



सत्यमेव जयते

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

Eastern Regional Power Committee

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



स./NO. पू.क्षे.वि.स./PROTECTION/2024/ 1096

दिनांक /DATE: 30/09/2024

सेवा में / To,

संलग्न सूची के अनुसार / As per list enclosed.

विषय : दिनांक – 30.09.2024 को आयोजित 139 वीं पीसीसी बैठक का कार्यवृत्त ।

Sub: Minutes of the 139th PCC meeting held on 26.09.2024

महोदय/ Sir,

26.09.2024 को आयोजित 139वीं 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 139th PCC meeting of ERPC held on 26.09.2024 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,

(आई.के.मेहरा / I.K.Mehra)

अधीक्षण अभियंता(पी.एस)

Superintending 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
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, 7 th 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), 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 rd 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 nd 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	

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-1 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-1 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, 3 rd 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 फोन: +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, डुक ग्रीन पावर कॉर्पोरेशन। पी.ओ. बॉक्स-1351, थिम्पू, 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, गुडगांव - 722002
निदेशक, शिगा एनर्जी पी.डब्ल्यू. लिमिटेड, 5वीं मंजिल, डीएलएफ बिल्डिंग नंबर 8, टावर-सी, गुडगांव - 722002	डीजीएम (ई एंड आई), हल्दिया एनर्जी लिमिटेड, बारीक भवन, कोकाता-700072, फैक्स: 033-22360955
प्लांट हेड, डिक्चु एचईपी, सिक्किम ।	



Minutes
of
139th PCC Meeting

Date:30.09.2024
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

MINUTES OF 139th PROTECTION COORDINATION SUB-COMMITTEE MEETING HELD ON 26.09.2024 AT 10:30 HRS THROUGH MS TEAMS

Member Secretary, ERPC chaired the meeting. List of participants is attached at **Annexure A**. ERLDC representative explained protection performance of eastern region for Aug 24 with help of presentation which is attached at **Annexure A.1**.

PART – A

ITEM NO. A.1: Confirmation of Minutes of 138th Protection Coordination sub-Committee Meeting held on 28th Aug 2024 through MS Teams.

The minutes of 138th Protection Coordination sub-Committee meeting held on 28.08.2024 was circulated vide letter dated 11.09.2024.

Members may confirm the minutes of the Meeting.

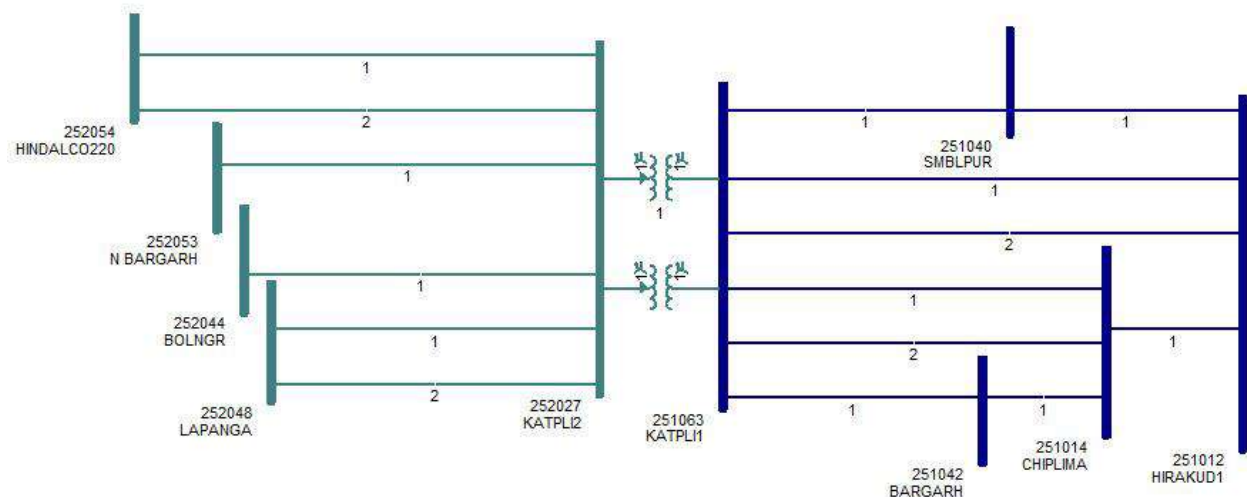
Deliberation in the meeting

Members confirmed the minutes of 138th PCC Meeting.

PART – B

ITEM NO. B.1: Total Power failure at 220/132 kV Katapalli (OPTCL) S/s on 29.08.2024 at 06:52 Hrs

On 29.08.2024, at 06:52 Hrs, a B phase fault developed in 220 kV Katapalli-Hindalco-2 consequently line got tripped immediately from Hindalco end however, breaker at Katapalli didn't open immediately. As LBB protection is not available at Katapalli, all lines at Katapalli got tripped and total power failure occurred at 220/132 kV Katapalli, Burla, Chiplima S/s. Further, Hindalco got islanded from the system.



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

Load Loss: 70 MW, Gen. Loss: 290 MW
Outage Duration: 00:51 Hrs
OPTCL may explain.

Deliberation in the meeting

ERLDC representative explained that incident at Katapalli on 29th Aug 2024 as follows –

a) Event at 06:52 Hrs-

- *B phase fault got developed in 132 kV Hirkud-Lapanga and 132 kV Burla-Lapanga line simultaneously at a particular location on double circuit tower.*
- *132 kV Hirkud-Lapanga, line got tripped immediately from Hirkud in Zone-1, however from Lapanga end it was not cleared either in Zone-1 or Zone-2 distance protection rather Directional O/c and Directional E/f had operated after around 640 msec.*
- *Similarly, 132 kV Burla-Lapanga also tripped in Zone-1 from Burla end, however from Lapanga it tripped after 640 msec in Directional O/c, E/f protection.*
- *After tripping of both circuits, generated power of Burla PH of around 225 MW was started to be evacuated through 132 kV Burla-Katapalli D/c, 132 kV Burla-Sambalpur and 132 kV Burla-Chiplima which were tripped sequentially on overcurrent protection. He informed that 132 kV Burla-Chiplima got tripped in o/c protection despite having flow in reverse direction.*

Thus, generation at Burla end become zero due to loss of evacuation path.

