



Agenda
for
118th PCC Meeting

Date:20.09.2022
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

AGENDA FOR 118th PROTECTION COORDINATION SUB-COMMITTEE MEETING TO BE HELD ON 20.09.2022 AT 10:30 HOURS

PART – A

ITEM NO. A.1: Confirmation of Minutes of 117th Protection Coordination sub-Committee Meeting held on 22nd August 2022 through MS Teams online platform.

The minutes of 117th Protection Coordination sub-Committee meeting held on 22.08.2022 was circulated vide letter dated 12.09.2022.

Members may confirm the minutes of meeting.

PART – B

ITEM NO. B.1: Disturbance at 220 kV Burmu(JUSNL) S/S on 01.08.2022 at 11:56 Hrs

At 11:56 Hrs, 220 kV Patratu-Burmu(Ratu) D/C line tripped on R_N fault leading to total power failure at 220/132 kV Burmu S/s. 400/220 kV ICT-1 at Patratu also tripped at the same time.

Relay Indications:

Name	End1	End2	PMU Observations
400/220 kV ICT-1 at Patratu	Backup O/c		18 kV dip in R_ph voltage at New Ranchi.
20 kV Patratu-Burmu (Ratu)-1	Patratu: R_N, 2.34 kA	Burmu: R_N, 0.95 kA	Fault clearance time: 400 msec
220 kV Patratu-Burmu (Ratu)-2	Patratu: R_N, 2.35 kA	Burmu: R_N, 1.36 kA	

Load Loss: 80 MW

Outage Duration: 01:05 Hrs

Disturbance report is attached at Annexure-B1.

JUSNL may explain.

ITEM NO. B.2: Disturbance at 400 kV Dikchu S/s on 10.08.2022 at 11:57 Hrs

400 kV Bus-2 at Dikchu S/s is out of service since May-21. 400 kV Teesta 3-Dikchu & 400 kV Rangpo-Dikchu are in one dia with main bay of Teesta-3 line is out of service.

At 11:57 Hrs, 400 kV Rangpo-Dikchu tripped due to B_N fault. Consequently 400 kV Teesta 3-Dikchu also tripped due to tripping of tie bay leading to tripping of both units at Dikchu due to loss of evacuation path.

Generation Loss: 105 MW

Outage Duration: 00:30 Hrs

Dikchu HEP may explain.

ITEM NO. B.3: Total Power failure at 220/132 kV Bantala(WBSETCL) S/s on 23.07.2022 at 08:46 Hrs

At 10:13 Hrs, total power failure occurred at 220/132 kV KLC Bantala S/s. As per the information received, Y_ph PT of 220 kV Bus-1 burst leading to tripping of all associated feeders and transformers.

Relay Indications:

Name	End1	End2	PMU Observations
220 kV Bus-1 at Bantala (KLC)	Feeders tripped from remote end		62 kV dip in Y_ph voltage and later 40 kV dip in R_ph voltage at Subhashgram. Fault clearance time:350 msec
20 kV Subhahsgram-Bantala (KLC)	Subhashgram: R_Y, Zone-2, Ir: 7.26 kA, Iy: 6.87 kA, 18.96 km	Didn't trip	
220 kV Bantala (KLC)-NewTown AA3	Didn't trip	NewTown AA 3: R_Y_N, Zone-2, 13.33 km, Ir: 7.97 kA, Iy: 7.16 kA	
220/132 kV ICT-1&2 at Bantala (KLC)			

Load Loss: 56 MW

Outage Duration: 00:10 Hrs

Disturbance report received from ERLDC is enclosed at **Annexure-B3**.

WBSETCL may explain.

ITEM NO. B.4: Major grid events other than GD/GI

B4.1: Bus tripping occurred in Eastern Region during August 2022

Element Name	Tripping Date	Reason	Utility
220 kV Main Bus-1 at Naubatpur	03.08.22 at 17:03 Hrs	Bus bar protection operated, No fault in PMU.	BGCL/PG ER-2

Concerned utility may explain.

B4.2: Repeated Tripping of Transmission Lines and associated issues

Following lines had tripped repeatedly in the month of August'22.

S.No.	Name of the Element	No. of times Tripped	Remarks	Utility
1	132 kV Rihand-Garhwa	7	Tripped from Rihand end only	JUSNL

2	220kV-Daltonganj-Chatra-2	4	B phase involved in all faults ,A/R successful only from Daltonganj	JUSNL
3	400 kV Koderma-Bokaro-1	4	All are B-earth between 70-80 Km from KTPS	PG-ER-1
4	400 kV Koderma-Bokaro-2	3	2 times B-earth Fault	PG-ER-1

Concerned utilities may explain.

ITEM NO. B.5: Bus Tripping at Malda S/s

The bus tripping event at 400 kV Malda S/s in recent times is given below:

Sr No	Element Name	Tripping Date	Tripping Time	Reason
1	400 kV Main Bus - 2 at Malda	04-09-2022	05:57	Bus bar maloperation at Malda
2	400 kV Main Bus - 1 at Malda	04-09-2022	05:57	Bus bar maloperation at Malda
3	400 kV Main Bus - 1 at Malda	17-12-2021	15:24	Due to very old electromechanical 402 LBB relay of 400KV TBC Bay (Presently 400KV Purnea CKt-I charged through TBC Bay), spurious trip was initiated from the LBB relay
4	400 kV Main Bus - 1 at Malda	23-10-2021	06:22	Suspected mal-operation of TBC LBB.
5	400 kV Main Bus - 1 at Malda	13-03-2021	22:20	TBC bus side isolator problem

It is gathered that the TBC LBB relay is a very old electromechanical relay which has caused spurious tripping of busbar relay.

Powergrid may explain and submit its action plan to resolve the issue.

ITEM NO. B.6: Tripping Incidence in month of August-2022

Single line tripping incidents in the month of August-2022 which needs explanation from constituents of either end is attached at **Annexure B6**.

Concerned utilities may explain.

PART- C :: OTHER ITEMS

ITEM NO. C.1: Follow-up of Decisions of the Previous Protection Sub-Committee Meeting(s)

The decisions of previous PCC meetings are attached at **Annexure C.1**.

Members may update the latest status.

ITEM NO. C.2: DEF protection setting review in Sikkim complex in view of LILO of 400 kV Teesta 3-Kishanganj at Rangpo

After LILO of 400 kV Teesta 3-Kishanganj at Rangpo, review of DEF settings for all lines emanating from Teesta-3, Dikchu, Rangpo was necessitated. In 111th PCC meeting, it was decided that PRDC would carry out the study for DEF relay setting coordination for Sikkim Complex with revised configuration of transmission network.

Subsequently the study was carried out and shared with ERLDC for verification of network configuration and fault level data.

In 117th PCC meeting ERLDC observed that the network configuration and fault level informations are in order.

The DEF settings based on the revised study is enclosed at **Annexure-C2**.

Concerned utilities are requested to implement the revised settings in DEF relay at their respective end.

Concerned utilities may note.

ITEM NO. C.3: Compliance of 3rd Party Protection Audit Team Observations

3rd party protection audit of various substations in Odisha was carried out from 25.04.2022 to 28.04.2022 by audit team. The observation of audit team is attached at **Annexure C.3**.

In 114th PCC meeting, concerned utilities were advised to comply the recommendations submitted by audit team.

In 117th PCC meeting, NTPC Darlipalli representative informed that the recommendation regarding overvoltage settings have already been complied with and for power swing blocking setting, the matter has been sent to their corporate wing for their comments.

Concerned utilities may update.

ITEM NO. C.4: Schedule for 3rd party Protection Audit by ERPC Protection Team.

Protection audit of following substations is proposed to be held in the month of Sep/Oct-22.

1. 220 kV Barauni TPS(NTPC)
2. 220 kV Begusarai S/s(BSPTCL)
3. 220 kV Hajipur S/s(BSPTCL)
4. 220 kV Mokama S/s
5. 400/220 kV Saharsa S/s(PMTL)

Members may discuss.

ITEM NO. C.5: Submission of protection settings in PDMS

Relay settings of various newly added transmission elements are not available in the protection database. Also, existing settings of some the relays have been revised due to change in network configuration however the settings have not been updated in PDMS.

In 116th PCC meeting, concerned utilities are advised to upload the relay settings in PDMS or send the relay settings to erpc-protection@gov.in . The settings data was received from Powergrid ER-1 & PMTL.

Subsequently vide email dated 05.09.22, all concerned utilities were requested to send the protection settings data for the newly commissioned elements. Requisite information was received from Bihar, OPTCL, WBSETCL.

PRDC may update. Members may note & comply.

ITEM NO. C.6: Collection of Protection Setting data by PRDC

In 116th PCC meeting, substation visit of following new substations have been planned by PRDC team to collect the necessary protection settings data.

SL NO	NEW SUBSTATION	VOLTAGE LEVEL	UTILITY	State
1	SAHARSA	400/220 kV	PMTL	Bihar
2	CHATRA	220 kV	JUSNL	Jharkhand
3	KARAMNASA(NEW)	220 kV	BSPTCL	Bihar
4	JAKKANPORE	400/220 kV	BGCL	Bihar
5	NAUBATPUR	400/220 kV	BGCL	Bihar
6	MOKAMAH	220 kV	BGCL	Bihar
7	SAHUPURI	220 kV	BSPTCL	Bihar
8	NPGCL	400 kV	NTPC	Bihar
9	GOBINDPUR	220 kV	JUSNL	Jharkhand
10	JAINAMORE	220 kV	JUSNL	Jharkhand
11	DHANBAD	220 kV	NKTL	Jharkhand
12	Rongichu	220 kV	MBPCL	Sikkim
13	Jorethang	220 kV	Dans Energy	Sikkim
14	MERAMUNDALI B	400 kV	OPTCL	Odisha

In 117th PCC meeting, PRDC representative updated that substation visit for data collection had been completed for the substations in Bihar & Jharkhand. For rest of the substations, the visit would be planned at the earliest.

PRDC may update.

पावर सिस्टम ऑपरेशन करपोरेशन लिमिटेड

(भारत सरकार का उद्यम)

POWER SYSTEM OPERATION CORPORATION LIMITED

(A Government of India Enterprise)



Eastern Regional Load Despatch Centre: 14, Golf Club Road, Tollygunge, Kolkata-700 033.

