.6: Major grid events other than GD/GI

A. Repeated tripping of transmission lines during the month of October'24

SI.No.	Name of the Element	No. of times Tripped	Remarks	Utility
1	220KV-RANCHI- MTPS(DVC)-1	3	A/r successful from Ranchi in all instances.	DVC
2	220KV-KHAGARIA-NEW PURNEA-1	3	Tripped on B_N fault (2 instances) and Y_B fault. In all instances fault distance was around 55-60 Km from New Purnea end.	PG(ER-I) & BSPTCL
3	220KV-KHAGARIA-NEW PURNEA-2	2	Tripped on Y_B fault in both events.	PG(ER-I) & BSPTCL

4	132KV- KAHALGAON(BSEB)- LALMATIA-1	6	Tripped on R-Earth fault in 3 instances.	BSPTCL & JUSNL
5	132KV-NAGARUNTARI- NABINAGAR-1	3	Tripped on phase to ground fault in all instances.	BSPTCL & JUSNL

Concerned utilities may explain.

B. Tripping of ICTs during the month of October'24

SI. No	Name of the Element	Trip Date	Trip Time	Remarks	Utility
1	400KV/220KV 315 MVA ICT 2 AT RAGHUNATHPUR	24-10-2024	21:55	Harmonic Block, REF Trip (33kV), IL1=83.10A, IL2=81.78A, IL3=0.73A, IN=2.25A	DVC
2	400KV/220KV 315 MVA ICT 2 AT RAGHUNATHPUR	24-10-2024	17:44	PRD Operated. ICT was charged on no load from 400 kV side	DVC
3	400KV/220KV 315 MVA ICT 1 AT NEW CHANDITALA	23-10-2024	13:06	Due to SF6 gas leakage following relay operated: In HV side, only 86A operated. In IV side, 86 operated with 63A relay operated.	WB
6	400KV/220KV 315 MVA ICT 3 AT JAMSHEDPUR	04-10-2024	02:16	86 Master trip relay operated	PG(ER-I)
7	400KV/220KV 315 MVA ICT 2 AT MEERAMUNDALI	01-10-2024	16:51	Pole Discrepancy	OPTCL

Members may discuss.

ITEM NO. B.7: Grid disturbance at 400 kV Lapanga S/s on 22.11.2024

On 22.11.2024 at 11:03 Hrs, 400 kV Bus-1 & 2 at Lapanga S/s became dead while availing shutdown of 400 kV Lapanga-Sterlite-2. It was reported that one B phase bus side isolator of Sterlite-2 at Lapanga remained stuck and earth switch was closed which led to bus fault. Later on, bus bar protection also didn't operate leading to disturbance at Lapanga S/s.

OPTCL may explain.

ITEM NO. B.8: Proposal for Additional overcurrent function for 315MVA, 400/220kV ICT-3 at Jamshedpur S/S: Powergrid

There are 03 nos of 400/220kV ICTs having rating 315MVA each at Jamshedpur S/S(Powergrid). 220 kV side of ICTs are directly connected to adjacent Ramchandrapur S/S(JUSNL). It has been observed that due to fault in 220 kV JUSNL switchyard, ICTs are feeding fault current for long duration due to delayed clearance of fault on back up protections.

400/220 kV ICTs at Jamshedpur are very critical and prone to damage if subjected to such type of faults. Also, failure of such critical elements may lead to long outage. Further, ICT-3 is more critical as its 220kV side is connected to JUSNL station through UG Cable (Length approx. 0.5KM) with

cable seal ends. The repeated delayed fault clearance gives more stress on cable weaker parts and increases the chances of cable insulation failure in cable and seal ends. In recent past, multiple cable insulation failures have occurred which has been rectified after availing long outages of ICT-3.

To avoid the cable failure and long outage of system in future, it is proposed to enable an additional overcurrent function at HV side of ICT-3 with 2.5kA in primary (average fault current observed in past tripping's) with 100ms delay.

Powergrid may explain. Members may discuss.

ITEM NO. B.9: Submission of protection performance indices on monthly basis by users to RPC and RLDC for 220 kV and above lines

As per IEGC 2023 Clause 15(6), 15(7) all users shall submit protection performance indices of previous month by 10th of every month to ERPC and ERLDC along with reasons for performance indices less than unity of individual element wise protection system to the respective RPC and action plan for corrective measures. For the month of October'24, BSPTCL, JUSNL, OPTCL, DVC, WBSETCL, DMTCL, NTPC KHSTPP, NTPC Farakka, PG ER-II, PG Odisha, Jorethang HEP, Tashiding HEP have submitted the same, which is attached as **Annexure B.9**.

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

Sl.no	Utility Name	June	July	August	September	October
1	PG-ER-1			YES (25.09.2024)		
2	PG-ER-2			YES (25.09.2024)	YES (23.10.2024)	Yes (26.11.2024)
3	PG-Odisha	YES			Yes (21.10.2024)	Yes (01.11.2024)/-
4	WBSETCL/WBPDCL	YES	YES	YES (20.09.24)/-	Yes (08.10.2024)/-	Yes (05.11.2024)/-
5	BSPTCL/ BGCL	YES		YES	Yes (15.10.2024)/-	Yes (12.11.2024)/-
6	OPTCL/ OHPC			YES (25.09.2024)	Yes (22.10.2024)	Yes (11.11.2024)
7	DVC					Yes (23.11.2024)/-
8	JUSNL	YES		Yes (14.09.24)	Yes (08.10.2024)	Yes (22.11.2024)/-
9	Sikkim					
10	OPGC					
11	PMTL					
12	NTPC- KHSTPP	YES	YES	YES	YES	Yes (13.11.2024)
13	NTPC- FSTPP	YES	YES	YES (18.09.2024)		Yes (07.11.2024)
14	NTPC-BARH	YES			Yes (16.10.2024)	
15	NTPC- TSTPP					
16	NTPC- KBUNL	YES	YES			
17	NPGC	YES				
18	BRBCL	YES				

19	NTPC- DARILAPLI					
20	NTPC- NORTH KARNPUARA	YES				
21	ATL					
22	APNRL					
23	CBPTCL					
24	DMTCL			Yes (13.09.24)	Yes (05.10.2024)	Yes (05.11.2024)
25	ENICL					
26	Chuzachen HEP					
27	Jorethang HEP	YES	YES	YES (01.09.24)	Yes (01.10.2024)	Yes (05.11.2024)
28	Tashiding Hep				Yes (03.10.2024)	Yes (05.11.2024)
29	GMR					
30	IBEUL					
31	JITPL					
32	MPL					
33	NKTL					
34						
35						
36	Powerlink					
37	PKTCL					
38	CESC					
39	Rongnichu HEP					
40	SPTL					

Members may discuss.

ITEM NO. B.10: Protection System Analysis Group of Eastern Region

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

In 140th PCC Meeting, ERPC representative informed that as per protection protocol developed by NPC in line with IEGC 2023, Protection System Analysis Group (PSAG) needs to be formed in eastern region with members from ERPC, NLDC, ERLDC, PGCIL, a Protection Expert from the region along with the entity under whose jurisdiction GD/GI occurred to analyze the GD/GI for analysis of Grid Disturbances/incidents at major/critical S/s and at substations that affected critical/essential/strategic in detail by visiting the respective substation/substations physically and conducting the meetings.

PCC advised concerned utilities to provide nominations of nodal officer by one week for forming Protection system analysis group of eastern region.

Members may update.

ITEM NO. B.11: Single Line Tripping Incidences in month of Oct 2024

Single line tripping incidents in the month of Oct 2024 which needs explanation from constituents of either end is attached at **Annexure B.11**.

Members may discuss.

PART- C: OTHER ITEMS

ITEM NO. C.1: 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
12	NHPC	Received
13	DMTCL	Received
14	IPP	Not Received

In 140th PCC Meeting, on enquiry from PCC, OPTCL representative informed that internal protection audit plan will be shared to ERPC/ERLDC by 2-3 days.

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

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

OPTCL vide email dated 22nd Nov 2024 had submitted internal protection audit plan.

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 140th PCC Meeting, ERPC representative informed that third party protection audit plan has been received from OPTCL and Powergrid ER-1. He further added 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 told that it is planned to carry out protection audit for critical substations by last week of November 2024.

NTPC representative informed that they are planning to carry out third party protection audit by CPRI in Dec 2024 /Jan 2025 for which audit plan will be shared to ERPC/ERLDC.

PCC advised all utilities to submit third party protection audit plan by 7 days 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.

Members may update.

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

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

Members may update.



event at 220 kV Balimela PH Generating Station of Eastern Region (To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f)) (आई ई जी सी 37.2 (एफ) के अनुपालन में)

Date(दिनांक):28-10-2024

1. Event Summary (घटना का सारांश):

At 19:03 Hrs 220kV-Balimela PH-Jayanagar-1 & 2 tripped on B_N fault simultaneously. Entire generation of Balimela PH around 430 MW was now being evacuated through single line 220kV-Balimela-Jeynagar ckt#3(via Gobindapally). 220 kV Gobindapally-Jayangar tripped on O/c. This led to islanding of generation at Balimela PH (430 MW) and 20 MW load at Balimela S/s. U#2,3,4 at Balimela PH tripped on BackUp impedance protection and U#5,6,7,8 remained on bar after load rejection. Later at 19:06 Hrs, all 4 units on bar were handtripped and total power failed at Balimela PH and Baliemla S/s Generation loss of around 430 MW and load loss of around 20 MW occurred.

Power extended at Balimela PH through 220kV- Balimela PH-Jayanagar-1 at 19:22 Hrs and unit#6 was synchronised.

- 2. Time and Date of the Event (घटना का समय और दिनांक): 19:03 hrs of 05.10.2024
- 3. Event Category (ग्रिड घटना का प्रकार): Grid Disturbance (GD)-1
- 4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Odisha
- 5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional	Regional	State Generation	State Demand
		Generation	Demand	Odisha	Odisha
Pre-Event	50:043 Hz	36047 MW	26757 MW	4780 MW	5931 MW
(घटना पूर्व)					
Post Event	50.026 Hz	35617 MW	26777 MW	4350 MW	5911 MW
(घटना के बाद)					

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

Important Transmission Line/Unit if under outage	
(महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो	Balimela PH unit 1
बंद है)	

Weather Condition (मौसम स्थिति)

1. Load and Generation loss (लोड और जेनरेशन हानि): Approximate Generation loss of 430 MW at Balimela PH and 20 MW load loss at Balimela.

Duration of interruption (रुकावट की अवधि): 19:03 Hrs to 19:34 Hrs.

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



Figure 1: Network across the affected area

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

8. 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	Balimela PH - UNIT 2	19:03			-
2	Balimela PH - UNIT 3	19:03	Backup impeda	ance operated	20:09
3	Balimela PH - UNIT 4	19:03		-	
4	Balimela PH - UNIT 5	19:06		20:34	
5	Balimela PH - UNIT 6	19:06		19:26	
6	Balimela PH - UNIT 7	19:06	Hand t	19:52	
7	Balimela PH - UNIT 8	19:06		20:22	
8	220 KV Balimela-Jayanagar-1	19:03	Balimela PH: Z-1, B_N, FC-4.22 kA	Jayanagar: Z-1, B_N	19:22
9	220 KV Balimela-Jayanagar-2	19:03	Baliemla PH: Z-1, B_N, FC-2.25 kA	Jayanagar: Z-1, B_N	21:10
10	220 KV Balimela- Gobindapally	19:03	Balimela PH: Tripped on over voltage		19:36
11	220 kV Gobindapally- Jayanagar	19:03	Gobindapally: Back Up O/c		19:36
12	220 kV Balimela PH-Balimela	19:03	Balimela PH: O/V St. 1	-	19:34
13	220 kV Balimela PH-Upper Sileru (Idle Charged)	19:03	Balimela PH: O/V St. 1	-	

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



- All units at Balimela PH (Except U#1 which was under S/D) were in service with total generation of around 430 MW.
- At 19:03:05.840 Hrs, 220kV-Balimela PH-Jayanagar ckt#1 & 2 tripped simultaneously due to B_N fault.



Figure 3: Balimela Bus PMU signature

- After tripping of Ckt# 1 & 2, total generation of Balimela was being evacuated through 220kV-Balimela-Gobindapally-Jayanagar and 220 kV Balimela PH-Balimela (radial load of around 20 MW)
- o Loading of 220 kV Balimela PH-Gobindapally-Jayanagar reached around 400 MW.



- Figure 4. 1 Mr0 of 220K V-Danmela- Jayanagar CKI#5 Current
- At 19:03:10 Hrs, 220 kV Gobinapally-Jayanagar tripped after around 4.5 seconds on O/c as current reached around 1000 A in each phase.
- $\circ~$ An island with around 430 MW generation at Balimela PH and load of around 20 MW at Balimela formed.



Figure 5: PMU of Balimela Bus frequency

- At 19:03:15 Hrs, 220 kV Balimela-Gobindapally tripped from Balimela on O/V.
- 220 kV Balimela (PH)-Balimela and 220 kV Balimela PH-Upper Sileru (idle charged from Balimela PH) also tripped on O/V.

- Frequency shot up to around 55 HZ. However, units didn't trip. As reported U#2,3,4 tripped later on BackUp impedance protection
- o U#2, U#3 and U#4 tripped on BackUp impedance protection.
- U#5,6,7,8 remained on bar with load rejection mode. These units were later handtripped at 19:06:30 Hrs and total power failed at Balimela PH and Balimela S/s.

R_Y_B Voltages R Y B Phase Voltage Magnitude Data R Y B Phase Voltage ×					05/10 19:03 - 28/10 11
4 05/10/2024 3 19:03:02.640 To 05/10/2024	19:06:33.760	▶ L 🗅 T 🛕			
		R Y B Phase Voltage			
200					
(V) abrillo 50	5				
0	19:04:00 19:04:15	19:04:30 19:04:45 19:05:0	0 19.05.15 19.05.30	19:05:45 19:06:00	19.06:15 19.06:30
l	SubstationId: BALIM_GR DeviceId: 220BUS2	SubstationId: BALJM_GR DeviceId: 220BUS2	SubstationId: BALIM_GR DeviceId: 220BUS2		

Figure 6: PMU of Balimela Bus voltage

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

- 220kV Balimela-Jeynagar ckt#1 & 2 tripped on single phase to ground fault. A/r not operated in either ckt. from any end. As reported, A/r scheme is not implemented in any line from Balimela PH. If A/r scheme had been in service, this disturbance could have been avoided. Necessary action may be taken up to enable A/r at both ends.
- As reported, all elements at Balimela PH are kept on either 220 kV Bus-1 or Bus-2 at a time due to non-availa bility of bus selection switch for metering circuit. Operation of Balimela PH with generation of around 480 MW on only one bus is undesirable. Suitable measures may be taken for double bus operation at the earliest.
- U#2,3 and 4 at Balimela PH tripped on Back Up impedance protection. The sequence of tripping of these units couldn't not be ascertained as DR were not time synchronized. Also, the dynamic behaviour of these units after tripping of all emanating lines needs to be studied as voltage dropped to around 50 kV and then again revived to around nominal value. Balimela PH may share unit-wise MW, MVAr, voltage and speed data with 1 minimum 1 second resolution.
- DRs at Balimela PH are not time synchronized.

• Action Taken/Remedial Measures (सुधारात्मक उपाय): Nil

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

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

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

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

SoE data not available at ERLDC.

Annexure 2:

DR of 220 KV Balimela-JAYANAGAR-1 at Jayanagar:



DR of 220 KV Balimela-JAYANAGAR-1 at Balimela :







DR of 220 KV Balimela-JAYANAGAR-3 at Balimela :



DR of Unit# 2 at Balimela :



DR of Unit# 3 at Balimela :



DR of Unit# 4 at Balimela :





event at 220 kV Balimela PH Generating Station of Eastern Region (To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f)) (आई ई जी सी 37.2 (एफ) के अनुपालन में)

Date(दिनांक):14-11-2024

1. Event Summary (घटना का सारांश):

At 09:05 Hrs on 30.10.2024, an inadvertent operation of opening of online isolator of on-bar Unit #8 of Balimela PH led to a bus fault. As reported, planned maintenance was supposed to be carried out in in U#7 which was under S/D for monthly maintenance work, but instead of opening isolator of U#7 bay, adjacent bay isolator of U#8 was opened. Since, all elements at Balimela were only on single bus, all elements tripped, and total power interruption occurred at Balimela PH. Around 365 MW generation loss and 20 MW load loss occurred at Balimela S/s.

Power extended to Balimela PH through 220kV- Balimela PH-Jayanagar-1 at 09:26 Hrs and unit#5 was synchronised at 09:32 Hrs.

