



Agenda for 125th PCC Meeting

Date: 19/04/2023
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

AGENDA FOR 125th PROTECTION COORDINATION SUB-COMMITTEE MEETING TO BE HELD ON 19.04.2023 AT 10:30 HRS THROUGH MS TEAMS PLATFORM

PART – A

ITEM NO. A.1: Confirmation of Minutes of 124th Protection Coordination sub-Committee Meeting held on 17th Mar 2023 through MS Teams online platform.

The minutes of 124th Protection Coordination sub-Committee meeting held on 17.03.2023 was circulated vide letter dated 29.03.2023

Members may confirm.

PART – B

ITEM NO. B.1: Tripping of both units of 270 MW at Adhunik (APNRL) on 12.03.2023 at 20:29 Hrs

On 12.03.2023 at 20:31 Hrs, both units at Adhunik (270 MW each) got tripped. It is reported that generator differential protection got operated in unit 2 subsequently supply to all auxiliaries got failed.

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

Gen. Loss: 485 MW

Outage Duration: 04:20 Hrs

APNRL may explain.

ITEM NO. B.2: Total Power failure at 220 kV Latehar and 220 kV Chatra S/s on 31.03.2023 at 18:23 Hrs.

220 kV 220 kV Daltonganj-Chatra-2 LIL Oed at Latehar got tripped due to B phase fault, leading to total power failure at Latehar S/s. At 18:25 Hrs, 220 kV Daltonganj-Chatra-1 also got tripped subsequently total power failure occurred at Chatra S/s.

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

Load Loss: 24 MW

Outage Duration: 01:15 Hrs

JUSNL may explain.

ITEM NO. B.3: Total Power failure at 400 kV Dikchu S/s on 26.03.2023 at 04:02 Hrs.

On 26.03.2023 at 04:02 Hrs, 400 kV Rangpo-Dikchu line got tripped due to B phase fault. At the same time, 400 kV Teesta 3-Dikchu also got tripped from Teesta 3 end and subsequently total power failure occurred at Dikchu.

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

No Load Loss and Generation Loss

Outage Duration: 01:28 Hrs

Dikchu HEP may explain.

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

B.4.1: Bus tripping occurred in Eastern Region during March 2023

Element Name	Tripping Date	Reason	Utility
Biharsariff(PG) - 400KV - Bus 4	21.03.23 at 05:49 Hrs	Tie bay LBB operated in 400KV BiharSharif Varanasi Ckt-2.	PG ER-1

Powergrid ER-1 may explain.

B.4.2: Repeated Tripping of line during the month of March 2023

S.No.	Name of the Element	No. of times Tripped	Remarks	Utility
1	400 kV Binaguri-Malbase-1	4	Single Phase fault at around 125 Km from Binaguri end.	PG-ER-2/Bhutan
2	220KV-Ranchi-MTPS(DVC)-1	4	All are R-earth fault, A/R successful from Ranchi end only.	JUSNL/DVC
3	132 kV Raxaul- Parwanipur	5	Tripping on Overcurrent each time.	BSPTCL
4	132 kV Sonnagar-Nagaruntari	4	Line idle charge from Sonnagar, B phase involved in all faults.	BSPTCL/JUSNL

Concerned Utility may explain.

ITEM NO. B.5: Repeated Line tripping of 220 kV Ramchandrapur -Joda in April 2023

It has been observed that 220 kV Joda-Ramchandrapur had tripped 9 times in last 15 Days in which fault was in R phase for 8 no. of trippings. It is further observed that most of time A/R is successful from Joda end however it had not operated successfully from RCP end due to PLCC issue.

Details of line tripping is mentioned below

S r. No	Element Name	Trip ping Date	Tripp ing Time	Reason	Revi val Date	Revi val Time
1	220KV-JODA-RAMCHAND RAPUR-1	17-04-2023	11:15	Joda: R-E, 75.03 KM, 1.320 KA		

2	220KV-JODA-RAMCHANDRAPUR-1	13-04-2023	13:00	Joda =Z-2,Y-ph,1.147kA,115km. Ramch=Z-1, ly=6.06kA, 14.3km,A/R unsuccessful.	13-04-2023	15:37
3	220KV-JODA-RAMCHANDRAPUR-1	13-04-2023	09:38	Joda=Rph,DT reciprt,Z-1,74kM,0.8kA,A/R successful.Ram=Z-1,la-1.87kA,lb-0.35kA,lc-0.39kA,A/R unsuccessful	13-04-2023	10:45
4	220KV-JODA-RAMCHANDRAPUR-1	12-04-2023	11:10	Joda: R-Ph, 0.9 KA, 74.4 Km Ramchandrapur:Zone 1, fault in R-phase,y-phase,b-phase,la-1.82 kA,lb-0.36kA,lc-0.41 kA,distance-54.6km	12-04-2023	18:08
5	220KV-JODA-RAMCHANDRAPUR-1	12-04-2023	10:08	Joda:A/R successful, R-Ph, 0.98 kA, 3.15 km Ramchandrapur: Z-2,126.5km,la-1.63kA,R-Ph	12-04-2023	10:56
6	220KV-JODA-RAMCHANDRAPUR-1	12-04-2023	10:08	Joda:A/R successful, R-Ph, 0.98 kA, 3.15 km Ramchandrapur: Z-2,126.5km,la-1.63kA,R-Ph	12-04-2023	10:56
7	220KV-JODA-RAMCHANDRAPUR-1	11-04-2023	11:55	Joda: Y-B-Ph, ly-2.63kA,lb-3.51kA, 26.74 km; Ramchandrapur:Y-B ph, ly-2.668kA,lb-2.4kA, Z-I,94.07km,	11-04-2023	13:03
8	220KV-JODA-RAMCHANDRAPUR-1	10-04-2023	13:13	JODA end:- R_N, Zone-1 Dist.=75.39KM Fault Current: la=1.361KA	10-04-2023	15:13
9	220KV-JODA-RAMCHANDRAPUR-1	02-04-2023	14:32	RAMCHANDRAPUR - R_N , FAULT - FC -1.62 KA , FD - 59.9 KM JODA - R_N , FAULT - FC -1.4 KA , FD - 78.35 KM	02-04-2023	15:23

Members may discuss.

ITEM NO. B.6: Bus tripping at Ramchandrapur in April 2023

- Bus tripping at 13:13 Hrs on 10/04/2023**

On 10/04/2023 at 13:13 Hrs, Bus bar differential protection operated subsequently 220 kV Main Bus-1 along with all the 220/132 kV ICTs at Ramchandrapur S/s got tripped. A total load loss of around 100 MW was observed during the event.

- Bus tripping at 11:10 Hrs on 12/04/2023**

On 12/04/2023 at 11:10 Hrs, there was fault developed in 220 kV Joda -Ramchndrapur -1. At the same time LBB protection operated that led to bus tripping.

It has been observed that various bus bar tripping events had occurred due to mal-operation of Busbar/LBB relay protection after installation of new Busbar at Ramchandrapur.

JUSNL is requested to explain the above events. It is also requested to do the fault finding /root cause analysis as soon as possible to avoid such instances in future.

JUSNL may explain.

ITEM NO. B.7: Tripping Incidence in month of March-2023

Single line tripping incidents in the month of March-2023 which needs explanation from constituents of either end is attached at **Annexure B.7.**

Members may discuss.

PART- C :: OTHER ITEMS

ITEM NO. C.1: Implementation of Single-Phase Auto recloser feature in DEF Relays for the 400 kV transmission lines of TPTL-(Agenda by TPTL)

In 108th PCC meeting, the proposal of implementing auto reclosure with DEF protection was discussed and after discussion it was opined that the proposal needs elaborate technical discussion and confirmation from the relay manufacturers regarding provision of the single-phase auto reclosing functionality in DEF relay for which PCC had further advised TPTL to furnish relevant document / information for further discussion in this regard.

Subsequently TPTL had contacted with the relay suppliers of 400 kV D/C Teesta III HEP – Kishanganj transmission line at Teesta III end and Kishanganj end. The supplier of P442 relay at Teesta III HEP end, i.e., M/s GE Renewable Energy has confirmed that single phase tripping and auto reclose is possible in aided DEF protection function in the P442 relay. Further, as per the relay manual of MiCOM P127 relay, supplied by M/s Areva (formerly M/s Schneider) at Teesta III end, auto reclosure feature is available in DEF protection function of the relay. At Kishanganj end it was also confirmed by the relay supplier, i.e., M/s Hitachi Energy (formerly M/s ABB Power Systems India) that single phase auto reclose is available in DEF protection function of REL670 relay.

In view of above, it is proposed to implement Single Phase Auto recloser feature in DEF Relays for the 400 kV transmission lines of TPTL.

Discussion was held in 121st PCC Meeting regarding this agenda and after detailed deliberation, the following way forward was decided:

- ERLDC to coordinate with NERLDC to get feedback regarding reliability and success rate of auto recloser scheme in DEF relay.
- TPTL to make a detailed presentation on proposed scheme & its logic and on implementation of the scheme at relay level along with wiring & communication channel detailing in next PCC meeting.
- All transmission utilities were advised to share comments to ERPC/ERLDC regarding implementation of single-phase auto reclosing feature in DEF relay.

In 122nd PCC Meeting, ERLDC representative informed that as per communication received from NERLDC, single phase auto-recloser scheme in DEF relay had been implemented in 400 kV Silchar- Imphal d/c and 400 kV Silchar- Misa d/c line and it is operating satisfactorily. He further informed that current reversal guard need to be implemented along with auto recloser scheme in DEF relay for its successful operation.

PCC advised TPTL to make a detailed presentation on proposed scheme & its logic and on implementation of the scheme at relay level along with wiring & communication channel detailing in next PCC meeting.

In 123rd PCC Meeting, TPTL representative informed that as per advice of PCC, M/s GE was communicated to submit detailed scheme with regard to implementation of single phase auto-reclose scheme in DEF relay.

He further stated that, as intimated by M/s GE the detail scheme & its implementation will be presented in next PCC Meeting.

In 124th PCC, Powergrid representative shared case study paper of IIT Mumbai describing about mal operation of DEF protection resulting in spurious tripping of healthy line. He suggested that comments may be shared by utilities before implementing single phase auto recloser feature in DEF Relays for the 400 kV transmission lines of TPTL.

ERLDC informed that spurious tripping of healthy line is even possible if single phase auto recloser feature is disabled in DEF relays however they requested all utilities to share the observation on the proposed scheme.

