



Agenda for 131st PCC Meeting

Date: 19/01/2024
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

AGENDA FOR 131st PROTECTION COORDINATION SUB-COMMITTEE MEETING TO BE HELD ON 19th JANUARY 2024 AT 11:00 HRS THROUGH MS TEAMS

PART – A

ITEM NO. A.1: Confirmation of Minutes of 130th Protection Coordination sub-Committee Meeting held on 10th Nov 2023 at ERPC, Kolkata.

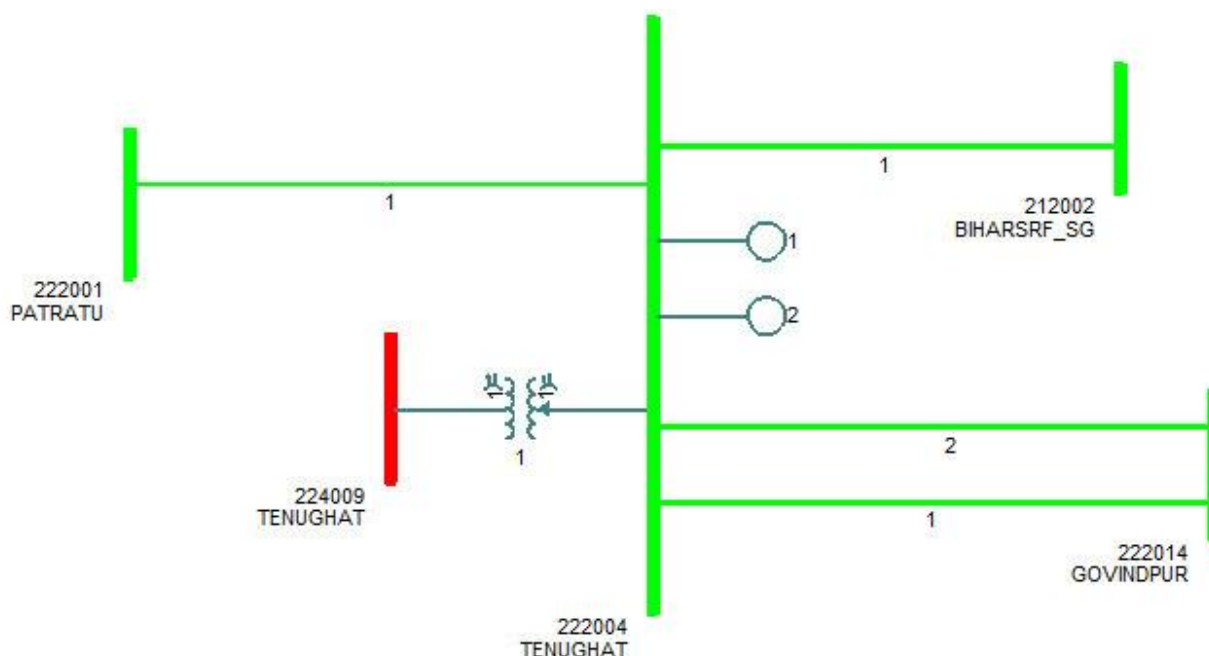
The minutes of 130th Protection Coordination sub-Committee meeting held on 10.11.2023 was circulated vide letter dated 08.12.2023.

Members may confirm.

PART – B

ITEM NO. B.1: Total Power failure at 400/220 kV Tenughat TPS(TVNL) on 06.12.2023 at 07:04 Hrs.

On 06.12.2023 at 07:04 Hrs, all emanating lines at 400/220 kV Tenughat S/s go tripped leading to loss of evacuation path for its 2 running units (2*210 MW). Consequently, 220 kV Tenughat S/s became dead.



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

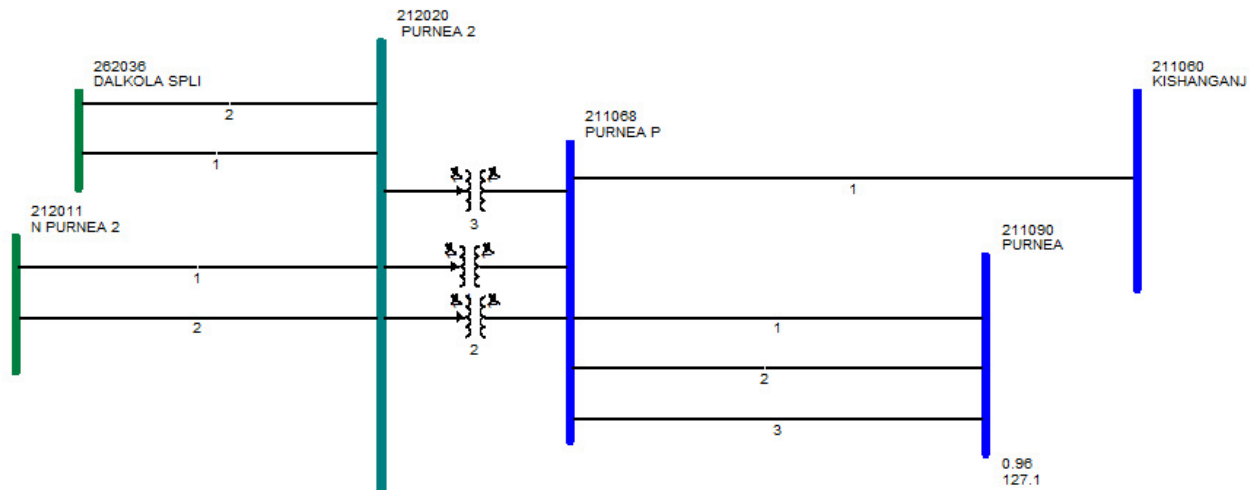
Gen. Loss: 330 MW

Outage Duration: 00:23 Hrs

TVNL may explain.

ITEM NO. B.2: Total Power failure at 220/132 kV Purnea(PG) S/s on 14.12.2023 at 11:58 Hrs

On 14th December 2023 at 11:58 Hrs, 220 kV Bus-1&2 at 220/132 kV Purnea S/s got tripped leading to total power interruption.



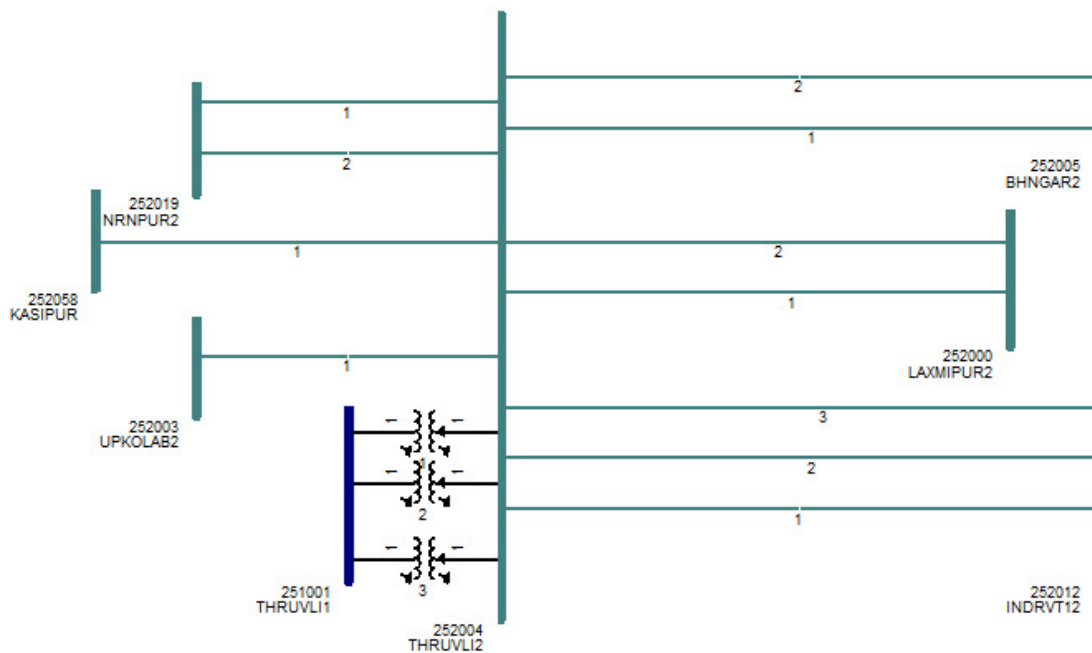
Detailed report from ERLDC is attached at **Annexure B.2**.

No Load Loss and Gen. Loss
Outage Duration: 01:43 Hrs

Powergrid ER-I may explain.

ITEM NO. B.3: Total Power failure at 220/132 kV Therubali(OPTCL) S/s on 28.12.2023 at 12:32 Hrs.

It was reported that a fire incident occurred in 132 kV Panel of 220/132 kV ATR-1 at Therubali S/s lead to failure of DC supply at the substn. Consequently, total power failure occurred at Therubali S/s.



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

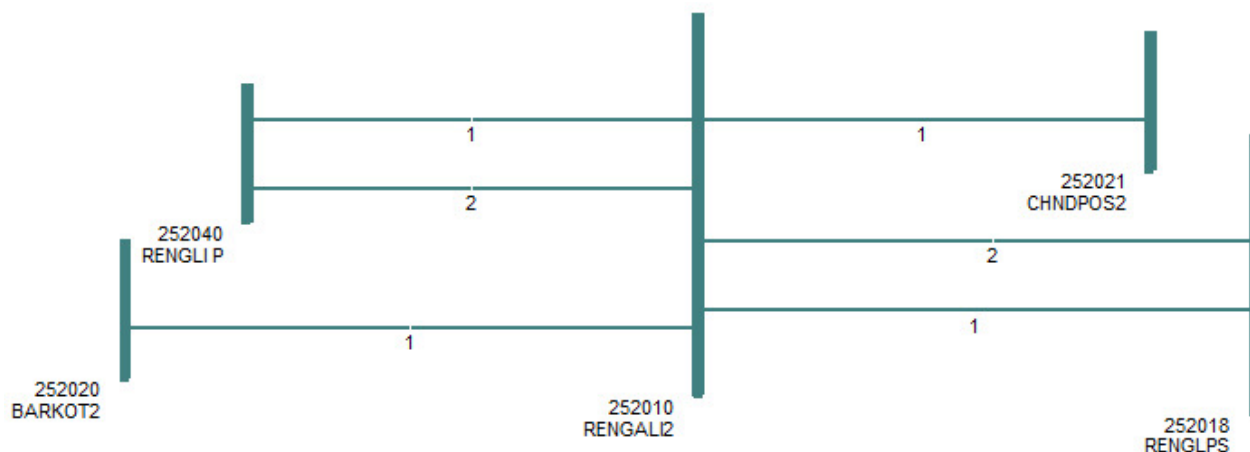
Load Loss: 75 MW
Outage Duration: 03:19 Hrs

OPTCL may explain.

ITEM NO. B.4: Disturbance at 220 kV Rengali(OPTCL) S/s & at Rengali PH(OHPC) on 04.12.2023 at 10:49 hrs

On 04th December 2023 at 10:49 Hrs, due to flashover in bus isolator, all the emanating lines from Rengali (OPTCL) were hand tripped at 10:49 hrs causing bus dead in the S/S.

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



No Load Loss and Gen. Loss
Outage Duration: 00:44 Hrs

OHPC and OPTCL may explain.

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

Bus tripping occurred in Eastern Region during November and December 2023

Element Name	Tripping Date	Reason	Utility
400 kV Main Bus-1 at Kahalgaon	28.11.23 at 13:44 Hrs	Bus bar protection operated	NTPC
765 kV Main Bus-1 at New Jeerat	13.12.23 at 11:38 Hrs	Bus bar protection operated	PMJTL

Concerned utilities may explain.

ITEM NO. B.6: Review of SPS at Sterlite (Vedanta)-reg.

SPS scheme at Vedanta Ltd. has been modified by Vedanta and import/export figure of 1600/800 MW respectively has been chosen for SPS to act irrespective of line flows of all four 400 kV lines at 400 kV Sterlite S/s (400 kV Sterlite-Lapanga D/c, 400 kV Sterlite-Jharsuguda D/c). Earlier SPS scheme, which took into account line flows of all four emanating lines, was modified without any concurrence or intimation to ERPC/ERLDC. Current implemented SPS will not provide any relief in case of any contingency of emanating lines at Sterlite unless it touches the set export/import limits.

Details is attached at **Annexure B.6.**

Vedanta may explain.

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

Single line tripping incidents in the month of Dec 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: 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),

Users shall submit the following protection performance indices of previous month to their respective RPC and RLDC on monthly basis for 220 kV and above (132 kV and above in NER) system, which shall be reviewed by the RPC:

(a) The Dependability Index defined as $D = \frac{N_c}{N_c + N_f}$

where,

N_c is the number of correct operations at internal power system faults and

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

(b) The Security Index defined as $S = \frac{N_c}{N_c + N_u}$

Where,

N_c is the number of correct operations at internal power system faults

N_u is the number of unwanted operations.

(c) The Reliability Index defined as $R = \frac{N_c}{N_c + N_i}$

Where,

N_c is the number of correct operations at internal power system faults

N_i is the number of incorrect operations and is the sum of N_f and N_u

Further, as per IEGC 2023 Clause 15 (7),

“Each user shall also submit the reasons for performance indices less than unity of individual element wise protection system to the respective RPC and action plan for corrective measures. The action plan will be followed up regularly in the respective RPC.”

Concerned utilities may note and comply.

ITEM NO. C.2: 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.

In 130th PCC Meeting, PCC advised all utilities to submit internal protection audit plan for FY 2024-25 to ERPC at the earliest. Subsequently the audit plan in respect of NHPC stations was received on 13.11.2023.

Concerned utilities may update.

ITEM NO. C.3: Submission of protection settings for newly charged elements/change in network configuration

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

The updated status of protection settings for new elements charged in ER Grid from Nov 22 to Dec 2023 is given at **Annexure C.3**.

In 130th PCC, PRDC representative informed that few numbers of protection settings are pending from BSPTCL and NTPC.

PCC advised concerned utilities to share protection settings to ERPC so that it can be updated in protection database.

Members may update.

ITEM NO. C.4: Follow-up of Decisions of the Previous Protection Sub-Committee Meeting(s)

The decisions of previous PCC meetings are attached at **Annexure C.4**.

Members may update the latest status.



ग्रिड-इंडिया
GRID-INDIA

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




पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / Eastern Regional Load Despatch Centre

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

**पूर्वी क्षेत्र के 220 केवी उप-केन्द्र में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event in 220 kV
Tenughat 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):14-12-2023

1. Event Summary (घटना का सारांश):

At 07:04 Hrs on 06.12.2023, all emanating lines at 400/220 kV Tenughat S/s tripped leading to loss of evacuation path for its 2 running units (2*210 MW). Consequently, 220 kV Tenughat S/s became dead and 330 MW generation loss occurred.