CIN: U40105DL2009GOI188682

फ़ोन: 033- 24235755, 24174049 फ़ैक्स : 033-24235809/5029 Website:www.erldc.org, Email ID- erldc@posoco.in

घटना संख्या: 01-08-2022/1

दिनांक: 24-08-2022

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

Summary of the event (घटना का सारांश):

At 11:56 Hrs, 220 kV Patratu-Burmu(Ratu) /c tripped due to R_N fault leading to total power failure at 220/132 kV Burmu S/s. 400/220 kV ICT- at Patratu also tripped at the same time. Load loss of 80 MW reported at Kanke and Burmu by Jharkhand SLDC.

Date / Time of disturbance: 01-08-2022 at 11:56 hrs

- **Event type:** GD-1
- **Systems/ Subsystems affected:** 220/132 kV Burmu(Ratu) S/s
- **Load and Generation loss.**
 - No generation loss was reported during the event.
 - Around 80 MW load loss reported during the event at Kanke and Burmu by Jharkhand SLDC.

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

- NIL

Major elements tripped (प्रमुख ट्रिपिंग):

- 400/220 kV ICT-1 at Patratu
- 220 kV Patratu-Burmu(Ratu) D/c

Network across the affected area (प्रभावित क्षेत्र का नक्शा)

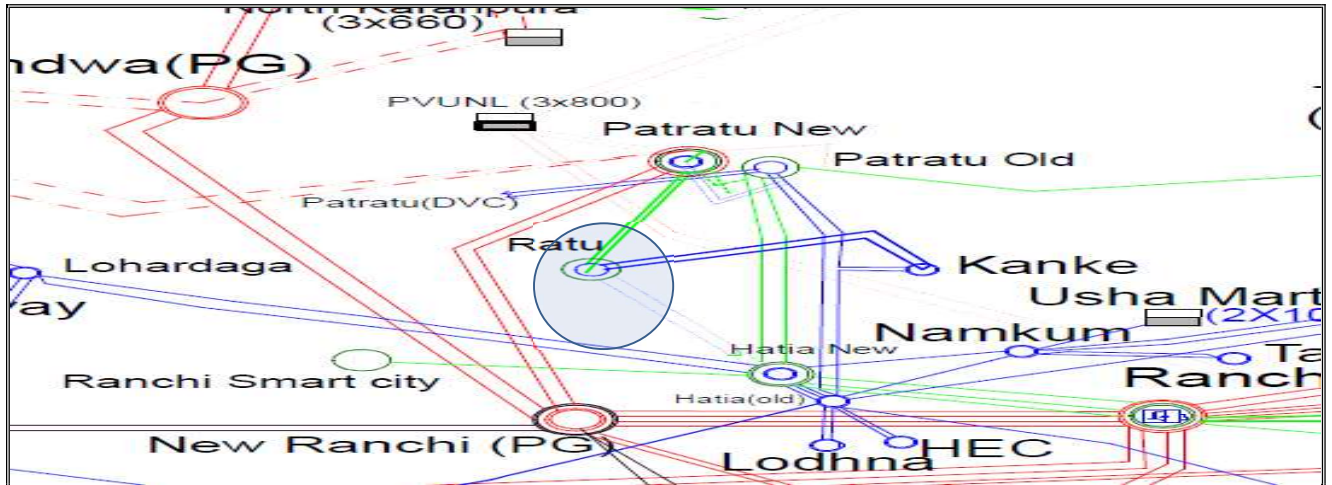


Figure 1: Network across the affected area

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

समय	नाम	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पीएमयू पर्यवेक्षण
11:56	400/220 kV ICT-1 at Patratu	BackUp O/c		18 kV dip in R_ph voltage at New Ranchi. Fault clearance time: 400 msec
	220 kV Patratu-Burmu (Ratu)-1	Patratu: R_N, 2.34 kA	Burmu: R_N, 0.95 kA	
	220 kV Patratu-Burmu (Ratu)-2	Patratu: R_N, 2.35 kA	Burmu: R_N, 1.36 kA	

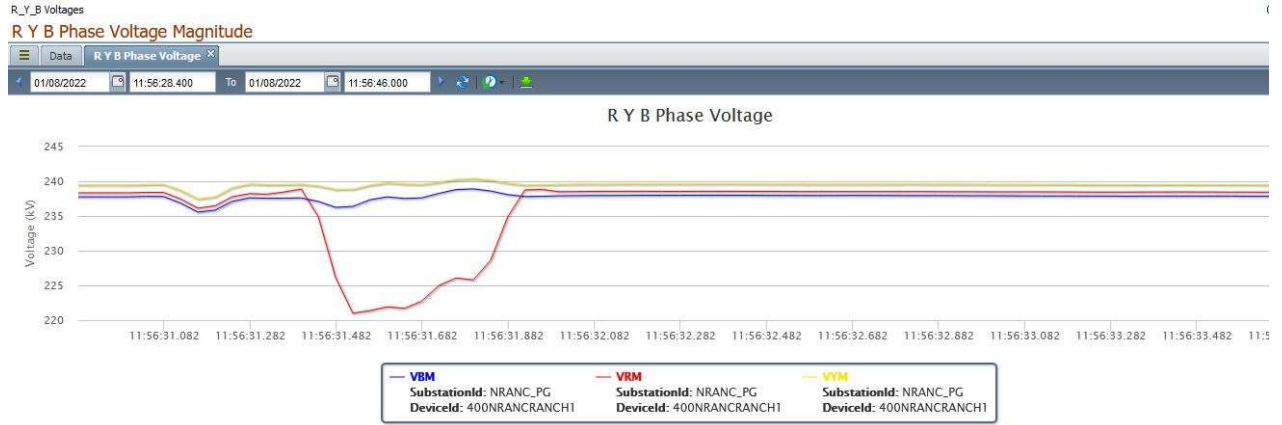


Figure 2: PMU snapshot of 400/220 kV New Ranchi S/s

Restoration (पूर्वावस्था की प्रप्ति)

Transmission/Generation element name	Restoration time
400/220 kV ICT-1 at Patratu	18:24
220 kV Patratu-Burmu (Ratu)-1	13:01
220 kV Patratu-Burmu (Ratu)-2	13:02

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

- R_ph fault struck both lines which was seen in Zone-2 from Patratu end and in Zone-1 from Burmu end.
- Both lines tripped from Burmu end within 100 msec. However, both lines opened in Zone-2 time from Patratu end. Whether carrier protection is healthy or not. JUSNL may confirm.
- At the same time, 400/220 kV ICT-1 at Patratu also tripped on Back-up O/c. Time co-ordination to be done to avoid tripping of ICT for faults at lower voltage level.
- DR triggering criteria for 220 kV Patratu-Burmu-2 at Patratu is set as **Any Trip**. The same may be changed to **Any Start**.

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

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

Status of Reporting (रिपोर्टिंग की स्थिति):

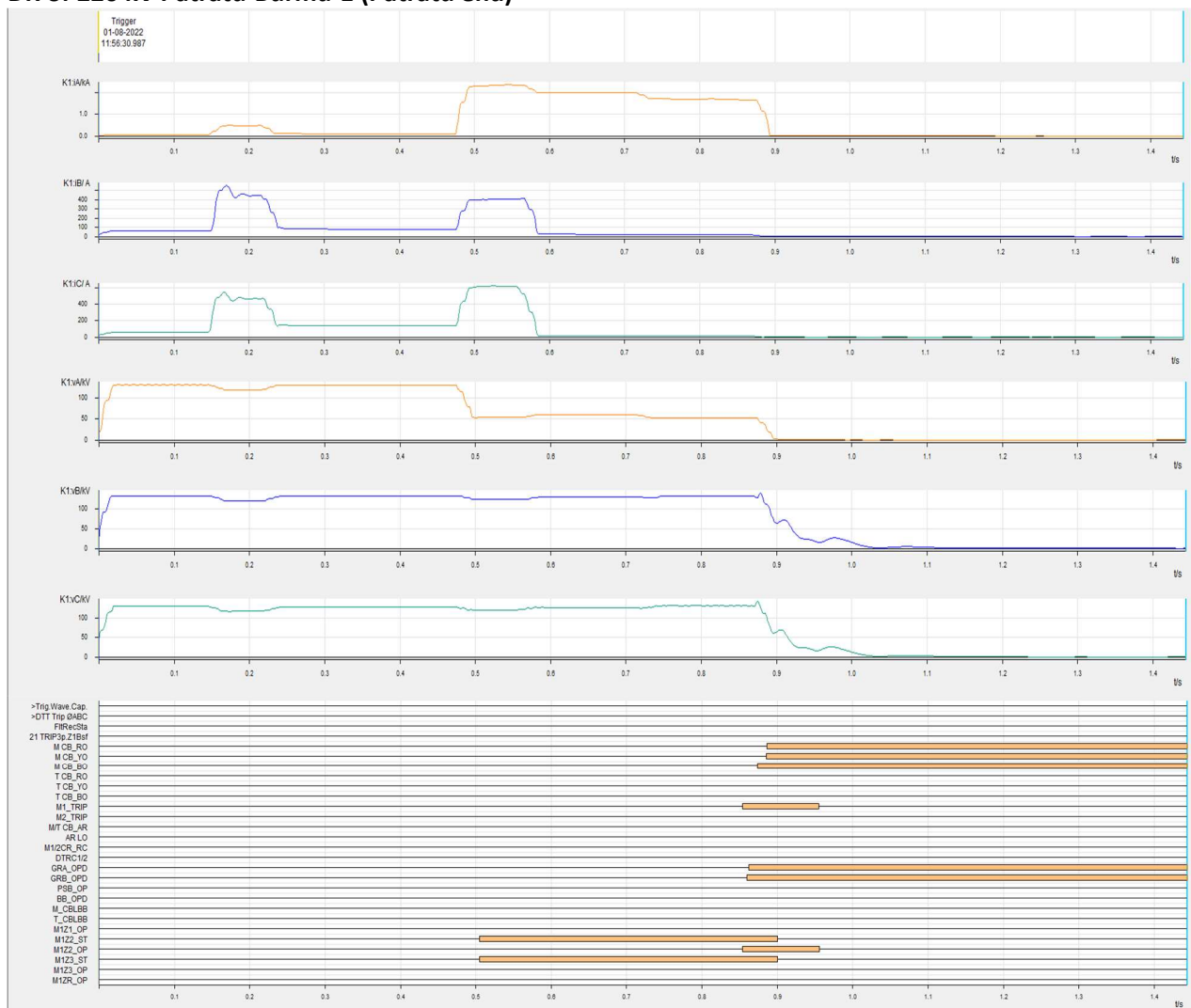
- Complete DR/EL yet to be received from JUSNL.