TPTL representative informed that as per communication made with M/s GE, the detail scheme & its implementation will be presented at the earliest.

TPTL may update.

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

The new elements charged in ER Grid during month of March 2023 is given at **Annexure C.2.**

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

On enquiry from ERLDC regarding facility in PDMS to review the settings implemented in the relay, PRDC representative replied that settings can be extracted from PDMS and analysis/review of same can be done by simulation tool of PSCT.

It was decided that the substation-wise review of protection settings may be carried out using PDMS & PSCT for that PRDC was advised to make a presentation in this regard in PCC.

PRDC may update.

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

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

Members may update the latest status.

ITEM NO. C.4: New Element Integration**4.1 FTC of 132 kV Rangpo- Samardong D/c**

As per information available at ERLDC, 132 kV Rangpo-Samardong D/c is going to be first time charged.

Line parameters are as below:

Name	Conductor Type	Length (km)
132 kV Rangpo-Samardong D/c	Twin Moose ACSR+Cable	2.843 (Twin Moose-2.312 km, Cable-0.531 km)

Chuzachen is requested to review their Zone-2 settings accordingly and give their consent after making necessary changes to facilitate FTC of 132 kV Rangpo-Samardong D/c.

Concerned utility may update.

घटना संख्या: 12-03-2023/1

दिनांक: 10-04-2023

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

Summary of the event (घटना का सारांश):

At 20:29 Hrs, both units at Adhunik (270 MW each) tripped. As reported, generator differential protection operated in U#2 and supply to all auxiliaries failed. Supply to two of three CW pumps was from U#2 auxiliary, tripping of which led to low vacuum pressure of U#1 and U#1 also tripped at the same time.

Date / Time of disturbance: 12-03-2023 at 20:29 hrs

- Event type: GD-1
- Systems/ Subsystems affected: 400 kV Adhunik (APNRL) S/s
- Load and Generation loss.
 - 485 MW generation loss occurred during the event.
 - No load loss occurred during the event.

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

- NIL

Major elements tripped (प्रमुख ट्रिपिंग):

- U#1, U#2 at Adhunik (270 MW each)

Network across the affected area (प्रभावित क्षेत्र का नक्शा)

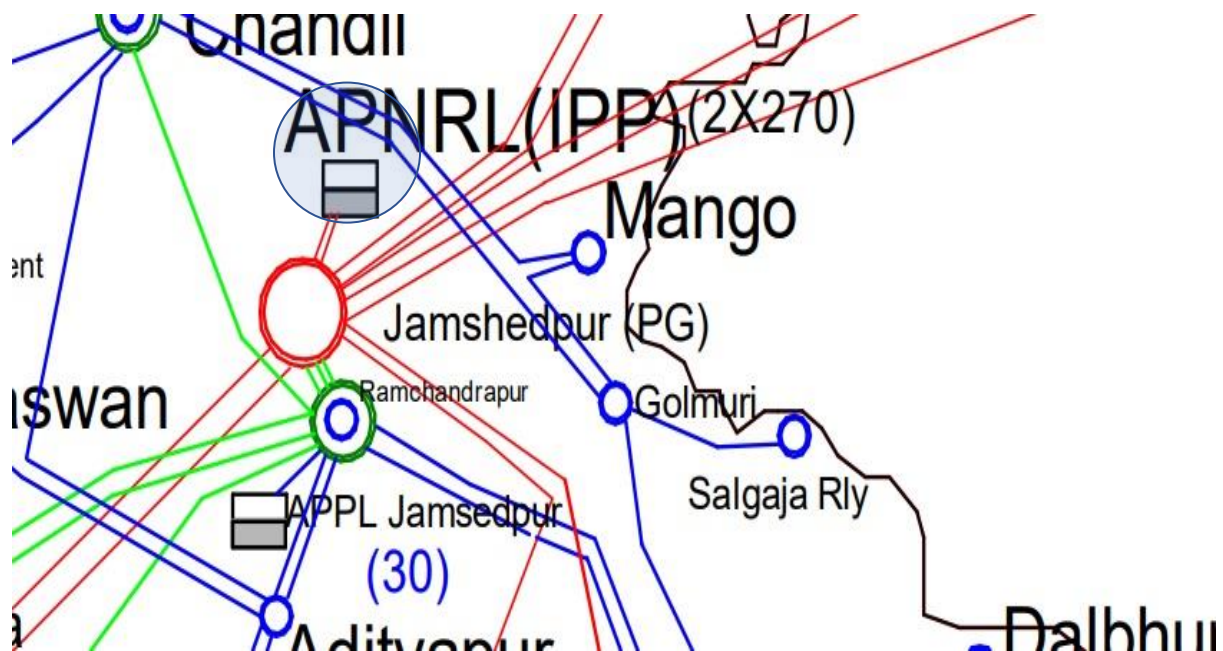


Figure 1: Network across the affected area

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

समय	नाम	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पीएमयू पर्यवेक्षण
20:29	APNRL U#1	Generator differential protection	-	15 kV dip in B_ph voltage at Jamshedpur
	APNRL U#2	Loss of auxiliary supply	-	

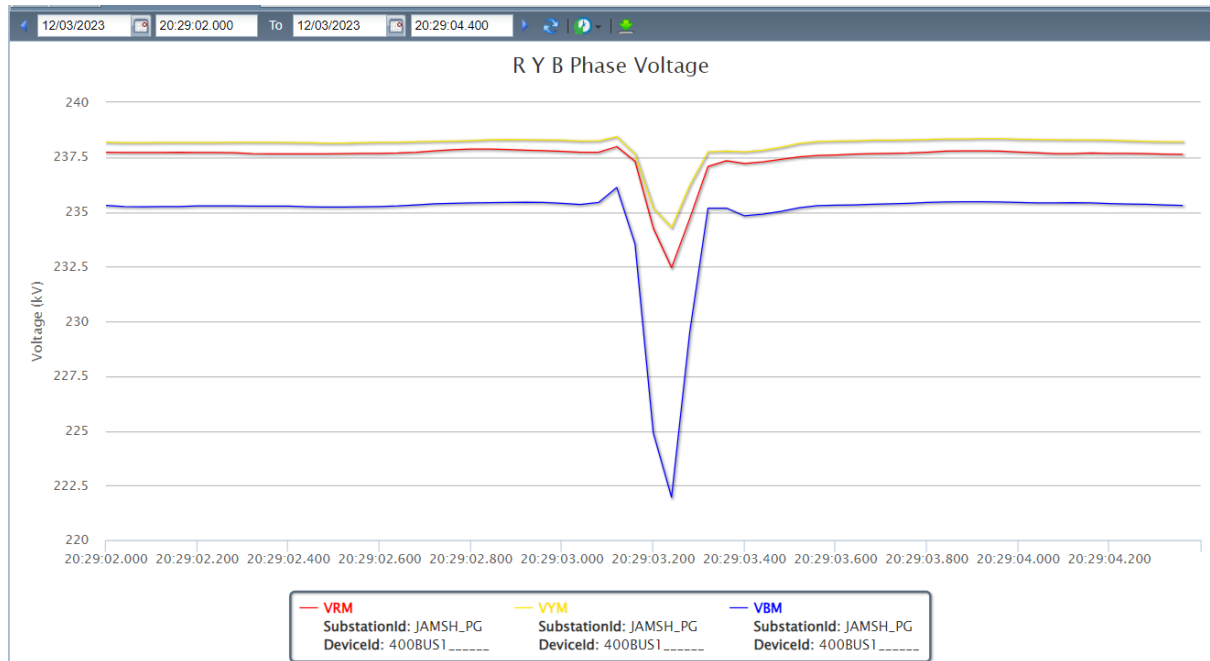


Figure 2: PMU snapshot of 400/220 kV Jamshedpur S/s (18:23 Hrs)

Restoration (पूर्वावस्था की प्रप्ति)

Transmission/Generation element name	Restoration time
APNRL U#1	00:49 (13.03.23)
APNRL U#2	Expected by 30.04.23

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

- U#2 tripped at 20:29 Hrs due to operation of generator differential protection, which led to tripping of GT.
- As GT tripped, auxiliary supply got interrupted. Two of the total three CW pumps supply was through U#2, failure of which led to availability of only one CW pump. Consequently, vacuum pressure of U#1 became low, and U#1 also tripped.
- This led to loss of 485 MW generation at Adhunik.
- Detailed analysis of U#2 tripping may be shared by APNRL.

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	APNRL

Status of Reporting (रिपोर्टिंग की स्थिति):

- DR/EL yet to be received from APNRL.

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 not submitted yet.

घटना संख्या: 31-03-2023/1

दिनांक: 10-04-2023

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

Summary of the event (घटना का सारांश):

At 18:23 Hrs, 220 kV Daltonganj-Latehar-Chatra (220 kV Daltonganj-Chatra-2 LIL) tripped due to B_N fault. At 18:25 Hrs, 220 kV Daltonganj-Chatra-1 also tripped, leading to total power failure at Latehar and Chatra S/s. Inclement weather reported during the event around Daltonganj and Chatra. Total 24 MW load loss occurred.

- **Date / Time of disturbance:** 31-03-2023 at 18:23 hrs
- **Event type:** GD-1
- **Systems/ Subsystems affected:** 220/132 kV Chatra, Latehar S/s
- **Load and Generation loss.**
 - No generation loss was reported during the event.
 - Around 24 MW load loss reported during the event at Chatra and Latehar by Jharkhand SLDC.