- 2. Time and Date of the Event (घटना का समय और दिनांक): 09:05 hrs of 30.10.2024
- 3. Event Category (ग्रिड घटना का प्रकार): Grid Disturbance (GD)-1
- 4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Odisha
- 5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional	Regional	State Generation	State Demand
		Generation	Demand	Odisha	Odisha
Pre-Event	49.894 Hz	31180 MW	22314	2898 MW	4831 MW
(घटना पूर्व)			MW		
Post Event	49.868 Hz	30890 MW	22314	2608 MW	4831 MW
(घटना के बाद)			MW		

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

Important Transmission Line/Unit if under outage	
(महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो	Balimela HEP unit 1 & 7
बंद है)	

Weather Condition (मौसम स्थिति)	Normal.	

1. Load and Generation loss (लोड और जेनरेशन हानि): Approximate Generation loss of 290 MW at Balimela PH and 20 MW load loss at Balimela.

Duration of interruption (रुकावट की अवधि): 09:05 Hrs to 09:26 Hrs.

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



Figure 1: Network across the affected area

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

8. 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	Balimela PH - UNIT 2				13:26
2	Balimela PH - UNIT 3	09:04:25	Tripped due to lo	oss of excitation	12:11
3	Balimela PH - UNIT 4				12:26

4	Balimela PH - UNIT 5	Tripped on Earth	fault protection	-
5	Balimela PH - UNIT 6	Tripped on Earth	fault protection	11:54
7	Balimela PH - UNIT 8	Earth fault & over current		17:08
8	220 KV Balimela-Jayanagar-1	R_Y, Z-1	R_Y, Z-2	09:26
9	220 KV Balimela-Jayanagar-2	Z-4	R_Y, Z-2	09:44
10	220 KV Balimela- Gobindapally	Z-1, R_Y	R_Y, Z-2	-

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



Figure 2: Schematic diagram of the affected area

- Balimela unit# 2,3,4,5 & 6 was running with generation around 365 MW (Balimela unit#1 under S/D and Balimela Unit#7 taken under S/d for monthly maintenance work).
- Isolator of U#8 was opened in live condition instead of U#7 isolator which led to heavy sparking and R_Y bus fault.
- Bus bar protection not operated due to failure of bay control unit (As per information received from Balimela).
- 220 kV Balimela PH-Jaynagar-1 tripped from Balimela PH in Zone-1. However still fault was persisting and tripped in Zone-2 from remote end.
- 220kV-Balimela PH-Jaynagar-2 tripped in Zone-4 at Balimela PH and in Zone-2 from Jaynagar.
- 220Kv-Balimela-Gobindapally tripped in Z-1 from Balimela PH end and in Zone-2 from remote end.

- Balimela U#5,6,8 tripped on Earth fault protection and U#2,3,4 tripped due to loss of excitation.
- Total generation loss of 365 MW and load loss 20 MW occurred at Balimela S/s.

E Data	Reserven Hible 2012 Har Settes The Settes TV Thin *	
	MeasurementData25hz Line Series: Line Series By Time	
	DeviceType — # 5.9bitstationid == 64/46.00, DeviceU == 2208/32	
140,000	-	Reset zoom
120,040		
100,000		
80,000 Ultim	5	
50,000		
40,000		
20,090	have the the the the the the the the the th	
0	09-04-25.177 09-04-25.577 09-04-25.577 09-04-25.577 09-04-25.577 09-04-25.577 09-04-27.577 09-04-27.577 09-04-27.577 09-04-25.577 09-04	09.04.29.977 29.777

Figure 3: PMU of Balimela voltage

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

- There is an interlock mechanism which prevents opening of isolator in live condition. Whether interlock was bypassed manually? Balimela PH may explain.
- As per information received from Balimela PH, Bus Bar protection not operated at Balimela due to failure of bay control unit. Since when BCU was faulty. Balimela PH may explain and also update current status of differential protection.
- All elements are kept on single bus at Balimela PH due to non-availability of bus selection switch for metering circuit. Necessary action may be taken to operationalize double bus operation.
- **DR length** of Balimela PH need to be increased as per ERPC/FOLD DR standardization guideline.
- Detailed report shared by Balimela PH is attached at Annexure-3.

11. Action Taken/Remedial Measures (स्धारात्मक उपाय): Nil

S.No.	Issues	Regulation Non-Compliance	Utilities
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12. Non-compliance observed (विनियमन का गैर-अन्पालन):

1.	DR/EL not submitted within 24 hours	1. IEGC section 2. CEA grid Star		OPTCL, OHPC		
.3. K	ey Lessons Learnt (प्रमुख अधिगम	बिंदु): Nil				
nnex	sure 1: (Sequence of Events-As pe	er ERLDC SCADA)	:			
oE da	ata not available at ERLDC.					
nne	ure 2:					
DR of	220 KV Balimela-JAYANAGAR-1 a	t Balimela :				
	Trigger 30-102024 09:04:25:576					
K7:VA JNRO						
	50					
K7:VB JNR0		0.10	0.20	0.30 0.4	10 O.S	⁵⁰ t/s
17110 100		0.10	0.20	1 0.30 0.4	10 0.5	50 t/s
K7.VG JNRC				Image:		
	25	0.10	0.20	0.30 0.4	0.01	⁵⁰ t/s
K7:VN JNRO	40 -					
		0.10	0,20	0.30 0.	10 0.	50
K7:1A JNRC				-		t/s
	1 0.00	0.10	0.20	0.30 0.4	0.	50 t/s

0.30

0.30

0.40

0.40

0.50 t/s

0.50 t/s

0.10

0.10

0.20

S

1.5 1.0 0.5 0.0

K7:IC JNRCIRCUIT1 C/ A









Annexure 3:



ODISHA HYDRO POWER CORPORATION LIMITED

OFFICE OF THE DIVISIONAL HEAD, BALIMELA GENERATION DIVISION, BALIMELA.

02/11/2

OWER CORD

/Dt. Balimela the, 02/ 11 /2024

Lr.No. BGD/T-05/

1322

То

The Unit Head, Balimela H.E.Project, Balimela.

Sub:-Submission of system disturbance report occurred on Dtd.30.10.2024 in Balimela Power House-Regarding : Regarding

Sir,

With reference to the subject cited above, please find enclosed here with the system disturbance report occurred on Dtd.30.10.2024 for further action at your end.

This is for favour of your kind reference and necessary action please.

Encl: - As above Yours faithfully,

DIVISIONAL HEAD

REGD. OFFICE: ODISHA HYDRO POWER CORPORATION LIMITED ODISHA STATE POLICE HOUSING & WELFARE CORPORATION BUILDING, VANIVIHAR CHOUK, JANAPATH, BHUBANESWAR-22 Tel:91-0674-2542983, 2542802, 2545526, Fax: 2542102, GRAM: HYDROPOWER, E-MAIL: ohpc.co@gmail.com / mt@ohpcltd.com, Web: www.ohpcltd.com, CIN: U401010R19955GC003963

SYSTEM DISTURBANCE REPORT OF BALIMELA POWER HOUSE OCCURRED AT 09:05 HRS. OF DTD.30.10.2024.

1. STATUS OF BALIMELA POWER HOUSE BEFORE DISTURBANCE:

Running Units:

#2/60MW,#3/60MW,#4/60MW,#5/60MW,#6/60MW & #8/65MW Total = 365 MW.

- PH Auxiliary:1)PH Auxiliary for 0.4KV 1H Sec-II & 0.4KV 2H Sec-II were fed separately from 12T &14T respectively (Through 5GT).
 - 2) PH Auxiliary for 0.4KV 1H Sec-I & 0.4KV 2H Sec-I were fed separately from SAT-I &SAT-II respectively as well as 11KV CKD & 11KV BML colony feeder(All Four) were fed from 220/11KV,20MVA Station Transformer.

220KV Feeder Status:

Balimela-JayanagarCkt-I(L203), Balimela-JayanagarCkt-II(L204),Balimela-JayanagarCkt-III(L202) & Balimela-OPTCL CKT(L205) were in charged condition.

BML-Upper Sileru (L201) feeder was idle charged condition from Balimela end.

220KV BUS Status:

BUS-II was in service. Bus Coupler was in Open condition. All the running units and feeders were connected to 220KV BUS-II only.

BUS-I was under Standby.

BUS Voltage -235 KV

BUS Frequency- 50.01 Hz.

Cause of Fault Initiation:

At 08:49 Hrs of Dtd. 30.10.2024, #7 of BHEP was stopped for taking Monthly maintenance.Subsequently the shift operator of switch yard was instructed to open the 2P isolator (i.e, Bus isolator connecting Bus-II & #7) of #7,which was in standstill condition.However wrongly, the operator opened locally the 2P isolatorof #8 (which was running with full load condition) from switchyard bay instead of #7 which are adjacent to each other.As a result, the disturbances occurred in 220 KV bus in the switch yard of power house.The consequences are as follows.

2. DURING DISTURBANCE

09:05 Hrs:

S: Due to the wrong operation of Unit-8 isolator of bus-II,heavy arc occurred in aforesaid isolator contact, thereby the feeders and units got tripped in cascading manner mentioned in the following :

220KV BML-JNR CKT-I(L-203) & 220KV BML-JNR CKT-II(L-204) got auto tripped with Zone-4 &

Zone-1 protection respectively with operation of distance protection relay.

220KV BML-JNR CKT-III (L202) got auto tripped from Govindpally end due to the disturbance.

220KV BML-OPTCL CKT (L205) remain in closed condition at both end.

#2,#3,#4 got auto tripped due to loss of excitation and generator under voltage and #8 got auto tripped with earth fault and over current due to high arc fault in its circuit.

#5 & #6 got auto tripped with operation of 13PY(external earth fault in 220 KV network) relay & remain in voltage build up condition.

220/11 KV,20MVA Station Transformer,11KV incomer breaker also got auto tripped due to under voltage in Bus.

3. <u>RESTORATION PROCESS.</u> 09:06 Hrs: PH auxiliary availed

PH auxiliary availed through 5GT only.(PH Auxiliary for 0.4KV 1H Sec-II & 0.4KV 2H Sec-II were fed separately from 12T &14T respectively with B/C (Bus Coupler) is in closed condition).

09:26 Hrs:	L203 (Balimeta-JayanagarCkt-I) feeder was charged from both Balimeta & Jayanagas and and all all
	OK & thus the 220 KV Bus of switch yard was charged through Bus-li
09:28 Hrs:	220/11KV,20MVA Station Transformer was charged from 220KV Bus-II &11KV incomer breaker was closed & stood OK.
09:30 Hrs:	Power House auxiliary availed through 5GT(12T & 14T) & 220/11KV,20MVA Station Transformer(SAT-I & SAT-II) separately.
09:32 Hrs:	#5 was synchronized with the grid and loaded 20 MW as required by SLDC
09:44 Hrs:	L204 (Balimela-JayanagarCkt-II) feeder was charged from both Balimela & Jayanagar End and stood OK .
11:16 Hrs:	Bus change over was done from 220 KV Bus-II to 220KV Bus-I at Switch Vard
11:54 Hrs:	#6 was synchronized with the grid (through 220KV Bus-I) and loaded 20 MW as required by SLDC.
12:11 Hrs:	#3 was synchronized with the grid and loaded 60 MW as required by SLDC
12:30 Hrs:	#4 was synchronized with the grid and loaded 60 MW as required by SLDC.
13:26 Hrs:	#2 was synchronized with the grid and loaded 60 MW as required by SLDC.
17:08 Hrs:	#8 was synchronized with the grid and loaded 65 MW as required by SLDC.
17:58 Hrs:	#7 was synchronized with the grid and loaded 65 MW as required by SLDC.
	BUS Voltage- 236 KV

BUS Frequency-50.02 Hz.

Thus Normalcy was restored in Balimela Power House.

9/s 02/11/24

Divisional Head >-Balimela Generation Division BHEP Balimela

Sub-Divisional officer (El.), Balimela Generation Sub-Division-I, Balimela.



220/132 Dumka 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 जो सी 37.2 (एफ) के अनुपालन में)

Date(दिनांक):13-11-2024

1. Event Summary (घटना का सारांश):

At 17:49 Hrs on 29.10.2024, 220 kV Maithon-Dumka D/c tripped due to mal-operation of newly designed SPS for 220 kV Maithon-Dumka D/c. Consequently, entire load of around 560 MW of Dumka, Giridih, Govindpur, Godda, Jasidih and Godda were fed through Biharsharif and one unit generation of 140 MW at Tenughat(140 MW generation). Thereafter, 220 kV Tenughat-Biharsharif tripped from Biharsharif leading to formation of island with 140 MW generation of Tenughat and around 560 MW load which didn't survive, leading to total power interruption at 220 kV Dumka, 220 kV Govindpur, 220 kV Jasidih, 220 kV Giridih, 400/220 kV Tenughat, 400 kV PVUNL, 220 kV Godda. Total load loss of 560 MW and generation loss of 140 MW occurred.

- 2. Time and Date of the Event (घटना का समय और दिनांक): 17:49 hrs of 29.10.2024
- 3. Event Category (ग्रिड घटना का प्रकार): Grid Disturbance (GD)-1
- 4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Jharkhand
- 5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional	Regional	State Generation	State Demand
	(Hz)	Generation (MW)	Demand (MW)	Jharkhand (MW)	Jharkhand (MW)
Pre-Event (घटना पूर्व)	50.000	34480	26286	268	1758
Post Event (घटना के बाद)	49.974	34340	25726	128	1158

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

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो	210 MW U#2 at Tenughat
बद रु)	
Weather Condition (मौसम स्थिति)	Normal

- 6. Load and Generation loss (लोड और जेनरेशन हानि): Approximate Generation loss of 140 MW at Tenughat TPS. Approximate load loss of 560 MW at 220 kV Dumka, 220 kV Govindpur, 220 kV Jasidih, 220 kV Giridih, 220 kV Godda during the event.
- 7. Duration of interruption (रुकावट की अवधि): Around 15 minutes
- 8. Network across the affected area (प्रभावित क्षेत्र का नक्शा):



Figure 1: Network across the affected area

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

क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220 kV Maithon-Dumka D/c		-	Dumka: SPS maloperated	18:04/18:10
2	220 kV Tenughat-Biharsharif	17:49:20	Tenughat: Didn't trip	Biharsharif: O/c operated	18:05
3	210 MW U#1 at Tenughat		Under fr	equency	21:55

10.Major Elements Tripped (प्रमुख ट्रिपिंग):
11. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):

- Prior to the event, flow of 220 kV Maithon-Dumka D/c reached 210 MW each. A new SPS was
 implemented at Dumka to control loading of 220 kV Maithon-Dumka D/c in case It reached
 beyond 210 MW by tripping 132 kV Dumka-Pakur D/c and 220 kV Dumka-Godda D/c in 2 stages
 with time delay of 2 seconds each.
- On the day of disturbance, as flow touched 210 MW in each circuit of 220 kV Maithon-Dumka D/c, it gave tripping command to breakers of 132 kV Dumka-Pakur D/c after 2 seconds as per set conditions. However, at the same time, 220 kV Maithon-Dumka D/c also tripped on O/c from Dumka end only.
- It was gathered that the SPS scheme has been implemented in the Main-2 relay (Siemens Make) of the D/c line at Dumka end as O/c St.1 & 2. The relay generated tripping signal for own line also.
- This led to tripping of 220 kV Maithon-Dumka D/c. Consequently, entire load of around 560 MW started getting fed from 220 kV Tenughat-Biharsharif and one Unit of Tenughat.
- 220 kV Tenughat-Biharsharif tripped from Biharsharif end on O/c.
- This led to formation of an island with 140 MW generation at Tenughat and 560 MW load of Govindpur, Dumka, Jasidih, Giridih, Godda and startup load of 400 kV PVUNL S/s. The island collapsed immediately due to large load generation imbalance.



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

• The SPS scheme tripped the line, the flow of which it was monitoring. This led to tripping of D/c line.

• 220 kV Tenughat-Biharsharif tripped from Biharsharif end only. As gathered, O/c setting is kept at 1200 A at Biharsharif end. However, the flow in the line didn't cross 1200 A. It was reported that Main-2 relay at Biharsharif operated.

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

• The pickup setting of said SPS was increased to 800 A on 29.10.2024 as a temporary measure on 29.10.2024 as it couldn't be disabled in the evening hours after the disturbance.

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

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

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

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

SoE data not available at ERLDC.

