Agenda
for
123rd PCC Meeting

Date:21/02/2023
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

AGENDA FOR 123rd PROTECTION COORDINATION SUB-COMMITTEE MEETING TO BE HELD ON 21.02.2023 AT 11:00 HOURS AT ERPC, KOLKATA

PART – A

ITEM NO. A.1: Confirmation of Minutes of 122nd Protection Coordination sub-Committee Meeting held on 16th January 2023 through MS Teams online platform.

The minutes of 122nd Protection Coordination sub-Committee meeting held on 16.01.2023 was circulated vide letter dated 14.02.2023.

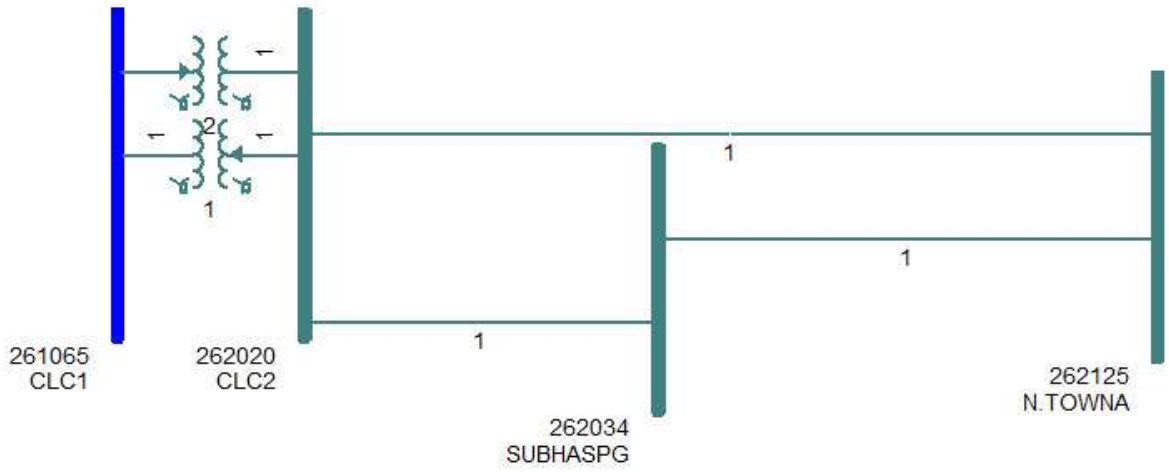
Members may confirm.

PART – B

ITEM NO. B.1: Total Power Failure at 220/132 kV KLC Bantala(WBSETCL) S/s

A) On 04.01.2023 at 04.42 Hrs

On 04th January 2023 at 04:42 Hrs, LBB of 220 kV Bantala-NewTown AA-3 operated spuriously, leading to tripping of all associated feeders and transformers subsequently total power failure occurred at 220/132 kV KLC Bantala S/s.



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

Load Loss: 20 MW
Outage Duration: 00:23 Hrs

B) On 04.01.2023 at 05:42 Hrs

At 05:42 hrs, LBB of 220 kV Bantala-NewTown AA-3 operated spuriously leading to tripping of all associated feeders and transformers.

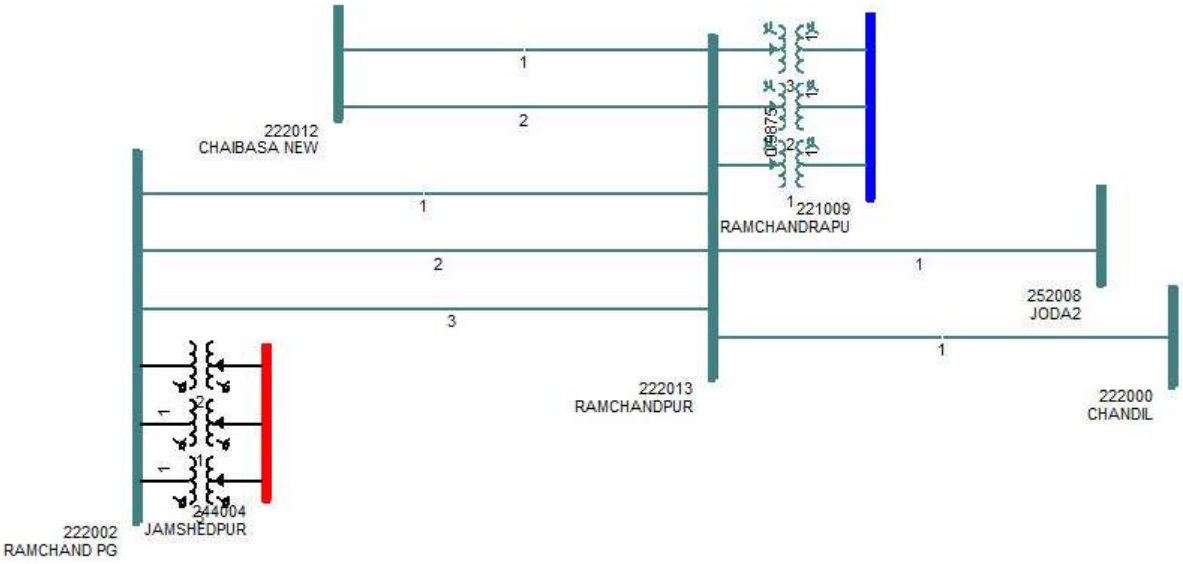
Load Loss: 21 MW
Outage Duration: 00:11 Hrs

WBSETCL may explain.

ITEM NO. B.2: Disturbances at 220 kV Ramchandrapur(JUSNL) S/s

A) On 04.01.2023 at 13:41 Hrs

At 13:41 Hrs, during LBB testing at Ramchandrapur 220 kV Bus-2 at Ramchandrapur along with connected feeders got tripped. It is reported that 220 kV Bus-1 was under shutdown for LBB testing.



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

Load Loss: 100 MW
Outage Duration: 00:23 Hrs

B) Disturbance at 220 kV Ramchandrapur(JUSNL) S/s on 04.01.2023 at 14:24 Hrs

At 14:24 Hrs, 220 kV Bus-2 at Ramchandrapur along with connected feeders tripped again during LBB testing.

Load Loss: 85 MW
Outage Duration: 00:36 Hrs

JUSNL may explain.

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

The new elements charged in ER Grid during month of Dec-22 & Mar-23 is given in the annexure-B3.

All utilities of Eastern Region are requested to intimate the changes in network configuration regularly & upload the relay settings in PDMS by using DMNS portal or by sending the settings file

to erpc-protection@gov.in. Timely furnishing of proper details would ensure that protection Database is maintained up-to-date, and can be reliably used for analyzing the disturbances & conducting protection coordination studies.

ITEM NO. B.4: Tripping Incidence in month of January-2023

Single line tripping incidents in the month of January-2023 which needs explanation from constituents of either end is attached at **Annexure-B4.**

Concerned utilities may explain.

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.

TPTL mat update.

ITEM NO. C.2: Follow-up of Decisions of the Previous Protection Sub-Committee Meeting(s)

The decisions of previous PCC meetings are attached at **Annexure C2.**

Members may update the latest status.

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

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

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

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

The DEF settings based on the revised study is enclosed at **Annexure C.3.**

In 122nd PCC Meeting, it was informed that confirmation of implementation of proposed settings had been received by all concerned utilities except Powergrid ER-II.

Powergrid ER-II vide email dated 16.02.2022 informed that the revised settings have been implemented at their end.

Members may note.

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पावर सिस्टम ऑपरेशन करपोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Government of India Enterprise)
Eastern Regional Load Despatch Centre: 14, Golf Club Road, Tollygunge, Kolkata-700 033.
CIN: U40105DL2009GOI188682
फ़ोन: 033- 24235755, 24174049 फैक्स : 033-24235809/5029 Website:www.erldc.org, Email ID- erldc@posoco.in

घटना संख्या: **04-01-2023/1-2** दिनांक: **03-02-2023**

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

Summary of the event (घटना का सारांश):

Event 1:

At 04:42 Hrs on 04th January 2023, total power failure occurred at 220/132 kV KLC Bantala S/s. As reported, LBB of 220 kV Bantala-NewTown AA-3 operated spuriously, leading to tripping of all associated feeders and transformers. Bantala has Single bus scheme. 20 MW load loss reported during the event by SLDC West Bengal.

- **Date / Time of disturbance:** 04-01-2023 at 04:42 hrs.
- **Event type:** GD - 1
- **Systems/ Subsystems affected:** 220/132 kV Bantala S/s
- **Load and Generation loss**.
  - No generation loss occurred during the event.
  - 20 MW load loss reported during the event by SLDC West Bengal.

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

- NIL

Major elements tripped (प्रमुख ट्रिपिंग)

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

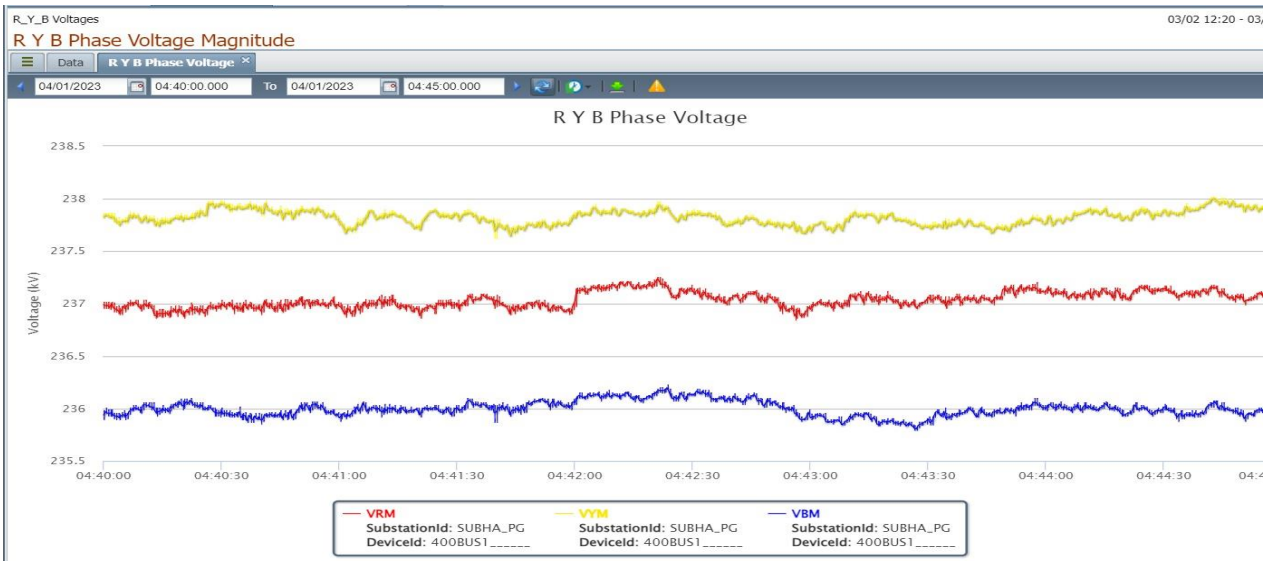


Figure 1: PMU Voltage snapshot of 400/220 kV Subhashgram S/s

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

समय	नाम	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पीएमयू पर्यवेक्षण
04:42	220 kV Bus-1 at Bantala (KLC)	LBB of 220 kV Bantala-NewTown AA 3 operated.		No fault observed from PMU
	220 kV Subhahsgram-Bantala (KLC)			
	220 kV Bantala (KLC)-NewTown AA 3			
	220/132 kV ICT-1&2 at Bantala (KLC)			

- **Restoration (पूर्वावस्था की प्राप्ति)**

Transmission/Generation element name	Restoration time
220 kV Bus-1 at Bantala (KLC)	05:05
220 kV Subhashgram-Bantala (KLC)	-
220 kV Bantala (KLC)-NewTown AA 3	-
220/132 kV ICT-1&2 at Bantala (KLC)	05:05

Event 2:

At 05:42 Hrs on 04th January 2023, total power failure occurred at 220/132 kV KLC Bantala S/s. As reported, LBB of 220 kV Bantala-NewTown AA-3 operated again, leading to tripping of all associated feeders and transformers. Bantala has Single bus scheme. 20 MW load loss reported during the event by SLDC West Bengal.

- **Date / Time of disturbance:** 04-01-2023 at 05:42 hrs.
- **Event type:** GD - 1
- **Systems/ Subsystems affected:** 220/132 kV Bantala S/s
- **Load and Generation loss**.
  - No generation loss occurred during the event.
  - 21 MW load loss reported during the event by SLDC West Bengal.

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

- NIL

Major elements tripped (प्रमुख ट्रिपिंग)

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

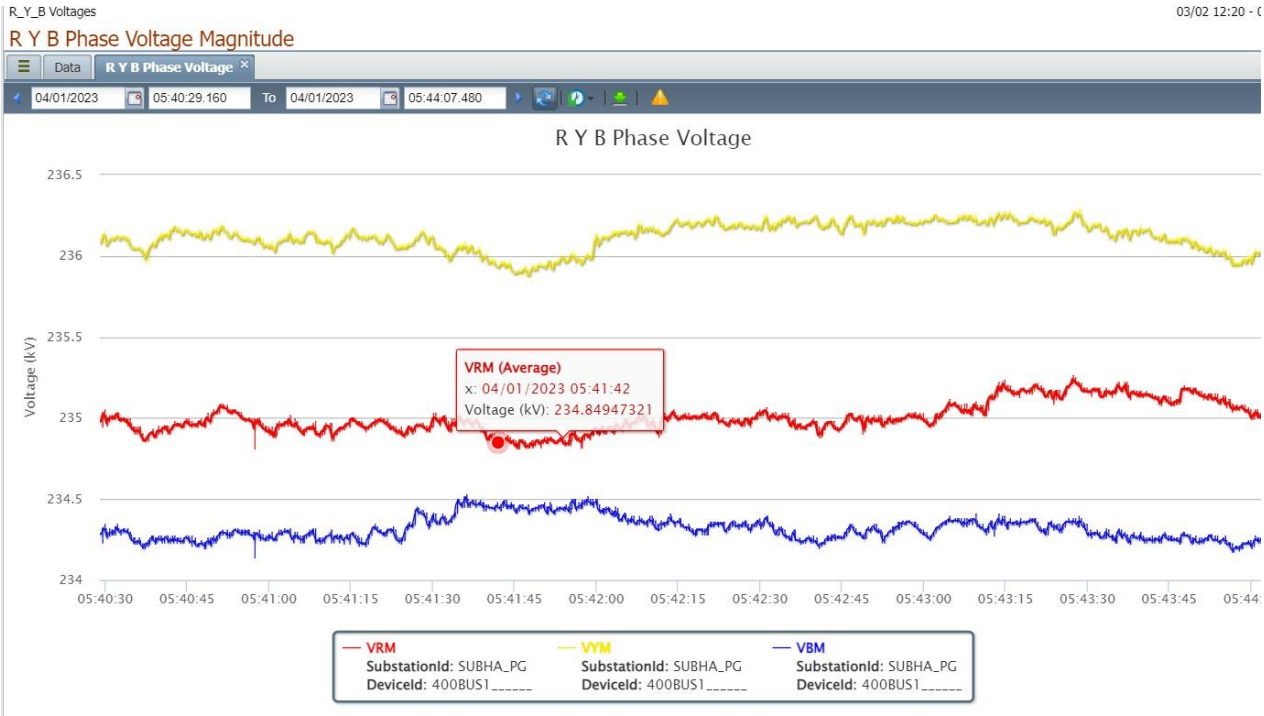


Figure 2: PMU Voltage snapshot of 400/220 kV Subhashgram S/s

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

समय	नाम	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पीएमयू पर्यवेक्षण
05:42	220 kV Bus-1 at Bantala (KLC)	LBB of 220 kV Bantala-NewTown AA 3 operated.		No fault observed from PMU
	220 kV Subhahsgram-Bantala (KLC)			
	220 kV Bantala (KLC)-NewTown AA 3			
	220/132 kV ICT-1&2 at Bantala (KLC)			