2. Time and Date of the Event (घटना का समय और दिनांक): 07:04 hrs of 06.12.2023

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand
Pre-Event (घटना पूर्व)	49.85 Hz	26413	18257
Post Event (घटना के बाद)	49.83 Hz	26083	18257

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

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विद्युत उत्पादन इकाइयां जो बंद हैं)	Nil
Weather Condition (मौसम स्थिति)	Normal weather

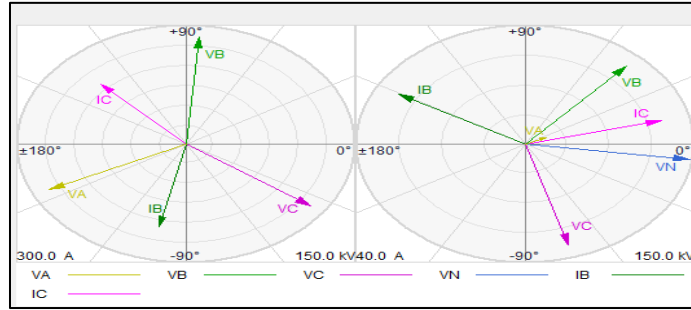
6. Load and Generation loss (लोड और जेनरेशन हानि): Generation loss: 330 MW; Load loss: NIL.

7. Duration of interruption (रूकावट की अवधि): 00:26 Hrs

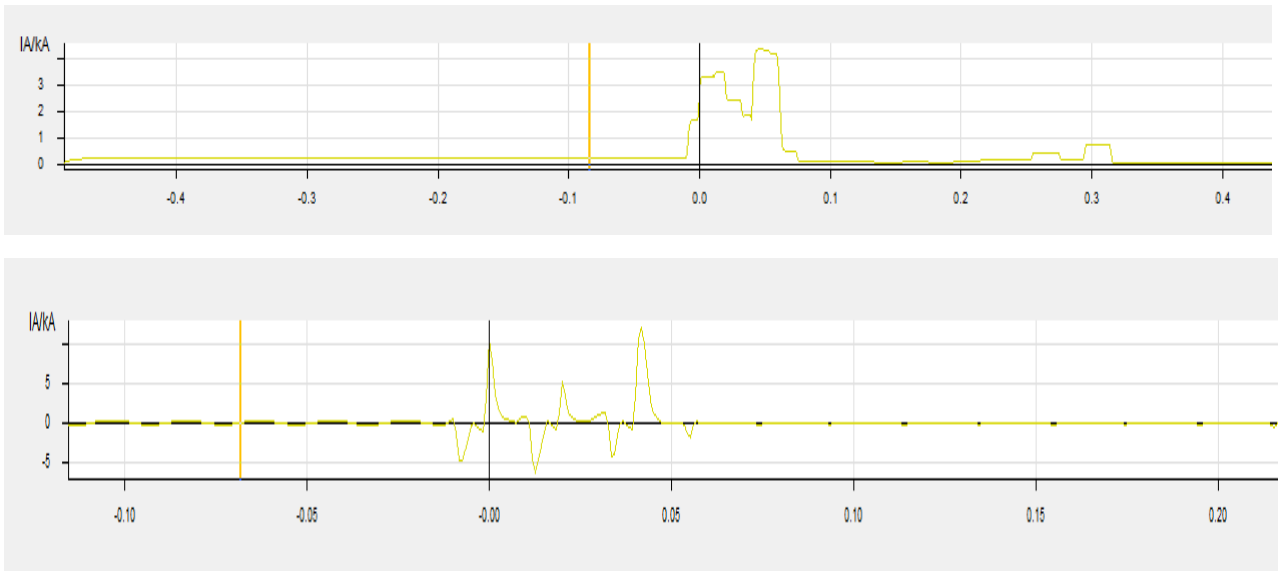
8. Network across the affected area (प्रभावित क्षेत्र का नक्शा)

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

- There was fault in 220 KV Tenughat- Govindpur -2 at very near to Tenughat end which sensed the fault in zone-1 from tenughat end and after 100 msec , 3 phase tripping from Tenughat end .
- Same fault was sensed by Govindpur also in zone-2 but as 3 phase tripping occurred from TTPS , and Govindpur end did not tripped as zone-2 also dropped which **indicates fault was beyond breaker** and from govindpur ckt-2 was intact .current and voltage phasor as shown below for govindpur shows it was **only charging current** as **I is leading V by 90 degree**.



- 220 kV Tenughat-Govindpur-1 and 220 kV Tenguhat-Biharsharif tripped from remote ends in Zone-2 time after 350 msec. During this time, Tenughat end sensed the fault in Zone-4.
- Despite tripping of 220 kV Tenughat-Govindpur-2 in Zone-1 from Tenughat, other feeders continued sensing the fault in Zone-4/Zone-2(Tenughat/remote ends), suggesting fault was before the breaker i.e., a Bus fault.
- **Fault of 220 KV Tenughat -Govindpur -2 seems to be some evolving /arcing fault as observed from rms current .Chanes of CT saturation may also be checked along with root cause and nature of fault.**



- 400 kV Tenughat-PVUNL was in charged condition with PVUNL taking startup power. As all emanating 220 kV feeders tripped, 2*210 MW running units tripped as due to load generation imbalance.

PMU Snapshot:

R_Y_B Voltages

06/12 07:12 - 14/12

R Y B Phase Voltage Magnitude

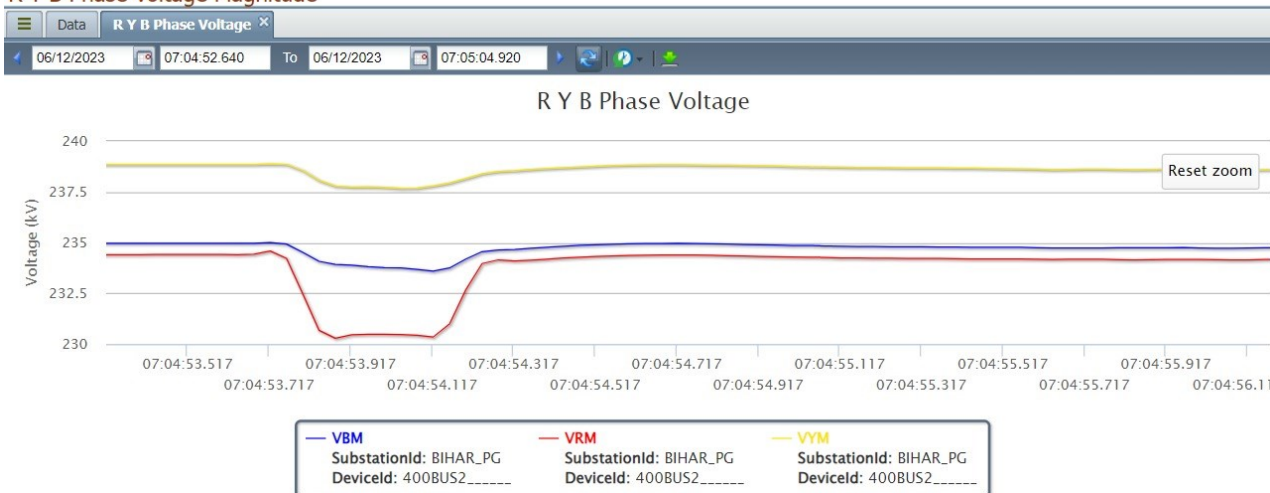


Figure 2: PMU Voltage snapshot of 220 kV Tenughat S/S

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

- Nature of fault and root cause along with location is important if it is in busbar zone reason for non-operation of bus bar protection to be checked at Tenughat. Arcing or flashover marks to be checked in detail to know the exact fault location
- CT saturation to be checked .
- Even after opening of breaker of 220 kV Tenughat-Govindpur-2 at Tenughat, its R_ph sensed current around 700 A after 300 msec. Root cause analysis for the same may be carried out.
- Directional earth fault picked up in reverse direction at Tenughat for 220 kV Tenughat-Govindpur-1 and 200 kV Tenughat-Biharsharif. Directional feature may be enabled.
- None of the DRs are time synchronized (Tenughat, Govindpur, Biharsharif).

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

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

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

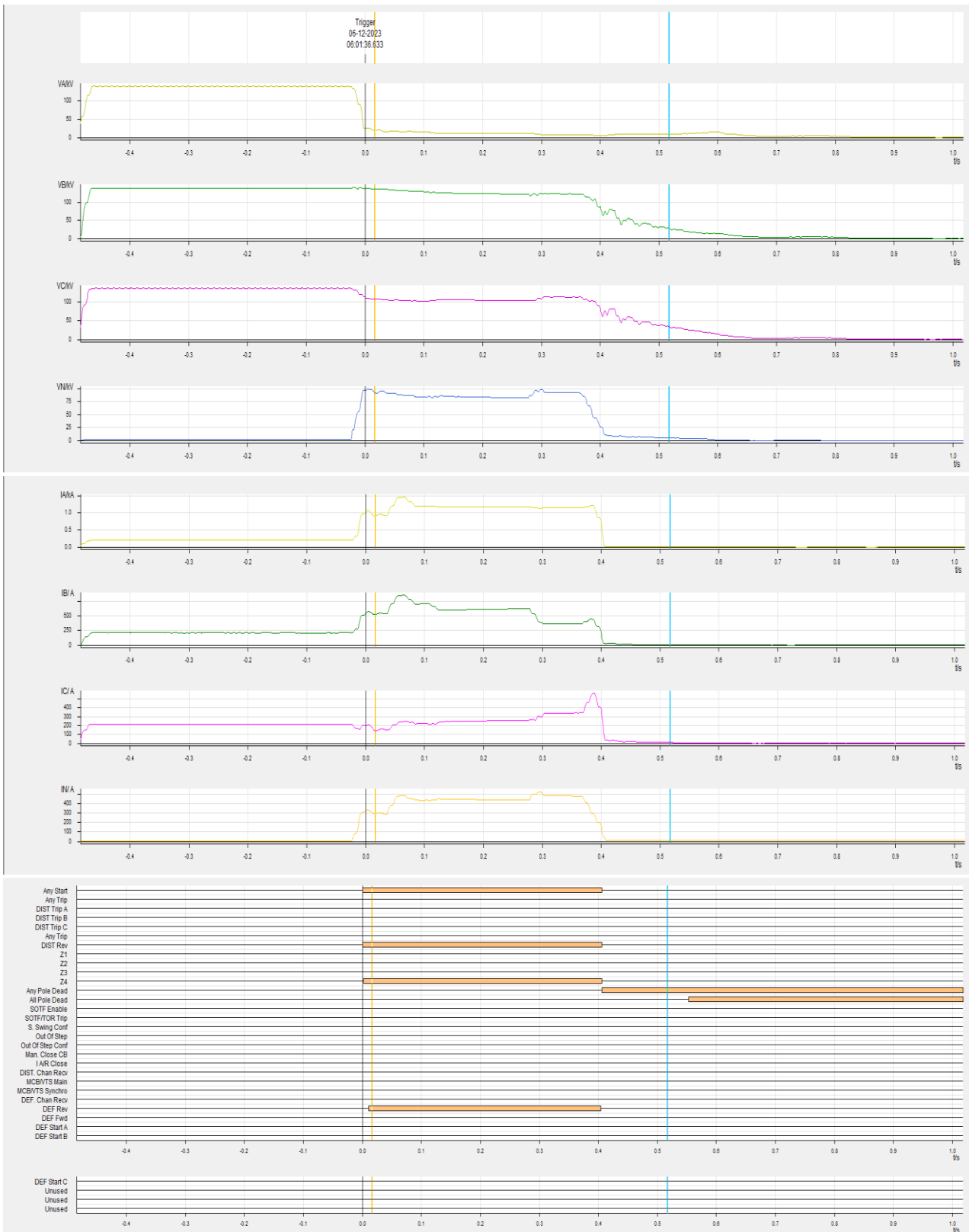
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु): Fault current signature of instantaneous value to be looked in great detail for signature analysis such as arcing fault or CT saturation etc.