Annexure 2:

DR of 220 kV Maithon-Dumka-2 (Dumka)





220/132 Dumka 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):13-11-2024

1. Event Summary (घटना का सारांश):

At 10:55 Hrs on 30.10.2024, 220 kV Maithon-Dumka-2 tripped due to B_N fault. A/r attempt from Maithon failed after 1 second. After tripping of Ckt-2, flow in 220 kV Maithon-Dumka-1 crossed 800 A in each phase. The SPS which mal-operated a day before, its setting was increased after first incident to 800 A on temporary basis. As one circuit tripped, flow in another circuit crossed the new set limit of 800 A. SPS again mal-operated and gave tripping command to 220 kV Maithon-Dumka-1 breaker at Dumka apart from tripping breaker of 132 kV Dumka-Pakur D/c. Consequently, entire load of around 510 MW of Dumka, Giridih, Govindpur, Godda, Jasidih and Godda were fed through Biharsharif and one unit generation of 145 MW at Tenughat. Thereafter, 220 kV Tenughat-Biharsharif tripped from Biharsharif leading to formation of island with 145 MW generation of Tenughat and around 510 MW load which didn't survive, leading to total power interruption at 220 kV Dumka, 220 kV Govindpur, 220 kV Jasidih, 220 kV Giridih, 400/220 kV Tenughat, 400 kV PVUNL, 220 kV Godda. Total load loss of 510 MW and generation loss of 145 MW occurred.

2. Time and Date of the Event (घटना का समय और दिनांक): 10:55 hrs of 30.10.2024

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

- 4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Jharkhand
- 5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional	Regional	State Generation	State Demand
	(Hz)	Generation (MW)	Demand (MW)	Jharkhand (MW)	Jharkhand (MW)
Pre-Event (घटना पूर्व)	49.949	29782	22968	198	1633
Post Event (घटना के बाद)	50.013	29637	22458	53	1123

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

Important Transmission Line/Unit if under outage	
(महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो	210 MW U#2 at Tenughat
बंद है)	

Weather Condition (मॉसम स्थिति) Normal	
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- 6. Load and Generation loss (लोड और जेनरेशन हानि): Approximate Generation loss of 145 MW at Tenughat TPS. Approximate load loss of 510 MW at 220 kV Dumka, 220 kV Govindpur, 220 kV Jasidih, 220 kV Giridih, 220 kV Godda during the event.
- 7. Duration of interruption (रुकावट की अवधि): Around 20 minutes
- 8. Network across the affected area (प्रभावित क्षेत्र का नक्शा):



Figure 1: Network across the affected area

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

10.Major Elements Tripped (प्रमुख ट्रिपिंग):

क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220 kV Maithon-Dumka-2	10:55:35	Maithon: B_N, 2.34 kA, A/r failed	Dumka: B_N, 1.73 kA	11:58
2	220 kV Maithon-Dumka-1		-	Dumka: SPS maloperated	11:30
3	220 kV Tenughat-Biharsharif	10:55:37	Tenughat: Didn't trip	Biharsharif: O/c operated	11:15
4	210 MW U#1 at Tenughat		Under fr	equency	20:13

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

- Prior to the event, flow of 220 kV Maithon-Dumka D/c was around 175 MW each. B-Earth fault struck 220 kV Maithon-Dumka-2. A/r attempted from Maithon end after 1 second but failed. All three-phase tripped from Dumka in the first instance of the fault.
- The SPS which operated a day before, its setting was increased to 800 A as a temporary measure as the same couldn't be disabled on 29.10.2024. After tripping of Ckt-2, flow in 220 kV Maithon-Dumka-1 crossed 800 A (around 310 MW).
- As power flow crossed new set limit of 800 A in the remaining 220 kV Maithon-Dumka-1, it gave tripping command to breakers of 132 kV Dumka-Pakur D/c after 2 seconds as per set conditions. However, at the same time, 220 kV Maithon-Dumka-1 also tripped on O/c from Dumka end only.
- Consequently, entire load of around 510 MW started getting fed from 220 kV Tenughat-Biharsharif and one Unit of Tenughat.
- 220 kV Tenughat-Biharsharif tripped from Biharsharif end on O/c.
- This led to formation of an island with 145 MW generation at Tenughat and 560 MW load of Govindpur, Dumka, Jasidih, Giridih, Godda and startup load of 400 kV PVUNL S/s. The island collapsed immediately due to large load generation imbalance.



- The SPS scheme tripped the line, the flow of which it was monitoring. This led to tripping of D/c line.
- A/r is not operating at Dumka end. Three phase tripping occurred for single phase fault.
- 220 kV Tenughat-Biharsharif tripped from Biharsharif end only. As gathered, O/c setting is kept at 1200 A at Biharsharif end. However, the flow in the line didn't cross 1200 A. It was reported that Main-2 relay at Biharsharif operated.

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

- The said SPS was disabled on 30.10.2024 after 2nd incident. It will be taken in service by JUSNL after proper testing.
- O/c setting in Main-2 relay of 220 kV Tenughat-Biharsharif has been disabled at Biharsharif. Back Up O/c with 1200 A pickup has been kept in service.
- A meeting was held on 30.10.2024 after the 2nd incident. Record notes of meeting is attached at Annexure-3.

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

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

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

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

SoE data not available at ERLDC.

Annexure 2:

DR of 220 kV Maithon-Dumka-2 (Maithon)











Annexure 3:

Record Notes of meeting to discuss repeated disturbance at Dumka S/s and SPS at Dumka

A meeting was held at 15:30 Hrs on 30.10.2024 through MS Teams platform (online mode) with participants from ERPC, ERLDC, SLDC Jharkhand, Tenughat, CRITL JUSNL & Dumka S/s to discuss regarding two disturbance occurred at Dumka S/s and mal-operation of newly commissioned SPS for the D/c line.

Following points were discussed:

- ERLDC apprised about the two disturbances that occurred at Dumka and nearby S/s on 29.10.2024 and 30.10.2024.
- On 29.10.2024, loading of each circuit of 220 kV Maithon-Dumka D/c touched 210 MW and the condition for SPS at Dumka got satisfied. The SPS scheme tripped 132 kV Pakur load but at the same time it extended tripping command to 220 kV Maithon-Dumka D/c lines also.
- On 30.10.2024, 220 kV Maithon-Dumka-2 tripped due to B_N fault. Loading of circuit-1 crossed set SPS limit and again SPS acted in the same way as on 29.10.2024 and 220 kV Maithon-Dumka-1 tripped.
- In both instances, after tripping of 220 kV Maithon-Dumka D/c, entire power supply to Dumka and nearby areas was being supplied through 220 kV Biharsharif-Tenguhat and Tenughat generation. 220 kV Biharsharif-Tenughat tripped from Biharsharif end which led to formation of island with Tenguhat generation and all loads, which collapsed immediately due to large load generation imbalance and total power failure occurred at 220 kV Dumka, Govindpur, Tenughat, Godda, Jasidih and Giridih S/s.
- 220 kV Tenughat-Biharsharif shouldn't have tripped from Biharsharif end as loading was well within limit. ERLDC intimated that the matter is being taken up with BSPTCL and is expected to be resolved soon.
- ERLDC raised the issue of improper SPS operation to which CRITL team replied that the tripping command is being extended to 220 kV Maithon-Dumka lines also which was not checked at the time of testing of SPS.
- Representative from Dumka S/s confirmed that after disturbance on 30.10.2024, the said SPS was disabled. ERLDC pointed out that SPS scheme should have feature to bypass it easily if required as per grid conditions.

- ERLDC appraised the issue of continuous high loading of 220 kV Maithon-Dumka D/c and possibility of cascaded tripping of the lines and thereafter similar blackout incident might occur at any time. SLDC Jharkhand agreed to prepare a SOP to take necessary measures to regulate loading of 220 kV Maithon-Dumka D/c to avoid any cascaded tripping.
- SLDC Jharkhand also agreed to investigate the Possibility of keeping 220 kV Dumka-Govindpur in closed condition along with O/c setting to avoid outage of Tenguhat generation in case of tripping of 220 kV Maithon-Dumka D/c.
- All members agreed that the SPS scheme is required to be implemented properly at the earliest. It was decided that a committee with members from SLDC Jharkhand, Powergrid, CRITL JUSNL may be formed, and the committee will visit Dumka S/s during SPS testing. ERPC/ERLDC will be available through virtual mode if any assistance is required. After confirmation from the committee, SPS scheme will be taken in service.
- \circ $\;$ The present SPS is kept disabled for the time being.

Following action points were agreed upon:

- 1. SLDC Jharkhand:
 - a. To prepare a Standard Operating Procedure to mitigate high loading of 220 kV Maithon-Dumka D/c and prevent any cascaded tripping of lines.
- 2. CRITL JUSNL
 - a. Implement the SPS scheme of 220 kV Maithon-Dumka D/c properly and arrange for earliest testing.
- 3. **ERLDC:**
 - a. Review tripping of 220 kV Tenughat-Biharsharif in consultation with BSPTCL and revise the settings at Biharsharif end, if required.
- 4. SLDC Jharkhand, Powergrid, CRITL JUSNL will nominate members for a committee visit to Dumka during testing of SPS after implementation.

Meeting ended with vote of thanks



at 220/132 kV Bargarh New S/s of Eastern Region (To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f)) (आई ई जी सी 37.2 (एफ) के अनुपालन में)

Date(दिनांक):29-10-2024

1. Event Summary (घटना का सारांश):

At 19:04 Hrs on 10.10.2024, 220kV- Bargarh New-Katapalli tripped on over current from Bargarh end. Bargarh New was being radially fed from Katapalli and 220 kV Bolangir (GR)-Bargarh New was kept open to control loading of 220 kV Bolangir (PG)– Bolangir (GR) D/C. Consequently, total power failed at Bargarh New S/s. Around 190 MW load loss occurred. Power extended at 19:10 Hrs through 220kV-Bargarh New-Katapalli.

2. Time and Date of the Event (घटना का समय और दिनांक): 19:04 hrs of 10.10.2024

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional	Regional	State Generation	State Demand
	Frequency	Generation	Demand	Odisha	Odisha
Pre-Event	50.00	25550	26521	4571	5955
(घटना पूर्व)	50.08	30009	26521	4571	5855
Post Event					
(घटना के	50.08	35559	26331	4571	5665
बाद)					

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

Important Transmission Line/Unit if under outage	220 kV Bargarh New- Bolangir (GR) line
(महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो	kept open, to control loading of 220 kV
बंद है)	Bolangir (PG)– Bolangir (GR) D/C.
Weather Condition (मौसम स्थिति)	Normal.

Load and Generation loss (लोड और जेनरेशन हानि): Approximate Load loss of 190 MW at Bargarh.

Duration of interruption (रुकावट की अवधि): 00:06 Hrs

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



Figure 1: Network across the affected area

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

8. Major Elements Tripped (प्रमुख ट्रिपिंग):

क्र₀स₀	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220 kV Bargarh- Katapalli	19:04	O/C Tripped from Bargarh end only. Ia= 610 A, Ib= 560 A, Ic= 620 A	Not tripped.	19:10

- 9. Event Analysis (Based on PMU, SCADA & DR) (घटना का विश्लेषण):
 - Load of around 190 MW at Bargarh New S/s was being fed through 220 kV Katapalli-Bargarh new radially.
 - At 19:04 Hrs 220kV-Bargarh New-Katapalli tripped on over current from Bargarh end (Ia-610 A, Ib-560 A, Ic-620 A) which led to total power failure of Bargarh New S/s. There was no fault in the line.



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

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

- 220kV-Bargarh New-Katapali line tripped on over current with load current around 620 A. As reported by OPTCL, O/c setting was kept enabled at Bargarh end with setting of around 600A, 0.25 TMS. This conservative setting of O/c below thermal limit of the line led to total power interruption at Bargarh New S/s. This has been disabled now and only E/f setting has been kept enabled.
- Detailed report received from OPTCL is attached at Annexure-3.

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

12.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

13. Key Lessons Learnt (प्रमुख अधिगम बिंद्): Nil

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

Sequence of Events not available at ERLDC.

Annexure 2: DR/EL not submitted yet.



kV Jorethang PH Generating Station of Eastern Region (To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f)) (आईई जी सी 37.2 (एफ) के अनुपालन में)

Date(दिनांक):04 -11-2024

1. Event Summary (घटना का सारांश):

At 10:19 Hrs 220kV-Jorethang-New Melli ckt #1 tripped on B phase to earth fault (Jorethang Generation was radially connected to New Melli due to breakdown of 220kV-Jorethang-New Melli ckt#2) as a result total generation loss of 82 MW occurred at Jorethang S/s due to loss of evacuation.

At 10:28 Hrs power extended through 220kV-Jorethang-New Melli ckt #2 and generation restored at 10:32 Hrs.

- 2. Time and Date of the Event (घटना का समय और दिनांक): 10:19 hrs of 17.10.2024
- 3. Event Category (ग्रिड घटना का प्रकार): Grid Disturbance (GD)-1
- 4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Sikkim
- 5. Report submitted by utility on: NA
- 6. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand
Pre-Event (घटना पूर्व)	49.934Hz	27075	23680
Post Event (घटना के	49.934Hz	26993	23680
बाद)			

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

Important Transmission Line/Unit if under outage	220KV-JORETHANG-NEW MELLI-2 was
(महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो	under tripped condition from 09:58 hrs
बंद है)	due to B-N Fault
Weather Condition (मौसम स्थिति)	Normal.

Load and Generation loss (लोड और जेनरेशन हानि): Approximate Generation loss of 82 MW at JLHEP (as reported by JLHEP).

Duration of interruption (रुकावट की अवधि): 10:19 Hrs to 10:28 Hrs.

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



Figure 1: Network across the affected area

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

9. Major Elements Tripped (प्रमुख ट्रिपिंग):

क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220KV-JORETHANG-NEW MELLI-1	10:19	-	Z-2, B_N	10:51
2	220KV-JORETHANG-NEW MELLI-2	09:58	Distance protection operated	Z-2, B_N, FC-4.3 Ka	10:28

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

Pre-Disturbance condition (Event at 09:58 Hrs):

- At 09:58 Hrs 220kV-Jorethang-New Melli Ckt#2 was already under tripped condition on B_N fault.
- Jorethang full generation (82 MW) was radially evacuated through 220kV-Jorethange-New Melli Ckt#2.



Figure 2: PMU plot of Rangpo Bus at 09:58 Hrs.

Event at 10:19 Hrs:

- At 10:19 Hrs 220kV-Jorethang-New Melli ckt#1 tripped on B-Phase to Earth fault, this lead to loss of evacuation path of Jorethang HEP and machines tripped.
- At 10:28 Hrs power extended through 220kV-Jorethang-New Melli ckt #2 and generation restored at 10:32 Hrs.



Figure 3: PMU plot of Rangpo Bus at 10:19 Hrs.

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

• Event at 09:58 Hrs.

 A_high resistive fault occurred in 220kV-Jorethang-New Melli ckt#2. From DR phasor at New Melli end, current and voltage was in almost same phase during fault feeding time, which conclude that New Melli act as source for fault feeding, it means fault was in 220kV-Jorethang-New Melli ckt#2.



Figure 4: DR of 220kV-Jorethang-New Melli Ckt#2 at New Melli

- Line tripped from New Melli end in Z-2 with time delayed of 350 msec. The same fault should have been sensed in zone-1 by Jorethang end and should have tripped immediately but it appears that from Jorethang end it tripped after tripping from new melli end .Reason of Z-1 failure /Delayed tripping may be checked and shared by Jorethang.
- Event at 10:19 Hrs.
 - Again, high resistive fault occurred at 10:19 Hrs in 220kV-Jorethang-New Melli ckt#1. From New Melli end line tripped in Z-2.
 - With tripping of this line, Jorethang machines were isolated from the grid.
 - Till this point even after tripping from new melli end it appears from DR that Jorethang end breaker was intact till 1 second as B phase voltage was suppressed till 1 second and became zero either due to machine tripping or line tripping which could not be ascertained from DR.
 - Jorethang to explain whether line breaker tripped or not? Distance protection setting at Jorethang end may be checked.
 - Machines DR yet to be received.
 - DR is not time synchronised at Jorethang end.

• Action Taken/Remedial Measures (सुधारात्मक उपाय): Distance protection Zone setting at Jorethang end to be reviewed.

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

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

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

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

Time	Station	Description	Status
17-10-2024 _09:58:25	MELNW_PG	220_JORET_PG_2_CB	Open
17-10-2024 _10:19:34	MELNW_PG	220_JORET_PG_1_CB	Open
17-10-2024 _10:27:21	MELNW_PG	220_JORET_PG_2_CB	Closed
17-10-2024 _10:51:53	MELNW_PG	220_JORET_PG_1_CB	Closed

* SOE of Jorethang HEP S/s not available at ERLDC end.