- **Restoration (पूर्वावस्था की प्राप्ति)**

Transmission/Generation element name	Restoration time
220 kV Bus-1 at Bantala (KLC)	05:53
220 kV Subhashgram-Bantala (KLC)	12:40
220 kV Bantala (KLC)-NewTown AA 3	-
220/132 kV ICT-1&2 at Bantala (KLC)	05:53

Network across the affected area (प्रभावित क्षेत्र का नक्शा)

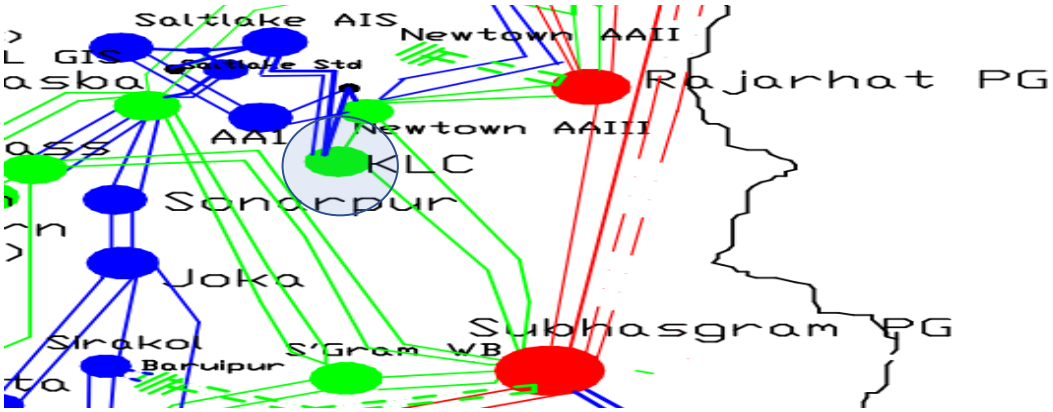


Figure 3: Network across the affected area

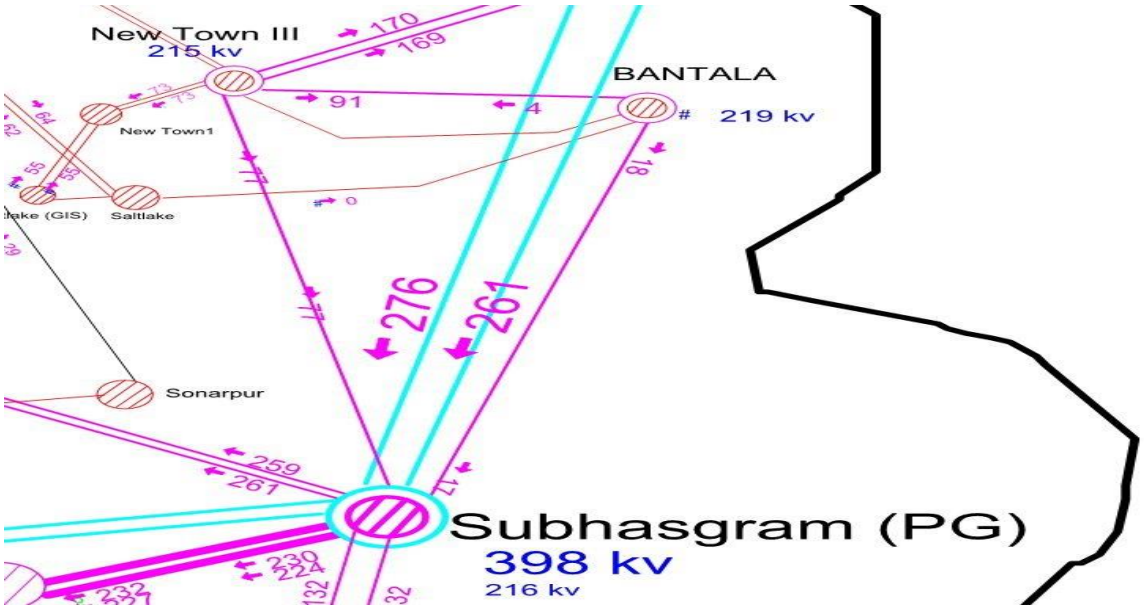


Figure 4: SCADA snapshot for of the system

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

- As reported, in both events, LBB of 220 kV Bantala-NewTown AA 3 operated at Bantala due to terminal shorting of LBB contacts in combiflex plinth and forming an external communication path.
- There was no fault in the system. Total power supply failed as Bantala has Single Main Transfer bus Scheme.
- As S/s is in close vicinity of a tannery, chemical contamination is frequent. Report from WBSETCL is attached at Annexure-3.

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

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

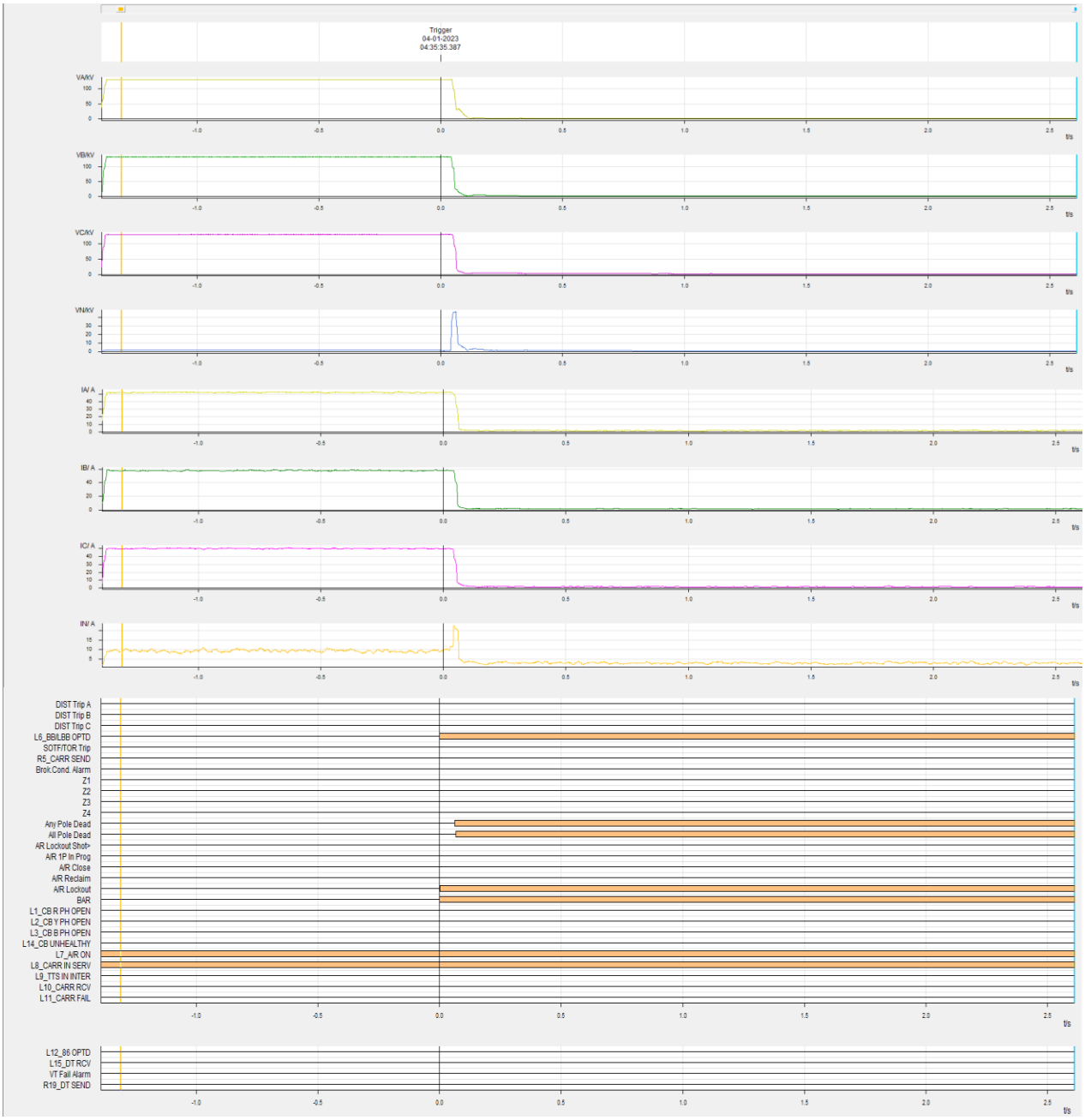
Status of Reporting (रिपोर्टिंग की स्थिति):

- DR/EL received from WBSETCL.

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

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

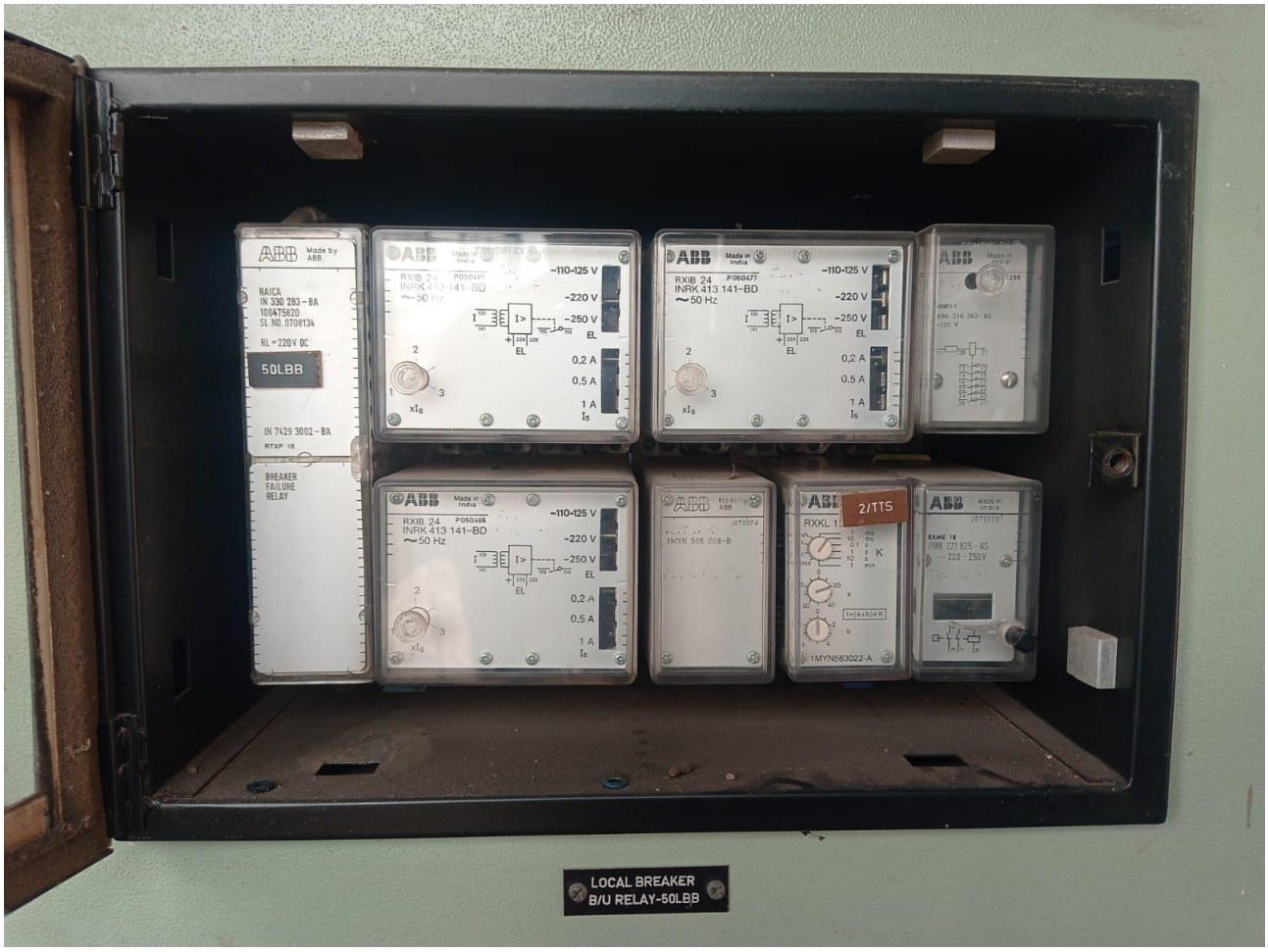
Annexure 2: DR recorded



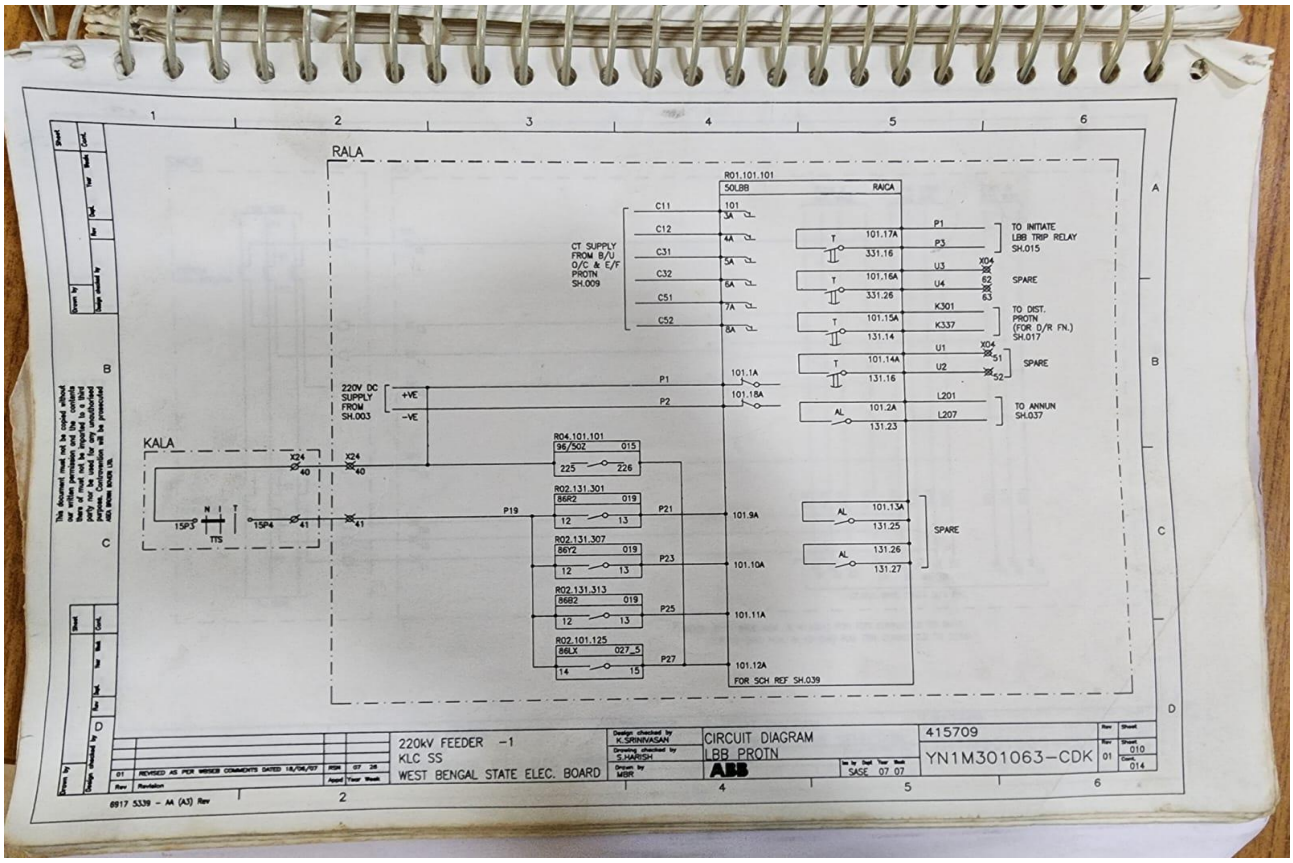
INCIDENT / EVENT REPORTING iro Total power failure at KLC-220KV substation on 04.01.2023

