



सत्यमेव जयते

भारत सरकार  
Government of India  
विद्युत मंत्रालय  
Ministry of Power  
पूर्वी क्षेत्रीय विद्युत समिति

**Eastern Regional Power Committee**

14, गोल्फ क्लब रोड, टालीगंज, कोलकाता-700033  
14 Golf Club Road, Tollygunj, Kolkata-700033



वसुधैव कुटुम्बकम्  
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सं./NO. पू.क्षे.वि.स./PROTECTION/2024/1801

दिनांक /DATE:28/03/2024

सेवा में / To,

संलग्न सूची के अनुसार / As per list enclosed.

विषय : दिनांक – 12.03.2024 को आयोजित 133 वीं पीसीसी बैठक का कार्यवृत्त ।

Sub: Minutes of the 133<sup>rd</sup> PCC meeting held on 12.03.2024

महोदय/ Sir,

12.03.2024 को आयोजित 133वीं पीसीसी बैठक का कार्यवृत्त पू.क्षे.वि.स. की वेबसाइट (<http://www.erpc.gov.in/>) पर उपलब्ध है। कृपया देखें।

Please find the minutes of the 133<sup>rd</sup> PCC meeting of ERPC held on 12.03.2024 available at ERPC website (<http://www.erpc.gov.in/>).

यदि कोई अवलोकन हो, तो कृपया इस कार्यालय को यथाशीघ्र भेजा जाए।

Observations, if any, may please be forwarded to this office at the earliest.

यह सदस्य सचिव, पू. क्षे. वि. स. के अनुमोदन से जारी किया जाता है।

This issues with approval of Member Secretary, ERPC.

भवदीय / Yours faithfully,

*P.P. Jena*  
28.3.24

(पी. पी. जेना / P.P.Jena)  
कार्यपालक अभियंता(पी.एस)  
Executive Engineer (PS)

**LIST OF ADDRESSES:**

Chief Engineer, Trans (O&M) Bihar State Power Transmission Limited, Vidyut Bhawan, Bailey Road, Patna-800021	Chief Engineer (CRITL) Bihar State Power Transmission Limited, Vidyut Bhawan, Bailey, Road, Patna-800021
Chief Engineer( System Operation), SLDC , BSPTCL, Patna-800021	
Chief Engineer (SLDC) Damodar Valley Corporation, GOMD-I Premises, P.O.- DaneshSeikh Lane, Howrah- 711109	Chief Engineer (CTC) Damodar Valley Corporation, P.O. Maithon Dam, Dist. Dhanbad,Jharkhand-828207
Chief Engineer, (CRITL) Jharkhand Urja Sancharan Nigam Limited Kusai Colony, Doranda, Ranchi-834002	Chief Engineer (CLD) Jharkhand UrjaSancharan Nigam Limited, Kusai Colony,Doranda, Ranchi-834002
Chief General Manager (O&M), OPTCL, Janpath, Bhubaneswar, Odisha – 751 022. FAX: 0674-2542932 cgm.onm@optcl.co.in	Sr. General Manager (PPA), Technical Wing, OHPCL, Orissa State Police Housing & Welfare Corp. Bldg. VaniviharChowk, Janpath, Bhubaneswar-752022
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General Manager(O&M) FSTPS, NTPC Ltd., P.O. Nabarun, Dist. Murshidabad, West Bengal-742236	Dy. General Manager (Engineering), WBPDC, OS Dept. Corporate Office, 3/C, L.A Block, Salt Lake-III, Kolkata-700098 (Fax-033-23350516)
General Manager (O&M) Barh STPS, NTPC Ltd., P.O. NTPC Barh, Dist. Patna, Bihar-803213	General Manager (OS), ERHQ-II, NTPC Ltd., 3 <sup>rd</sup> flr. OLIC Building, Plot no. N 17/2, Nayapalli, Unit-8 Bhubaneswar- 751012 (Fax No. 0674-2540919)
General Manager(O&M), TSTPS, NTPC Ltd., P.O.Kaniha, Dist. Angul, Orissa-759117	General Manager (AM), POWERGRID, Odisha Projects, Sahid Nagar, Bhubaneswar – 751 007
General Manager (OS), ERHQ-I, NTPC Ltd., LoknayakJaiprakashBhawan, (2 <sup>nd</sup> Floor), DakBunglowChawk, Patna-800001	Manager (Electrical), Adhunik Power & Natural Resources Ltd. “Lansdowne Towers, Kolkata-700020 (Fax No. 033-2289 0285)
Executive Director (O&M) NHPC Ltd., NHPC Office Complex, Sector-33, Faridabad, Haryana-121003 (Fax-01292272413)	Electrical Superintending Engineer, TTPS, TenughatVidyut Nigam Ltd.,Lalpania, Dist. Bokaro, Jharkhand-829149
Dy. General Manager (Electrical) IB Thermal Power Station, OPGCL Banhapalli, Dist. Jharsuguda-768234, Orissa	General Manager (AM), ER-I Power Grid Corporation of India Ltd., Alankar Place, Boring Road, Patna-800001
Chief Engineer (Trans.) Power Deptt., Govt. of Sikkim, Gangtok-731010	Sr. Manager (CTMC) Durgapur Projects Limited,Durgapur-713201
Executive Director, ERLDC, POSOCO, Tollygunge, Kolkata-700033	Head –Regulatory and contracts, IndiGrid Limited , 247 Embassy, Office No 107, ‘B’ Wing, Hindustan Co. Bus Stop, Gandhi Nagar, L.B.S. Road, Vikhroli West, Mumbai – 400 079. Ph : +91 845509 96408
General Manager (AM), ER-II Power Grid Corporation of India Ltd., J-I-15, Block-EP, Sector-V,Salt Lake,Kolkata-91	The Plant Head, Maithon Power Limited, Maithon Office, MA 5 Gogna, Dist. Dhanbad, Jhankand State, PIN-828207
General Manager (P&O), PTC Ltd., Kanchanjunga Bldg.,18, Barakhamba Road,	