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

- NIL

Major elements tripped (प्रमुख ट्रिपिंग):

- 220 kV Daltonganj-Latehar
- 220 kV Daltonganj-Chatra-1

Network across the affected area (प्रभावित क्षेत्र का नक्शा)

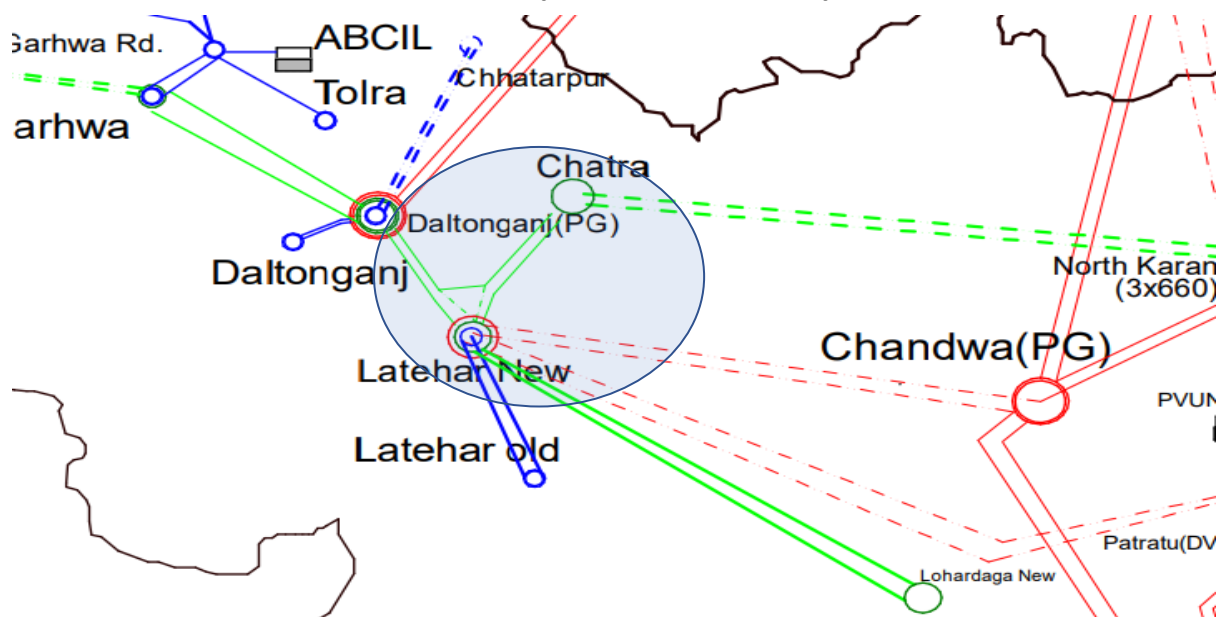
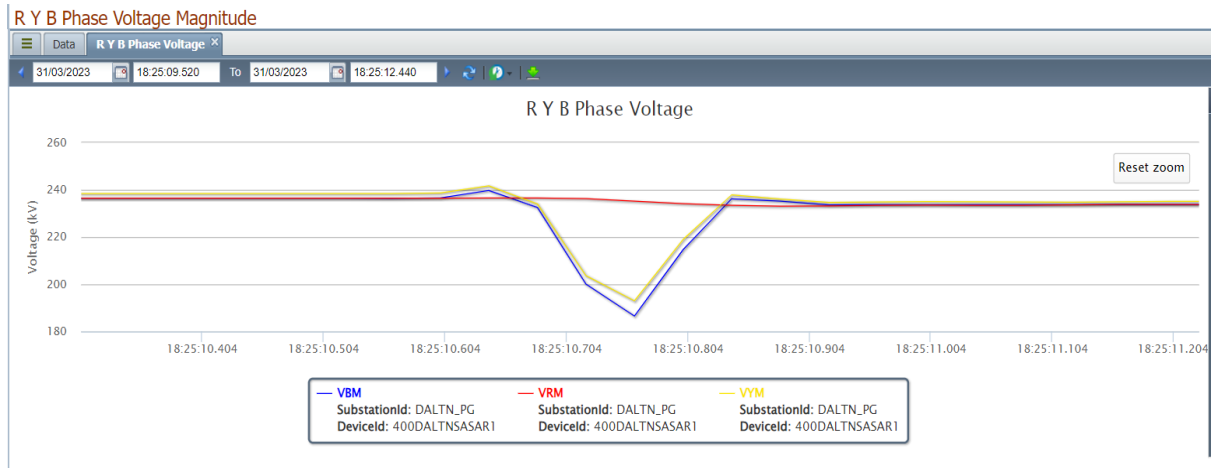
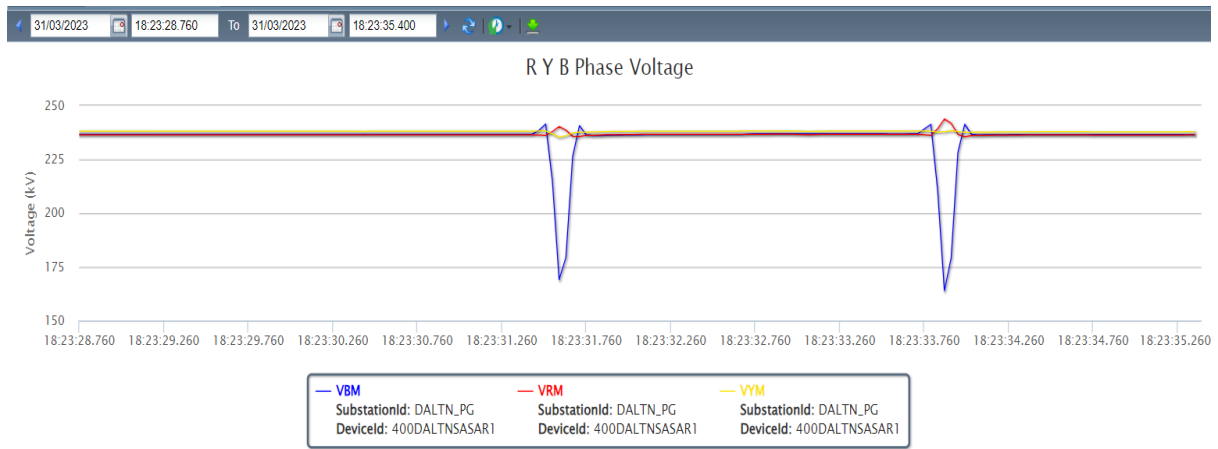


Figure 1: Network across the affected area

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

समय	नाम	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पीएमयू पर्यवेक्षण
18:23	220 kV Daltonagnj-Latehar-1	Daltonganj: B_N, 9.9 km, 5.3 kA	-	72 kV dip in B_ph voltage at Daltonganj
18:25	220 kV Daltonagnj-Chatra-1	Daltonganj: Y_B, 10.5 km, 4.8 kA, Ib: 4.8 kA	-	41 kV dip in Y_ph an 53 kV dip in B_ph voltage at Daltonganj



Restoration (पूर्वावस्था की प्रप्ति)

Transmission/Generation element name	Restoration time
220 kV Daltonganj-Latehar-1	19:38
220 kV Latehar-Chatra-1	19:38
220 kV Daltonganj-Chatra-1	20:16

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

- 220 kV Daltonganj-Latehar-1 tripped at 18:23 Hrs due to B_N fault. A/r attempt was successful from Daltonganj only. However, line tripped again within reclaim time after 1.5 seconds.
- No A/r attempt was taken by Latehar for 220 kV Daltonganj-Latehar-1. JUSNL may explain.
- At 18:25 Hrs, 220 kV Daltonganj-Chatra-1 tripped due to Y_B_N fault. Consequently, Latehar and Chatra S/s became dead.

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

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

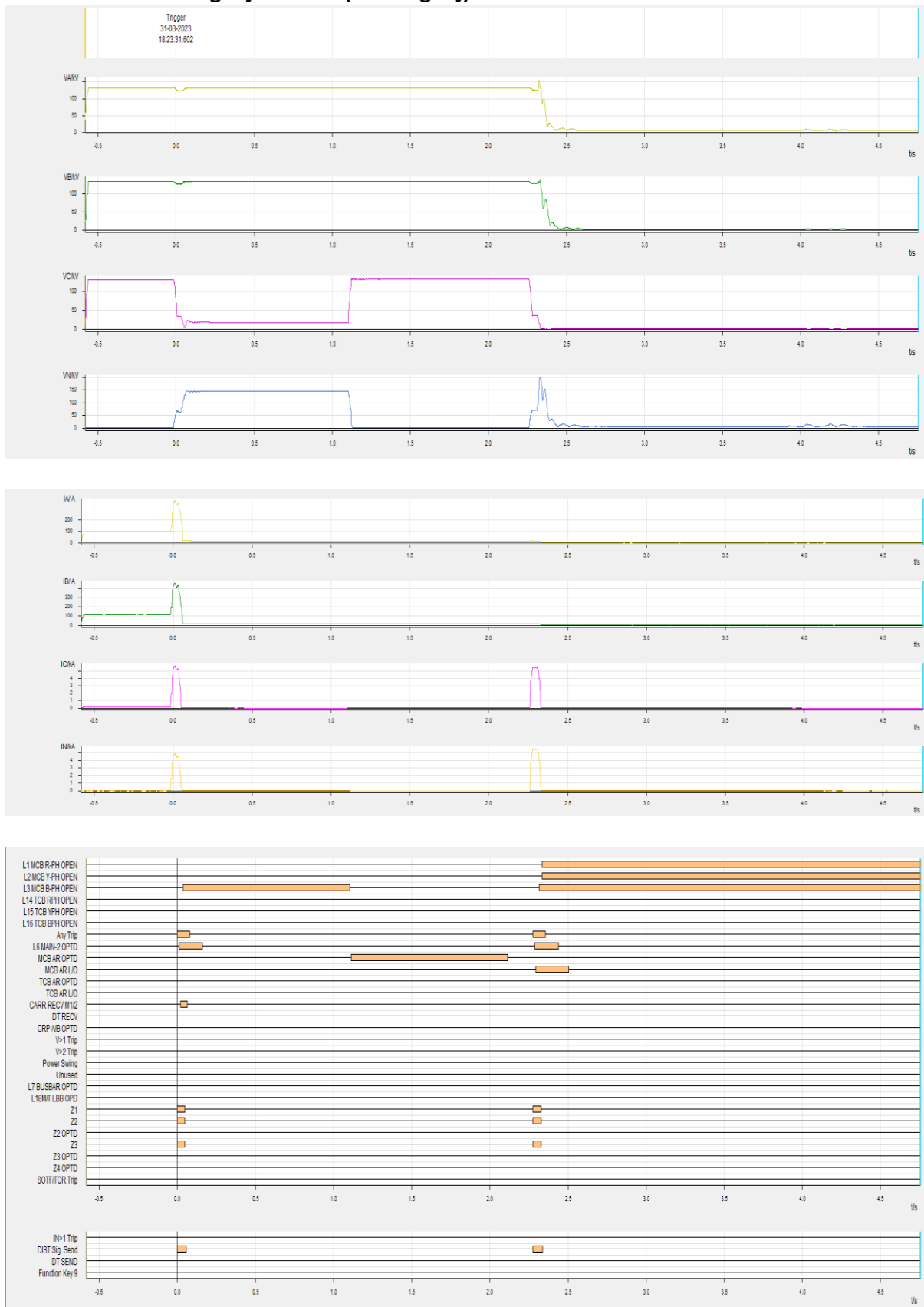
Status of Reporting (रिपोर्टिंग की स्थिति):

- DR/EL yet to be received from JUSNL.