	DETAILS	**REMARKS**
(i)	Time and date of event	04:42 Hr. & 05:42 Hr. on04.01.2023
(ii)	Location	KLC-Bantala220 KV Sub-Station.
(iii)	Plant and/or Equipment directly involved	220KV KLC-NAA-III feeder bay with 220 KV main bus (1 Main 1 transfer Bus scheme in 220 KV side)
(iv)	Description and cause of event	LBB relay in KLC-NT AAIII is of ABB make RAICA type(Picture 1 and 2).During checking by testing wing it was observed that in NT-AA-III 220KV bay LBB relay B phase current coil (RXIB) output terminal no-114 &115 was shorted (picture -3)by an external conductive path which was created due to heavy sedimentation throughout the contact(Picture-4).For this positive was extended to the timer ckt (RXKL)of LBB, thus LBB operated and all feeders and transformers connected to 220 KV Main Bus tripped as it runs as 1 Main 1 Transfer bus scheme. The conducting channel path is not of permanent conducting type, that's why after first LBB operation (at 04:42 hrs),LBB relay could reset. However after charging, LBB again came after 37 minutes of holding, indicating shorting was not permanent. As KLC 220 KV substation is in vicinity of tannery, severe chemical contamination (plinth puncture, relay failure) is quite common phenomenon. However keeping in mind in the recent past 2 incident of combiflex plinth shorting incident , it is recommended to clean all combiflex terminals in every month.
(v)	Antecedent conditions	KLC-220KV substation was drawing power through 220KV KLC-SBGM PGCL ckt and 220KV KLC-NAA-III ckt. 160MVA Tr-I and 160MVA Tr-II was under normal condition.220kv,132kv and 33KV bus transfer bus was completely free. All three no's 50MVA Transformer was running parallel and under normal condition.
(vi)	Demand and/or Generation (in MW) interrupted and duration of interruption	Total load loss around 20MW from 04:42 hrs to 05:05 hrs. Total load loss around 21MW from 05:42 hrs to 05:53 hrs.

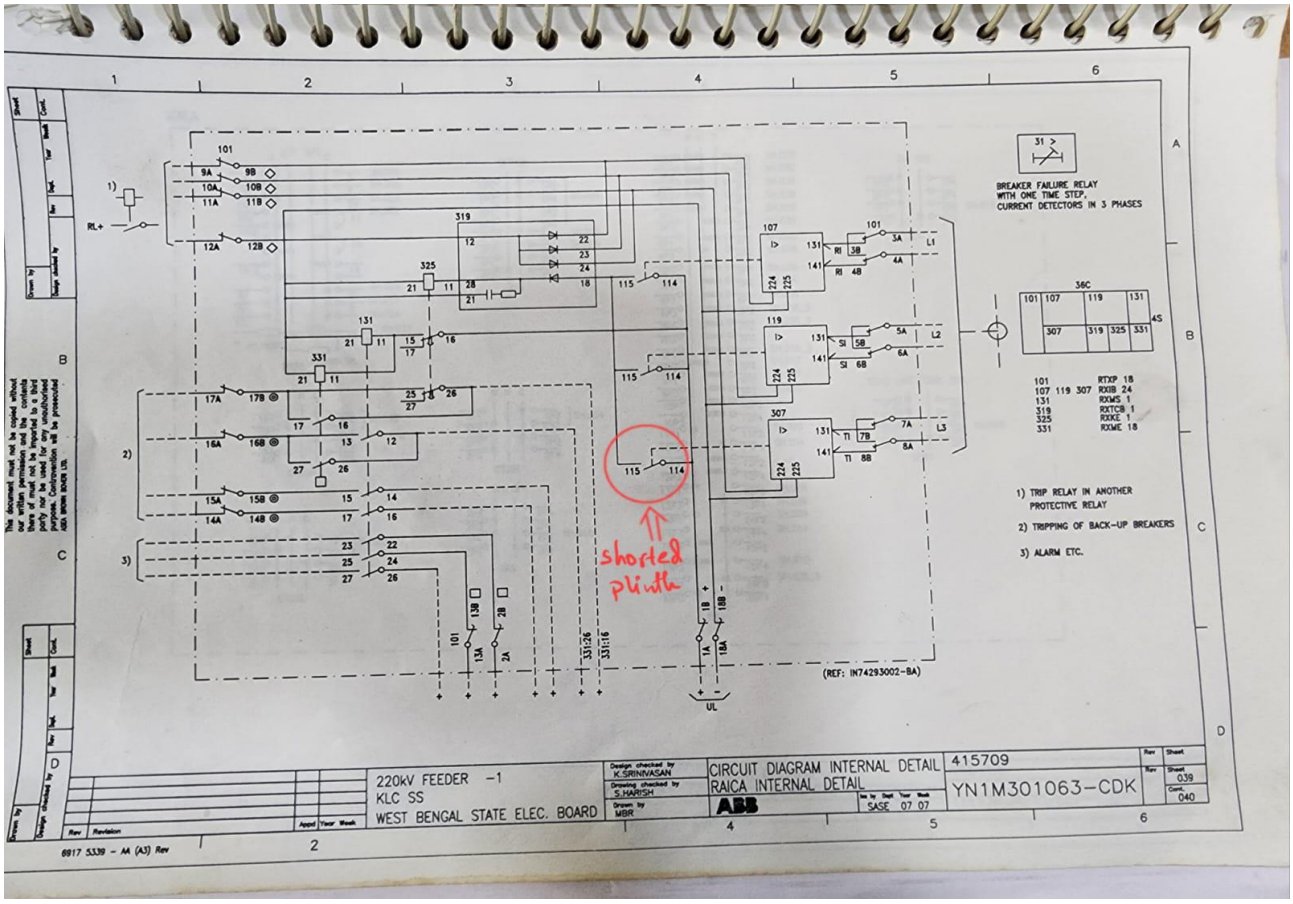
(vii)	All Relevant system data including copies of records of all recording instruments including Disturbance Recorder, Event, Logger, DAS etc.	DR from each 220 KV feeder panel were taken and during analyzing it was found LBB was coming from KLC-NT220 KV bay.
(viii)	Sequence of trippings with time	Total power failure occurred at KLC-220KV substation at around 04:42 hrs on 04.01.2023.All the CB's along 220KV side tripped with LBB at 220KV KLC-NAA-III feeder panel and LBB operated facia displayed. At around 05:05 hrs 220 KV KLC-NAA-III feeder bay charged and 160MVA TR-I was charged as per instruction of SLDC and stood Ok. But after that again at around 05:42 hrs total power failure occurred at KLC-220KV substation with LBB at 220KV KLC-NAA-III feeder panel and power was restored through 132KV KLC-Kasba-Saltlake Ckt at around 05:54 hrs. Entire 220KV System was normalized at 12:40 hrs.
(ix)	Details of Relay Flags	**1) LBB,96 at220KV KLC-NAA-III feeder panel.** **2) 96at220KV KLC-PGCL feeder panel.** **3) 96at 160MVA TR-I and 160MVA TR-II panel**
(x)	Remedial measure	1.Relay terminal was thoroughly checked and the shorted terminals were cleaned. 2.LBB relay at **KLC-NAA-III 220 KV feeder was checked and found OK.**
(xi)	Estimate of time to return to service	At 12:40 HRS entire system normalized .
(xii)	Recommendation for Future Improvement/Repeat Incident	As KLC 220 KV substation is in vicinity of tannery , severe chemical contamination (plinth puncture, relay failure) is quite common. However keeping in mind in the recent past 2 incident of combiflex plinth shorting incident occurring, it is recommended to clean all combiflex terminals in every month.
(xiii)	Name of The Organization	WBSETCL.



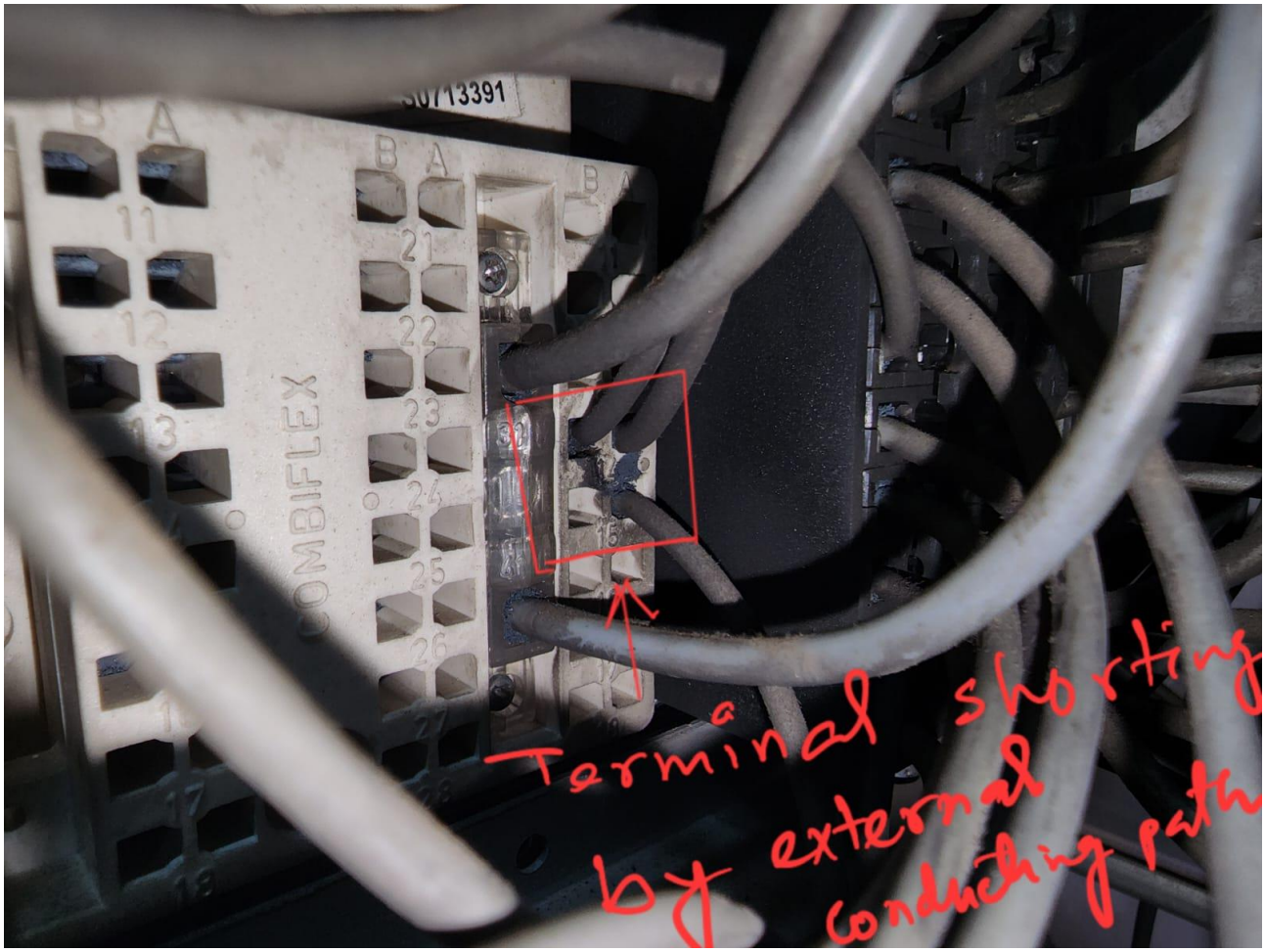
Picture 1-LBB relay iro KLC-NTAAIII 220 KV circuit.



Picture 2-LBB relay block drawing



Picture 3-LBB Relay internal Drawing(ABB RAICA make) clearly indicating shorted contact.



Picture 4-LBB relay Terminal View

पावर सिस्टम ऑपरेशन करपोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Government of India Enterprise)
Eastern Regional Load Despatch Centre: 14, Golf Club Road, Tollygunge, Kolkata-700 033.
CIN: U40105DL2009GOI188682
फ़ोन: 033- 24235755, 24174049 फैक्स : 033-24235809/5029 Website:www.erldc.org, Email ID- erldc@posoco.in

घटना संख्या: **04-01-2023/1** दिनांक: **13-02-2023**

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

Summary of the event (घटना का सारांश):

Event 1:

At 13:41 Hrs, during LBB testing at Ramchandrapur, 220 kV Bus-2 at Ramchandrapur along with connected feeders tripped. 220 kV Bus-1 was under shutdown for LBB testing. This led to load loss of around 100 MW at Ramchandrapur, Adityapur.