Annexure 2:



• DR of 220KV-JORETHANG-NEW MELLI-2 at Jorethang :

Trigger 17-10-2024 09:58:25.685 I_R PH/ A 1 150 100 50 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 t/s I-Y PH/ A 150 100 50 0 2.0 1.5 2.5 0.0 0.5 1.0 3.0 3.5 t/s I-B PH/kA 1 0.5 1.5 2.0 2.5 3.5 0.0 1.0 3.0 t/s V-R PH/kV 100 50 0.5 1.5 2.0 2.5 3.0 1.0 3.5 t/s V-Y PH/kV 100 h 50 0.5 1.0 1.5 2.0 2.5 3.0 3.5 t/s V-B PH/kV 100 50 0.5 2.0 2.5 3.5 0.0 1.0 1.5 3.0 t/s ļ 2.5 3.0 0.5 1.5 2.0 3.5 0.0 1.0 t/s L1 FUSE FAIL BE OPTIME BE OPTIME PENETY BUILTY BU 5 E 2.5 0.0 0.5 1.0 1.5 2.0 3.0 3.5 t/s

• DR of 220KV-JORETHANG-NEW MELLI-2 at New Melli :

• DR of 220KV-JORETHANG-NEW MELLI-1 at Jorethang :



DR of 220KV-JORETHANG-NEW MELLI-1 at New Melli : •





at 220/132 kV Ramchandrapur Sub-Station of Eastern Region (To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f)) (आई ई जी सी 37.2 (एफ) के अनुपालन में)

Date(दिनांक):13-11-2024

1. Event Summary (घटना का सारांश):

At 05:08 hrs on 22.10.2024, B_ph PT of 220 kV Bus-2 at Ramchandrapur burst leading to tripping of all elements connected to Bus-2. However, due to flashing, after around 900 msec, the fault struck 220 kV Bus-1 also. This led to total power failure at 220/132 kV Ramchandrapur S/s. Total Load loss occurred around 150 MW at Ramchandrapur. Power was extended through 220 kV Ramchandrapur-Chaibasa (JUSNL)-1 at 06:30 Hrs.

- 2. Time and Date of the Event (घटना का समय और दिनांक): 05:08 hrs of 22.10.2024
- 3. Event Category (ग्रिड घटना का प्रकार): Grid Disturbance (GD)-1
- 4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Jharkhand
- 5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency (Hz)	Regional Generation	Regional Demand	State Generation Jharkhand	State Demand Jharkhand
Pre-Event (घटना पूर्व)	49.94	31963	22416	267	1439
Post Event (घटना के बाद)	49.95	31963	22266	267	1289

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

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

6. Load and Generation loss (लोड और जेनरेशन हानि): Approximate Load loss of 150 MW at Ramchandrapur S/s.

Duration of interruption (रुकावट की अवधि): 05:08 Hrs to 06:30 Hrs (1 Hr 22 minutes).

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



8. Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): B_ph PT of 220 kV Bus-2 at Ramchandrapur burst.

9. Major Elements Tripped (प्रमुख ट्रिपिंग):

क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220KV-RAMCHANDRAPUR- JAMSHEDPUR-1	05:08	Ramchandrapur: O/c Hi-set	-	07:05
2	220KV-RAMCHANDRAPUR- JAMSHEDPUR-2	05:08	Ramchandrapur: O/c Hi-set	-	07:29
3	220KV-RAMCHANDRAPUR- JAMSHEDPUR-3	05:08	-	Jamshedpur: Back Up impedance, Zone-2	11:11
4	220KV-RAMCHANDRAPUR- CHAIBASA(JUSNL)-1	05:08	Ramchandrapur: B_N, 2.20 kA, E/f	Chaibasa: Didn't Trip	06:30
5	220KV-RAMCHANDRAPUR- CHAIBASA(JUSNL)-2	05:08	Ramchandrapur: B_N, Z-4, 3.77 kA	Chaibasa: BN, Z2, 3.78 kA	06:56

6	220KV-RAMCHANDRAPUR- CHANDIL-1	05:08	Ramchandrapur: B_N, 2.96 kA, E/f	Didn't Trip	07:36
7	220KV-RAMCHANDRAPUR- JODA	05:08	Ramchandrapur: B_N, 1.36 kA, Zone-1 . Other two phase tripped on E/f	-	07:32
8	220 kV Bus Coupler	05:08	Ib: 8.06 kA, O/C Hi-Set		-

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



Figure 2: Schematic Diagram of 220kV Ramchandrapur S/s(Received from JUSNL)

- At 05:08 Hrs B-Phase PT of 220 kV-Ramchandrapur Bus #2 burst and bus fault occurred.
- Bus bar protection at Ramchandrapur is out of service.
- 220 kV Bus Coupler ripped on O/c Hi-set after 150 msec.
- 220 kV Ramchandrapur-Chaibasa-2 tripped in Zone-4 from Ramchandrapur. Still the fault was persisting, and line tripped from remote end in Zone-2.
- 400/220 kV ICT-3 at Jamshedpur (220 kV Jamshedpur-Ramchandrapur-3) tripped on Backup impedance from Jamshedpur end in Zone-2.
- 220/132 kV ICT-3 at Ramchandrapur tripped on E/f.
- 400/220 kV ICT-1&2 at Jamshedpur (220 kV Jamshedpur-Ramchandrapur-1&2) which was connected to Bus-1 tripped from 220 kV side immediately on O/c Hi-set.
- Due to PT failure and flashing thereafter, the fault wasn't totally cleared and it struck 220 kV Bus-1 also (Evolved into phase to phase fault after around 900 msec-R_ph and B_ph).

Data I	R Y B Phase Voltage ×									
22/10/2024	05:08:13.600 To	22/10/2024	05:08:26.960	1 610	< l 🛓					
					R Y B Phase	Voltage				
250										Recet Toom
225						1	~			Reset 200m
n 200 —			1							
175										
150										
	05:08:17 486	05:08:17	686 05:08:1	7.886	05:08:18.086	05:08:18.286	05:08:18.486	05:08:18.686	05:08:18.886	05:08:19.0
		ſ	- VBM		- VRM	-	- VYM	1		
			Substationid: JA	MSH_PG	Substationid:	AMSH_PG	SubstationId: JAMSH_PG DeviceId: 4008U51			

Figure 3: PMU voltage snapshot of 400/220 kV Jamshedpur S/s

- 220kV Ramchandrapur-Chaibasa-1 & 220kV Ramchandrapur-Chandil tripped on earth fault protection after around 1 sec as distance protection got blocked due to PT fuse fail.
- B_ph of 220kV Ramchandrapur-Joda tripped in Z-1 from Ramchandrapur during first fault itself. Other two phase tripped on E/F after 1 second.
- Consequently, total power failed, and load loss of 150 MW occurred at Ramchandrapur S/s.

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

- Bus bar protection at Jamshedpur is kept disabled. Necessary action may be taken to enable it at the earliest.
- As reported, 400/220 kV ICT-1&2 at Jamshedpur tripped immediately on Hi-Set O/c from 220 kV side. Setting may be reviewed as to avoid its tripping in case of fault in adjacent bus. O/c Hi-set setting of ICT-3 also may be reviewed in co-ordination with other two ICTs.
- Only one Bus PT is used as input for all elements on both 220 kV bus at any instance. The reason for the same may be explained. The two Bus PTs should be independently used for respective elements of the two bus. JUSNL may explain.
- Detailed report received from JUSNL attached as Annexure 3:

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

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

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

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

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

SoE data not available at ERLDC.

Annexure 2:



DR of 220KV-RAMCHANDRAPUR-JAMSHEDPUR-1 at Jamshedpur:

DR of 220KV-RAMCHANDRAPUR-JAMSHEDPUR-2 at Jamshedpur:



DR of 220KV-RAMCHANDRAPUR-Joda at Ramchandrapur:



DR of 220KV-RAMCHANDRAPUR-CHANDIL at Ramchandrapur:



DR of 220KV-RAMCHANDRAPUR-CHAIBASA at Ramchandrapur:



Annexure 3:



GRID DISTURBANCE AT 220/132 kV RAMCHANDRAPUR (RCP) GSS ON 22.10.2024 at 05:08 hrs
Disturbance at Ramchandrapur GSS

Overview of Incident :-

At 05:08 hrs, B Phase of PT of Main Bus- 02 was got burst due to which both main bus – 01 & 02 became dead. Initially the fault is in B ph, after 900 ms it converted into RB phase fault and due to bursting and flame this created both Main- 1 & 2 bus fault.

Load loss: 150 MW Weather Condition- Normal

Elements tripped during the event:-

- ➤ 220 Kv RCP PGCIL ckt-01, 02 & 03,
- > 220 KV RCP Chaibasa ckt-01 & ckt-02,
- ➢ 220 KV RCP JODA S/c
- ➢ 220 KV RCP − Chandil S/C,
- ➤ 150 MVA, 220/132 KV ICT 01, 02 & 03

Elements under outage:- None



Fault conditions :-



• Relay Indications:-

Element's Name	Relay End-1	Relay End-2	Remarks
220 kV RCP - Joda	BN, Z1, 1.36 kA, only B -Ph & other Ph tripped on EF in approx. 1s		
220 kV RCP - Chandil	BN, 2.96 kA, Z2&Z3 pick up but tripped on EF approx. 1s.	Didn't Tripped	
220 kV RCP – CBSA - 01	BN, 2.20 kA, Z2&Z3 pick up but tripped on EF approx. 1s.	Didn't Tripped	
220 kV RCP – CBSA - 02	BN, Z4, 3.77 kA	BN, Z2, 3.78 kA	
220 kV RCP - PG – 01, 02 & 03	BN, O/C & EF (Inter-trip	o), within 100 ms.	
220 kV Bus Coupler	BN, 8.06 kA, O/C in app	orox. 150 ms	

• Tripping Analysis :-

Due to bursting of B-Phase, 220 kV PT of Main Bus- 02, both the main Bus became dead.

220 kV Bus Coupler : - Tripped on O/C in approx. 150 ms

220 kV Chaibasa- 02 :- The fault (BN) was sensed on Z4 and tripped approx. 300 ms. (tZ4 = 250 ms)

✤ 220 kV PG – 01, 02 & 03 :- All the feeders are tripped on Back up protection (inter- trip) within 100 ms.

After the tripping of Bus Coupler and bus- 2 elements (PG – 3, Chaisbasa- 2and 150 ICT- 3), the bus- 2 fault got cleared.

However, due bursting of PT and flame, BN fault converted to RBN fault after 900 ms, this also leads to bus-1 fault.

Tripping Analysis :-

- *220 kV Chandil & 220 kV Chaidasa- 01 feeders sensed the fault in Z2 & Z3 but distance got block due to Fuse fail protection, eventually both the feeders tripped on E/F protection in approx 1s.
- 220 kV Joda feeder sensed the fault in Z1 and tripped B phase only. Other phases tripped on E/F in approx 1s.

At the time of fault, only bus-2 PT was in service.

Protection Issue observed during the event:-

- The fault was sensed in forward direction by all the 220 kV feeders of Main Bus- 1, reason of same could not be identified. The fault clearing time of bus- 1 elements is aprox 1sec.
- Bus Bar protection and LBB was out of service.

Remedial Measures:-

After isolating faulted PT of main – 2 bus all the elements are normalized.

<u>Restoration of elements</u>:-

SI. No.	Element's Name	Restoration Time
1	220 kV Ramchandrapur - Chandil	07:36 hrs
2	220 kV Ramchandrapur – Chaibasa - 01	06:30 hrs
3	220 kV Ramchandrapur – Chaibasa - 02	06:56 hrs
4	220 kV Ramchandrapur – Joda	07:32 hrs
5	220 kV Ramchandrapur – PG – 01, 02 & 03	07:05, 07:29 & 11:11 hrs
6	150 MVA ICT – 02 & 03	13:21 hrs & 06:47 hrs

Thank You

Protection Performance Indices for the month of October'24 (BSPTCL)

						Reason (Relay	vindication)	r	Nc	1	Nu		Nf	Dependabilit	Security Index	Reliability Index	Remarks (Reason for performance
5. N	 Name of the element 	Tripping Date	Tripping Time	Restoration Date	Restoration Time	End A	End B	End A	End B	End A	End B	End A	End B	- y index (Nc/(Nc+Nf))	(Nc/(Nc+Nu))	(Nc/(Nc+Nu+ Nf))	indices less than 1)
1	220KV-KHAGARIA-NEW PURNEA-1	01-10-2024	07:48	04-10-2024	11:44	Khagaria:B-N, Ib- 2.787 kA, 54.29 km	New Purnea: B_N, 3.56kA, 53.8 km	1	1	0	0	0	0	1	1	1	
2	220KV-DARBHANGA(DMTCL)- LAUKAHI-2	02-10-2024	18:45	02-10-2024	19:29		Laukahi: Y_N, 42.5 Km, 2.28 kA		0		0		1	0	0	0	PLCC testing will be done in coordination with Telecom wing.
3	220KV-KHAGARIA-NEW PURNEA-1	04-10-2024	11:58	05-10-2024	19:04	Khagaria : B_N, 2.91 kA, 50.7 Km	New Purnea: B_N, 3.862 kA, 57.5 Km	1	1	0	0 0 0 1		1	1	1		
4	220KV-NEW PURNEA-MADHEPURA 2	. 04-10-2024	12:16	04-10-2024	13:50	New Purnea: B_N	Madhepura: B_N, Ib 2.41 kA, 11.2 Km	0	1	o	o	1	0	New Purnea- 0 Madhepura- 1	New Purnea-0 Madhepura-1	New Purnea- 0 Madhepura- 1	Distance Protection relay at Purnea PG end will be tested shortly after taking shutdown
5	220KV-MUZAFFARPUR-HAJIPUR-1	06-10-2024	09:45	06-10-2024	10:58	Muzaffarpur, B-N pahse,1.3KA	Hajipur: B_N, 2.8 KA, 29 Km	0	o	o	o	1	1	0	0	0	All 220 KV panels have been replaced by agency but Auto - reclose has not been checked/tested in Hajipur- Muzaffarpur ckt-01. Shutdown has been applied in OCC for the month of November and the same will be tested as per avaibility of Agency. PLCC is also not working in this circuit.
6	220KV-DARBHANGA (DMTCL)- SAMASTIPUR-1	09-10-2024	11:21	09-10-2024	11:58		Samastipur: Y- B, Iy=5.12 kA, Ib=5.099 kA, 24.4 km		1		0		0	Samastipur-1	Samastipur-1	Samastipur- 1	
7	220KV-KHAGARIA-NEW PURNEA-2	11-10-2024	10:59	11-10-2024	11:47	Khagaria-YB,Z-1 protection operated	Purnea: Y_B, 2.96 kA, 75.5 Km	1	1	0	0	0	0	1	1	1	
8	220KV-SAHARSA(PMTL)- KHAGARIA(NEW)-1	15-10-2024	07:56	16-10-2024	20:34		Khagaria: R_N, Ir- 1.284 kA, 51.94 km		1		0		0	Khagaria-1	Khagaria-1	Khagaria-1	

9	220KV-TENUGHAT-BIHARSARIFF-1	19-10-2024	09:38	19-10-2024	10:12		Biharshariff :B_N, 1.191 kA, 109.5 Km		0		o		1	0	0	0	PLCC Panel erected at BIHARSARIFF end while PLCC not available at TTPS end Hence Auto reclose doesnot work.
10	220KV-KHAGARIA-NEW PURNEA-2	23-10-2024	18:26	23-10-2024	18:37	Khagaria:Y-B, Iy- 3.610kA, Ib-3.627 kA, 46.86 km	New Purnea: Y- B, Iy 3.81 kA, Ib 3.78 kA, 58.8 km	1	1	o	0	0	0	1	1	1	
11	220KV-KHAGARIA-NEW PURNEA-1	25-10-2024	09:55	25-10-2024	10:38	Khagaria: Y- B, Ir 0.04 kA, Iy- 3.92 kA, Ib- 3.93 kA, 39.2 km	New Purnea: Y- B, IY-3.8 kA, IB 3.75 kA, 56 km	1	1	0	0	0	0	1	1	1	