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

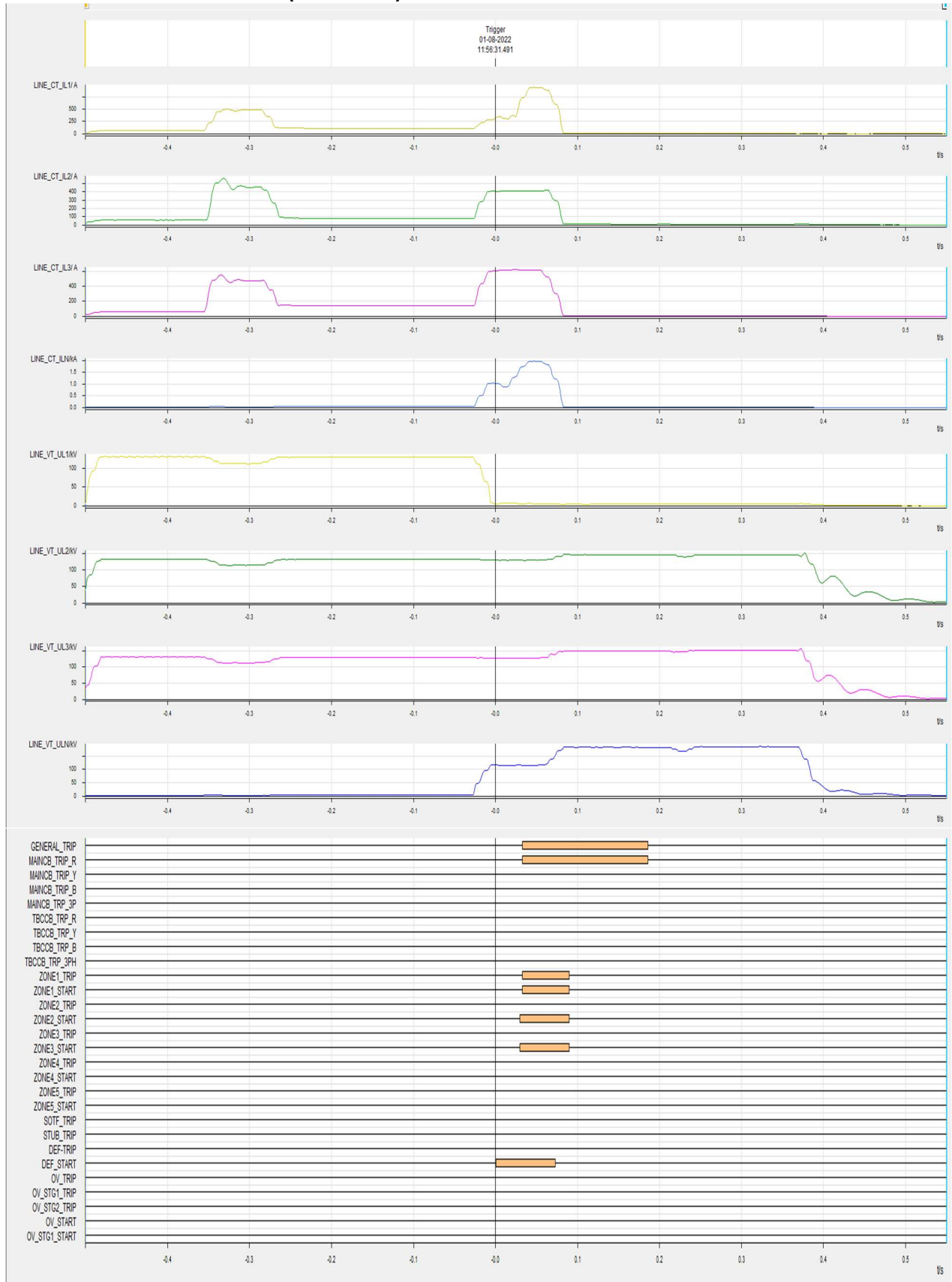
Sequence of Events not recorded at the time of event.

Annexure 2: DR recorded

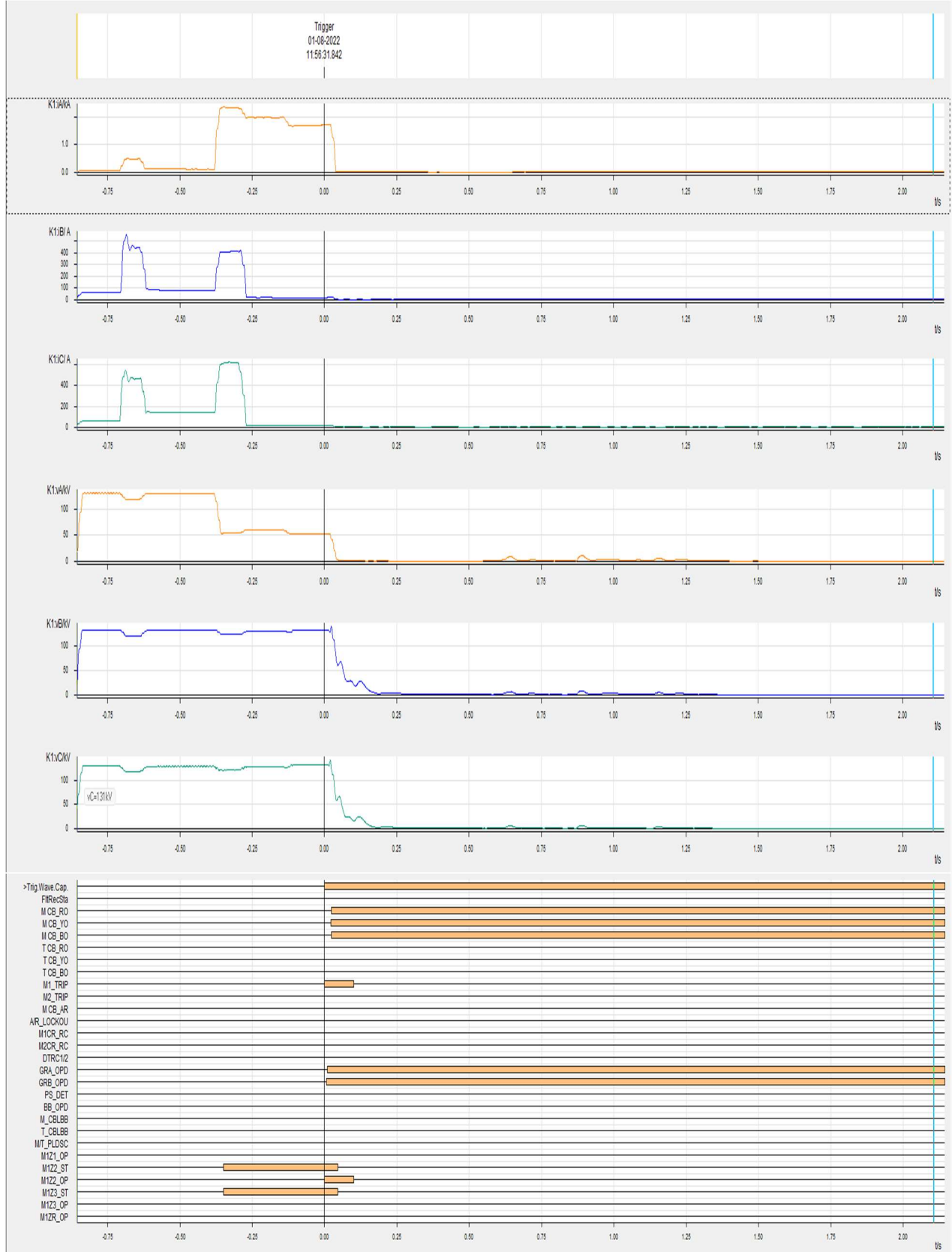
DR of 220 kV Patrattu-Burmu-1 (Patrattu end)



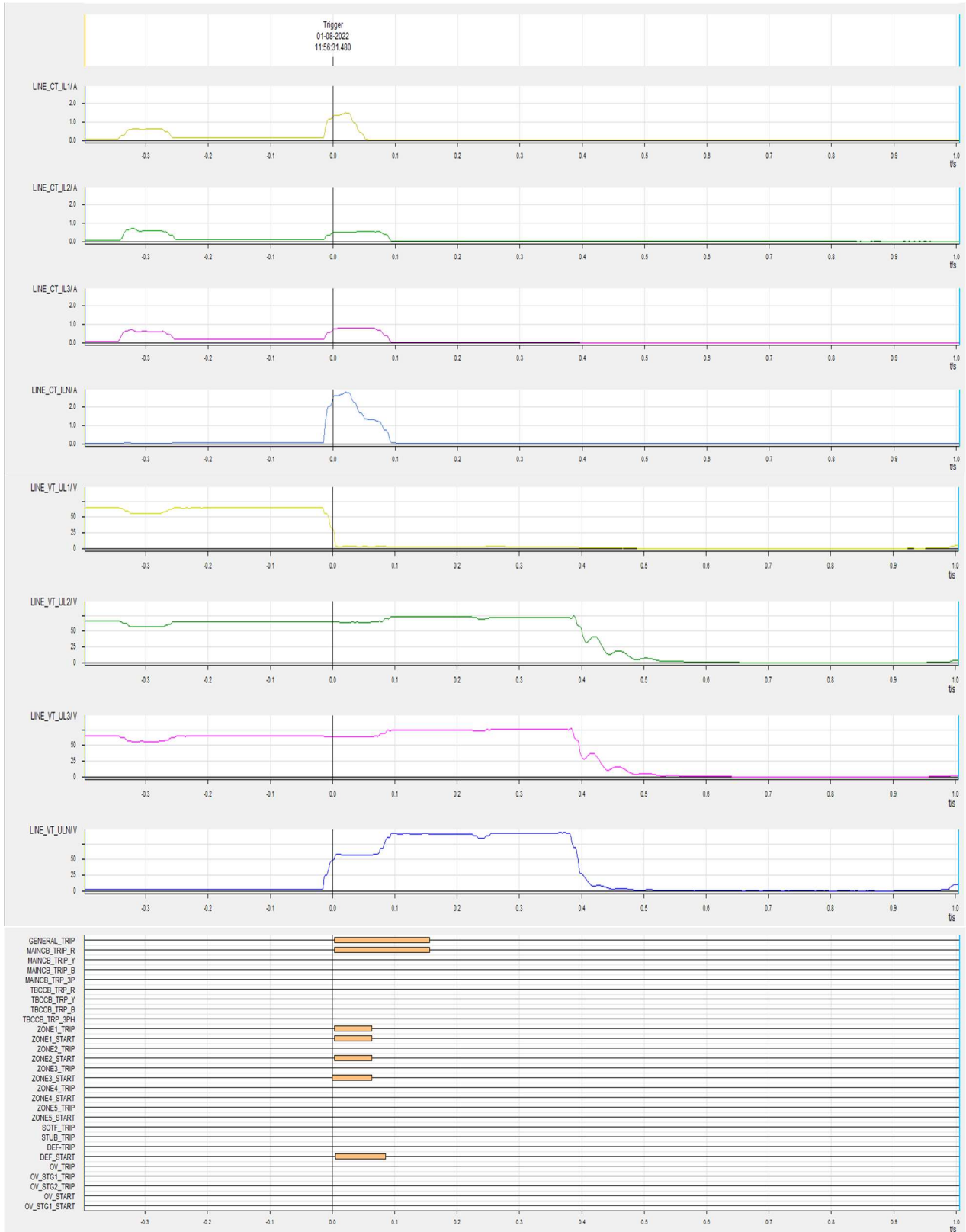
DR of 220 kV Patratu-Burmu-1 (Burmu end)