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- **Date / Time of disturbance:** 04-01-2023 at 13:41 hrs
- **Event type:** GD-1
- **Systems/ Subsystems affected:** 220/132 kV Ramchandrapur
- **Load and Generation loss**.
    - No generation loss was reported during the event.
    - 100 MW load loss reported during the event at Adityapur, Ramchandrapur

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

- 220 kV Main Bus-1 at Ramchandrapur
- 220 kV Jamshedpur-Ramchandrapur-1, 2 (440/220 kV ICT-1, 2 at Jamshedpur)
- 220 kV Ramchandrapur-Chaibasa-1
- 220 kV Ramchandrapur-Chandil
- 220 kV Ramchandrapur-Joda

Major elements tripped (प्रमुख ट्रिपिंग):

- 220 kV Main Bus 2 at Ramchandrapur
- 220 KV Jamshedpur-Ramchandrapur 3 (400/220 kV ICT 3 at Jamshedpur)
- 220 kV Chaibasa-Ramchandrapur-2
- 150 MVA 220/132 kV ATR 2 at Ramchandrapur

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

समय	नाम	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पीएमयू पर्यवेक्षण
13:41	220 kV Bus-2 at Ramchandrapur	Bus bar protection operated At Ramchandrapur	-	No fault observed from PMU
	220 kV Ramchandrapur-Jamshedpur- 3		Jamshedpur: Didn't trip	
	220 kV Ramchandrapur-Chaibasa-2		-	
	220/132 kV ATR-2 at Ramchandrapur		-	

Restoration (पूर्वावस्था की प्राप्ति)

Transmission/Generation element name	Restoration time
220 kV Bus 2 at Ramchandrapur	13:44
220 kV Jamshedpur-Ramchandrapur 3	14:04
220 kV Ramchandrapur-Chaibasa 2	13:44
150 MVA 220/132 kV ICT II at Ramchandrapur	-

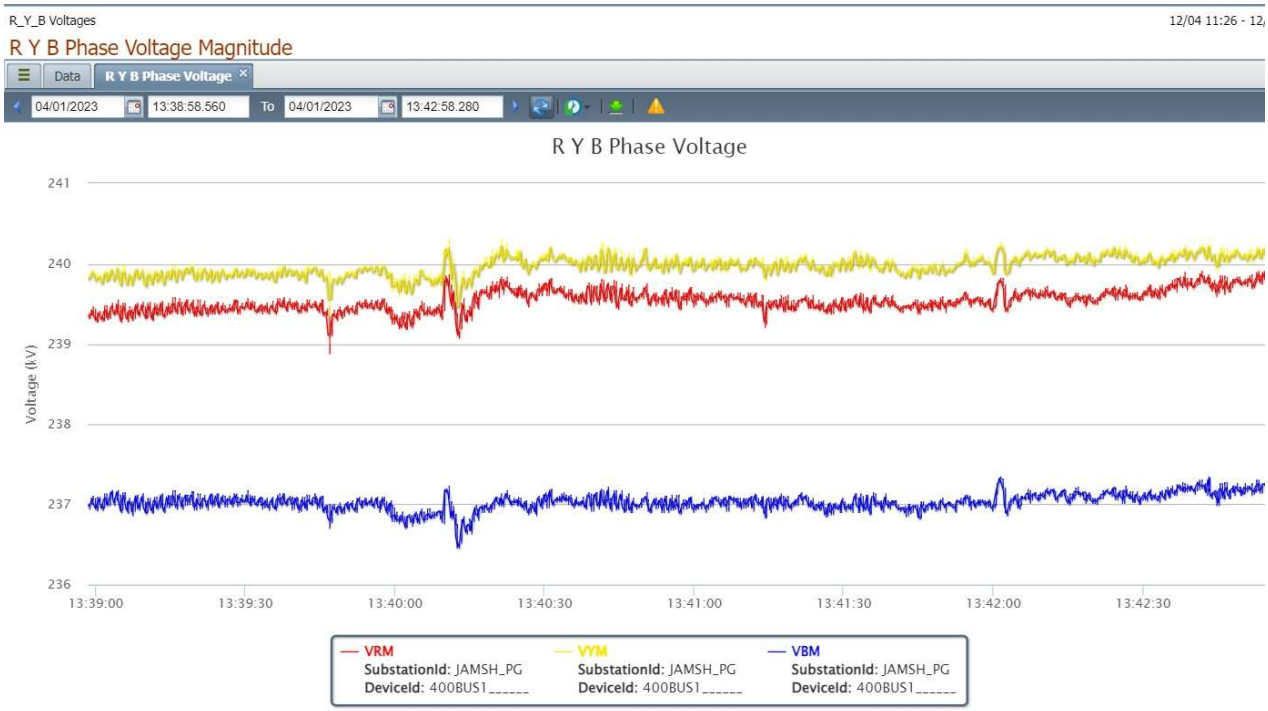

Figure 1: PMU snapshot of 400/220 kV Jamshedpur S/s

Event 2:

At 14:24 Hrs, during LBB testing at Ramchandrapur, 220 kV Bus-2 at Ramchandrapur along with connected feeders tripped. 220 kV Bus-1 was under shutdown for LBB testing. This led to load loss of around 85 MW at Ramchandrapur, Adityapur.

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- **Date / Time of disturbance:** 04-01-2023 at 14:24 hrs
- **Event type:** GD-1
- **Systems/ Subsystems affected:** 220/132 kV Ramchandrapur
- **Load and Generation loss**.
    - No generation loss was reported during the event.
    - 85 MW load loss reported during the event at Adityapur, Ramchandrapur

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

- 220 kV Main Bus-1 at Ramchandrapur
- 220 kV Jamshedpur-Ramchandrapur-1, 2 (440/220 kV ICT-1, 2 at Jamshedpur)
- 220 kV Ramchandrapur-Chaibasa-1
- 220 kV Ramchandrapur-Chandil
- 220 kV Ramchandrapur-Joda

Major elements tripped (प्रमुख ट्रिपिंग):

- 220 kV Main Bus 2 at Ramchandrapur
- 220 KV Jamshedpur-Ramchandrapur 3 (400/220 kV ICT 3 at Jamshedpur)
- 220 kV Chaibasa-Ramchandrapur-2
- 150 MVA 220/132 kV ATR 2 at Ramchandrapur

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

समय	नाम	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पीएमयू पर्यवेक्षण
14:24	220 kV Bus-2 at Ramchandrapur	Bus bar protection operated At Ramchandrapur	-	No fault observed from PMU
	220 kV Ramchandrapur-Jamshedpur- 3		Didn't trip	
	220 kV Ramchandrapur-Chaibasa-2		-	
	220/132 kV ATR-2 at Ramchandrapur		-	

Restoration (पूर्वावस्था की प्राप्ति)

Transmission/Generation element name	Restoration time
220 kV Bus 2 at Ramchandrapur	15:00
220 kV Jamshedpur-Ramchandrapur 3	18:41
220 kV Ramchandrapur-Chaibasa 2	-
150 MVA 220/132 kV ICT II at Ramchandrapur	15:00

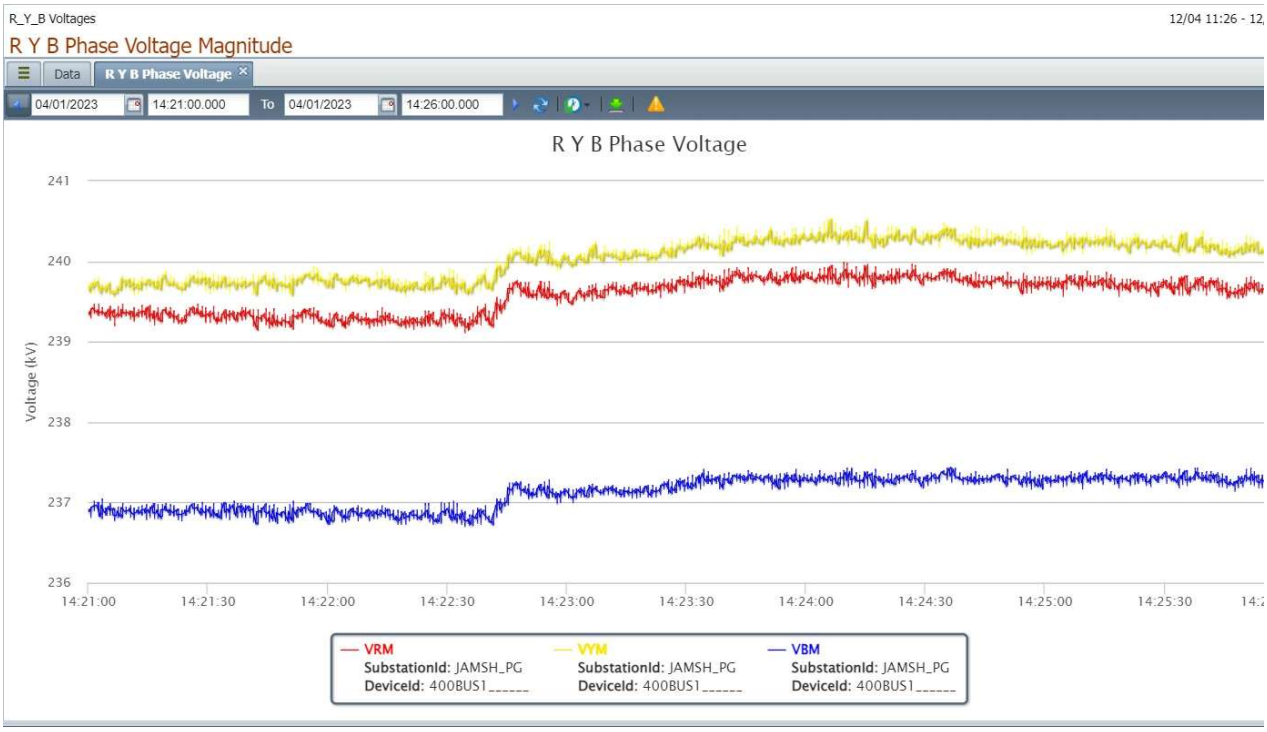


Figure 2: PMU snapshot of 400/220 kV Jamshedpur S/s

Network across the affected area (प्रभावित क्षेत्र का नक्शा)

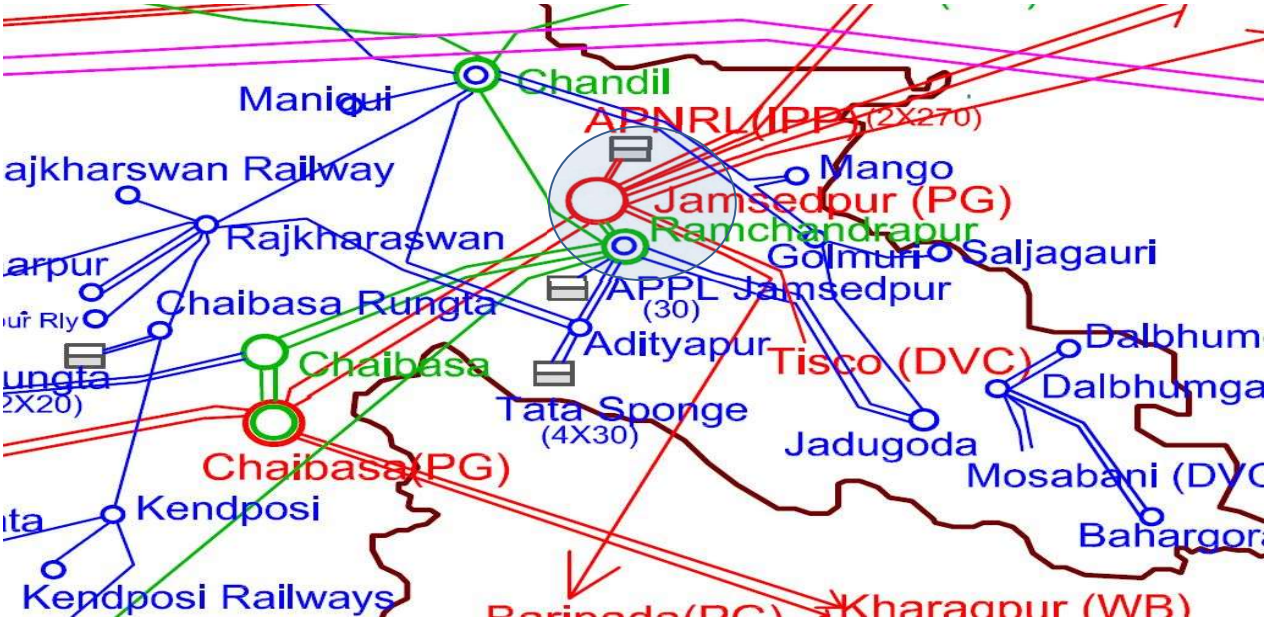


Figure 3: Network across the affected area

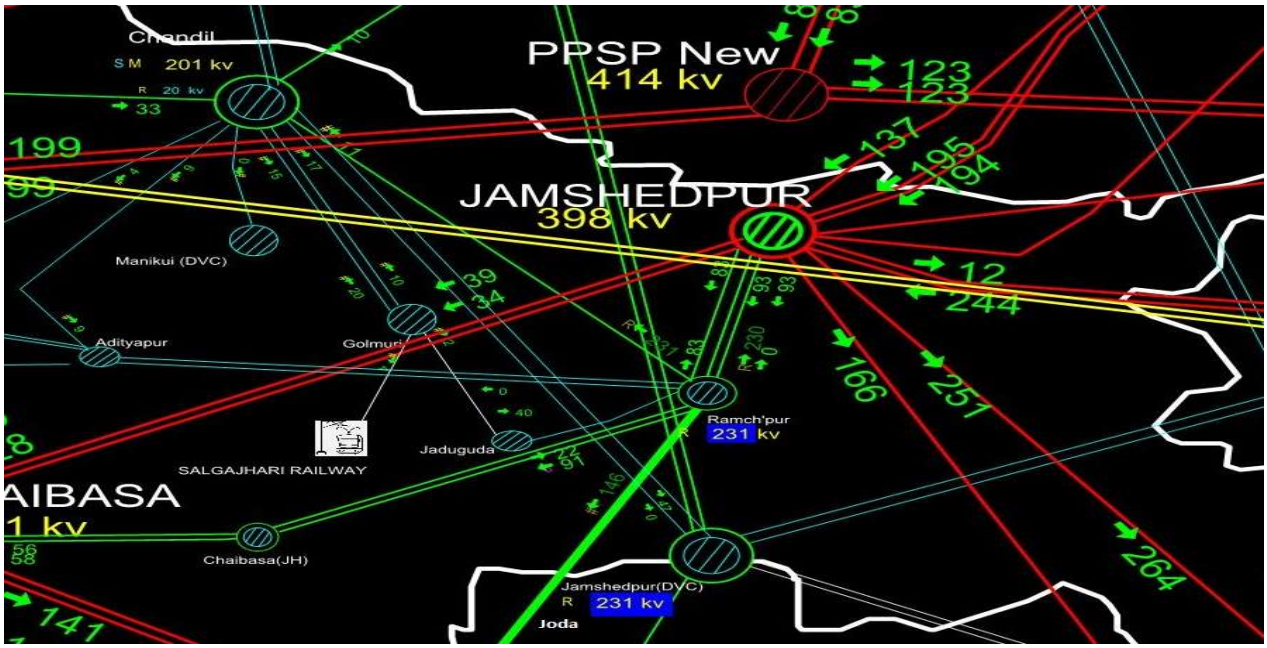


Figure 4: SCADA snapshot of the system

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

- At 13:41 Hrs, during LBB testing of 220 kV side bay of 400/220 kV ICT-3 at Rmachandrapur (connected to 220 kV bus-1), Bus bar protection of Bus-2 operated.
- As per DR, LBB of both buses got high. As reported, spare NO contact point from master trip relay (96) of bus coupler bay was taken as input for its LBB initiation.
- As LBB was triggered for ICT-3, 220 kV Bus-1 and bus coupler tripped. As bus coupler tripped, LBB initiated for bus coupler bay, which in turn tripped both 220 kV Bus.
- At 14:24 Hrs, 220 kV Bus-2 tripped again due to same problem.
- Later, LBB initiation signal for bus coupler bay was configured from output of back-up O/c relay of the coupler.
- **Any deviation from model protection scheme should be logged properly and updated schemes should be studied in detail before carrying out any testing activity, particularly bus-bar protection.**
- Report from JUSNL is attached at Annexure-3.