New Delhi-110001	
Managing Director, Bhutan Power Corporation Post Box no. 580, Thimpu, Bhutan.	Managing Director, Druk Green Power Corprn. P.O. Box-1351, Thimpu, Bhutan.
Associate Director ( Commercial and Regulatory) Darbhanga-Motihari Transmission Company Limited (DMTCL),503,Windsor, Off CST Road, Kalina, Santacruz(E), Mumbai-400098	The Plant Head, JITPL. (FAX:011-26139256-65)
General Manager, Sikkim Urja Limited, New Delhi (FAX:011-46529744)	President , TPTEL, Bhikaji Cama Place, New Delhi , 110066
Director (NPC), CEA, NRPC Building, KatwariaSarai, New Delhi- 110016	President, Dans Energy Pvt. Ltd, 5th Floor, DLF Building No. 8, Tower-C, Gurgaon - 722002
Director, Shiga Energy Pw. Ltd., 5th Floor, DLF Building No. 8, Tower-C, Gurgaon - 722002	DGM (E&I), HALDIA ENERGY LIMITED, BARIK BHAWAN, KOKATA-700072, FAX: 033-22360955
The Plant Head, Dikchu HEP, Sikkim	



Minutes  
of  
**133<sup>rd</sup> PCC Meeting**

**Date: 28.03.2024**  
**Eastern Regional Power Committee**  
**14, Golf Club Road, Tollygunge**  
**Kolkata: 700 033**

# EASTERN REGIONAL POWER COMMITTEE

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## MINUTES OF 133<sup>rd</sup> PROTECTION COORDINATION SUB-COMMITTEE MEETING HELD ON 12<sup>th</sup> MARCH 2024 AT 10:30 HRS THROUGH MS TEAMS

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Member Secretary Chaired the Meeting. List of Participants is attached at **Annexure A**.

### PART – A

#### **ITEM NO. A.1: Confirmation of Minutes of 132<sup>nd</sup> Protection Coordination sub-Committee Meeting held on 27<sup>th</sup> Feb 2024 at ERPC, Kolkata.**

The minutes of 132<sup>nd</sup> Protection Coordination sub-Committee meeting held on 27.02.2024 was circulated vide letter dated 08.03.2024.

Members may confirm the Minutes of the Meeting.

#### **Deliberation in the meeting**

*Members confirmed the minutes of 132<sup>nd</sup> PCC Meeting*

### PART – B

#### **ITEM NO. B.1: Total Power Failure at 220/132 kV Dhanbad S/s(DVC) on 16.02.2024 at 09:15 Hrs.**

It was reported that due to Shorting of B Phase MB#2 and Y-Phase MB#1 on account of some foreign element, busbar protection operated for both 220/132 kV Bus at Dhanbad S/s of DVC.

**Load Loss: 90 MW, Gen. Loss: Nil  
Outage Duration: 02:37 Hrs**

The disturbance analysis report DVC is enclosed at **Annexure B1**.

DVC may explain.

#### **Deliberation in the meeting**

*The event was explained by DVC representative as follows:*

- *On 16.02.24, 220 kV Dhanbad- Giridih line was diverted to transfer bus therefore the transfer bus was in charged condition.*
- *At 09:15 AM , a plant creeper fell (by a bird) on B phase of transfer bus which was connected to main bus 2 and also touched Y phase of pipe bus of ATR 1 connected to main bus 1 resulting a YB phase to phase fault between main bus 1 and main bus 2.*
- *Subsequently bus bar differential protection got operated for both 220 kV main bus 1(zone 1) and main bus 2(zone2) and all connected elements to both buses got tripped.*

- On physical inspection after the incident, it was found that some flashing had occurred in B phase of transfer bus and Y phase of pipe bus of ATR -1. Further, plant creeper was found hanging on the B-Phase of the transfer bus.
- He further added that distance relay of all the lines had sensed the fault in zone 4 (reverse zone) in Y-B phase loop.

PCC observed that there was no discrepancy with regard to the protection operation during the event.

**ITEM NO. B.2: 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.”*

In 131<sup>st</sup> PCC meeting, all utilities were advised to submit mentioned protection performance indices of 220 kV and above system (132 kV and above for Sikkim) to ERPC/ERLDC every month in compliance to the Grid Code.

NTPC NKSTPP and Powergrid Odisha submitted the same, which are attached as Annexure-B2.

Other utilities are requested to submit the details every month for necessary compliance.

### **Deliberation in the meeting**

*The Protection indices in respect of Powergrid Odisha, NKSTPP, JUSNL has been received.*

*DVC representative informed that SLDC DVC must be communicated to get these data. PCC suggested that intra-state entities including state transmission utilities may submit protection performance incidences to SLDCs and further SLDC is advised to coordinate all concerned transmission and generating utilities in their control area for getting data and further submission to ERPC/ERLDC.*

*As representatives of SLDCs (except SLDC Odisha) are not present in the meeting, PCC decided to refer the issue to OCC meeting for discussion and compliance.*

### **ITEM NO. B.3: 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 131<sup>st</sup> PCC Meeting, PCC advised all utilities to submit annual audit plan for the substations 220kV and above voltage level for FY 2024-25 to ERPC at earliest.

The audit plan was received from NHPC & JUSNL.

Other utilities are requested to submit the audit plan at the earliest.