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

s.		Tringing Date	Trippi	Restorati	Restoratio	Reason (Rel	ay indication)	ſ	lc	Nu	ŗ	Nf	Dependability	Security Index	Reliability Index	Remarks (Reason for
No.	Name of the element	Tripping Date	Time	on Date	n Time	End A	End B	End A	End B	End A End B	End A	End B	(Nc/(Nc+Nf))	(Nc/(Nc+Nu))	(Nc/(Nc+Nu +Nf))	than 1)
1	220 kV TVNL - Govindpur - 02	05.10.2024	09:47			-	BN, Z1, 1.68 kA, 3 Ph tripping		1	0		1	1	1.00	0.50	DTPC is not healthy
2	220 KV DALTONGANJ - CHATRA -1	07.10.2024	16:34			Daltaonganj : R_N, 1.494 kA, 84.6 km	DT received.		1	0		0	1	1.00	1.00	
3	220 kV Dumka II - Govindpur - 02	08.10.2024	13:40			RN, Z1, 3 Ph tripping	RN, Z1, 1.89 kA, A/R successful.	1	1	0 0	1	0	1	1.00	1.00	3 Ph tripping for single phase fault at Dumka end. DTPC is not installed
4	220 KV DALTONGANJ - CHATRA -1	08.10.2024	16:16			Daltonganj: B-N, 1.1 kA, 125 km, .	BN, Z1, 1.22 kA, A/R successful.		1	0		0	1	1.00	1.00	
5	220KV-MAITHON(PG)- DUMKA-1	09-10-2024	12:41			Maithon: Y-B, IY- 21.3 kA, IB-21.0 kA, 3.3 km	Dumka: Y_B, IY-1.4 KA, Ib-1.09 kA, 69 km		1	0		0	1	1	1	
6	220KV-RANCHI-HATIA-2	09-10-2024	18:32			Ranchi : R_B, Ir: 6.25 kA, Ib: 6.9 kA, 23.8 Km	: R_B, Ir: 8.53 kA, Ib: 7.33 kA, 23.8 Km		1	0		0	1	1	1	
7	220KV-RANCHI-HATIA-2	10-10-2024	17:32			Ranchi: R-Y, Ir- 13.38 KA , Iy- 11.2 KA, 11 Km	Hatia : R-Y, Ir: 4.359 kA, Iy:4.087 kA, 20.64 km		1	0		0	1	1	1.00	
8	220KV-DALTONGUNJ- GARWAH (NEW)-2	13-10-2024	11:57			Daltonganj: Y_B, Iy-3.6 kA, Ib-3.6 kA, 15.3 Km	Garwah : Y_B, 51.63 Km		1	0		0	1	1	1	
9	220 kV Ramchandrapur - Chandil	22-10-2024	05:08			BN, 2.96 kA, Z2&Z3 pick up but tripped on EF approx. 1s.	Didn't Tripped	1		0	0		1	1.00	1.00	

10	220 kV Ramchandrapur - Joda	22-10-2024	05:08		BN, Z1, 1.36 kA, only B -Ph & other Ph tripped on EF in approx. 1s	-	1	0		0		1	1.00	1.00	BUS-2 fault 220/132 kV
11	220 kV Ramchandrapur - Chaibasa - 1	22-10-2024	05:08		BN, 2.20 kA, Z2&Z3 pick up but tripped on EF approx. 1s.	Didn't Tripped	1	0		0		1	1.00	1.00	GSS Ramchandrapur
12	220 kV Ramchandrapur - Chaibasa - 1	22-10-2024	05:08		BN, Z4, 3.77 kA	BN, Z2, 3.78 kA	1	1 0	0	0	0	1	1.00	1.00	
13	220KV-MAITHON(PG)- DUMKA-1	29-10-2024	17:50		No Fault	Mal-tripping due to SPS		1	1		0	1	0.5	1	
14	220KV-MAITHON(PG)- DUMKA-2	29-10-2024	17:50		No Fault	Mal-tripping due to SPS		1	1		0	1	0.5	1	SPS mal -operated at Dumka
15	220KV-MAITHON(PG)- DUMKA-1	30-10-2024	10:56		No Fault	Mal-tripping due to SPS		1	1		0	1	0.5	1	
16	DUMKA-2	30-10-2024	10:56		BN, 2.34 kA	BN, Z1, 1.73 kA, 26 km, AR unsuccessful.		1	0		0	1	1	1	DTPC is not healthy

					RESTORATION	REASON(REL	AX INDICATION)		NC		NU		NF	DEPENDABILITY	SECURITY INDEX	RELIABILITY	
SLING	NAME OF THE ELEMENT	TRIPPING DATE		RESTORATION DATE	TIME	END-A	END-B	END- A	END-B	END- A	END-B	END-A	END-B	INDEX (NC/NC+NF)	(NC/NC+NU)	INDEX(NC/NC+NU+NF)	KEMAKKS
1	220KV RENGALI PH- TSTPP-1	03-10-2024	14:15	04-10-2024	19:12	DP/EF OPTD		1	0	0	0	0	1	END A=1 ,END B=0	END A=1 ,END B=0	END A=1 ,END B=0	DELAY FAULT CLEARANCE 800ms
2	220KV RENGALI - TTPS-1	08-10-2024	10:02	08-10-2024	15:41	R-N/17.38 KA/0.8KM	ZONE-1/RN/17.38 KA/0.8KM	1	1	0	0	0	0	END A=1 ,END B=1	END A=1 ,END B=1	END A=1 ,END B=1	DELAY OPENNING
3	400KV MRDL-MDSL- 1	19-10-2024	15:21	19-10-2024	22:46	R-N/4.5KA/65.8KM	R-N/6.36KA/38.1KM	1	1	0	0	0	0	END A=1 ,END B=1	END A=1 ,END B=1	END A=1 ,END B=1	A/R FAILED BOTH END AFTER 1 SEC
4	220KV BUDHIPADAR KORBA-2	26-10-2024	08:15	26-10-2024	11:31	A/R SUCCESSFUL	R-N/2.336KA/29.42KM	1	1	0	0	0	0	END A=1 ,END B=1	END A=1 ,END B=1	END A=1 ,END B=1	A/R NOT OPERATED AT KORBA END
5	220KV TTPS-TSTPP-1	28-10-2024	17:08	30-10-2024	18:37	B-N/5.6KA/17.75KM	B-N/9.1KA/10.3KM	1	1	0	0	0	0	END A=1 ,END B=1	END A=1 ,END B=1	END A=1 ,END B=1	A/R NOT OPERATED BOTH END
6	400KV MRDL- LAPANGA-1	31-10-2024	12:06	31-10-2024	14:30	R-N/6.6KA/24.9KM	R-N/2.14KA/139.5KM	1	1	0	0	0	0	END A=1 ,END B=1	END A=1 ,END B=1	END A=1 ,END B=1	A/R FAILED BOTH END DUE TO PERSISTENT FAULT

PROTECTION PERFORMANCE INDICES AS PER 141TH PCC MEETING AGENDA FOR THE MONTH OF OCT-2024 FOR OPTCL ,SLDC,ODISHA

SL NC	VOLTAGE LEVEL	LINE NUMBER AND LINE LENGTH	S/D,B/D,TRIP, AUTO RECLOSE	INITIALISATION TIME	NORMALISATION TIME	OUTAGE HOUR	OUTAGE DESCRIPTION WITH RELAY INDIC	ATION AND PLCC COUNTER READING	PRELIMINARY FINDINGS	ACTION TAKEN/REMEDIAL ACTION	WEATHER CONDITION
1	132 KV	L#26 (Howrah-Kolaghat) Line Length: 57.3 km	Howrah End :Trip Kolaghat End: Trip	23.10.24,12:20 hrs	23.10.24,12:24 hrs	00:04:00	KOLAGHAT END Protection Operated/Sitance protection Zone-1 Operated Bay Position-Normal Fault In Phase:Red-Phase Fault Distance: 44. 4KM Fault Loop:A-N Audiary Relay: 1858,2868,86L/0 Operated Autorectose Status:Autoreclose Lockout Fault Current:Rel 7249.7AL-788,787.vet342475A.85.0°, IB=177.5AL-40.4*, IN-833.51 AL-69.1* Voltage before Fault :VRN=66.398KVL.00*, VVN=124.67KVL-113.5*, VSN=123.81KVL.119.7,VN=21.021KVL.15.6.	HOW RATEEND Protection Operated: Distance protection Zone-1 Operated Bay Position:Normal Fault in Phase: Red-Phase Fault Distance: 5.3393KM Fault Lop:A-X Auxilary Relay: 86A,86B Operated Autoreclose Status:Autoreclose- Lockout	Decapping of R-Phase at loc 165 in Line 232	REMEDIAL ACTION REQUIRED: After rectification line was normalised	At the time of tripping weather was cloudy & windy
2	220 kv	L#235 (MTP5-Durgapur) Line Length: 31.45 km	MTPS End :Trip Durgapur End:Trip	23.10.24,12:42hrs	23.10.24,15:46 hrs	03:04:00	DURGAPUR END Protection Operated:Distance Protection Zone-1 Operated in both 21M1 & 21 M2 Relay along with Z-Com in 21 M2 relay. Bay Position:Normal Fault in Phase:Blue-Phase Fault Distance: 18.7 KM Fault Loop: B-N Auxilary Relay: 861/0 Operated Autoreclose Status:Autoreclose lockout Fault Loopmedance: 0 Carrier Status: Carrier Switch-IN, Carrier Healthy, Pre Fault Current::Re 11.606A.100.2°, IY = 12.075A26.7° JIB=12.45A147.4°, JIN=1.443.A41.5°. Voltage before Fault : VRN=129.38VL.00°, VYN=130.37VL-120.2°, VBN=129.74VL.109.4 Fault Current::Re 13.235A.102.5°, JY = 11.741AL-29°, IB=5922.34L.71°, JIN=197.7 AL.71°. Voltage during Fault : VRN=125.38VL.0.0°, VYN=137.71KVL-116.5°, VBN=97.270VL.119.1	MTTPS END Protection Operated:Distance Protection Zone-1 Operated Bay Position:Normal Fault in Phase:Blue-Phase Fault Distance: 10 296 KM Fault Distance: 86A Operated Auxilary Relay: 86A Operated Autoreclose Status:Autoreclose- lockout Fault Resistance: 0 Carrier Status:	As per the fault current and voltage angle(43.1 degree) it seem that fault is resistive(might be vegetation in the vicnity of the line) in nature.	REMEDIAL ACTION REQUIRED: Check for vegetation nearby the line corrodor	Heavily stormy with rain and thunder at the time of tripping.
3	220 KV	L#211 (DSTPS-DTPS) Line Length: 10 km	DTPS End :Trip DSTPS End : No Trip	24.10.24,12:15hrs	24.10.24,20:24hrs	08:09:00	INTPS END Protection Operated Distance Protection Zone-1 Operated Bay Position-Normal Fault In Phase: Yellow -Phase Fault Distance: 2.17 KM Fault Loop:B-G Auxilary Relay: 186RT,A86VT.186BT,185R,185Y,186B,86 Operated Autorectoos Status-Autorectoose Blocked Carrier Status: Carrier healthy,Carrier send CLOSING SHOT ZNEKN AT 12:20 KMRS BUT LINE AGAIN TRIPPED WITH RELAY INDICATION AS BELOW Protection Operated: Distance Protection Zone-1 Operated Bay Position:Normal Fault In Phase: Yellow -Phase Fault Distance: 2.29 KM Fault Distance: 2.29 KM Fault Distance: Status:Autoreclose Blocked Carrier Status: Carrier healthy,Carrier send REMARKS:	DSTPS END NO TRIPPING AT DSTPS END	After patrolling fault (y- jumper opened) has detected at Loc- 24/2 multi circuit tower	REMEDIAL ACTION REQUIRED: Dead-end jumper cone was damaged and it has been replaced by dead end Tee connector	Heavily stormy with rain and thunder at the time of tripping.
4	220 KV	Line#215(jamshedpur- Jindal) Line Length:134.7km	Jamshedpur End :Autoreclose Jindal End:Autoreclose	26.10.24.,19:05hrs	Instantaneous	00:00:00	JAMISTIEDPUR END Protection Operated:Distance Protection Zone-1 operated and Z- COM Operated after receiving carrier signal. Bay Position:Normal Fault Distance:27.9 KM Fault Dosp:8-N Autiary Relay: 186R,286R Operated Autoreclose Status:Autoreclose Successful Carrier Status: Carrier Switch:NLC Arrier Healthy, Carrier Send Pre Fault Current:IR-36AL-173.7', IY =31.8AL 78.3', IB=39.202 AL 44.1', INP-015 AL-46.3. Voltage before Fault KN=130.76KVL0.0'', VYN=131.77KVL- 119.8'', VIN=132.08KVL 119.8', VN=0084V151.2L'. Eauth Current:IR=140.414.1'.0'', V=3208.44.1' SEG_ '' IB=51.53	JODA END Protection Operated:Distance Protection Z-COM Operated Bay Position:Normal Fault In Phase:YPhase Fault Distance:120.4KM Fault Doyation: 51.63 ms Relay Trip Time: 80 mS Auxilary Relay: 186R,286R Operated Autoreclose Status: Autoreclose Successful Fault Rositance: 5.415 Ω Carrier Status: Carrier Switch IN,Carrier Healthy, Carrier Receive Fault Current:IR= 138A,IY =1211 A, IB=43.46A. Valansed wirker Cally UNI-Dis 211/ UNI-8	19:05:42:226:line tripped in Zone-1 19:05:42:2298.1:Both R& Y Pole opened after 72.1 ms of Zone-1 Trip 19:05:43:33-2 After dead time 1107 ms (after dead time setting 1000 ms)Line autorecloseLfrom the fault current and voltage angle(70.5 degree) it seem to be	Back flash over can be avoided by proper tower foot resistance; it is required to check the tower foot resistance of the tower in the location +/ 10 percent from the fault locatio	Weather was rainy at the time of tripping.