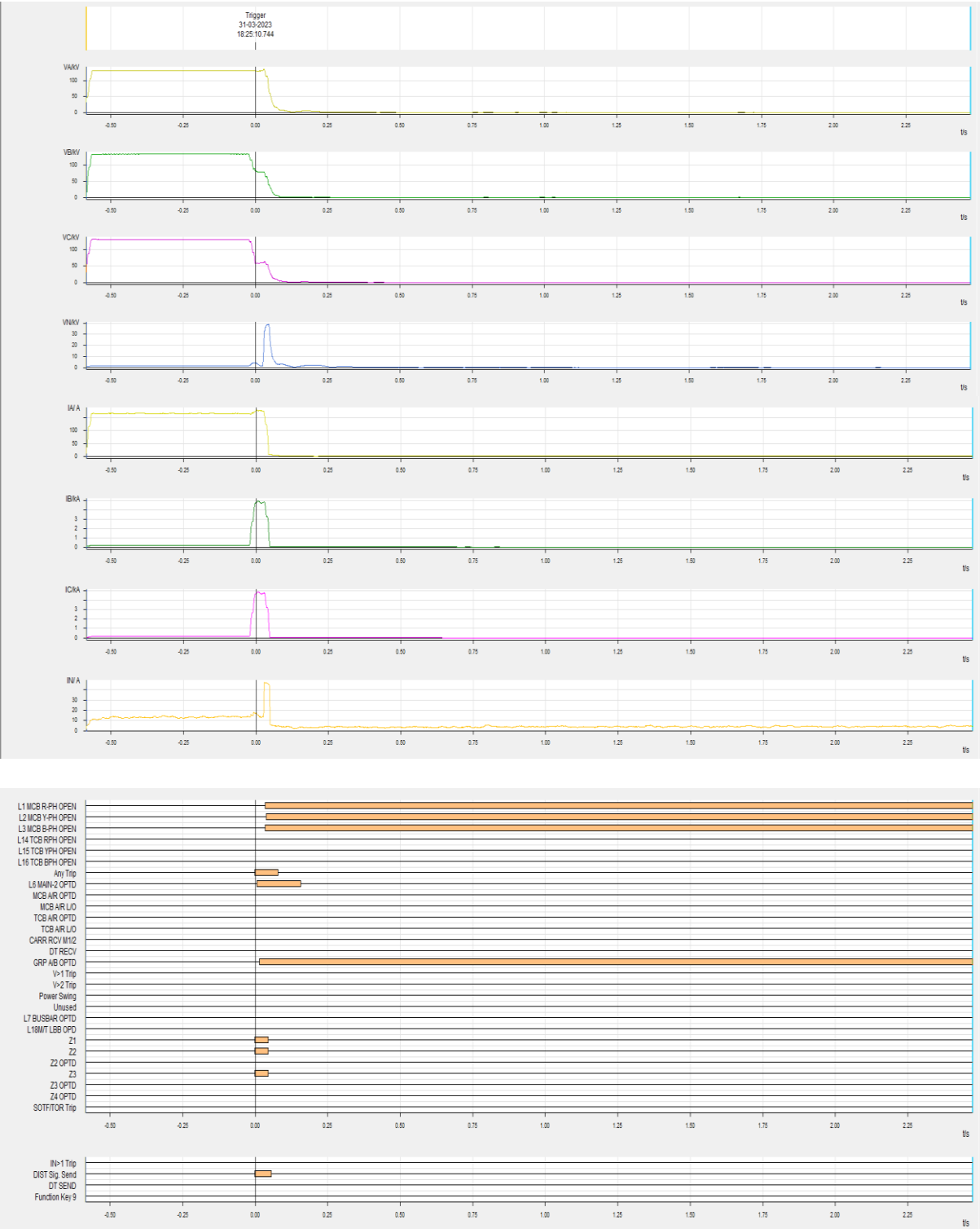
Annexure 1: Sequence of events recorded at ERLDC SCADA data at the time of the event
Sequence of Events not recorded at the time of event.

Annexure 2: DR recorded

DR of 220 kV Daltonganj-Latehar (Daltonganj)



DR of 220 kV Daltonganj-Chatra (Daltonganj)



घटना संख्या: 26-03-2023/1

दिनांक: 06-04-2023

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

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

At 04:02 Hrs, 400 kV Rangpo-Dikchu tripped due to B_N fault. At the same time, 400 kV Teesta 3-Dikchu tripped from Teesta 3 end. This led to total power failure at Dikchu. There was no generation or load loss at Dikchu as no unit was running at that time.

- **Date / Time of disturbance:** 26-03-2023 at 04:02 hrs.
- **Event type:** GD - 1
- **Systems/ Subsystems affected:** 400 kV Dikchu S/s
- **Load and Generation loss.**
 - No generation or load loss occurred during the event.

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

- NIL

3. Major elements tripped (प्रमुख ट्रिपिंग)

- 400 kV Teesta 3-Dikchu
- 400 kV Rangpo-Dikchu

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

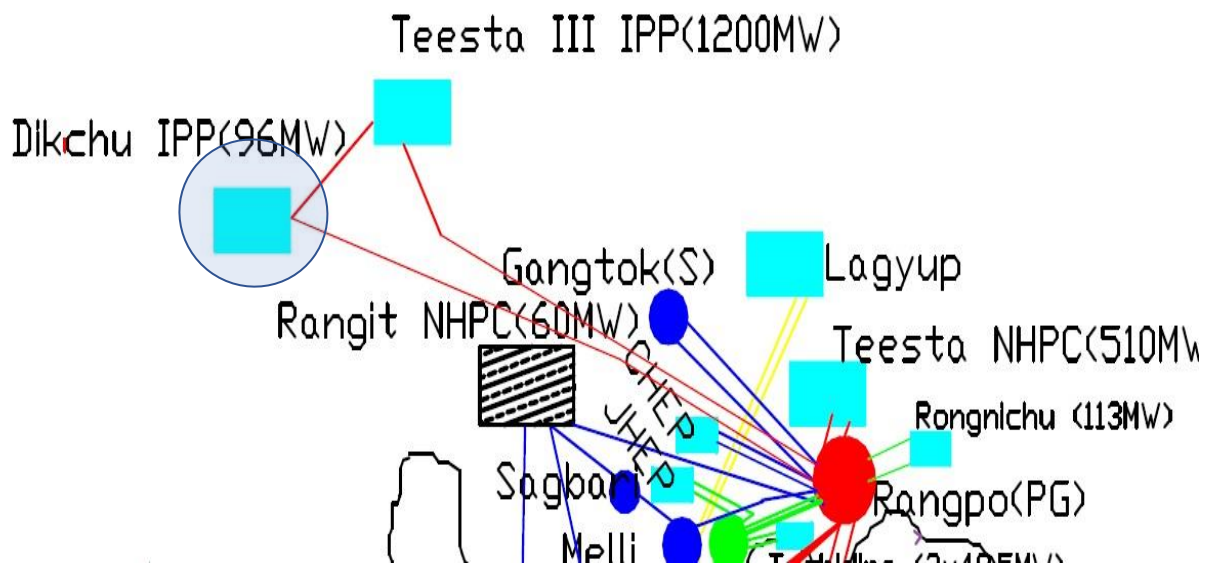


Figure 1: Network across the affected area

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

समय	नाम	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पीएमयू पर्यवेक्षण
04:02	400 kV Teesta 3-Dikchu	Teesta 3: B_N, 2.862 kA	Dikchu: Didn't trip	112 kV dip in B_ph voltage at Rangpo. Fault clearance time: 960 msec
	400 kV Rangpo-Dikchu	Rangpo: B_N, 33 km, A/r successful	Dikchu: B_N, Zone-2, 14.1 km, 1.33 kA	

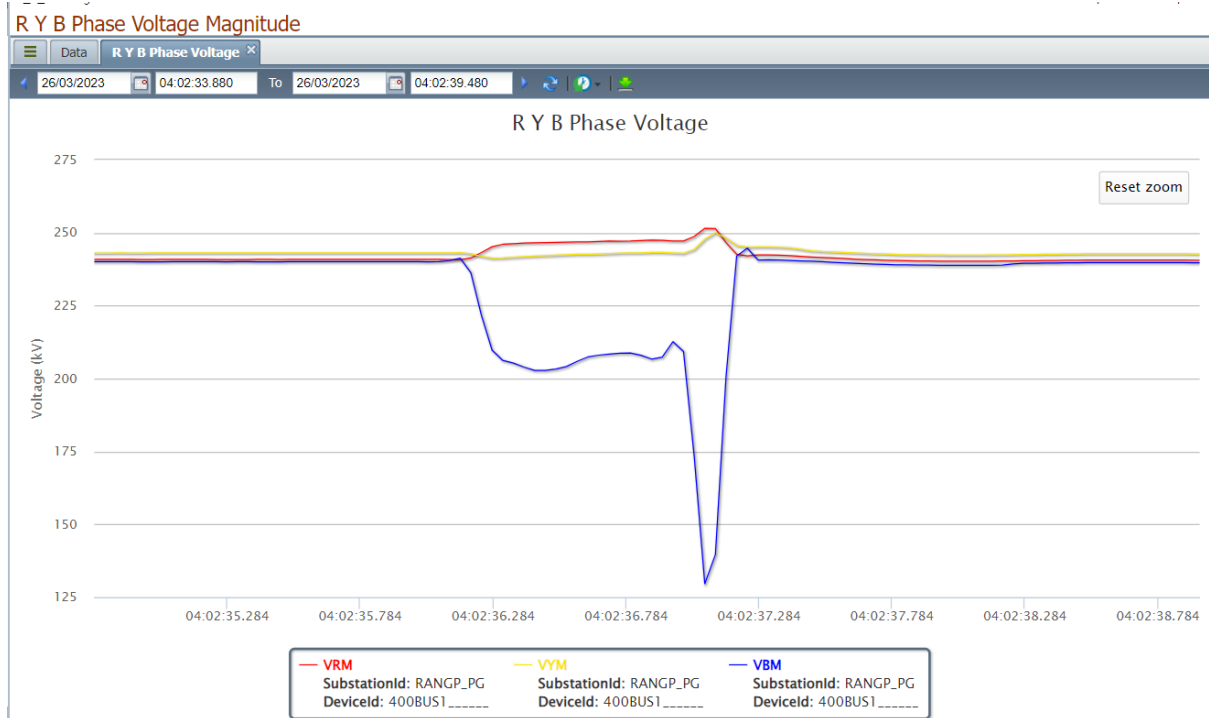


Figure 2: PMU Voltage snapshot of 400/220 kV Rangpo S/s

Figure 3: PMU snapshot of current in 400 kV Rangpo-Dikchu @ Rangpo

6. Restoration (पूर्वावस्था की प्रप्ति)

Transmission/Generation element name	Restoration time
400 kV Teesta 3-Dikchu	06:05
400 kV Rangpo-Dikchu	05:30

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

- A resistive fault struck B_ph of 400 kV Rangpo-Dikchu line. Fault was cleared after 960 msec when it came in Zone-1 of distance protection from both ends. A/r was successful at Rangpo end only.
- At Dikchu, B_ph breaker opened first, however, after 360 msec, other two phase also tripped at Dikchu. In previous tripping instance in August'22 also, this issue was highlighted. Dikchu may update.
- 400 kV Teesta 3-Dikchu sensed the same fault in Zone-2 from Teesta 3 end, however all three phases at Teesta 3 tripped instantaneously. It was also observed that zone settings of all zones are not as per ERPC protection philosophy. Teesta-3 may update on both issues.
- B_ph voltage at Teesta-3 of 400 kV Teesta 3-Dikchu touched 400 kV (phase voltage) during the fault, however no tripping command issued. O/V settings at Teesta-3 may be checked.