### **Deliberation in the meeting**

*It was informed that audit plan had been received from WBSETCL, NHPC and JUSNL.*

*OPTCL representative informed that detailed protection audit plan will be submitted soon. BSPTCL representative informed that during winter maintenance activities, protection audit of substations was done however it had not been done as per prescribed format. He further informed that detailed protection audit plan will be submitted soon.*

*PCC advised Powergrid, NTPC, DVC and IPPs to share their protection audit plan at the earliest.*

### **ITEM NO. B.4: Status of Busbar Protection at 220 kV Substations-reg**

In 46th TCC & ERPC Meeting, the status of implementation of busbar protection for 220 kV substations was discussed.



In the meeting, BSPTCL representative updated that out of twelve substations where busbar protection is not available, proposal for ten no of substations has been sent for funding through PSDF. Busbar protection of Fatuha S/s will be commissioned in August'22. For Biharsharif S/s, there is space constraint and the busbar protection can be implemented after construction of new control room building.

OPTCL representative informed that some of the substations where busbar is not operational are under SAS project and the commissioning of busbar is covered under the SAS project. For these substations, the tentative timeline for implementation would be one year.

Concerned utilities are requested to submit the present status of the busbar protection at 220 kV substations.

### **Deliberation in the meeting**

*PCC advised state transmission utilities to share the present status of bus bar protection at 220 kV and above substations to ERPC as per the format enclosed at **Annexure B4**.*

### **ITEM NO. B.5: Preventive maintenance of Line Corridors to avoid repeated tripping of EHV lines**

With onset of summer, preventive maintenance of RoW corridors of all lines maybe taken up as a pre-emptive measure to avoid repeated tripping. A list of repeated tripping occurred during March'23-July'23 is as below:

<b>S.No.</b>	<b>Name of the element</b>	<b>No. of tripping</b>	<b>Utility</b>
1	220 KV Joda-Ramchandrapur-1	12	JUSNL/OPTCL
2	220 KV Daltonganj-Chatra-1	11	JUSNL/OPTCL
3	220 KV Ranchi-Mejia (mtps)-1	10	DVC
4	400 KV Binaguri-Malbase-1	9	PG ER-2/Bhutan
5	220 KV Begusarai-Saharsa-1	8	BSPTCL/PMTL
6	220 KV Begusarai-Saharsa-2	6	BSPTCL/PMTL
7	220 KV Chandil-Ranchi-1	7	JUSNL
8	400 KV Binaguri-Tala-1	7	PG ER-2/Bhutan
9	400 KV PPSP-Bidhannagar-1	7	WBSETCL
10	400 KV PPSP-Bidhannagar-2	6	WBSETCL
11	220 KV Chukha-Birpara-1	6	PG ER-2/Bhutan
12	400 KV Durgapur-Kahalgaon-1	6	PG ER-1
13	400 KV Meramundali-Mendhasal-1	6	OPTCL
14	400 KV Meramundali-Mendhasal-2	5	OPTCL
15	400 KV Meramundali-Lapanga-2	6	OPTCL
16	220 KV Budhipadar-Raigarh-1	5	OPTCL
17	400 KV Arambagh-Bakreswar-1	5	WBSETCL
18	400 KV Medinipur-Kharagpur-2	5	PMJTL

Members may discuss.

### **Deliberation in the meeting**

*Representatives of JUSNL, BSPTCL, OPTCL, DVC and WBSETCL stated that preventive maintenance of their respective lines as mentioned in the above table has already been completed.*



*JUSNL and BSPTCL informed that further communication will also be made to the local team at site for clearing of the vegetation related issues, if any, pending for the lines.*

**ITEM NO. B.6: Single Line Tripping Incidences in month of Feb 2024**

Single line tripping incidents in the month of Feb 2024 which needs explanation from constituents of either end is attached.

Members may discuss.

**Deliberation in the meeting**

*Explanation from constituents of either end for single line tripping incidents in the month of Feb 2024 is attached at **Annexure B.6.***

**PART- C: OTHER ITEMS**

**ITEM NO. C.1: Disturbance at Kahalgaon S/s on 30.01.2024**

The disturbance occurred at NTPC Kahalgan on 30.01.2024 was discussed in 132<sup>nd</sup> PCC meeting and NTPC Kahalgaon was advised following:

- I. To submit action taken report on the observations made by the technical committee in its disturbance analysis report as well as for discrepancies discussed in this meeting. The report shall include compliance for all the observations/discrepancies as discussed along with the timeline.
- II. To submit last test report of failed circuit breakers and data regarding last successful operation of the breaker.
- III. To submit data of relay functionality test last carried out for the relays where discrepancies were observed during this disturbance, and the periodicity of testing of the relays followed at site
- IV. To carry out the testing of 400 kV busbar protection at the earliest
- V. To carry out periodical protection audit of all substations as per the IEGC 2023 and compliance of the audit observations in time bound manner.
- VI. To make the event logger of the station functional at the earliest
- VII.** To ensure time synchronization of all the relays with GPS clock and configuration DR with proper DR time length. After completion of the task, sample DR for all the relays shall be submitted for verification.

NTPC Kahalgaon may update.

**Deliberation in the meeting**

*NTPC representative updated that the site visit at Kahalgaon is going on and the report will be submitted after completion of the site visit.*

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

The decisions of previous PCC meetings are attached.

Members may update the latest status.

**Deliberation in the meeting**

*Updated status of decisions of previous PCC meetings are attached at **Annexure C.2.***

**ITEM NO. C.3: Review of SPS at Sterlite(Vedanta)**

In 131st PCC meeting, ERLDC intimated that existing SPS scheme at Vedanta Ltd. has been modified. The import/export figure of 1600/800 MW has been chosen respectively 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) as considered in earlier SPS scheme. He further informed that modified scheme has been implemented without discussion/concurrence of ERPC forum.