a) Event at 06:58 Hrs-

- *At 06:58 Hrs, R phase fault got developed in 220 kV Katapalli-Hindalco-2 consequently line got tripped immediately from Hindalco end however none of the protection operated at Katapalli immediately.*
- *As reported, Hindalco has its islanding scheme set at 450A(O/c), 191 kV (U/V) with instantaneous islanding therefore Hindalco got islanded with tripping of remaining Katapalli line.*
- *After 710 msec Directional O/c protection operated from Katapalli end but breaker at Katapalli didn't open so fault was still being fed meanwhile 132 kV Katapalli-Chiplima D/c tripped in around 450 msec from Chiplima on Directional E/f, leading to total generation loss at Chiplima.*
- *220 kV Katapalli-Bolangir (PG) tripped in Zone-3 from Bolangir after 800 msec.*
- *220 kV Katapalli-Bargarh tripped in Zone-3 from Bargarh after 800 msec.*
- *220 kV Katapalli-Lapanga D/c tripped on Directional O/c and E/f after around 800 msec from Lapanga however B phase of 220 kV Lapanga-Katapalli-1 didn't open at Lapanga.*

On enquiry from MS, ERPC regarding reason behind non operation of distance protection from Lapanga end during the disturbance, OPTCL representative informed that distance protection had operated correctly on 21st Aug 2024 correctly however reason for non operation of distance protection on 29th Aug 2024 can not be ascertained till date therefore it is planned to test relays by availing shutdown of lines as earliest as possible however at present they are facing difficulty in getting shutdown of lines due to evacuation path issue for heavy generation of Burla PH.

PCC advised OHPC representative to coordinate with OPTCL representative for carrying out preventive maintenance activities as well testing of protection system on periodic basis to avoid such type of tripping incidence in future.

ERPC representative informed that status of remedial measures against protection/operation issues as per report from ERLDC was received from OPTCL vide email dated 25/09/2024.

On enquiry from ERPC representative regarding status of implementation of bus bar protection at Katapalli end, OPTCL representative replied that renovation work is going at substation at 33 k V level subsequently upgradation work will be done for 132 k V & 220 k V which will cover implementation of bus bar protection also.

Regarding non operation of differential protection and distance protection at Katapalli end for 220 kV Katapalli- Hindalco D/c, OPTCL representative replied that relays were tested on 4th Sep 2024 along with breaker and relays as well breaker operation was satisfactory. PCC opined that there might be certain reason behind non operation of protection on date of incident so it advised OPTCL to investigate about reason behind non-operation of protection on 29th Aug 2024 and submit observation to ERPC/ERLDC.

Regarding keeping Hindalco islanding scheme to be instantaneous, ERLDC opined that even for transient faults Hindalco system is getting islanded instantaneously.

PCC advised SLDC Odisha, OPTCL to communicate with Hindalco to explore possibility of setting delay time of 100-150 ms in islanding scheme of Hindalco to avoid islanding in transient faults and submit summary of discussion and decision taken to ERPC/ERLDC.

Regarding non-operation of LBB protection at Lapanga end for instance of non opening of B phase breaker of 220 k V Katapalli – Lapanaga -1, OPTCL representative replied that due to mechanical damage of B phase limb of breaker, it was not opened during the incident. Further, shutdown is planned in next week during which LBB will be tested and report will be shared to ERPC/ERLDC.

Regarding o/c e/f settings, OPTCL representative informed that O/C E/F settings for all 220 k V feeders is already disabled except for Hindalco d/c however digital channels for DR will be configured again.

PCC advised SLDC Odisha, OPTCL, OHPC representative to review o/c e/f settings at Lapanga, Burla, Chiplima, Katapalli, Sambalpur for all feeders and submit revised settings to ERPC/ERLDC Subsequently a meeting will be conducted among ERPC, ERLDC, OPTCL, OHPC, SLDC Odisha representative to finalize the settings.

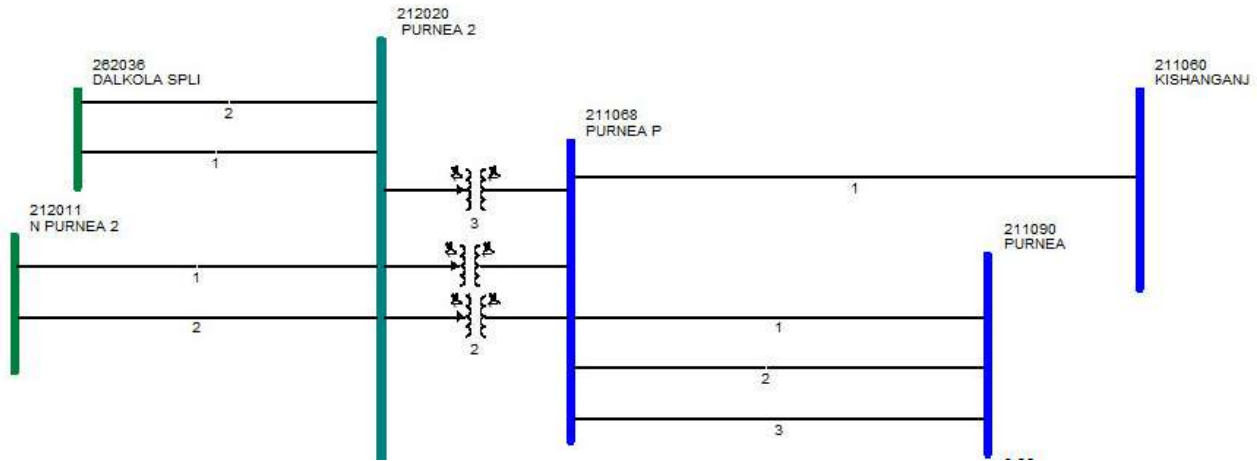
Regarding DR time synchronization issue, OPTCL representative informed that GPS clock is not available for 220 k V system at Lapanga and for Katapalli end automatic upgradation work is in process subsequently issue will be resolved.

On enquiry from ERPC representative regarding identification of physical fault, OPTCL representative informed that no physical fault was found for the incident.

PCC advised OPTCL representative to share status of remedial measures taken for protection/operation issues to ERPC/ERLDC on periodic basis.

ITEM NO. B.2: Total Power failure at 220/132 kV Purnea (PG) S/s on 01.08.2024 at 15:50 Hrs

On 01.08.2024, at 15:50 Hrs, 220/132 kV Purnea (PG) S/s became dead due to tripping of 220 kV New Purnea-Purnea D/c and 220 kV Gazole-Dalkhola D/c (Gazole-Dalkhola-Purnea link) during a fault in downstream of 132 kV Purnea (PG).



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

Load Loss: 110 MW

Outage Duration: 00:23 Hrs

Powergrid may explain.

Deliberation in the meeting

*Powergrid representative explained that incident with help of report which is attached at **Annexure B.2.1.***

He informed that on 1st Aug 2024, various no. of faults was observed in downstream of 132 k V Purnea (BSPTCL)S/s between 15:40- 15:50 Hrs which were cleared however at 15:50 Hrs, B phase fault got developed in the downstream of 132 kV Purnea S/s which was not cleared.