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

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

9. Status of Reporting (रिपोर्टिंग की स्थिति):

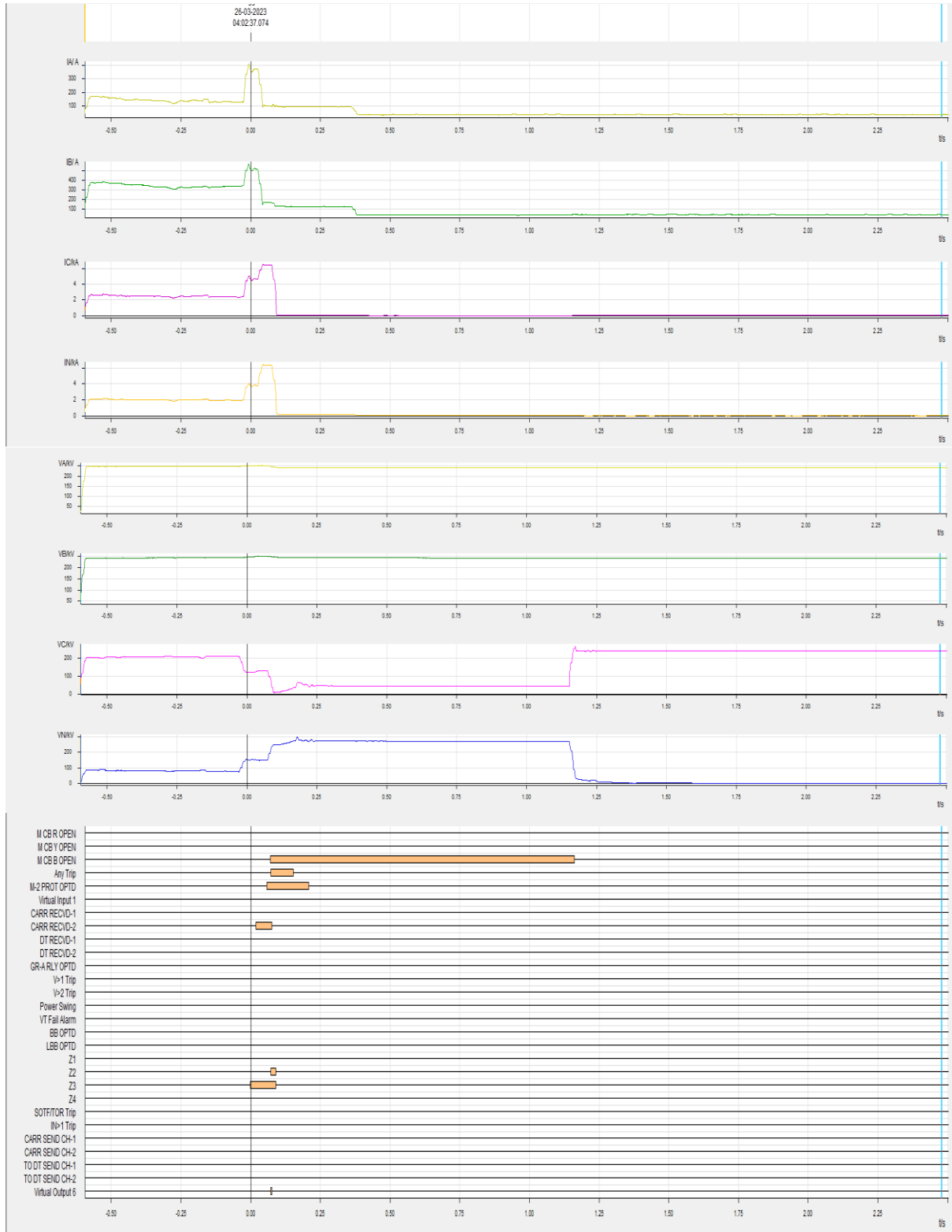
- DR/EL received from Teesta 3, Dikchu, PG ER-2

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

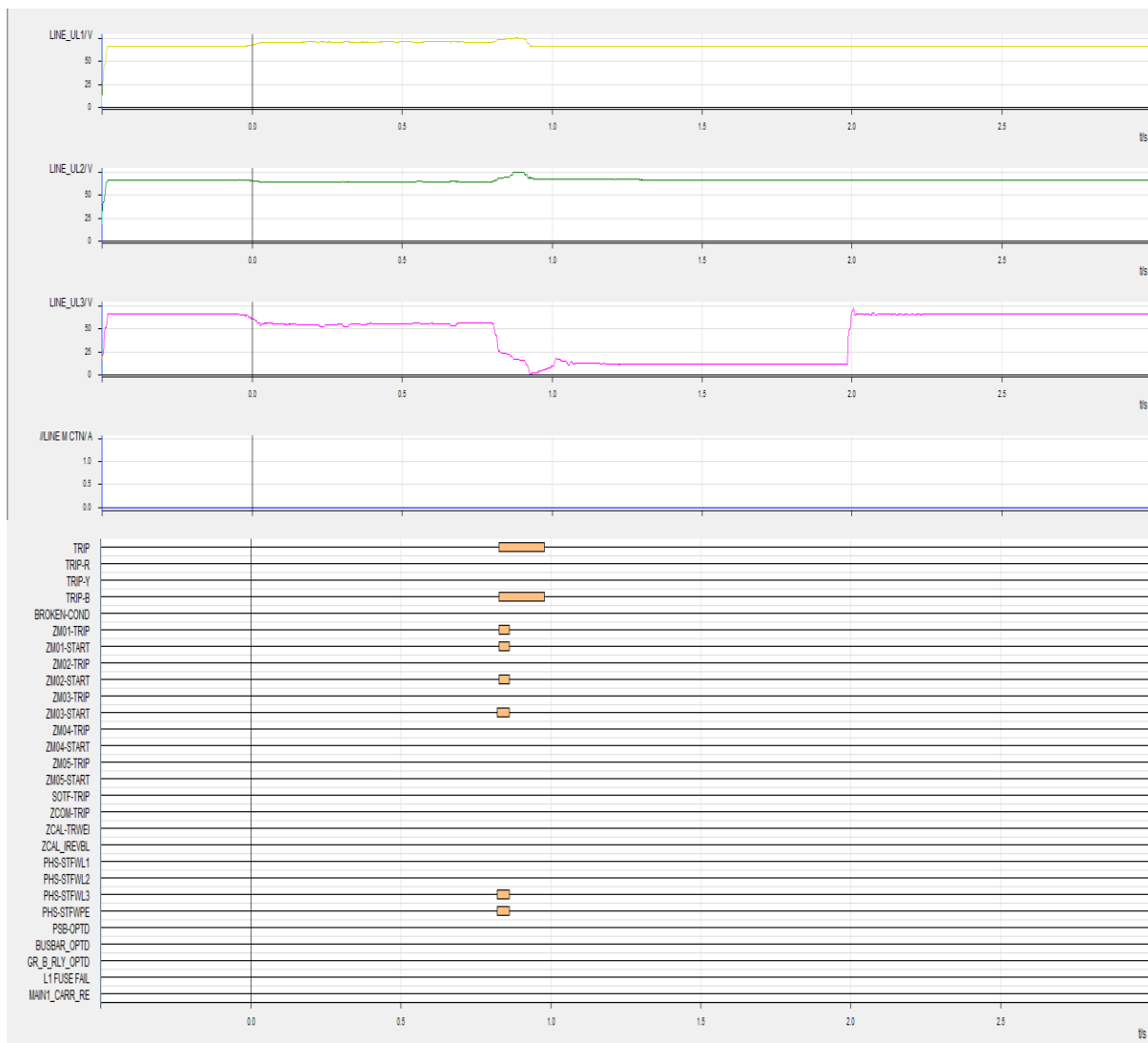
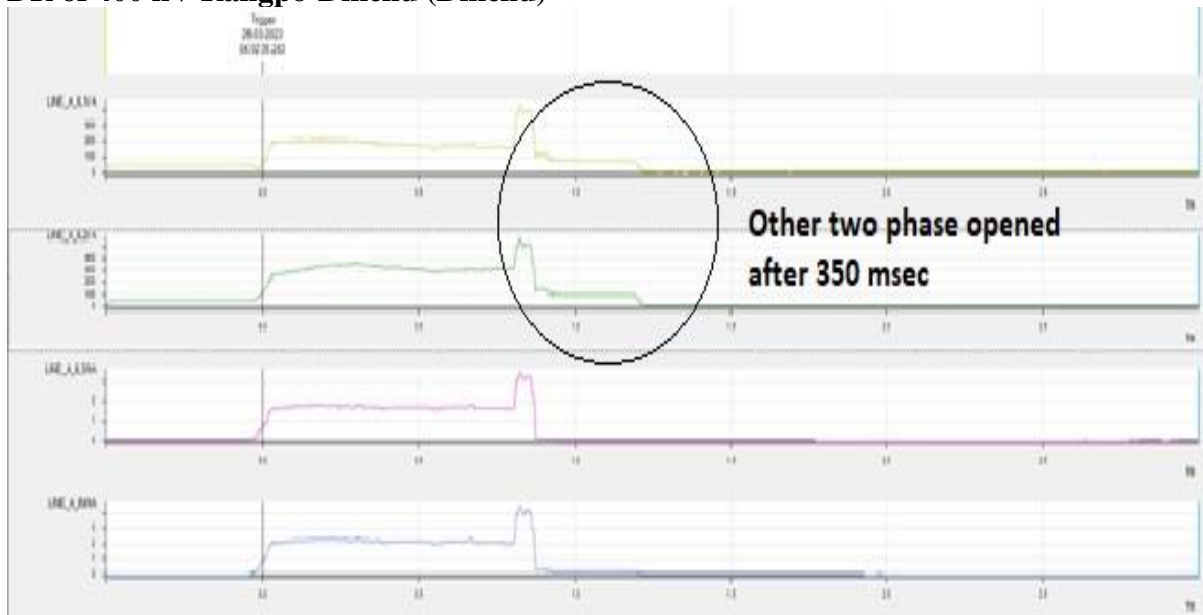
Sequence of Event not recorded at the time of event.