Vedanta representative replied that the review was necessitated considering the network changes in recent times. The SPS has been modified taking into consideration the commercial aspects also. However, they are ready to discuss the scheme with all concerned utilities.

PCC advised that a separate meeting may be convened among Vedanta, SLDC Odisha, OPTCL, ERLDC and ERPC to discuss the SPS scheme.

*In the special meeting the followings were agreed:*

- *Vedanta to implement the SPS scheme as discussed for quick relief in the line flow in case it crosses 800 MW in any of the four abovementioned lines.*
- *A meeting will be called by SLDC Odisha with members from GRIDCO, OPTCL and Vedanta to discuss the modalities of implementation of proposed SPS scheme.*

SLDC Odisha may update.

**Deliberation in the meeting**

*SLDC Odisha representative informed that the meeting to discuss the modalities of implementation of proposed SPS scheme will be convened within a week.*

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## List of participants in 133rd PCC Meeting

Name	First Join	Email			
Pranay Jena	3/12/24, 10:16:02 AM	ppjena@KolkataMST.onmicrosoft.com			
NIRMAL MONDAL (WBSETCL)	3/12/24, 10:16:14 AM				
SLDC ODISHA	3/12/24, 10:16:15 AM				
rajendra prasad (Guest)	3/12/24, 10:16:15 AM				
SMS SAHOO, DGM(ELECT), OPTCL, BHUBANESWAR	3/12/24, 10:25:20 AM				
Akash Kumar Modi	3/12/24, 10:25:20 AM	akmodi@erldc.onmicrosoft.com			
Alok Pratap Singh	3/12/24, 10:25:30 AM	apsingh@erldc.onmicrosoft.com			
ce critl bsptcl	3/12/24, 10:25:31 AM				
Kumar Niraj	3/12/24, 10:26:30 AM	nirajkumar@tatapower.com			
Abakash Adhikary (DVC)	3/12/24, 10:27:37 AM				
arindam bsptcl	3/12/24, 10:28:25 AM				
Somnath Chatterjee	3/12/24, 10:29:18 AM	s chatterjee@tatapower.com			
Dilip Kant Jha EEE	3/12/24, 10:30:05 AM				
S KONAR	3/12/24, 10:30:08 AM				
Bilash Achari	3/12/24, 10:30:11 AM	bilash.achari@erldc.onmicrosoft.com			
Rajiv Singh - CESC	3/12/24, 10:30:37 AM				
Chilakalapalli Mohana Rao {सी एच मोहन राव}	3/12/24, 10:30:57 AM	mohan.rao@powergrid.in			
Diptikanta Panda (GMR)	3/12/24, 10:31:05 AM				
ms erpc	3/12/24, 10:31:09 AM				
SUDIPTA MAITI	3/12/24, 10:31:39 AM	sudipta.maiti@dvc.gov.in			
Nishant Kumar Shankwar	3/12/24, 10:31:41 AM	Nishant.Kumar@energy-sel.com			
avinash kumar	3/12/24, 10:32:09 AM				
MITHUN GAYEN	3/12/24, 10:32:41 AM				
WBPDCL (Guest)	3/12/24, 10:34:05 AM				
Saibal Ghosh	3/12/24, 10:35:56 AM	saibal@erldc.onmicrosoft.com			
Pinki Debnath	3/12/24, 10:36:02 AM	pinkidebnath@erldc.onmicrosoft.com			
Amresh Prusti	3/12/24, 10:37:14 AM	amresh.prusti@opgc.co.in			
Chandan kumar	3/12/24, 10:37:39 AM	chandan@erldc.onmicrosoft.com			
Kumar Satyam	3/12/24, 10:38:43 AM				
ESE BSPTCL	3/12/24, 10:42:53 AM				
"prabhat kumar CGM(SPTL)	3/12/24, 10:44:34 AM				
Varun Vineet/ESE	3/12/24, 10:45:15 AM				

N kumar	3/12/24, 10:48:04 AM				
shadab	3/12/24, 10:50:19 AM				
Dharm Das Murmu, JM, CRITL, JUSNL	3/12/24, 10:50:21 AM				
Dilshad Alam	3/12/24, 10:53:18 AM				
U.K.Mishra	3/12/24, 10:57:29 AM				
Yamana Ayyappa	3/12/24, 11:00:17 AM	ya@sikkimurjalimited.in			
Samai Majhi	3/12/24, 11:04:02 AM				
AEE CRITL	3/12/24, 11:06:03 AM				
DGM.J.Road.OPTCL	3/12/24, 11:23:06 AM				
Sudeep Kumar {सुदीप कुमार}	3/12/24, 11:32:20 AM	sudeepkumar@powergrid.in			
Mayank Teotia	3/12/24, 11:39:34 AM				
Premkant Kumar Singh	3/12/24, 11:52:17 AM	premkant@erldc.onmicrosoft.com			

**Investigation report on 220KV Total Power Failure at Dhanbad Sub-Station on  
16-02-2024**

**Brief History: -**

It was reported that 220KV Total Power Failure (TPF) occurred at Dhanbad substation at around 9:15 a.m. on 16-02-2024 due to tripping of both Main Bus#1 and Main Bus#2 through Bus-Differential protection.