He further added that after 350 ms of initiation of fault, 220 kV New Purnea-Purnea D/c tripped due to back Up O/c and E/f fault from New Purnea end.

After tripping of 220 kV New Purnea-Purnea D/c, 220 kV Gazole-Dalkhola D/c started feeding the fault through 220 kV Gazole-Dalkhola-Purnea link subsequently 132 kV Purnea-Purnea-2 & 3 tripped from PG end in Zone-3 after 1150 ms from New Purnea end however Back Up O/c and E/f protection also operated for 132 kV Purnea-Purnea- 3.

He further added that pickup for Backup O/C & E/F protection and Zone-3 protection was also observed for 132 kV Purnea-Purnea-1 however zone 3 protection got reset and hence no tripping was observed for this line due to which fault was still getting fed and it was cleared after tripping of 220kV Dalkhola- Gazole d/c from Gazole end in 1270 ms after initiation of fault.

Since all sources got tripped in the incident hence total supply failure occurred at 220/132 k V Purnea (PG) S/s.

ERLDC representative informed that 132 kV Purnea-Purnea-1 didn't trip from either end as in between Zone-3 dropped for around 120 msec and picked again however, Back Up O/c Picked at Purnea (Bihar) at 1060 ms from initiation of fault. Further, direction of B phase current also reversed at Purnea which shows that at this instance, fault developed in 132 kV Purnea-Purnea-1.

Powergrid representative submitted the actions taken against protection/operational issues highlighted in ERLDC report which are as follows –

- *Regarding review of o/c e/f settings of 220 kV New Purnea-Purnea D/c with back up o/c settings of 220/132 k V ICTs, PG representative informed that the settings are reviewed and shared to site for implementation.*
- *Regarding operation/pickup of distance protection (as backup protection) for 132 kV Purnea-Purnea T/c instead of differential protection (as main protection), PG representative replied that even though the differential protection is in healthy state, all the zones (except Zone1) will operate as backup protection.*

- Regarding non operation of differential protection for 132 kV Purnea-Purnea-1, PG representative replied that differential protection will be tested during next opportunity shutdown.
- Regarding non time synchronization of DR of 132 kV Purnea-Purnea-3, PG representative informed that DR time synchronization had been completed.

On enquiry from ERPC representative regarding physical fault found during the incident, ERLDC representative & BSPTCL representative informed that there was initial fault observed in downstream of 132 kV Purnea (BSPTCL) S/s however due to paucity of PMU visibility and sufficient data, the exact location of fault couldn't be ascertained. However, another fault was also developed in 132 kV Purnea-Purnea-1 later which is confirmed by DR.

PCC advised PG representative to test differential protection for 132 kV Purnea-Purnea-1 along with rectification. It further advised BSPTCL representative to test OPGW and differential protection for 132 kV Purnea-Purnea-1 along with rectification at their end.

ERLDC representative said that there were different fault currents in each circuit of 132 kV Purnea-Purnea T/c with 132 kV Purnea-Purnea-2 having highest fault current of around 7 kA in the beginning. This is because at Purnea (PG) bus configuration is as below:

Bus-1: 220/132 kV ICT-1, Purnea-1, Purnea-3

Bus-2: 220/132 kV ICT-2,3 and Purnea-2

So, it is expected that the beginning of fault 132 kV Bus coupler might have also tripped. PG representative replied that bus coupler had not opened during the disturbance so till date cause had not been identified for the difference in fault currents.

PCC advised PG representative to identify reason behind difference in fault currents in each circuit of 132 kV Purnea-Purnea T/c.

PCC advised PG representative to share reviewed settings at Purnea (PG) with ERPC/ERLDC for their confirmation.

ERLDC representative informed that as per communication received from WBSETCL representative zone 3-time settings at Gazole end for 220 kV Gazole-Dalkhola has been increased to 1.2 second in coordination with 220/132 kV ICTs at Purnea & 220 kV Dalkhola-Purnea.

PCC advised PG ER-II representative to review zone 3 protection settings at Dalkhola end for 220 kV Dalkhola-Purnea in coordination with 220/132 kV ICTs at Purnea & 220 kV Gazole-Dalkhola and coordinate with WBSETCL for same.

ITEM NO. B.3: Total Power failure at 220 kV Darbhanga (BSPTCL) S/s on 01.08.2024 at 17:59 Hrs

On 01.08.2024, at 17:59 hrs, a fault struck B phase of 220kV Darbhanga (DMTCL) – Darbhanga - 1 closer to BSPTCL end however due to failure of opening of Circuit Breaker at Darbhanga end all other circuit connected to Darbhanga (BSPTCL) opened from remote end in Zone-2 time which led to total power failure at 220kV Darbhanga (BSPTCL) S/s.

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

Load Loss: 80 MW

Outage Duration: 00:35 Hrs

BSPTCL may explain.

Deliberation in the meeting

BSPTCL representative informed that on day of incident, heavy thunderstorm and rain was observed and heavy sound was heard near boundary wall at time of incidence. At 17:59 Hrs, a B phase fault developed in 220kV Darbhanga (DMTCL)–Darbhanga -1 which was sensed in Zone 1 at Darbhanga (BSPTCL) end as per event recorder, but circuit breaker did not open at Darbhanga (BSPTCL), While at DMTCL end fault was sensed in Zone -2. He further added that at BSPTCL end, Zone-4 picked up momentarily in 220 kV Darbhanga (DMTCL)-Darbhanga 2 and then DEF Rev picked up. Since bus bar protection is not available at BSPTCL end Zone-4-time delay was kept at 250 msec however breaker didn't open as Zone-4 remained high for less than 50 msec. He informed that as the fault wasn't cleared from BSPTCL end, 220kV Darbhanga (DMTCL)–Darbhanga d/c and 220kV Mushari–Darbhanga d/c, tripped from remote end in Zone-2-time delay of around 400 msec to clear the fault, resulting in total power failure of 220 kV Darbhanga (BSPTCL).

ERPC representative informed that in reply to the protection/operational issues observed in the incident as per report shared by ERLDC, BSPTCL had shared remedial actions taken so far to ERPC vide email dated 23.09.2024 which is given below.