DR of 220 kV Patratu-Burmu-2 (Patratu end)



DR of 220 kV Patratu-Burmu-2 (Burmu end)



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घटना संख्या: 26-08-2022/1

दिनांक: 31-08-2022

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

1. Summary of the event (घटना का सारांश):

At 10:13 Hrs on 26th August 2022, total power failure occurred at 220/132 kV KLC Bantala S/s. As reported, Y_ph PT of 220 kV Bus-1 burst, leading to tripping of all associated feeders and transformers. 56 MW load loss reported during the event by SLDC West Bengal.

- **Date / Time of disturbance:** 26-08-2022 at 10:13 hrs.
- **Event type:** GD - 1
- **Systems/ Subsystems affected:** 220/132 kV Bantala S/s
- **Load and Generation loss.**
 - No generation loss occurred during the event.
 - 56 MW load loss reported during the event by SLDC West Bengal.

2. Important Transmission Line/element if out (महत्वपूर्ण संचरण लाइने जो बंद है):

- NIL

3. Major elements tripped (प्रमुख ट्रिपिंग)

- 220 kV Bus-1 at Bantala (KLC)
- 220 kV Subhashgram-Bantala (KLC)
- 220 kV Bantala (KLC)-NewTown AA 3
- 220/132 kV ICT-1 & 2 at Bantala (KLC)

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

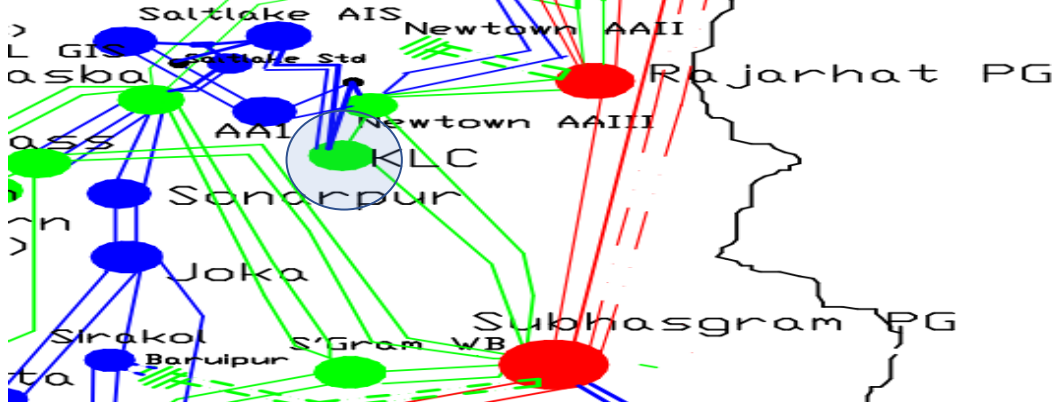


Figure 1: Network across the affected area

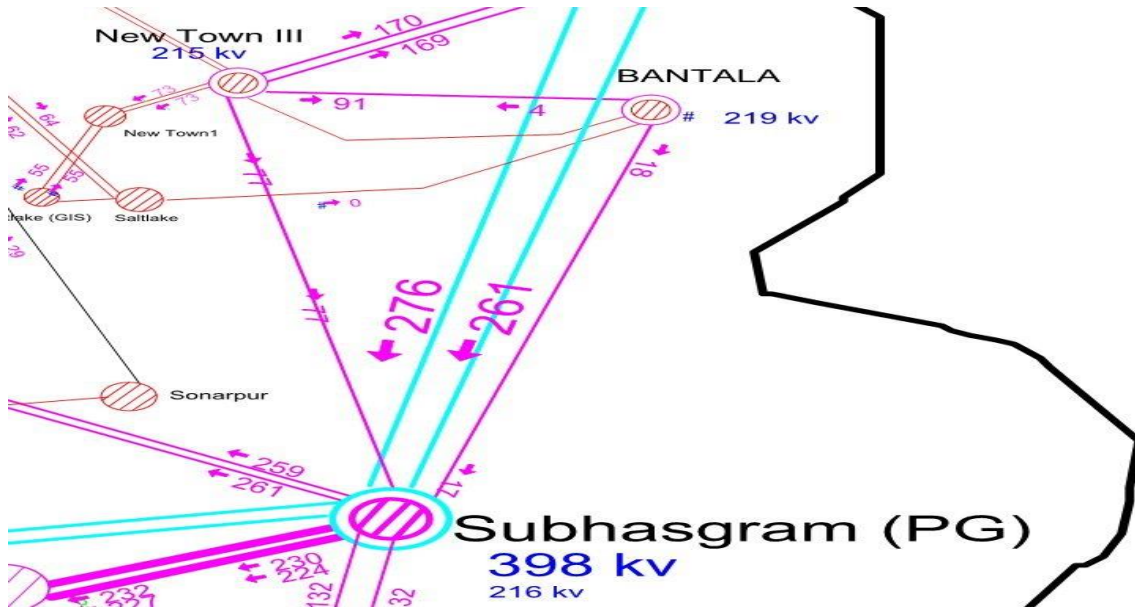


Figure 2: SCADA snapshot for of the system

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

समय	नाम	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पीएमयू पर्यवेक्षण
10:13	220 kV Bus-1 at Bantala (KLC)	Feeders tripped from remote end		62 kV dip in Y_ph voltage and later 40 kV dip in R_ph voltage at Subhashgram. Fault clearance time: 350 msec
	220 kV Subhahsgram-Bantala (KLC)	Subhashgram: R_Y, Zone-2, Ir: 7.26 kA, Iy: 6.87 kA, 18.96 km	Didn't trip	
	220 kV Bantala (KLC)-NewTown AA 3	Didn't trip	NewTown AA 3: R_Y_N, Zone-2, 13.33 km, Ir: 7.97 kA, Iy: 7.16 kA	
	220/132 kV ICT-1&2 at Bantala (KLC)	-		

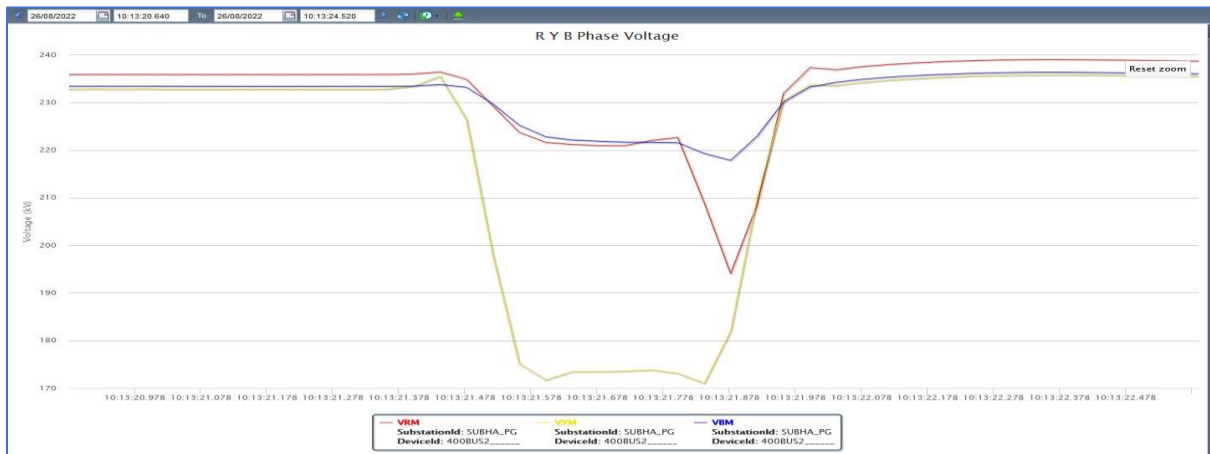


Figure 3: PMU Voltage snapshot of 400/220 kV Subhashgram S/s

5. Restoration (पूर्वावस्था की प्रप्ति)

Transmission/Generation element name	Restoration time
220 kV Bus-1 at Bantala (KLC)	10:57
220 kV Subhashgram-Bantala (KLC)	11:19
220 kV Bantala (KLC)-NewTown AA 3	10:57
220/132 kV ICT-1&2 at Bantala (KLC)	-

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

- Y_ph PT of 220 kV Bus-1 burst. Bantala has single main and transfer scheme.
- As informed, Bus bar protection was kept out of service due to failure of Y_ph unit of bus bar relay. Since when the Busbar was out of service, why Intimation of same was not given to ERLDC& ERPC.
- 220 kV Subhashgram-Bantala and 220 kV NewTown AA 3- Bantala tripped from remote ends in Zone-2 time after 350 msec.
- Z-4 timings of lines may be reduced till the Busbar is not in service.
- Expected timeline for restoration of Busbar may be intimated.
- ICT tripping occurred on which protection? **(WBSETCL to explain).**

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

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

8. Status of Reporting (रिपोर्टिंग की स्थिति):

- DR/EL yet to be received from WBSETCL for ICT & PG-ER-2 for subhasgram line.