**Bus Configuration on 16-02-2024: -**

Bay/Feeder	Connected to Bus	Bay/Feeder	Connected to Bus
ATR#1	MB#1	L#247	MB#2
ATR#2	MB#1	L#248	MB#2 diverted through Transfer Bus
L#201	MB#1	L#217	MB#2
L#202	MB#1	L#218	MB#2
L#241	MB#1	PTR#1	MB#2
L#242	MB#1	PTR#2	MB#2

**Relay Indication and Fault Current: -**

Bay/Feeder	Relay Indication	Fault Current
ATR#1	96	$I_Y = 0.62 \text{ KA}$ $I_B = 0.75 \text{ KA}$
ATR#2	96	$I_Y = 0.61 \text{ KA}$ $I_B = 0.74 \text{ KA}$
L#201	96	$I_Y = 3.39 \text{ KA}$ $I_B = 3.34 \text{ KA}$
L#202	96	$I_Y = 3.44 \text{ KA}$ $I_B = 3.40 \text{ KA}$
L#241	96	$I_Y = 0.38 \text{ KA}$ $I_B = 0.49 \text{ KA}$
L#242	96	$I_Y = 0.38 \text{ KA}$ $I_B = 0.48 \text{ KA}$
L#247	96	$I_Y = 1.52 \text{ KA}$ $I_B = 1.65 \text{ KA}$
L#248	96	$I_Y = 1.52 \text{ KA}$ $I_B = 1.71 \text{ KA}$
L#217	96	$I_Y = 3.82 \text{ KA}$ $I_B = 3.46 \text{ KA}$
L#218	96	$I_Y = 3.64 \text{ KA}$ $I_B = 3.29 \text{ KA}$
PTR#1	96	NA
PTR#2	96	NA

### **Analysis of the Disturbance Record: -**

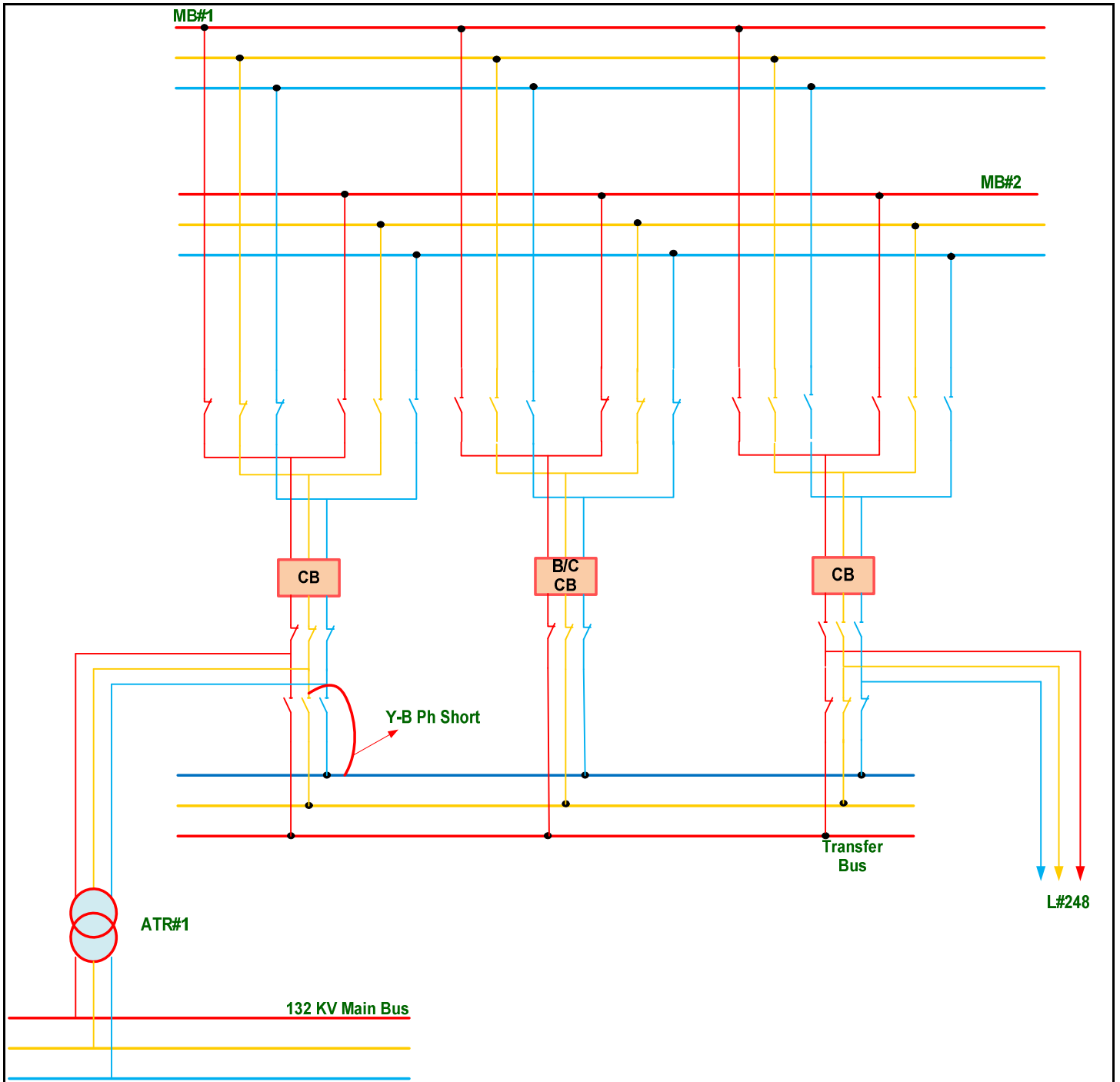
From the disturbance record of the Central Unit (CU relay which issued tripping command to all the 96 relays) it was observed that the relay had sensed YB phase to phase fault and both Zone#1 (for Main Bus#1) and Zone#2 (for Main Bus#2) differential protection had operated. Snapshot of the Disturbance record of the CU relay is mentioned in Annexure-II. Similarly, distance relay of all the lines had sensed a fault in zone#4 (reverse zone) in Y-B phase loop.