- *Circuit Breaker Timing Test has been performed in 220 kV DMTCL-Darbhanga (BSPTCL) ckt-1 and results obtained were found satisfactory.*
- *Also due to the unhealthiness of PLCC system, carrier signal was not sent to Remote end. Telecom Wing Team has visited the site for rectification of the same.*
- *As far as Zone-4 pickup in 220 k V DMTCL-Darbhanga (BSPTCL) ckt-2 is concerned, it seems that due to very short line length (2.98 km) the fault might have seen in reverse and Zone-4 picked up.*
- *Reverse DEF has been disabled in the Relay and forward direction in DEF has been implemented.*
- *Proper configuration of DR channel is to be done.*
- *The SAS implementation work at the S/s is under process. The time synchronization issue will be rectified after this.*

BSPTCL representative informed that since no issue was observed in breaker timing test so it is planned to carry out testing of breaker by issuing trip command from relay and testing of relay too for which shutdown will be taken in first week of Oct 2024 and report of test conducted will be shared to ERPC/ERLDC by first week of Nov 2024.

DMTCL representative informed that similar incident was observed in 2022 where breaker got failed from BSPTCL end which resulted in tripping of ICT also during that incident.

MS, ERPC advised BSPTCL representative to carry out third party inspection at Darbhanga S/s in coordination with DMTCL and submit observations to ERPC/ERLDC. PCC advised same to BSPTCL & DMTCL representative.

On enquiry from ERPC representative regarding status of PLCC issue, BSPTCL representative informed that telecom wing had visited the site for rectification of PLCC on 8th Aug 2024 where HE cable was found broken between PLCC Panel and CVT junction box of bay of circuit 2 and got rectified. He informed that PLCC is healthy at present.

PCC opined that zone 4 pickup at BSPTCL end in 220 kV Darbhanga (DMTCL)-Darbhanga 2 should not have dropped in 50 ms so it advised BSPTCL representative to check the issue and submit observation to ERPC/ERLDC.

On enquiry from ERPC representative regarding SAS implementation work, BSPTCL representative informed that at present SAS implementation is going in South Bihar S/s and after that SAS implementation will be done in North Bihar S/s like Darbhanga, Madhepura etc.

PCC opined that since SAS implementation work will be taking much time so rectification of DR channel configuration and time synchronization issue should not be delayed till implementation of SAS as DR issue will affect study of future trippings occurred there hence it advised BSPTCL representative to resolve issue of DR channel configuration and time synchronization at BSPTCL end at earliest and share confirmation to ERPC/ERLDC after its rectification.

ITEM NO. B.4: Total Power failure at 220 kV Arrah (PG) S/s on 09.08.2024 at 19:51 Hrs

On 09.08.2024, at 19:51 Hrs, 220 kV Bus-2 at 220/132 kV Arrah(PG) S/s got tripped during bus bar stability testing of 220 kV Bus-1 which led to total power failure at Arrah S/s.

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

Load Loss: 294 MW
 Outage Duration: 00:20 Hrs
 Powergrid may explain.

Deliberation in the meeting

Powergrid representative explained the event with help of report which is attached at **Annexure B.4.1.**

He informed that on 09.08.2024, 220kV Bus 1 was under shutdown from 10:10 hrs for Bus Bar stability works under Bay extension works therefore all the 220kV elements were connected in 220kV Main Bus 2. In order to eliminate any chance of tripping of Bus 2, CT Switching Relay, Relay used for Selection of zone-B by 203 ICT4 upcoming bay and Relay used for Selection of zone-B by 209 was racked out.

He further informed that as per existing scheme, Back trip from LBB of bay of ICT4 extended the +ve to TB1 14 which made the +ve available at relay terminal number 7 of CT switching relay of Bus 1 and Bus 2 as per existing scheme and CT Shorting NO Contact having terminal no 7 and 8 is used for extending the +ve from LBB to tripping Bus.

On investigation after disturbance it was found that on Racking out mentioned relays, the terminal no 7 and 8 got shorted and the circuit was through. Further, NO Contact confirmation could not be confirmed as -ve was present on both terminals no 7 and 8 subsequently +ve was extended by 389AX and 389BX to both tripping bus of Zone-A and Zone-B leading to tripping of 220kV Bus 2 on checking of back trip.

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

a) Bus tripping occurred in Eastern Region during August'24

Element Name	Tripping Date	Reason	Utility
220KV MAIN BUS - 2 AT ARRAH(PG)	23/08/2024	Bus Bar Protection Operated at Arrah (PG) end	PG(ER-1)

Powergrid may explain.

Deliberation in the meeting

Powergrid representative explained the incident with help of report which is attached at **Annexure B.5.A.**

He informed that in and around the Arrah sub-station lots of birds are habituated. These Birds used to make nest regularly on the tower and gantry structure inside the sub-station however nest is cleared as a regular activity to prevent any disturbance.

He informed that on 23rd Aug 2024, Y phase bus fault was developed due to short circuit path created by GI wire from the gantry structure to the Y-phase conductor by a bird resulting in operation of bus bar protection for 220 k V main bus -2 at Arrah resulting in bus tripping leading to isolation of all elements connected to bus 2.

PCC advised Powergrid representative to do cleaning activity on periodic basis to avoid such disturbance.

b) Repeated tripping of transmission lines during the month of August'24

Sl.No.	Name of the Element	No. of times Tripped	Remarks	Utility
1	132KV-KAHALGAON(BSEB)-LALMATIA-1	4	Tripped on B_N fault in all instances.	BSPTCL/JUSNL
2	132KV-RIHAND-GARWAH-1	4	Tripped from Rihand end only in 2 instances.	JUSNL
3	220KV-CHUKHA-BIRPARA-1	3	Tripped due to clearance issue at around 50-60 Km span (under Bhutan Jurisdiction) (4 times A/R successful in same fault)	PG ER-II/Bhutan
4	220KV-DARBHANGA (DMTCL)-MOTIPUR-1	4	Tripped on B_N fault with A/R successful from Motipur end in 2 instances.	DMTCL/BSPTCL

Concerned utilities may explain.

Deliberation in the meeting

• **Repeated tripping of 132 kV-KAHALGAON(BSEB)-LALMATIA-1**

BSPTCL representative informed that line had tripped in zone 2 from their end. He further added that testing of relay had been done at their end and protection settings was also checked which is fine.

JUSNL representative informed that line is passing through forest area in which vegetation issues were present that resulted in transient faults subsequently leading to repeated tripping of line however clearance issues had been resolved and no tripping of line is observed recently.

ERLDC representative informed that since line was charged within 30-40 mins of tripping which clearly indicates that faults are transient in nature.

On enquiry from BSPTCL representative regarding reviewing protection settings at their end as per Sahibgunj, ERLDC representative replied that instead of line feeding the Sahibgunj through transfer bus, settings at Kahalgaon end needs to be kept as per Lalmatia line length since distance protection relay is also present at Lalmatia end.