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

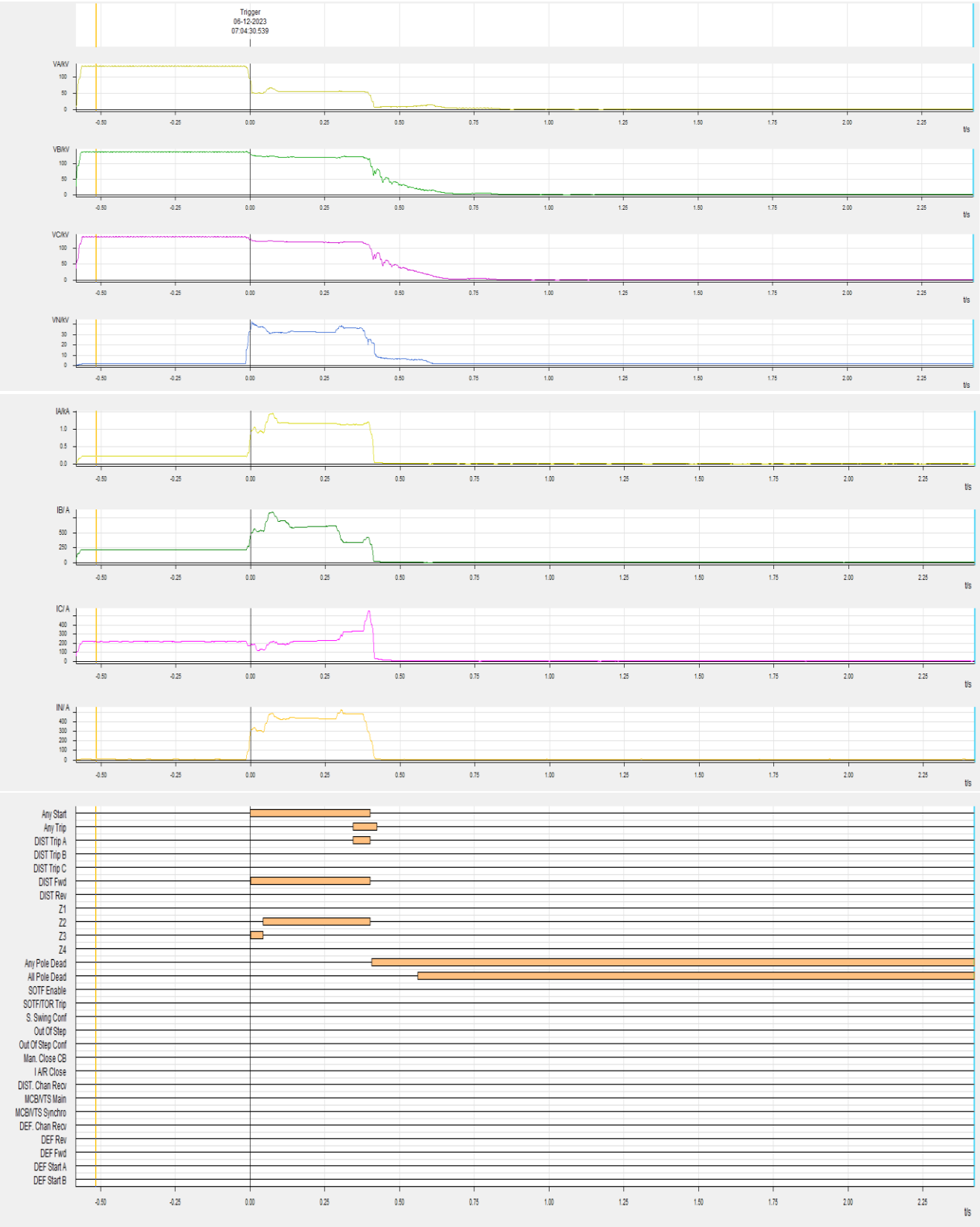
Date	Time	STATION	DESCRIPTION	STATUS
06-12-2023	07:12:12.804	TENUG_JH	220_GOVIN_JH_2_CB	open
06-12-2023	07:12:12.804	TENUG_JH	220_GOVIN_JH_2_CB	open
06-12-2023	07:12:12.885	TENUG_JH	220_Unit2_Xfmr2_CB	open
06-12-2023	07:12:12.885	TENUG_JH	220_Unit2_Xfmr2_CB	open
06-12-2023	07:12:13.064	TENUG_JH	220_Unit1_Xfmr1_CB	open
06-12-2023	07:12:13.064	TENUG_JH	220_Unit1_Xfmr1_CB	open
06-12-2023	07:12:41.477	TENUG_JH	220_Unit2_Xfmr2_CB	open
06-12-2023	07:12:41.477	TENUG_JH	220_Unit2_Xfmr2_CB	open
06-12-2023	07:30:00.801	TENUG_JH	220_Unit2_Xfmr2_L_ISO	Open
06-12-2023	07:31:52.188	TENUG_JH	400_PVUNL_CB	open
06-12-2023	07:32:04.873	TENUG_JH	220_Unit1_Xfmr1_L_ISO	Open
06-12-2023	09:03:28.951	TENUG_JH	220_GOVIN_JH_2_CB	closed
06-12-2023	09:37:37.818	TENUG_JH	220_Unit2_Xfmr2_L_ISO	Closed
06-12-2023	09:49:11.095	TENUG_JH	220_Unit2_Xfmr2_CB	closed
06-12-2023	09:49:22.156	TENUG_JH	220_Unit2_Xfmr2_CB	closed
06-12-2023	10:28:06.764	TENUG_JH	220_GOVIN_JH_2_CB	open
06-12-2023	10:42:18.530	TENUG_JH	220_Unit1_Xfmr1_L_ISO	Closed
06-12-2023	10:54:03.267	TENUG_JH	220_Unit1_Xfmr1_CB	travel
06-12-2023	11:41:57.426	TENUG_JH	220_Unit1_Xfmr1_CB	open
06-12-2023	11:42:11.713	TENUG_JH	220_Unit1_Xfmr1_CB	open
06-12-2023	11:52:19.652	TENUG_JH	220_GOVIN_JH_2_L_ISO	Open
06-12-2023	12:09:43.296	TENUG_JH	220_Unit1_Xfmr1_L_ISO	Open
06-12-2023	12:12:04.745	TENUG_JH	220_GOVIN_JH_2_L_ISO	Closed

Annexure 2:

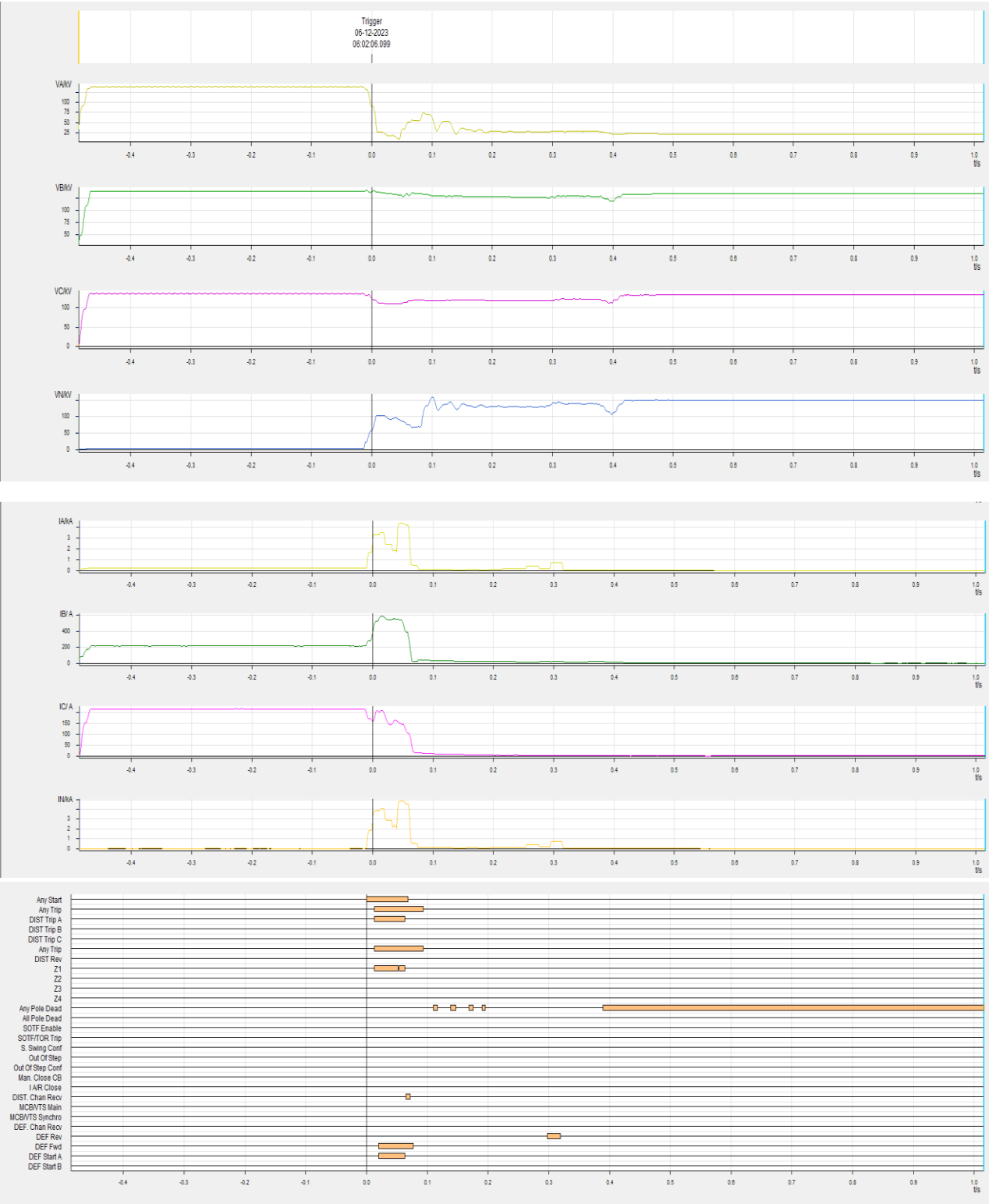
DR of 220 kV Tenughat-Govindpur-1 (Tenughat)



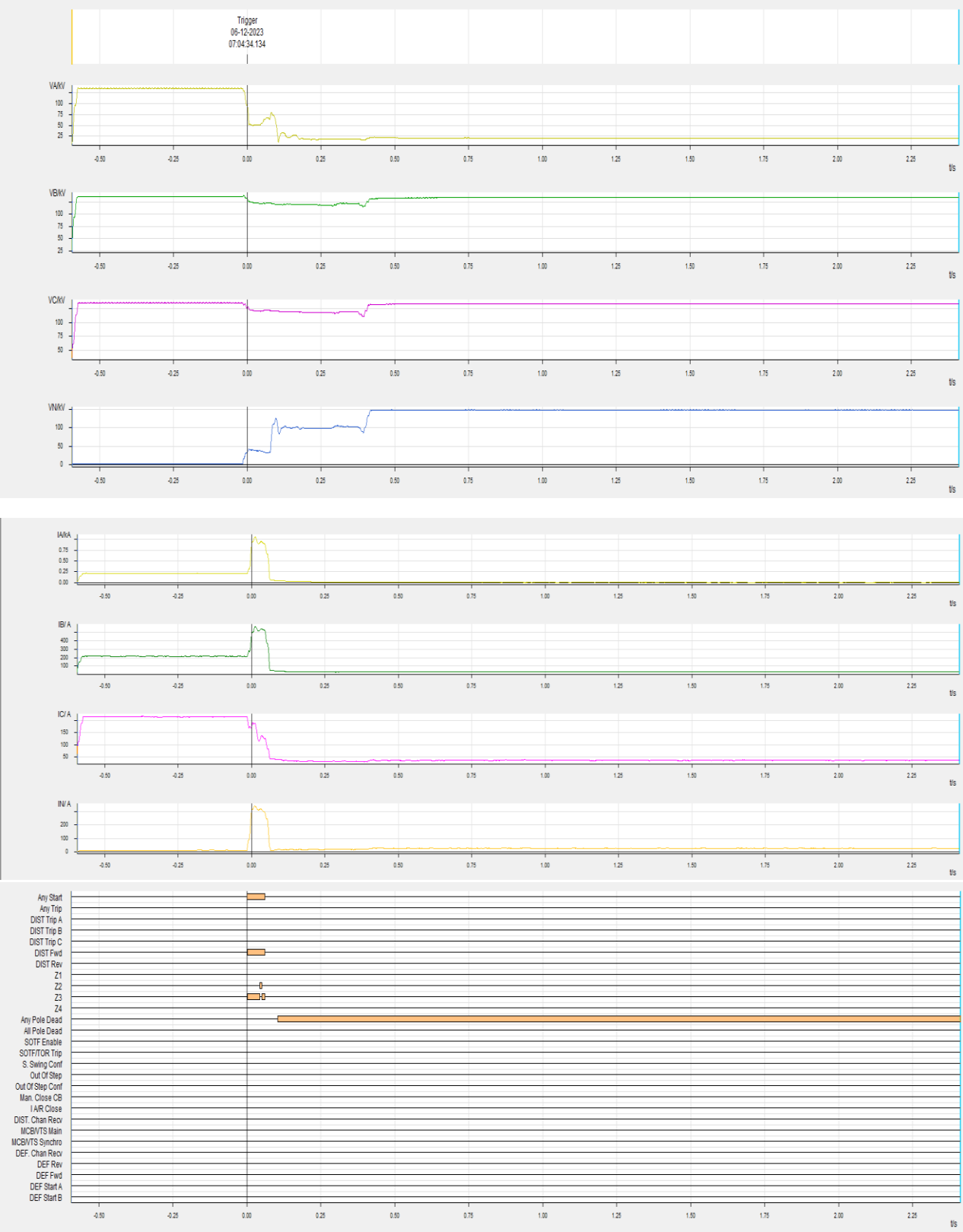
DR of 220 kV Tenughat-Govindpur-1 (Govindpur)



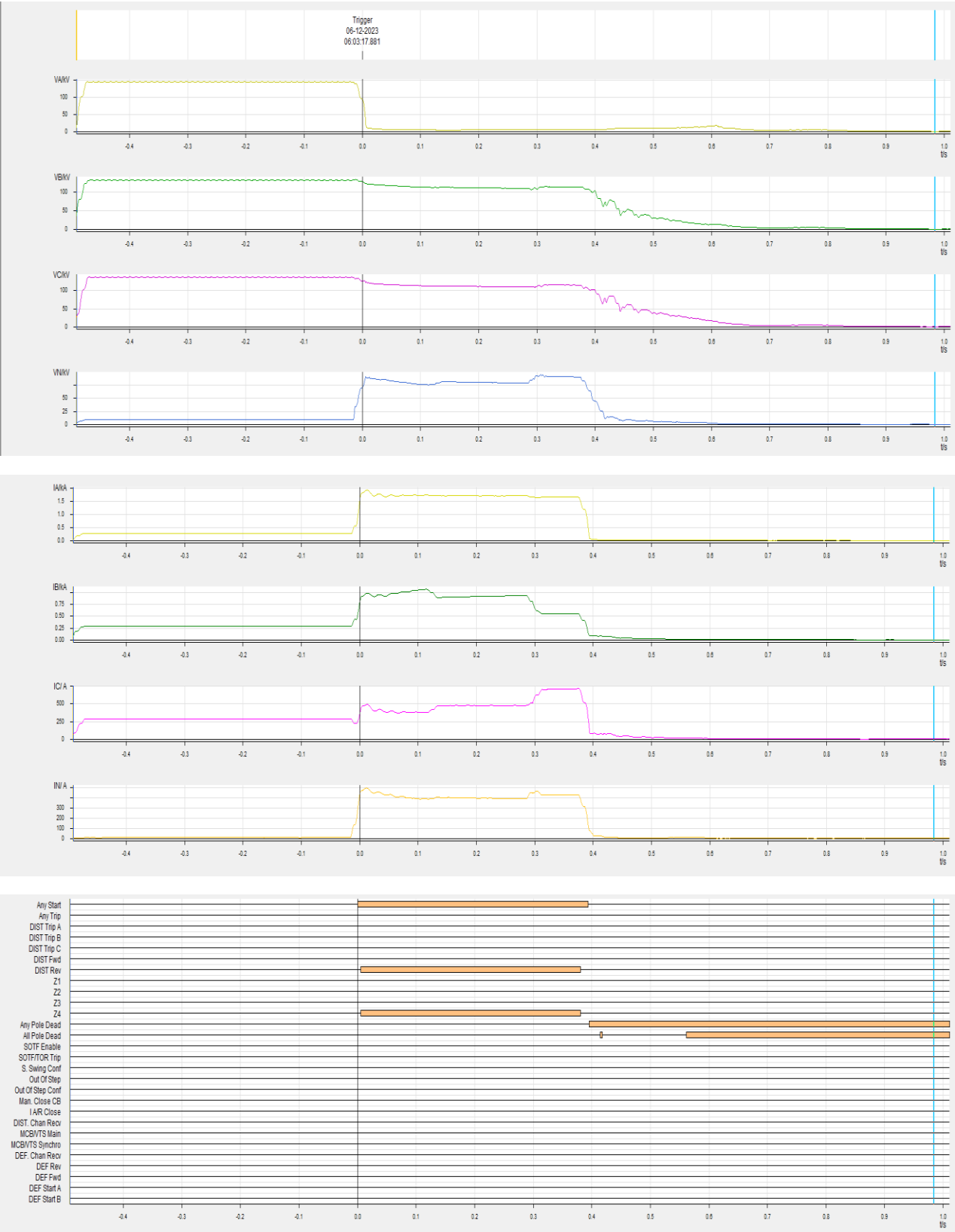
DR of 220 kV Tenughat-Govindpur-2 (Tenughat)