### **Analysis of the event: -**

Dhanbad-Giridih line L#248 was diverted to Transfer Bus through Main Bus#2 thus the Transfer Bus was under charged condition. After all the tripping had taken place the 220KV switchyard was investigated, and some flashing was observed in the B-Phase of the Transfer Bus and Y-Phase of the pipe bus (which was connecting ATR#1 to the Main Bus#1) of ATR#1. Plant creeper was found hanging on the B-Phase of the Transfer Bus lying just above the pipe bus of ATR#1. One creeper was found lying on the ground under the pipe bus of ATR#1. Thus it is concluded that a plant creeper fell on the B-Phase of the Transfer Bus (connected to Main Bus#2) and touched the Y-Phase of the pipe bus of ATR#1 (Connected to Main Bus#1) thus creating a YB phase to phase fault between Main Bus#1 and Main Bus#2 causing the operation of Bus-Differential function and tripping all the bays connected to Main Bus#1 and Main Bus#2. SLD of incidence is shown in Annexure-I.

# Annexure-I

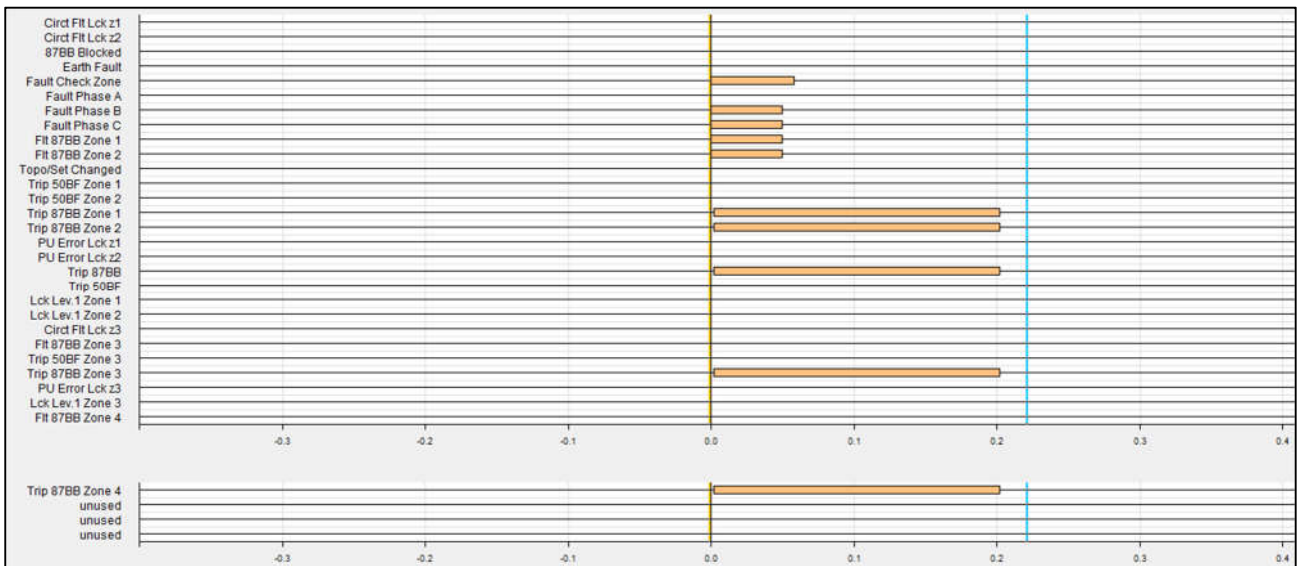
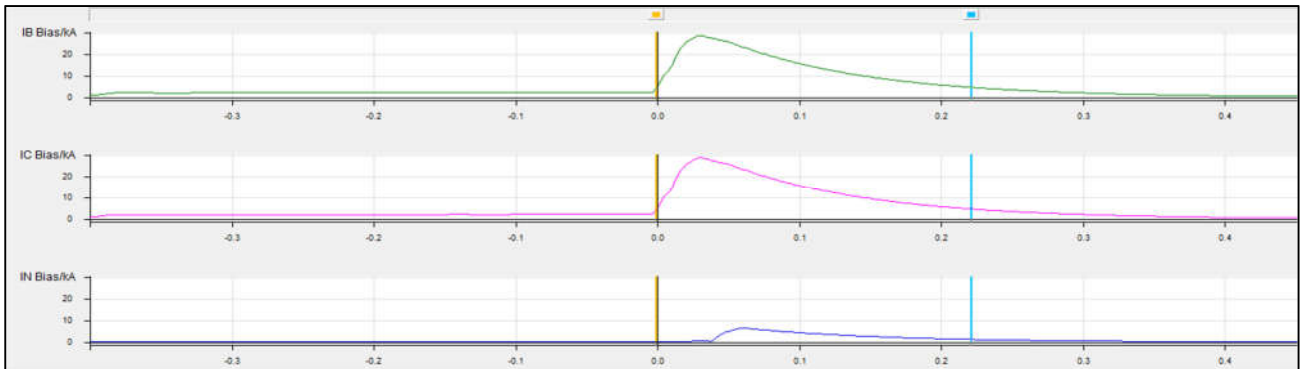
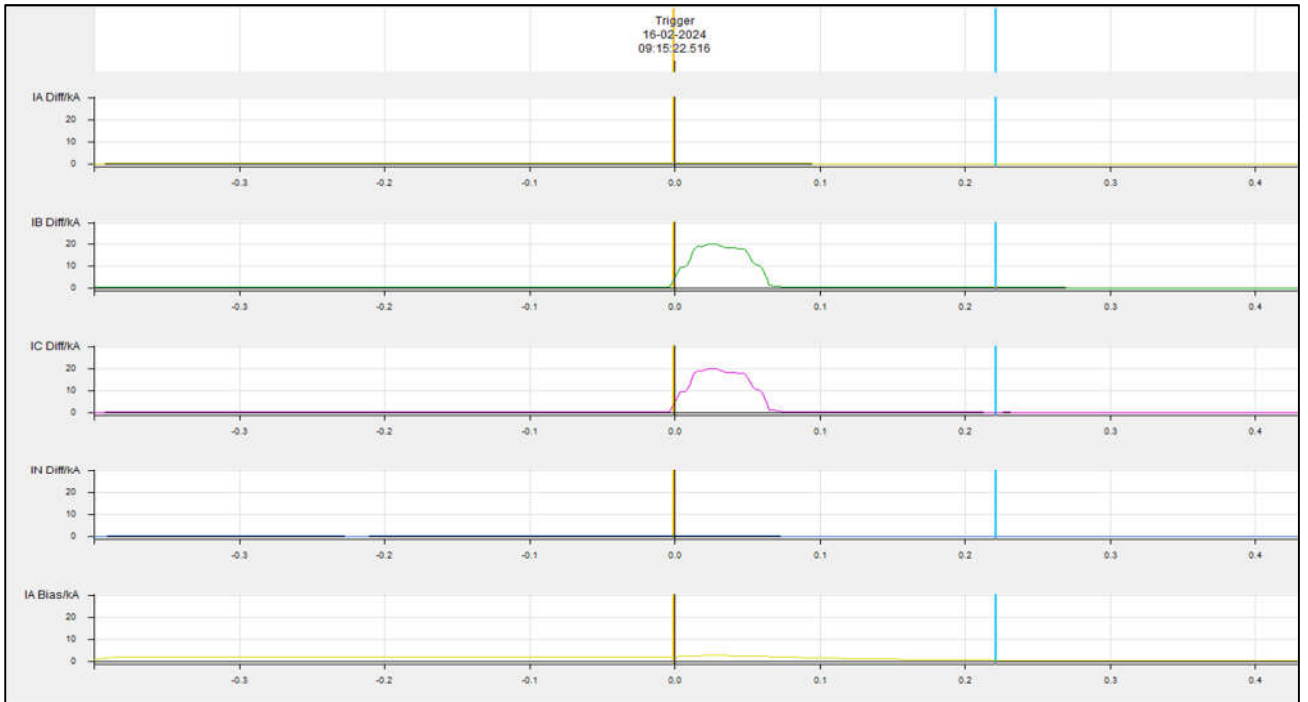
## SLD of the Faulty section of the busbar.