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

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

Status of Reporting (रिपोर्टिंग की स्थिति):

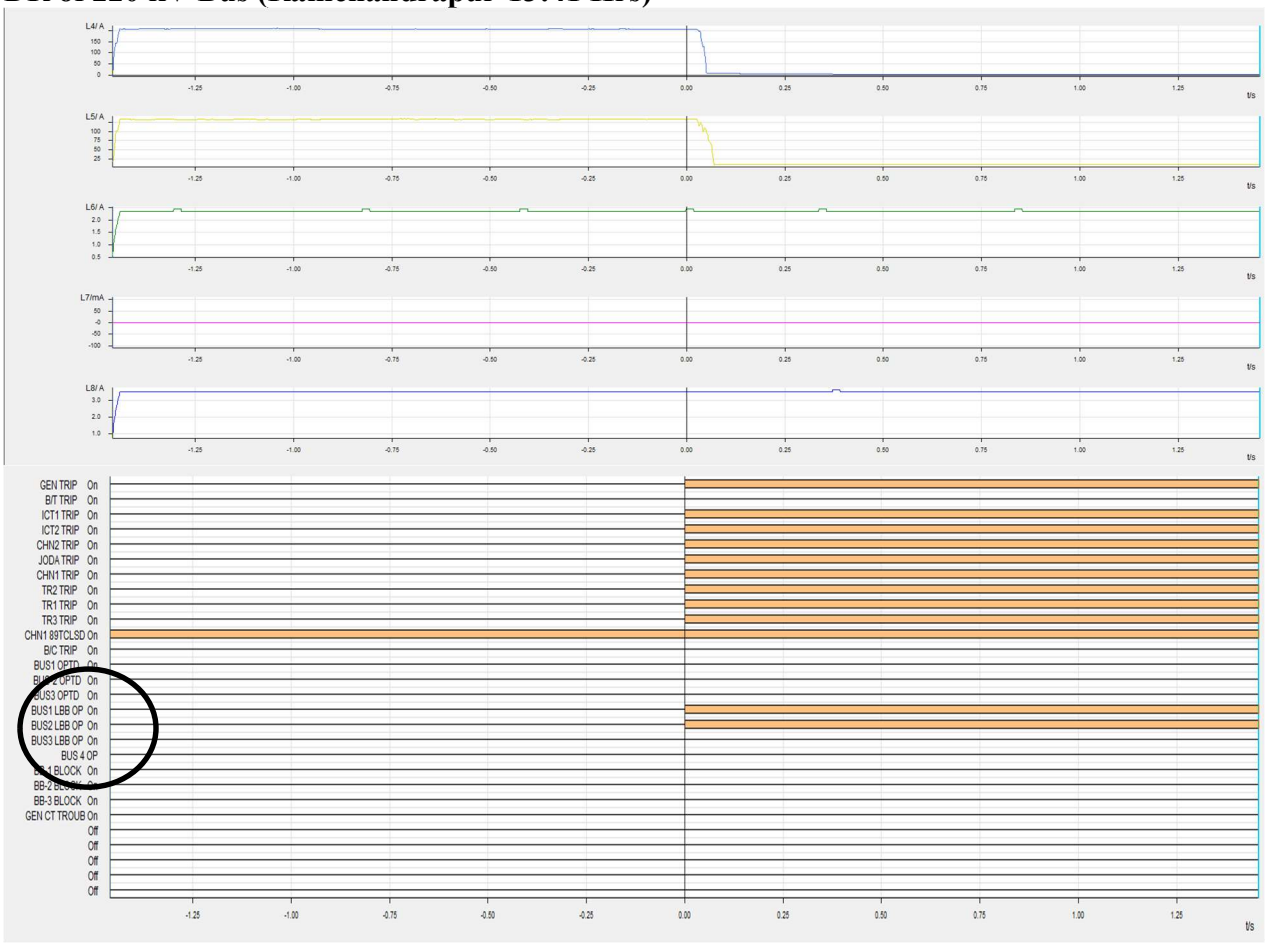
- DR/EL received from JUSNL.

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 220 kV Bus (Ramchandrapur-13:41 Hrs)



Disturbance at 220 kV Ramchandrapur S/s on 04.01.2023 at 13:41 hrs and 14:24 hrs

During the testing of LBB protection of Main Bus-2 feeders (220 kV RCP-PGCIL ckt-03, 150MVA ATR-02 & 220 KV CBSA-2) both Main Bus-1 & Main Bus-2 tripped alongwith all elements.

In that day LBB protection was going to incorporate with Bus bar differential protection and during its testing both main- 1and main- 2 bus got tripped due to improper mapping of LBB initiation from B/C bay and TBC bay to bus bar differential protection.

Tripping reporting from Ramchandrapur GSS

Subject: Tripping details of 220 KV Main Bus-2 feeders
GSS Ramchandrapur <aeeetsdrcp@gmail.com>
Sent: Thu, 5 Jan 2023 14:59:00 GMT+0530
To: sldcranchi <sldcranchi@gmail.com>, chief engineer critl <cecritl.jusnl@rediffmail.com>
Cc: DIVISION ADITYAPUR <td.adtp@gmail.com>
(20) Attachments: bus_04_01_01.cfg [2.43 KB] bus_04_01_01.dat [100.38 KB] bus_04_01_01.hdr [0.09 KB]
Bus_04_01_02.cfg [2.43 KB] Bus_04_01_02.dat [100.38 KB] Bus_04_01_02.hdr [0.09 KB]
Bus_04_01_03.cfg [2.43 KB] Bus_04_01_03.dat [100.38 KB] event.evt [73.65 KB]
Bus_04_01_03.hdr [0.09 KB] bus_04_01_01.cfg [2.43 KB] bus_04_01_02.cfg [2.43 KB]
bus_04_01_01.hdr [0.09 KB] bus_04_01_02.dat [103.13 KB] bus_04_01_01.dat [103.13 KB]
bus_04_01_03.cfg [2.43 KB] bus_04_01_02.hdr [0.09 KB] bus_04_01_03.dat [103.13 KB]
bus_04_01_03.hdr [0.09 KB] event.evt [71.68 KB]

Dear sir,
Please find the attachment of the DR and EL of the bus-bar differential relay, tripped on dated 04/01/2023 at 13:41 Hrs & 14:26 Hrs.During the testing of LBB protection Main Bus-2 feeders(220 KV RCP-PGCIL ckt-03, 220 Kv ATR-02 & 220 KV CBSA-2) tripped due 96 relay contacts of 220 KV B/C & 220 KV TBC which are connected to the 220 Kv BUS-BAR differential relay. The same has been rectified.

--
220/132kV G/S/S
Adityapur-2,Ramchandrapur.

Tripping Analysis :-

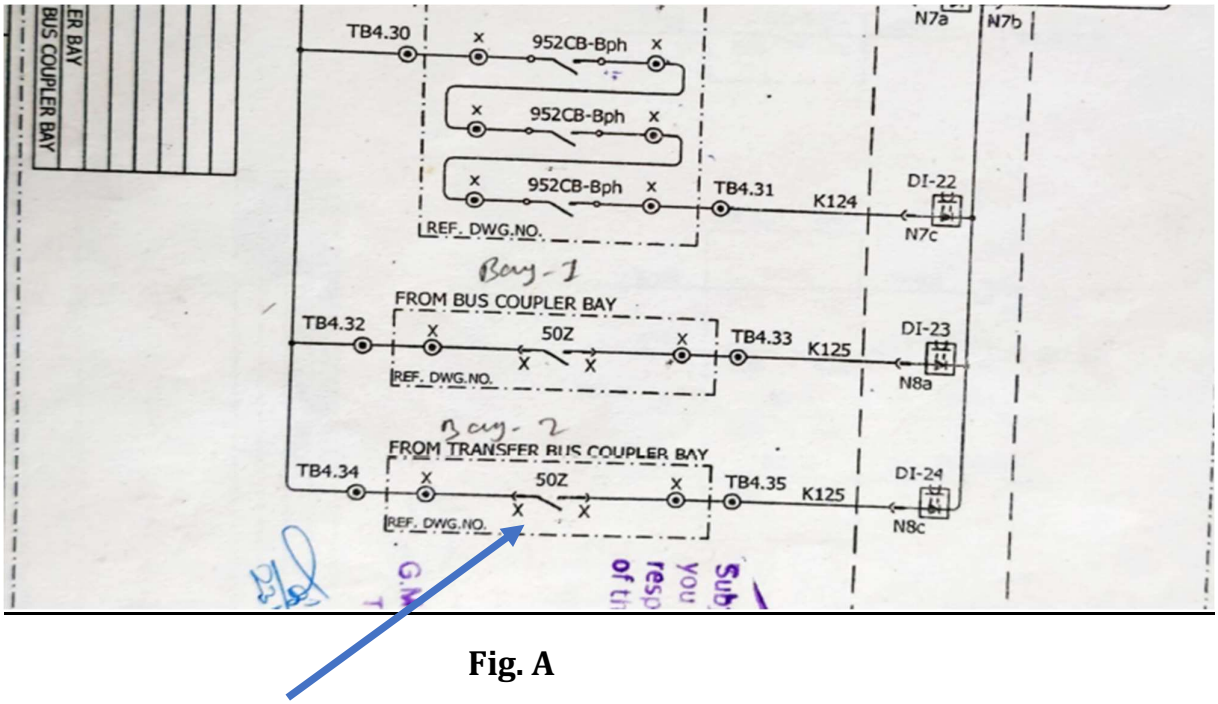
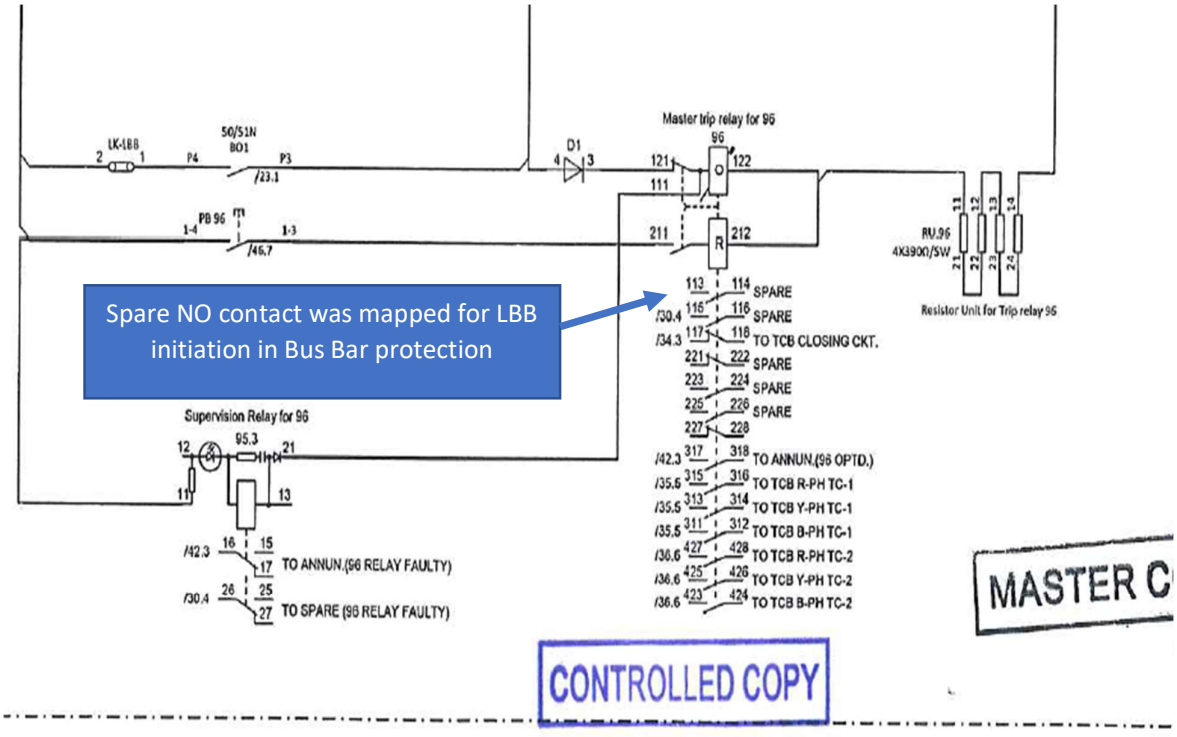


