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

स./NO. पू.क्षे.वि.स./PROTECTION/2026/ 2388

दिनांक /DATE: 09/03/2026

सेवा में / To,

संलग्न सूची के अनुसार / As per list enclosed.

विषय : दिनांक – 19.02.2026 को आयोजित 155 वीं पीसीसी बैठक का कार्यवृत्त।

Sub: Minutes of the 155th PCC meeting held on 19.02.2026

महोदय/ Sir,

19.02.2026 को आयोजित **155**वीं 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 **155th PCC** meeting of ERPC held on **19.02.2026** 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.

भवदीय / **Yours faithfully,**

9/3/2026

(आई.के.मेहरा / I.K.Mehra)
अधीक्षण अभियंता(पी.एस)
Superintending Engineer (PS)

14 गोल्फ क्लब रोड, टॉलीगंज, कोलकाता - 700 033 | 14 Golf Club Road, Tollygunge, Kolkata – 700 033.
Tele: 24239657, 24239651, 24239650. Fax: 24239652, 24239653. www.erpc.gov.in, Email: mserpc-power@nic.in

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 Corpn. Bldg. VaniviharChowk, Janpath, Bhubaneswar-752022
Chief Load Dispatcher, SLDC OPTCL, P.O. Mancheswar Rly. Colony Bhubaneswar-751017	Chief Engineer (Testing), WBSETCL Central Testing Laboratory, Abhikshan, Salt Lake, Kolkata-700091 (Fax no. 2367-3578/1235)
Chief Engineer (CLD) WBSETCL, P.O.Danesh Sheikh Lane, AndulRoad, Howrah-711109	Addl. Chief Engineer (ALDC) West Bengal Electricity Distribution Company Ltd VidyutBhavan, 7th Floor, Bidhannagar, Sector-I Salt Lake City, Kolkata-700091(Fax-033-2334-5862)
Dy. Chief Engineer (Testing)/ Sr. Manager (Testing) CESC Ltd.,4, SasiSekhar Bose Road, Kolkata-700025	General Manager (O&M) KhSTPS, NTPC Ltd., P.O. Deepti Nagar, Dist. Bhagalpur, Bihar-813203
General Manager(O&M) FSTPS, NTPC Ltd., P.O. Nabarun, Dist. Murshidabad, West Bengal-742236	Dy. General Manager (Engineering), WBPDCL, 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., 3rdflr. 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, (2nd 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 , TPTL, 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 - 722OO2
Director, Shiga Energy Pw. Ltd., 5th Floor, DLF Building No. 8, Tower-C, Gurgaon - 722OO2	DGM (E&I), HALDIA ENERGY LIMITED, BARIK BHAWAN, KOKATA-700072, FAX: 033-22360955
The Plant Head, Dikchu HEP, Sikkim	

मुख्य अभियंता, ट्रांस (ओ एंड एम), बिहार स्टेट पावर ट्रांसमिशन लिमिटेड, विद्युत भवन, बेली रोड, पटना-800021	मुख्य अभियंता (सीआरआईटीएल), बिहार स्टेट पावर ट्रांसमिशन लिमिटेड, विद्युत भवन, बेली, रोड, पटना-800021
मुख्य अभियंता (सिस्टम ऑपरेशन), एसएलडीसी, बीएसपीटीसीएल, पटना-800021	
मुख्य अभियंता (एसएलडीसी), दामोदर वैली कॉर्पोरेशन, जीओएमडी-I परिसर, पी.ओ.-दानेशशेख लेन, हावड़ा- 711109	मुख्य अभियंता (सीटीसी), दामोदर घाटी निगम, पी.ओ. मैथन बांध, जिला। धनबाद, झारखण्ड-828207
मुख्य अभियंता (सीआरआईटीएल), झारखण्ड ऊर्जा संचरण निगम लिमिटेड कुसाई कॉलोनी, डोरंडा, रांची-834002	मुख्य अभियंता (सीएलडी), झारखंड ऊर्जा संचरण निगम लिमिटेड, कुसाई कॉलोनी, डोरंडा, रांची-834002
मुख्य महाप्रबंधक (ओ एंड एम), ओपीटीसीएल, जनपथ, भुवनेश्वर, ओडिशा – 751 022. फैक्स: 0674-2542932 cgm.onm@optcl.co.in	वरिष्ठ महाप्रबंधक (पीपीए), तकनीकी विंग, ओएचपीसीएल, उड़ीसा राज्य पुलिस आवास एवं कल्याण निगम बिल्डिंग वाणीविहार चौक, जनपथ, भुवनेश्वर-752022
मुख्य लोड डिस्पैचर, एसएलडीसी ओपीटीसीएल, पी.ओ. मंचेश्वर रेलवे कॉलोनी भुवनेश्वर-751017	मुख्य अभियंता (परीक्षण), डब्ल्यूबीएसईटीसीएल केंद्रीय परीक्षण प्रयोगशाला, अभिक्षण, साल्ट लेक, कोलकाता-700091 (फैक्स नंबर 2367-3578/1235)
मुख्य अभियंता (सीएलडी), डब्ल्यूबीएसईटीसीएल, पी.ओ. दानेश शेख लेन, अंदुलरोड, हावड़ा-711109	अतिरिक्त मुख्य अभियंता (एएलडीसी), पश्चिम बंगाल विद्युत वितरण कंपनी लिमिटेड विद्युत भवन, 7वीं मंजिल, बिधाननगर, सेक्टर-I साल्ट लेक सिटी, कोलकाता-700091 (फैक्स-033-2334-5862)
उप मुख्य अभियंता (परीक्षण)/वरिष्ठ प्रबंधक (परीक्षण) सीईएससी लिमिटेड, 4, शशि शेखर बोस रोड, कोलकाता-700025	महाप्रबंधक (ओ एंड एम), खएसटीपीएस, एनटीपीसी लिमिटेड, पी.ओ. दीप्ति नगर, जिला भागलपुर, बिहार-813203
महाप्रबंधक (ओ एंड एम) एफएसटीपीएस, एनटीपीसी लिमिटेड, पी.ओ. नबारून, जिला-मुर्शिदाबाद, पश्चिम बंगाल-742236	उप. महाप्रबंधक (इंजीनियरिंग), डब्ल्यूबीपीडीसीएल, ओएस विभाग कॉर्पोरेट कार्यालय, 3/सी, एलए ब्लॉक, साल्ट लेक-III, कोलकाता-700098 (फैक्स-033-23350516)
महाप्रबंधक (ओ एंड एम), बाढ़ एसटीपीएस, एनटीपीसी लिमिटेड, पी.ओ. एनटीपीसी बाढ़, जिला-पटना, बिहार-803213	महाप्रबंधक (ओएस), ईआरएचक्यू-II, एनटीपीसी लिमिटेड, 3rd Floor, ओएलआईसी बिल्डिंग, प्लॉट नं. एन 17/2, नयापल्ली, यूनिट-8 भुवनेश्वर- 751012 (फैक्स नंबर 0674-2540919)
महाप्रबंधक (ओ एंड एम), टीएसटीपीएस, एनटीपीसी लिमिटेड, पी.ओ.कनिहा, जिला- अंगुल, उड़ीसा-759117	महाप्रबंधक (एएम), पावरग्रिड, ओडिशा प्रोजेक्ट्स, साहिद नगर, भुवनेश्वर - 751 007
महाप्रबंधक (ओएस), ईआरएचक्यू-I, एनटीपीसी लिमिटेड, लोकनायक जयप्रकाश भवन, (दूसरी मंजिल), डाकबंगलाचौक, पटना-800001	प्रबंधक (इलेक्ट्रिकल), आधुनिक पावर एंड नेचुरल रिसोर्सेज लिमिटेड, लैंसडाउन टावर्स, कोलकाता-700020 (फैक्स नंबर 033-2289 0285)

कार्यकारी निदेशक (ओ एंड एम), एनएचपीसी लिमिटेड, एनएचपीसी कार्यालय परिसर, सेक्टर-33, फरीदाबाद, हरियाणा-121003 (फैक्स-01292272413)	विद्युत अधीक्षण अभियंता, टीटीपीएस, तेनुघाट विद्युत निगम लिमिटेड, ललपनिया, जिला। बोकारो, झारखण्ड-829149
उप महाप्रबंधक (विद्युत), आईबी थर्मल पावर स्टेशन, ओपीजीसीएल बनहापल्ली, जिला। झारसुगुड़ा-768234, उड़ीसा	महाप्रबंधक (एएम), ईआर-I पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड, अलंकार प्लेस, बोरिंग रोड, पटना- 800001
मुख्य अभियंता (ट्रांस.), विद्युत विभाग, सरकार। सिक्किम, गंगटोक-731010	वरिष्ठ प्रबंधक (सीटीएमसी), दुर्गापुर प्रोजेक्ट्स लिमिटेड, दुर्गापुर-713201
कार्यकारी निदेशक, ईआरएलडीसी, पोसोको, टॉलीगंज, कोलकाता-700033	प्रमुख-नियामक और अनुबंध, इंडीग्रिड लिमिटेड, 247 दूतावास, कार्यालय संख्या 107, 'बी' विंग, हिंदुस्तान कंपनी बस स्टॉप, गांधी नगर, एल.बी.एस. रोड, विक्रोली, पश्चिम, मुंबई - 400 079 फ़ोन: +91 845509 96408
महाप्रबंधक (एएम), ईआर-II इंडिया लिमिटेड का पावर ग्रिड कॉर्पोरेशन।, जे-आई-15, ब्लॉक-ईपी, सेक्टर-वी, साल्ट लेक, कोलकाता- 91	प्लांट हेड, मैथन पावर लिमिटेड, मैथन कार्यालय, एमए 5 गोगना, जिला। धनबाद, झारखंड राज्य, पिन-828207
महाप्रबंधक (पी एंड ओ), पीटीसी लिमिटेड, कंचनजंगा बिल्डिंग, 18, बाराखंभा रोड, नई दिल्ली-110001	
प्रबंध निदेशक, भूटान पावर कॉर्पोरेशन पोस्ट बॉक्स नं. 580, थिम्पू, भूटान।	प्रबंध निदेशक, ड्रुक ग्रीन पावर कॉर्पोरेशन। पी.ओ. बॉक्स-1351, थिंपू, भूटान।
सह निदेशक (वाणिज्यिक एवं नियामक), दरभंगा-मोतिहारी ट्रांसमिशन कंपनी लिमिटेड (डीएमटीसीएल), 503, विंडसर, ऑफ सीएसटी रोड, कलिना, सांताक्रूज़ (पूर्व), मुंबई- 400098	प्लांट हेड, जेआईटीपीएल। (फैक्स:011-26139256-65)
महाप्रबंधक, सिक्किम ऊर्जा लिमिटेड, नई दिल्ली (फैक्स:011-46529744)	अध्यक्ष, टीपीटीएल, भीकाजी कामा प्लेस, नई दिल्ली-110066
निदेशक (एनपीसी), सीईए, एनआरपीसी बिल्डिंग, कटवारियासराय, नई दिल्ली- 110016	अध्यक्ष, डान्स एनर्जी प्रा. लिमिटेड, 5वीं मंजिल, डीएलएफ बिल्डिंग नंबर 8, टावर-सी, गुड़गांव - 722OO2
निदेशक, शिगा एनर्जी पी.डब्ल्यू. लिमिटेड, 5वीं मंजिल, डीएलएफ बिल्डिंग नंबर 8, टावर-सी, गुड़गांव - 722OO2	डीजीएम (ई एंड आई), हल्दिया एनर्जी लिमिटेड, बारीक भवन, कोकाता-700072, फैक्स: 033-22360955
प्लांट हेड, डिक्चु एचईपी, सिक्किम ।	

GOVERNMENT OF INDIA

MINISTRY OF POWER

Eastern Regional Power Committee

MINUTES

OF

155th PCC MEETING

Date: 09.03.2026

Contents

Eastern Regional Power Committee, Kolkata

Minutes of 155th PCC MEETING
Date: 19th February, 2026(Thursday) at 11:00 Hrs

Member Secretary, ERPC chaired the meeting. List of participants is attached at ***Annexure A.1.*** *The protection performance of Eastern Region for Jan-26 is briefly explained by ERLDC through a presentation. The presentation is enclosed at* ***Annexure A.2.***

1. PART-A

1.1. Confirmation of Minutes of 154th PCC Meeting held on 20.01.2026

The minutes of 154th PCC meeting held on 20.01.2026 through virtual mode was circulated vide letter no. ERPC/ Protection/2026/2127 dated 04.02.2026.

Members may confirm the minutes of 154th PCC meeting.

Deliberation in the meeting

Powergrid vide mail dated 18.02.2026 requested for following amendment regarding agenda Item B.9 (5) i.e Tripping of 220/132kV 160MVA ICT-1 at Malda:

PG representative informed that 132kV Malda S/s is connected with load. Hence, as per fault level study, contribution from 132kV side in case of fault in HV side is insignificant. Therefore, TMS values comes as negative for directional back up protection of 132kV side. In such cases, minimum available TMS value of relay is generally adopted. However, on that day, due to some network configuration, 132kV side contributed fault current in other fault in upstream network. Hence, tripping happened. Subsequently they have increased TMS value to a safe margin.

Members confirmed the minutes of 154th PCC Meeting with the above amendment suggested by Powergrid.

2. PART-B: ITEMS FOR DISCUSSION

2.1 Disturbance at 220 kV Bolangir New (OPTCL) S/s on 13.01.2026 at 12:38 Hrs

Prior to the disturbance, 220kV Bolangir (OPTCL) was drawing power from 220kV BolangirBolangir (PG) D/C through 220kV Main Bus #1(220kV Main Bus #2 was under planned shutdown). At 12:38 Hrs, during shifting of 220kV Kesinga line to TBC bay for availing shutdown of main bay of 220kV Kesinga line at Bolangir, LBB protection operated. This resulted tripping of all connected lines. Consequently, 220kV Bolangir (OPTCL) S/s became dead.

Report from ERLDC is attached at **Annexure 2.1.**

Load Loss: 15 MW
Outage Duration: 00:13 Hrs

OPTCL may explain.

Deliberation in the meeting

OPTCL representative informed that SAS upgradation work is in progress at Bolangir S/s. For SAS system configuration, the CB status of Kesinga feeder was required and accordingly shutdown of main bay of 220 kV Kesinga bay was availed and the feeder was diverted through TBC.

On 13th Jan 2026 at 12:38:45 Hrs, during shifting of 220kV Kesinga feeder to TBC bay, LBB protection of TBC bay operated on CB close command. On investigation it was found that TBC close status and LBB operated wires were interchanged in the busbar panel. Due to this wrong wiring in the panel, LBB protection operated and all the feeders at 220 kV Balangir New were tripped.

He submitted that the wrong wiring in panel was done during the ongoing SAS upgradation work and they have now rectified the wiring issue.

On enquiry from PCC forum,regarding status of Main bus 2, OPTCL representative replied that Main bus 2 and bus bar protection will be in service within one week.

2.2 Total Power Failure at 220 kV Rengali S/s on 12th Dec 2025 at 19:06 Hrs

On 12.12.2025 at 19:06 hrs, Y phase Bus-1 post insulator of 220 kV Bus coupler at Rengali S/s got snapped and created Y phase bus fault. Fault was sensed in zone -4 protection by all emanating lines and got tripped after 250 msec in Z-4 protection as Bus bar protection was not in service. subsequently 220kV Rengali S/s became dead. Further, Rengali HEP unit -1 & 2 also tripped at the same time.

The following discrepancies were highlighted by ERLDC in 154th PCC Meeting:

- Tripping of Rengali PH Unit 1 & 2 due to unwanted GT REF protection
- Non time synchronization of DR for 220kV Rengali-Tarkera line at Tarkera S/s
- Non segregation of feeders between two main buses in the absence of busbar protection at Rengali S/s
- Non availability of differential protection for short 220 kV Rengali–Rengali PH line and 220 kV Rengali-Rengali PG lines of line length less than 10 kms.

OPTCL & OHPC may explain.

Deliberation in the meeting

OHPC updated following:

For Unit #2 , GT REF was operated and on investigation the ground sorting point was found in loose condition which was addressed immediately. For Unit#1, the DR could not be analyzed after the incident as DR was not saved in the relay due to limited memory.

OPTCL updated that they are in the process of segregating the feeders between both bus of Rengali(OPTCL) S/s and it will be completed within a month.

After deliberation, PCC advised followings:

1. *OHPC was suggested to download the DR files immediately after the tripping occurs from the relay which has limited memory space. This will enable proper analysis of the event.*
2. *OPTCL was advised to enable overcurrent highest protection in bus coupler at Rengali*

S/s after the segregation of feeders.

3. *OPTCL would submit a timeline for restoration of the busbar protection at Rengali S/s.*
4. *220 kV Rengali(PH)-Rengali(OPTCL) & 220 kV Rengali(OPTCL)-Rengali(PG) lines being short lines, line differential protection need to be implemented as per the CEA(Technical Standards for Construction of Electric Lines) Regulation, 2022. Accordingly, OPTCL was advised to take necessary action to implement the line differential protection in coordination with OHPC & Powergrid.*

2.3 Third Party Protection audit by ERPC for the Year 2026-27

In 55th TCC & ERPC Meeting held in Dec-25, ERPC approved the proposal for carrying out audit for 15 nos. of substations in ER in FY 2026-27.