# Annexure-II

## Disturbance Record of the Central Unit Relay



## Annexure-B2

## Protection Performance Indices for the month of January'24 &amp; February'24 (In compliance of Clause 15(6) of IEGC 2023)

S. No.	Name of the element	Tripping Date	Tripping Time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc		Nu		Nf		Dependability index (Nc/(Nc+Nf))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+Nu+Nf))	Remarks (Reason for performance indices less than 1)
						End A	End B	End A	End B	End A	End B	End A	End B				
1	220KV Bolangir-Sadaipali Line-1	04-01-2024	17:05:00	05-01-2024	02:19:00	Tripped on R-PH to Ground Fault. R/I at Bolangir: M1:Z1, 8.86kA,2.1KM M1:Z1, 8.82kA,2.8KM	Reason of Fault: LA Blasted at Sadaipali SS.	1	1	0	0	0	0	1	1	1	
2	765KV Sundargarh-Dharamjaygarh Ckt#1	19-01-2024	01:22:00	19-01-2024	19:39:00	Line tripped on Persistent fault R/I at Sundargarh end : M1: Z-1; BN Fault; 117.9 km; 5 kA M2:Z-1; BN Fault; 95 km; 5.3 kA	Dharmajayagarh end : M1: Z-1; BN Fault;23.3 km; 18.88 kA M2: Z-1; BN Fault;24.35 km;18.88 kA	1	1	0	0	0	0	1	1	1	
3	220KV Bolangir-Kesinga	30-01-2024	12:24:00	30-01-2024	17:47:00	Tripped on persistrnt fault in R-G R/I at Bolangir: M1:Z1; RN Fault; 49.9 km;R=2.23 kA M1:Z1;RN Fault; 48.7km; , R=2.29=kA	R/I at kesinga M1:Z1; RN Fault; 44.5 km; 1.42kA M2;Z1; RN Fault; 12.12 km; 2.15kA	1	1	0	0	0	0	1	1	1	
4	220kV Budhipada-Korba ck	12-02-2024	01:56:44	12-02-2024	05:02:00	tripped due to R-B-N fault in the line. Relay indication details are Main-1, Zone-1, R-B-N, Ir-2.11kA, Ib-1.95kA, F.L-87.6KM Main-2, Zone-1, R-B-N, Ir-2.12kA, Ib-		1	1	0	0	0	0	1	1	1	
5	220kV Rourkela-Tarkera-1	23-02-2024	20:35	23-02-2024	20:42	Tripped on PD	-	0	0	1	0	0	0	0	0	0	From DR it is evident that the B pole opened spuriously which led to tripping of Circuit Breaker on ploer discrepancy/on further investigation the



### List of important transmission lines in ER which tripped in February-2024

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	D R/ E L R E C E I V E D F R O M L O C A L E N D	D R/ E L R E C E I V E D F R O M R E M O T E E N D	UTILITY RESPONSE
1	220 KV PUSAULI KARMN ASHA-1	10-02-2024	14:20	10-02-2024	17:05		Karmnash: Didn't trip	No fault	NA	PG ER-1 may explain		Yes	No	Tripped due to moisture ingress in MB