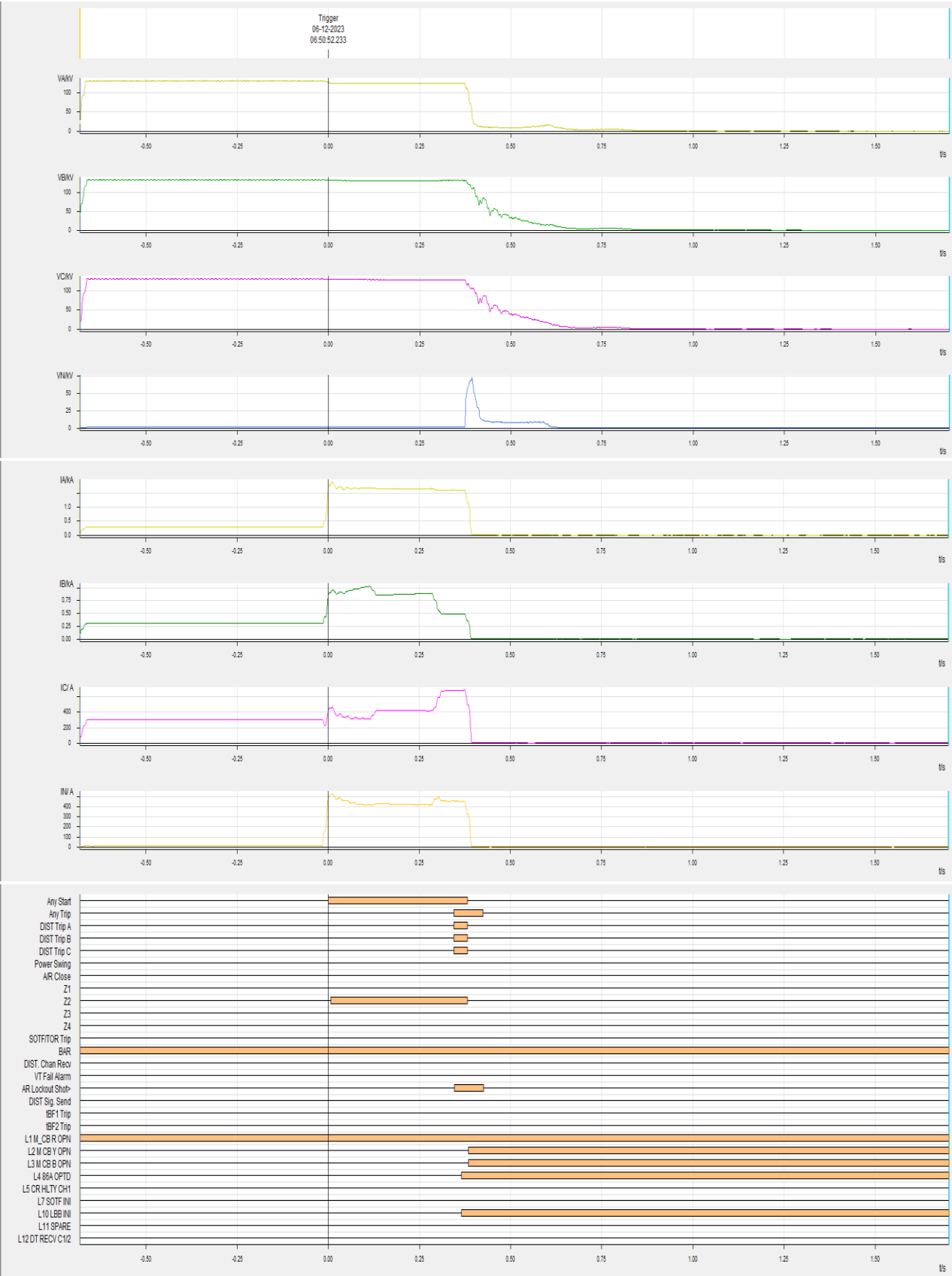
DR of 220 kV Tenughat-Govindpur-2 (Govindpur)



DR of 220 kV Tenughat-Biharsharif-1 (Tenughat)



DR of 220 kV Tenughat-Biharsharif-1 (Biharsharif)





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




पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / Eastern Regional Load Despatch Centre

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

पूर्वी क्षेत्र के 220/132 केवी पूर्णिया उप-केन्द्र में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event in 220/132 kV Purnea S/s of Eastern Region

(To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f))
(आई ई जी सी 37.2 (एफ) के अनुपालन में)

Date(दिनांक):29-12-2023

1. Event Summary (घटना का सारांश):

At 11:58 Hrs on 14th December 2023, 220 kV Bus-1&2 at 220/132 kV Purnea S/s tripped leading to total power interruption. No load loss or generation loss occurred.

2. Time and Date of the Event (घटना का समय और दिनांक): 11:58 hrs of 14.12.2023

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
Pre-Event (घटना पूर्व)	50.00Hz	24244 MW	18023 MW	222	3091
Post Event (घटना के बाद)	50.01 Hz	24244 MW	18023 MW	222	3091

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

Important Transmission Line/Unit if under outage महत्वपूर्ण संचरण लाइने/ विद्युत उत्पादन इकाइयां जो बंद हैं	220 kV Dalkhola-Purnea-1 (Under S/d)
Weather Condition (मौसम स्थिति)	Normal

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

7. Duration of interruption (रूकावट की अवधि): 01:43 Min

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

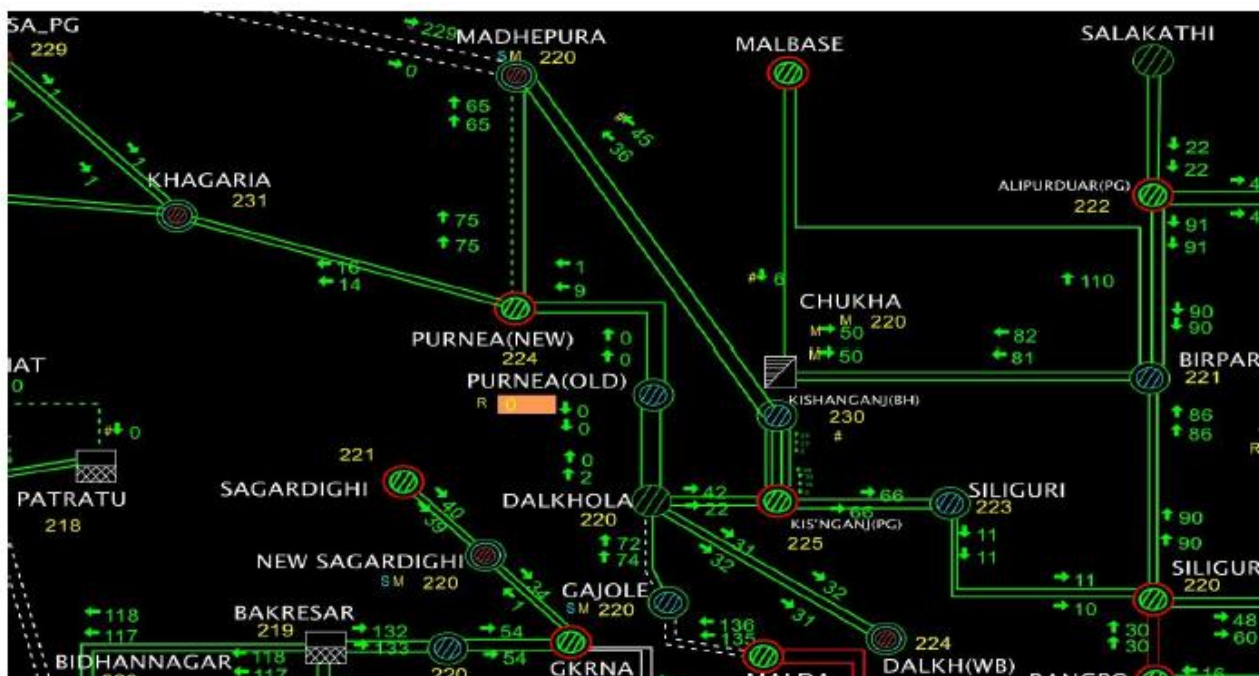


Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग)

S.No. (क्र० सं०)	Transmission/Generation element name (संचरण लाइन / विद्युत उत्पादन इकाई का नाम)	Trip Time (बंद होने का समय)	Restoration time (वापस आने का समय)	Reason/ Relay Indication (कारण/रिले संकेत)
1	220 kV Bus#1 at Purnea	11:58 Hrs	13:41 Hrs	Bus bar protection operated
2	220 kV Bus#2 at Purnea		13:43 Hrs	
3	220 kV Purnea-New Purnea-1		14:24 Hrs	
4	220 kV Purnea-New Purnea-2		13:41 Hrs	
5	220 kV Purnea-Dalkhola-2		14:20 Hrs	

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

- As reported, R-Earth fault struck 220 kV Bus-1 at Purnea and Bus bar protection operated. After around 55 msec, Bus bar protection of Bus-2 also operated and both bus tripped , leading to total power interruption at 220/132 kV Purnea S/s.
- Details of fault occurred may be shared.
- Root cause analysis of operation of bus bar protection of Bus-2 may be done.

PMU Snapshot:

R_Y_B Voltages

14/12 11:57 -

R Y B Phase Voltage Magnitude

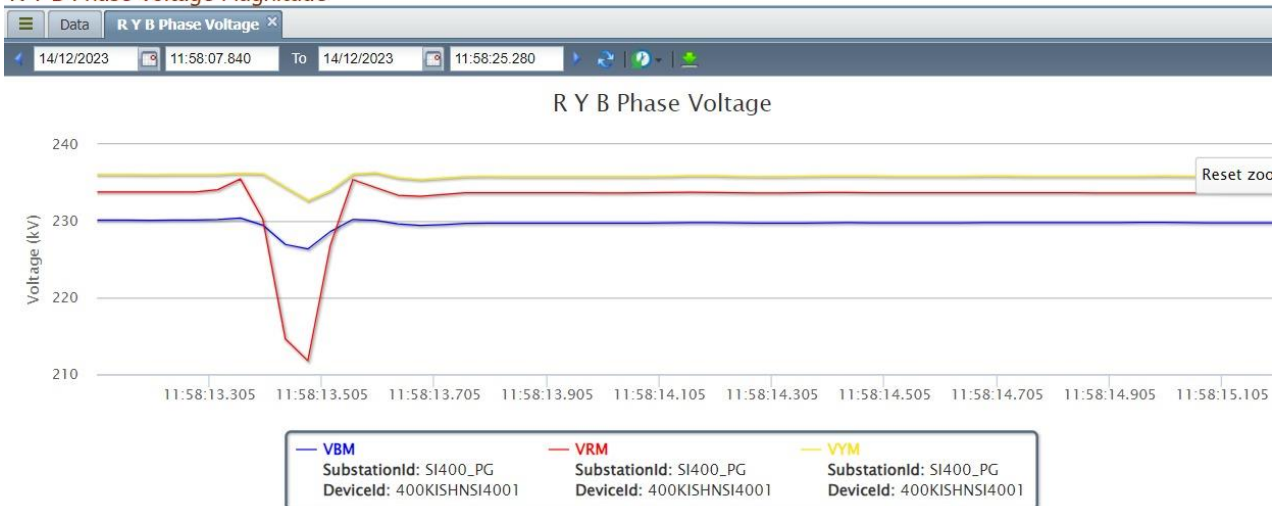


Figure 2: PMU Voltage snapshot of 400/220 kV New Purnea S/S

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

- Bus bar protection operated for both bus instead of only Bus-1 where fault struck.

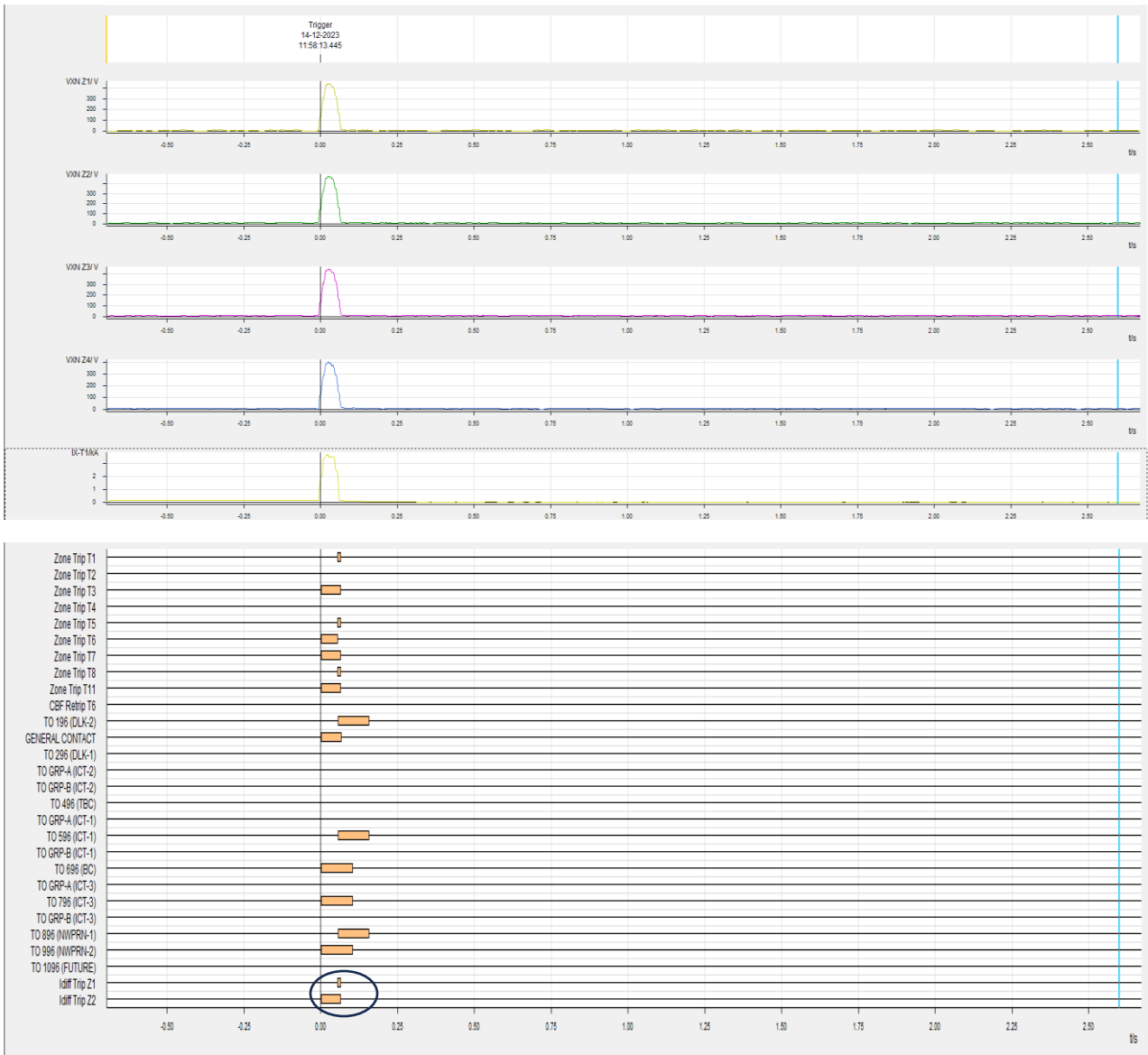
13. Action Taken/Remedial Measures (सुधारात्मक उपाय): Nil

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

S.No.	Issues	Regulation Non-Compliance	Utilities
1.	Whether DR/EL provided within 24 Hours?	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	PG ER-1
2.	Detailed report/data submission by User/SLDC within 7 days of GD-1	1. IEGC Section 37.2 (f)	PG ER-1

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

Annexure 1: DR of 220 kV Bus-1 at Purnea





ग्रिड-इंडिया
GRID-INDIA

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




पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / Eastern Regional Load Despatch Centre

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

पूर्वी क्षेत्र के 220/132 केवी थेरुबली उप-केन्द्र में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event in 220/132 kV Therubali 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):09-01-2024

1. Event Summary (घटना का सारांश):

At 12:32 Hrs on 28th December 2023, a fire incident occurred in 132 kV Panel of 12.5 MVA Power Transformer-1 at Therubali, leading to failure of DC supply. All feeders tripped from remote ends leading to total power failure at Therubali S/s. Around 75 MW load loss occurred at Kashipur, Jaypatna.