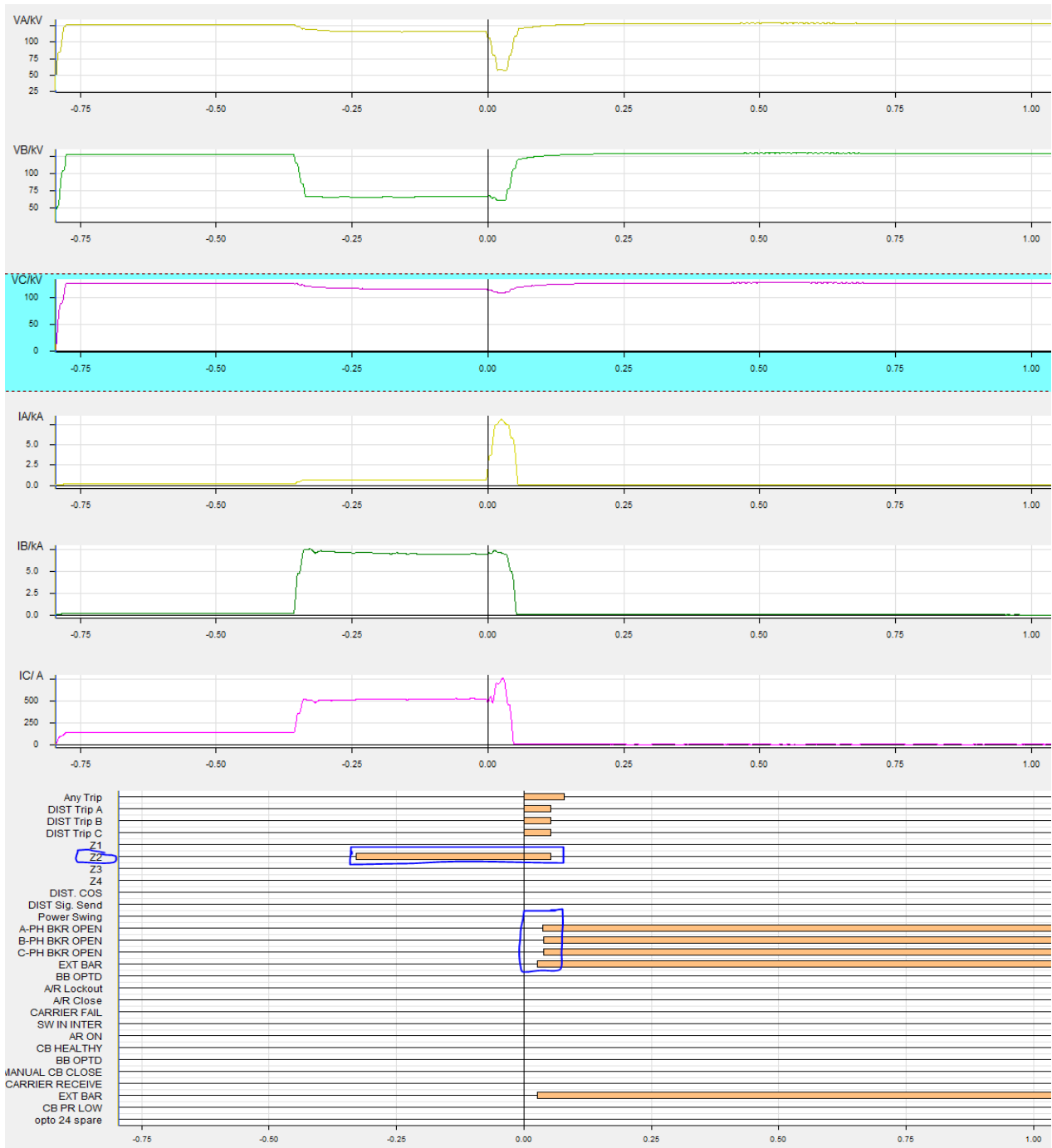
Annexure 1: Sequence of events recorded at ERLDC SCADA data at the time of the event.

Sequence of events not recorded at the time of the event.

Annexure 2: DR recorded

DR/EL yet to be received from, PG ER-2.

NEW TOWN BANTALA AT NEWTOWN END:



List of important transmission lines in ER which tripped in August-2022

Sl. No.	LINE NAME	TRIP DATE	TRIP TIME	RESTORATION DATE	RESTORATION TIME	Relay Indication LOCAL END	Relay Indication REMOTE END	Reason	Fault Clearance time in msec	Remarks	PMU Location	DR/EL RECEIVED FROM LOCAL END	DR/EL RECEIVED FROM REMOTE END	LOCAL END UTILITY	REMOTE END UTILITY
1	220 KV JEYPORE-JAYNAGAR-1	01-08-2022	06:08	01-08-2022	07:05	Jeypore: B_N, Zone-1, 3.95 km, 5.8 kA	Jaynagar: B_N, 3.4 km, 7.4 kA	B-Earth	100	Other two phase at Jeypore tripped after 2.5 seconds	Jeypore	Yes	No	PG ODISHA	OPTCL
2	400 KV BARH-MOTIHARI-1	01-08-2022	17:55	01-08-2022	18:33	Barh: R_B, 203.8 km, Ir: 3.02 kA, Ib: 3.4 kA	Motihari: R_B, 32.7 km, Ir: 8.84 kA, Ib:	R-B-Earth	100	Phase-to-phase fault	Barh	Yes	Yes	NTPC BARH	DMTCL
3	220 KV DARBHANGA (DMTCL)-LAUKAHI-2	01-08-2022	19:50	01-08-2022	20:27		Laukahi: R_N, 13.81 km, 4.54 kA	R-Earth	100	Three phase tripping at Laukahi. A/r successful from Darbhanga after 700 msec	Muzaffarpur	No	Yes	DMTCL	BSPTCL
4	400 KV MEJIA-JAMSHEDPUR-1	03-08-2022	13:02	03-08-2022	14:30	Mejia: R_N, 14.29 km, 10 kA	Jamshedpur: R_N, 125 km, 3.23 kA	R-Earth	100	Three phase tripping at Jamshedpur. A/r failed after 1 second from Mejia. B_ph CB at Mejia opened momentarily after 1 sec at Mejia. DVC may check	Jamshedpur	Yes	Yes		DVC PG ER-1
5	220 KV DALTONGANJ-CHATRA-2	04-08-2022	13:03	04-08-2022	14:03	Daltonganj: B_N, 2.8 kA, A/r successful		B-Earth	100	A/r successful from Daltonganj only	Daltonganj	Yes	No	PG ER-1	JUSNL
6	220 KV DARBHANGA (DMTCL)-LAUKAHI-1	05-08-2022	10:22	05-08-2022	11:53	Darbhangha: B_N, 1.9 kA	Laukahi: B_N, 17 km, 3.5 kA	B-Earth	350	Tripped in zone-2 time from Darbhanga despite carrier receipt. A/r attempt unsuccessful from Laukahi end	Muzaffarpur	Yes	No	DMTCL	BSPTCL
7	220 KV DALTONGANJ-CHATRA-2	05-08-2022	11:34	05-08-2022	12:36	Daltonganj: Y_B, 138.7 km, Iy: 1.13 kA, Ib: 1.12 kA		Y-B	100		Daltonganj	No	No	PG ER-1	JUSNL
8	220 KV CHANDIL-RANCHI-1	05-08-2022	13:57	05-08-2022	14:23	Chandil: B_N, 7.9 km, 2.18 kA	Ranchi: B_N, 2.18 kA	B-Earth	350	Tripped in Zone-2 time from Ranchi. Carrier channels not healthy	Ranchi	No	Yes	JUSNL	PG ER-1
9	220 KV BUDHIPADAR-KORBA-1	06-08-2022	17:08	06-08-2022	18:05	Budhipadar: R_N, 80.1 km, 1.92 kA		R-Earth	100	Three phase tripping for single phase fault.	Budhipadar	Yes	NA	OPTCL	WR
10	220 KV BUDHIPADAR-RAIGARH-1	06-08-2022	17:08	07-08-2022	15:58	Budhipadar: R_N, 69 km, 2.41 kA, Earthwire snapped		R-Earth	400	Tripped in Zone-2 time from Raigarh	Budhipadar	Yes	NA	OPTCL	WR
11	220 KV DARBHANGA (DMTCL)-SAMASTIPUR-1	07-08-2022	12:08	07-08-2022	13:17	DMTCL: B_N, Zone-1	Samastipur: B_N, 1.3 kA	B-Earth			Muzaffarpur	Yes	No	DMTCL	BSPTCL
12	220 KV BEGUSARAI-SAHARSA-1	07-08-2022	13:44	07-08-2022	15:58	Begusarai: Master Trip relay operated	Saharsa: Didn't trip	No fault	NA		Saharsa	No	NA	BSPTCL	PMTL
13	220 KV BEGUSARAI-SAHARSA-2	07-08-2022	13:44	07-08-2022	15:58	Begusarai: Master Trip relay operated	Saharsa: Didn't trip	No fault	NA	220 KV BEGUSARAI-KHAGARIA D/C tripped at the same time	Saharsa	No	NA	BSPTCL	PMTL
14	220 KV BEGUSARAI-SAHARSA-1	07-08-2022	16:50	11-08-2022	16:52	Begusarai: Master Trip relay operated	Saharsa: Didn't trip	No fault	NA		Saharsa	No	NA	BSPTCL	PMTL
15	220 KV BEGUSARAI-SAHARSA-2	08-08-2022	03:50	11-08-2022	16:54	Begusarai: Master Trip relay operated	Saharsa: Didn't trip	No fault	NA		Saharsa	No	NA	BSPTCL	PMTL
16	220 KV DALTONGANJ-CHATRA-2	08-08-2022	16:02	08-08-2022	16:41	Daltonganj: B_N, 176 km, 0.7 kA	Chatra: B_N, 39.18 km, 1.09 kA	B-Earth	160	A/r successful from Daltonganj only	Daltonganj	Yes	No	PG ER-1	JUSNL
17	220 KV TENUGHAT-BIHARSHARIF-1	08-08-2022	16:30	08-08-2022	20:17	Tenughat: R_Y_N, 133.6 km, Ir: 2.074 kA, Iy: 1.91 kA	Biharsharif: R_Y_N, Ir: 6.13 kA, Iy: 6.14 kA	R-Y	100	Phase-to-phase fault	Tenughat	No	Yes	TVNL	BSPTCL
18	400 KV KAHALGAON-DURGAPUR-2	08-08-2022	22:25	09-08-2022	00:02	Kahalgaon: Y_N, Zone-1, A/r unsuccessful	Durgapur: Y_N, 172.3 km, 2.05 kA	Y-Earth	100		Durgapur	No	No	NTPC KHSTPP	PG ER-2