Fig. A

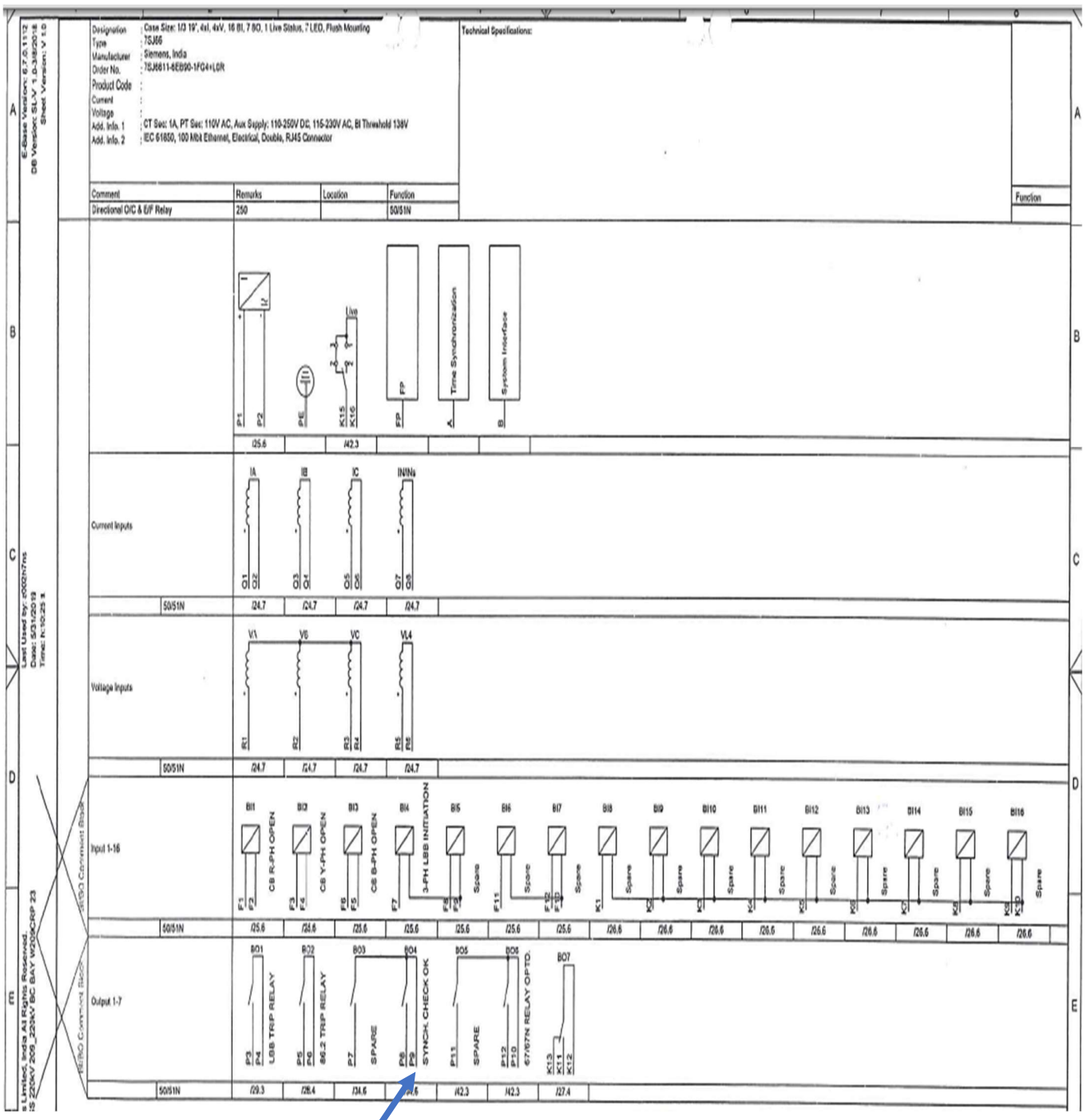
Ideally this LBB initiation should come from protection relay (as separate LBB relay is not provided) of B/C bay but this input was taken from spare NO contact of 96 relay (LBB trip relay) of bus coupler bay (as shown below).



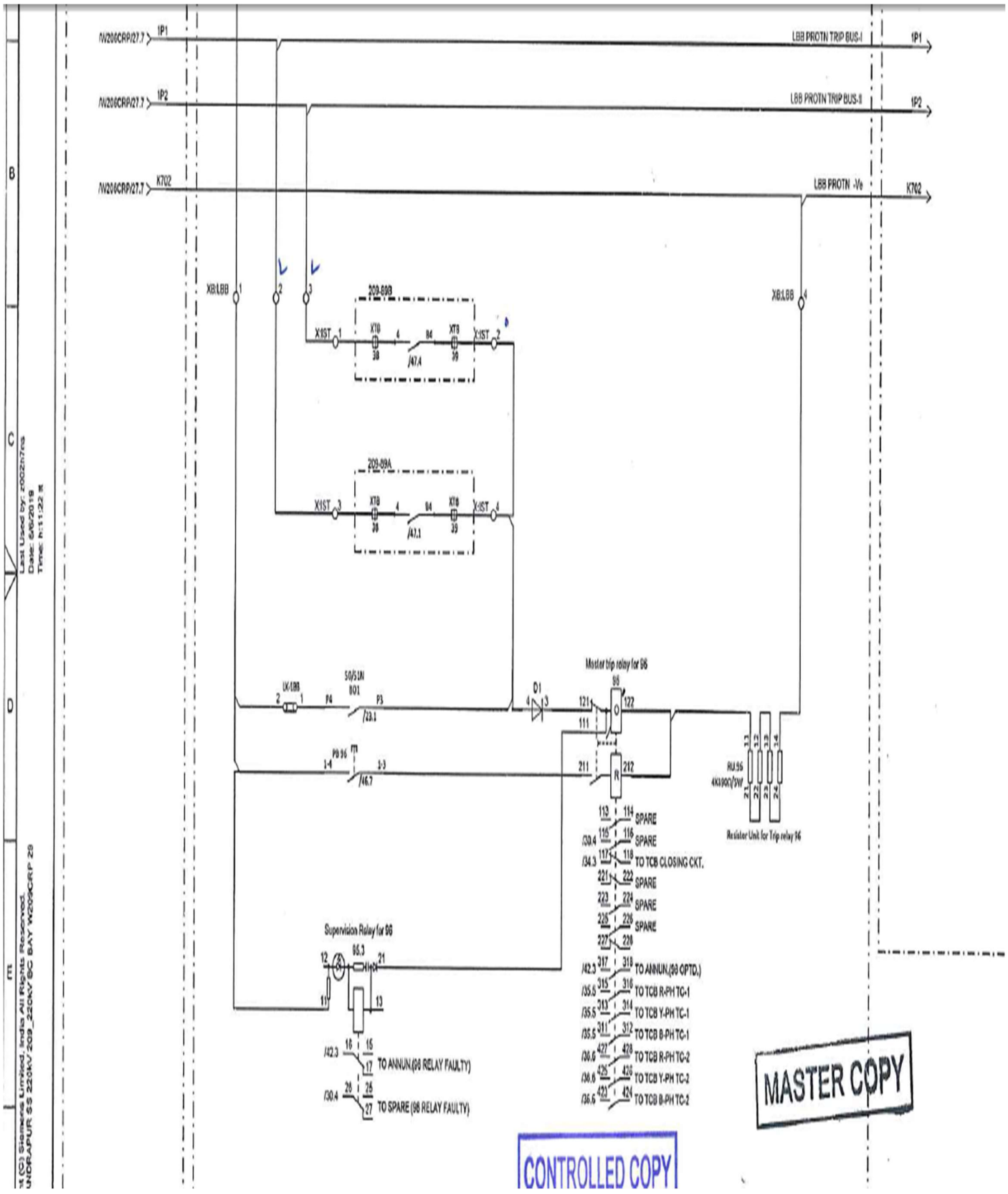
5/30/2019	RAMCHANDRAPUR SS 220kV		SIEMENS	209_220kV BC BAY	220/132/33kV JUSNL PACKAGE 3 &
MSK	JHARKHAND URJA SANCHARAN NIGAM LIMITED			96 LBB TRIP RELAY CKT.	
MSK	GEPDEC INFRATECH LTD.				
MJU	Orig.:	Replaces:	Replaced by:	Wiring Schematics	3006111835 (4)G7

Due to above wrongly mapped contact of LBB initiation to Bus Bar Differential protection, when LBB testing was conducted in PGCIL bay this bay generate LBB trip to Bus-1 and B/C. This leads to operation of 96 relay of B/C bay resulting continuous extending of +ve DC to LBB initiation of Bus Bar Differential protection (as shown in Fig. A) and Bus bar protection sense it like fault at B/C bay subsequently tripping of both main- 1 and main-2 bus in LBB protection.

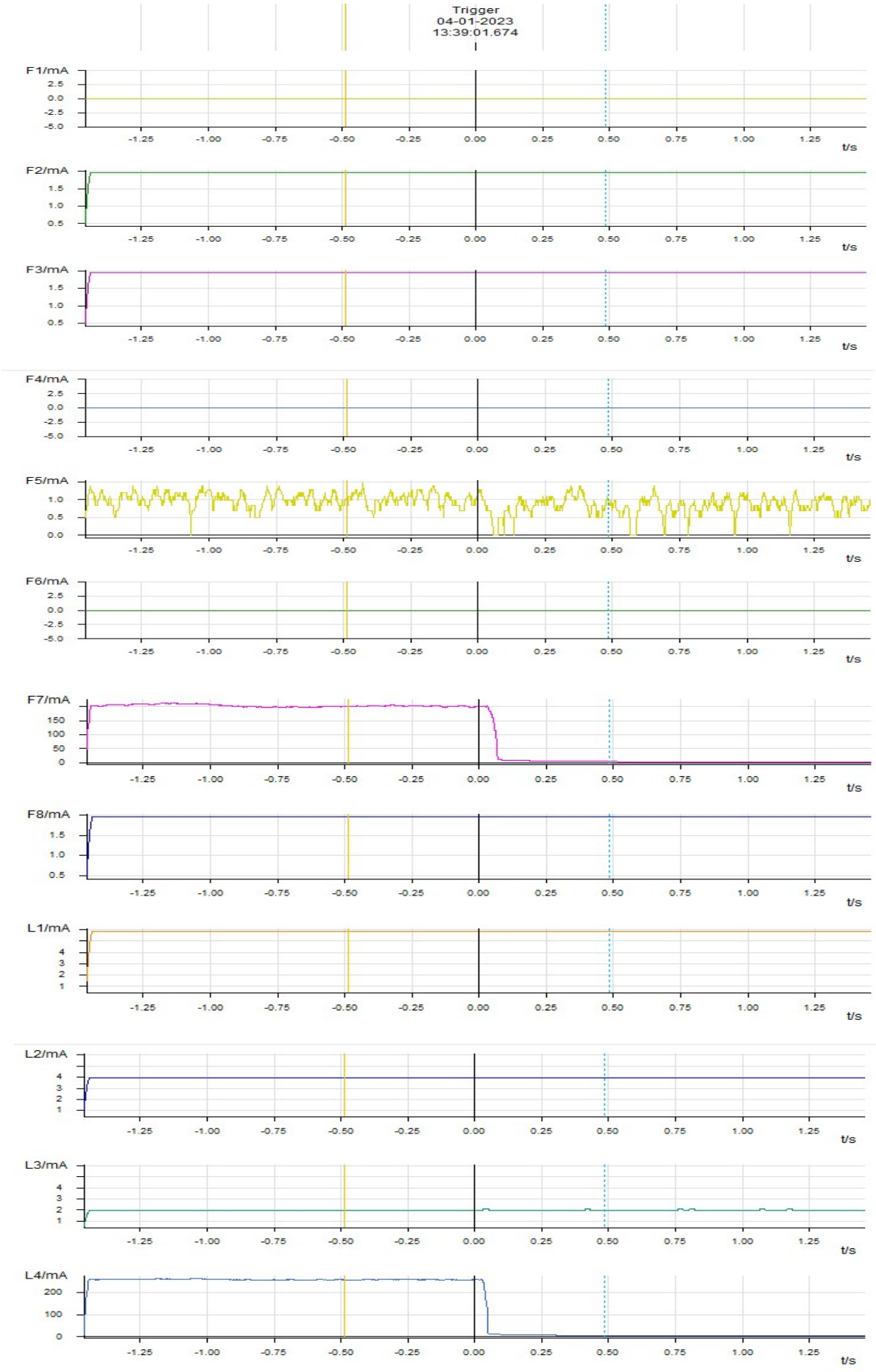
Remedial measure :-

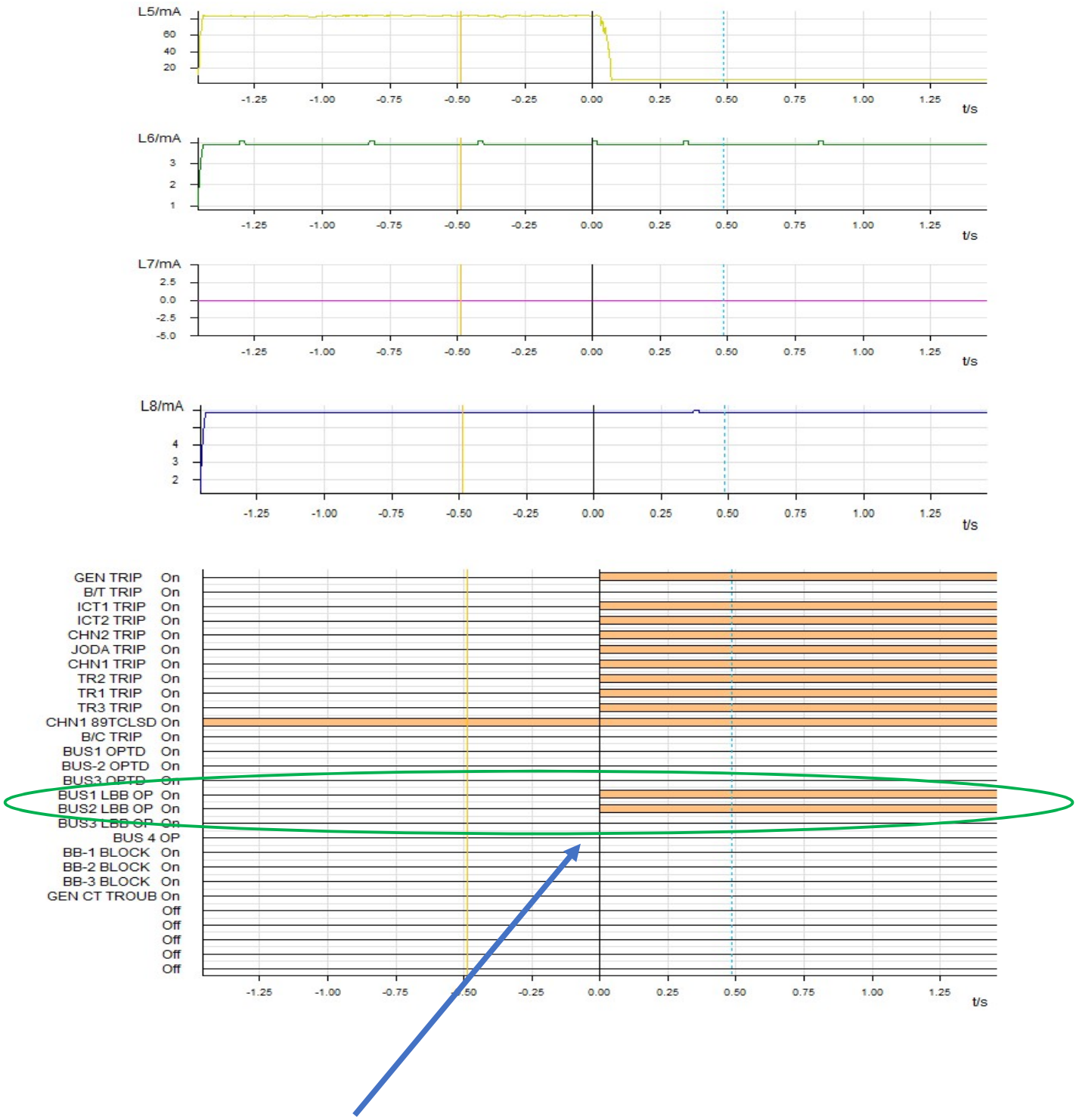


Output contact of back up relay of B/C bay is used for LBB initiation to Bus bar Differential Protection



DR of Bus bar protection





Tripping of both main bus-1 and main bus-2 in LBB

LIST OF NEW ELEMENTS CHARGED DURING Dec-22 & Jan-23

TRANSMISSION LINES

SL. NO.	Agency/Owner	LINE NAME	Length (KM)	Conductor Type	DATE	Remarks
1	JUSNL	400 kV Chandwa (PG) - Latehar (JUSNL) D/C Line	1.400	ACSR Moose	8-Dec-22	Lines were charged for the first time as anti-theft measure upto 1.4 kms from Chandwa end on 8 Dec 2022 at 18:18 hrs and 17:42 hrs.
2	BSPTCL	220 kV Patna (PG) - Sipara (BSPTCL) D/C Line after re-conductoring	0.614	ACCC Drake HTLS Zebra	8-Dec-22	Lines were charged after re-conductoring for the first time on 08-Dec-2022 on 17:34 and 17:37 Hrs
1	DFCCIL-IR	220 kV Pusauli (PG) - Durgauti (IR) D/C Line	17.249	ACSR Zebra	21-01-2023	Line 1 & 2 was anti-theft charged from Pusauli end along with associated bays 209 & 210 respectively upto length 17.24 kms on 22.01.2023 at 13:26 & 13:44 hours.