Annexure 2: DR recorded

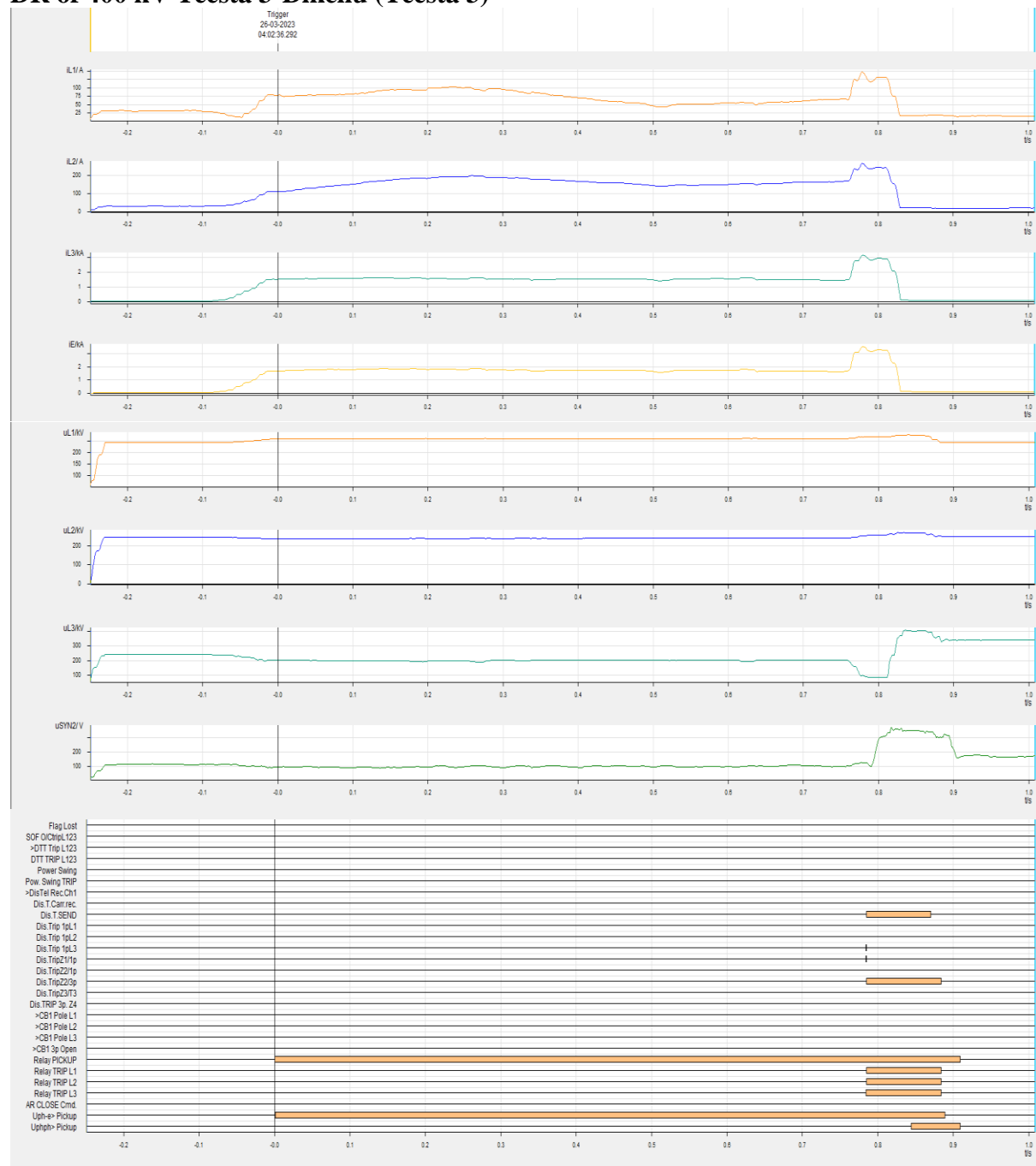
DR of 400 kV Rangpo-Dikchu (Rangpo)



DR of 400 kV Rangpo-Dikchu (Dikchu)



DR of 400 kV Teesta 3-Dikchu (Teesta 3)



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

Sl. No.	LINE NAME	TRIP DATE	TRIP TIME	RESTORATION DATE	RESTORATION TIME	Relay Indication LOCAL END	Relay Indication REMOTE END	Reason	Fault Clearance time in msec	Remarks	DR Configuration Discrepancy	DR/EL RECEIVED FROM REMOTE END
1	400 KV DURGAPUR-SAGARDIGHI-1	01/03/2023	18:08	01/03/2023	18:34	Durgapur : R_N, 81 km, 8.35 kA	Sagardighi: R_N ,Zone-1, 73.3 km, 3.41 kA	R-Earth	100	A/r failed after 1 second		Yes
2	400 KV MAITHON-MAITHON RB-1	01/03/2023	19:42	01/03/2023	23:12		Maithon RB: Main bay under outage, tripped due to tripping of dia element (U#1)	No fault	NA	Unit was de-synchronized due to BTL. MPL may explain if this tripping could have been avoided.		No
3	400 KV JHARSUGUDA(GIS)-OPGC-1	02/03/2023	15:30	02/03/2023	18:42	Jharsuguda: B_N, 34.950 km, 9.518 kA	OPGC : B_N, Zone-1, 19 km, 9 kA	B-Earth	100	A/r failed after 1 second		Yes
4	400 KV RANCHI-RAGHUNATHPUR-2	02/03/2023	18:46	02/03/2023	19:05	Ranchi : DT received	Raghunathpur: Didn't trip	No fault	NA	DVC may update		NA

5	400 KV MALBASE-BINAGURI-1	03/03/2023	02:35	03/03/2023	02:46	Malbase: R_N, Zone-1, 69.96 km, 3.239 kA		R-Earth	100	A/r successful from Binaguri only		NA	Yes
6	400 KV MEERAMUNDALI-NEW DUBURI-2	03/03/2023	07:00	03/03/2023	08:21	Meeramundali: DT received	New Duburi: Didn't trip	No fault	NA	OPTCL may explain.		Yes	NA
7	220 KV BUDHIPADAR-RAIGARH-1	03/03/2023	14:22	03/03/2023	18:07	Budhipadar: B_N, 23.5 km, 4.5 kA	Raigarh: B_N, 63.5 km	B-Earth	100	Three phase A/r enabled instead of single phase.		Yes	NA
8	400 KV MAITHON-RANCHI-1	04/03/2023	15:54	04/03/2023	16:32	Maithon: B_N, 16.4 km, 11.7 kA	Ranchi: B_N, Zone-1, 183 km, 2.19 kA	B-Earth	100	A/r failed after 1 sec		Yes	No
9	220 KV CHANDIL-STPS(WBPDC)-1	06/03/2023	04:18	06/03/2023	04:41	Chandil: Y_N, Zone-1, 90 km, 5.7 kA	STPS: Y_N, Zone-1, 11.1 km	Y-Earth	100	Other two phase at Chandil tripped after 200 msec. JUSNL may explain.	DR length at Chandil may be increased	Yes	Yes
10	220 KV BARUIPUR-SUBHASGRAM(PG)-1	07/03/2023	17:41	07/03/2023	18:37	Baruipur: Y_B, 29.2 km	Subhasgram: Y_B, Zone-1, 1.8 km, Iy= 20.9 kA, Ib= 21.02 kA	Y-B	100	Phase-to-phase fault		Yes	Yes
11	220 KV RANCHI-MTPS(DVC)-1	08/03/2023	15:41	08/03/2023	16:44	Ranchi: R_N, 91.07 km, 1.72 kA, A/r successful	MTPS: R_N, Zone-1, 126.92 km, 1.320 kA	R-Earth	100	A/r disabled at Mejia end		No	Yes
12	220 KV SUBHASGRAM(PG)-BANTALA-1	09/03/2023	04:25	09/03/2023	04:43	Subhshgram: Didn't trip	Bantala: DT received	No fault	NA	Problem in DTPC panel at Bantala. WBSETCL may explain.		NA	Yes
13	220 KV SUBHASGRAM(PG)-BANTALA-1	09/03/2023	18:42	09/03/2023	18:56	Subhshgram: Didn't trip	Bantala: DT received	No fault	NA			NA	Yes

14	220 KV SUBHASGRAM(PG)- BANTALA-1	10/03/2023	12:07	10/03/2023	12:50	Subhshgram: Didn't trip	Bantala: DT received	No fault	NA			NA	Yes
15	400 KV JEERAT- BAKRESWAR-1	10/03/2023	12:51	11/03/2023	04:57	Jeerat: Y_N, 156 km, 2.91 kA	Bakreswar: Y_N, Zone-1, 114.5 km, 3.78kA	Y-Earth	100	A/r failed after 1 second		Yes	No
16	400 KV DURGAPUR- SAGARDIGHI-2	10/03/2023	15:20	10/03/2023	16:14	Durgapur: Y_N, Zone-1, 37.6 km, 6.842 kA	Sagardighi: Y_N, Zone-1 70 km, 3.9 kA	Y-Earth	100	A/r failed after 1 second		Yes	Yes
17	400 KV PPSP- BIDHANNAGAR-2	10/03/2023	20:36	10/03/2023	21:05	PPSP: R_N, Zone-1, 110.9 km	Bidhannagar: R_N, 42.32 km, 5.446 kA	R-Earth	100	A/r disabled as per OEM advise		No	Yes
18	220 KV DALTONGANJ- CHATRA-1	12/03/2023	12:15	12/03/2023	14:16	Daltonganj: Y_B, Zone-1, 70.711 km, 2.06kA	Chatra: Y_B, Zone- 1, 71.5 km	Y-B	100	Phase-to-phase fault		No	No
19	220 KV CHANDIL- RANCHI-1	15/03/2023	13:40	15/03/2023	14:02	Chandil: AR successful	Ranchi: B_N, Zone- 2, 84.5 km, 2.15 kA	B-Earth	350	Tripped in Zone-2 time from Ranchi	file uploaded from Chandil	Yes	No
20	400 KV MALBASE- BINAGURI-1	15/03/2023	15:51	15/03/2023	16:56		Binaguri: B_N, 126 km, 2.49 kA	B-Earth	1800	Highly resistive fault. Fault clearance time as observed from PMU. PG ER-2 may share DR/EL.		NA	No
21	400 KV GMR-ANGUL- 1	15/03/2023	18:57	15/03/2023	20:04		Angul: R_N, Zone- 1, 6.1 km, 15.86 kA	R-Earth	100	A/r successful. Tripped again within reclaim time		Yes	Yes
22	220 KV TENUGHAT- BIHARSARIFF-1	16/03/2023	12:44	16/03/2023	13:16	Tenughat: Y_N, Zone-1, 139.6 km, 1.212 kA		Y-Earth	100	Three phase tripping for single phase fault		Yes	Yes