2. Time and Date of the Event (घटना का समय और दिनांक): 12:32 hrs of 28.12.2023

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 Generation	Regional Demand	State Generation	State Demand
Pre-Event (घटना पूर्व)	50.038 Hz	25522 MW	19838 MW	2564	4975
Post Event (घटना के बाद)	50.007 Hz	25522 MW	19763 MW	2564	4900

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

Important Transmission Line/Unit if under outage महत्वपूर्ण संचरण लाइने/ विद्युत उत्पादन इकाइयां जो बंद हैं	220 kV Therubali-Bhanjagar-2 was under s/d
Weather Condition (मौसम स्थिति)	Normal

6. Load and Generation loss (लोड और जेनरेशन हानि): Generation loss: NIL; Load loss: 75 MW

7. Duration of interruption (रूकावट की अवधि): 03:19 Hrs

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

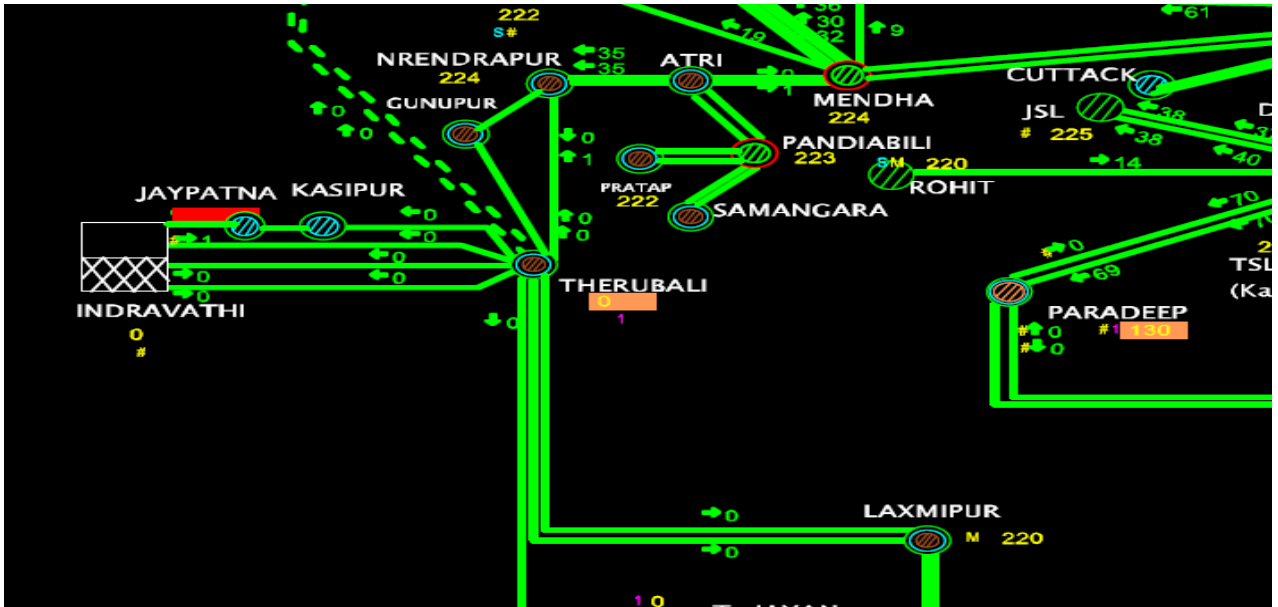


Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग)

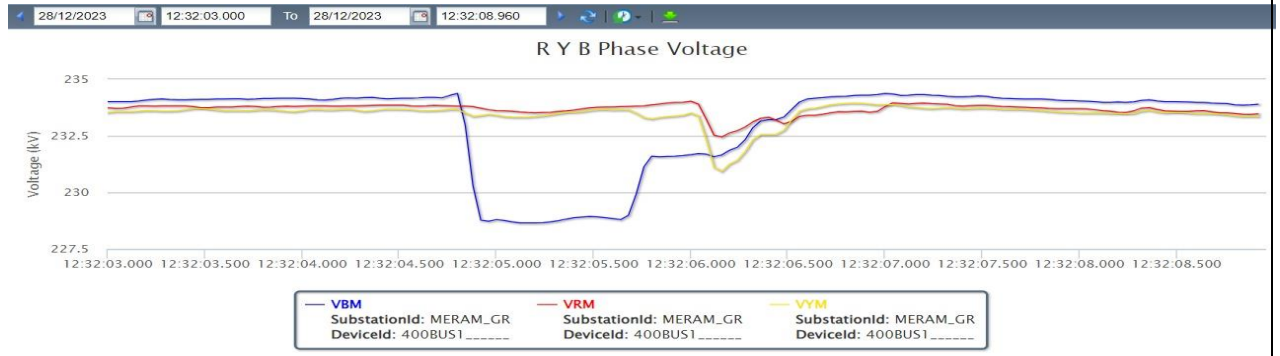
क्र०स०	नाम	ट्रिपिंग का समय	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पुनर्स्थापना का समय
1	220KV Therubali-Laxmipur-1	12:32	Therubali: Didn't trip	Laxmipur: Y_B_N, 178.2 km, Iy: 0.918 kA	15:51
2	220KV Therubali-Laxmipur-2			Laxmipur: R_N, 1.218 kA	16:15
3	220KV Therubali-Bhanjanagar-1			Bhanjanagar: B_N, 284 km, 0.703 kA	15:55
4	220KV Therubali-Gunupur-1			Gunupur: B/u O/c, Ib: 0.522 kA	16:13
5	220KV Therubali-Narendrapur-1			Narendrapur: B_N, 457.4 km, Zone-3, 0.441 kA	16:52

**Other 220 kV feeders didn't trip from either end as those were radially fed from Therubali or there was no source at remote end.*

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

- As reported, Sudden flashover observed at 12.5 MVA power transformer 132 KV panel in control room and DC supply failed.
- Total S/s became dead as all feeders tripped from remote end. None of the breakers tripped at Therubali.
- On inspection, it was found that 132KV SI and DI Isolator mechanism, 132KV breaker marshalling box of 12.5 MVA power transformer-1, wiring and cables burnt.
- Root cause and reason for Flashover may be shared, and remedial measures taken to avoid in future may also be shared.
- As per PMU, there was a fault in B_ph which was cleared in around 1.5 seconds.
- DR files of remote end tripping may be analyzed to check whether Zone reach settings of all feeders are in order or not.
- 220 kV Therubali-Gunupur-1 tripped on B/u O/c. OPTCL may confirm whether any Back-Up O/c protection implemented.

PMU Snapshot:



R Y B Phase Voltages Angles

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

12. Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या): DR files of remote end tripping awaited.

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

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

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

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



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पूर्वी क्षेत्र के 220 केवी उप-केन्द्र में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event in 220 kV Rengali(OPTCL) 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):11-12-2023

1. Event Summary (घटना का सारांश):

On 04th December 2023 ,Due to flashover in bus isolator, all the emanating lines from Rengali (OPTCL) were hand tripped at 10:49 hrs causing bus dead in the S/S.

2. Time and Date of the Event (घटना का समय और दिनांक): 10:49 hrs of 04.12.2023

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 Generation	Regional Demand	State Generation	State Demand
Pre-Event (घटना पूर्व)	50.023 Hz	25910 MW	18653 MW	2293	4115
Post Event (घटना के बाद)	50.023 Hz	25910 MW	18653 MW	2293	4115

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

Important Transmission Line/Unit if under outage महत्वपूर्ण संचरण लाइने/ विद्युत उत्पादन इकाइयां जो बंद हैं	220KV-RENGALI(PH)-TSTPP-1 was under tripped condition due to earth fault from 10:29 hrs of 04.12.23
Weather Condition (मौसम स्थिति)	Normal

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

7. Duration of interruption (रूकावट की अवधि): 00:43 Min

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

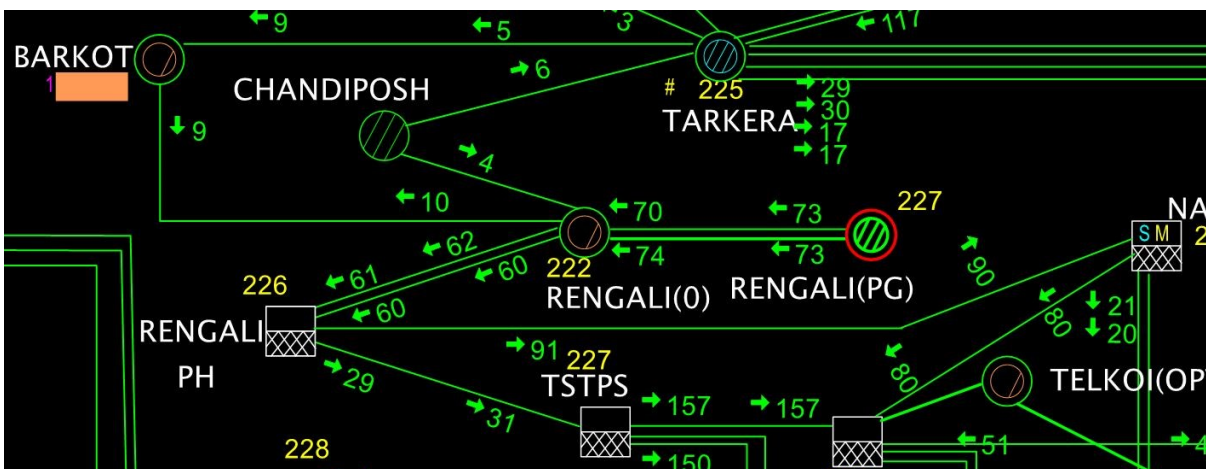


Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग)

S.No. (क्र० सं०)	Transmission/Generation element name (संचरण लाइन / विद्युत उत्पादन इकाई का नाम)	Trip Time (बंद होने का समय)	Restoration time (वापस आने का समय)	Reason/ Relay Indication (कारण/रिले संकेत)
1	220kV Bus#1 at Rengali (OPTCL)	10:49Hrs	11:33 Hrs	Hand tripped due to flashover
2	220kV Bus#2 at Rengali (OPTCL)		11:33 Hrs	
3	220KV-RENGALI(PG)-RENGALI(OPTCL)-1		11:33 Hrs	
4	220KV-RENGALI(PG)-RENGALI(OPTCL)-2		11:34 Hrs	
5	220KV-RENGALI(PH)-RENGALI(OPTCL)-1		11:34 Hrs	
6	220KV-RENGALI(PH)-RENGALI(OPTCL)-2		11:34 Hrs	
7	220KV-CHANDIPOSH-RENGALI(OPTCL)-1		11:35 Hrs	
8	220KV-BARKOT-RENGALI(OPTCL)-1		11:37 Hrs	

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

- There was no fault in any line as can be seen from PMU plot but Due to flashover in bus isolator, all the emanating lines from Rengali (OPTCL) were hand tripped at 10:49 hrs causing bus dead in the S/S.
- If any Protection picked up detecting that flashover or not may also be communicated.
- Root cause and reason for Flashover may be shared with exact location, and remedial measures taken to avoid in future may also be shared.