BUS/LINE REACTORS

SL. NO.	Agency/Owner	Element Name	SUB-STATION	Voltage Level (kV)	DATE	Remarks
1	OPTCL	400 kV 125 MVAr Bus Reactor at Mendhasal GSS	Mendhasal	400	15-Dec-22	Reactor was charged for the first time on 16-12-2022 at 20:16 Hrs.

BAYS

SL. NO.	Agency/Owner	Element Name	SUB-STATION	Voltage Level (kV)	DATE	Remarks
1	NTPC	Main Bays of 400 kV Gaya D/C Line at NTPC sitchyard	North Karanpura	400	2-Dec-22	Bay No. 2 was first time charged on 03-12-2022 at 12:35 Hrs.

FTC details for the month November & December 2022

SLDC. <sldc.dept@bsptcl.bihar.gov.in>

Tue 03-01-2023 10:08

To: Operation Maintenance <operation.maint@bsptcl.bihar.gov.in>; ERLDC FTC Grid Element <ftcer@grid-india.in>; ftcer@gmail.com <ftcer@gmail.com>;

Sir,
Following elements have been charged in month November & December 2022

GSS Name	Description	FTC Date	FTC Time	Remarks
Gangwara	132KV Gangwara-Pandaul line(HTLS)	31-12-2022	18:05	Charged after reconductoring work
132 Darbhanga	132KV Darbhanga-Samastipur(HTLS) S/C T/L	19-12-2022	16:32	Charged after reconductoring work
Gaurichak	220kV PG Patna -Sipara (Gaurichak) TL ckt - 2	08-12-2022	17:37	re-conductoring work completed by ACCC drake type HT:LS conductor
Gaurichak	220kV PG Patna -Sipara (Gaurichak) TL ckt - 1	08-12-2022	17:34	re-conductoring work completed by ACCC drake type HT:LS conductor
BGCL	220kV S/C Jakkanpur New (BGCL) - Khagaul (BSPTCL) T/L	03-12-2022	12:12	
BGCL	220kV S/C Jakkanpur New (BGCL) - Sipara (BSPTCL) ST/L	03-12-2022	12:28	
Dumrao	132 KV Dumraon-Bikramganj S/C T/L(HTLS)	20-11-2022	15:05	Charged after reconductoring work
Samastipur 220	220kV Samastipur(New/Ujiyarpur)-DMTCL(Darbhanga) ckt - 2	18-11-2022	13:10	Anti theft charge

Elements charged for first time in January-2023			
Sl No.	**Name of the element charged first time**	**Date**	**Time**
1	132/33kV 20MVA Power TRF-II at 220/132/33KV GSS, Aska New	6/1/2023	14:45HRS
2	132kV Barbil-Kamanda line from location no-119 to Kamanda end.	15/1/2023	14:46HRS
3	132kV Switching Station Kutra along with 132kV LILO from 132kV Kuchinda-Rajgangpur SC line to Kutra.	16/1/2023	14:52HRS
4	132kV Kutra-M/S Shiva Cement SC line	16/1/2023	15:23HRS
5	132/33kV 20MVA Power TRF-II at 132/33KV GSS, Chandipur	18/1/2023	14:28HRS
6	132kV LILO Sw. Station near M/S Ultratech Cements Ltd at Khamarnuagaon, Khuntuni with 132kV LILO arrangement from 132kV Arati steel-T.S.Alloys line.	18/1/2023	17:53HRS
7	12.5MW Solar Power Plant at 33kV level in 132/33kV witchyard of M/S ABREL having connectivity at 132kV with LILO switching station Saintala	23/1/2023	09:31HRS
8	220kV switchyard at 220/132/33kV GSS, Bamra having LILO connectivity with 220kV Budhipadar-Tarkera Ckt-II.	24/1/2023	18:17HRS
9	220/132kV 160MVA Auto TRF No-I at 220/132/33kV GSS, Bamra	24/1/2023	18:45HRS
10	220/132/33kV GSS, Kuarmunda having LILO connectivity with 220kV Budhipadar-Tarkera Ckt-I.	25/1/2023	16:44HRS
11	220/132kV 160MVA Auto TRF No-II at 220/132/33kV GSS, Kuarmunda	25/1/2023	16:54HRS
12	132/33kV 40MVA Power TRF-I at 220/132/33KV GSS, Kuarmunda	25/1/2023	18:04HRS
13	Synchronization(re-energization) of 19.5MW TG-I of CGP of M/S NINL, Duburi with OPTCL network of 220/132/33KV GSS,Duburi(old) through 220kv Duburi(old)-NINL feeder.	27/1/2023	14:11HRS

List of important transmission lines in ER which tripped in January-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 LOCAL END	DR/EL RECEIVED FROM REMOTE END	UTILITY RESPONSE
1	400 KV BARH-PATNA-1	01-01-2023	02:48	01-01-2023	04:24	-	Patna: DT received	No fault	NA	After 200 msec of fault in Barh-Kahalgaon, tie bay LBB operated.		Yes	Yes	
2	400 KV BARH-KAHALGAON (KHSTPP)-1	01-01-2023	02:48	01-01-2023	04:33	Barh: Y_N, Zone-1, 10.28 km, 19.59 kA	Kahalgaon: DT received	Y-Earth	100	After 200 msec, LBB of tie bay operated. LBB logic was rectified. Barh may explain.		Yes	No	
3	400 KV BARH-PATNA-1	01-01-2023	04:38	01-01-2023	06:02	-	Patna: DT received	No fault	NA	After 200 msec of fault in Barh-Kahalgaon, tie bay LBB operated.		Yes	Yes	

4	400 KV BARH-KAHALGAON (KHSTPP)-1	01-01-2023	04:38	01-01-2023	19:04	Barh: Y_N, Zone-1, 10.08 km, 20.33 kA	Kahalgaon: DT received	Y-Earth	100	After 200 msec, LBB of tie bay operated. LBB logic was rectified. Barh may explain.		Yes	No	
5	400 KV BIHARSHARIF-VARANASI-2	01-01-2023	06:26	01-01-2023	08:05	Biharsharif: B_N, 112.5 km, 3.345 kA	Varanasi: B_N, 190.90 km, 2.127 kA	B-Earth	100	A/r failed after 1 second		Yes	NA	
6	220 KV SUBHASHGRAM-BARUIPUR-1	01-01-2023	17:04	02-01-2023	07:24	Subhashgram: R_Y, 1.2 km, Ir: 20.4 kA, Iy: 20.36 kA	Baruipur: R_Y, Zone-2, 29.35 km, Ir: 5.45 kA, Iy: 5.6 kA	R-Y	100	Phase to phase fault		No	Yes	
7	400 KV BIHARSHARIF-VARANASI-2	01-01-2023	23:25	02-01-2023	16:18	Biharsharif: B_N, 36.59 km, 7.433 kA	-	B-Earth	100	A/r failed after 1 second		Yes	NA	
8	400 KV MUZAFFARPUR-GORAKHPUR-1	02-01-2023	00:20	02-01-2023	11:17	Muzaffarpur: Y_N, 261 km (100%), 1.732 kA	Gorakhpur: Y_N, 2 km, 16 kA	Y-Earth	100	A/r failed after 1 second		Yes	NA	
9	400 KV SASARAM-ALLAHABAD-1	02-01-2023	00:40	02-01-2023	10:48	Sasaram: Y_N, 22.6 km, 3.5 kA		Y-Earth	100	A/r failed after 1 second		Yes	NA	
10	400 KV BIHARSHARIF-VARANASI-1	02-01-2023	00:46	02-01-2023	06:26	Biharsharif: R_N, 52.31 km, 6.036 km		R-Earth	100	A/r failed after 1 second		Yes	NA	

11	400 KV BIHARSHARIF-SASARAM-2	02-01-2023	01:18	02-01-2023	02:06	Biharsharif: Tie bay LBB operated. 400 kV Biharsharif-Balia-2 is in same dia	Sasaram: DT received	No fault	NA	During A/r of 400 kV Biharsharif-Balia-2, tie bay LBB operated at Biharsharif. PG ER-1 may explain.		Yes	Yes	
12	400 KV BIHARSHARIF-BALIA-2	02-01-2023	01:18	02-01-2023	07:53	Biharsharif: Y_N, 0.5 km, 20.38 kA		Y-Earth	100	Fault in Y_ph during A/r		Yes	NA	
13	400 KV BIHARSHARIF-KODERMA-2	02-01-2023	02:18	02-01-2023	02:45	Biharsharif: Y_N, 17.9 km, 7.3 kA	Koderma: Y_N, 18.8 km, 6.6 kA	Y-Earth	100	A/r successful from Biharsharif only. Other two phase tripped at Koderma after 3.5 seconds. PD time may be reviewed by DVC.		Yes	Yes	
14	400 KV BIHARSHARIF-KODERMA-1	02-01-2023	02:34	02-01-2023	18:11		Koderma: Y_N, 96.7 km, 6.92 kA	Y-Earth	100	Three phase tripping at Biharsharif, A/r successful from Koderma.		Yes	Yes	

15	400 KV BIHARSHARIF-KODERMA-2	02-01-2023	03:45	02-01-2023	05:08		Koderma: Y_N, 100.75 km, 4.32 kA	Y-Earth	100	A/r successful from Biharsharif only. Other two phase tripped at Koderma after 3.5 seconds. PD time may be reviewed by DVC.		Yes	Yes	
16	400 KV NEW PURNEA-FARAKKA-1	02-01-2023	04:36	03-01-2023	14:28	New purnea: R_B, 37.45 km, Ir: 10.2 kA, Ib: 10.12 kA	Farakka: R_B, 130 km, Ir: 4.45 kA, Ib: 4.25 kA	R-B	100	Phase to phase fault		Yes	Yes	
17	400 KV NEW PURNEA-MUZAFFARPUR-1	02-01-2023	08:00	03-01-2023	16:18	New Purnea: Y_N, 169 km, 2.04 kA	Muzaffarpur: Y_N, 57.29 km, 6.346 kA	Y-Earth	100	A/r failed after 1 second		No	Yes	
18	400 KV ARAMBAG-BAKRESWAR-1	03-01-2023	05:18	03-01-2023	17:56	Arambag: R_N, 87.51 km, 4.71 kA	Bakreswar: R_N, 52.5 km, 4.31 kA	R-Earth	100	A/r failed after 1 second		Yes	No	
19	400 KV FARAKKA-RAJARHAT-1	03-01-2023	06:14	03-01-2023	07:41	Farakka: Y_N, 2 kA	Rajarhat: Y_N, 169 km, 2.46 kA	Y-Earth	100	A/r failed after 1 second		Yes	Yes	

20	220 KV RANCHI-RAMGARH-1	05-01-2023	02:35	05-01-2023	03:21	Ranchi: R_N, A/r successful	Ramgarh: R_N, 22.35 km	R-Earth	100	Three phase tripping at Ramgarh. A/r attempted but only 2 phase closed. DVC may explain.		Yes	Yes	
21	400 KV SASARAM-BRBCL-2	07-01-2023	02:58	08-01-2023	17:00	Sasaram: R_N, 51.35 km, 5.7 kA		R-Earth	100	A/r failed after 1 second		Yes	No	
22	400 KV BIHARSHARIF-VARANASI-1	07-01-2023	04:21	07-01-2023	21:45	Biharsharif: Y_N, 152.49 km, 2.79 kA		Y-Earth	100	A/r failed after 1 second		Yes	NA	
23	400 KV BIHARSHARIF-VARANASI-1	09-01-2023	06:13	09-01-2023	16:48	Biharsharif: Y_N, 148.8 km, 2.9 kA		Y-Earth	100	A/r failed after 1 second		Yes	NA	
24	400 KV BIHARSHARIF-VARANASI-2	10-01-2023	00:24	11-01-2023	00:19	Biharsharif: R_N, 172 km, 2.5 kA	Varanasi: R_N, 128 km, 3.5 kA	R-Earth	100	A/r failed after 1 second		Yes	NA	
25	400 KV BIHARSHARIF-VARANASI-1	10-01-2023	01:56	10-01-2023	22:23	Biharsharif: Y_N, 156 km, 2.6 kA		Y-Earth	100	A/r failed after 1 second		Yes	NA	
26	SASARAM-BRBCL-1	10-01-2023	02:46	10-01-2023	17:37	Sasaram: Y_N, 50.8 km, 6.4 kA	BRBCL: Y_N, 47 km, 4.07 kA	Y-Earth	100	A/r failed after 1 second		Yes	No	
27	400 KV SASARAM-DALTONGANJ-2	10-01-2023	03:24	10-01-2023	19:40	Sasaram: Y_N, 7.54 km, 13.15 kA		Y-Earth	100	A/r failed after 1 second		Yes	No	
28	400 KV BIHARSHARIF-KODERMA-2	10-01-2023	05:57	10-01-2023	06:29	Biharsharif: Y_N, 19.2 km, 7.11 kA, A/r successful	Koderma: Y_N, 85.17 km, 4.45 kA	Y-Earth	100	A/r successful from Biharsharif only. Other two phase tripped at Koderma after 3.5 seconds. PD time may be reviewed by DVC.		Yes	Yes	