23	220 KV DALTONGUNJ- GARWAH (NEW)-2	16/03/2023	14:47	16/03/2023	16:05	Daltongunj: R_N, Zone-1, 18.17 km, 4.43 kA	Garwah: R_N, 61.43 km	R-Earth	100	A/r failed after 1 second		No	Yes
24	220 KV DALTONGANJ- LATEHAR(JUSNL)-2	16/03/2023	14:52	16/03/2023	16:26		Latehar: R_N, Zone- 1, 1.78 kA	R-Earth	100	Three phase tripping at Latehar for single phase fault. A/r successful from Daltonganj		No	Yes
25	220 KV RANCHI- RAMGARH-1	16/03/2023	16:29	16/03/2023	16:59	Ranchi: AR successsful	Ramgarh: R_N, Zone-1, 65.8 km,	R-Earth	100	Three phase tripping for single phase fault at Ramgarh. A/r also triggered after 1 sec but A/r attempt not taken. DVC may explain.		No	Yes
26	220 KV RANCHI- MTPS(DVC)-1	16/03/2023	16:29	16/03/2023	17:10	Ranchi: R_N, A/r successful	MTPS: R_N, 228 km, 0.757 kA	R-Earth	100	A/r disabled at Mejia end	DR length is less at Mejia	No	Yes
27	400 KV PPSP- BIDHANNAGAR-2	16/03/2023	17:57	16/03/2023	18:19	PPSP :B_N, Zone-1, 102.2 km	Bidhannagar: B_N, Zone-1, 77.31 km , 3.995 kA	B-Earth	100	A/r disabled as per OEM advise		No	Yes
28	220 KV DARBHANGA(DMT CL)-LAUKAHI-2	17/03/2023	09:17	17/03/2023	09:59	Dharbhanga: B_N, Zone- 1,36.3 km, 3.15 kA		B-Earth	100	A/r successful at Darbhanga. Three phase tripping at Laukahi	DR at Laukahi not time synchroniz ed	No	Yes
29	220 KV RANCHI- MTPS(DVC)-1	17/03/2023	14:15	17/03/2023	15:03	Ranchi: R_N, Zone-1, 68.8 km, 2.27 kA	MTPS: R_N, Zone- 1, 147.6 km, 1.21585 kA	R-Earth	100	A/r disabled at Mejia end	DR length is less	No	Yes
30	400 KV JAKKANPUR(BH)- PATNA-2	17/03/2023	14:54	17/03/2023	15:36	Jakkanpur: DT received	Patna: Didn't trip	No fault	NA	PG ER-1 may explain.		No	NA

31	400 KV PPSP-BIDHANNAGAR-1	18/03/2023	15:58	18/03/2023	16:19	PPSP: B_N, Zone-1, 96 km	Bidhannagar: B_N, Zone-1, 84 km, 3.714 kA	B-Earth	100	A/r disabled as per OEM advise		No	Yes
32	220 KV BUDHIPADAR-KORBA-1	18/03/2023	16:30	18/03/2023	17:30	Budhipadar: Y_N, Zone-1, 6.9 km, 15.83 kA, A/r successful		Y-Earth	100	Three phase A/r enabled instead of single phase at Budhipadar		Yes	NA
33	220 KV BUDHIPADAR-RAIGARH-1	18/03/2023	16:30	18/03/2023	17:22	Budhipadar: R_N, Zone-1, 3 km, 19.48 kA		R-Earth	100	Three phase tripping for single phase fault		Yes	NA
34	400 KV GMR-ANGUL-1	18/03/2023	18:09	18/03/2023	18:40	GMR: R_N, Zone-1, 22.24 km, 4.5 kA	Angul: R_N, Zone-1, 6 km, 16.11 kA	R-Earth	100	A/r successful. Line tripped again within reclaim time		Yes	Yes
35	400 KV MEERAMUNDALI-MENDHASAL-1	18/03/2023	19:22	19/03/2023	20:05	Meeramundali: Y_N, 86 km, 3.8 kA	Mendhasal: Y_N, 18 km, 8.9 kA	Y-Earth	100	A/r successful. Tripped again within reclaim time		Yes	Yes
36	400 KV MAITHON-MAITHON RB-2	18/03/2023	19:36	18/03/2023	21:31	Main bay under Shut-down at MPL, dia element (U#1 GT) tripped on Buchholz protection.		No fault	NA	MPL may explain.		No	No
37	400 KV GORAKHPUR-MOTIHARI-2	18/03/2023	19:37	18/03/2023	20:36	Gorakhpur: R_N, 163.4 km, 2.11 kA	Motihari: R_N, Zone-1, 7.1 km, 9.69 kA	R-Earth	100	A/r failed after 1 sec		NA	Yes

38	220 KV NEW TOWN(AA-III)-RAJARHAT-1	19/03/2023	12:38	19/03/2023	13:24	NewTown: B_N, 9.88 kA	Rajarhat: B_N, Zone-1, 0.45 km, 20.61 kA	B-Earth	100	A/r failed after 1 sec		Yes	Yes
39	220 KV RAJARHAT-BARASAT-1	19/03/2023	14:49	19/03/2023	23:21	Rajarhat: DT received	Barasat: Master trip operated	No fault	NA	R_ph control cable monitoring gas pressure at Barasat was faulty, which led to energization of master trip at Barasat and DT sent to remote end		Yes	NA
40	400 KV NEW PPSP-NEW RANCHI-1	19/03/2023	18:05	20/03/2023	15:50	New PPSP: B_N, 105.3 km. 2.69 kA	New Ranchi: B_N, 21.1 km, 12.6 kA	B-Earth	100	A/r failed after 1 sec		Yes	No
41	765 KV NEW RANCHI-DHARAMJAIGARH-1	19/03/2023	21:32	20/03/2023	06:36	-	Dharamjaigarh: Bus tripped	Y-Earth	500	Y_ph CT of main bay of New Ranchi-2 burst at Dharamjaigarh.		No	NA
42	765 KV NEW RANCHI-DHARAMJAIGARH-2	19/03/2023	21:32	20/03/2023	06:50	-		Y-Earth	500			No	NA
43	765 KV JHARSUGUDA-DHARAMJAIGARH-1	19/03/2023	21:32	20/03/2023	06:07	Jharsuguda: Y_N, 151.5 km, 3.95 kA		Y-Earth	500			Yes	NA
44	765 KV JHARSUGUDA-DHARAMJAIGARH-2	19/03/2023	21:32	20/03/2023	06:45	Jharsuguda: Y_N, 151.5 km, 3.45 kA		Y-Earth	500			Yes	NA

45	400 KV PPSP-BIDHANNAGAR-1	19/03/2023	21:37	19/03/2023	22:58	PPSP: Didn't trip	Bidhannagar: O/V St.1	O/V St.1	NA	Tripped from Bidhannagar on O/V St.1. As per DR, voltage touched 255 kV in Y_ph. However, PMU voltage at Durgapur was 236 kV in Y_ph		No	Yes
46	400 KV JAKKANPUR(BH)-PATNA-2	20/03/2023	12:11	20/03/2023	13:22	Jakkanpur: DT received	Patna: Didn't trip	No fault	NA	PG ER-1 may explain.		No	NA
47	400 KV PUSAULI(PG)-NABINAGAR(BRBCL)-2	21/03/2023	04:38	21/03/2023	13:32	Pusauly: Y_B, 49.647 km, 5.945 kA	BRBCL: Y_B, Zone-1, 26 km, 4 kA	Y-B	100	Phase-to-phase fault		No	No
48	400 KV BIHARSARIFF(PG)-VARANASI-2	21/03/2023	05:49	21/03/2023	08:35	Biharsariff: R_N, 125.67 km, 3.042 kA		R-Earth	100	A/r failed after 1 second		No	NA
49	400 KV MERAMUNDALI-LAPANGA-2	21/03/2023	11:04	22/03/2023	14:09	Meramundali: R_N, Zone-1, 23.2 kA	Lapanga: R_N, 2.44 kA	R-Earth	100	A/r dead time set at 500 msec at Meramundali. A/r failed after 1 second from Lapanga. Another fault struck B_ph after 1 second. B phase (Top) conductor at Loc no 14 failed from Insulator due to lightening.		Yes	Yes