In 154th PCC Meeting held in Jan-26, SE, ERPC representative informed that ERPC secretariat is planning to carryout protection audit for another 15 substations in Eastern Region in FY 2026-27 for which a list of fifteen number S/s has been prepared as per discussion between ERPC and ERLDC which is attached above. He intimated that JUSNL is already carrying out third party protection audit for all its 220 kV and above substations hence the list has does not include substations of JUSNL.

ERLDC representative stated that grid disturbance had occurred in the past at Mejia S/s, Indravati S/s, Budhipadar S/s, Rengali S/s etc in last one year. Further Mendhasal S/s and Subhasgram S/s are critical in view of load connected with them. Carrier communication issues have been observed at Hazipur S/s, Begusarai S/s and Darbhanga S/s in last 6 months. Therefore, all these substations are suggested for carrying out protection audit in 2026-27.

It was informed that third party protection audit for Kalyaneshawari, Mejia S/s is in progress. Further tender for protection audit of CTPS S/s is already floated.

After discussion, PCC advised all state utilities to suggest 3-4 important/critical substations in each of their control area for third party protection audit within a week so that list of the substations for audit can be finalized.

However, no suggestion was received from any of the utility in this regard.

A list of the substations is proposed below:

1. 400/220 kV Mendhasal S/s(OPTCL)	2. 220 kV Subhasgram S/s(WBSETCL)
3. 400/220 kV New Duburi(OPTCL)	4. 220 kV Kasba S/s(WBSETCL)
5. 220 kV Jaynagar S/s(OPTCL)	6. 220 kV Balimela HEP(OHPC)
7. 220 kV Budhipadar S/s(OPTCL)	8. 220 kV Indravati HEP(OHPC)
9. 220 kV Rengali S/s(OPTCL)	10. 220 kV Hazipur S/s(BSPTCL)
11. 220 kV Begusarai S/s(BSPTCL)	12. 220 kV Darbhanga S/s(BSPTCL)

Members may discuss.

Deliberation in the meeting

OPTCL representative informed that SAS upgradation work in progress during at Budhipadar S/s and they are reviewing the protection settings comprehensively at Budhipadar. He suggested that the third-party audit of Budhipadar S/s by ERPC is not necessary at present.

The modified list is given below:

1. 400/220 kV Mendhasal S/s(OPTCL)	2. 220 kV Subhasgram S/s(WBSETCL)
3. 400/220 kV New Duburi(OPTCL)	4. 220 kV Kasba S/s(WBSETCL)
5. 220 kV Jaynagar S/s(OPTCL)	6. 220 kV Balimela HEP(OHPC)
7. 220 kV Indravati HEP(OHPC)	
8. 220 kV Rengali S/s(OPTCL)	9. 220 kV Hazipur S/s(BSPTCL)
10. 220 kV Begusarai S/s(BSPTCL)	11. 220 kV Darbhanga S/s(BSPTCL)

PCC advised all state utilities to give their suggestions with respect to provided list (any addition or deletion) so that list of the critical substations for audit can be finalized.

2.4 Submission of Protection Audit Plan & Audit Reports

The Clause (5) of Regulation 15 of IEGC Regulations, 2023 envisages as below:

Quote

(3) *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). .....*

(4) All users shall also conduct third party protection audit of each substation at 220 kV and above (132 kV and above in NER) once in five years or earlier as advised by the respective RPC.

…….

(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

Internal Audit Plan Status

Sl No.	Utility Name	Audit Plan for FY 2025-26	Audit Plan for FY 2026-27
1	PG-ER-1 & PMTL		
2	PG-ER-2		
3	PG-Odisha		
4	WBSETCL		
5	BSPTCL		
6	OPTCL		
7	DVC		
8	JUSNL		
9	OPGC		
10	OHPC		

11	CESC		
12	NHPC		
13	DMTCL		
14	NTPC ER-I		
15	NTPC ER-II		
16	Tashiding HEP		
17	Jorethang HEP		
18	MPL		
19	JITPL		
20	GMR		
21	Adhunik		
22	IBEUL		

Received, Not Received

Members may update.

Deliberation in the meeting

OPGC intimated that they are planning to carry out third party protection audit of OPGC in FY 2026-27 and internal audit for FY 2026-27 in May-26.

OHPC, NTPC ER-1 and ER-2 representative were not present in the meeting.

MPL representative informed that protection audit plan for FY 2026-27 will be shared to ERPC/ERLDC within a week.

2.5 Tripping of ICTs during the month of January-26

Sl. No	Name of the Element	Trip Date/Time	Reason of tripping	Utility
1	400KV/220KV 250 MVA ICT 2 AT TENUGHAT	24-01-2026 03:10	Differential Protection operated, FC- Iy-2.252kA	TVNL
2	400KV/220KV 315 MVA ICT 3 AT BIHARSARIFF	07-01-2026 12:09	During Charging attempt of 220kV BSPTCL-Asthama line, 220kV side Circuit Breaker (CB) of 315MVA ICT-3 tripped at the BSPTCL end.	BSPTCL/PG ER-1

3	400KV/220KV 315 MVA ICT 3 AT BIHARSARIFF	07-01-2026 02:35	Spurious 86 relay Operated	BSPTCL/PG ER-1
4	400KV/220KV 500 MVA ICT 2 AT NEW PURNEA	01-01-2026 06:16	LBB operated during Auto-reclose attempt in 220 kV Madhepura- New Purnea-1 due to non-opening of CB at New Purnea PG.	PG ER-1

Concerned Utilities may explain.

Deliberation in the meeting

- **Tripping of 400KV/220KV 250 MVA ICT 2 AT TENUGHAT on 24th Jan 2026 at 03:10 Hrs**

TVNL representative informed that the ICT-2 tripped spuriously on differential protection. No physical fault was identified, and the ICT was charged immediately.

- **Tripping of 400KV/220KV 315 MVA ICT 3 AT BIHARSARIFF on 7th Jan 2026 at 02:35 Hrs and on 12:09 Hrs**

Powergrid explained as follows:

On 7th Jan 2026 at 12:09 Hrs, during tripping of 220 kV BSPTCL-Asthama line, 220kV side Circuit Breaker (CB) of 315MVA ICT-3 also tripped. He informed that both HV & LV side relays are on the Powergrid end and during the incident only LV side tripped. He stated that the tripping might be due to DC earth fault in the220 kV Biharsharif end. Subsequently they replaced the cables connected to 86 relays of LV side of the ICT.

- **Tripping of 400KV/220KV 500 MVA ICT 2 AT NEW PURNEA on 1st Jan 2026 at 06:16 Hrs**

It was informed by ERLDC that there was a single phase to ground fault in 220 kV New Purnea-Madhepura-1 line. Auto reclosure was not successful at Madhepura end. At New Purnea end, three phase tripping did not occur and after 200 msec, LBB operated and resulted in tripping of all the feeders of 220 main bus-2 at New Purnea.

2.6 Tripping of Buses during the month of January-26

Sl. No	Name of the Element	Trip Date	Trip Time	Reason of tripping	Utility
1	400KV MAIN BUS - 2 AT NEW PPSP	20-01-2026	13:27	Busbar Protection Operated due to SF6 gas zone tripping during replacement of 400 kV Main	WBSETCL

				Bay CB/isolator of 400 kV Arambagh-2 bay.	
2	400KV MAIN BUS - 1 AT NEW PPSP	02-01-2026	23:21	Busbar Protection Operated due to CT flashover inside 400 kV PPSP-1 main bay GIS module.	WBSETCL
3	220KV MAIN BUS - 2 AT NEW PURNEA	01-01-2026	06:16	LBB operated during Auto-reclose attempt in 220 kV Madhepura- New Purnea-1 due to non-opening of CB at New Purnea PG.	PG ER-1

Concerned Utilities may explain.

Deliberation in the meeting

- **Tripping of 400KV MAIN BUS - 1 AT NEW PPSP on 2nd Jan 2026 at 23:21 Hrs**

WBSETCL representative informed that the fault developed due to insulation failure between 400 kV main bus 2 breaker and CT of 400 kV PPSP-1 line inside the GIS chamber. Subsequently main bus-2 tripped. However, as the fault is between breaker and CT, the fault was not cleared even after tripping of main bus-2. Consequently LBB operated and resulted in tripping of line. He intimated that the line is at present out of service. After replacing the chamber which contains the affected CT, the line will be put into service. He stated that the restoration will be completed in approximately ten days.

subsequently 400 k V main bus 2 got tripped. However, fault was not isolated consequently LBB operated and resulted in tripping of line and tripping of 400 kV Main Bus 1. He further said that line will be charged in 10 days.

On 20th Jan 2026 at 13:27 Hrs

WBSETCL representative informed that breaker chamber of 400 kV Arambagh-2 bay got faulty last year. While changing breaker compartment, DC MCB of gas zone tripping was kept intentionally off. However, while putting AC MCB for power, DC MCB of gas zone tripping was made ON by mistake by their operation personnel which resulted in energisation of gas zone tripping of breaker. Consequently, Busbar Protection for 400KV MAIN BUS - 2 Operated due to SF6 gas zone tripping.

He further informed that tie bay was also tripped during the incident along with bus bar protection due to incorrect trip logic in busbar relay. The issue was identified and subsequently rectified by availing bus shutdown.

- **Tripping of 220KV MAIN BUS - 2 AT NEW PURNEA on 1st Jan 2026 at 06:16 Hrs**

It was informed by ERLDC that there was a single phase to ground fault in 220 kV New Purnea-Madhepura-1 line. Auto reclosure was not successful at Madhepura end. At New Purnea end, three phase tripping did not occur and after 200 msec, LBB operated and resulted in tripping of all the feeders of 220 main bus-2 at New Purnea. BSPTCL intimated that trip synchronisation contactor of the breaker was found faulty during thorough checking of the breaker at New Purnea end. The same was replaced and the line was

charged.

2.7 Repeated tripping of transmission lines during the month of January-26

Sl.No.	Name of the Element	No. of times Tripped	Reason of tripping	Utility
1	220KV-CHAIBASA(PG)-CHAIBASA(JUSNL)-1	2	DT received at PG end in both instances.	PG ER-1 and JUSNL
2	220KV-DALTONGANJ-CHATRA-1	2	Tripped on R-Y and Y-Earth fault with fault distance was 43 kM and 63 kM from Daltonganj end respectively.	JUSNL
2	220KV-MUZAFFARPUR(PG)-AMNOUR-1	2	Tripped on R-Y and Y-B fault with fault distance was 25 kM and 13 kM from Amnour end respectively.	BSPTCL

Deliberation in the meeting

- **Repeated tripping of 220KV-CHAIBASA(PG)-CHAIBASA(JUSNL)-1**

JUSNL representative informed that due to low SF6 gas pressure of CT. tripping of line occurred from local end and DT was sent to remote end in both tripping. He further said that on investigation, SF6 pressure was found ok however incorrect input was observed by relay due to circuitry issue.
PCC advised JUSNL representative to configure phase wise CT SF6 pressure in DR for accurate monitoring.

- **Repeated tripping of 220KV-DALTONGANJ-CHATRA-1**

The trippings are due to vegetation issue. JUSNL representative informed that trimming of excess vegetation is already in progress.

- **Repeated tripping of 220KV-MUZAFFARPUR(PG)-AMNOUR-1**

BSPTCL representative informed that 220KV-MUZAFFARPUR(PG)-AMNOUR-1 had tripped on 15th Jan 2026 and 25th Jan 2026. He informed that patrolling of line had been done after the incident however no issue was observed. He apprehended that the tripping might be due to kite flying.

2.8 Single Line Tripping Incidences in month of January-2026

Single line tripping incidents in the month of January-2026 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 incidences in month of Jan 26 is attached at ***Annexure 2.8.***

3. PART-C: FOLLOW UP ITEMS

3.1. Status of Carrier Communication for 220 kV Biharsharif–TTPS transmission line

In 154th PCC Meeting held in Jan-26, PCC observed that the issue was previously discussed in PCC meeting and even after repeated recommendations, both BSPTCL & TVNL have failed to resolve the issue bilaterally.

Member Secretary, ERPC opined that 220 kV Biharsharif-Tenughat line is an interstate line and critical for evacuation of Tenughat Power. He suggested TVNL to take immediate steps for implementation of PLCC at their end by their own. For compatibility in technical specifications of the equipment with the Biharsharif end, they may consult BSPTCL before finalizing the work.

TVNL may update the status.

Deliberation in the meeting

TVNL representative opined that the PLCC implementation at TVNL end for 220 kV Tenughat-Biharsharif line may be taken up by JUSNL considering the fact that PLCC of other feeders emanating from Tenughat TPS is under the scope of JUSNL.

JUSNL representative submitted that PLCC for 220 kV Tenughat-Biharsharif may be implemented either by BSPTCL or TVNL.

TVNL further submitted that they would need a confirmation form BSPTCL that the earlier work order has been closed and BSPTCL carries no obligation of erection of PLCC and associated system at TTPS. PCC requested BSPTCL to give a confirmation to TVNL on this matter.

3.2. Over-voltage setting of 400kV & above transmission lines in Eastern Region

In 152nd PCC Meeting, it was decided that ERLDC will circulate list of 400 kV & above level lines in the ER to all the concerned utilities. Concerned Utilities will verify the details & submit the existing overvoltage settings of the lines.

After receiving all the details, the overvoltage protections will be reviewed in the subsequent PCC Meeting.

The settings have been received from all the utilities.

ERLDC may update. Members may discuss.

Deliberation in the meeting

ERLDC shared the draft settings and intimated that the settings have been suggested by incorporating grading in terms of voltage pick up & time delay of the overvoltage protection. The proposed settings are enclosed at ***Annexure 3.2.***

PCC advised concerned utilities to go through the proposed settings and share their observations, if any to ERPC/ERLDC.

3.3. 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), 15(7) all users shall submit protection performance indices of previous month by 10th of every month to ERPC and ERLDC along with reasons for performance indices less than unity of individual element wise protection system to the respective RPC and action plan for corrective measures. For the month of January'26, detailed list attached. Below table shows the status of PP Indices received for last five months. Utilities are requested to submit the details every month for necessary grid code compliance.

Sl.no	Utility Name	August 2025	September 2025	November 2025	December 2025	January 2026
1	PG-ER-1	Yes (08.09.2025)	Yes (22.10.2025)	Yes (10.12.2025)	Yes (19.01.2026)	Yes (12.02.2026)
2	PG-ER-2		Yes (17.10.2025)	Yes (31.12.2025)	Yes (12.01.2026)	
3	PG-Odisha	Yes (03.09.2025)	Yes (06.10.2025)		Yes (05.01.2026)	Yes (04.02.2026)
4	WBSETCL/ WBPDCL	Yes (04.09.2025)	Yes (08.10.2025)	Yes (04.12.2025)	Yes (05.01.2026)	Yes (05.02.2026)
5	BSPTCL/ BGCL		Yes (21.10.2025)	Yes (19.12.2025)		Yes (13.02.2026)
6	OPTCL/ OHPC					

7	DVC		Yes (20.11.2025)			
8	JUSNL	Yes (06.09.2025)	Yes (21.10.2025)	Yes (17.12.2025)		Yes (04.02.2026)
9	Sikkim					
10	OPGC					
11	PMTL					
12	NTPC-KHSTPP	Yes (17.09.2025)				
13	NTPC-FSTPP		Yes (10.10.2025)			
14	NTPC-BARH					
15	NTPC-TSTPP					
16	NTPC-KBUNL		Yes (10.10.2025)			
17	NPGC					
18	BRBCL					
19	NTPC-DARILAPLI	Yes (01.09.2025)	Yes (01.10.2025)	Yes (01.12.2025)	Yes (01/01/2026)	
20	NTPC-NORTH KARNPUARA					
21	ATL					
22	APNRL					
23	CBPTCL					

24	DMTCL	Yes (04/09/2025)	Yes (04/10/2025)	Yes (03/12/2025)	Yes (02/01/2026)	Yes (04/02/2026)
25	ENICL	Yes (03.09.2025)	Yes (05.10.2025)	Yes (06.12.2025)		
26	Chuzachen HEP					
27	Jorethang HEP	Yes (01/09/2025)	Yes (05/10/2025)	Yes (07/12/2025)	Yes (02/01/2026)	
28	Tashiding Hep	Yes (01/09/2025	Yes (05/10/2025)	Yes (07/12/2025)	Yes (02/01/2026)	
29	GMR					
30	IBEUL					
31	JITPL					
32	MPL					
33	NKTL					
34	OGPTL	Yes (09/09/2025)	Yes (05.10.2025)	Yes (06.12.2025)		
35	PMJTL					
36	Powerlink					
37	PKTCL	Yes (09/09/2025)	Yes (05.10.2025)	Yes (06.12.2025)		
38	CESC	Yes (26/11/2025)	Yes (26/11/2025)	Yes (26/11/2025)		
39	Rongnichu HEP					
40	SPTL					
41	TVNL	Yes (04.09.2025)	Yes (03.10.2025)			

Members my update.