29	400 KV BIHARSHARIF-KODERMA-2	11-01-2023	03:50	11-01-2023	04:31	Biharsharif: Y_N, 18.18 km, 8.66 kA, A/r successful	Koderma: Y_N, 85.66 km, 4.37 kA	Y-Earth	100	A/r successful from Biharsharif only. Other two phase tripped at Koderma after 3.5 seconds. PD time may be reviewed by DVC.		Yes	Yes	
30	765 KV GAYA-VARANASI-2	11-01-2023	04:31	11-01-2023	05:32	Gaya: R_N, 236.7 km, 3.6 kA	Varanasi: A/r successful	R-Earth	100	Three phase tripping for single phase fault. PG ER-1 may explain.		Yes	NA	
31	400 KV BIHARSHARIF-KODERMA-2	11-01-2023	04:49	11-01-2023	19:54	Biharsharif: Y_N, 18.79 km, 9.52 kA	Koderma: Y_N, 74.4 km, 6.02 kA	Y-Earth	100	A/r failed after 1 second		Yes	Yes	
32	220 KV KARMNASHA-SAHUPURI-1	12-01-2023	05:14	12-01-2023	06:57	Karmnasha: Didn't trip	Sahupuri: R_N, 36.36 km, 3.211 kA	R-Earth	100	A/r couldn't be ascertained from PMU. BSPTCL may confirm.		No	NA	
33	400 KV NORTH KARNPURA-CHANDWA-1	12-01-2023	12:27	12-01-2023	13:03		Chandwa: DT received	No fault	NA	JUSNL/NTPC may explain		No	No	
34	220 KV MUZAFFARPUR-HAZIPUR-2	12-01-2023	13:04	12-01-2023	14:26	Muzaffarpur: DT received	Hazipur: Bus bar protection operated	No fault	NA	BSPTCL may explain		No	NA	

35	220 KV RANCHI-RAMGARH-1	12-01-2023	16:20	12-01-2023	16:35	Ranchi: DT received	Ramgarh: Didn't trip	No fault	NA	DVC may explain		Yes	NA	
36	400 KV NEW DUBURI-MERAMUNDALI-1	14-01-2023	05:06	14-01-2023	19:13	New Duburi: B_N, 30.6 km, 9.06 kA, A/r attempt unsuccessful	Meramundali: B_N, 59.3 km, 5.2 kA, A/r unsuccessful	B-Earth	100	A.r failed after 1 sec		Yes	Yes	
37	220 KV NEW PURNEA-KHAGARIA-1	14-01-2023	06:26	14-01-2023	07:51	New Purnea: B_N, 94.5 km, 2.35 kA	Khagaria: B_N, 4.98 km, 6.31 kA, A/r successful	B-Earth	350	Tripped in Zone-2 time from New Purnea. A/r successful from Khagaria.		Yes	Yes	
38	400 KV RANGPO-TEESTA 3-1	14-01-2023	16:51	15-01-2023	11:00	Rangpo: R_N, 38.06 km, 4.96 kA	Teesta 3: R_N, 15.24 km, 5.468 kA	R-Earth	100	A/r under shutdown for OPGW work		Yes	Yes	
39	220 KV RAJARHAT-BARASAT-1	15-01-2023	03:49	15-01-2023	07:49	Rajarhat: B_N, 3 km, 14.4 kA	Barasat: B_N, Zone-2, 16 km, 5 kA	B-Earth	100	Three phase tripping for single phase fault. DT received at Rajarhat after 150 msec. WBSETCL may explain.		Yes	Yes	
40	220 KV MUZAFFARPUR-HAZIPUR-2	15-01-2023	22:59	15-01-2023	23:21	Muzaffarpur: DT received	Hazipur: Didn't trip	No fault	NA	BSPTCL may explain		No	NA	
41	220 KV MUZAFFARPUR-HAZIPUR-2	15-01-2023	23:52	16-01-2023	18:39	Muzaffarpur: DT received	Hazipur: Didn't trip	No fault	NA	BSPTCL may explain		No	NA	

42	220 KV SANTALDIH-CHANDIL-1	18-01-2023	05:19	18-01-2023	11:53	Santaldih: R_N, 22.9 km	Chandil: R_N, 82 km, 1.09 kA	R-Earth	100	Other two phase at Chandil tripped after 200 msec. JUSNL/WBPDCL may explain.		No	Yes	
43	400 KV KOLAGHAT-KHARAGPUR-1	18-01-2023	07:10	18-01-2023	07:22	Tripped during diversion through TBC at Kolaghat		No fault	NA	WBPDCL may explain		No	Yes	
44	400 KV RANGPO-TEESTA 3-1	18-01-2023	14:45	18-01-2023	16:13	Rangpo: R_N, 42.77 km, 5.3 kA	Teesta 3: R_N, 9.15 km, 2.64 kA	R-Earth	100	A/r under shutdown for OPGW work		Yes	Yes	
45	220 KV JEYPORE-JAYNAGAR-1	19-01-2023	13:25	19-01-2023	13:58	Jeypore: Didn't trip	Jayanagar: DT received	No fault	NA	After bay swapping b/w Ckt-1 & 2, necessary changes in carrier protection was not done. OPTCL may explain.		NA	No	
46	400 KV RANCHI-RAGHUNATHPUR-1	19-01-2023	16:19	19-01-2023	16:38	Ranchi: DT received	Raghunathpur: Didn't trip	No fault	NA	DVC may explain		Yes	NA	
47	400 KV SASARAM-ALLAHABAD-1	21-01-2023	00:15	21-01-2023	01:06	Sasaram: R_B, 101.4 km, Ir: 2.2 kA, Ib: 2.3 kA		R-B	100	Phase to phase fault		Yes	NA	
48	220 KV JODA-RAMCHANDRAPUR-1	22-01-2023	13:20	22-01-2023	14:35	Joda: R_N, 2.058 km, 5.745 kA	Ramchandrapur: R_N, Zone-2, 122 km, 1.35 kA	R-Earth	400	Tripped in Zone-2 time from Ramchandrapur.		No	Yes	

49	400 KV BARH-MOTIHARI-1	23-01-2023	02:25	23-01-2023	02:55		Motihari: R_Y, 8.9 km, Ir: 11.75 kA, Iy: 12.15 kA	R-Y	100	Phase to phase fault		Yes	Yes	
50	220 KV MUZAFFARPUR-HAZIPUR-2	23-01-2023	12:33	23-01-2023	13:53	Muzaffarpur: B_N, 35.2 km, 3.348 kA	Hazipur: B_N, 24.7 km, 3.11 kA	B-Earth	100	A/r couldn't be ascertained from PMU. PG ER-1/BSPTCL may explain.		No	No	
51	400 KV MERAMUNDALI-JSPL-1	25-01-2023	13:03	25-01-2023	15:06	Meramundali: B_N, 17.3 km, 11.88 kA		B-Earth	100	A/r attempt failed after 500 msec. A/r dead time may be reviewed.		Yes	No	
52	220 KV MAITHON-DHANBAD-2	26-01-2023	05:03	26-01-2023	05:59	Maithon: R_N, 37.25 km, 3.41 kA		R-Earth	100	A/r successful from Dhanbad. Three phase tripping at Maithon. PG ER-2 may explain.		Yes	Yes	
53	400 KV RANCHI-RAGHUNATHPUR-2	27-01-2023	17:16	27-01-2023	17:35	Ranchi: DT received	Raghunathpur: Didn't trip	No fault	NA	DVC may explain		Yes	Yes	

54	400 KV BIDHANNAGAR-NEW CHANDITALA-1	29-01-2023	12:14	29-01-2023	12:33		New Chanditala: R_N, 48 km, 6.1 kA	R-Earth	100	A/r failed after 800 msec		Yes	Yes	

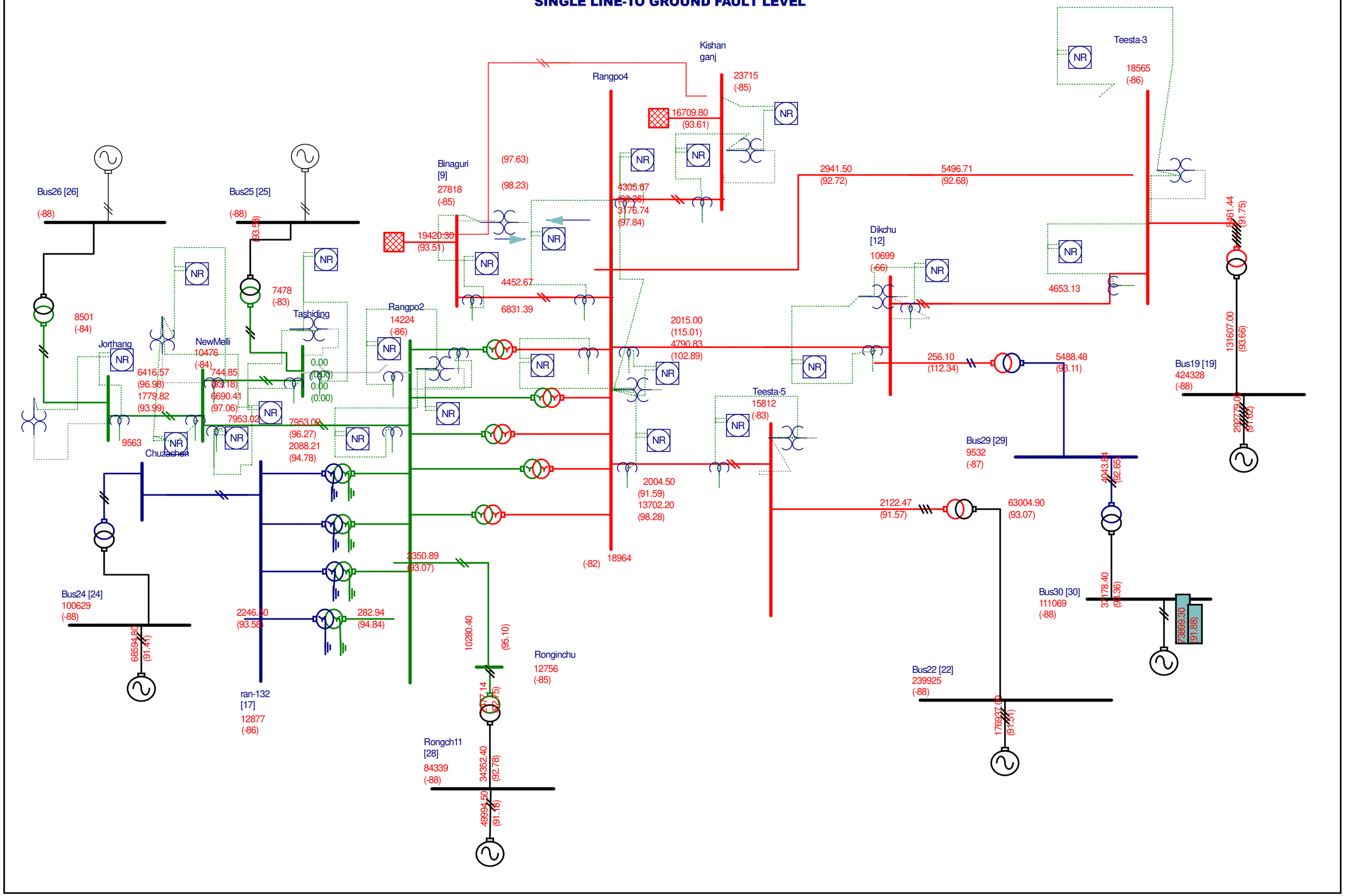
ANNEXURE-C.2

Sl No.	Name of the incidence	PCC Recommendation	Latest status
122nd PCC Meeting			
1.	Total Power failure at 220 kV Ramchandrapur(JUSNL) S/s on 17.12.2022 at 11:23 Hrs.	PCC advised JUSNL to test the concerned relay for 132 kV Ramchandrapur-Adityapur D/c at Adityapur end in consultation with relay OEM and share observation to ERPC/ERLDC after testing. PCC further advised JUSNL/SLDC Jharkhand for maintaining uniform feeder distribution for each bus at Ramchandrapur as well as for other substations.	
2.	Total Power failure at 220/132 kV Jayanagar (OPTCL) and 220 kV Balimela HEP S/s on 24.12.2022 at 12:05 Hrs	PCC advised OPTCL to test the distance protection relay of 220 kV Jayanagar- Laxmipur circuit-2 at Laxmipur end. PCC advised OPTCL to test DEF relay at Laxmipur end for 220 kV Jayanagar- Laxmipur circuit-1 in coordination with relay OEM and in case the relay is found faulty, the same needs to be replaced at the earliest. Further it was advised to check & ensure zero sequence polarization was set in relay instead of negative sequence polarization. It was recommended to test backup overcurrent relay too at Laxmipur end for 220 kV Jayanagar- Laxmipur D/c. PCC advised OHPC to change non directional E/F protection to directional E/F protection for other feeders also.	
121st PCC Meeting			
3.	Total Power failure at 220 kV Chatra(JUSNL) S/s on 18.11.2022 at 01:23 Hrs	PCC advised JUSNL to test the healthiness of bus bar relay at Chatra end for its non-operation during the incident.	*JUSNL representative informed that relay engineer is present at site for necessary testing of the relay. subsequently*

			observation will be shared to ERPC/ERLDC after completion of the testing.
119th PCC Meeting			
4.	Disturbance at 220 kV Tenughat (TVNL) S/S on 09.09.2022 at 12:55 Hrs	PCC advised JUSNL to rectify all clearance related issues present in 220 kV Tenughat-Govindpur D/C line so that similar type of incidents can be avoided in future. PCC advised JUSNL to share PSL logic of relay to ERPC/ERLDC. It further advised JUSNL to communicate this matter to relay manufacturer for testing and updating firmware in the relay. PCC advised TVNL to review overcurrent settings of unit #2 considering the present transmission network & fault level data at Tenughat. The coordination study may be done considering when one unit in operation & there is a line fault in one of the outgoing feeders (worst case scenario). The revised setting may be implemented at Unit end & the same may be intimated to PCC.	Regarding updating firmware in relay, JUSNL representative informed that site visit of relay engineer has been scheduled in last week of Nov-22. TVNL representative informed that they are in communication with PRDC in order to review overcurrent settings of unit #2. He further added that as per M/s BHEL has also been communicated with regard to the review of the settings in Unit #2. *Regarding updating firmware in relay, JUSNL representative informed that it will take 2-3 months more as work is planned to be executed with upgrdation of SCADA.*
118th PCC Meeting			
5.	Disturbance at 400 kV Dikchu S/s on 10.08.2022 at 11:57 Hrs	PCC advised Dikchu HEP to expedite the visit of relay engineer and resolve the issue by Sep-22. PCC also raised serious concern about long outage of the main bus-2 of Dikchu HEP and advised DIkchu HEP to continuously take up with the vendor for supply of the breaker at the earliest. Further, Dikchu HEP was advised to submit a firm time-line for restoration	In 120th PCC meeting, Dikchu HEP representative informed that breaker will reach the site by end of Nov 2022. *Dikchu HEP representative informed that breaker had been received at site. He further added that shutdown of bus is planned from 21st Jan 2023 and restoration*

		of the main bus-2 which would be monitored in PCC meeting.	*of main bus-2 will be completed by end of Jan 2023 in case service engineer visit is scheduled in January else work will be completed Feb-23.*

SIKKIM NETWORK
SINGLE LINE-TO GROUND FAULT LEVEL



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

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

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