PMU Snapshot:

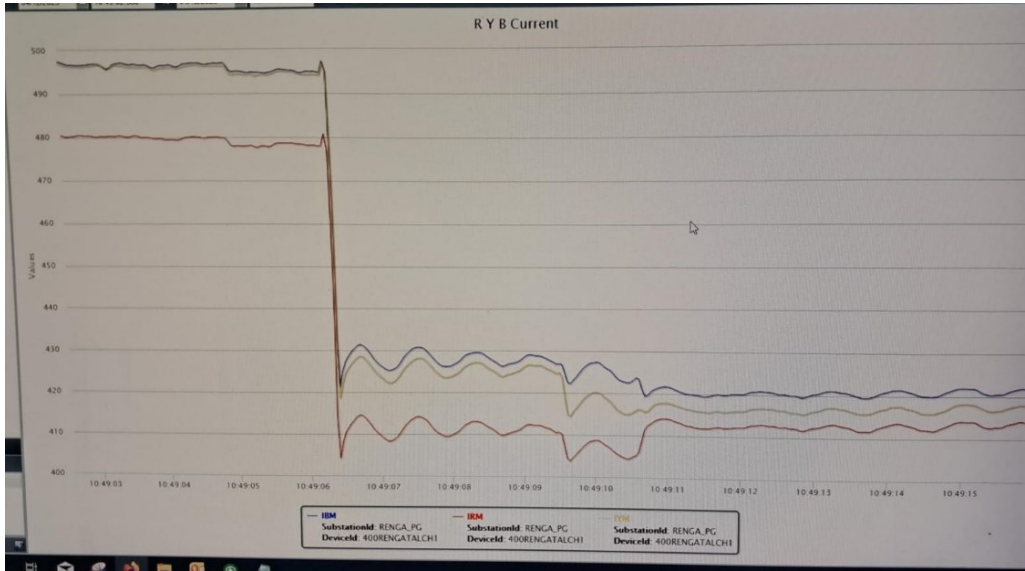


Figure 2: PMU Voltage snapshot of 400 kV Rengali S/S

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

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

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

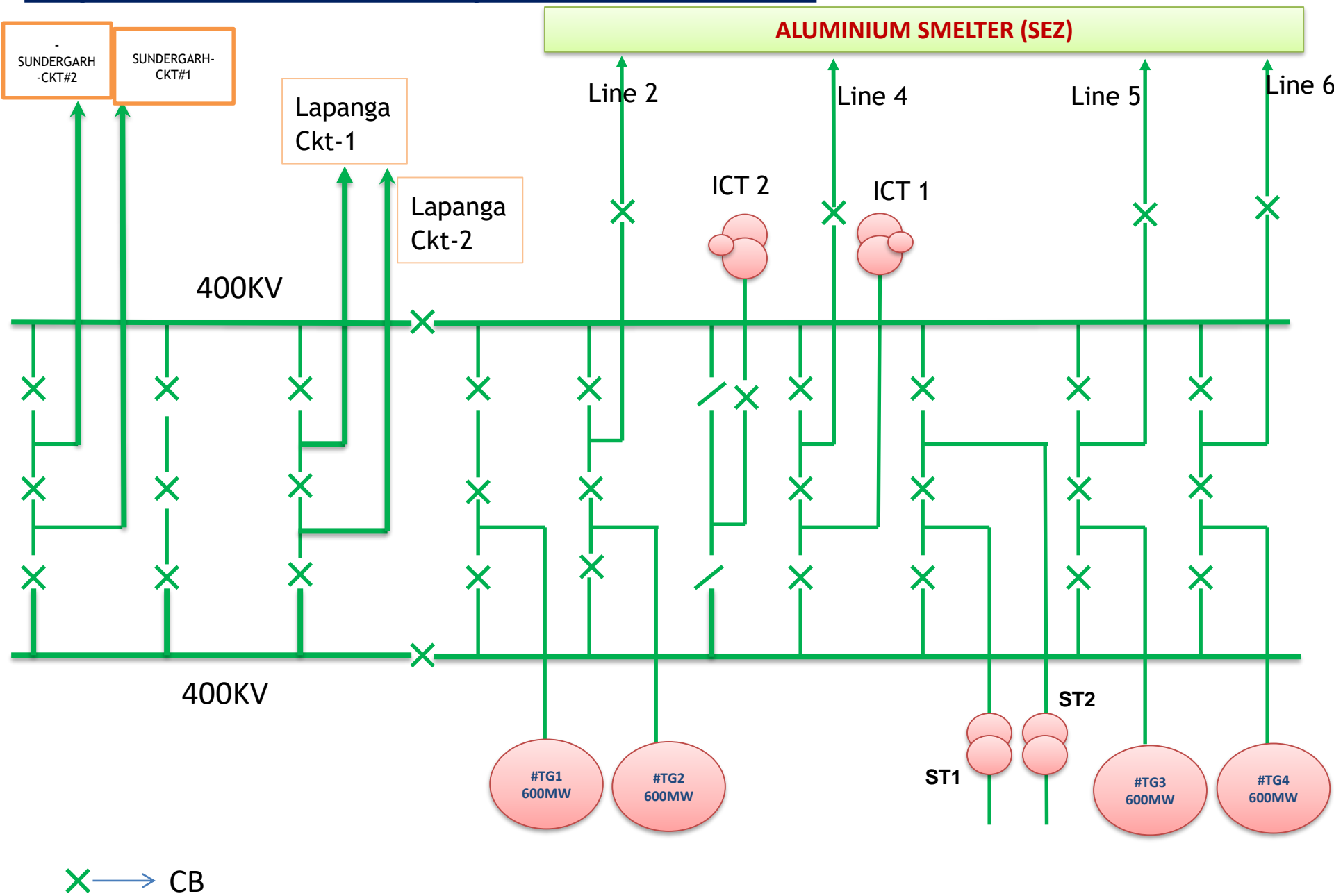
S.No.	Issues	Regulation Non-Compliance	Utilities
2.	Whether DR/EL provided within 24 Hours?	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	N/A

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

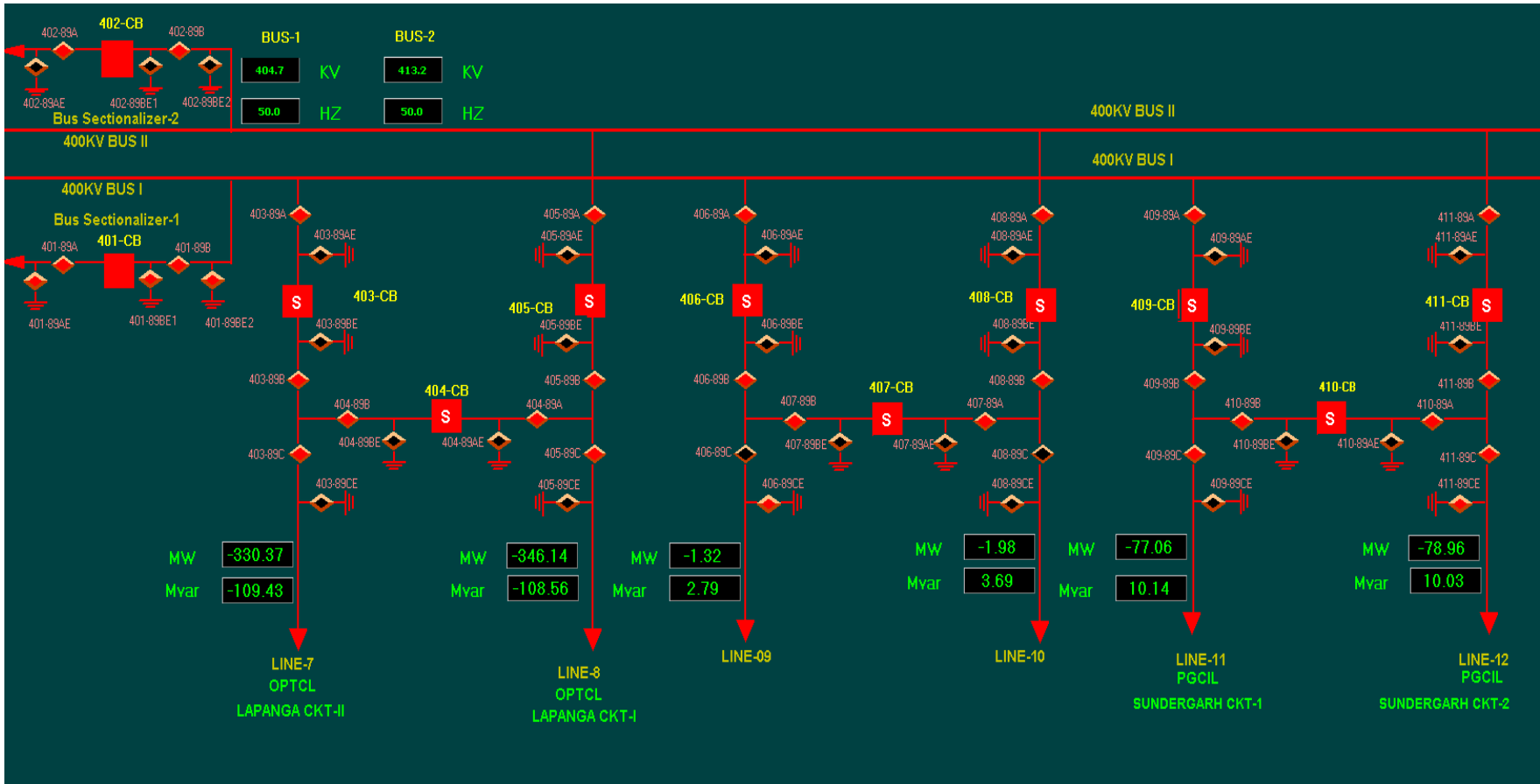
Vedanta Ltd, Jharsuguda
(4x600MW) TPP
internal SPS-CILMS

(Composite Islanding & Load Management system)

Simplified SLD of 400KV Switchyard of Vedanta Limited:



400KV VL- Sundergarh, VL-Lapanga Ckt-1 & 2



Purpose of internal SPS- CILMS

Purpose:

1. Successful Islanding of Vedanta power network during Grid disturbance and balancing Generation & Load.
2. Since the running Aluminium Smelter is Power Sensitive in nature, CILMS plays a vital role by managing Generation and Load of Vedanta Power Network.
3. CILMS limits Export/ Import in Grid connected condition by Controls Generation and Load for safe Grid Operation.

Supplier of CILMS- M/S Hitachi Energy India Ltd

(Formerly ABB Power Products and Systems India Ltd)

Generation Shedding during Export Violation Violation:

- Cilms monitors Realtime VAL power Exchange MW with Grid and execute Generator shed action followed by gradual or sudden load throw scenario in VAL plant to maintain grid stability.

Generation to be shed (MW) value after any load throw contingency is calculated by following power balance .

$$\text{GENERATION TO BE SHED(MW)} = (\text{VAL NET GEN .MW} + \text{GRID IMPORT MW}) - (\text{VAL PLANT LOAD MW} + \text{GRID EXPORT MW SETPOINT})$$

(or)

$$\text{GENERATION TO BE SHED(MW)} = \text{TOTAL GRID EXPORT(MW)} - \text{GRID EXPORT MW SETPOINT}$$

- In case generation to be shed value > 0 followed by any load throw contingency ,cilms initiates Generator shed action and issue trip as per the below predefined Accumulated Shedd able generation table logic .

[Accumu Table x MW < Generation to be shed (MW) < Accumu.Table (x+1) MW] then cilms will Trip issued to Accumu Table (x+1) Generation MW.

i.e if **[Accumu.Table2 < Generation to be shed (MW) < Accumu.Table 3 MW]** then cilms issue will issue trip to corresponding sheddable Accumulated Table3.. Generation MW.

PRIORITY BASED ACCUMULATED GENERATION SHED TABLE	
1	AccumTable1 MW = Gen1HPLP
2	AccumTable2 MW = Gen1HPLP + Gen2HPLP
3	AccumTable3 MW = Gen1HPLP + Gen2HPLP + Gen3HPLP
4	AccumTable4 MW = Gen1HPLP + Gen2HPLP + Gen3HPLP + Gen4HPLP
5	AccumTable5 MW = Gen1
6	AccumTable6 MW = Gen1 + Gen2HPLP
7	AccumTable7 MW = Gen1 + Gen2HPLP + Gen3HPLP
8	AccumTable8 MW = Gen1 + Gen2HPLP + Gen3HPLP + Gen4HPLP
9	AccumTable9 MW = Gen1 GCB OPEN + Gen2 GCB OPEN
10	AccumTable10 MW= Gen1 + Gen2 + Gen3HPLP
11	AccumTable11 MW= Gen1 + Gen2 + Gen3HPLP + Gen4HPLP
12	AccumTable12 MW= Gen1 GCB OPEN + Gen2 GCB OPEN+ Gen3 GCB OPEN
13	AccumTable13 MW= Gen1 + Gen2 + Gen3 + Gen4HPLP
14	AccumTable14 MW= Gen1 + Gen2 + Gen3 + Gen4

Gen1 = Priority1 Generator Net MW
 Gen1HPLP = Priority1 Generator HPLP MW
 Gen2 = Priority2 Generator Net MW
 Gen2HPLP = Priority2 Generator HPLP MW
 Gen3 = Priority3 Generator Net MW
 Gen3HPLP = Priority3 Generator HPLP MW
 Gen4 = Priority4 Generator Net MW
 Gen4HPLP = Priority4 Generator HPLP MW
 Generator HPLP MW = 30% of the Generation Net MW

Main Generator Shedding HMI display:

MAIN GENERATION SHEDDING DISPLAY											GRID Export Setpoint
<div>ISLANDED</div> <div></div>		USER NAME		User Name		PASSWORD		*****		LOGIN	
Generators		Generation	Priority	Priority Enter	HPLP Auto Inhibition	Gen Auto Inhibition	Gen Manual Inhibition	GenHPLP Shed Cmd	Gen.Shed Cmd	DROOP CMD	
1	GENERATOR 1	429.3	2	2			Off				
2	GENERATOR 2	324.1	1	1			Off				
3	GENERATOR 3	0.0	3	3			Off				
4	GENERATOR 4	326.9	4	4			Off				
<div>NOTE: ALWAYS RESET GEN. SHEDDING ONCE , BEFORE ACTIVATING GS</div> <div>Generator Shedding Activate</div> <div>ACTIVATED</div> <div>GEN Shedding Reset Command</div> <div>RESET</div>					<div>Priority Accept Command</div> <div>Off</div> <div>GS Status: De Blocked</div> <div></div> <div>GS Deblock</div> <div>On</div>						
SubNetwork 1		ACCUM.TABLE	SubNetwork 2		ACCUM.TABLE	SubNetwork 3		ACCUM.TABLE	SubNetwork 4		ACCUM.TABLE
Total Load		2687.0	Total Load		0.0	Total Load		0.0	Total Load		0.0
Total Generation		1905.2	Total Generation		0.0	Total Generation		0.0	Total Generation		0.0
Gen to be Shed		-781.8	Gen to be Shed		0.0	Gen to be Shed		0.0	Gen to be Shed		0.0
ICT1 MW		-1.9	ICT2 MW		-6.8						

Power Export control HMI display :

	GRID EXPORT SETPOINT		ENTER SETPOINT	GRID WORKING POINT	
SUBNETWORK -01	800.0	MW	800.00	-819.9	MW
SUBNETWORK -02	800.0	MW	800.00	000.0	MW
SUBNETWORK-03	800.0	MW	800.00	000.0	MW
SUBNETWORK-04	800.0	MW	800.00	000.0	MW

Load Shedding during Grid Import Violation:

- Cilms monitors Realtime VAL power Exchange MW with Grid and execute Load shed action followed by gradual or sudden Generation throw scenario in VAL plant to maintain grid stability.
- Load to be shed (MW) value after any Generation throw contingency is calculated by following power balance.
LOAD TO BE SHED(MW)= (VAL PLANT LOAD + GRID EXPORT MW) –(VAL PLANT NET GENERATION+ GRID IMPORT MW SETPOINT) .
OR
LOAD TO BE SHED(MW)= TOTAL GRID IMPORT(MW)- GRID IMPORT MW SETPOINT
- In case Load to be shed value>0 followed by any generation throw contingency ,cilms initiates Load shed action and issue trip as per the below predefined Accumulated Shedd able load table logic.

[Accumu Table x MW < Load to be shed (MW)< Accumu.Table (x+1) MW] then cilms will Trip issued to Accumu Table (x+1) load MW.

i.e Example: if [Accumu.Table2 < **Load to be shed (MW)**< Accumu.Table 3 MW] then cilms issue will issue trip to corresponding sheddable Accumulated Table3 load MW.