Deliberation in the meeting

Protection performance indices for Jan 2026 received from utilities is attached at ***Annexure 3.3.***

PCC advised concerned utilities to share indices data of particular month by 10th day of subsequent month to ERPC/ERLDC.

3.4. Follow-up of Decisions of the Previous Protection Sub-Committee Meeting(s)

Sl No.	Name of the Incidence	PCC Recommendation	Latest status
154th PCC Meeting			
1.	Total Power Failure at 400 kV TISCO S/s on 5th Dec 2025 at 19:21 Hrs	PCC observed that line isolator interlock at the TISCO end for the Baripada line appears to have been bypassed for which DVC representative replied that issue has been identified and will be rectified during the shutdown in Feb 2026.	*DVC representative informed that non directional protection settings has already been enabled at TISCO end and revision of distance protection settings will be done in March 2026.*
2.	Total Power Failure at 400 kV PVUNL S/s on 20th Dec 2025 at 11:23 Hrs	PCC advised JUSNL representative to take rectification measures as suggested by the OEM and submit a compliance to ERPC/ERLDC.	*JUSNL representative informed that line of differential relay for 400 kV PVUNL-Patratu Line will be implemented by Feb-26.* *He further updated that configuration issue has been updated in relay as advised by the relay OEM. However, CT connection issue, double earthing issue and bus stability test will be done during shutdown of the line/bus.*
153rd PCC Meeting			
3.	Total Power Failure at 220 k V IBTPS(OPGC) S/s on 21st Oct 2025 at 17:25 Hrs	PCC advised OPGC representative to increase DR length to 3 sec with pre-fault time of 500 msec and post fault 2500 msec as per ERPC protection philosophy. OPGC was further advised to share settings of bus coupler to ERPC/ERLDC for review.	*OPGC representative informed that DR length has been increased to 3 sec with pre-fault time of 500 msec and post fault 2500 msec.* *He updated that numerical relay based busbar protection will be commissioned shortly.*
151st PCC Meeting			
4.	Disturbance at 220 kV Chatra (JUSNL) S/s on 7th Aug 2025 at 04:43 Hrs	PCC advised that DC leakage issue in the substation shall be promptly addressed and resolved to avoid this type of disturbance in future.	JUSNL representative informed that 220 k V Daltongunj Itkhori -1 is charged through bus

		Regarding restoration of BCU & PLCC panel, they updated that both BCU & PLCC are of ZIV make and the OEM has been communicated for support. Further the BCU will be replaced with the spare BCU available with them. They added that OPGW in the line is already commissioned. DTPC will be commissioned soon. After commissioning DTPC, the carrier communication issue will be resolved.	coupler at present.Regarding BCU rectification, it is expected that rectification work will be started by 2nd Dec 2025 and issue will be resolved by 2nd week of Dec 2025. *In 155th PCC Meeting, JUSNL representative informed that issue associated with coupler will be resolved by 15th March 2026.*
5.	Total Power Failure at 220 kV Goraul (BSPTCL) S/s on 7th July 2025 at 14:31 Hrs	BSPTCL was advised to configure the DR time window as per ERPC Guidelines.	*In 155th PCC Meeting BSPTCL representative informed that tender has been awarded and BCU replacement will be completed by March 2026.*

Deliberation in the meeting

The updated status is given in the table.

Annexure A.1 List of participants in 155th PCC Meeting

Name	First Join	Email
ERPC Kolkata	2/19/26, 10:42:07 AM	ERPC@KolkataMST.onmicrosoft.com
Samish (External)	2/19/26, 10:42:28 AM	samish@tvnl.in
OPTCL BALANGIR (Unverified)	2/19/26, 10:42:28 AM	
DGM,E&MR DIVISION, BURLA (Unverified)	2/19/26, 10:42:28 AM	
AKHAND DVC (Unverified)	2/19/26, 10:42:29 AM	
CTD WBSETCL (Unverified)	2/19/26, 10:42:29 AM	
Mithun Gayen {मिथुन गायेन} (External)	2/19/26, 10:42:30 AM	mithun.gayen@powergrid.in
SLDC ODISHA (Unverified)	2/19/26, 10:42:30 AM	
Surya Pratap Rath, AGM OPTCL (Unverified)	2/19/26, 10:48:22 AM	
Nishant Kumar Shankwar	2/19/26, 10:51:07 AM	Nishant.Kumar@energy-sel.com
AKHAND (Unverified)	2/19/26, 10:52:17 AM	
PARAG CHATTERJEE (External)	2/19/26, 10:52:37 AM	PARAGCHATTERJEE@NTPC.CO.IN
Somnath Chatterjee (External)	2/19/26, 10:54:40 AM	schatterjee@tatapower.com
Gitesh Patel (External)	2/19/26, 10:57:44 AM	giteshpatel@erldc.onmicrosoft.com
ssarkar (Unverified)	2/19/26, 10:58:30 AM	
OPTCL E&MR DIV, MRDL (Unverified)	2/19/26, 10:58:36 AM	
Subrat Sarangi	2/19/26, 10:58:40 AM	
Amresh Prusti (External)	2/19/26, 10:58:41 AM	amresh.prusti@opgc.co.in
Arindam BSPTCL (Unverified)	2/19/26, 10:59:55 AM	
EEE CRITL (Unverified)	2/19/26, 11:00:16 AM	
SJVN Mandar (Unverified)	2/19/26, 11:00:41 AM	
ravi ranjan verma	2/19/26, 11:00:58 AM	
P K PRUSTY EMR BURLA (Unverified)	2/19/26, 11:01:00 AM	
EEE,CRITL,BSPTCL (Unverified)	2/19/26, 11:01:21 AM	
Avinash Kumar	2/19/26, 11:01:36 AM	
TVNL (Unverified)	2/19/26, 11:02:19 AM	
Eee CRitl (Unverified)	2/19/26, 11:02:27 AM	
Bimal (Unverified)	2/19/26, 11:03:06 AM	
Nisar Husain	2/19/26, 11:03:11 AM	
TASHIDING HEP (Unverified)	2/19/26, 11:04:07 AM	
K B Jagtap MS ERPC (Unverified)	2/19/26, 11:05:00 AM	
Debabrata Biswas (External)	2/19/26, 11:05:51 AM	dbiswas@erldc.onmicrosoft.com
Rahul Srivastava (Unverified)	2/19/26, 11:05:54 AM	

CE CRITL (Unverified)	2/19/26, 11:06:05 AM	
Dharm Das Murmu (Unverified)	2/19/26, 11:06:06 AM	
kanak kumari (Unverified)	2/19/26, 11:07:21 AM	
Puja Ranjan (Unverified)	2/19/26, 11:07:36 AM	
Prabhakar kishore	2/19/26, 11:07:51 AM	
I K Mehra SE ERPC (Unverified)	2/19/26, 11:08:22 AM	
Roma (Unverified)	2/19/26, 11:08:26 AM	
Santosha kumar sahoo (Unverified)	2/19/26, 11:09:08 AM	
Junior Manager CRITL	2/19/26, 11:10:14 AM	
Manas Das (External)	2/19/26, 11:11:36 AM	manasdas@erldc.onmicrosoft.com
Rajeev Ranjan Kumar (Unverified)	2/19/26, 11:13:05 AM	
bsptcl 123	2/19/26, 11:13:16 AM	
Ranjib (Unverified)	2/19/26, 11:15:56 AM	
Ranjan Kumar Biswal {रंजन कुमार बिस्वाल} (External)	2/19/26, 11:16:02 AM	ranjankumar@powergrid.in
amaresh.prusti@gmail.com	2/19/26, 11:18:17 AM	
PRABHAT KUMAR SPTL (Unverified)	2/19/26, 11:20:24 AM	
Dgm e&mr div balangir (Unverified)	2/19/26, 11:22:07 AM	
Dilshad Alam (Unverified)	2/19/26, 11:24:18 AM	
BSPTCL (Unverified)	2/19/26, 11:24:46 AM	
ERLDC (Unverified)	2/19/26, 11:27:47 AM	
Deepak Kumar EEE, CRITL, BSPTCL	2/19/26, 11:28:42 AM	
Samai Majhi (Unverified)	2/19/26, 11:52:03 AM	
Akhand Pratap (Unverified)	2/19/26, 12:00:18 PM	
Pandi Krishnan N {पाण्डी कृष्णन एन.} (External)	2/19/26, 12:26:22 PM	pandikrishnan.n@powergrid.in
Deepak (Unverified)	2/19/26, 12:53:52 PM	
Tashidin HEP (Unverified)	2/19/26, 1:22:47 PM	

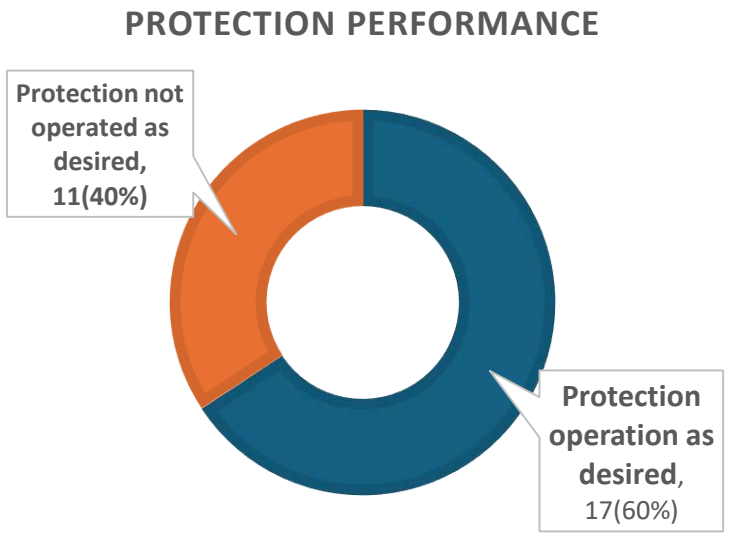
Annexure A.2

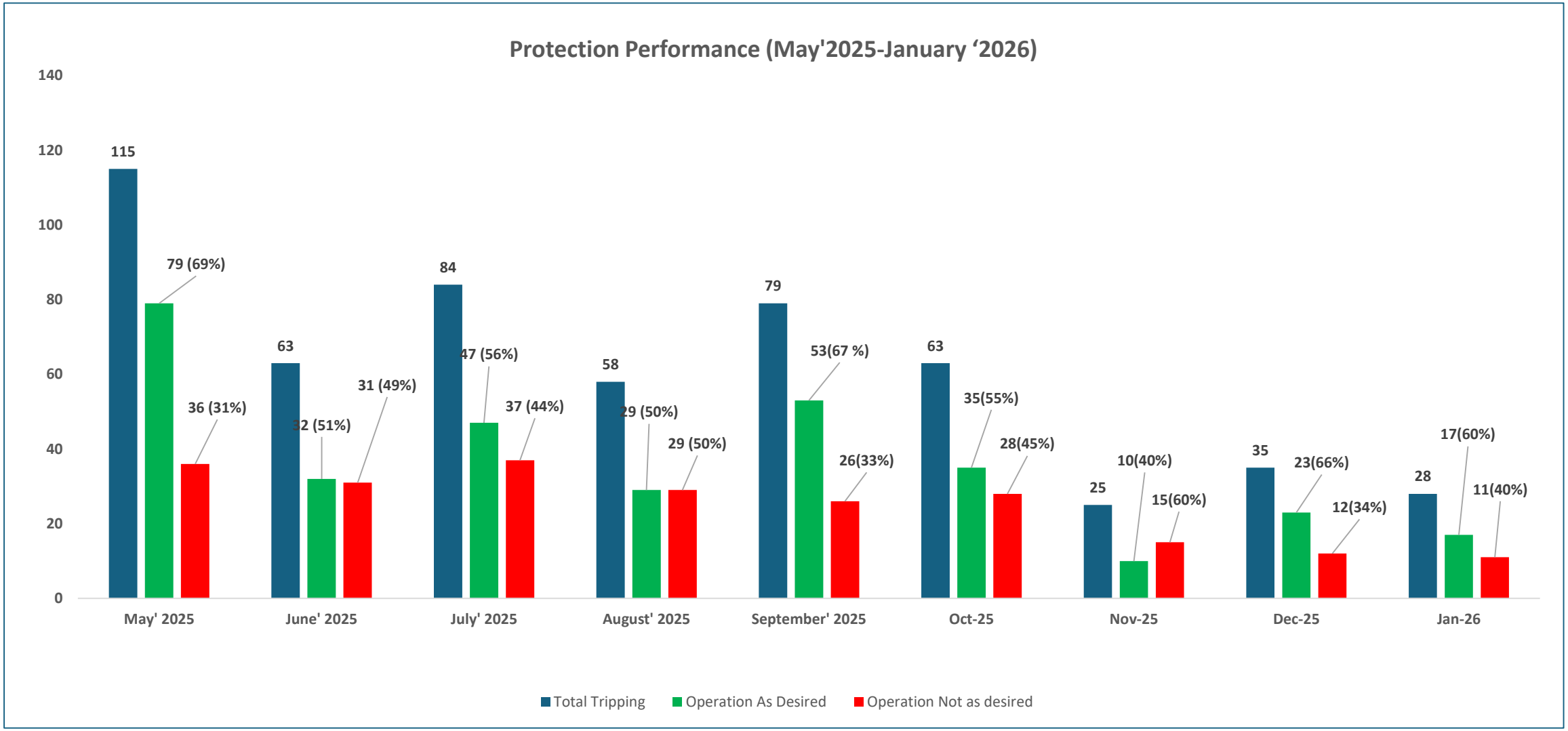
155th PCC Meeting
(19-02-2026)

Protection Performance For The Month Of January 2026

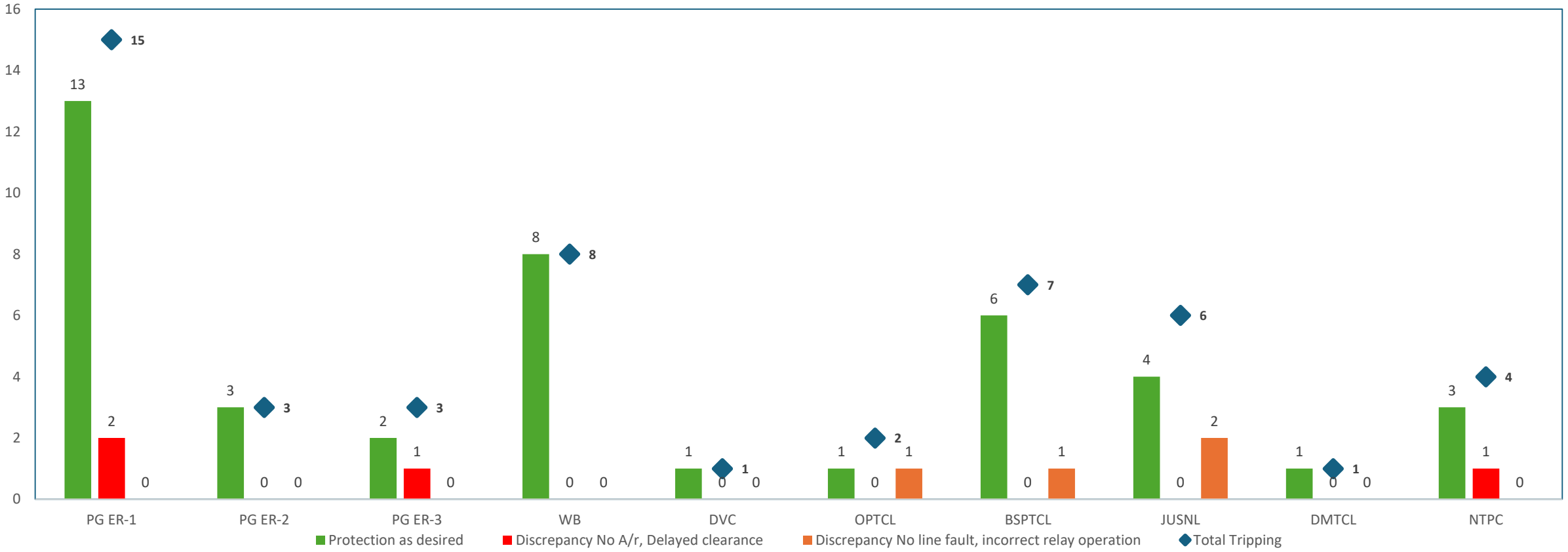
- Total **28**-line tripping:
  - Protection operation as per scheme: **17(60%)**
  - Protection operation not as desired: **11 (40%)**

- Number of Grid Event: **1**
  - Maximum load loss: 15 **MW**(During disturbance at Bolangir (GRIDCO) due to unwanted LBB protection operation on 13/01/2026