2	220 KV RANCHI- HATIA-2	19-02-2024	12:41	19-02-2024	13:20	Ranchi: B-N, 7.28 K=kA, 19 km, A/r successful	Hatia :B-N, 5.19 kA, 22.4 Km	B- Earth	100	Three phase tripping and no A/r attempted at Hatia. A/r successful from Ranchi.	DR not time synchroniz ed at Hatia	Ye s	Ye s	There is some issue in A/r circuit, its checking and rectification has been planed in 1st week of April 2024. Due to defective GPS DR not time synchronized at Hatia, necessary instruction has been given to concern officials for its rectification.
3	220 KV DARBHA NGA- DARBHA NGA(DM TCL)-2	21-02-2024	05:58	21-02-2024	06:53		DMTCL: Didn't trip	No fault	NA	No fault observed from PMU. BSPTCL may explain.		No	NA	Main-1 Distance relay maloperated at BSPTCL end.
4	220 KV DARBHA NGA- DARBHA NGA(DM TCL)-2	21-02-2024	07:43	21-02-2024	10:39		DMTCL: Didn't trip	No fault	NA	No fault observed from PMU. BSPTCL may explain.		No	NA	

5	220 KV ROURKE LA- TARKER A-1	23-02-2024	20:35	23-02-2024	20:43	PD operated at Rourkela		No fault	NA	No fault observed from PMU. PG Odisha may explain.		No	N A	From DR it is evident that the B pole opened spuriously which led to tripping of Circuit Breaker on ploe discrepancy/on further investigation the Auxilliary Switch of Circuit Breaker was found broken maloperation of contacts might have led to B pole tripping.
6	400 KV ARAMB AGH- KOLAGH AT-1	25-02-2024	07:46	25-02-2024	08:06	Arambag: B_N, 48.6 km, 5.8 kA	Kolaghat: B_N, A/r successful	B- Earth	100	A/r successful at Kolaghat. No A/r attempted at Arambagh and other two phase CB tripped on PD after 2.5 seconds.		Yes	No	It was found that internal A/R is disabled in the relay. The causes of disable was not identified and they made it enable on that day. But it was not tested due to unavailable of shutdown. The relay and A/R scheme will be tested on 12/03/24.
7	220 KV CHANDI L- SANTAL DIH	29-02-2024	00:56	02-03-2024	23:29	Chandil: R_N, 29 km, 1.4 kA	Santaldih: R_N, 86.03km, 1.64 kA, Zone- 2	R- Earth	100	Charging attempted at 01:48 Hrs but line didn't hold. R-Phase cross-arm was in damaged condition at tower Loc no 274 and the conductor was broken between tower no 274-275. Whether A/r attempted from either end	DR length less at Chandil	Yes	No	A/r attempted from chandil end but not successful. Due to improper triggering criteria DR is not recording for the entire event, which has been corrected now.

SI No.	Name of the incidence	PCC Recommendation	Latest status
<b>132nd PCC Meeting</b>			
1	Disturbance at 220 kV Biharsharif S/s on 14.01.2024	<ul style="list-style-type: none"> <li>➤ PCC advised Powergrid and BSPTCL to jointly review the highset overcurrent protection considering the present network configuration and fault level.</li> <li>➤ PCC advised BSPTCL to review E/F setting of the ICTs as well as lines at 220 kV Biharsharif S/s</li> <li>➤ DR configuration to be done by BSPTCL for the relays of ICT-1 &amp; 2 and relays of Mokama lines.</li> </ul>	<p><i>BSPTCL representative informed that Powergrid had been already communicated to revise overcurrent settings at their end and settings at their end will be revised consequently. He further informed that shutdown of ICT 1 and 2 is applied for 18<sup>th</sup> March 2024 in order to rectify DR and other issues.</i></p> <p><i>Powergrid representative replied that settings will be reviewed shortly.</i></p>
<b>131st PCC Meeting</b>			
1.	Total Power failure at 400/220 kV Tenughat TPS(TVNL) on 06.12.2023 at 07:04 Hrs.	<p>PCC advised TVNL following:</p> <ul style="list-style-type: none"> <li>➤ To replace the static busbar relay with numerical relay for better performance and reliability.</li> <li>➤ To time-synchronize the relays with GPS clock.</li> <li>➤ To enable directional feature in earthfault relay of the 220 kV feeders.</li> <li>➤ JUSNL was advised to rectify the GPS clock synchronization issue at Govindpur end.</li> </ul> <p>TVNL representative was not available in 132<sup>nd</sup> PCC Meeting</p>	<p><i>TVNL representative informed that preventive maintenance work had been completed. He further added that procurement of GPS clock is under process and time synchronisation with relay will be done afterwards. He also informed that visit of team for relay testing is scheduled by April-24 and during that visit directional feature in earthfault relay in 220 kV feeders will be enabled. Regarding bus bar protection, he informed that proposal for addition four additional bay is under consideration.</i></p> <p><i>Regarding GPS clock synchronization issue at Govindpur end, JUSNL</i></p>



			<i>representative informed that there is no progress till date.</i>
<b>130<sup>th</sup> PCC Meeting</b>			
2.	Tripping of 220 kV Main Bus-2 at Budhipadar on 06.10.23 at 16:14 Hrs	<p>PCC advised to replace the defective bay unit at the earliest and restore the busbar protection for bus-2 thereafter.</p> <p><i>In 132<sup>nd</sup> PCC Meeting, OPTCL representative informed that OEM M/s Siemens had been communicated for this issue. He further informed that bus bar protection for bus 2 is in off condition and for bus 1 is in service at present.</i></p>	<i>OPTCL representative informed that M/s Siemens had been communicated to submit estimate for procurement of new relay.</i>
<b>125<sup>th</sup> PCC Meeting</b>			
6.	Repeated Line tripping of 220 kV Ramchandrapur - Joda in April 2023	<p>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> <p><i>In 132<sup>nd</sup> PCC Meeting, JUSNL representtaive informed that the tendering for procurement of DTPC is in process.</i></p>	<i>No further update.</i>