PCC advised JUSNL to do maintenance activities on periodic basis so that repeated tripping of line can be avoided.

• **Repeated tripping of 132kV-RIHAND-GARWAH-1**

JUSNL representative informed that line had tripped twice in month of Aug 2024 from their end and remaining 2 times tripping was observed from Rihand end only.

JUSNL representative informed that on 18th Aug 2024, jumper snapping had resulted in development of fault leading to tripping of line in zone 2 and on 16th Aug 2024, line had tripped in zone 1 from their end.

PCC advised JUSNL to identify fault location and jurisdiction and share details to ERPC/ERLDC so that issue can be further coordinated with Uttar Pradesh & Bihar in order to resolve issue of repeated tripping of line.

- **Repeated tripping of 220kV-CHUKHA-BIRPARA-1**

Powergrid representative informed that line had tripped due to fault in Bhutan jurisdiction and auto-reclose operation was done from their end each time. ERLDC representative informed that as per communication received from Bhutan, clearance issue was present at particular location in their jurisdiction resulting in repeated tripping of line however issue had been resolved and no tripping had been observed in Sep 2024.

- **Repeated tripping of 220kV-DARBHANGA (DMTCL)-MOTIPUR-1**

DMTCL representative informed that 3 phase tripping had been observed for 2 times however due to unhealthiness of carrier at Motipur end, tripping had occurred on 30th Aug 2024. Regarding tripping of line on 11th Aug 2024, He informed that carrier was received from Motipur end however auto-recloser was not successful from their end due to BCU logic issue resulting in tripping of line. He further informed that DR length had been rectified.

On enquiry from PCC about healthiness of carrier presently, DMTCL representative replied that carrier of Motipur -2 is healthy however carrier of Motipur -1 is unhealthy.

BSPTCL representative informed that patrolling of line was done and all clearance issues was resolved by taking shutdown of line on 7th Sep 2024. He further added that on 30th Aug 2024, carrier was shared from Motipur end to DMTCL end so there was no unhealthiness of carrier on that day.

PCC advised BSPTCL representative to check healthiness of carrier at their end for Motipur-1 and rectify at earliest and share update to ERPC/ERLDC. It further advised DMTCL to check details of tripping held on 30th Aug 2024 and share with BSPTCL along with ERPC/ERLDC.

c) Tripping of ICTs during the month of August'24

Sl. No	Name of the Element	Trip Date	Trip Time	Remarks	Utility
1	400KV/220KV 315 MVA ICT 2 AT BIHARSHARIF	26-08-2024	18:26	Over current Earth Fault.	PG ER-1/BSPTCL
2	400KV/220KV 315 MVA ICT 2 AT NEW DUBURI	18-08-2024	14:46	Due to CT Blast at 220 kV JSL- New Duburi-II at New Duburi	OPTCL
3	400KV/220KV 315 MVA ICT 1 AT JEERAT	05-08-2024	23:05	Bucholz Alarm (Y-Phase) appeared	WBSETCL
4	400KV/220KV 315 MVA ICT 1 AT KODERMA	04-08-2024	04:13	Pole discrepancy	DVC
5	400KV/220KV 315 MVA ICT 2 AT KODERMA	04-08-2024	04:13	Pole discrepancy	DVC
6	400KV/220KV 315 MVA ICT 1 AT BOKARO-A TPS	02-08-2024	22:39	86A Relay, PRV-1 Trip	DVC

Concerned utilities may explain.

Deliberation in the meeting

Regarding tripping of 400KV/220KV 315 MVA ICT 2 AT BIHARSHARIF on 26th Aug 2024, Powergrid representative informed that lv side numerical relay of ICT is maintained by Bihar. He informed that as per communication received from BSPTCL, lower insulation resistance of contacts of relay resulted in extension of DC intertrip command resulting in tripping of ICT.

BSPTCL representative informed that there are two high contacts of ZIB relay for intertrip present on their side in which one of contact was given to 220 k V Fathua line and other was given to Powergrid however after receiving observation from Powergrid regarding malfunction of contacts given to them, contacts given to Fathua for load trimming has been shifted to Powergrid. He further informed that contacts given to Fathua had been checked and found fine.

Regarding tripping of 400KV/220KV 315 MVA ICT 2 AT NEW DUBURI on 18th Aug 2024, OPTCL representative informed that due to B phase CT blast at 220 kV JSL- New Duburi-II at New Duburi, 220 kV New Duburi- Paradeep-1 line got tripped. Since 220 k V bay of ICT 2 & JSL -II is nearby there is chances that DC fault might extended to 220 k V side of ICT 2 resulting in its tripping. On enquiry from ERLDC representative regarding details of elements tripped during the incident, OPTCL representative informed that JSL- I, JSL-II, Paradeep -1 & 220 k V side of ICT 2 had tripped however bus tripping had not occurred.

On enquiry from PCC regarding protection that had operated in ICT 2 resulting in its tripping, OPTCL representative replied that no protection had operated during the incident however there might be chances that spurious tripping had occurred through contacts of hand tripping causing breaker to open. He further added that NIT switch will be checked by availing shutdown of ICT in Oct 2024 and observations will be shared to ERPC/ERLDC.

Regarding tripping of 400KV/220KV 315 MVA ICT 1 AT JEERAT on 5th Aug 2024, WBSETCL representative replied that spurious bucholz alarm was initiated however on checking no gas acquisition was found. Further cable, merciline box, DC system, relay etc were checked and found ok. He further added that no tripping was observed during the incident and only alarm was initiated however shutdown of ICT was done post tripping for testing relay.

ERLDC representative suggested that o/c relay may be connected in series with bucholz & PRV relay so that Bucholz & PRV relay would operate after operation of o/c protection else only alarm will be observed.

MPL representative informed that as per their practice, bucholz alarm is only used for SCADA for event purpose. Further delay of 5 second is kept between alarm and trip for bucholz relay at unit. He further informed that mercury float switch relays had been replaced by magnetic read relays to avoid spurious operation of relays due to transformer vibration, close in fault etc. On enquiry from DVC representative about manufacturers of magnetic read bucholz relays, MPL representative informed that OEM like Adverse and Yogya enterprises etc are manufacturing the magnetic read bucholz relays.

PCC advised all utilities to share preventive practices that are followed by them to avoid maloperation of mechanical relays associated with ICTs to ERPC/ERLDC so that these practices can be compiled and guidelines can be prepared.

Regarding tripping of 400KV/220KV 315 MVA ICT 1 & 2 AT KODERMA on 4th Aug 2024, DVC representative informed that on day of incident, heavy lightening and rain was observed due to which DC fault was developed in common DC circuit of both ICTs resulting in operation of R phase Pole discrepancy relay of both ICTs subsequently leading to tripping of both ICTs. He further added that no tripping had been observed recently.