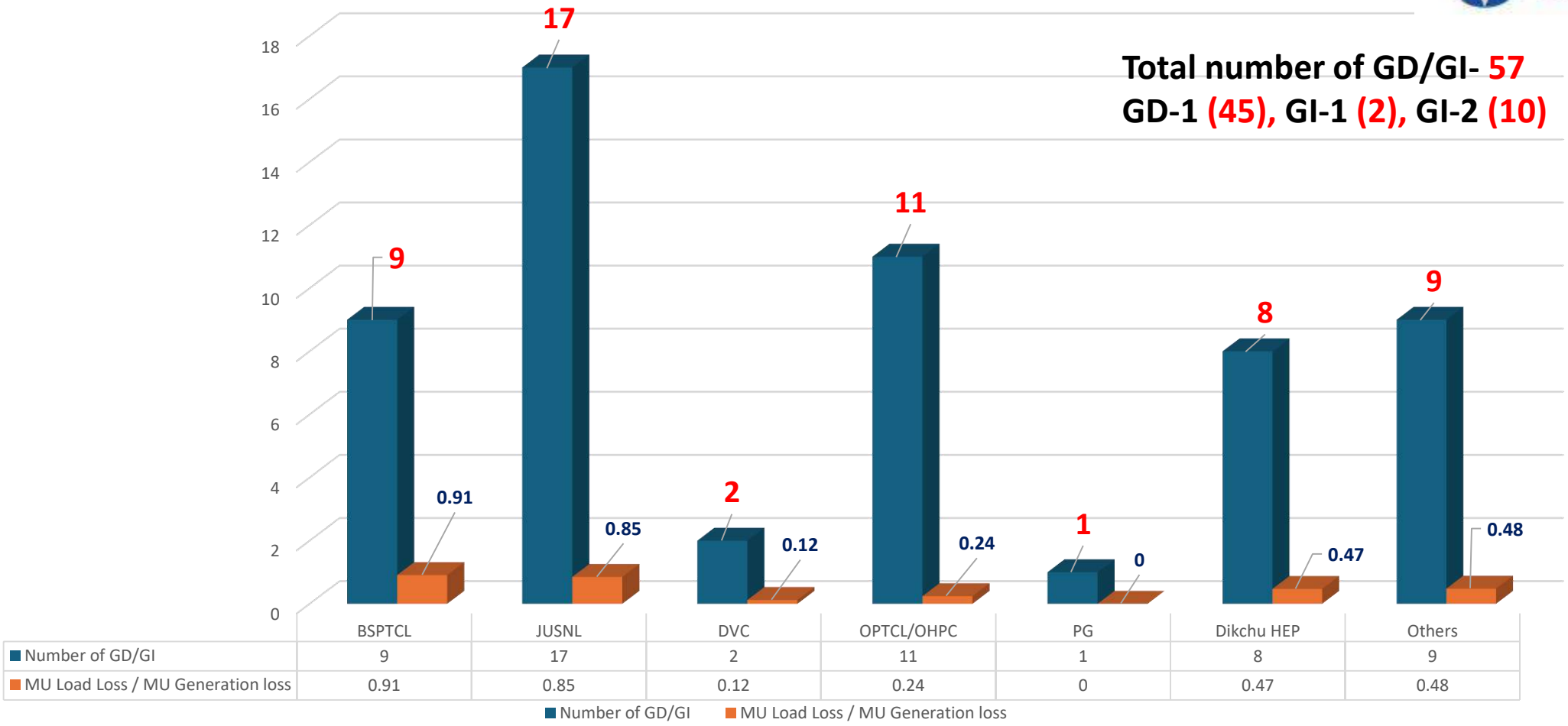



Protection Performance (May'2025-January '2026)
140
120
100
80
60
40
20
0
115
79 (69%)
36 (31%)
63
32 (51%)
31 (49%)
84
47 (56%)
37 (44%)
58
29 (50%)
29 (50%)
79
53(67 %)
26(33%)
63
35(55%)
28(45%)
25
10(40%)
15(60%)
35
23(66%)
12(34%)
28
17(60%)
11(40%)
May' 2025
June' 2025
July' 2025
August' 2025
September' 2025
Oct-25
Nov-25
Dec-25
Jan-26
Total Tripping
Operation As Desired
Operation Not as desired

Utility wise performance for the month of January’26



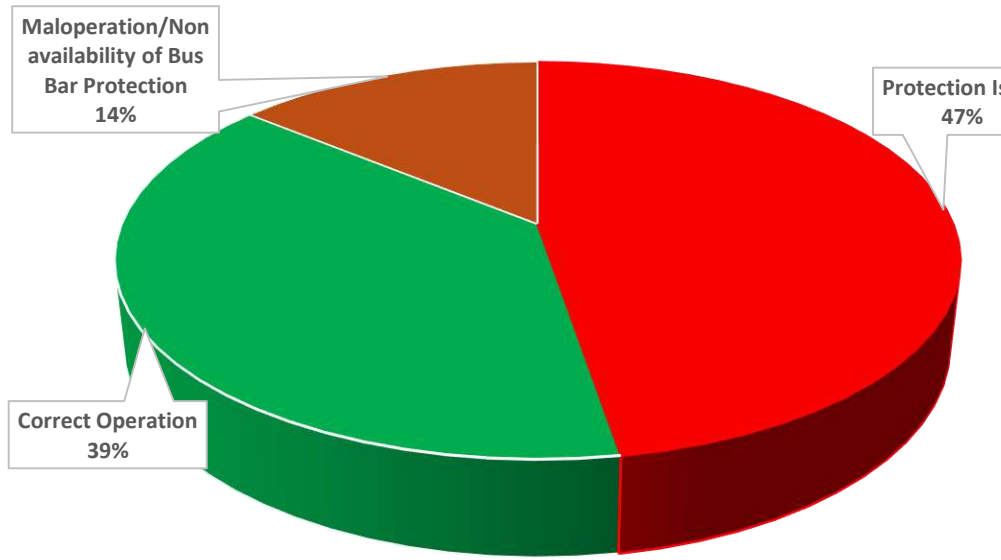
Utility wise GD/GI and MU load loss during 2025



- Maximum Generation loss: 1800 MW at NTPC Barh on 04/01/2025 due to O/C protection operation.
- Maximum load loss: 310 MW at Bodhgaya on 21/04/2025 due to O/C protection operation.

Classification of Reason of GD/GI for 2025:

- **39 % GD/GI cases-** Protection operated correctly.
- **47 % disturbances-** Attributed to protection issues mainly due to incorrect relay setting and improper setting coordination.
- **14 % disturbances-** Due to Maloperation of LBB/BB protection and Non availability of Bus Bar protection.



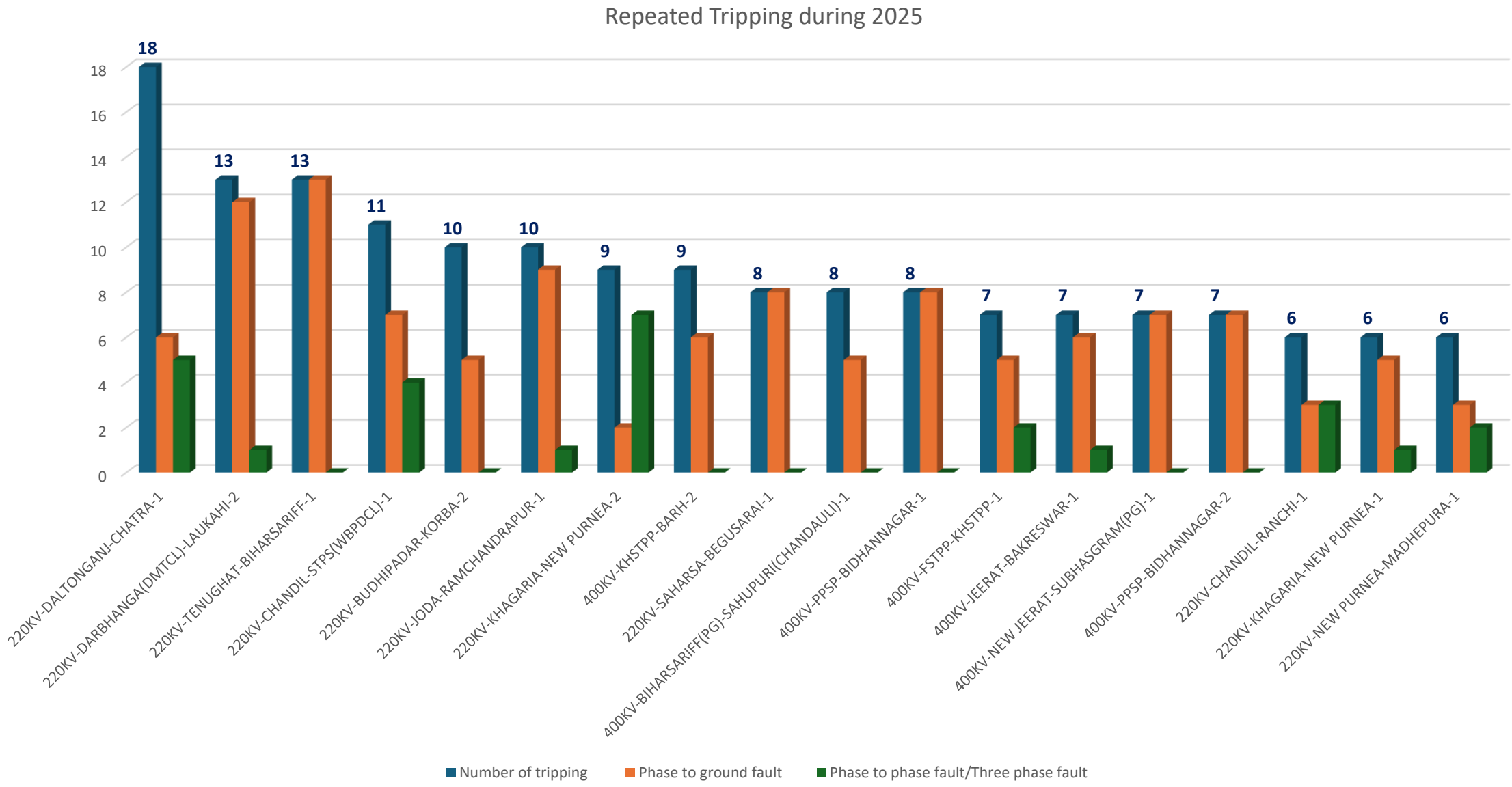
Remedial Measures:

In case of Bus bar protection non-availability/out of service

- Z-4-time delay revised to 250 msec for all feeders.
- Proper segregation of feeder ensured on both Main 1 & 2
- High set O/C Earth fault protection enabled in bus coupler bay to avoid total black out in case of bus fault.
- OPTCL already implemented O/C E/F high set in (8) 220kV S/s where Bus Bar protection not in service.

Periodic review of protection setting –

- To minimize tripping/disturbance
- Ensure compliance of IEGC through internal and third-party protection audit.


Repeated Tripping during 2025
18
13
13
11
10
10
9
9
8
8
8
7
7
7
7
6
6
6
0
2
4
6
8
10
12
14
16
18
220KV-DALTONGANJ-CHATRA-1
220KV-DARBHANGA(DMTCL)-LAUKAHI-2
220KV-TENUGHAT-BIHARSARIFF-1
220KV-CHANDIL-STPS(WBPDCL)-1
220KV-BUDHIPADAR-KORBA-2
220KV-JODA-RAMCHANDRAPUR-1
220KV-KHAGARIA-NEW PURNEA-2
400KV-KHSTPP-BARH-2
220KV-SAHARSA-BEGUSARAI-1
400KV-BIHARSARIFF(PG)-SAHUPURI(CHANDAULI)-1
400KV-PPSP-BIDHANNAGAR-1
400KV-FSTPP-KHSTPP-1
400KV-JEERAT-BAKRESWAR-1
400KV-NEW JEERAT-SUBHASGRAM(PG)-1
400KV-PPSP-BIDHANNAGAR-2
220KV-CHANDIL-RANCHI-1
220KV-KHAGARIA-NEW PURNEA-1
220KV-NEW PURNEA-MADHEPURA-1
Number of tripping
Phase to ground fault
Phase to phase fault/Three phase fault

Thank You

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, टालिगंज, 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 बोलांगिर में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event at 220/132 kV Bolangir New 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): 12-02-2026

1. Event Summary (घटना का सारांश):

Prior to the disturbance, 220kV Bolangir (OPTCL) was drawing power from 220kV Bolangir-Bolangir (PG) D/C through 220kV Main Bus #1(220kV Main Bus #2 was under planned shutdown).

At 12:38 Hrs, during shifting of 220kV Kesinga line to TBC bay for availing shutdown of main bay of 220kV Kesinga line at Bolangir, LBB protection operated. This resulted tripping of all connected lines. Consequently, 220kV Bolangir (OPTCL) S/s became dead.

Total load loss of **15 MW** reported at Bolangir (OPTCL) S/s of Odisha Power System.

2. Time and Date of the Event (घटना का समय और दिनांक): 12:38 hrs of 13/01/2026**.**

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 in (Hz)	Regional Generation in (MW)	Regional Demand in (MW)
Pre-Event (घटना पूर्व)	49.96	25800	22317
Post Event (घटना के बाद)	49.96	25800	22317

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

Important Transmission Line/Unit if under outage	**220 kV Bolangir (Gr)- Bargarh (Idle charged from Bargarh end),**

(महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो बंद है)	**220 kV Bus -2 at Bolangir (Gr) (SD)**
Weather Condition (मौसम स्थिति)	Normal.

6. **Load and Generation loss (**लोड और जेनरेशन हानि**):** Approximate load loss of **15 MW** at Bolangir S/s.
7. **Duration of interruption (**रुकावट की अवधि**):** 00:13 Hrs (13 minutes).

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

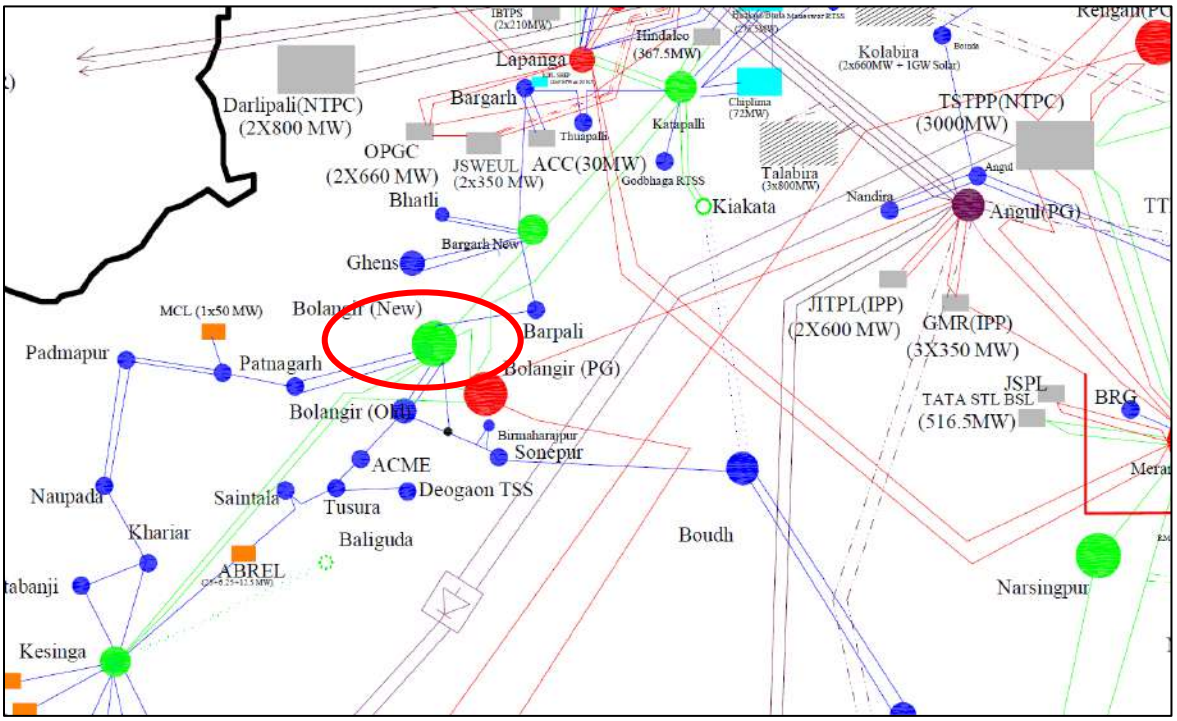


Figure 1: Network across the affected area

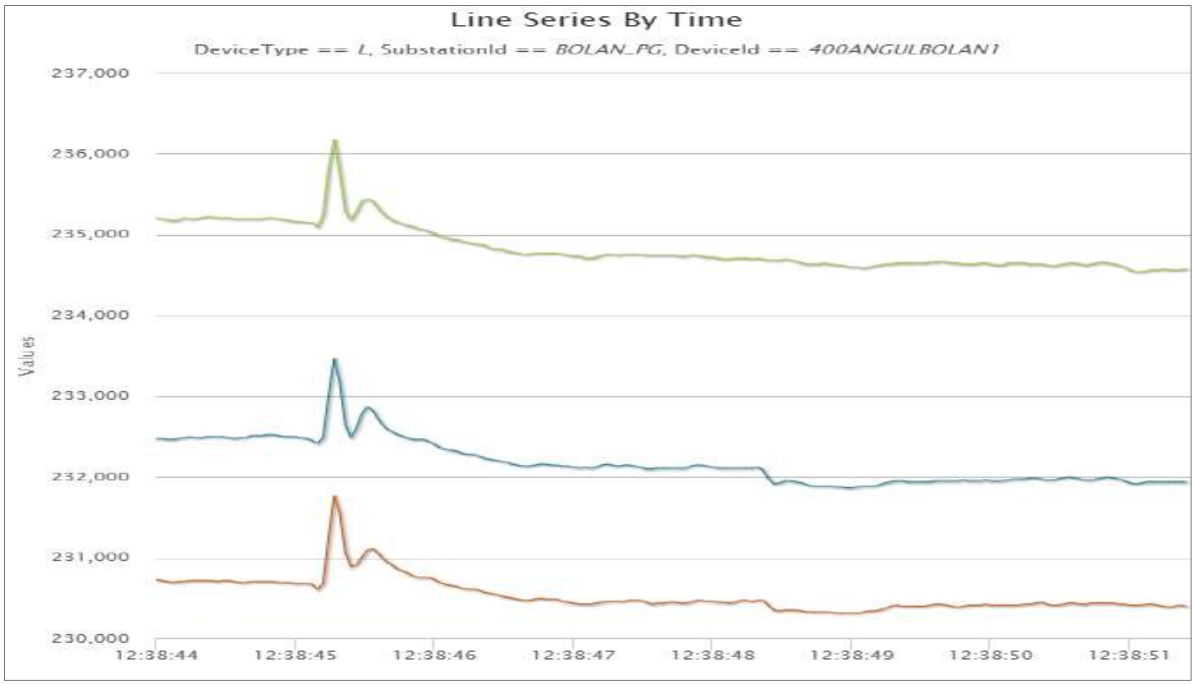
9. **Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण):** NIL