							Table Contentine - Interaction / Toronal Content Local / 1000/01/20 AL 173/5', Int 1155 AL 100.1 Voltage during Fault VRN-132.75KV_0.0°, VYN-67.542kV 129.9°, VRN-137.2KV_113.8°, VN-27.08kV_65.2°. PLCC COUNTER READING : REMARKS:	Volage utiling Fault VNVF-123-SNV, VTIY-38-82V, VBYF- 132.38V. PICC COUNTER READING : PICC Fault: TX= RX= After Fault: TX= RX= REMARKS:	non resistive in nature,Line autoreclose du to backflashover.	REMEDIAL ACTION REQUIRED:	
5	220 KV	Line#215(jamshedpur- Jindai) Line Length:134.7km	Jamshedpur End Autoreciose Jindal End Autoreciose	26.10.24.,19.23hrs	Instantaneous	00:00:00	JAMSHEDPT/ILEEND Protection Operated.Distance Protection Zone-1 operated and Z- COM Operated after receiving carrier signal. Bay Position:Normal Fault in Phase: V-Phase Fault Distance:25.3 KM Fault cop:Bay Auxilary Relay: 186R;286R Operated Auxilary Relay: 186R;286R Operated Auxorectore Status:Autorecioes Successful Carrier Status: Carrier Switch-IN,Carrier Healthy, Carrier Send Pre Fault Corner:18:26:332A726:4;1Y:24.10A.179.7*, IB=3019.445.4*, IN=0.16.At.176.1 Voltage before:Fault VRN=131.01VvL.00*, VNN=131.74kVv- 119.7*, VBN=132.49kVvL120*,VIN=0.16kVvL141.1*, Fault Current:IR=163.11AL.178.9*, VI ~ 3510.3At.172.7*, IB=64.633.At.173.8*, IN=123.21kVvL.00*, VNN=64.248kVvL- 121.2*, VBN=133.45kVv.132.5*, VN=28.788kVvL75.6*, PLCC CONTER READING : REMARKS:	1001A END Protection Operated:Distance Protection Z-COM Operated Bay Position:Normal Fault In Phase:YPhase Fault Dustance:I23.9 KM Fault Dustance:I23.9 KM Fault Dustance:I23.9 KM Fault Dustance:I28.9 KM Audiary Relay:I286A;286R Operated Autorectose Status:Autorectose Successful Fault Resistance: S.896 O Carrier Status: Carrier Switch-IN,Carrier Healthy, Carrier Receive Fault Gurent:Re: 127.5A,IY =1229 A, IB= 31.89A. Yottage during Fault KNn=129.5KV, VMN=96.18V, VBN= 132.1KV. PLCC COUNTER READING : Before Fault: TX= RX= REMARKS:	19:23:30:465:line tripped in Zone-1, Y- Phase Operated 19:23:30:55:80th R& Y Pole opened after 70.4 ms of Zone-1 Trip 19:23:31:573: After 1108:3 ms (after deat time setting 1000 ms)Line autoreclosed:From the fault current and voltage angle(66:1 degree) it seem to be non resistive in nature,Line autoreclose du to backflashover.	Back flash over can be avoided by proper tower foot resistance, it is required to check the tower foot resistance of the tower in the location + 10 percent from the fault locatio REMEDIALACTION REQUIRED :	Weather was rainy at the time of tripping.
6	132 KV	L-24(Belmuri-Howrah) Line Length=49.3 km	Belmuri End :Trip Howrah End:Trip	27.10.24.,10:06hrs 27.10.24.,10:19hrs	27.10.24.,10:09 hrs 27.10.24.,17:17hrs	00:03:00 06:58:00	BELINUTRE EN D Protection Operated:Distance Protection Zone-1 Operated Bay Position.Normal Fault in Phase:Red-Phase Fault Dojz-AN Auxilary Relay: 86 A Operated Autorecodes Status-Autoreclose Lockout Operated Fault Resistance: 0 Carrier Status: Pre Fault Current:IR= 2546A,IY = 220.2A , IB=135.4A, IN=11.5 AL.S8.3'. Voltage before Fault : VRN=22.29KV, VYN=82.48KV, VBN= 77.04KV. REMARKS: o Before fault : RX=89496 , RX=89441 Atter fault: TR=89476946+1), RX=89438(8491+2) AGAIN LINE TRIPPED ON 27.10.24 AT 10:19 HRS Protection Operated:Directional Earth Fault Operated Fault Relay: 86 A Operated Fault Distance: KM Auxilary Relay: 86 A Operated Fault Current:K= 0.0A,Y1=100A, IB=180A Voltage before Fault : VRN=22.29KV, VYN=82.48KV, VBN= 7.04KV.	IOW RAH END Protection Operated:Distance protection Zone-1 Operated Bay Position-Normal Fault In Phase:R-Phase Fault Distance: 38.25 KM Fault Distance: 30.25 KM Auxilary Relay: 86,94 Operated Autorecoles Status-SubtoreColes Lockout Operated Fault Distance: Ω Fault Distance: Ω Fault Distance: Ω Grafter Status: Pre-Fault Current:Re: 920.64,IY = 218.4A, IB=13D.4A, . Voltage before: Fault : VRN=22.76KV, VYN=82.69KV, VBN=76.38KV. FG-3.8KV. REMARKS:	Y phase jumper snapped at Loc-33 of L#24	REMEDIAL ACTION REQUIRED: After rectification line was normalized on 27.10.24 at 17:17 hrs	Heavily stormy with rain and thunder at the time of tripping.
7	220 KV	Line#215(jamshedpur- Jindal) Line Length:134.7km	Jamshedpur End :Autoreciose Jindal End:Autoreciose	27.10.24.,19:54hrs	Instantaneous	00:00:00	JAMSHEDPUR END Protection Operated Distance Protection Zone-1 operated Bay Position:Normal Fault In Phase: B-Phase Fault Distance: I.5.7 KM Fault Loop:B-N Auxilary Relay: 1868,286B Operated Autorecise Status:Autorecise Successful Carrier Status: Carrier Switch-IN,Carrier Healthy, Carrier Send Pre Fault Current:Re-26,94123', IM-807,431,432 Voltage before Fault VRN-131,3KVL-0.0'', VNH-131,83KVL-119,6'' , VBN= 132,73KVL 120,1 120,1',VN=9,72KVL166,2''. Fault Current:Re-153,7AL,432,'') = 171,75AL,56.4'', IB=4140,7 AL,43.6'', IN-1847,3AL,441. Voltage during Fault VRN-135,48KVL.0.0'', VNN=134,99KVL- 112,8'', VBN=48,99KVL-113,1 '',VN=34,087KVL-51,2'. PLCC COUNTER READING : REMARKS:	JODA END Protection Operated: Distance Protection Z-COM Operated Bay Position-Normal Fault In PhaseYPhase Fault Distance: KM Auxilary Relay: 186R,286R Operated Auxilary Relay: 186R,286R Operated Auxila	19:54:32:065:line tripped in Zone-1 B-Phass Operated 19:54:32:126.9: Breaker B-pole opened after 6.1 9 nS 19:54:33:162.6: :After dead time 1097.6 ms (after dead time setting 1000 ms)Breaker B Pole autoreclosed.From the fault current and voltage angle(6)5.2 degree) It seem to be non resistive in nature,Line autoreclose due to backflashover.	Back flash over can be avoided by proper tower foot resistance. It is required to check the tower foot resistance of the tower in the location +/- 10 percent from the fault location REMEDIAL ACTION REQUIRED :	Weather was rainy at the time of tripping.
						1	JAMSHEDPUR END	RTPS END			1

8	220 KV	Line#213(Jamshedpur- BTPS) Line Length:153.5km	Jamshedpur End :Autoreclose BTPS End:Autoreclose	28.10.24.,19:54hrs	Instantaneous	00:00:00	Protection Operated:Distance Protection Zone-1 operated Bay Position:Normal Fault in Phase:Blue-Phase Fault Distance:144.9 KM Fault Dop:Normal Auxilary Relay: 1568,2568 Operated Auxilary Relay: 1568,2568 Operated Auxilary Relay: 1568,2568 Operated Auxilary Relay: 1568,2568 Operated Mattroccoles Status:Autoreclose Successful Carrier Status: Carrier Switch-IN,Carrier Healthy ,Carrier Send Pre Fault Current:R=229,164135.6°, Y1-139,468,4°, IB=124,26,1-376, /IN=2014135.6°, V104,284,47°, IB=124,26,1-376, /IN=2014135.6°, V104,129,21,24VL-119,8° V01age before Fault: VRN=131,4KVL.00°, VNN=132,124VL-119,8° V01age during Fault: VRN=127,11KVL.0.0°, VNN=128,81kVL- 124.9°, VRN=109,12KVL.115,8°,VN=3,17kVL-51,1°. PLCC COUNTER READING : REMARKS:	Protection Operated: Distance protection Zone-1 Operated Bay Position:Normal Fault in Phase: Blue-Phase Fault Distance::7.634KM Fault Lop:C-N Auxilary Relay: 186R,286R Operated Autoreclose Status:Autoreclose Successful Fault Impedance: REMARKS: picc end fault current data and	10:50:57:672:line tripped in Zone-1 B-Phase Operated 10:50:57:748.3: Reaker B-pole opened alter 76.3 mS 10:50:58:784.8: After dead time 1112.8 ms (alter dead time setting 1000 ms)Reaker B- Pole autoreclosed.From the fault current and voltage angle/75.5 degreg 1: seem to be non resistive in nature,Line autoreclose due to backflashover.	Back flash over can be avoided by proper tower foot resistance of the tower foot resistance of the tower inot the location +/- 10 percent from the fault locatio REMEDIAL ACTION REQUIRED:	Weather was rainy at the time of tripping.
9	220 KV	Line#214(Jamshedpur- BTPS) Line Length:153.5km	Jamshedpur End :Autoreclose BTPS End:Autoreclose	29.10.24.,19:16hrs	Instantaneous	00:00:00	JAMSHEDPUR END Protection Operated:Distance Protection Zone-1 operated Bay Position:Normal Fault In Phase:Red:-Phase Fault Distance:129 SKM Fault Loop:A-N Auxilary Relay: 186R,286R Operated Autoreclose Status:Autoreclose Successful Carrier Status: Carrier Switch-INCarrier Healthy, Carrier Fsend Fault Carrier 1138.8AL-756, 71, =142.44AL.85.2*, IB=95.243 AL-30.5; IN=359.24AL-69.5. Voltage during Fault VRN=105.03KV_0.0*, VYN=130.49KVL- 16.6*, VBN=130.19KV_122.4*, VNN=8.17KVL-164.7*. REMARKS:	BTPS END Protection Operated: Distance protection Zone-1 Operated Bay Position:Normal Fault In Phase:RED=Phase Fault Distance:25.886KM Fault Loop:C-N Fault Impedance Resistance:0.57+j6.57 Auxilary Relay:1887,J887 TO Operated Fault Current:IR= 4701A.164.77',IV=120.5AA.156.38 *, IB=130 S9A.4516', IV-84312.4163. Voltage during Fault VRN=91.47KV125', VTN=128.34KV.121.2', VRN=121.76KV1.87 *. Autoreclose Stutu:Autoreclose Successful REMARKS:	After dead time 1025 ms (after dead time setting 1000 ms)Breaker R-Pole autoreclosed. From the fault current and voltage angle(75.6 degree) it seem to be no resistive in nature, line autoreclose due to backflashover. UR214, loc.mo.417, R-ph, 9 pcs flashing noted	Back flash over can be avoided by proper tower foot resistance, it is required to check the tower foot resistance of the tower in the location +/ 10 percent from the fault locatio REMEDIAL ACTION REQUIRED:	Weather was rainy at the time of tripping.

NUMBER OF CORRECT OPERATION	NC	9
NUMBER OF FAILURE	Nf	0
NUMBER OF UNWANTED OPERATION	Nu	2
NUMBER OF INCORRECT OPERATION	Ni	0
Dependibility Index	D= Nc / (Nc+Nf)	1
Security Index	S= Nc/ (Nc + Nu)	0.82
Reliability Index	R= Nc / (Nc + Ni)	1

WBSETCL

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

sı.	Name of the element g Date	Tripping	Restora	Restorati	Reason (Rel	ay indication)	r	Nc	N	u	N	Vf	Dependability	Security Index	Reliability Index	Remarks (Reason for	Analysis of the event	
No.		g Date	Time	Date	on Time	End A	End B	End A	End B	End A	End B	End A	End B	(Nc/(Nc+Nf))	(Nc/(Nc+Nu))	(Nc/(Nc+Nu +Nf))	less than 1)	
1	Jeerat-BKTPP	01.10.2	13:16:00	01.10.2	13:53:00	Y-phase, Zone-1, A/R SW OFF , A/R L/O		1		0		0		1	1	1		
2	Subhasgram WB-Subhasgram PG# 2	01.10.2	16:42:00	01.10.2	17:35:00	Trip due to Busbar relay operation.		0		1		0		#	#	#	Mal-tripping due to Bus bar relay operation.	Subhasgram-Baruipur 220 Kv circuit tripped with Zone-1, R- phase during lightning and thunder storm and subsequently 220 KV Busbar operates and all the bay connected with Bus- 2 tripped as Baruipur circuit was connected in Bus-2. The present Busbar relay is static relay, Make- AEAVA, Type-FAC, seems mal-operates with external fault. The old Bus-bar relay will be replaced by Numerical B90 relay shortly.
3	Kharagour-Chaibasa	08.10.2	11:26:00	08.10.2	15:55:00	Y-phase, Zone-1, A/R close , A/R L/O		1		0		0		1	1	1		
4	Durgapur- New-chanditala	16.10.2 4	06:22:00	16.10.2 024	06:48:00	Y-phase, Zone-1, A/R Close ,	Y-phase, Zone-2, A/R close , A/R L/O	1	1	0	0	0	0	1	1	1		

DMTCL

						Protect	ion Performa	nce Indic	es for the	e month	of Octob	oer'2024						
Sr.	Nome of the Element	Tripping	Tripping	Restorat	Restorat	Reason (Rela	y indication)	Nc	Nc	Nu	Nu	Nf	Nf	Dependabilit y	Security Index	Reliability Index	Remarks (Reason for	Analysis of the
No.	Name of the Element	Date	Time	ion Date	Time	End A	End B	End A	End B	End A	End B	End A	End B	index (Nc/(Nc+Nf))	(Nc/(Nc+N u))	(Nc/(Nc+N u+Nf))	indices less than 1)	event
N	o-Tripping in October'20	24 Month																

				Protectio	n Perfom	ance Indi	ces fo	r the	mont	h-OC	T-202	24 - N	TPC	Kahalga	on			*
						Reason (R indicatio	elay n)	N	lc	N	łu	1	Nf	Dependabil	Security	Reliability	Remark(Reas	5
SL No.	Name of ELEMENT	Tripping Date	Tripping Time	Restoration Date	Restoration Time	End A	End B	End A	End B	End A	End B	End A	End B	ity index (Nc/(Nc+N f))	Index (Nc/(Nc+N u))	Index (Nc/(Nc+N u+Nf))	on for perfomace indices less than 1)	Analysis for the event
1	Lakhisarai 02 TIE 852 CB	09.10.2024	13:49	09.10.2024	18:16	AR unsuccessful		1		0		0		1	1	1		A/R circuit to be checked
2	Unit-01 Main 352 CB and TIE 252 CB	09.10.2024	18:38	09.10.2024	22:58			1		0		0		1	1	1		Unit shut down
3	Unit-01 Main 352 CB and TIE 252 CB	23.10.2024	07:24	23.10.2024	14:57			1		0		0		1	1	1		Unit shut down
4	Unit-06 Main 3652 CB and TIE 3452 CB	23.10.2024	09:12	23.10.2024	19:41			1		0		0		1	1	1		Unit shut down
5	Lakhisarai 02 TIE 852 CB	27.10.2024	12:23	27.10.2024	16:45	AR unsuccessful		1		0		0		1	1	1	4	VR circuit to be checked
Ne	Number of	correct operat	ion at inter	nal power syst	tem Faults													
Nf	Number of	failures to open	rate at inte	mal power sys	tem Faults]												



Checked By

Reviewed By

दीपक कुमार पात्रा / Deepak Kumar Patra अपर मन प्रवंक (प्रखंजनु./ई.एम.ज्ञे.) AGM (O&M/E.M.D.) एनटीपीसी लिमिटेड/NTPC, Limitec कहलगाँव,भागलपुर / Kahalgaon,Bhagalp

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

S.	Name of the element	Trippin	Tripp	Restora	Restorat	Reason (Rela	ay indication)	N	lc	N	u	r	Nf	Dependabil ity index	Security Index	Reliability Index	, Remarks (Reason for
No.	Name of the element	g Date	Time	Date	ion Time	End A	End B	End A	End E	End A	End B	End A	End B	(Nc/(Nc+Nf))	(Nc/(Nc+Nu))	(Nc/(Nc+ Nu+Nf))	performance indices less than 1)
	no trips	_	_	_	-	-	-	0	-	0	-	0	-	1	1	1	

Powergrid ER-II

			List of important to	ransmission lines in ER whi	ich tripped in October-20	024														
												END-/	4					END-B		
Sl. No.	LINE NAME	TRIP DATE	Relay Indication LOCAL END	Relay Indication REMOTE END	Remarks	LOCAL END UTILITY	REMOTE END UTILITY	UTILITY RESPONSE	Nc	Nu	Nf	Dependability Index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+N f)	Nc	Nu	Nf	Dependability Index (Nc/(Nc+Nf))	Security Index Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf)
1	220KV-SUBHASGRAM(PG)- SUBHASGRAM(WB)-2	01-10-2024	-	Subhasgram (WB): 96 optd, carrier sent	Seems Bus fault at WB end, WBSETCL may explain	ER-II	WBSETCL	No trip observed at PG ER-2 end. Line tripped from WB end only.	1			1	1	1				·		
2	220KV-MAITHON-DHANBAD-1	06-10-2024	Maithon :R_N 10.6 KA, 16.228 Km	Dhanbad : R_N, 5.17 KA, 30.40 Km	Three phase tripping for phase to ground fault at Maithon end. A/r successful from Dhanbad end.	ER-II	DVC	Line was kept in TBC due to CB replacement work in main bay. TBC has static type AR relay which failed to reclose. Failed component has been replaced & AR function has been tested successfully.			1	0	#DIV/0!	0						
3	220KV-MAITHON(PG)-DUMKA-1	09-10-2024	Maithon: Y-B, IY-21.3 kA, IB-21.0 kA, 3.3 km	Dumka: Y_B, IY-1.4 KA, Ib-1.09 kA, 69 km	Phase to Phase fault.	ER-II	JUSNL	Protection operated properly at PG ER-2 end.	1			1	1	1					NA	
4	220KV-ALIPURDUAR (PG)- SALAKATI-1	10-10-2024	Alipurduar (PG): R_B , Ir 1.86 KA, Ib 1.6 KA, 89 Km	Z-1 protection operated	Phase to Phase fault.	ER-II	BHUTAN	Protection operated properly at PG ER-2 end.	1			1	1	1						
5	400KV-ALIPURDUAR (PG)- BONGAIGAON-1	21-10-2024	Alipurduar : R_B, Ir - 2.43 kA, Ib- 5.04 kA, 64 Km	Bongaigaon: R to Earth Fault	Initially R-earth fault was there but no pickup at PG end ER or Bongaigaon end then after 1.5 seconds it got converted to phase to phase fault and then line tripped.	ER-II	NORTH_EAS T REGION	High resistive fault was observed initially & thereafter it evolved in R & B phase and there phase trip happened. Protection operated properly at PG ER-2 end.	1			1	1	1						
6	400KV-ALIPURDUAR (PG)- BINAGURI-4	23-10-2024	Alipurduar: B_N,11.18 kA, 10.2 km	Binaguri: B_N, 2.464 kA, 104.5 km	Line tripped in reclaim time.	ER-II	ER-II	A/R was successful through main bay. However, after 1.7 sec of initial fault, it re-appeared again in same phase. So, AR lock out operated due to fault within reclaim time. Protection operated properly at PG ER-2 end.	1			1	1	1	1			1	1	1
7	400KV-BAHARAMPUR- BHERAMARA-3	25-10-2024	Berhampur: B-N, 4.834 kA, 65.23 Km	-	A/r failed from both end after 1 second due to persistent fault.	ER-II	BANGLADES H	Line tripped due to persisting fault on AR attempt. Protection operated properly at PG ER-2 end.	1			1	1	1					NA	