Regarding tripping of 400KV/220KV 315 MVA ICT 1 AT BOKARO-A TPS on 2nd Aug 2024, DVC representative informed that due to water ingress, PRV relay had operated leading to tripping of ICT however after the incident, sealing had been done for ICTs and no further tripping was observed.

PCC advised DVC and other utilities to adopt preventive measures before monsoon season like proper sealing etc to avoid tripping of ICTs in future.

ITEM NO. B.6: 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 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 Aug '24, BSPTCL, JUSNL, DVC, WBSETCL, DMTCL, NTPC Farkka & Jorethang HEP had submitted the same, which is attached

Following table shows the status of PP Indices received for last four months.

Sl.no	Utility Name	May	June	July	August
1	PG-ER-1				
2	PG-ER-2				
3	PG-Odisha		YES		
4	WBSETCL/WBPDCL	YES	YES	YES	YES (20.09.24)
5	BSPTCL/ BGCL		YES		YES (19.09.24)
6	OPTCL/ OHPC				
7	DVC		YES	YES	YES (24.09.24)
8	JUSNL		YES		Yes (14.09.24)
9	Sikkim				
10	OPGC				
11	PMTL				
12	NTPC- KHSTPP		YES		
13	NTPC- FSTPP		YES	YES	YES (18.09.24)
14	NTPC-BARH		YES		
15	NTPC- TSTPP				
16	NTPC- KBUNL	YES	YES	YES	
17	NPGC		YES		
18	BRBCL		YES		
19	NTPC- DARILAPLI				
20	NTPC- NORTH KARNPUARA	YES	YES		
21	ATL				
22	APNRL				
23	CBPTCL				
24	DMTCL				YES (13.09.24)
25	ENICL				
26	Chuzachen HEP				
27	Jorethang HEP	YES	YES	YES	YES (01.09.24)
28	Tashiding Hep				
29	GMR				
30	IBEUL				
31	JITPL				
32	MPL				

33	NKTL				
34	OGPTL				
35	PMJTL				
36	Powerlink				
37	PKTCL				
38	NHPC Rangit				
39	Rongnichu HEP				
40	SPTL				

In 138th PCC Meeting, ERPC representative informed that as per IEGC 2023 Clause 15(6), 15(7) all users shall submit protection performance indices of previous 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 however for the month of July '24, only NTPC (KBUNL), WBSETCL, BSPTCL & Jorethang HEP had submitted the same.

On enquiry from PCC regarding reason behind non submission of protection performance indices, following replies were submitted by concerned utilities –

- PG ER-1 representative replied that outage data is being shared to ERPC/ERLDC however PP indices will be submitted from Sep 2024 in coordination with PG ER-II.
- NTPC Barh representative submitted that PP indices was shared on 14th Aug 2024.
- OPTCL representative submitted that PP indices data will be shared from Sep 2024 and there is no such issue being faced in calculation of indices.
- DVC representative submitted that PP indices for month of June 2024 and July 2024 had been submitted on 27th Aug 2024 however it will be submitted timely by 10th of each month from Sep 2024. ERLDC representative replied that in PP indices for only 132 k V lines and single number of 220 k V line was given however it needs to be provided for 132, 220 & 400 k V level lines where tripping was observed. DVC representative agreed with the same.
- JUSNL representative replied that in month of Aug 2024, a greater number of visits were done by CRITL team therefore PP indices was not complied however PP indices for July 2024 and Aug 2024 will be shared by 10th Sep 2024.

Member Secretary advised ERPC representative to include all IPPs in list and provide date of receipt of indices also in list so that it can be tracked for all utilities. He requested all utilities to provide nodal officer details also so that it will be easier for ERPC to coordinate for getting these details. He also requested all SLDC representative to coordinate with their concerned utilities for getting these data.

PCC advised all utilities to submit Protection Performance Indices on timely basis otherwise issue will be highlighted to higher authority. It further advised concerned utilities to share details of nodal officer to ERPC.

Members may explain the reason for non-submission of details.

Deliberation in the meeting

ERPC representative informed that for the month of Aug '24, Powergrid ER-1, Powergrid ER-2, BSPTCL, JUSNL, DVC, OPTCL, WBSETCL, DMTCL, NTPC Farkka, NTPC Barh & Jorethang HEP had submitted the protection performance indices.

On enquiry from ERPC representative regarding non submission of PP indices, Powergrid Odisha representative submitted that since no tripping had occurred in month of Aug 2024 therefore indices was not submitted.

SE, ERPC replied Powergrid Odisha representative that even in case of no tripping of lines, PP indices can be submitted mentioning nil tripping.

ERPC representative informed DVC representative that indices submitted by DVC is not in desired format and indices needs to be given for all elements individually for which DVC representative requested ERPC representative to share format of PP indices. As per the request, ERPC representative had shared format which is attached at **Annexure B.6**.

PCC advised all utilities to submit Protection Performance Indices of every month before 10th day of next month so that it can be analyzed jointly by ERPC & ERLDC. It further requested all utilities to provide nodal officer details also so that it will be easier for ERPC to coordinate for getting these details. It also requested all SLDC representative to coordinate with their concerned utilities for getting these data.

ITEM NO. B.7: Single Line Tripping Incidences in month of Aug 2024

Single line tripping incidents in the month of Aug 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 incidences in month of Aug 2024 is attached at **Annexure B.7**.

PART- C: OTHER ITEMS

ITEM NO. C.1: 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.

The utility wise status is given below:

Sl.no	Utility Name	Status
1	PG-ER-1 & PMTL	Received

2	PG-ER-2	Received
3	PG-Odisha	Received
4	WBSETCL	Received
5	BSPTCL	Received
6	OPTCL	Not Received
7	DVC	Received
8	JUSNL	Received
9	OPGC	Not Received
10	CESC	Received
11	NTPC	Not Received
20	NHPC	Received
21	IPP	Not Received

Utilities are requested to update completion status of audit as per the schedule along with audit report.

In 138th PCC Meeting, OPTCL representative submitted that internal protection audit plan upto Oct 2024 had been received however plan upto March 2025 will be received soon and subsequently it will be submitted to ERPC/ERLDC by 15 days.

NTPC representative submitted that plan had been submitted to NTPC Barh already accordingly internal audit is planned in Sep 2024. NTPC Barh representative was not available in the meeting.

PCC advised NTPC & IPPs to share internal protection audit plan at earliest to ERPC/ERLDC.

On enquiry from ERPC representative regarding status of internal protection audit carried out as per the proposed plan following comments were received from utilities.