10. Major Elements Tripped (प्रमुख ट्रिपिंग):

क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time (Hrs)
1	220 kV Bolangir (PG)-Bolangir (GRIDCO) -1	12:38:45	-	LBB of TBC bay operated during shifting of Kesinga feeder to TBC	15:05
2	220 kV Bolangir (PG)-Bolangir (GRIDCO) -2		-		15:35
3	220 kV Kesinga-Bolangir (GRIDCO)		-		15:50
4	220 kV Main Bus-1 at Bolangir (GRIDCO)		-		12:51

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

- Prior to the disturbance, 220kV Bolangir (OPTCL) was drawing power from 220kV Bolangir-Bolangir (PG) D/C through 220kV Main Bus #1(220kV Main Bus #2 was under planned shutdown).
- At 12:38:45 Hrs, during shifting of 220kV Kesinga feeder to TBC bay for availing shutdown of 220kV main bay of Kesinga, LBB protection of TBC bay operated due to wrong wring of TBC CB close command with LBB operated.
- Due to LBB protection operation all connected feeders from main 220 kV Main bus #1 got tripped.
- Consequently, 220kV Bolangir New S/s became dead.
- Around 15 MW load loss reported at Bolangir New S/s.



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

- Detail reason of LBB protection operation and remedial measures taken may be shared.
- It is requested to check LBB/BB protection wiring as per scheme and ensure its proper healthiness. Necessary corrective action may be taken to prevent any unintended LBB/BB operation, which may otherwise lead to disturbance/ load loss.

13. Action Taken/Remedial Measures (सुधारात्मक उपाय): Not furnished.

14. Key Lessons Learnt (प्रमुख अधिगम बिंदु): Meticulous planning, supervision and adherence to standard procedures are essential during execution of R&M works. Periodic testing and verification of protection relay circuits as per Grid Code provisions helps in early detection and rectification of potential issues, thereby enhancing system reliability and security.

List of important transmission lines in ER which tripped in January-2026

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(Local End)	DR Configuration Discrepancy(Remote End)	DR/EL RECEIVED FROM LOCAL END	DR/EL RECEIVED FROM REMOTE END	LOCAL END UTILITY	REMOTE END UTILITY	UTILITY RESPONSE
1	400KV-DURGAPUR-KAHALGAON-2	31-01-2026	03:28	31-01-2026	06:19	Zone 1 , 6.8 KM , Y_N , 23.961 KA, A/r successful from Durgapur end.	Line tripped from NTPC end only, Y-Earth, Z-1	Y-Earth	>100 msec	A/r successful from Durgapur end and three phase tripping from NTPC end. NTPC may explain.			YES	NO	PG ER-II	NTPC	Fault was single phase type & A/R was successful at Durgapur SS. Protection operated properly at PG ER-2 end.
2	220KV-DALKHOLA (PG)-GAZOLE-2	19-01-2026	07:06	19-01-2026	19:37	Dalkhola-A/r successful	Gazole: B_N, 70.9 km, 0.79 kA	B-Earth	>100 msec	A/r successful from Dalkhola end and A/r failed from Gazole end.			YES	YES	PG ER-II	WBSETCL	Fault was single phase type & A/R was successful at Dalkhola SS. Protection operated properly at PG ER-2 end.
3	220KV-DALTONGANJ-CHATRA-1	27-01-2026	01:53	27-01-2026	02:37	Daltonganj-Y_N fault,FC-2.11kA,FD-63.58kM	Chatra-Zone-1, FD-64.076 km, Ia-165.6A, Ib-1514.4 A, Ic-231.6 A, fault phase Y-N	Y-Earth	>100 msec	Three phase tripping for phase to ground fault from both end.			YES	YES	PG ER-I	JUSNL	A/R BLOCKED DUE TO PLCC CHANNEL UNHEALTHY. PLCC BELOGNS TO JUSNL.
4	220KV-KHAGARIA-NEW PURNEA-2	23-01-2026	06:06	23-01-2026	06:59	New Purnea: R-N , fc-2.44 kA, Fd-82.6 km		R-Earth	350 msec	A/r successful from Khagaria end and three phase tripping from Purnea end in Z-2 protection. PG and BSPTCL may explain.		DR length needs to be increased to 3 sec.	YES	YES	BSPTCL	PG ER-I	BAY, PROTECTION & PLCC OWNED & MAINTAINED BY BSPTCL

5	400KV-JAKKANPUR(BH)-PATNA-1	05-01-2026	11:34	05-01-2026	20:10	Patna end relay: BN fault, 14.3 km, 12.52 kA,		B-Earth	>100 msec	A/r failed after 1 sec from Jakkanpur end and three phase tripping from Patna end for phase to ground fault. PG ER-1 may explain			NO	YES	BGCL	BSPTCL	A/R INITIATED WITH B-PH TO N FAULT, BUT AFTER 100MS (IN DEAD TIME) R-PH TO N FAULT ALSO DETECTED BY MAIN-2 (D-60) RELAY AND RESULTED INTO A/R LOCKOUT. MATTER TAKEN WITH OEM.
6	220KV-NEW PURNEA-MADHEPURA-1	01-01-2026	06:16	07-01-2026	21:02	New Purnea End: R_N,2.18kA ,71.1KM;	Madhepura end : Z-1,R_N,3.905kA,9.85 KM			R-Earth fault occurred in 220kV N Purnea-Madhepura line and CB at N Purnea end not opened during A/r failed operation, resulting in LBB operation at New Purnea S/s.			YES	YES	PG ER-I	BSPTCL	MADHEPURA BAY, PROTECTION & PLCC OWNED & MAINTAINED BY BSPTCL
7	400KV-MEDINIPUR-NEW CHANDITALA-2	24-01-2026	16:30	24-01-2026	11:10	Medinipur : R_N, FD: 48.9 km, FC: 4.998 kA	Chanditala end:R_N, FD: 34.37 Km,FC:8.943 kA	R-Earth	>100 msec	A/r failed after 1 sec.			YES	YES	PMJTL	WBSETCL	The line was patrolled by Arambag & New Chanditala 400 KV Area office but not visible fault found. Accordingly line was charged and it stood ok.

Name of the substation		OVERVOLTAGE % SETTING							
		LOCAL END(STAGE-I)		LOCAL END(STAGE-II)		REMOTE END(STAGE-I)		REMOTE END(STAGE-II)	
		VOLTAGE GARDIENT(% setting)	TIME DELAY(sec)	VOLTAGE GARDIENT(% setting)	TIME DELAY(sec)	VOLTAGE GARDIENT(% setting)	TIME DELAY(sec)	VOLTAGE GARDIENT(% setting)	TIME DELAY(sec)
Binaguri	400 KV Alipurduar- Binaguri -1	110	5	150	0.1	110	5	150	0.1
	400 KV Alipurduar- Binaguri -2	110	6	150	0.1	111	6	150	0.1
	400 KV Alipurduar- Binaguri -3	110	5	150	0.1	110	5	150	0.1
	400 KV Alipurduar- Binaguri -4	111	6	150	0.1	111	6	150	0.1
	400 KV Binaguri- Kishanganj -1	110	6	150	0.1	110	6	150	0.1
	400 KV Binaguri- Kishanganj -2	111	6	150	0.1	111	6	150	0.1
	400 KV Binaguri- Rangpo -1	110	6	150	0.1	110	5	150	0.1
	400 KV Binaguri- Rangpo -2	111	6	150	0.1	111	6	150	0.1
	400 KV New Purnea - Binaguri -1	110	5	150	0.1	110	5	150	0.1
	400 KV New Purnea - Binaguri -2	111	6	150	0.1	111	6	150	0.1
	400 KV Binaguri- Bongaigaon -1	110	5	150	0.1	-	-	-	-
	400 KV Binaguri- Bongaigaon -2	111	6	150	0.1	-	-	-	-
	400 KV Binaguri- Tala -1	110	5	150	0.1	-	-	-	-
	400 KV Binaguri- Tala -2	111	6	150	0.1	-	-	-	-
	400 KV Binaguri- Tala -4	110	5	150	0.1	-	-	-	-
	400 KV Binaguri- Malbase -3	110	6	150	0.1	-	-	-	-
Kishanganj	400 KV Saharsa - Kishanganj -1	110	5	150	0.1	110	5	150	0.1
	400 KV Saharsa - Kishanganj -2	111	6	150	0.1	111	6	150	0.1
	400 KV KISHANGANJ- Saharsha -3	110	5	150	0.1	110	5	150	0.1
	400 KV KISHANGANJ- Saharsha -4	111	6	150	0.1	111	6	150	0.1
	400 KV Binaguri- Kishanganj -1	110	5	150	0.1	110	6	150	0.1
	400 KV Binaguri- Kishanganj -2	111	6	150	0.1	111	6	150	0.1
	400 KV Kishanganj- Rangpo -1	111	6	150	0.1	110	5	150	0.1
	400 KV Kishanganj- Rangpo - 2	110	6	150	0.1	111	6	150	0.1
	400 KV New Purnea - Kishanganj -1	110	5	150	0.1	110	5	150	0.1
	400 KV New Purnea - Kishanganj -2	111	6	150	0.1	111	6	150	0.1
Rangpo	400 KV Teesta V- Rangpo -1	110	3	150	0	110	7	140	0.1
	400 KV Teesta V- Rangpo -2	111	3	150	0	110	5	140	0.1
	400 KV Rangpo- Dikchu -1	110	5	150	0.1	110	5	0.1	0.1
	400 KV Rangpo- Teesta III -	107	3	150	0.1	110	5	0.1	0.1
	400 KV Binaguri- Rangpo -1	110	7	150	0.1	110	5	150	0.1
	400 KV Binaguri- Rangpo -2	111	7	150	0.1	111	6	150	0.1
	400 KV Kishanganj- Rangpo -1	110	5	150	0.1	110	5	150	0.1
	400 KV Kishanganj- Rangpo -2	111	6	150	0.1	111	6	150	0.1
PURNEA	400KV NEW PURNEA-GOKARNA	110	5	150	0.1	110	5	150	0.1
	400 KV Farakka- New Purnea -1	110	5	150	0.1	110	5	150	0.1
	400 KV Biharshariff- New Purnea -1	110	5	150	0.1	110	5	150	0.1
	400 KV Biharshariff- New Purnea -2	111	6	150	0.1	110	6	150	0.1
	400 KV Malda - New Purnea -1	111	5	150	0.1	111	5	150	0.1
	400 KV Malda - New Purnea -2	111	6	150	0.1	111	6	150	0.1
	400 KV New Purnea - Binaguri -1	110	5	150	0.1	110	5	150	0.1
	400 KV New Purnea - Binaguri -2	111	6	150	0.1	111	6	150	0.1

	400 KV New Purnea - Muzaffarpur -1	110	5	150	0.1	111	5	150	0.1
	400 KV New Purnea - Muzaffarpur -2	111	6	150	0.1	112	6	150	0.1
	400 KV New Purnea - Kishanganj -1	110	5	150	0.1	110	5	150	0.1
	400 KV New Purnea - Kishanganj -2	111	6	150	0.1	111	6	150	0.1
MALDA	400 KV Farakka- Malda -1	110	5	140	0.1	110	5	140	0.1
	400 KV Farakka- Malda -2	111	5	150	0.1	111	5	150	0.1
	400 KV Malda - New Purnea -1	111	5	150	0.1	111	5	150	0.1
	400 KV Malda - New Purnea -2	111	6	150	0.1	111	6	150	0.1
FARAKKA	400 KV Sagardighi- Farakka -1	110	5	140	0.1	110	5	140	0.1
	400 KV Sagardighi- Farakka -2	110	6	140	0.1	110	6	140	0.1
	400 KV Farakka- Malda -1	110	5	140	0.1	110	5	140	0.1
	400 KV Farakka- Malda -2	110	6	150	0.1	110	6	150	0.1
	400 KV Farakka- Baharampur -1	110	6	140	0.1	110	6	140	0.1
	400 KV Farakka- Baharampur -2	110	5	140	0.1	110	5	140	0.1
	400 KV Farakka- New Purnea -1	110	5	140	0.1	110	5	140	0.1
	400 KV Farakka- Rajarhat -1	111	6	140	0.1	111	6	140	0.1
	400 KV Kahalgaon B- Farakka -1	111	5	140	0.1	111	5	140	0.1
	400 KV Kahalgaon B- Farakka -2	111	6	140	0.1	111	6	140	0.1
Jeerat	400 KV Jeerat- Subhasgram -1	112	6	150	0.1	112	6	150	0.1
	400 KV Jeerat- Rajarhat -1	111	5	150	0.1	111	5	150	0.1
	400 KV Bakreshwar - Jeerat -2	110	6	150	0.1	110	6	150	0.1
	400 KV New Chanditala - Jeerat -1	110	5	150	0.1	110	5	150	0.1
	400 kV-Jeerat-New Jeerat-1	110	5	150	0.1	110	5	150	0.1
	400 kV-Jeerat-New Jeerat-2	111	6	150	0.1	111	6	150	0.1
	400 kV-Jeerat-Sagardighi-1	110	5	150	0.1	110	5	150	0.1
	400 kV-Jeerat-Sagardighi-2	111	6	150	0.1	111	6	150	0.1
Subhashgram	400 KV Jeerat- Subhasgram -1	112	6	150	0.1	112	6	150	0.1
	400 KV Rajarhat- Subhasgram -1	112	5	150	0.1	112	5	150	0.1
	400 KV New Jeerat- Subhasgram -1	110	5	150	0.1	110	5	150	0.1
	400 KV New Jeerat- Subhasgram -2	111	6	150	0.1	111	6	150	0.1
	400 KV Haldia- Subhasgram -1	111	5	150	0.1	111	5	150	0.1
	400 KV Haldia- Subhasgram -2	111	6	150	0.1	111	6	150	0.1
SAGARDIGHI	400 KV Sagardighi- Farakka -1	110	5	150	0.1	110	5	150	0.1
	400 KV Sagardighi- Farakka -2	111	6	150	0.1	111	6	150	0.1
	400 KV Sagardighi- Baharampur -1	110	5	150	0.1	110	5	150	0.1
	400 KV Sagardighi- Baharampur -2	110	6	150	0.1	110	6	150	0.1
	400 KV Jeerat- Sagardighi -1	110	5	150	0.1	110	5	150	0.1
	400 KV Jeerat- Sagardighi -1	111	6	150	0.1	111	6	150	0.1
	400 KV Sagardighi- Durgapur B -1	110	5	150	0.1	110	5	150	0.1
	400 KV Sagardighi- Durgapur B -2	111	6	150	0.1	111	6	150	0.1
Durgapur	400 KV Sagardighi- Durgapur B -1	110	5	150	0.1	110	5	150	0.1
	400 KV Sagardighi- Durgapur B -2	111	6	150	0.1	111	6	150	0.1
	400 KV Kahalgaon - Durgapur B -1	110	5	150	0.1	110	5	150	0.1
	400 KV Kahalgaon - Durgapur B -2	111	6	150	0.1	111	6	150	0.1
	400 KV Maithon A- Durgapur A -1	110	5	150	0.1	110	5	150	0.1
	400 KV Maithon A- Durgapur A -2	111	6	150	0.1	111	6	150	0.1
	400 KV Bidhannagar- Durgapur B -2	110	5	150	0.1	110	5	150	0.1