Priority based Accumulated Load shed Table:

PRIORITY ACCUMULATED LOAD SHED TABLE
ACCUM. TABLE1=PRIO1_PL CCZ
ACCUM. TABLE2=PRIO1_PL CCZ+PRIO2_PL CCZ
ACCUM. TABLE3=PRIO1_PL CCZ+PRIO2_PL CCZ+PRIO3_PL CCZ
ACCUM. TABLE4=PRIO1_PL CCZ+PRIO2_PL CCZ+PRIO3_PL CCZ+PRIO4_CCZ
ACCUM. TABLE5=PRIO1_PL_1RFU&CCZ+PRIO2_PL CCZ+PRIO3_PL CCZ+PRIO4_CCZ
ACCUM. TABLE6=PRIO1_PL_1RFU&CCZ+PRIO2_PL_1RFU&CCZ+PRIO3_PL CCZ+PRIO4_CCZ
ACCUM. TABLE7=PRIO1_PL_1RFU&CCZ+PRIO2_PL_1RFU&CCZ+PRIO3_PL_1RFU&CCZ+PRIO4_CCZ
ACCUM. TABLE8=PRIO1_PL_1RFU&CCZ+PRIO2_PL_1RFU&CCZ+PRIO3_PL_1RFU&CCZ+PRIO4_PL_1RFU&CCZ
ACCUM. TABLE9=PRIO1_PL_2RFU&CCZ+PRIO2_PL_1RFU&CCZ+PRIO3_PL_1RFU&CCZ+PRIO4_PL_1RFU&CCZ
ACCUM. TABLE10=PRIO1_PL_2RFU&CCZ+PRIO2_PL_2RFU&CCZ+PRIO3_PL_1RFU&CCZ+PRIO4_PL_1RFU&CCZ
ACCUM. TABLE11=PRIO1_PL_2RFU&CCZ+PRIO2_PL_2RFU&CCZ+PRIO3_PL_2RFU&CCZ+PRIO4_PL_1RFU&CCZ
ACCUM. TABLE12=PRIO1_PL_2RFU&CCZ+PRIO2_PL_2RFU&CCZ+PRIO3_PL_2RFU&CCZ+PRIO4_PL_2RFU&CCZ
ACCUM. TABLE13=PRIO1_PL
ACCUM. TABLE14=PRIO1_PL+PRIO2_PL_1RFU&CCZ
ACCUM. TABLE15=PRIO1_PL+PRIO2_PL_1RFU&CCZ+PRIO3_PL_1RFU&CCZ
ACCUM. TABLE16=PRIO1_PL+PRIO2_PL_1RFU&CCZ+PRIO3_PL_1RFU&CCZ+PRIO4_PL_1RFU&CCZ
ACCUM. TABLE17=PRIO1_PL+PRIO2_PL_2RFU&CCZ+PRIO3_PL_1RFU&CCZ+PRIO4_PL_1RFU&CCZ
ACCUM. TABLE18=PRIO1_PL+PRIO2_PL_2RFU&CCZ+PRIO3_PL_2RFU&CCZ+PRIO4_PL_2RFU&CCZ
ACCUM. TABLE19=PRIO1_PL+ PRIO2_PL+PRIO3_PL_1RFU&CCZ
ACCUM. TABLE20=PRIO1_PL+ PRIO2_PL+PRIO3_PL_1RFU&CCZ+PRIO4_PL_1RFU&CCZ
ACCUM. TABLE21=PRIO1_PL+ PRIO2_PL+PRIO3_PL_2RFU&CCZ+PRIO4_PL_1RFU&CCZ
ACCUM. TABLE22=PRIO1_PL+ PRIO2_PL+PRIO3_PL_2RFU&CCZ+PRIO4_PL_2RFU&CCZ
ACCUM. TABLE23=PRIO1_PL+ PRIO2_PL+PRIO3_PL
ACCUM. TABLE24=PRIO1_PL+ PRIO2_PL+PRIO3_PL+PRIO4_PL_1RFU&CCZ
ACCUM. TABLE25=PRIO1_PL+ PRIO2_PL+PRIO3_PL+PRIO4_PL_2RFU&CCZ

PRIOX_PL_CCZ = PRIORITY X POTLINE CURRENT CONTRO ZERO(MW)

PRIOX_PL = PRIORITY X POLINE LOAD MW

PRIOX_PL_1RFU&CCZ= PRIORITY X POTLINE 1 RECTIFORMER LOAD AND CURRENT CONTROL ZERO (MW)

PRIOX_PL_2RFU&CCZ= PRIORITY XPOTLINE 2 RECTIFORMER LOAD AND CURRENT CONTROL ZERO(MW)

Power Import control HMI display:

GRID EXCHANGE MW			FAST LOAD SHED GRID IMPORT MW SETPOINT		
Import MW: -ve					
SN01 GRID WORKING POINT	-800	MW	SN01 FLS SETPOINT	900	MW
SN02 GRID WORKING POINT	0	MW	SN02 FLS SETPOINT	900	MW
SN03 GRID WORKING POINT	0	MW	SN03 FLS SETPOINT	900	MW
SN04 GRID WORKING POINT	0	MW	SN04 FLS SETPOINT	900	MW
			<div>Note: FLS SETPOINT ENTRY PROCEDURE</div> <div>1) LOGIN WITH VALID CREDENTIALS</div> <div>2) ENSURE BELOW CRITERIA WHILE ENTERING FLS MW SETPOINT</div> <div>(FLS GRID IMP.MW SETPOINT >= GRID IMP.SCHEDULE AND GRID IMP.WORKING POINT</div>		

Thanks

Old SPS (As approved)

1. SPS-7: SPS at Sterlite Power (Sterlite)

Item	Information														
Reporting Party	ERLDC, NLDC, POSOCO														
Scheme’s Name	Special protection system at SEL (Sterlite Energy Limited)														
Classification	SPS Related to loading of outgoing lines for SEL														
Reference No.	SPS-7														
Operating Procedure	By Sensing flow of outgoing 400 kV lines form SEL														
Design Objectives	SPS at SEL continuously monitor flow of all four 400 kV lines and it gets actuated whenever flow of any line touches 650 MW.														
Operation	Generation reduction at SEL in case of high generation scenario														
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Original In-Service Year	2011														
Recent Assessment Group	SEL, GRIDCO Due to change in connectivity														
Recent Assessment Date	2017														

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

Sl. No.	LINE NAME	TRIP DATE	TRIP TIME	Relay Indication LOCAL END	Relay Indication REMOTE END	Reason	Fault Clearance time in msec	Remarks	DR/EL RECEIVED FROM LOCAL END	DR/EL RECEIVED FROM REMOTE END	LOCAL END UTILITY	REMOTE END UTILITY
1	220KV-PUSAULI-KARAMANSA-1	01-12-2023	14:10	Tripped from Pusauli only		No fault	NA	PG ER-1/BSPTCL may explain.	No	NA	PG ER-1	BSPTCL
2	400KV-FSTPP-KHSTPP-2	02-12-2023	01:56	Tripped from Farakka only		No fault	NA	Y_ph O/V St.1 operated at Farakka. Y_ph Voltage was around 242 kV	No	NA	NTPC	NTPC
3	765KV-DHARAMJAIGARH-JHARSUGUDA-1	02-12-2023	17:06		Jharsuguda: R_N, Zone-1, 31.8 km, 13.62 kA	R-Earth	100	A/r kept in non-auto mode for OPGW work	NA	Yes	WR	PG Odisha
4	220KV-RENGALI(PH)-TSTPP-1	04-12-2023	10:29	-	-	No fault	NA	As per PMU, no fault observed. OPTCL/NTPC may explain	No	No	OHPC	NTPC
5	400KV-PPSP-BIDHANNAGAR-2	05-12-2023	07:59	PPSP: R_Y, Zone-1, 111.8 km	Bidhannagar: R_Y, Zone-1, 75.38 km, Ir= 5.513 kA, Iy= 5.417 kA	R-Y-Earth	100	Phase to phase fault	No	Yes	WBSEDCL	WBSETCL
6	765KV-DHARAMJAIGARH-JHARSUGUDA-1	05-12-2023	01:08		Jharsuguda: B_N, 116 km, 5.03 kA	B-Earth	100	A/r failed after 1 second	NA	Yes	WR	PG Odisha
7	400KV-CHANDWA-NORTH KARANPURA-1	05-12-2023	11:27	Chandwa: DT received		No fault	NA	PG ER-1/NTPC may explain	No	No	PG ER-1	NTPC
8	400KV-PPSP-BIDHANNAGAR-2	05-12-2023	11:01	PPSP: B_E, Zone-1, 110.3 km	Bidhannagar: B_E, Zone-1, 66.34 km, 4.173 kA	B-Earth	100	A/r kept disabled as per OEM advise	No	Yes	WBSEDCL	WBSETCL
9	220KV-DARBHANGA(DMTCL)-LAUKAHI-1	06-12-2023	12:30	Darbhang: R_N, Zone-1, 53.61 km, 2.80 kA	Laukahi: R_N, 3.16 kA, A/r successful	R-Earth	100	A/r successful from Laukahi only. Other two phase at Darbhanga didn't trip during fault.	No	Yes	DMTCL	BSPTCL
10	220KV-MAITHON-DUMKA-2	06-12-2023	07:47		Tripped from Dumka only	No fault	NA	PG ER-2/JUSNL may explain	NA	No	PG ER-2	JUSNL
11	400KV-PUSAULI(PG)-NABINAGAR(BRBCL)-2	07-12-2023	11:11	Pusauli: Y_B, 12 km, 10.85 kA	Nabinagar: Y_B, 57 km, 2.5 kA	Y-B-Earth	100	Phase to phase fault	Yes	No	PG ER-1	BRBCL
12	400KV-BIDHANNAGAR-NEW CHANDITALA-1	07-12-2023	09:24	Bidhanagar: B_N, Zone-1, 13.9 km, 9.12 kA	New Chanditala: B_N, Zone-1, 118.1 km, 3.417 kA	B-Earth	100	A/r failed after 1 second	Yes	Yes	WBSETCL	WBSETCL
13	765KV-GAYA-BALIA-1	10-12-2023	11:31	Gaya: Y_B, 195.3 km, Iy= 4.58 kA, Ib=4.08 kA	Balia: Y_B, 38 km, 10 kA	Y-B-Earth	100	Phase to phase fault	Yes	NA	PG ER-1	NR
14	400KV-RANCHI-RAGHUNATHPUR-3	12-12-2023	11:15	Ranchi: DT received		No fault	NA	No fault in line. DT received at Ranchi. DVC may explain.	Yes	No	PG ER-1	DVC

15	400KV-KISHANGANJ(PG)-RANGPO-2	12-12-2023	17:42	Kishanganj:R_Y, Zone-1, 107.3 km, Ir=4.48 kA, Iy=4.7 kA	Rangpo: R_Y, Zone-1, 86.98 km, Ir=3.845 kA, Iy=3.649 kA	R-Y	100	Phase to phase fault	Yes	Yes	PG ER-1	PG ER-2
16	765KV-MEDINIPUR-NEW JEERAT-2	13-12-2023	11:38		New Jeerat: 765 kV Bus-1 tripped due to bus bar protection. Main bay was under shutdown, however tie bay also tripped	B-Earth	250	Bus fault at New Jeerat which was momentarily picked up in Zone-1 by Medinipur. DT received at Medinipur. PMJTL may explain.	Yes	Yes	PMJTL	PMJTL
17	220KV-NEW MELLI-TASHIDING-2	13-12-2023	12:14	New melli:Y_B, Zone-1, 12.56 km, Iy= 4.5 kA, Ib= 4.57 kA	Tashiding: Y_B, 6.7 km,Iy=Ib= 2.5 kA, Earth Fault	Y_B	100	Phase to phase fault	Yes	No	PG ER-2	THEP
18	400KV-MAITHON-GAYA-1	13-12-2023	12:47	Maithon: R_Y, 56.5 km, Ir=7.37 kA, Iy= 7.32 kA		R_Y	100	Phase to phase fault	Yes	Yes	PG ER-2	PG ER-1
19	400KV-MALDA(PG)-NEW PURNEA-1	17-12-2023	02:28		New Purnea: Y_B, Zone-1, 114.13 km, Iy=4.28 kA, Ib=4.28 kA	Y_B	100	Phase to phase fault	Yes	Yes	PG ER-2	PG ER-1
20	400KV-NEW DUBURI-TSL-1	20-12-2023	07:48	New Duburi: InterTrip received		No fault	NA	OPTCL/TSL may explain	No	No	OPTCL	TSL
21	400KV-NEW DUBURI-TSL-1	22-12-2023	08:52	New Duburi: DT received		No fault	NA	OPTCL/TSL may explain	No	No	OPTCL	TSL
22	400KV-KHSTPP-BARH-1	23-12-2023	13:47		Barh:Y_N ,4.6 km, 23 kA	Y-Earth	100	Three phase tripping from both ends for single phase fault	No	Yes	NTPC	NTPC
23	220KV-ROURKELA-TARKERA-1	26-12-2023	19:15	Tripped from Rourkela during LBB testing		No fault	NA	Tripped from Rourkela only along with bus coupler. PG Odisha may explain.	No	NA	PG Odisha	OPTCL
24	220KV-KARAMNASHA (NEW)-SAHUPURI-1	28-12-2023	05:50	Karmnasa:R_N, Zone-1, 28 km, 2.83 kA		R-Earth	100	A/r failed after 1 second	No	NA	BSPTCL	NR
25	220KV-BUDHIPADAR-KORBA-1	29-12-2023	13:50	Budhipadar: Didn't trip	Korba: Y_N, Zone-2, 1.063 kA	Y-Earth	100	As per PMU, Y-Earth fault occurred. OPTCL may share the details	No	NA	OPTCL	WR
26	400KV-PUSAULI(PG)-NABINAGAR(BRBCL)-2	29-12-2023	06:28	Pusauli:B_N, Zone-1, 42.2 km, 5.97 kA	Nabinagar:B_N ,43.1 km, 3.9 kA	B-Earth	100	A/r successful. Tripped again within reclaim time	Yes	No	PG ER-1	BRBCL