- Powergrid ER- 1 representative informed that internal audit had been completed as per schedule upto July 2024 however confirmation has not been received from site for proposed audit plan for Aug 2024
- Powergrid ER- 2 representative informed that internal audit had been completed as per schedule upto Aug 2024.
- Powergrid Odisha representative was not available in the meeting.
- BSPTCL representative submitted that internal audit had been completed for Biharsharif, Gopalganj, Dehri, Bodhgaya, Khagaul and few other substations for which updated list will be shared to ERPC/ERLDC.
- JUSNL representative informed that internal audit had been completed for Chandil, Ramchandrapur, Chaibasa-I, Hatia-II, Itkhori, Govindpur, Dumka, Jasidih, Giridih etc for which updated list will be shared to ERPC/ERLDC along with proposed date for remaining S/s.
- DVC representative submitted that audit had been completed for 3 nos of S/s and it is proposed that audit will be carried out for major no of S/s in Sep 2024 subsequently report will be submitted.
- WBSETCL representative submitted that audit had been completed for 4 nos of S/s
- CESC & NHPC representative was not present in the meeting.

PCC advised concerned utilities to submit internal protection audit report for S/s where audit had been completed to ERPC/ERLDC.

JUSNL vide email dated 29.08.2024 had shared protection audit plan status along with report to ERPC

Concerned utilities may update.

Deliberation in the meeting

On enquiry from ERPC representative regarding internal audit plan, OPTCL representative submitted that internal protection audit plan upto March 2025 had been received and it will be submitted to ERPC/ERLDC by 7 days.

PCC advised NTPC & IPPs to share internal protection audit plan at earliest to ERPC/ERLDC.

PCC advised concerned utilities to submit internal protection audit report for S/s where audit had been completed to ERPC/ERLDC.

ITEM NO. C.2: Third Party Protection audit of Sub stations for the Year 2024-25

As per IEGC 2023 Clause 15.2, "All users shall also conduct third party protection audit of each sub-station at 220 kV and above (132 kV and above in NER) once in five years or earlier as advised by the respective RPC."

Further IEGC 2023 Clause 15.3 states that "After analysis of any event, each RPC shall identify a list of substations / and generating stations where third-party protection audit is required to be carried out and accordingly advise the respective users to complete third party audit within three months."

Accordingly, a list of S/s has been identified where third-party protection audit needs to be carried out:

NTPC Kahalgaon	Tenughat	Budhipadar	Darbhanga (BH)
NTPC Farakka	Chatra	Lapanga	Biharsharif (BH)
NTPC Barh	Hatia	Rengali (OPTCL)	Purnea Old (PG)
Jorethang	Garhwa	Rengali (PH)	Kishanganj (PG)
Tashiding	Chandil	Therubali	Meramundali
Ramchandrapur	Bantala (KLC)	Balimela	

As per SOP for Third Party Protection Audit prepared by NPC, Third Party Protection Audit shall be carried out by the third party designated agencies in line with the IEGC Regulations 2023 or by the audit teams constituted by RPCs with the members from other states (at least two) who opt for the RPC coordinated third party protection audit.

In 138th PCC Meeting, ERPC representative informed that as per SOP for Third Party Protection Audit prepared by NPC, Third Party Protection Audit shall be carried out by the third party designated agencies in line with the IEGC Regulations 2023 or by the audit teams constituted by RPCs with the members from other states (at least two) who opt for the RPC coordinated third party protection audit.

PCC advised all utilities to submit third party protection audit plan by one month to ERPC along with their choice to carry out protection audit either through ERPC coordinated third party protection audit or by third party designated agencies.

Member Secretary, ERPC informed that after receiving audit plan from all utilities, ERPC will communicate to concerned utilities regarding substations for which protection audit can be done through audit team of ERPC. He further proposed that ERPC Secretariat would identify critical substations in consultation with ERLDC for which the protection audit will be carried out by ERPC along with the members from ERLDC & other utilities with help of third party agencies (to be hired by ERPC).

PCC agreed with proposal made by Member Secretary, ERPC.

Members may discuss.

Deliberation in the meeting

ERPC representative informed that third party protection audit plan has been received from OPTCL. He further added that after receiving audit plan from all utilities, ERPC will communicate to concerned utilities regarding substations for which protection audit can be done through audit team of ERPC.

OPTCL representative requested ERPC representative to intimate list of substations for which protection audit can be done through audit team of ERPC so that date can be finalized for carrying out audit for which ERPC representative replied that after discussing with ERLDC, list for substations for which audit will be done through them will be shared. He also informed that third party agency will be hired for carrying out audit.

SE, ERPC informed that ERPC Secretariat would identify critical substations in consultation with ERLDC for which the protection audit will be carried out by ERPC along with the members from ERLDC & other utilities with help of third party agencies (to be hired by ERPC).

PCC advised all utilities to submit third party protection audit plan by 15 days to ERPC along with their choice to carry out protection audit either through ERPC coordinated third party protection audit or by third party designated agencies.

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

The decisions of previous PCC meetings are attached.

Members may update.

Deliberation in the meeting

*Updated status of decisions of previous PCC meetings is attached at **Annexure C.3**.*