BIDHANNAGAR	400 KV Bidhannagar- New Chanditala -1	110	5	150	0.1	110	5	150	0.1
	400 KV PPSP- Bidhannagar -1	110	5	150	0.1	110	5	150	0.1
	400 KV PPSP- Bidhannagar -2	112	6	150	0.1	112	6	150	0.1
	400 KV Bidhannagar- Durgapur B -1	110	5	150	0.1	110	5	150	0.1
	400 KV Bidhannagar- Durgapur B -2	111	5	150	0.1	111	5	150	0.1
PPSP	400 KV PPSP-BIDHAN NAGAR-I	110	5	150	0.1	110	5	150	0.1
	400 KV PPSP-BIDHAN NAGAR-II	112	6	150	0.1	112	6	150	0.1
	400 KV PPSP-New PPSP-1	111	5	150	0.1	111	5	150	0.1
	400 KV PPSP-New PPSP-1	112	6	150	0.1	112	6	150	0.1
Arambag	400 KV Bakreshwar - Arambagh -1	110	5	150	0.1	110	5	150	0.1
	400 KV Arambagh- New Chanditala -1	111	5	150	0.1	111	5	150	0.1
	400 KV Kolaghat TPS- Arambagh -1	110	6	150	0.1	110	6	150	0.1
	400 KV New PPSP - Arambagh -1	111	5	150	0.1	111	5	150	0.1
	400 KV New PPSP - Arambagh -2	112	6	150	0.1	112	6	150	0.1
Satgachia	Satgachia-Gokarna Ckt-I	110	5	150	0.1	110	5	150	0.1
	Satgachia-Gokarna Ckt-II	111	6	150	0.1	111	6	150	0.1
	Satgachia-New Chanditala Ckt-I	110	5	150	0.1	110	5	150	0.1
	Satgachia-New Chanditala Ckt-II	111	6	150	0.1	111	6	150	0.1
BAKRESWAR	400 KV BAKRESWAR-JEERAT	110	5	150	0.1	110	5	150	0.1
	400 KV BAKRESWAR-ARAMBAG	111	6	150	0.1	111	6	150	0.1
KOLAGHAT	400 KV Kolaghat TPS- Arambagh -1	111	6	150	0.1	111	6	150	0.1
	400 KV Kolaghat TPS- New Chanditala -1	110	6	150	0.1	110	6	150	0.1
	400 KV Kolaghat TPS- Kharagpur -1	110	5	150	0.1	110	5	150	0.1
	400 KV Kolaghat TPS- Kharagpur -1	111	6	150	0.1	111	6	150	0.1
KHARAGPUR	400 KV Chaibasa- Kharagpur -1	110	5	150	0.1	110	5	150	0.1
	400 KV Chaibasa- Kharagpur -2	111	5	150	0.1	111	5	150	0.1
	400 KV Medinipur- Kharagpur -1	110	5	150	0.1	110	5	150	0.1
	400 KV Medinipur- Kharagpur -2	111	5	150	0.1	111	5	150	0.1
	400 KV Kolaghat TPS- Kharagpur -1	111	5	150	0.1	111	5	150	0.1
	401 KV Kolaghat TPS- Kharagpur -1	111	6	150	0.1	111	6	150	0.1
	400 KV Baripada- Kharagpur -1	111	6	150	0.1	111	6	150	0.1
BARIPADA	400 KV TISCO- Baripada -1	111	5	150	0.1	111	5	150	0.1
	400 KV New Dubri- Baripada -1	111	5	150	0.1	111	5	150	0.1
	400 KV Baripada - Pandiabili -1	111	6	150	0.1	111	6	150	0.1
	400 KV Jamshedpur- Baripada -1	111	6	150	0.1	111	6	150	0.1
	400 KV Keonjhar- Baripada -1	110	5	150	0.1	110	5	150	0.1
	400 KV Baripada- Kharagpur -1	111	6	150	0.1	111	6	150	0.1
Jamshedpur	400 KV Adhunik- Jamshedpur -1	111	5	140	0.1	111	5	140	0.1
	400 KV Adhunik- Jamshedpur -2	111	6	140	0.1	111	6	140	0.1
	400 KV ANDAL- Jamshedpur -1	110	5	140	0.1	110	5	140	0.1
	400 KV ANDAL- Jamshedpur -2	111	6	140	0.1	111	6	140	0.1
	400 KV Mejia- Jamshedpur -1	111	5	140	0.1	111	5	140	0.1
	400 KV TISCO- Jamshedpur -1	111	5	150	0.1	111	5	150	0.1
	400 KV Jamshedpur - Chaibasa -1	110	5	140	0.1	110	5	140	0.1
	400 KV Jamshedpur - Chaibasa -2	110	6	140	0.1	110	6	140	0.1
	400 KV Jamshedpur- Baripada -1	111	6	150	0.1	111	6	150	0.1
	400KV JAMSHEDPUR-DURGAPUR	110	5	140	0.1	110	5	140	0.1

	400 KV Maithon A- Jamshedpur -1	110	6	140	0.1	110	6	140	0.1
CHAIBASA	400 KV Chaibasa- Kharagpur -1	110	5	150	0.1	110	5	150	0.1
	400 KV Chaibasa- Kharagpur -2	111	5	150	0.1	111	5	150	0.1
	400 KV Chaibasa- Rourkela -1	110	5	150	0.1	110	5	150	0.1
	400 KV Chaibasa- Rourkela -2	111	6	150	0.1	111	6	150	0.1
	400 KV Jamshedpur - Chaibasa -1	110	5	150	0.1	110	5	150	0.1
	400 KV Jamshedpur - Chaibasa -2	111	6	150	0.1	111	6	150	0.1
APNRL	400 KV APNRL-JAMSHEDPUR-I	111	5	140	0.1	111	5	140	0.1
	400 KV APNRL-JAMSHEDPUR -II	111	6	140	0.1	111	6	140	0.1
TISCO	400 KV TISCO-JAMSHEDPUR	111	5	150	0.1	111	5	150	0.1
	400 KV TISCO-BIRPADA	111	5	150	0.1	111	5	150	0.1
Maithon	400 KV Kahalgaon B- Maithon A -1	110	6	150	0.1	110	6	150	0.1
	400 KV Kahalgaon A- Maithon B -1	110	7	150	0.1	110	7	150	0.1
	400 KV MPL- Maithon A -1	111	5	150	0.1	111	5	150	0.1
	400 KV MPL- Maithon A -2	111	6	150	0.1	111	6	150	0.1
	400 KV Raghunathpur- Maithon A -1	110	5	150	0.1	110	5	150	0.1
	400 KV Mejia- Maithon B -2	110	5	150	0.1	110	5	150	0.1
	400 KV Mejia- Maithon B -3	111	5	150	0.1	111	5	150	0.1
	400 KV Mejia- Maithon B -1	111	6	150	0.1	111	6	150	0.1
	400 KV Maithon A- Jamshedpur -1	111	5	150	0.1	111	5	150	0.1
	400 KV Maithon A- Ranchi -1	110	5	150	0.1	110	5	150	0.1
	400 KV Maithon B- Gaya -1	110	5	150	0.1	110	5	150	0.1
	400 KV Maithon B- Gaya -2	111	6	150	0.1	111	6	150	0.1
	400 KV Maithon A- Durgapur A -1	110	5	150	0.1	110	5	150	0.1
	400 KV Maithon A- Durgapur A -2	111	6	150	0.1	111	6	150	0.1
Ranchi	400 KV Ranchi- Raghunathpur -2	112	7	150	0.1	112	7	150	0.1
	400 KV Ranchi- Raghunathpur -3	110	5	150	0.1	110	5	150	0.1
	400 KV Ranchi- Raghunathpur -1	110	5	150	0.1	110	5	150	0.1
	400 KV Dhanbad NKTL- Ranchi -	110	5	150	0.1	110	5	150	0.1
	400 KV Dhanbad NKTL- Ranchi -	111	6	150	0.1	111	6	150	0.1
	400 KV Maithon A- Ranchi -1	110	5	150	0.1	110	5	150	0.1
	400 KV Ranchi- Ranchi New -1	110	5	150	0.1	110	5	150	0.1
	400 KV Ranchi- Ranchi New -2	111	6	150	0.1	111	6	150	0.1
	400 KV Ranchi- Ranchi New -3	110	5	150	0.1	110	5	150	0.1
	400 KV Ranchi- Ranchi New -4	111	6	150	0.1	111	6	150	0.1
	400 KV Ranchi- Rourkela -1	110	5	150	0.1	110	5	150	0.1
	401 KV Ranchi- Rourkela -2	112	7	150	0.1	112	7	150	0.1
	400 KV Ranchi- Sipat -1	110	7	150	0.1	110	7	150	0.1
	400 KV Ranchi- Sipat -2	112	5	150	0.1	112	5	150	0.1
765/400 KV NEW RANCHI S/S	765KV NEW RANCHI-DHARAMJAIGARH-1	105	5	140	0.1	105	5	140	0.1
	765KV NEW RANCHI-DHARAMJAIGARH-2	106	6	140	0.1	106	6	140	0.1
	765KV NEW RANCHI-MEDINIPUR-1	105	5	140	0.1	105	5	140	0.1
	765KV NEW RANCHI-MEDINIPUR-2	106	6	140	0.1	106	6	140	0.1
	400 KV New Ranchi- New PPSP -1	111	5	150	0.1	111	5	150	0.1
	400 KV New Ranchi- New PPSP -2	111	7	150	0.1	111	7	150	0.1
	400 KV New Ranchi- Chandwa -1	110	5	150	0.1	110	5	150	0.1
	400 KV New Ranchi- Chandwa -2	112	7	150	0.1	112	7	150	0.1

	400 KV New Ranchi- Patratu -1	111	5	150	0.1	111	5	150	0.1
	400 KV New Ranchi- Patratu -2	112	6	150	0.1	112	6	150	0.1
	400 KV Ranchi- Ranchi New -1	110	5	150	0.1	110	5	150	0.1
	400 KV Ranchi- Ranchi New -2	110	7	150	0.1	110	7	150	0.1
	400 KV Ranchi- Ranchi New -3	112	5	150	0.1	112	5	150	0.1
	400 KV Ranchi- Ranchi New -4	112	7	150	0.1	112	7	150	0.1
CHANDWA	400 KV North Karanpura- Chandwa -1	111	6	150	0.1	111	6	150	0.1
	400 KV North Karanpura- Chandwa -2	112	7	150	0.1	112	7	150	0.1
	400 KV New Ranchi- Chandwa -1	110	5	150	0.1	110	5	150	0.1
	400 KV New Ranchi- Chandwa -2	111	6	150	0.1	111	6	150	0.1
	400 KV Gaya- Chandwa -1	110	5	150	0.1	110	5	150	0.1
	400 KV Gaya- Chandwa -2	111	6	150	0.1	111	6	150	0.1
	400 KV Chandwa- Latehar New -2	110	5	150	0.1	110	5	150	0.1
	400 KV Chandwa- Latehar New -1	110	6	150	0.1	110	6	150	0.1
MAITHON RIGHT BANK	400 KV MPL- Maithon A -1	110	5	150	0.1	110	5	150	0.1
	400 KV MPL- Maithon A -2	111	6	150	0.1	111	6	150	0.1
	400 KV Dhanbad NKTL- MPL -1	110	6	150	0.1	110	6	150	0.1
	400 KV Dhanbad NKTL- MPL -2	111	6	150	0.1	111	6	150	0.1
DSTPS	400 KV DSTPS- Jamshedpur -1	110	5	140	0.1	110	5	140	0.1
	400 KV DSTPS- Jamshedpur -2	111	6	140	0.1	111	6	140	0.1
	400 KV DSTPS- Raghunathpur -1	111	5	150	0.1	111	5	150	0.1
	400 KV DSTPS- Raghunathpur -2	111	6	150	0.1	111	6	150	0.1
KODERMA	400 KV Biharshariff- Koderma -1	110	5	150	0.1	110	5	150	0.1
	400 KV Biharshariff- Koderma -2	111	5	150	0.1	111	5	150	0.1
	400 KV Gaya- Koderma -1	110	6	150	0.1	110	6	150	0.1
	400 KV Gaya- Koderma -2	111	6	150	0.1	110	6	150	0.1
	400 KV Bokaro- Koderma -1	111	6	150	0.1	111	6	150	0.1
	400 KV Bokaro- Koderma -2	111	7	150	0.1	111	7	150	0.1
BOKARO-A	400KV BOKARO-A-KODERMA-I	111	6	150	0.1	111	6	150	0.1
	400KV BOKARO-A-KODERMA-II	111	7	150	0.1	111	7	150	0.1
Mejia	400 KV Mejia- Maithon B -2	110	5	150	0.1	110	5	150	0.1
	400 KV Mejia- Maithon B -3	111	5	150	0.1	111	5	150	0.1
	400 KV Mejia- Maithon B -1	111	6	150	0.1	111	6	150	0.1
	400 KV Mejia- Jamshedpur -1	111	5	150	0.1	111	5	150	0.1
RAGHUNATHPUR	400 KV Ranchi- Raghunathpur -2	110	5	150	0.1	110	5	150	0.1
	400 KV Ranchi- Raghunathpur -3	111	5	150	0.1	111	5	150	0.1
	400 KV Ranchi- Raghunathpur -1	111	6	150	0.1	111	6	150	0.1
	400 KV Raghunathpur- Maithon A -1	110	5	150	0.1	110	5	150	0.1
	400 KV DSTPS- Raghunathpur -1	111	5	150	0.1	111	5	150	0.1
	400 KV DSTPS- Raghunathpur -2	111	6	150	0.1	111	6	150	0.1
PANDIABILLI	400 KV PANDIABILLI-MENDASAL-I	110	5	150	0.1	110	5	150	0.1
	400 KV PANDIABILLI-MENDASAL-II	111	6	150	0.1	111	6	150	0.1
	400 KV PANDIABILLI-N.DUBURI	110	5	150	0.1	110	5	150	0.1
	400 KV PANDIABILLI - BARIPADA	110	5	150	0.1	111	5	150	0.1
	400 KV MEERAMUNDALI-TALCHER-1	113%	5	140%	0.1	113%	5	140%	0.1
	401 KV MEERAMUNDALI-TALCHER-2	113%	4	142%	0.1	113%	4	142%	0.1
	400 KV MEERAMUNDALI-JINDAL-I	110%	5	140%	0.1	110%	5	140%	0.1

MEERAMUNDALI	400 KV MEERAMUNDALI-JINDAL-II	110%	4	142%	0.1	110%	4	142%	0.1
	400 KV MEERAMUNDALI-ANGUL-I	105%	3	140%	0.1	105%	3	140%	0.1
	400KV MERAMUNDALI-GMR	110%	5	140%	0.1	110%	5	140%	0.1
	400 KV MERAMUNDALI-LAPANGA -I	110%	5	140%	0.1	110%	5	140%	0.1
	401 KV MERAMUNDALI-LAPANGA -II	110%	4	142%	0.1	110%	4	142%	0.1
	400 KV MERAMUNDALI-N.DUBURI -I	110%	5	140%	0.1	110%	5	140%	0.1
	400 KV MERAMUNDALI-N.DUBURI -II	110%	4	142%	0.1	110%	4	142%	0.1
	400KV MERAMUNDALI-MENDHASAL-1	110%	5	140%	0.1	110%	5	140%	0.1
	400KV MERAMUNDALI-MENDHASAL-2	110%	4	142%	0.1	110%	4	142%	0.1
ANGUL	400 KV ANGUL-MEERAMUNDALI-I	108%	5	149%	0.1	108%	5	149%	0.1
	400KV ANGUL-BOLANGIR	110%	4	142%	0.1	110%	4	142%	0.1
	400 KV ANGUL-JITPL-II	109%	5	150%	0.1	109%	5	150%	0.1
	400 KV ANGUL-JITPL-I	109%	4	139%	0.1	109%	4	139%	0.1
	400KV ANGUL-GMR-I	110%	5	150%	0.1	110%	5	150%	0.1
	400KV ANGUL-GMR-II	110%	6	150%	0.1	110%	6	150%	0.1
	765kV Angul-Jharsuguda-I	108%	6	150	0.1	108%	6	150	0.1
	765kV Angul-Jharsuguda-II	108%	5	150	0.1	108%	5	150	0.1
JITPL	400 KV JITPL-ANGUL-I	109%	5	150%	0.1	109%	5	150%	0.1
	400 KV JITPL-ANGUL-II	109%	4	139%	0.1	109%	4	139%	0.1
BOLANGIR	400 KV BOLANGIR-ANGUL	110.08	5	150.08	0.1	110.08	5	150.08	0.1
	400 KV BOLANGIR-JEYPORE	110.08	5	150.08	0.1	110.08	5	150.08	0.1
Jeypore	400 KV Jeypore - Indravati -1	110	5	140	0.1	110	5	140	0.1
	400 KV Jeypore - Bolangir -1	110	5	150	0.1	110	5	150	0.1
	400 KV Jeypore- Gazuwaka -1	110	5	140	0.1	110	5	140	0.1
	400 KV Jeypore- Gazuwaka -2	110	10	140	0.1	110	10	140	0.1
	400 KV Jeypore- Jagdalpur -1	110	5	140	0.1	110	5	140	0.1
	400 KV Jeypore- Jagdalpur -2	111	6	142	0.1	111	6	142	0.1
INDRAVATI(PG)	400 KV INDRAVATI-JEYPORE	110	5	150	0.1	110	5	150	0.1
	400 KV INDRAVATI-RENGALI	110	5	150	0.1	110	5	150	0.1
INDRAVATI(GR)	400 KV INDRAVTI(GR)-INDRAVATI(PG)	110	5	150	0.1	110	5	150	0.1
Rengali	400 KV RENGALI-INDRAVATI(PG)	110.24	5	149.68	0.1	110.24	5	149.68	0.1
	400 KV RENGALI-KEONJHAR	110.24	5	150.08	0.1	110.24	5	150.08	0.1
	400 KV RENGALI-TALCHER-I	110.24	6	141.73	0.1	110.24	6	141.73	0.1
	400 KV RENGALI-TALCHER-II	110.24	6	141.73	0.1	110.24	6	141.73	0.1
KEONJHOR	400 KV KEONJHAR-RENGALI	110%	5	150%	0.1	110%	5	150%	0.1
	400 KV KEONJHAR-BIRPADA	110%	5	150%	0.1	110%	5	150%	0.1
Talcher	400 KV Talcher-Rourkela-I	110%	5	140%	0.1	110%	5	140%	0.1
	400 KV Talcher-Rourkela-II	110%	5	140%	0.1	110%	5	140%	0.1
	400 KV Talcher-Rengali-I	110%	4	140%	0.1	110%	4	140%	0.1
	400 KV Talcher-Rengali-II	110%	5	140%	0.1	110%	5	140%	0.1