					Protectio	n Performance Indices fo	r the month of Octob	er'24 (Ir	compli	ance of	Clause 1	L5(6) of I	EGC 20	23)			
S. No.	Name of the element	Tripping Date	Trippi	Restoration	Restoratio	Reason (Relay	indication)	7	lc		Nu	7	Nf	Dependability index	Security Index	Reliability Index	Remarks (Reason for performance
			Time	Date	n lime	End A	End B	End A	End B	End A	End B	End A	End B	(Nc/(Nc+Nf))	(Nc/(Nc+Nu))	(Nc/(Nc+Nu +Nf))	indices less than 1)
1	220 KV-JEYPORE 400/220 KV-220 KV JAYANAGAR220KV-2	03-10-2024	13:48	05-09-2024	13:14	AR successful at Jeypore M1:Z2,BG fault, 5.825km, 5.64kA M2:Z1,BG fault, 4.7km, 5.5kA		1	0	0	1	0	0	1	0.5	0.5	AR Successful at jeypore end but Line tripped from remote end. Mater informed to Jayanagar for further checking.
2	765 KV-ANGUL -765 KV- SRIKAKULAM-1	03-10-2024	13:57	05-09-2024	13:55	Line tripped for 1-pf fault due AR Block Condition for OPGW works. M1:Z1, RN Fault, 17.1km, 11.38kA M2:Z1, RN Fault, 18km, 10.8kA		1	0	0	0	0	0	1	1	1	
3	400 KV-KUCHEI BARIPADA 400kV- 400 KV-PANDIABIL 400KV(PGCIL)-1	19-10-2024	15:21	05-09-2024	18:14	Line tripped on persistent fault M1:21, RN fault,223.2km, 1.68kA M2:21, RN fault,220.8km, 1.74kA	Line tripped on persistent fault M1:R-G, Z1, 5.36kA, 43.1km M2:R-G, Z1, 5.28kA, 43.2km	1	1	0	0	0	0	1	1	1	

Jorethang Loop Hydro Electric Project 2 X 28 MW

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

Sl. No.	Name of the element	Tripping Date	Trippin g Time	Restoration Date	Restorati on Time	Reason (Relay indic	ation) End B	۲ End A	Vc End B	N End A	Iu End B	Nf End A End B	Dependability index (Nc/(Nc+N f))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+ Nu+Nf))	Remarks (Reason for performance indices less than 1)	Analysis of the event
1	220KV Jorethang- New Melli Line-1	17-10-2024	10:19	17-10-2024	10:52	Line-1 P442 Relay record: Started phase ACN Tripped Phase -ABC E.F start IN1 over current I>1 Distance trip Z2 10:19:34 fault duration-949.2 ms Relay trip time-80.07 ms fault location 77-5.794 KM system frequency-49.96 Fault record: IA-283.3A,VAN-129.7 KV IB-117.5A,VBN-129.6. KV IC-710.50A,VCN-115.9 KV Zone-02		1		0		0	1	1	1		Due to Earth fault in line-1 simultaneously both runing Unit triped(Line-2 was Dead from 09:58 Hrs.)
2	220KV Jorethang- New Melli Line-2	17-10-2024	09:58	17-10-2024	10:28	Line-2 P442 Relay record: Started phase ACN Tripped Phase -ABC E.F start IN1 over current I>1 Distance trip Z2 09:58:25 fault duration-461.3 ms Relay trip time-79:91 ms fault location x7-5.794 KM system frequency-50.04 Fault record: IA-195.9A,VAN-130.7 KV B=108A,VBN-129.4 KV IC-1.652 KA,VCN-106.9 KV		1		0		0	I	I	1		Due to Earth fault in line-2

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

Nu - is the number of unwanted operations.

Tashiding Hydro Electric Project 2 X 48.5 MW

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

SI.	Name of the	Trippin	Trippin	Restorati	Restorati	Reason (Rel	ay indication)	Ν	le	N	lu	1	Nf	Dependability index	Security Index	Reliability Index	Remarks (Reason for	Ar heir fahr met
No.	element	g Date	g Time	on Date	on Time	End A	End B	End A	End B	End A	End B	End A	End B	(Nc/(Nc+N f))	(Nc/(Nc+Nu))	(NC/(NC+ Nu+Nf))	performance indices less than 1)	Analysis of the event
1	220KV Tashiding- New Melli Line-1																NO TRIPPING	
2	220KV Tashiding- New Melli Line-2																NO TRIPPING	-

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

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

Annexure B.11

						List of important transm	nission lines in ER whic	h tripped in October-2	2024							
Sl. No.	LINE NAME	TRIP DATE	TRIP TIME	RESTORA TION DATE	RESTO RATIO N TIME	Relay Indication LOCAL END	Relay Indication REMOTE END	Reason	Fault Clearanc e time in msec	Remarks	DR Configurat ion Discrepanc y END-1	DR Configura tion Discrepan cy END-2	DR/E L REC EIVE D FRO M LOC AL END	DR/E L REC EIVE D FRO M REM OTE END	LOCAL END UTILIT Y	REMOT E END UTILITY
1	220KV-KHAGARIA-NEW PURNEA 1	01-10-2024	07:48	04-10-2024	11:44	Khagaria:B-N, Ib- 2.787 kA, 54.29 km	New Purnea: B_N, 3.56kA, 53.8 km	B_Earth	120msec	A/r failed from both end after 1 second due to persistent fault.			YES	YES	BSPTCL	ER-I
2	400KV-JEERAT-BAKRESWAR-1	01-10-2024	13:16	01-10-2024	13:54	Jeerat:- Y-N, 4.04 KA, 101.8 Km	Bakreswar- Y-N, 3.83 KA, 60.28 Km	Y_Earth	120 msec	Three phase tripping for Phase to ground fault, A/r under S/D condition.			YES	NO	WBSETC L	WBPDCL
3	220KV-SUBHASGRAM(PG)- SUBHASGRAM(WB)-2	01-10-2024	16:42	01-10-2024	17:15	-	Subhasgram (WB): 96 optd, carrier sent	No Fault	120 msec	Seems Bus fault at WB end, WBSETCL may explain			NA	YES	ER-II	WBSETCL
4	220KV-DARBHANGA(DMTCL}- LAUKAHI-2	02-10-2024	18:45	02-10-2024	19:29	Darbhanga(DMTCL.) - Y_N, 35.8 Km, 3.96 kA	Laukahi: Y_N, 42.5 Km, 2.28 kA	Y_Earth	100 msec	Three phase tripping for Phase to ground fault, A/r not attempted from either end. DMTCL & BSPTCL may explain.			YES	YES	DMTCL	BSPTCL
5	220KV-JEYPORE-JAYNAGAR-2	03-10-2024	13:48	03-10-2024	14:08	Jeypore: A/r successful from jeypore end	Jaynagar: B-N, Jy: 1.5 kA, Ib:9.7 kA, 5.5 Km	B_Earth	100 msec	A/r successful from Jeypore end. Three phase tripping at the instance of fault from jaynagar. A/r from Jaynagar not attempted. OPTCL may explain		DR is not Time Synchronized & DR length needs to be increased	YES	YES	PG ODISHA	OPTCL
6	765KV-ANGUL-SRIKAKULAM-1	03-10-2024	13:57	03-10-2024	15:58	Angul: R_N, 11.38 kA, 17.1 Km	-	R_Earth	400 msec	Three phase tripping for phase to ground fault from Angul end. PG Odisha may explain. Carrier send by PG end still line tripped in zone-2 from srikakulam.			YES	NO	PG ODISHA	SOUTHER N REGION
7	220KV-RENGALI(PH)-TSTPP-1	03-10-2024	14:15	04-10-2024	19:12	Tripped only at Rengali end; D/P, E/F operated		Earth Fault	800 msec	Delayed Fault clearance , DR not submitted OPTCL may explain			NO	NO	онрс	NTPC

8	220KV-KHAGARIA-NEW PURNEA 1	. 04-10-2024	11:58	05-10-2024	19:04	Khagaria : B_N, 2.91 kA, 50.7 Km	New Purnea: B_N, 3.862 kA, 57.5 Km	B_Earth	100 msec	A/r failed from both end after 1 second due to persistent fault.	DR length needs to be increased	YES	YES	BSPTCL	ER-I
9	220KV-NEW PURNEA- MADHEPURA-2	04-10-2024	12:16	04-10-2024	13:50	New Purnea: B_N	Madhepura: B_N, Ib 2.41 kA, 11.2 Km	B_Earth	160 msec	A/R successul from Madhepura end, and failed from Purnea end , PG may explain	DR length needs to be increased	YES	YES	ER-I	BSPTCL
10	220KV-RANCHI-MTPS(DVC)-1	04-10-2024	21:33	04-10-2024	22:48	Ranchi: A/r successful from Ranchi end	R_Earth	R_Earth	160 msec	A/R successful from Ranchi end only. A/r kept disabled at Mejia		YES	NO	ER-I	DVC
11	220KV-MUZAFFARPUR-HAJIPUR- 1	. 06-10-2024	09:45	06-10-2024	10:58	Muzaffarpur : B_N, 4 KA, 30 Km	Hajipur: B_N, 2.8 KA, 29 Km	B_Earth	80 msec	DR not submitted		NO	NO	ER-I	BSPTCL
12	220KV-MAITHON-DHANBAD-1	06-10-2024	10:54	06-10-2024	11:33	Maithon : <u>R_</u> N 10.6 KA, 16.228 Km	Dhanbad : R_N, 5.17 KA, 30.40 Km	R_Earth	80 msec	Three phase tripping for phase to ground fault at Maithon end. A/r successful from Dhanbad end.	DR length needs to be increased	YES	YES	ER-II	DVC
13	220KV-DALTONGANJ- CHATRA-1	07-10-2024	16:34	07-10-2024	17:20	Daltaonganj : R_N, 1.494 kA, 84.6 km	DT received.	R_Earth	120 msec	Three phase tripping for phase to ground fault. PG(ER-I) and JUSNL may explain.	DR is not Time Synchronized	YES	YES	ER-I	JUSNL
14	400KV-BIHARSARIFF(PG)- BANKA(PG)-1	08-10-2024	03:15	08-10-2024	04:51	A/r successful from Biharsariff end	Banka: R_N, Ir-1 kA	R_Earth	100 msec	Three phase tripping for phase to ground fault from Banka end. A/r successful from Biharsariff end. PG(ER I) may explain.		YES	YES	ER-I	ER-I
15	400KV-BIHARSARIFF(PG)- BANKA(PG)-2	08-10-2024	03:15	08-10-2024	04:57	A/r successful from Biharsariff end	Banka: R_N, 1r-7.2 kA, 13.8 Km	R_Earth	100 msec	Three phase tripping for phase to ground fault from Banka end. A/r successful from Biharsariff end. PG(ER I) may explain.		YES	YES	ER-I	ER-I
16	220KV-RENGALI-TTPS-1	08-10-2024	10:02	08-10-2024	15:41	Renagali: R-N, 17.38 kA, 0.8 km	TSTPP:Z1, R-N, 0.8km, 17.38kA	R_Earth	100 msec	Delayed opening after 350 msec from one end.		NO	NO	онрс	OPTCL

17	400KV-KHARAGPUR- CHAIBASA-1	08-10-2024	11:25	08-10-2024	16:04	Kharagpur :Y-N, 3.65 kA, 74.09 km	Chaibasa:- Y-N, 3.72 kA, 115 km	Y_Earth	120 msec	Line tripped in reclaim time.		YES	YES	WBSETC L	ER-I
18	220KV-RANCHI-MTPS(DVC)- 1	08-10-2024	16:16	08-10-2024	17:10	Ranchi: R-N, 0.963 kA, 177.943 Km	Mejia :R_N, 10.6 kA, 12.24 Km	R_Earth	160 msec	A/R successful from Ranchi end only. A/r kept disabled at Mejia		YES	NO	ER-I	DVC
19	220KV-DALTONGANJ- CHATRA-1	08-10-2024	16:16	08-10-2024	17:24	Daltonganj: B-N, 1.1 kA, 125 km, .	Chatra: Did not trip.	B_Earth	100 msec	Three phase tripped from Daltonganj end for phase to ground fault. A/r successful from Chatra end. PG(ER-I) may explain.		YES	YES	ER-I	JUSNL
20	220KV-DARBHANGA (DMTCL)- SAMASTIPUR-1	09-10-2024	11:21	09-10-2024	11:58	DMTCL: Y-B, Iy=7.6 kA Ib=7.63 kA, 20.3 km.	Samastipur: Y-B, Iy=5.12 kA, Ib=5.099 kA, 24.4 km	У В	100 msec	Phase to Phase fault.		YES	NO	DMTCL	PMTL
21	220KV-MAITHON(PG)-DUMKA-1	09-10-2024	12:41	09-10-2024	21:12	Maithon: Y-B, IY-21.3 kA, IB-21.0 kA, 3.3 km	Dumka: Y_B, IY-1.4 KA, Ib-1.09 kA, 69 km	У В	350 msec	Phase to Phase fault.		YES	YES	ER-II	JUSNL
22	220KV-RANCHI-HATIA-2	09-10-2024	18:32	09-10-2024	19:32	Ranchi : R_B, Ir: 6.25 kA, Ib: 6.9 kA, 23.8 Km	-	RB	100 msec	Phase to Phase fault.	DR length needs to be increased	YES	YES	ER-I	JUSNL
23	220KV-ALIPURDUAR (PG)- SALAKATI-1	10-10-2024	00:35	10-10-2024	01:36	Alipurduar (PG): R_B , Ir 1.86 KA, Ib 1.6 KA, 89 Km	Z-1 protection operated	R_B	80msec	Phase to Phase fault.		YES	NO	ER-II	BHUTAN
24	220KV-RANCHI-HATIA-2	10-10-2024	17:32	10-10-2024	18:14	Ranchi: R-Y, Ir- 13.38 KA , Iy- 11.2 KA, 11 Km	Hatia : R-Y, Ir: 4.359 kA, Iy:4.087 kA, 20.64 km	RY	100 msec	Phase to Phase fault.		YES	NO	ER-I	JUSNL
25	220KV-KHAGARIA-NEW PURNEA 2	11-10-2024	10:59	11-10-2024	11:47	Z-1 protection operated	Purnea: Y_B, 2.96 kA, 75.5 Km	Y B	100 msec	Phase to Phase fault.		YES	YES	BSPTCL	ER-I

26	220KV-DALTONGUNI-GARWAH (NEW)-2	13-10-2024	11:57	13-10-2024	13:25	Daltonganj: Y_B, Iy-3.6 kA, Ib-3.6 kA, 15.3 Km	Garwah : Y_B, 51.63 Km	УВ	100 msec	Phase to Phase fault.		YES	NO	ER-I	JUSNL
27	220KV-SAHARSA(PMTL)- KHAGARIA(NEW)-1	15-10-2024	07:56	16-10-2024	20:34	Saharsa: R_N, 15.5 Km, 6.98 kA	Khagaria: R_N, Ir- 1.284 kA, 51.94 km	R_Earth	100 msec	A/r failed from both end after 1 second due to persistent fault.		YES	YES	PMTL	BSPTCL
28	400KV-BIDHANNAGAR- NEW CHANDITALA-1	16-10-2024	06:22	16-10-2024	06:49	Bidhannagar:- Y_N, 13.0 KA, 6.1 Km	New Chanditala:- Y_N, 3.1 KA, 125 Km	Y_Earth	100 msec	Line tripped in reclaim time.		YES	YES	WBSETC L	WBSETCL
29	220KV-RANCHI-MTPS(DVC)- 1	. 17-10-2024	04:10	17-10-2024	04:54	Ranchi : A/R Successful	MTPS : R-N, FC-6.438.51 kA, FD=21.81 KM	R_Earth	100 msec	A/R successful from Ranchi end only. A/r kept disabled at Mejia		YES	NO	ER-I	DVC
30	220KV-TENUGHAT-BIHARSARIFF 1	. 19-10-2024	09:38	19-10-2024	10:12	Biharshariff : B_N, 1.191 kA, 109.5 Km	-	B_Earth	100 msec	Three phase tripping for phase to ground fault. JUSNL and BSPTCL may explain.		NO	YES	JUSNL	BSPTCL
31	400KV-MEERAMUNDALI- MENDHASAL-1	19-10-2024	15:21	19-10-2024	22:46	Meeramundali: R-N, 4.5 kA, 65.8 km	Mendhasal: R_N, 6.36 kA, 38.1 km	R_Earth	100 msec	A/r failed from both end after 1 second due to persistent fault.		YES	YES	OPTCL	OPTCL
32	400KV-BARIPADA-PANDIABILI-1	19-10-2024	15:21	19-10-2024	15:49	Baripada : R <u>N</u> , 223.2 Km, 1.68 kA	Pandiabili: R_N, 43.1 Km, 5.36kA	R_Earth	100 msec	A/r failed from both end after 1 second due to persistent fault.		YES	YES	PG ODISHA	OPTCL
33	400KV-PUSAULI(PG)- ALLAHABAD-1	20-10-2024	13:05	20-10-2024	14:03	Pusauli :B_N, 161.44 Km, 1.17 KA	Allahabad :B_N, 6.71kA, 40.7 Km	B_Earth	100 msec	A/r failed from both end after 1 second due to persistent fault.		YES	NO	ER-I	NORTHER N REGION
34	400KV-ALIPURDUAR (PG)- BONGAIGAON-1	21-10-2024	12:31	21-10-2024	15:36	Alipurduar : R_B, Ir – 2.43 kA, Ib- 5.04 kA, 64 Km	Bongaigaon: R to Earth Fault	R_B-Earth	1.5 seconds	Initially R-earth fault was there but no pickup at PG end ER or Bongaigaon end then after 1.5 seconds it got converted to phase to phase fault and then line tripped.		YES	NO	ER-II	NORTH_E AST REGION