Sl. No.	LINE NAME	TRIP DATE	TRIP TIME	RESTORATION DATE	RESTORATION TIME	Relay Indication LOCAL END	Relay Indication REMOTE END	Reason	Fault Clearance time in msec	Remarks	PMU Location	DR/EL RECEIVED FROM LOCAL END	DR/EL RECEIVED FROM REMOTE END	LOCAL END UTILITY	REMOTE END UTILI
19	220 KV DARBHANGA (DMTCL)-MOTIPUR-2	09-08-2022	14:04	09-08-2022	14:34	Darbhanga: B_N, Zone-2, 94 km, 2.24 kA	Motipur: B_N, 2.3 kA	B-Earth	100	A/r successful from Motipur	Muzaffarpur	No	Yes	DMTCL	BSPTCL
20	220 KV JODA-RAMCHANDRAPUR-1	10-08-2022	20:07	11-08-2022	13:26	Joda: Y_B, 1.54 km, 6.5 kA	Ramchandrapur: Y_B, 120.5 km, Zone-2, Iy: 2.2 kA, Ib: 2.07 kA	Y-B	350		Jamshedpur	No	No	OPTCL	JUSNL
21	400 KV KODERMA-BOKARO-1	11-08-2022	03:30	11-08-2022	05:16	Koderma: B_N, A/r unsuccessful		B-Earth	100		Koderma	Yes	Yes	DVC	DVC
22	400 KV KODERMA-BOKARO-2	11-08-2022	03:30	11-08-2022	05:26	Koderma: B_N, 80 km, 4.14 kA	Bokaro: B_N, 22.07 km, 6.48 kA, A/r unsuccessful	B-Earth	100	A/r failed after 1 sec	Koderma	Yes	Yes	DVC	DVC
23	400 KV ALIPURDUAR-PUNATSANGCHUN-JIGMELLING-2	11-08-2022	13:29			Alipurduar: B_N, Zone-2 (100%)		B-Earth	350	High resistive fault	Alipurduar	No	NA	PG ER-2	BHUTAN
24	400 KV BIHARSHARIF-NEW PURNEA-1	11-08-2022	14:26	13-08-2022	14:43	Biharsharif: B_N, 75.3 km, 4.4 kA	New Purnea: B_N, 139.5 km, 2.93 kA	B-Earth	100	Other two phase at New Purnea tripped after 2.5 seconds. A/r attempt by Biharsharif after 2 seconds which failed due to persisting fault	Biharsharif	Yes	Yes	PG ER-1	PG ER-1
25	220 KV NEW PURNEA-MADHEPURA-2	11-08-2022	16:07	11-08-2022	17:35	New Purnea: Y_B, 77.8 km, Iy: 2.85 kA, Ib: 2.7 kA		Y-B	100	Phase-to-phase fault	New Purnea	Yes	Yes	P ER-1	BSPTCL
26	400 KV ALIPURDUAR-JIGMELLING-1	13-08-2022	17:27	13-08-2022	17:56	Alipurduar: B_N, 45.9 km, 8.18 kA		B-Earth	100		Alipurduar	No	NA	PG ER-2	BHUTAN
27	220 KV BUDHIPADAR-KORBA-3	14-08-2022	10:47	14-08-2022	13:10	Budhipadar: Y_B_N, Iy: 1.7 kA, Ib: 2.19 kA		Y-B-Earth	450	Resistive phase-to-phase fault	Budhipadar	Yes	NA	OPTCL	WR
28	400 KV MERAMUNDALI-LAPANGA-1	14-08-2022	17:34	16-08-2022	13:31	Meramundali: R_Y_N, 148 km, Ir=Iy=3.23 kA	Lapanga: R_Y_N, 44 km, Ir=Iy=9.5 kA	R-Earth	100	Initially single phase fault and A/r successful from both ends. After 2 seconds phase-to-phase fault appeared.	Meramundali	Yes	Yes	OPTCL	OPTCL
29	400 KV ALIPURDUAR-JIGMELLING-1	15-08-2022	10:33			Alipurduar: O/V operated	Jigmelling: DT received	No fault	NA		Alipurduar	No	NA	PG ER-2	BHUTAN
30	400 KV ALIPURDUAR-PUNATSANGCHUN-JIGMELLING-1	16-08-2022	03:53	16-08-2022	04:13	Alipurduar: Y_N, 68.2 km, 6.6 kA, A/r successful		Y-Earth	100		Alipurduar	No	NA	PG ER-2	BHUTAN
31	220 KV ALIPURDUAR-BIRPARA-1	16-08-2022	07:01	16-08-2022	07:46	Alipurduar: Y_B, 43.5 km, Iy: 3.96 kA, Ib: 2.99 kA	Birpara: Y_B, 10.58 km, Iy: 8.2 kA, Ib: 4.4 kA	Y-B	100		Alipurduar	No	No	PG ER-2	PG ER-2
32	220 KV ALIPURDUAR-BIRPARA-2	16-08-2022	07:01	16-08-2022	07:11	Alipurduar: Y_B, 57.8 km, Iy: 1.37 kA, Ib: 2.75 kA	Birpara: B_N, 11.7 km, 3.5 kA, A/r successful	Y-B	100		Alipurduar	No	No	PG ER-2	PG ER-2
33	400 KV PPSP-BIDHANNAGAR-1	17-08-2022	04:47	17-08-2022	05:06	PPSP: R_N, Zone-1, 58.6 km	Bidhannagar: R_N, 130 km, 2.788 kA	R-Earth	100	A/r not kept in service as per OEM advise	Durgapur	No	Yes	WBSIEDCL	WBSIEDCL
34	220 KV BARIPADA-BALASORE-2	17-08-2022	20:06	18-08-2022	19:51	Baripada: Y_B, 17.7 km, Iy: 6.66 kA, Ib: 8.07 kA	Balasore: B_N, Zone-1, 49.3 km, 2.69 kA	Y-B-Earth	100	Phase-to-phase fault. A/r attempt taken from Balasore end after 1 sec which failed due to persistent fault	Baripada	Yes	No	PG ODISHA	OPTCL
35	400 KV PPSP-BIDHANNAGAR-1	18-08-2022	10:15	18-08-2022	10:38	PPSP: R_N, 143.2 km, 1.1 kA	Bidhannagar: R_N, 44 km, 5.9 kA	R-Earth	100	A/r not kept in service as per OEM advise	Durgapur	No	Yes	WBSIEDCL	WBSIEDCL
36	400 KV TALA-BINAGURI-1	18-08-2022	14:26			Tala: B_N, Zone-1, 22.6 km	Binaguri: B_N, 122.4 km, 3.093 kA	B-Earth	100		Binaguri	NA	No	BHUTAN	PG ER-2
37	220 KV BIRPARA-MALBASE-1	18-08-2022	14:26			Birpara: 39.96 km, 3.335 kA		B-Earth	100		Alipurduar	No	NA	PG ER-2	BHUTAN