	400 KV Talcher-MERAMUNDALI	110%	5	140%	0.1	110%	5	140%	0.1
	400 KV Talcher-ANGUL	110%	5	140%	0.1	110%	5	140%	0.1
Rourkela	400 KV ROURKELLA-JHARSHUGUDA-I	110%	5	150%	0.1	110%	5	150%	0.1
	400 KV ROURKELLA-JHARSHUGUDA-II	110%	5	150%	0.1	110%	5	150%	0.1
	400 KV ROURKELLA-RAIGARH	111%	6	150%	0.1	111%	6	150%	0.1
	400 KV ROURKELLA-STERLITE-II	111%	6	150%	0.1	111%	6	150%	0.1
	400 KV ROURKELA-TALCHER-I	110%	5	150%	0.1	110%	5	150%	0.1
	400 KV ROURKELA-TALCHER-II	111%	6	150%	0.1	111%	6	150%	0.1
	400 KV ROURKELA-CHAIBASA-I	110%	5	150%	0.1	110%	5	150%	0.1
	400 KV ROURKELA-CHAIBASA-II	111%	6	150%	0.1	111%	6	150%	0.1
	400 KV ROURKELA-RANCHI-I	110%	5	150%	0.1	110%	5	150%	0.1
	400 KV ROURKELA-RANCHI-II	111%	6	150%	0.1	111%	6	150%	0.1
Jharshuguda	400KV JHSUGUDA-ROURKELA-I	109	4	140	0.1	109	4	140	0.1
	400KV JHSUGUDA-ROURKELA-II	110	6	140	0.1	110	6	140	0.1
	400KV JHSUGUDA-ROURKELA-III	109	5	140	0.1	109	5	140	0.1
	400KV JHSUGUDA-ROURKELA-IV	110	7	140	0.1	110	7	140	0.1
	400 KV JHARSHUGUDA-RAIGARH -I	109	4	140	0.1	109	4	140	0.1
	400 KV JHARSHUGUDA-RAIGARH -II	110	6	140	0.1	110	6	140	0.1
	400 KV JHARSHUGUDA-RAIGARH -III	109	5	140	0.1	109	5	140	0.1
	400 KV JHARSHUGUDA-RAIGARH -IV	110	7	140	0.1	110	7	140	0.1
	400 KV JHARSHUGUDA-OPGC -I	109	5	140	0.1	109	5	140	0.1
	400 KV JHARSHUGUDA-JSWEUL	109	7	140	0.1	109	7	140	0.1
	400 KV JHARSHUGUDA-STERLITE-I	110	6	140	0.1	110	6	140	0.1
	400 KV JHARSHUGUDA-STERLITE-II	110	8	140	0.1	110	8	140	0.1
	765kV JHARSUGUDA-ANGUL-I	108	5	150	0.1	108	5	150	0.1
	765kVJHARSUGUDA-ANGUL-II	109.5	7	150	0.1	109.5	7	150	0.1
	765kV JHARSUGUDA-ANGUL-III	108	6	150	0.1	108	6	150	0.1
	765kV JHARSUGUDA-ANGUL-IV	110	8	150	0.1	110	8	150	0.1
	765kV JHARSUGUDA-NTPC DARLIPALI-I	110	7	150	0.1	110	7	150	0.1
	765kV JHARSUGUDA-NTPC DARLIPALI-II	110	8	150	0.1	110	8	150	0.1
	765kV JHARSUGUDA-RAIPUR-I	108	5	150	0.1	108	5	150	0.1
	765kV JHARSUGUDA-RAIPUR-II	108	6	150	0.1	108	6	150	0.1
	765kV JHARSUGUDA-DHARAMJAYGARH-I	108	5	150	0.1	108	5	150	0.1
	765kV JHARSUGUDA-DHARAMJAYGARH-II	109.5	7	150	0.1	109.5	7	150	0.1
	765kV JHARSUGUDA-DHARAMJAYGARH-III	108	6	150	0.1	108	6	150	0.1
	765kV JHARSUGUDA-DHARAMJAYGARH-IV	109.5	8	150	0.1	109.5	8	150	0.1
BIHARSHARIFF	400 KV Biharshariff- Koderma -1	110	5	150	0.1	110	5	150	0.1
	400 KV Biharshariff- Koderma -2	111	6	150	0.1	111	6	150	0.1
	400 KV Lakhisarai- Biharshariff -1	110	5	150	0.1	110	5	150	0.1
	400 KV Lakhisarai- Biharshariff -2	111	6	150	0.1	111	6	150	0.1
	400 KV Banka- Biharshariff -1	110	5	150	0.1	110	5	150	0.1
	400 KV Banka- Biharshariff -2	111	6	150	0.1	111	6	150	0.1
	400 KV Biharshariff- Pusauli -1	110	5	150	0.1	110	5	150	0.1
	400 KV Biharshariff- Pusauli -2	111	6	150	0.1	111	6	150	0.1
	400 KV Biharshariff- Muzaffarpur -1	110	5	150	0.1	110	5	150	0.1
	400 KV Biharshariff- Muzaffarpur -2	111	6	150	0.1	111	6	150	0.1
	400 KV Biharshariff- New Purnea -1	110	5	150	0.1	110	5	150	0.1

	400 KV Biharshariff- New Purnea -2	111	6	150	0.1	111	6	150	0.1
	400 KV Biharshariff- Balia -1	110	5	150	0.1	110	5	150	0.1
	400 KV Biharshariff- Balia -2	111	6	150	0.1	111	6	150	0.1
	400 KV Biharshariff- Sahupuri(Chandauli) -1	110	5	150	0.1	110	5	150	0.1
	400 KV Biharshariff- Sahupuri(Chandauli) -2	111	6	150	0.1	111	6	150	0.1
Kahalgaon	400 KV KhSTPP-BANKA -I	110%	6	140%	0.1	110%	6	140%	0.1
	400 KV KhSTPP-BANKA - II	112%	7	140%	0.1	112%	7	140%	0.1
	400 KV KhSTPP - LAKHISARAI- I	112%	7	140%	0.1	112%	7	140%	0.1
	400 KV KhSTPP - LAKHISARAI- II	112%	5	140%	0.1	112%	5	140%	0.1
	400 KV KhSTPP-MAITHON -I	112%	5	140%	0.1	112%	5	140%	0.1
	400 KV KhSTPP-MAITHON -II	110%	5	140%	0.1	110%	5	140%	0.1
	400 KV KhSTPP-BARH - I	110%	6	140%	0.1	110%	6	140%	0.1
	400 KV KhSTPP-BARH- II	110%	6	140%	0.1	110%	6	140%	0.1
	400 KV KHSTPP-FKK-I	110%	5	140%	0.1	110%	5	140%	0.1
	400 KV KHSTPP-FKK-II	112%	5	140%	0.1	112%	5	140%	0.1
	400 KV KHSTPP-DGP-I	110%	5	150%	0.1	110%	5	150%	0.1
	400 KV KHSTPP-DGP-II	111%	6	150%	0.1	111%	6	150%	0.1
Barh	400 KV BARH-KAHALGAON-I	110%	6	140%	0.1	110%	6	140%	0.1
	400 KV BARH-KAHALGAON-II	110%	6	140%	0.1	110%	6	140%	0.1
	400 KV BARH - BAKHTIYARPUR-I	110%	6	140%	0.1	110%	6	140%	0.1
	400 KV BARH - BAKHTIYARPUR-II	110%	6	140%	0.1	110%	6	140%	0.1
	400 KV BARH - PATNA-IIII	110%	6	140%	0.1	110%	6	140%	0.1
	400 KV BARH - PATNA-IV	110%	6	140%	0.1	110%	6	140%	0.1
	400 KV BARH - MOTIHARI-I	110%	6	140%	0.1	110%	6	140%	0.1
	400 KV BARH - MOTIHARI-II	110%	6	140%	0.1	110%	6	140%	0.1
PATNA	400 KV PATNA-BAKHTIYARPUR-I	112	6	150	0.1	112	6	150	0.1
	400 KV PATNA-BAKHTIYARPUR-II	112	7	150	0.1	112	7	150	0.1
	400 KV PATNA-BARH-III	110	4	150	0.1	110	4	150	0.1
	400 KV PATNA-BARH-IV	110	5	150	0.1	110	5	150	0.1
	400KV PATNA-SAHARSA-1	112	7	150	0.1	112	7	150	0.1
	400KV PATNA-SAHARSA-2	111	5	150	0.1	111	5	150	0.1
	400 KV PATNA - BALIA - I	110	5	150	0.1	110	5	150	0.1
	400 KV PATNA - BALIA - II	112	6	150	0.1	112	6	150	0.1
	400 KV PATNA - BALIA - III	110	5	150	0.1	110	5	150	0.1
	400KV PATNA-NAUBATPUR	112	6	150	0.1	112	6	150	0.1
	400KV PATNA-JAKKANPUR-1	111	6	150	0.1	111	6	150	0.1
	400KV PATNA-JAKKANPUR-2	110	5	150	0.1	110	5	150	0.1
Sasaram	765KV SASARAM-FATEHPUR	109	5	140	0.1	109	5	140	0.1
	400 KV PUSAULI - VARANASI	112	7	150	0.1	112	7	150	0.1
	400 KV PUSAULI - ALLAHABAD	112	7	150	0.1	112	7	150	0.1
	400 KV PASAULI-BIHARSHARIFF-I	110	5	150	0.1	110	5	150	0.1
	400 KV PASAULI-BIHARSHARIFF-II	112	5	150	0.1	112	5	150	0.1
	400KV PUSAULI-NABINAGAR-I	110	5	150	0.1	110	5	150	0.1
	400KV PUSAULI-NABINAGAR-II	110	6	150	0.1	110	6	150	0.1
	400KV DALTONGANJ-SASARAM-1	110	5	150	0.1	110	5	150	0.1
	400KV DALTONGANJ-SASARAM-2	111	6	150	0.1	111	6	150	0.1
	400 KV GAYA-KODERMA-I	110	5	150	0.1	110	5	150	0.1

Gaya	400KV GAYA-KODERMA-II	111	6	150	0.1	111	6	150	0.1
	400KV GAYA-MAITHON-I	110	5	150	0.1	110	5	150	0.1
	400KV GAYA-MAITHON-II	111	6	150	0.1	111	6	150	0.1
	400KV GAYA-CHANDWA-1	110	5	150	0.1	110	5	150	0.1
	400KV GAYA-CHANDWA-2	111	6	150	0.1	111	6	150	0.1
	400KV GAYA-CHANDAUTI-1	110	5	150	0.1	110	5	150	0.1
	400KV GAYA-CHANDAUTI-2	111	6	150	0.1	111	6	150	0.1
	765 KV GAYA-VARANASI-I	105	5	140	0.1	105	5	140	0.1
	765 KV GAYA-VARANASI-II	106	6	140	0.1	106	6	140	0.1
	765 KV GAYA-BALIA	105	5	140	0.1	105	5	140	0.1
BANKA	400 KV BANKA-BIHARSHARIFF-I	110	5	150	0.1	110	5	150	0.1
	400 KV BANKA-BIHARSHARIFF-II	111	6	150	0.1	111	6	150	0.1
	400 KV BANKA-KAHALGAON-I	110	5	150	0.1	110	5	150	0.1
	400 KV BANKA-KAHALGAON-II	111	6	150	0.1	111	6	150	0.1
Muzaffarpur	400 KV MUZAFFARPUR - NEW PURNEA - I	111	5	150	0.1	111	5	150	0.1
	400 KV MUZAFFARPUR - NEW PURNEA - II	112	6	150	0.1	112	6	150	0.1
	400 KV MUZAFFARPUR - GORAKHPUR - I	111	6	150	0.1	111	6	150	0.1
	400 KV MUZAFFARPUR - GORAKHPUR - II	110	5	150	0.1	110	5	150	0.1
	400 KV MUZAFFARPUR - BIHARSHARIFF - I	110	6	150	0.1	110	6	150	0.1
	400 KV MUZAFFARPUR - BIHARSHARIFF - II	111	6	150	0.1	111	6	150	0.1
	400KV MUZAFFARPUR-NEPAL-1	110	5	150	0.1	110	5	150	0.1
	400KV MUZAFFARPUR-NEPAL-2	111	6	150	0.1	111	6	150	0.1
	400KV MUZAFFARPUR-DARBHANGA-1	111	6	150	0.1	111	6	150	0.1
	400KV MUZAFFARPUR-DARBHANGA-2	110	5	150	0.1	110	5	150	0.1
LAKHISARAI	400 KV LAKHISARI-BIHARSHARIFF-I	110	5	150	0.1	110	5	150	0.1
	400 KV LAKHISARI-BIHARSHARIFF-II	111	6	150	0.1	111	6	150	0.1
	400 KV LAKHISARAI-KAHALGAON-I	110	5	150	0.1	110	5	150	0.1
	400 KV LAKHISARI-KAHALGAON-II	111	6	150	0.1	111	6	150	0.1
Medinipur	765kV-Medinipur-New Ranchi-1	108%	5	140%	0.1	108%	5	140%	0.1
	765kV-Medinipur-New Ranchi-2	108%	6	140%	0.1	108%	6	140%	0.1
	765kV-Medinipur-New Jeerat-1	109%	5	140%	0.1	109%	5	140%	0.1
	765kV-Medinipur-New Jeerat-2	109%	6	140%	0.1	109%	6	140%	0.1
400/220/33 KV GSS NEW DUBURI	400KV NEW DUBURI -MERAMUNDALI-1	110%	5	140%	0.1	110%	5	140%	0.1
	400KV NEW DUBURI -MERAMUNDALI-2	110%	5	140%	0.1	110%	5	140%	0.1
	400KV NEW DUBURI -PANDIABIL	110%	5	150%	0.1	110%	5	150%	0.1
	400KV NEW DUBURI -BARIPADA	110%	5	150%	0.1	110%	5	150%	0.1
	400KV NEW DUBURI-TATA-1	110%	5	140%	0.1	110%	5	140%	0.1
	400KV NEW DUBURI-TATA-2	110%	5	140%	0.1	110%	5	140%	0.1
400KV CHANDAUTI	400KV GAYA-CHANDAUTI-1	110	5	150	0.1	110	5	150	0.1
	400KV GAYA-CHANDAUTI-2	111	6	150	0.1	111	6	150	0.1
	400KV CHANDAUTI-NABINAGAR-1	110	5	150	0.1	110	5	150	0.1
	400KV CHANDAUTI-NABINAGAR-2	111	6	150	0.1	111	6	150	0.1
400KV SAHARSA	400KV KISHENGANJ-SAHARSA-1	110	5	150	0.1	110	5	150	0.1
	400KV KISHENGANJ-SAHARSA-2	111	6	150	0.1	111	6	150	0.1
	400KV KISHENGANJ-SAHARSA-3	112	5	150	0.1	112	5	150	0.1
	400KV KISHENGANJ-SAHARSA-4	112	7	150	0.1	112	7	150	0.1
	400KV PATNA-SAHARSA-1	110	5	150	0.1	110	5	150	0.1
	400KV PATNA-SAHARSA-2	111	6	150	0.1	111	6	150	0.1

	400KV SAHARSA-DARBHANGA-1	110	5	150	0.1	110	5	150	0.1
	400KV SAHARSA-DARBHANGA-2	111	6	150	0.1	111	6	150	0.1
400KV SITAMARHI	400KV SITAMARHI-DARBHANGA-1	110	5	150	0.1	110	5	150	0.1
	400KV SITAMARHI-DARBHANGA-2	111	6	150	0.1	111	6	150	0.1
	400KV SITAMARHI-MOTIHARI-1	110	5	150	0.1	110	5	150	0.1
	400KV SITAMARHI-MOTIHARI-2	111	6	150	0.1	111	6	150	0.1