Annexure C.3

SL NO	MONTH	UTILITY	ELEMENT	DETAILS OF ELEMENT	REMARKS
5	OCC_JAN_2023	OPTCL	T/L	RE-GENERATION 132KV BALASORE ALLOY PLANT 220/132/33KV BALASORE	Data required
6	OCC_JAN_2023	OPTCL	ICT	RE-ENERGIZATION 1*25MW TURBO GENARATOR AT M/S MSP METALICS LTD JHARSUGUDA OPTCL SYSTEM AT 132KV MSP FEEDER FROM 220/132/33kv GSS,BUDHIPADAR	Data required
7	OCC_JAN_2023	OPTCL	ICT	RE-ENERGIZATION OF 220/132kv 100MVA AUTO TRF-III AT MERAMUNDALI	Data required
13	OCC_FEB_2023	OPTCL	T/L	132kv Switching station near M/s Ultrateh Cement ltd at Khamarnuagaon,Khuntuni,132kv LILO arrangement from Arati steel -TS alloys line	Data required
14	OCC_FEB_2023	OPTCL	T/L	12.5 MW Solar power plant at 33kv Level in 132/33kv witchyard M/S ARBEL having connectivity at 132kv With LILO switching station SAINTALA	Data required
15	OCC_FEB_2023	OPTCL	T/L	220kv Switchyard at 220/132/33kv GSS,BAMRA having LILO connectivity 220kv Budhipadar-Tarkera ckt-II& CKT-I	Data required
19	OCC_FEB_2023	OPTCL	T/L	Synchronization(re-energization 19.5MW TG-1 OF CGP of m/s ninl Duburi with OPTCL network,220/132/33kv GSS 220kv DUBURI OLD-NINL FEEDER	Data required
21	OCC_MAR_2023	OPTCL	T/L	132kv 2 PH S/C LINE,132kv GSS,KAMAKHYANAGAR FOR EXTENTION OF P/S TO RTSS KAMAKHYANAGAR	Data required
23	OCC_MAR_2023	OPTCL	ICT	132/33kv 20MVA POWER TR NO-2 AND 1 132kv FEEDER BAY GSS BIRMAHARAJPUR	Data required
24	OCC_APR_2023	OPTCL	ICT	400KV MAIN BAY OF 400KV/220kv 315 MVA ICT-3 AT KALINGANAGAR	DATA REQUIRED
25	OCC_APR_2023	OPTCL	T/L	132kv 2 PH S/C LINE,DC TOWER FROM M/S JABAMAYEE FERO ALLOY STATION-TO SUKINDA LINE	DATA REQUIRED
26	OCC_APR_2023	OPTCL	T/L	1*25MW TG#2 OF 132KV RUNGTA MINE LTD DHENKANAL STEEL PLANT WITH OPTCL SYSTEM THROUGH MERAMUNDALI-RML DSP LINE FEEDER	DATA REQUIRED
27	OCC_APR_2023	OPTCL			DATA REQUIRED
28	OCC_APR_2023	OPTCL	ICT	400/220kv ICT-III AT BRPS TATA STEEL KALINGANAGAR	DATA REQUIRED
29	OCC_APR_2023	OPTCL	T/L	132kv BHATLI-BARGARH BAY AT 220/132/33kv	DATA REQUIRED
30	OCC_APR_2023	OPTCL	T/L	33kv GEDCOL-BOLANGIR NEWBAY AT 220/132/33kv AT BOLANGIR	DATA REQUIRED
31	OCC_APR_2023	OPTCL	ICT	400/220kv 315MVA ICT-1 AT INDRAVATI	DATA REQUIRED
32	OCC_MAY_2023	OPTCL	T/L	SYNCHRONIZATION OF 2MW GEDCOL SOLAR PV PLANT HAVING 33kv CONNECTIVITY AT 220/132/33kv,GSS BOLANGIR NEW FOR 2MW SOLAR PV PLANT	DATA REQUIRED
33	OCC_MAY_2023	OPTCL	T/L	220kv LILO LINE LOC NO 227 OF EXITING 220kv NEW DUBURI-BALASORE LINE UPTO GANTRY OF 220/132/33kv GRID S/S DHARMA	DATA REQUIRED
34	OCC_MAY_2023	OPTCL	T/L	SYNCHRONIZATION OF 3.64MW SOLAR PV PLANT HAVING 11kv LEVEL CONNECTIVITY AT 132/33kv,SWITCHYARD OF M/S SHREE CEMENT LTD CONNECTED WITH KHUNTUNI-SHREE CEMENT FE	DATA REQUIRED
35	OCC_MAY_2023	OPTCL	ICT	220/33kv GSS,KANTABADA LILO CONNECTIVITY FROM LOC NO 453 AND 455 OF 220kv CHANDAKA-MENDASHAL CKT-III ALONG WITH 02 NOS OF 220/33 Kv 63mva power trf	DATA REQUIRED
36	OCC_MAY_2023	OPTCL	T/L	SYNCHRONIZATION OF 30MW THERMAL UNIT OF M/S JAGANNATH STEEL AND POWER KEONJHAR WITH OPTCL SYSTEM	DATA REQUIRED
37	OCC_MAY_2023	OPTCL	T/L	33kv SOLAR BAY EXTENSION AT 132/33kv AT BARIKADA	DATA REQUIRED
38	OCC_MAY_2023	OPTCL	T/L	132/33kv GSS,BORIGUMA LILO CONNECTIVITY OF 132kv JAYANAGAR-TENTULKHANTI CKT-2(132kv JAYANAGAR-NABARANGPUR LINE	DATA REQUIRED
39	OCC_MAY_2023	OPTCL	T/L	132/33kv 40MVA POWER TRANSFORMER -2 AT ROURLKELA	DATA REQUIRED
40	OCC_MAY_2023	OPTCL	T/L	132kv BRAJARAJNAGAR-LAKHANPUR DC LINE& 132kv LAKHANPUR GSS(5NOS 132kv,132kv TRANSFORMER1&2 20MVA	DATA REQUIRED
41	OCC_JULY_2023	OPTCL	T/L	220/132/33kv 132kv GUNUPUR-RTSS LINE	DATA REQUIRED
42	OCC_JULY_2023	OPTCL	ICT	220/132/33kv GSS,40MVA TR-II AT DHARMA	DATA REQUIRED
43	OCC_JULY_2023	OPTCL	T/L	132kv BHAWANIPATNA-RTSS LINE-II	DATA REQUIRED
44	OCC_JULY_2023	OPTCL	T/L	132/33kv BUDHIPADAR-LAKHANPUR LINE AND BRAJRAJNAGAR-JORABAGA MCL AT LILO ARRANGMENT BUDHIPADAR-JORABAGA MCLCKT-II AND LAKHANPUR-BRAJRAJNAGAR	DATA REQUIRED
45	OCC_JULY_2023	OPTCL	ICT	132/33kv 40MVA POWER TRANSFORMER-I BARGARH NEW-BHATLI D/C LINE	DARA REQUIRED

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

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

SL NO	MONTH	UTILITY	ELEMENT	DETAILS OF ELEMENT	REMARKS
1	OCC_NOV_2022	JUSNL	T/L	400KV MAIN BAY OF LATEHAR(JUSNL)-1 AT CHANDWA(PG)	PDMS AND PSCT DONE AT CHANDWA END AND DATA REQUIRED AT LATEHAR END
2	OCC_NOV_2022	JUSNL	T/L	400KV MAIN BAY OF LATEHAR(JUSNL)-2 AT CHANDWA(PG)	PDMS AND PSCT DONE AT CHANDWA END AND DATA REQUIRED AT LATEHAR END
3	OCC_JAN_2023	JUSNL	T/L	400 kV Chandwa (PG) - Latehar (JUSNL) D/C Line	PDMS AND PSCT DONE AT CHANDWA END AND LATEHAR END DATA REQUIRED
1	OCC_AUG_2023	JUSNL	T/L	400 kV Tenughat – Patratu S/C Line anti-theft charging from Tenughat end [upto 64 kms] (upto Patratu gantry)	DATA REQUIRED
2	OCC_DEC_2023	JUSNL	T/L	220KV MAIN BAY OF 315MVA ICT -1(Bay No-205)AT LATEHAR(JUSNL)	

SL NO	MONTH	UTILITY	ELEMEN	DETAILS OF ELEMENT	REMARKS
1	OCC_NOV_2022	NTPC (North Karanpura)		660MW New Generating Unit charged a Tandwa,Jharkhand	DATA REQUIRED
2	OCC_NOV_2022	NTPC (North Karanpura)	ICT	400KV MAIN BAY OF 400KV/11.50KV 315 MVA ST-3 AT NORTH KARANPURA	PDMS AND PSCT DONE
3	OCC_NOV_2022	NTPC (North Karanpura)	GT-1	400KV MAIN BAY OF 400KV/21KV 265 MVA GT-1 AT NORTH KARANPURA	PDMS AND PSCT DONE
4	OCC_NOV_2022	NKTL	T/L	400 kV North Karanpura(NTPC)- Chandwa(PG) Transmission Line -1	PDMS AND PSCT DONE AT NORTH KARANPURA END AND DATA REQUIRED CHANDWA END
5	OCC_NOV_2022	NKTL	T/L	400 kV North Karanpura(NTPC)- Chandwa(PG) Transmission Line 2	PDMS AND PSCT DONE AT NORTH KARANPURA END AND DATA REQUIRED CHANDWA END
6	OCC_JAN_2023	NTPC	T/L	Main Bays of 400 kV Gaya D/C Line at NTPC sitchyard	NOT CHARGED
7	OCC_MAR_2023	NTPC		NTPC Barh Stage Unit #2, 24 kV, 660 MW is yet to be synchronized	Data required
8	OCC_MAR_2023	NTPC	GT(3*26	400kv GT#2 of NTPC Barh	Data required
9	OCC_APR_2023	NTPC	GT	NTPC Barh Stage 1 Unit #2 660MW	DATA REQUIRED
10	OCC_AUG_2023	NTPC	T/L	33 kV Darlipalli (NTPC) - Dulanga CMP Line 2	PDMS AND PSCT DONE
11	OCC_DEC_2023	NTPC	T/L	NORTH KARANPURAUNIT 2	DATA REQUIRED
12	OCC_DEC_2024	NTPC	GT	MAIN BAY OF GT-2(Bay No-413) NORTH KARANPURA UNIT -2	

SL NO	MONTH	UTILITY	ELEMENT	DETAILS OF ELEMENT	REMARKS
1	OCC_DEC_2022	PGCIL	ICT	400KV MAIN BAY OF 400KV/220KV/33kV 315 MVA ICT 2 AT DURGAPUR SS	PDMS AND PSCT DONE
2	OCC_JAN_2023	PGCIL	T/L	PG-Patna-Gaurichak TL CKT-2(reconducting)	DATA REQUIRED
3	OCC_JAN_2023	PGCIL	T/L	PG-Patna-Gaurichak TL CKT-1(reconducting)	DATA REQUIRED
4	OCC_FEB_2023	PGCIL	T/L	220 kV Pusauli (PG) - Durgauti (IR) D/C Line	Data required in both end
5	OCC_APR_2023	POWERGRID	T/L	132 kV Ranpo (PG) - Samardong (EPD, Sikkim) Line 1	PDMS AND PSCT DONE AT RANGPO END
6	OCC_APR_2023	POWERGRID	T/L	133 kV Ranpo (PG) - Samardong (EPD, Sikkim) Line 2	PDMS AND PSCT DONE AT RANGPO END
7	OCC_APR_2023	POWERGRID	T/L	220 kV Pusauli (PG) - Durgauti (IR) D/C Line2	DATA REQUIRED
8	OCC_MAY_2023	POWERGRID	T/L	220 kV Pusauli (PG) -Durgauti Line 2	DATA REQUIRED
9	OCC_AUG_2023	PGCIL	T/L	400 kV Sitamarhi (PGCIL) -Dhalkebar (Nepal) Line 1 &2	DATA REQUIRED
10	OCC_AUG_2023	PGCIL	T/L	400 kV Maithon (PGCIL) -Maithon RB (MPL) Line 1&2	PDMS and PSCT DONE
11	OCC_DEC_2023	PGCIL	ICT	220/132kV ICT-1 AT MALDA(PG)SS	DATA REQUIRED
12	OCC_DEC_2023	PGCIL	T/L	220KV MUZAFFARPUR(PG)- AMNOUR-1	DATA REQUIRED
13	OCC_DEC_2023	PGCIL	T/L	132KV MAIN BUS - 1 AT MALDA(PG)	DATA REQUIRED
14	OCC_DEC_2023	PGCIL	T/L	132KV MAIN BUS - 2 AT MALDA(PG)	DATA REQUIRED
15	OCC_DEC_2023	PGCIL	T/L	ICT-1 Bay (Bay No-101) at MALDA(PG)	DATA REQUIRED
16	OCC_DEC_2023	PGCIL	T/L	ICT-4 Bay (Bay No-106) at MALDA(PG)	DATA REQUIRED

SL NO	MONTH	UTILITY	ELEMEN	DETAILS OF ELEMENT	REMARKS
1	OCC_JUNE_2023	WBSETCL	B/R	400 kV 125 MVAR BusReactor at Gokarna SS	PDMS AND PSCT DONE
2	OCC_SEP_2023	WBSETCL	ICT	400/220/33 315MVA ICT-3 AT GOKARNA S/S	PDMS AND PSCT DONE
3	OCC_DEC_2023	WBSETCL	B/R	125MVAR 400KV B/R-1 AT NEW CHANDITALA	PDMS AND PSCT DONE

SI No.	Name of the incidence	PCC Recommendation	Latest status
130th PCC Meeting			
1.	Tripping of 220 kV Main Bus-1 at Ramchandrapur on 01.10.2023 at 04:38 Hrs	PCC advised to take up the matter with the equipment manufacturer for further analysis of the failure of the elements and if necessary, replace all the PT/CT of similar make /lot to avoid these kinds of tripping in future. PCC also advised JUSNL to share failure report of any power system elements including CT & PTs to CEA for their root cause analysis.	
2.	Tripping of 220 kV Main Bus-2 at Budhipadar on 06.10.23 at 16:14 Hrs	PCC advised to replace the defective bay unit at the earliest and restore the busbar protection for bus-2 thereafter.	
3.	Tripping of 220 kV Main Bus-1 at Ramchandrapur on 20.10.23 at 00:11 Hrs	PCC advised CRITL, JUSNL to so investigation for maloperation of LBB protection and submit report to ERPC/ERLDC.	
4.	Repeated tripping of 220 kV Darbhanga (DMTCL)-Laukahi D/c	PCC advised BSPTCL representative to rectify all vegetation issues and replace the damaged insulators at earliest so that further tripping of line is not observed.	
129th PCC Meeting			
5.	Disturbance at 220 kV Budhipadar(OPTCL) S/s and 220 kV Ib-TPS(OPGC) S/s on 29.07.2023 at 19:13 Hrs	PCC advised OPTCL to rectify autorecloser issues of the connected lines to Budhipadar and take necessary action for ensuring the system healthy all the time.	
125th PCC Meeting			

6.	Repeated Line tripping of 220 kV Ramchandrapur - Joda in April 2023	Regarding status of commissioning of DTPC in the line, PCC advised the matter may be taken with their telecom wing for early commissioning of the same.	<p><i>JUSNL representative informed that work order for commissioning of DTPC in the line will be issued shortly and it is expected that work will be completed by July 2023.</i></p> <p><i>In 129th PCC meeting, JUSNL representative informed that there is no further update to this however they are planning to implement DTPC at earliest.</i></p> <p><i>JUSNL representative informed that there is no progress in the status due to delay in getting internal approval for the work.</i></p>
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