Sl. No.	LINE NAME	TRIP DATE	TRIP TIME	RESTORATION DATE	RESTORATION TIME	Relay Indication LOCAL END	Relay Indication REMOTE END	Reason	Fault Clearance time in msec	Remarks	PMU Location	DR/EL RECEIVED FROM LOCAL END	DR/EL RECEIVED FROM REMOTE END	LOCAL END UTILITY	REMOTE END UTILITY
38	220 KV JAMSHEDPUR-JINDAL-1	18-08-2022	16:44	18-08-2022	17:22	Jamshedpur: B_N, Zone-2, 131.9 km, 1.07 kA		B-Earth	550	Tripped in Zone-2 time from Jamshedpur. Carrier scheme not available	Bokaro	Yes	No	DVC	JSPL
39	220 KV ALIPURDUAR-BIRPARA-1	19-08-2022	06:00	19-08-2022	06:18	Alipurduar: R_B, 57.5 km, Ir: 2.85 kA, Ib: 1.3 kA	Birpara: R_N, 12.06 km, 3.67 kA, A/r successful	R-Earth	100		Alipurduar	No	No	PG ER-2	PG ER-2
40	220 KV ALIPURDUAR-BIRPARA-2	19-08-2022	06:00	19-08-2022	06:40	Alipurduar: R_B, 45.89 km, Ir: 2.8 kA, Ib: 3.98 kA	Birpara: R_B, 10.37 km, Ir: 3.5 kA, Ib: 7.5 kA	R-B-Earth	100		Alipurduar	No	No	PG ER-2	PG ER-2
41	400 KV NEW PPSP-NEW RANCHI-2	19-08-2022	17:25	19-08-2022	17:42	New PPSP: DT received		No fault	NA	Ingress of water into density monitor of Y_ph Bus-duct chamber	New Ranchi	No	No	WBSETCL	PG ER-1
42	400 KV MEDINIPUR-NEW CHANDITALA-2	19-08-2022	22:26	19-08-2022	22:55	Medinipur: R_N, 50 km, 4.659 kA	New Chanditala: R_N, 39.27 km, 6.747 kA	R-Earth	100	A/r failed after 1 sec	Medinipur	No	Yes	PMJTL	WBSETCL
43	400 KV NEW PPSP-NEW RANCHI-2	19-08-2022	22:18	19-08-2022	23:35	New PPSP: Contact malfunctioning	New Ranchi: Didn't trip	No fault	NA	Ingress of water into density monitor of Y_ph Bus-duct chamber	New Ranchi	No	Yes	WBSETCL	PG ER-1
44	220 KV DALTONGANJ-CHATRA-1	19-08-2022	22:40	19-08-2022	23:12	Daltonganj: R_N, 125 km, 1.129 kA	Chatra: R_N, 72.576 km, 1.022 kA	R-Earth	100	A/r successful at Daltonganj. Three phase tripping at Chatra	Daltonganj	Yes	Yes	PG ER-1	JUSNL
45	220 KV RANCHI-HATIA-2	20-08-2022	09:42	20-08-2022	17:05	Ranchi: B_N, 28.7 km, 4.9 kA, A/r successful		B-Earth	100	A/r successful at Ranchi. Three phase tripping at Hatia. Tripped at 10:07 Hrs from Ranchi end	Ranchi	No	Yes	PG ER-1	JUSNL
46	220 KV RANCHI-RAMGARH-1	20-08-2022	19:34	20-08-2022	21:03	Ranchi: Didn't trip	Ramgarh: R_N Fault, master trip	R-Earth	100		Ranchi	NA	No	PG ER-1	DVC
47	220 KV RANCHI-RAMGARH-1	20-08-2022	21:40	20-08-2022	23:34	Ranchi: Didn't trip	Ramgarh: DT auxiliary relay malfunctioned	No fault	NA	No fault. DT received multiple times at Ramgarh.	Ranchi	NA	Yes	PG ER-1	DVC
48	400 KV JEERAT-SAGARDIGHI-1	22-08-2022	05:27	22-08-2022	07:01	Jeerat: Didn't trip	Sagardighi: DT received	No fault	NA	DT received at Sagardighi. Spurious DT sent from Jeerat	Durgapur	No	Yes	WBSETCL	WBPDC
49	400 KV PPSP-BIDHANNAGAR-1	22-08-2022	10:31	22-08-2022	10:50	PPSP: R_N, Zone-1, 139.9 km	Bidhannagar: R_N, 42.92 km, 6.086 kA	R-Earth	100	A/r not kept in service as per OEM advise	Durgapur	No	Yes	WBSEDCL	WBSETCL
50	400 KV KHSTPP-LAKHISARAI-1	23-08-2022	13:40	23-08-2022	17:09	KhSTPP: B_N, Zone-1	Lakhisarai: B_N, 130.8 km, 3.3 kA	B-Earth	100	3 phase tripping from Lakhisarai occurred and High overvoltage upto 1100 kv in B phase at lakhisarai end observed even after opening of 3 phase .	Lakhisarai	No	Yes	NTPC KHSTPP	PG ER-1
51	220 KV KARMNASHA-SAHUPURI-1	23-08-2022	15:52	23-08-2022	17:34	Karmnasha: O/c (Y_ph, 1.98 kA)		Y-Earth	100		Sasaram	Yes	NA	BSPTCL	NR
52	400 KV KODERMA-BOKARO-1	24-08-2022	12:16	24-08-2022	13:47	Koderma: B_N, 44.1 km, 6.54 kA	Bokaro: B_N, 85.7 km, 6.64 kA	B-Earth	100	MCB & TCB both took unsuccessful A/R attempt this should be checked and rectified.	Koderma	Yes	No	DVC	DVC
53	220 KV DARBHANGA (DMTCL)-SAMASTIPUR-1	24-08-2022	18:52	24-08-2022	19:26	Darbhangha: R_N, 20 km, 5.97 kA, A/r successful	Samastipur: R_N, 4.4 kA	R-Earth	100	A/R successful only from DMTCL end .	Muzaffarpur	Yes	No	DMTCL	BSPTCL
54	220 KV BIRPARA-MALBASE-1	26-08-2022	18:04	27-08-2022	14:16	Birpara: B_N, 40.7 km, 3.26 kA, A/r successful. Tripped again within reclaim time		B-Earth	100		Birpara	No	NA	PG ER-2	BHUTAN
55	220 KV DARBHANGA (DMTCL)-LAUKAHI-2	27-08-2022	09:41	27-08-2022	10:40	Darbhangha: B_N, 6.5 km, 5.68 kA, A/r successful	Laukahi: B_N, 0.929 kA	B-Earth	100		Muzaffarpur	No	No	DMTCL	BSPTCL
56	220 KV TTPS-TSTPP-1	27-08-2022	14:46	28-08-2022	00:43		TSTPP: R_N, Zone-1, 18.9 km, 5.19 kA	R-Earth	100		TSTPP	No	No	OPTCL	NTPC TSTPP
57	220 KV RENGALI (PH)-TSTPP-1	28-08-2022	12:16	28-08-2022	14:06	Rengali: R_N, 2.63 kA, 25.06 km	TSTPP: R_N, 13.4 km, 4.54 kA	R-Earth	100		TSTPP	No	No	OHPC	NTPC TSTPP
58	400 KV RANCHI-RAGHUNATHPUR-3	29-08-2022	00:21	29-08-2022	01:05	Ranchi: B_N, 94.57 km, 4.07 kA	Raghunathpur: B_N, 77.43 km, 5.109 kA, A/r successful	B-Earth	100	No auto reclose occurred from ranchi end while a/r successful from rps	Ranchi	YES	No	PG ER-1	DVC

Sl. No.	LINE NAME	TRIP DATE	TRIP TIME	RESTORATION DATE	RESTORATION TIME	Relay Indication LOCAL END	Relay Indication REMOTE END	Reason	Fault Clearance time in msec	Remarks	PMU Location	DR/EL RECEIVED FROM LOCAL END	DR/EL RECEIVED FROM REMOTE END	LOCAL END UTILITY	REMOTE END UTILITY
59	220 KV CHUKHA-BIRPARA-2	29-08-2022	04:51	29-08-2022	05:18	Chukha: R_N, Zone-2, 70.2 km, 3.177 kA	Birpara: R_N, 3.9 km, 10.7 kA, A/r successful	R-Earth	100		Birpara	NA	No	BHUTAN	PG ER-2
60	400 KV PPSP-BIDHANNAGAR-2	30-08-2022	11:39	30-08-2022	12:10	PPSP: R_N, 139.4 km	Bidhannagar: R_N, Zone-1, 43.8 km, 6.38 kA	R-Earth	100	NO A/R scheme	Bidhannagar	No	No	WBSEDCL	WBSETCL
61	400 KV BIDHANNAGAR-NEW CHANDITALA-2	30-08-2022	11:39	30-08-2022	12:22	Bidhannagar: B_N, 329 km, 0.31 kA	Chanditala: DT received, broken conductor	B-Earth	100	NO A/R from chanditala ,and bidhannagar end sensed R phase and B Phase cb opened and rest 2 phase were opened for 1.5 seconds and tripped after that due to suspected PD operation.	Bidhannagar	YES	YES	WBSETCL	WBSETCL
62	400 KV KODERMA-BOKARO-1	30-08-2022	21:13			Koderma: B_N, 7.8 km, 22.61 kA	Bokaro: B_N, 72.14 km, 4 kA	B-Earth	100	Tower collapse	Koderma	YES	No	DVC	DVC
63	400 KV KODERMA-BOKARO-2	30-08-2022	21:13			Koderma: B_N, 3.5 km, 19.57 kA	Bokaro: B_N, 92.43 km, 2.65 kA	B-Earth	100	Tower collapse	Koderma	No	No	DVC	DVC
64	400 KV MERAMUNDALI-LAPANGA-	31-08-2022	11:17			Meramundali: R_N, 135.4 km, 2.29 kA	Lapanga: R_N, 5.25 km, 20.04 kA	R-Earth	100	A/R unsuccessful , MCB &TCB A/R attempt should be time delayed.	Meramundali	Yes	Yes	OPTCL	OPTCL
65	220 KV DALTONGANJ-CHATRA-2	31-08-2022	12:03	31-08-2022	12:41	Daltonganj: B_N, 152 km, 0.78 kA, A/r successful	Chatra: B_N, 64.82 km, 1.03 kA	B-Earth	100	Before fault started ,B phase current was high and B & Y phase were 180 degree apart indicating clearance issue .Also A/R was successful from only PG end only .	Daltonganj	Yes	No	PG ER-1	JUSNL
66	220 KV MAITHON-DHANBAD-2	31-08-2022	14:14			Maithon: R_N, 48 km, 3.91 kA, A/r successful		R-Earth	100	3 phase tripping at Dhanbad end no auto reclose occurred.	Maithon	No	Yes	PG ER-2	DVC
67	765 KV JHARSUGUDA-RAIPUR(P5)-1	31-08-2022	15:16			Jharsuguda: Y_ph LA burst	Raipur: Y_N, 304 km, 3.715 kA	Y-Earth	100		Jharsuguda			PG ODISHA	WR

SI No.	Name of the incidence	PCC Recommendation	Latest status
117th PCC Meeting			
1	Disturbance at 220kV Hajipur (BSPTCL) S/s on 31.07.2022 at 00:28 Hrs	<i>BSPTCL was advised to set zone-4 timing of all connected feeders at Hazipur S/s to 250 msec.</i>	
2	Total Power failure at 220 kV Joda (OPTCL) S/s on 27.07.2022 at 11:30 Hrs	<i>OPTCL representative replied that they would take necessary action for implementing autorecloser without PLCC at TTPS end. Further he informed that OPGW for the above line has been commissioned and after completion of DTPC commissioning work, the A/R scheme with OPGW communication would be implemented subsequently.</i>	
116th PCC Meeting			
3.	Disturbance at 400/220 kV Meramundali(OPTCL) S/s on 20.06.2022 at 16:31 Hrs	Regarding dead time setting of 330 msec in New Duburi line, PCC advised to set the dead time setting of autorecloser to one second as per the general practice. PCC opined that Meramundali being an important substation in Odisha system, necessary measure may be taken to ensure healthiness of all the protection system in the substation at the earliest and advised OPTCL to submit a timeline for restoration of LBB protection for all the concerned bays at Meramundali end.	OPTCL updated that the dead time setting has been revised as per the suggestion of PCC. Regarding LBB, he updated that the procurement process has already initiated. It would be installed within Oct-22
4.	Total Power failure at 220 kV Chatra(JUSNL) S/s on 17.06.2022 at 11:36 Hrs	PCC advised JUSNL to share PUTT scheme implemented at Chatra end to ERPC/ERLDC for review. PCC further advised JUSNL to ensure implementation of weak infeed protection at Chatra end with a delay of 50 ms for current reversal guard timer for 220 kV Daltonganj-Chatra D/C line.	JUSNL representative updated that the work could not be completed due to non-availability of relay engineer.