35	400KV-TENUGHAT-PVUNL- 1	22-10-2024	13:05	22-10-2024	13:58	-	Tripped on Stg-1 over voltage protection	No Fault	-	Due to over voltage		NO	NO	TVNL	NTPC
36	400KV-ALIPURDUAR (PG)- BINAGURI-4	23-10-2024	11:37	23-10-2024	15:38	Alipurduar: B_N,11.18 kA, 10.2 km	Binaguri: B_N, 2.464 kA, 104.5 km	B_Earth	120 msec	Line tripped in reclaim time.		YES	YES	ER-II	ER-II
37	220KV-KHAGARIA-NEW PURNEA 2	23-10-2024	18:26	23-10-2024	18:37	Khagaria:Y-B, Iy-3.610kA, Ib-3.627 kA, 46.86 km	New Purnea: Y-B, Iy 3.81 kA, Ib 3.78 kA, 58.8 km	Y_B	100 msec	Phase to Phase fault.		YES	YES	BSPTCL	ER-I
38	220KV-KHAGARIA-NEW PURNEA 1	. 25-10-2024	09:55	25-10-2024	10:38	Khagaria: Y- B, Ir-0.04 kA, Iy- 3.92 kA, Ib- 3.93 kA, 39.2 km	New Purnea: Y-B, IY-3.8 kA, IB-3.75 kA, 56 km	Y_B	100 msec	Phase to Phase fault.		YES	YES	BSPTCL	ER-I
39	400KV-BAHARAMPUR- BHERAMARA-3	25-10-2024	15:54	26-10-2024	13:50	Berhampur: B-N, 4.834 kA, 65.23 Km	-	B_Earth	160 msec	A/r failed from both end after 1 second due to persistent fault.		YES	NO	ER-II	BANGLAD ESH
40	220KV-BUDHIPADAR-KORBA-2	26-10-2024	08:15	26-10-2024	11:31	A/r successful from Budipadar end	Korba: B-N, 2.336 kA, 29.42 Km	B_Earth	200 msec	A/r successful from Budipadar end. A/r not attempted from Korba end.		YES	NO	OPTCL	WESTERN REGION
41	400KV-CHANDAUTI (PMTL) GAYA-1	. 28-10-2024	14:59	28-10-2024	20:43	Z-1, Y_N	Z-1, Y_N	Y_Earth	120 msec	A/r failed from both end after 1 second due to persistent fault.		YES	YES	PMTL	ER-I
42	220KV-TTPS-TSTPP-1	28-10-2024	17:08	30-10-2024	18:37	TTPS end: BN fault, current 5.6 KA,distance 17.75 Km	TSTPP end: BN fault, fault current 9.1 KA, distance 10.3 KM.	B_N	80 msec	A/r not attempted from either end. OPTCL may explain		NO	NO	OPTCL	NTPC
43	400KV-TENUGHAT-PVUNL- 1	29-10-2024	17:50	29-10-2024	19:31	-	-	No Fault	-	Tripped during Disturbance at Tenughat		NO	NO	TVNL	NTPC

44	400KV-MERAMUNDALI- LAPANGA-1	31-10-2024	12:06	31-10-2024	14:30	Meramundali : R_N, 6.6 kA, 24.9 km.	Lapanga: R_N, 2.14 kA, 139.5 km	R_Earth	100 msec	A/r failed from both end after 1 second due to persistent fault.		YES	YES	OPTCL	OPTCL

ANNEXURE C.3

SI	Name of the incidence	PCC Recommendation	Latest status					
No.								
140 th PCC Meeting								
1.	Repeated tripping of 765KV-JHARSUGUDA- RAIPUR PS (DURG)-1	Member Secretary, ERPC advised Indigrid to share root cause analysis report for damaged insulator to ERPC/ERLDC/Powergrid Odisha. PCC advised same to Indigrid. Powergrid representative informed that after receiving observation from OEM, it will be shared to ERPC/ERLDC.						
2.	Repeated tripping of 220KV-KHAGARIA-NEW PURNEA-1	PCC advised ERLDC representative to do analysis of tripping of 220KV-KHAGARIA- NEW PURNEA-1 & 2 for last one year and share to ERPC/BSPTCL. It further advised BSPTCL representative to resolve all clearance issues along with root cause analysis of repeated tripping of line after flood ends and share analysis report to ERPC/ERLDC.						
3.	Repeated tripping of 220KV-PATNA- KHAGAUL-1	MS, ERPC advised BSPTCL representative to share photographs of site to ERPC/ERLDC.						
4.	Repeated tripping of 132KV-NAGARUNTARI- NABINAGAR-1	PCC advised BSPTCL & JUSNL representative to carry out third party inspection in concerned jurisdiction and share report to ERPC/ERLDC.						
5.	Repeated tripping of 132KV-MAITHON- JAMTARA-1	PCC advised DVC to share report prepared by them to ERPC/ERLDC and send letter to JUSNL asking for actions taken so far for removing dumping done by industry.						
6.	Implementation of A/r in 220 kV Ranchi-Mejia (MTPS)-1	DVC representative informed that scheme suggested by ERLDC regarding increasing A/r dead time at Mejia end is under discussion for						

4001		which a meeting is scheduled in one week so that logic of A/r will be finalized along with communication scheme at their end and further it will be implemented in coordination with Powergrid by Oct 2024.	
13911	PCC meeting		
7.	Total Power failure at 220/132 kV Katapalli (OPTCL) S/s on 29.08.2024 at 06:52 Hrs	OPTCL representative informed that it is planned to test relays by availing shutdown of lines as earliest as possible however at present they are facing difficulty in getting shutdown of lines due to evacuation path issue for heavy generation of Burla PH. PCC advised OPTCL to investigate about reason behind non-operation of protection on 29 th Aug 2024 and submit observation to ERPC/ERLDC. PCC advised SLDC Odisha, OPTCL to communicate with Hindalco to explore possibility of setting delay time of 100-150 ms in islanding scheme of Hindalco to avoid islanding in transient faults and submit summary of discussion and decision taken to ERPC/ERLDC. PCC advised SLDC Odisha,	SLDC Odisha representative informed that protection settings had been collected from OHPC and shared to OPTCL for study. He further informed that at present, team is engaged in planning and restoration work for cyclone therefore meeting is scheduled in next week among concerned utilties to revise settings. On enquiry from ERPC representative regarding setting delay time of 100-150 ms in islanding scheme of Hindalco, SLDC Odisha representative replied that communication had been sent to Hindalco will be present in scheduled meeting where it will be discussed. PCC advised SLDC Odisha to
		OPTCL, OHPC representative to review o/c e/f settings at Lapanga, Burla, Chiplima, Katapalli, Sambalpur for all feeders and	share deliberation of scheduled meeting to ERPC/ERLDC.
		submit revised settings to ERPC/ERLDC Subsequently a meeting will be conducted among ERPC, ERLDC, OPTCL, OHPC, SLDC Odisha representative to finalize the settings. PCC advised OPTCL	PCC advised ERPC to convey meeting among ERPC, ERLDC, OPTCL, OHPC, SLDC Odisha representative to finalize the settings after receiving revised settings from OPTCL, OHPC and SLDC Odisha.

		remedial measures taken for protection/ operation issues to ERPC/ERLDC on periodic basis.	
8.	Total Power failure at 220/132 kV Purnea (PG) S/s on 01.08.2024 at 15:50 Hrs	 PCC advised PG representative to test differential protection for 132 kV Purnea-Purnea-1 along with rectification. It further advised BSPTCL representative to test OPGW and differential protection for 132 kV Purnea-Purnea-1 along with rectification at their end. PCC advised PG representative to identify reason behind difference in fault currents in each circuit of 132 k V Purnea-Purnea T/c. PCC advised PG ER-II representative to review zone 3 protection settings at Dalkhola end for 220 kV Dalkhola-Purnea in coordination with 220/132 kV ICTs at Purnea & 220 kV Gazole-Dalkhola and coordinate with WBSETCL for same. 	PCC advised PG ER-II representative to review zone 3 protection settings at Dalkhola end for 220 kV Dalkhola-Purnea in coordination with 220/132 kV ICTs at Purnea & 220 kV Gazole-Dalkhola and share revised settings to ERPC/ERLDC.
9.	Total Power failure at 220 kV Darbhanga (BSPTCL) S/s on 01.08.2024 at 17:59 Hrs	MS, ERPC advised BSPTCL representative to carry out third party inspection at Darbhanga S/s in coordination with DMTCL and submit observations to ERPC/ERLDC. PCC advised same to BSPTCL & DMTCL representative. PCC opined that zone 4 pickup at BSPTCL end in 220 kV Darbhanga (DMTCL)-Darbhanga 2 should not	DMTCL representative informed that shutdown date is not provided by BSPTCL for third party inspection at Darbhanga S/s hence inspeection had not been done till date. BSPTCL representative informed that DCRM test for circuit breaker had been
		have dropped in 50 ms so it	performed and results were
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		advised BSPTCL representative to	satisfactory
		check the issue and submit	Salislaciory.
		observation to ERPC/ERLDC	PCC advised BSPTCL
		Observation to ERF C/EREDC.	representative to share report
		PCC advised BSPTCL	to ERPC, ERLDC & DMTCL.
		representative to resolve issue of DR channel configuration and time synchronization at BSPTCL end at	PCC advised BSPTCL representative to resolve
		earliest and share confirmation to ERPC/ERLDC after its rectification.	issue of DR channel configuration and time synchronization at BSPTCL end at earliest and share
			ERPC/ERLDC.
			Regarding drop of zone 4 pickup at BSPTCL end within 50 ms, BSPTCL
			since line is very short
			protection might had dropped
			in 50 ms however relay will be
			tested again and result will be shared to ERPC/ERI DC
10.	Repeated tripping of	PCC advised JUSNL to identify	JUSNL representative was
	132kV-RIHAND-	fault location and jurisdiction and	not available in the meeting.
	GARWAH-1	share details to ERPC/ERLDC so	
		that issue can be further	
		coordinated with Uttar Pradesh &	
		Bihar in order to resolve issue of	
		repeated tripping of line.	
138 th	PCC Meeting		
11.	Disturbance at 220 kV	DVC representative replied that old	Regarding old MOCB breaker
• • •	Bokaro (DVC) S/s on	MOCB breaker is present at BTPS	DVC representtaive replied
	20.07.2024 at 19:38 Hrs	B which failed to open during the	that procurement process had
		disturbance therefore it is planned	been started and it will be
		to replace all old MOCB breaker by	implemeneted by Dec 2024.
		Sep 2024.	Pogording two pot of
		DVC representative informed that	
		at present there is no independent	ballenes, DVC representative
		at present there is no independent	informed that two DC sources
		set of batteries however during	are kept at S/s however
	1	I renovation work at CTPS & RTPS-	LUCCR is ted from only one

	 B, two independent set of batteries will be installed. 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. 	source at present. He further added that complete switchyard at Bokaro S/s will be renovated by one and half year during which numerical relay, two independent sources etc issue will be reolved.
	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. PCC advised DVC representative	On enquiry from ERLDC, DVC representatve submitted that since additional independent source is available so in case of failure of connected DC source, it can be replaced manually by additional source hence similar issue of DC power failure will not be
	to replace the Old High Impedance Bus bar scheme with low impedance Bus Bar Scheme for	observed. PCC advised all utilities to
	PCC advised DVC representative to share status of renovation/upgradation work to ERPC/ERLDC on periodic basis	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.
	DVC representative replied that DC system will be rectified along with enabling of bus bar protection by 10 th Sep 2024.	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.
		PCC advised DVC representative to share status of renovation/upgradation work to ERPC/ERLDC on periodic basis.
		In 140 th PCC Meeting, PCC advised DVC representative to share status of renovation/upgradation work to ERPC/ERLDC.

137th	PCC Meeting		
12.	Disturbance at 220 kV Budhipadar(OPTCL) S/s and 220 kV Ib-TPS (OPGC) S/s on 05.06.2024 at 04:11 Hrs	 PCC advised SLDC Odisha to coordinate with CPPs and share islanding scheme details to ERPC/ERLDC. 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. PCC advised OPTCL to test relays at earliest and submit observation to ERPC/ERLDC. PCC advised OPTCL to conduct testing of breaker also and submit observation to ERPC/ERLDC. PCC advised OPTCL to conduct testing of breaker also and submit observation to ERPC/ERLDC. PCC advised OPTCL to representative to review zone 3 time & reach settings of relay at Budhipadar end for 132 k V Budhipadar-Lapanga. PCC advised OPTCL representative to increase in DR length to 3 seconds. It further advised OPTCL representative to prepare annual maintenance plan and outage plan of each S/s and share to ERPC/ERLDC. 	OPTCL representative informed that testing of relay of Korba-1 is done and testing of relay of raigarh will be done by Sep 2024. 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. PCC advised OPTCL representative to share further plan of testing with ERPC/ERLDC. In 140 th PCC Meeting, OPTCL representative informed that breaker at Raigarh had been installed. He further informed that relay will be tested by next week. PCC advised SLDC Odisha to coordinate with CPPs and share islanding scheme details to ERPC/ERLDC.
13.	Disturbance at 400 kV Meeramundali B (OPTCL)	PCC advised OPTCL & GMR to carry out testing of the carrier	OPTCL representative informed that testing of carrier

	S/ s and 400 kV GMR S/s on 20.06.2024 at 19:18 Hrs	communication jointly and submit observation to ERPC/ERLDC.	will be done before 7 th Nov 2024 and testing report will be shared to ERPC/ERLDC.
136th	PCC Meeting		
14.	Disturbance at 220 kV Tenughat (TVNL) S/s on 29.05.2024 at 12:57 Hrs	PCCadvisedJUSNLrepresentative to rectify auto- reclose issue at Govindpur end by next week and intimate to ERPC/ERLDC.TVNL representative informed that settings at their end had been implemented by CRITL, JUSNL team and he further assured that O/C E/F settings will be revised at the earliest after consultation with CRITL, JUSNL team.PCC advised CRITL, JUSNL team to test auto-reclose and carrier at both Govindpur as well as Tenughat end.	JUSNL representative informed that work order for auto-reclose will be issued by 10 th Oct 2024 for Govindpur end and will be done for Tenughat end and Dumka end soon. In 140 th PCC Meeting, JUSNL representative was not available in the meeting. TVNL representative informed that as per update received from JUSNL, auto-recloser had not been rectified at Govindpur end. He further informed that implementation work of two new feeders (Gomia and Hazaribagh) at their end will be started by JUSNL (by Nov 2024 tentatively) during which auto-
133rd	PCC Meeting		
15.	Review of SPS at Sterlite (Vedanta)	SLDC Odisha representative informed that the meeting to discuss the modalities of implementation of proposed SPS scheme will be convened within a week.	SLDC Odisha representative informed that as per communication made with Vedanta , agency is prepared for implementing SPS however they require discussion with ERLDC before implemeting SPS for which ERLDC representative agreed. PCC advised ERPC, ERLDC, SLDC Odisha and Vedanata to have discussion by 8 th Nov

	2024 for implementing SPS at
	earliest.