50	765 KV GAYA-VARANASI-2	21/03/2023	20:40	22/03/2023	08:41	Gaya: Y_N, Zone-2 , 263.4 km, 1.68 kA		Y-Earth	100	Three phase tripping for single phase fault		No	NA
51	400 KV ALIPURDUAR (PG)-BINAGURI-4	22/03/2023	10:21	23/03/2023	16:15	Alipurduar: B_N, 73.7 km, 3.15 kA	Binaguri: B_N, 56.63 km, 2.03 kA	B-Earth	100	A/r failed after 1 second		No	Yes
52	220 KV BIRPARA-MALBASE-1	22/03/2023	13:14	22/03/2023	14:31	Birpara: Didn't trip		B-Earth	500	No tripping at Birpara. PG may share details, if any		NA	NA
53	400 KV MALBASE-BINAGURI-1	22/03/2023	13:14	22/03/2023	14:45	Malbase: Bus bar protection operated	Binaguri: B_N, 125.07 km, 2.15 kA	B-Earth	1200	Tripped in Zone-2 time from Binaguri. However, fault was cleared after 1200 msec. PG ER-2 may share details if any.		Yes	NA
54	220 KV ALIPURDUAR (PG)-SALAKATI-2	22/03/2023	16:02	22/03/2023	16:55	Alipurduar: R_N, Zone-1, 62.4 km, 2.4343 kA		R-Earth	100	A/r successful. Tripped again within reclaim time		Yes	NA
55	220 KV BUDHIPADAR-KORBA-1	22/03/2023	16:53	23/03/2023	22:06	Budhipadar: Y_N, Zone-1, 2.5 km, 18.06 kA		Y-Earth	100	Three phase A/r enabled instead of single phase. Fault in another phase during reclaim time.		Yes	NA
56	220 KV ALIPURDUAR (PG)-SALAKATI-2	22/03/2023	21:23	22/03/2023	22:36	Alipurduar: R_N, 56.4 km, 2.61 kA	Salakati: R_N, 33.56 km, 4.02 kA	R-Earth	100	A/r failed after 1 second		Yes	NA
57	400 KV BARIPADA-JAMSHEDPUR-1	23/03/2023	16:04	23/03/2023	16:28	Baripada: Didn't trip	Jamshedpur: DT received	No fault	NA	Powergrid may explain		NA	No

58	400KV TEESTA-III-DIKCHU-1	26/03/2023	04:02	26/03/2023	06:05	Teesta-3: B_N, Zone-1, 2.862 kA	Dikchu: Didn't trip	B-Earth	100	Zone settings may be reviewed at Teesta-3. Fault was in 400 kV Rangpo-Dikchu		Yes	Yes
59	400KV RANGPO-DIKCHU-1	26/03/2023	04:02	26/03/2023	05:30	Dikchu: B_N, 14.1 km, 1.33 kA	Rangpo: B_N, 33 km	B-Earth	100	A/r successful from Rangpo only		Yes	Yes
60	220KV RANCHI-HATIA-3	26/03/2023	12:31	27/03/2023	21:32	Ranchi: B_N, 1.8 km, 9.5 kA	Hatia: B_N, 44.9 km, 2.51 kA	B-Earth	100	A/r failed after 1 second		No	Yes
61	220KV RANCHI-HATIA-1	26/03/2023	12:31	26/03/2023	15:38	Ranchi: B_N, 6.75 km, 9.6 kA , A/r successful	Hatia: B_N, 4.10 kA	B-Earth	100	Three phase tripping at Hatia		No	Yes
62	400KV JEERAT-SAGARDIGHI-1	27/03/2023	13:30	27/03/2023	14:02	Jeerat: B_N, Zone-1, 13.97 km, 14.24 kA	Sagardighi: B_N, Zone-2, 181.4 km, 2.57 kA	B-Earth	100	A/r failed after 1 second		Yes	Yes
63	220 KV DALTONGANJ-LATEHAR(JUSNL)-1	27/03/2023	17:37	27/03/2023	18:37	Daltonganj: B_N, Zone-1, 9.8 km, 5.1 kA	Latehar: B_N, Zone-2, 29.61 km, 0.5 kA	B-Earth	100	A/r successful from Daltonganj only.		No	Yes
64	400 KV MERAMUNDALI B-GMR-1	29/03/2023	15:18	29/03/2023	17:10	Meramundali B: R_N, 31.3 kA	GMR: DT received	R-Earth	1000	Fault in R_ph, however, it was seen in Zone-3 from GMR. After, 1 second just before A/r at Meramundali, DEF operated and DT was sent to GMR.		Yes	Yes
65	220 KV-NEW MELLI-TASHIDING-1	29/03/2023	17:58	29/03/2023	18:38	New Melli: R_Y, Zone-2, 21.02 km, Ir = 5.74 kA, Iy = 5.743 kA		R-Y	350	Tripped in Zone-2 time from New Melli		Yes	No

66	400 KV-KHSTPP-BARH-1	30/03/2023	11:41	30/03/2023	13:03		Barh: Y_E, zone-1, 88.96 km, 4.647 kA	Y-Earth	100	A/r failed after 1 second, however, other two phase of main bay at Barh didn't trip during A/r failure. After 2 second, another fault appeared in R_ph at Barh end		No	Yes
67	400 KV KHSTPP-BARH-1	30/03/2023	13:05	30/03/2023	23:40		Barh: R_N, Zone-1, 75.63 km, 5.702 kA	R-Earth	100	A/r failed after 1 second, however, other two phase of main bay at Barh didn't trip during A/r failure.		No	Yes
68	220 KV-RANCHI-HATIA-2	30/03/2023	15:24	30/03/2023	16:23	Ranchi: B_N, Zone-2, 71.7 km, 2.45 kA		B-Earth	100	A/r couldn't be ascertained from PMU. PG ER-1 may share details.		No	No
69	400 KV SITAMARHI-MOTIHARI-2	30/03/2023	15:59	30/03/2023	16:33	Sitamarhi: Didn't trip	Motihari : DT received	No fault	NA	PG ER-1 may explain.		NA	No
70	220 KV CHANDIL-RANCHI-1	30/03/2023	16:08	30/03/2023	17:09	Chandil: B_N, 0.93 kA	Ranchi: B_N, Zone-1, 61.5 km. 2.08 kA	B-Earth	1500	Highly resistive fault. Directional Earth Fault operated at Chandil. Pick-Up settings may be reviewed.		Yes	No
71	400 KV MEERAMUNDALI-MENDHASAL-1	31/03/2023	03:03	31/03/2023	13:53	Meeramundali: R_Y, 18.5 km, Ir= 13.9 kA, Iy= 13.5 kA	Mendhasal: R_Y, 82.3 km, Ir= 4.61 kA, Iy= 4.59 kA	R-Y-Earth	100	Phase-to-phase fault	Main-1 DR length at Meramundali is less.	Yes	Yes

72	765 KV JHARSUGUDA- RAIPUR PS-1	31/03/2023	18:22	31/03/2023	21:16	Jharsuguda: R_N, 238 km, 3.451 kA		R-Earth	100	Fault in another phase (Y_ph) before A/r and three phase tripping occurred		No	NA
73	220 KV TSTPP- MERAMUNDALI-2	31/03/2023	18:38	31/03/2023	19:04	TSTPP: B_N, 4.2 km, 1.417 kA		B-Earth	100	A/r successful from Meramundali only. Other two phase at TSTPP tripped on PD after 2.1 second	DR at both ends are not time synchronized. DR length of TSTPP is less. May be reviewed	Yes	Yes
74	400 KV PUSAULI(PG)- NABINAGAR(BRBCL)-2	31/03/2023	19:04	01/04/2023	12:37	Pusauly: R_N, 47 km, 6.9 kA	Nabinagar: R_N, 40 km, 6.6 kA	R-Earth	100	A/r failed after 1 second		No	No
75	220 KV RANCHI- MTPS (DVC)-1	31/03/2023	20:57	31/03/2023	22:00	Ranchi: R_N, 39.98 km, 3.78 kA, A/r successful. Tripped again at 21:26 Hrs	Mejia: R_N, 176.5 km, 1.005 kA	R-Earth	100	A/r disabled at Mejia end		No	Yes

Annexure C.2

SL NO	MONTH	UTILITY	ELEMENT	DETAILS OF ELEMENT	REMARKS
1	OCC_MAR_2023	NTPC		NTPC Barh Stage Unit #2, 24 kV, 660 MW is yet to be synchronized	Data required
2	OCC_MAR_2023	NTPC	GT(3*260MVA)	400kV GT#2 of NTPC Barh	Data required
3	OCC_MAR_2023	BGCL	ICT-1	400/220/33kV ICT 1 500MVA at Naubatpur SS	Data required
4	OCC_MAR_2023	OPTCL	T/L	400 kV GMR - Meramundali-B S/C Line after LILO work of 400 kV GMR - Meramundali-A Line at Meramundali-B SS	Data required
5	OCC_MAR_2023	OPTCL	T/L	132kV 2 PH S/C LINE, 132kV GSS, KAMAKHYANAGAR FOR EXTENTION OF P/S TO RTSS KAMAKHYANAGAR	Data required
6	OCC_MAR_2023	OPTCL	T/L	400kV GMR-MERAMUNDALI-B SC LINE & MERAMUNDALI-B TO MERAMUNDALI-A LINE AFTER LILO OF GMR-MERAMUNDALI-A SC LINE MERAMUNDALI-B GIS	Data required
7	OCC_MAR_2023	OPTCL	ICT	132/33kV 20MVA POWER TR NO-2 AND 1 132kV FEEDER BAY GSS BIRMAHARAJPUR	Data required
8	OCC_MAR_2023	BSPTCL	T/L	220kV BIHARSARIFF-TTPS S/C(RECONDUCTING)	Data required
9	OCC_MAR_2023	BSPTCL	T/L	132kV SONENAGAR(OLD)-NAGARUNTARI TSS,SCTL(RECONDUCTING)	Data required
10	OCC_MAR_2023	BGCL	ICT	500MVA ICT-1 400/220/132/33kV ,NAUBATPUR	Data required
11	OCC_MAR_2023	BGCL	T/L	132kV KHAGAIL-BIHITA NEW(BGCL) S/L	Data required
12	OCC_MAR_2023	BGCL	T/L	132kVBIHITA NEW(BGCL)-DIGHA(BSPTCL)	Data required
13	OCC_MAR_2023	BSPTCL	T/L	132kV RAJGIR ASTHAWAN CKT1&2	Data required

SI No.	Name of the incidence	PCC Recommendation	Latest status
124th PCC Meeting			
1.	Total Power Failure at 220 kV Barauni, Hazipur, Amnour and Mokama S/s on 22.02.2023 at 18:11 Hrs	It was observed that DRs at Hazipur end is not time synchronized accordingly BSPTCL was advised to rectify it at the earliest.	
2.	Tripping of 400 kV GMR-Meramundali line and Outage of GMR unit 3 on 28.02.2023	<p>PCC advised OPTCL following:</p> <ul style="list-style-type: none"> • To disable SOTF & TOR in the relay for 400 kV Meramundali-A-Meramundali B line. • Relay OEM may be contacted for reducing the current threshold value in SOTF setting and for implementation of AND condition with manual closing for triggering of SOTF. • To remove T-connection for the lines connected among 220 k V Meramundali A/220 kV Meramundali B & 220 kV Goda, 220 kV Duburi at the earliest. • To implement line differential protection for 400 kV Meramndali A-Meramundali B line. 	