Annexure 3.3

NTPC Barh

Month	January

Date	Line tripping	Cause of Tripping	Tripping Analysis	Correct Operations at NTPC Barh (Nc)	Failed operations at NTPC Barh(Nf)	Number of Unwanted Operation (Nu)	Number of incorrect operations (Ni= Nf+Nu)
27.01.2026	400 kV Barh-Motihari#2	Distance Protection operated (Zone 2-B phase, Zone 1-Y phase)	At NTPC Barh end, zone-2 B phase protection operated. As per SCADA event, zone-1 Y phase operated after 737 ms. Dead time for auto reclosure operation is 1 second. As fault actuated in second phase within the dead time, three phase tripping was generated leading to opening of breaker poles at Barh end. Impedance plot of main-1 relay shows point of tripping in zone-2 (Y-B phase).	1	0	0	0

Dependability Index D = Nc/(Nc+Nf)	1
Security Index S = Nc /(Nc+Nu)	1
Reliability Index R= Nc/(Nc+Ni)	1

Chatterjee 2/2/26

Signature of Area Engineer

Signature of Area In-charge

पराग चटर्जी/Parag Chatterjee
वरिष्ठ प्रबंधक (प्र॰ एवं अनु॰/वि॰अनु॰ विभाग)
Sr. Manager (O&M/EMD)
एनटीपीसी लि॰, बाढ़/NTPC Ltd., Barh

कनिष्क रंजन/KANISHKA RANJAN
उप महाप्रबंधक (प्र॰ एवं अनु॰/विद्युत अनुरक्षण विभाग)
Dy. General Manager (O&M/EMD)
एनटीपीसी लि॰ बाढ़/NTPC Ltd. Barh

Protection Performance Indices for the month of Jan'26 (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	132kVARA-DUMRAON(BSPTCL)-1	08-01-2026	06:34:00	08-01-2026	07:46:00	TRIPPED FROM BOTH ENDS DUE TO Y-N FAULT.FAULT DETAILS, ARA(SITE)-FD-7.550KM FC-6.215KA. FAULT IS UNDER BSPTCL JURISDICTION	Other Utility	1	NA	0	NA	0	NA	1	1	1	
2	220kV PURNEA-NEW PURNEA-1	01-01-2026	06:16:00	01-01-2026	09:14:00	TRIPPED FROM NEW PURNEA END ONLY BECAUSE LBB OPERATED IN 220 KV NEW PURNEA-MADHEPURA CKT-1 (LINE AND BAY OWNED AND MAINTAINED BY BSPTCL), WHICH OPERATED THE BUSBAR PROTECTION OF 220 KV BUS-2 AT NEW PURNEA ULTIMATELY TRIPPING THE CB OF 220 KV NEW PURNEA-PURNEA-1 AT NEW PURNEA END.		1	NA	0	NA	0	NA	1	1	1	
3	220kV RANCHI-HATIA(JSEB)-2	13-01-2026	11:39:00	13-01-2026	14:40:00	TRIPPED DUE TO R-Y FAULT FROM BOTH ENDS. RANCHI AFAS DETAILS: M1: FC=6.8KA, FD=28.83KM. FAULT UNDER JUSNL JURISDICTION.	Other Utility	1	NA	0	NA	0	NA	1	1	1	
4	315MVA,400/220KV ICT-3 AT BIHARSHARIFF	07-01-2026	12:09:00	07-01-2026	20:59:00	TRIPPED ONLY FROM BSPTCL END (220KV SIDE) DURING CHARGING OF 132 KV BSPTCL-ASTHAMA LINE BY BSPTCL, DUE TO WIRING ISSUE AT BSPTCL END. FAULT UNDER BSPTCL JURISDICTION.		1	NA	0	NA	0	NA	1	1	1	
5	315MVA,400/220KV ICT-3 AT BIHARSHARIFF	07-01-2026	02:35:00	07-01-2026	06:26:00	TRIPPED ONLY FROM BSPTCL END (220KV SIDE), DUE TO MASTER TRIP RELAY WIRING ISSUE IN BSPTCL BAYS. FAULT UNDER BSPTCL JURISDICTION.		1	NA	0	NA	0	NA	1	1	1	
6	400kV DALTONGANJ- SASARAM-1	09-01-2026	19:56:00	09-01-2026	19:56:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO Y-N FAULT DUE TO DENSE FOG AROUND FAULT AREA.FAULT DETILS, DALTONGANG(SITE)-M1: FD-65.399KM FC-1.995KA		1	1	0	0	0	0	1	1	1	
7	400kV BARH(NTPC)-MOTIHARI(DMTCL)-2	27-01-2026	13:30:00	27-01-2026	16:13:00	TRIPPED FROM BOTH ENDS DUE TO B-N FAULT.FAULT DETAILS- MOTIHARI (SITE)-M1: FD-10.6KM FC-14.26KA FAULT UNDER DMTCL JURISDICTION		NA	NA	NA	NA	NA	NA	NA	NA	NA	
8	400kV CHANDWA-GAYA-2	10-01-2026	23:44:00	10-01-2026	23:44:00	A/R SUCCESSFUL FROM BOTH END DUE TO Y-N FAULT DUE TO DENSE FOG AROUND FAULT AREA. GAYA AFAS- M2: FD-67.921KM, FC- 6.431 kA. CHANDWA AFAS- M1: FD- 48.747KM, FC-6.487 kA, M2: FD- 48.765KM, FC- 6.489 kA		1	1	0	0	0	0	1	1	1	
9	400kV PATNA-JAKKANPUR CKT-1	05-01-2026	11:34:00	05-01-2026	20:10:00	TRIPPED FROM BOTH ENDS DUE TO B-N FAULT. JAKKANPUR(SITE) DETAIL- M2: FD- 3.43KM, FC- 18.96KA, FAULT UNDER BGCL JURISDICTION.	Other Utility	1	NA	0	NA	0	NA	1	1	1	
10	400kV RANCHI-MAITHON-1	12-01-2026	21:41:00	12-01-2026	21:41:00	A/R SUCCESSFUL FROM BOTH ENDS DUE TO Y-N FAULT RANCHI (AFAS):M1-FD-76.812KM, FC-4.077KA. KITE THREAD FOUND ON TOWER BODY AT LOC. NO. 292.	Other Utility	1	NA	0	NA	0	NA	1	1	1	
11	500MVA,400/220KV ICT-2 AT NEW PURNEA	01-01-2026	06:16:00	01-01-2026	09:11:00	TRIPPED BECAUSE LBB OPERATED IN 220 KV NEW PURNEA-MADHEPURA CKT-1 (LINE AND BAY OWNED AND MAINTAINED BY BSPTCL), WHICH OPERATED THE BUSBAR PROTECTION OF 220 KV BUS-2 AT NEW PURNEA ULTIMATELY LEADING TO TRIPPING OF ICT.		1	NA	0	NA	0	NA	1	1	1	
12	765kV GAYA-VARANASI-2	14-01-2026	14:31:00	14-01-2026	14:31:00	A/R SUCCESSFUL FROM BOTH END DUE TO R-N FAULT DUE TO DENSE FOG AROUND FAULT AREA. GAYA (SITE): M1: FD-32.1KM. FC-9.54kA ; M2: FD-31.41KM. FC-9.464	Other Utility	1	NA	0	NA	0	NA	1	1	1	

PG Odisha

Protection Performance Indices for the month of January-26 (In compliance of Clause 15(6) of IEGC 2023)															
S. No.	Name of the element	Tripping Date	Tripping 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				
	400 KVRourkela -Talcher-1	08-01-2026	03:33:00	Line tripped on 1-ph fault due to AR relay issue without AR attempt M1:Z1, RN fault, 24.6KM, 10.4KA M2:Z1, RN fault, 25.3KM, 10.3KA		0	1	1	0	0	0	1	0.5	0.5	**Line tripped on 1-ph fault due to AR relay issue without AR attempt after retrofitting of AR Relay in main bay.** **Un-tested AR Relay in main bay causes the AR Loukout & 86A/B operation.** **Action taken: Schme modified and Bay wise testing of AR carried out & found OK.**

WBSETCL

Protection Performance Indices for the month of JAN'26 (In compliance of Clause 15(6) of IEGC 2023)																	
Sl. 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	GOKARNA-PURNIA #1	02.01.2026	15:14:00	03.01.2026	00:35:00	Zone-2,R-B-Phase,BAR, CR , A/R L/O		1		0		0		1	1	1	
2	New PPSP-Ranchi # 1	02.01.2026	23:21:00	03.01.2026	01:47:00	Gas Zone Trip		0		1		0		#	#	#	
3	New PPSP-Ranchi # 2	02.01.2026	23:21:00	03.01.2026	01:49:00	Gas Zone Trip		0		1		0		#	#	#	
4	New-Town AA3-Subhasgram PG	10.02.2026	16:38:00	11.02.2026	12:35:00	Zone-1,R-Phase, 3-phase Trip		1		0		0		1	1	1	
5	Gazol-Dalkhola PG #2	19.01.2026	07:06:00	19.01.2026	19:37:00	Zone-1,B-Phase,A/R Close, A/R L/O		1		0		0		1	1	1	
6	New PPSP-OLD PPSP # 2	20.01.2026	13:32:00	20.01.2026	14:36:00	Gas Zone Trip		0		1		0		#	#	#	
7	New PPSP-Arambag # 1	20.01.2026	13:32:00	20.01.2026	14:32:00	Gas Zone Trip		0		1		0		#	#	#	
8	New-Chanditala-Midnapore PG #2	24.01.2026	16:30:00	25.01.26	11:10:00	Zone-1,R-Phase,A/R Close, A/R L/O		1		0		0		1	1	1	
9	Arambag-Kolaghat # 1	25.01.2026	15:27:00	25.01.26	19:53:00	Zone-1,B-Phase,A/R Close, A/R L/O		1		0		0		1	1	1	
10	Arambag- BKTPP # 1	25.01.2026	15:28:00	25.01.26	15:58:00	DT Receive		1		0		0		1	1	1	
11	Manikchak-Malda PG #2	31.01.2026	04:02:00	31.01.2026	04:54:00	Zone-1,R-Phase,CS, CR ,3-phase Trip		1		0		0		1	1	1	

JUSNL

Protection Performance Indices for the month of January' 2026 (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 CHAIBASA(PG) - CHAIBASA(JUSNL) -1	10-01-2026	13:45			CT SF6 Low trip	DT received	1		1		0		1	0.5	0.5	Mal-operated due to circuitary issue.
2	220KV CHAIBASA(PG) - CHAIBASA(JUSNL) -1	12-01-2026	13:18			CT SF6 Low trip	DT received	1		1		0		1	0.5	0.5	Mal-operated due to circuitary issue.
3	220 kV Hatia - Ranchi (PG) - 02	13-01-2026	11:40			RY, Z1, 3.80 km, IR- 11.33 kA, IY - 11.56 kA		1		0		0		1	1	1	
4	220KV CHANDIL - STPS(WBPDCL) - 1	15-01-2026	22:40			YN, Z1, 53.6 km, IY- 2.50 kA, A/R successful	A/R successful	1		0		0		1	1	1	
5	220 kV Chatra - Daltonganj - 1	21-01-2026	16:07			RY, Z1, 94.668 km, IR- 1.29 kA, IY - 1.24 kA		1		0		0		1	1	1	
6	220 kV Chatra - Latehar - 2	21-01-2026				RN, Z1, 66.91 km, IR- 0.992 kA		1		1		0		1	0.5	0.5	DTPC is not installed
7	220 kV Chatra - Daltonganj -1	27-01-2026	01:53			YN, Z1, 64.076 km, IY- 1.53 kA		1		1		0		1	0.5	0.5	PLCC is unhealthy
8	220kV Govindpur - TTPS - II	27-01-2026	04:55			RN, Z1, 47.55 km, IR- 2.03 kA		1		1		0		1	0.5	0.5	DTPC is unhealthy

Protection Performance Indices for the month of January'26

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 (/Rectification)
						End A	End B	End A	End B	End A	End B	End A	End B				
1	220KV-MUZAFFARPUR(PG)-AMNOUR-1	25-01-2026	14:12	25-01-2026	15:11		Amnour R_Y, 25.7 km, Ir 4.15 kA, Iy 4.33 kA		1		0		0	1	1	1	Line tripped on phase to phase fault.
2	220KV-KHAGARIA-NEW PURNEA-2	23-01-2026	06:06	23-01-2026	06:59	Khagaria: R-N ,Z1, Ar success	New Purnea: R-N , fc-2.44 kA, Fd-82.6 km	1	0	0	0	0	1	Khagaria-1 Purnea-0	Khagaria-1 Purnea-0	Khagaria-1 Purnea-0	PLC defective at PG end. Engagement of OEM for Testing/Replacement of Burnt card at field level is under process
3	220KV-MUZAFFARPUR(PG)-AMNOUR-1	15-01-2026	14:08	15-01-2026	18:49		Amnour:Y_B, distance 13 km, IB - 5.57 kA, IC-5.71 kA		1		0		0	1	1	1	Line tripped in phase to phase fault.
4	220KV-SAHARSA-BEGUSARAI-2	03-01-2026	03:42	03-01-2026	23:33		Begusarai: Z-1, B-N, 71.6km, 2.2kA		1		0		0	1	1	1	A/r failed after 1 sec.
5	220KV-KHAGARIA-NEW PURNEA-2	01-01-2026	06:16			LBB operated at New Purnea S/s(PG) due to fault in 220 kV Madhepura- New Purnea-1			1		0		0	1	1	1	R-Earth fault occurred in 220kV N Purnea-Madhepura1 line and CB at N Purnea end not opened during A/r failed operation, resulting in LBB operation at New Purnea S/s. After thorough inspection and analysis contactor K11 of breakr of Madhepura-1 Line found suspicious and replaced.
6	220KV-NEW PURNEA-MADHEPURA-1	01-01-2026	06:16	07-01-2026	21:02	w Purnea End: R_N,2.18kA,71.1k	Madhepura end : Z-1,R_N,3.905kA,9.85 KM	0	1	0	0	1	0	Purnea-0 Madhepura-1	Purnea-0 Madhepura-1	Purnea-0 Madhepura-1	

DMTCL

Protection Performance Indices for the month of January'2026

Sr.No.	Name of the Element	Tripping Date	Tripping Time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc	Nc	Nu	Nu	Nf	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)	Analysis of the event
						End A	End B	End A	End B	End A	End B	End A	End B					
1	400 kV Motihari - Barh Circuit - 2	27/1/2026	13:30Hrs	27/1/2026	16:13Hrs	BN, Z1,10.6km, IB-14.26Ka, AR suuessful; tripped in reclaim time	BN, Z2 Operated,215km, IB-2.72Ka,	1	1	0	0	0	0	1	1	1	Line tripped in Zone-1, B-Phase Fault, FC:- 14.26kA, FD:- 10.6km.It was found that a high-intensity fire had occurred beneath the transmission line between Tower Nos. 73 to 75. The fire spread over a few square kilometers in the grassland area of the Gandak River, which is densely covered with elephant grass. The same is believed to be the probable/Natural calamity cause of the line tripping.	Fire was underneath 400 kV Barh-Motihari CKT-II & kept on spreading towards LILO Line. Due to this, carbon particles rose high in the air and due to their upward movement from ground to bottom & middle phases created a continuous pathway leading to arc effect blasts & simultaneous tripping.

Jorethang Loop Hydro Electric Project 2 X 28 MW

Protection Performance Indices for the January-2026 (In compliance of Clause 15(6) of IEGC 2023)

Sl. No.	Name of the element	Tripping Date	Tripping Time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc		Nu		Nf		Dependability index (Nc/(Nc+N f))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+ Nu+Nf))	Remarks (Reason for performance indices less than 1)	Analysis of the event
						End A	End B	End A	End B	End A	End B	End A	End B					
1	220KV Jorethang- New Melli Line-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NO Tripping
2	220KV Jorethang- New Melli Line-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No Tripping

Nc - is the number of correct operations at internal power system faults.
Nf - is the number of failures to operate at internal power system faults.
Nu - is the number of unwanted operations.

Tashiding Hydro Electric Project 2 X 48.5 MW

Protection Performance Indices for the JANUARY -2026 (In compliance of Clause 15(6) of IEGC 2023)

Sl. No.	Name of the element	Tripping Date	Tripping Time	Restoration Date	Restoration Time	Reason (Relay indication)		Nc		Nu		Nf		Dependability index (Nc/(Nc+N f))	Security Index (Nc/(Nc+Nu))	Reliability Index (Nc/(Nc+ Nu+Nf))	Remarks (Reason for performance indices less than 1)	Analysis of the event
						End A	End B	End A	End B	End A	End B	End A	End B					
1	220KV Tashiding- Legship Line-1	14-01-2026	08:44	14-01-2026	14:54	--	--	--	--	--	--	--	--	--	--	--	For cutting the Bamboo tree.	--
2	220KV Tashiding- Legship Line-1	26-01-2026	15:52	27-01-2026	13:51												During routine monitoring, we observed active sparking and signs of arcing on the Line end Isolator. To prevent a potential arc flash, equipment fire, or permanent damage to the infrastructure, an immediate isolation is required to investigate the fault.	

Nc - is the number of correct operations at internal power system faults.
Nf - is the number of failures to operate at internal power system faults.
Nu - is the number of unwanted operations.