		JUSNL was also advised to configure the disturbance recorders at Chatra end as per the guidelines approved by PCC.	
113th PCC Meeting			
5.	Disturbance at 220 kV Tenughat (TVNL) S/S On 24.03.2022 at 21:37 hrs	PCC advised JUSNL to complete the A/R testing for 220 kV Tenughat-Govindpur line and put the autorecloser in service at the earliest.	JUSNL representative updated that analog card failure was found in PLCC panel. New card is already received at site. The card would be replaced when service engineer visits the site.

Line	Relay Connected at	CT Ratio in A	Fault Location	Fault Current seen by the Relay	Existing			Proposed			
					Ie> in A (Primary)	TMS	Top in sec	Ie> in A (Primary)	TMS	Top in sec	TMS (correct)
Binaguri-Rangpo	Rangpo end	2000/1	Binaguri	4453	200	0.568	1.241985	400	0.564	1.6	0.56
Binaguri-Rangpo	Binaguri end	2000/1	Rangpo	6831	200	0.638	1.220696	400	0.667	1.6	0.67
Kishangunj-Rangpo	Rangpo end	3000/1	Kishangunj	3177	1200	0.514	3.65964	600	0.387	1.6	0.39
Kishangunj-Rangpo	Kishangunj end	3000/1	Rangpo	4306	400	0.28	0.805367	600	0.459	1.6	0.46
Rangpo- Dikchu	Rangpo end	3000/1	Dikchu	4791	200	0.61	1.302136	600	0.333	1.1	0.33
Rangpo- Dikchu	Dikchu end	3000/1	Rangpo	2015	600	1.5 (DT)	1.5	600	0.21	1.2	0.21
Rangpo- TeesthaV	Rangpo end	2000/1	Teestha V	13702	200	0.6	0.952209	400	0.575	1.1	0.58
Rangpo- TeesthaV	TeesthaV end	2000/1	Rangpo	2005	-	-		400	0.281	1.2	0.28
Rangpo-Teestha III	Rangpo end	3000/1	Teestha III	5497	1200	0.28	1.268379	600	0.356	1.1	0.4
Rangpo-Teestha III	Teestha III end	2000/1	Rangpo	2942	-	-		400	0.349	1.2	0.35
Dikchu-Teestha III	Dickchu end	3000/1	Teestha III	4653	400	1.5 (DT)	1.5	600	0.358	1.2	0.36
Dikchu-Teestha III	Teestha III end	3000/1	Dikchu	5832	-	-		600	0.399	1.2	0.40
Rangpo 220Kv Bus											
Rangpo- Newmelli	Rangpo end	1600/1	Newmelli	7953	320	0.399	0.841655	320	0.427	0.9	0.43
Rangpo- Newmelli	Newmelli end	1600/1	Rangpo	2088	320	0.33	1.208623	320	0.246	0.9	0.25

Tasheding-Newmelli	Tasheding end	800/1	Newmelli	745	160	0.24	1.075464	160	0.223	1	0.22
Tasheding-Newmelli	Newmelli end	1600/1	Tasheding	6690	320	0.314	0.701258	320	0.403	0.9	0.40
Newmelli-Jorethang	Newmelli end	400/1	Jorethang	6417	-	0.473		80	0.589	0.9	0.59
Newmelli-Jorethang	Jorethang end	400/1	Newmelli	1780	300	0.09	0.347553	300	0.155	0.6	0.16
Rangpo - Ronginchu	Rangpo end	1600/1	Ronginchu	10280	208	0.52	0.897307	208	0.522	0.9	0.52
Rangpo - Ronginchu	Ronginchu end	400/1	Rangpo	2351	60	0.5 (DT)	0.5	80	0.500	1	0.50

This is the condition by taking peak generation at all individual substation

Protection Audit Recommendations for the Stations audited protection audit team of ERPC				
SI No.	Name of Substation	Owner	Date of Audit	Remarks/Recommendation
1	765/400 kV Sundergarh S/s	Powergrid	25.04.2022	1.Switchyard equipments are in good and healthy condition. Switchyard area as well as overall station is well maintained.
				2.Provision for nameplate with bay/line name may be done in front of SPR(Kiosk) in switchyard for easy identification.
2	400/220/132 kV Lapanga(OPTCL) S/s	OPTCL	26.04.2022	1.Event logger is not available for 220 kV System. The same shall be provided.
				2.Time synchronising equipment is not available for 220 kV system.
				3.Busbar/LBB protection is not available for 220 kV system . The same shall be commissioned at the earliest.
				4.Autorecloser is implemented without PLCC for all the 220 kV feeders. It was informed that OPGW for these lines are under commissioning.
				5.OPGW/DTPC commissioning may be expedited and thereafter carrier based autorecloser as well as intertripping scheme may be implemented for 220 kV lines.
				6.For 220 kV control room housing the relay panels, air conditioning shall be provided for proper functioning of protection system panels & to prevent failure of numerical protection systems.
				7.Zone settings(zone-2, zone-3 & zone-4) in distance protection relay may be reviewed for all the 400 & 220 kV lines in line with the ERPC Protection philosophy.
				8.Group protection for 400 kV Lapanga-Meramundali line may be enabled and two group settings may be kept in the relay. One group considering 400 kV M'mundali-Bolangir in service and another group setting when 400 kV M'mundali-Bolangir is not in service. Group to be selected as per the actual configuration.
				9.Autorecloser in 400 kV Lapanga-Meramundali line is having some issue. The same may be rectified.
				10.Power swing blocking enabled for all zones. It may reviewed and blocking may be done all the zones except zone-1.
				11.Grading in terms of time/voltage setting shall be done in Overvoltage settings of 400 kV lines.
3	220/132 kV Budhipadar(OPTCL) S/s	OPTCL	26.04.2022	1. Time synchronising equipment in substation control room is not working. The same may be rectified & put into service.
				2.Main-I relay of 220 kV Budhipadar-Lapanga-I feeder and main-2 relay of 220 kV Budhipadar-SMC feeder was found to be defective and not in operation. Defective relay shall be changed with spare/new relay immediately.

				<p>3.Main-1 relay of following feeders are of static type. 220 kV Budhipadar-IB TPS line, 220 kV Budhipadar-Tarkera D/c line, 220 kV Budhipadar-Raigarh PG. All Electro Static Relays may be replaced with latest version of Numerical relays for quick and accurate analysis of Trippings.</p>
				<p>4.DC earth leakage were found in both DC-I & II sources. The same may be attended. Continous monitoring of dc earth leakage measurements to be done.</p>
				<p>5.PLCC is not in service for most of the lines. Autorecloser w/o PLCC is implemented for some of the feeders like 220 kV Tarkara D/C, 220 kV Lapanga D/C feeder. For rest of the feeders auto recloser was not in service.</p>
				<p>It was informed that OPGW for these lines are under commissioning. OPGW/DTPC commissioning may be expedited and thereafter carrier based autorecloser as well as intertripping scheme shall be implemented for 220 kV lines.</p>
				<p>6.For 220 kV Budhipadar-Korba-1 &2, the PLCC is not working and found to be out of service since long. Being inter-regional line, matter may be taken up with appropriate authority for restoring the PLCC communication in the line. Alternatively, It is suggested that carrier communication through OPGW network may be planned & implemented.</p>
				<p>7.Zone settings for all 220 kV lines need to be reviewed in line ith ERPC Protection Philosophy & considering the present network configuration at the remote end substations.</p>
				<p>8.Busbar protection is available for a single bus only. For other bus, it is out of service due to defective bay units. It is advised to restore the busbar protection for the second bus at the earliest. Similarly zone-4 settings of feeders corresponding to the bus for which busbar is out of service may be reduced to 250 msec.</p>
				<p>9. Oil leakages was observed in 220/132 kV Auto-I. Action may be taken to address the same.</p>
				<p>10.Vegetation shall be cleared & proper PCC and gravelling should be done in the switchyard.</p>
				<p>General:</p>
				<p>1. Uniform protection philosophy may be adopted across OPTCL network</p>
				<p>2. Protection co-ordination to be done as and when there is change in network configuration or commissioning of new lines</p>
				<p>3. O/V voltage/time gradation to be done for S/s level</p>
				<p>4. Periodic internal review of implemented protection settings</p>
4	220 kV IB TPS	OPGC	27.04.2022	<p>1. Event logger is not available for 220 kV system. The same shall be provided.</p>
				<p>2. Zone-2 timer setting may be reviewed considering the shortest line at remote end(budhipadar) for all 220 kV lines</p>

				3. Zone-4 reach and time delay may be reviewed for all 220 kV lines
				4. Zone-3 time delay may be reviewed as it is encroaching next voltage level (220 kV Lines)
				5. PLCC not operational for all four 220 kV feeders. It was informed that OPGW/DTPC based communication system will be commissioned in near future.
				6. OPGW/DTPC commissioning may be expedited and thereafter carrier based autorecloser as well as intertripping scheme may be implemented for 220 kV lines.
				7. Busbar relay is of static type. It was informed that renovation & upgradation of 220 kV switchyard is under proposal stage.
5	400 kV OPGC S/s	OPGC	27.04.2022	1. At 400 kV level, it was found the both main-1 & main-2 relays of outgoing transmission lines are of same make & model employing different characteristic. It is recommended that different make & model for main-1 & 2 relay is preferable and same may be implemented.
				2. Overvoltage setting for the lines need to be reviewed. Time grading / voltage grading may be done in the overvoltage settings for different lines/for overall substation
				3. DR time window may be increased. DR configuration may be done in line with guidelines approved in ERPC PCC meeting.
				4. Overcurrent protection in 400 kV lines may be disabled.
				5. Provision for sending DT signal to other end during operation of DEF protection may be implemented.
				6. Line length for 400 kV OPGC-Lapanga line may be verified in consultation with OPTCL.
				7. Zone-2 & Zone-3 settings of all 400 kV lines need to be reviewed and set as per the ERPC Protection philosophy.
				8. Adjacent shortest and longest line length maybe verified and zone settings maybe implemented accordingly
				9. Power swing block enabled for all zones. May be reviewed
6	765 kV Darlipali(NTPC) S/s	NTPC	28.04.2022	1. Time grading to be done in stage-I overvoltage settings for 765 kV Darlipalli-Jharsuguda D/c line.
				2. Power Swing blocking enabled for all zones. May be reviewed.
				3. Relay setting data is not available in Protection database of ERPC. The same may be updated at the earliest.