List of participants in 139th PCC Meeting held on 26th Sep 2024

Annexure A

Name	First Join	Email
ERPC Kolkata	9/26/24, 9:32:28 AM	ERPC@KolkataMST.onmicrosoft.com
Sunil-OHPC (Unverified)	9/26/24, 9:33:06 AM	
Kumar Satyam, AEE, ERPC (Unverified)	9/26/24, 10:02:49 AM	
NIRMAL MONDAL , ADDL. CE , WBSETCL (Unverified)	9/26/24, 10:04:02 AM	
Nishant Kumar Shankwar (External)	9/26/24, 10:18:05 AM	Nishant.Kumar@energy-sel.com
MERAMUNDALI OPTCL (Unverified)	9/26/24, 10:20:11 AM	
SLDC,ODISHA (Unverified)	9/26/24, 10:23:07 AM	
RAHUL RAJ (Unverified)	9/26/24, 10:23:59 AM	
DGM,E&MR,Burla (Unverified)	9/26/24, 10:24:06 AM	
PRASANTA KUMAR PRUSTY OPTCL BURLA (Unverified)	9/26/24, 10:27:13 AM	
SMS SAHOO, DGM(ELECT), OPTCL, BHUBANESWAR (Unverified)	9/26/24, 10:28:34 AM	
Akash Kumar Modi (External)	9/26/24, 10:29:58 AM	akmodi@erldc.onmicrosoft.com
Shyamal Konar (External)	9/26/24, 10:30:00 AM	konar_s@erldc.onmicrosoft.com
Rajiv Kumar Singh (Unverified)	9/26/24, 10:30:05 AM	
ESE/CRITL/BSPTCL (Unverified)	9/26/24, 10:31:16 AM	
SAGAR SUMAN BEHERA (Unverified)	9/26/24, 10:31:30 AM	
Sarv Verma	9/26/24, 10:31:41 AM	
Arindam Bsptcl (Unverified)	9/26/24, 10:31:52 AM	
critl bsptcl (Unverified)	9/26/24, 10:32:54 AM	
Mithun Gayen {मिथुन गायेन} (External)	9/26/24, 10:33:42 AM	mithun.gayen@powergrid.in
ssarkar (Unverified)	9/26/24, 10:35:08 AM	
Manas Das (External)	9/26/24, 10:35:36 AM	manasd@erldc.onmicrosoft.com
Sudeep Kumar {सुदीप कुमार} (External)	9/26/24, 10:36:06 AM	sudeepkumar@powergrid.in
P.S.Behera (Unverified)	9/26/24, 10:37:31 AM	
Sunil-ohpc (Unverified)	9/26/24, 10:37:50 AM	
Amresh Prusti (External)	9/26/24, 10:38:01 AM	amresh.prusti@opgc.co.in
CRITL BSPTCL (Unverified)	9/26/24, 10:39:12 AM	
Prafulla Satpathy (External)	9/26/24, 10:39:46 AM	prafulla.s@adityabirla.com
Gitesh ERLDC (Unverified)	9/26/24, 10:39:57 AM	
Eee CRITL (Unverified)	9/26/24, 10:42:48 AM	
DKS CHEP (Unverified)	9/26/24, 10:43:32 AM	
bsptcl 123	9/26/24, 10:45:53 AM	
Vallamsetty Anil Krishna {वेलमसेठी अनिल कृष्णा} (External)	9/26/24, 10:46:50 AM	anil.krishna.250@powergrid.in

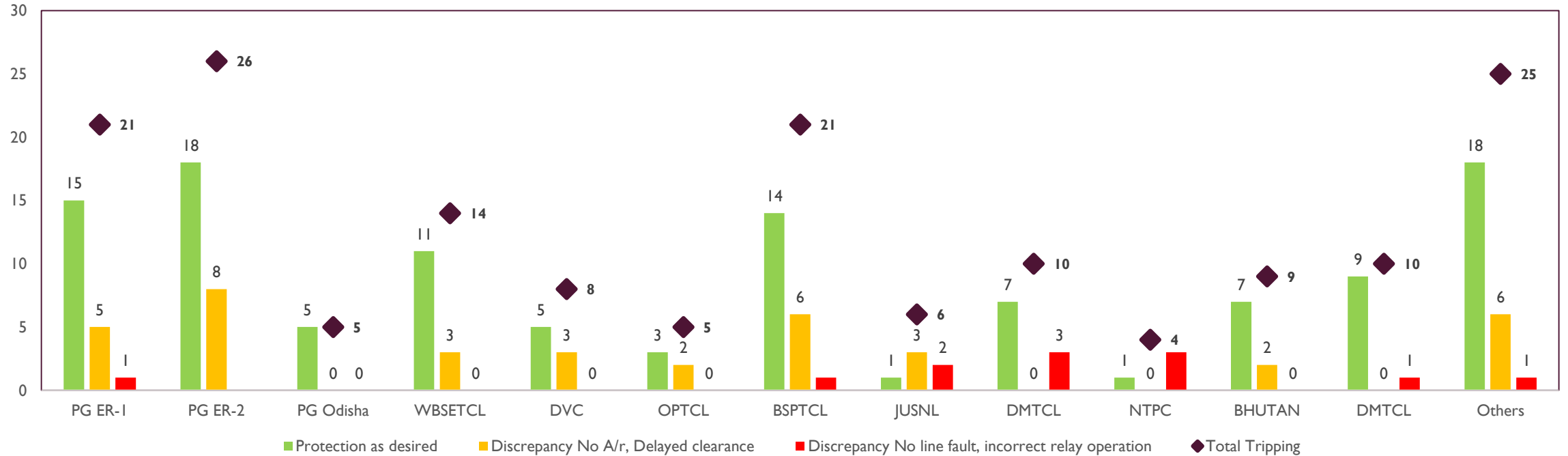
Avinash Kumar	9/26/24, 10:48:33 AM	
ESE, CRITL, BSPTCL (Unverified)	9/26/24, 10:49:09 AM	
Srimalya Ghosal (External)	9/26/24, 10:49:28 AM	sghosal@erldc.onmicrosoft.com
Laldhari Kumar (External)	9/26/24, 10:50:30 AM	laldhari@erldc.onmicrosoft.com
Chilakalapalli Mohana Rao {सी एच मोहन राव} (External)	9/26/24, 10:51:08 AM	mohan.rao@powergrid.in
WBPDC (Unverified)	9/26/24, 10:52:54 AM	
Dharm das Murmu (Unverified)	9/26/24, 10:53:19 AM	
D Tripathi (Unverified)	9/26/24, 10:56:44 AM	
Saurabh Vijay Agarwal (External)	9/26/24, 10:58:45 AM	saurabhvagarwal@erldc.onmicrosoft.com
E&MR SD N Duburi (Unverified)	9/26/24, 11:07:28 AM	
Tapan Panda (External)	9/26/24, 11:09:24 AM	tapan.panda@adityabirla.com
Sankhadeep Choudhury (Unverified)	9/26/24, 11:20:40 AM	
A Basu (Unverified)	9/26/24, 11:46:14 AM	
Sudhir Kumar (Unverified)	9/26/24, 11:51:28 AM	
PARAG CHATTERJEE (External)	9/26/24, 12:02:34 PM	PARAGCHATTERJEE@NTPC.CO.IN
Mangu Srinivas (External)	9/26/24, 12:13:29 PM	Mangu.Srinivas@vedanta.co.in
critl patna (Unverified)	9/26/24, 12:23:48 PM	
ssarkar (Unverified)	9/26/24, 12:33:58 PM	
CRITL PATNA (Unverified)	9/26/24, 12:59:51 PM	
Jalaj kumar singh JSPL (Unverified)	9/26/24, 1:10:28 PM	
C S Kumar (Unverified)	9/26/24, 1:13:14 PM	
Shanker choudhry	9/26/24, 1:33:40 PM	
Yamana Ayyappa	9/26/24, 2:13:51 PM	ya@sikkimurjalimited.in



139TH PCC (EASTERN REGION)

UTILITY WISE PERFORMANCE FOR THE MONTH OF AUGUST'24

Utility wise performance for the month of August'24

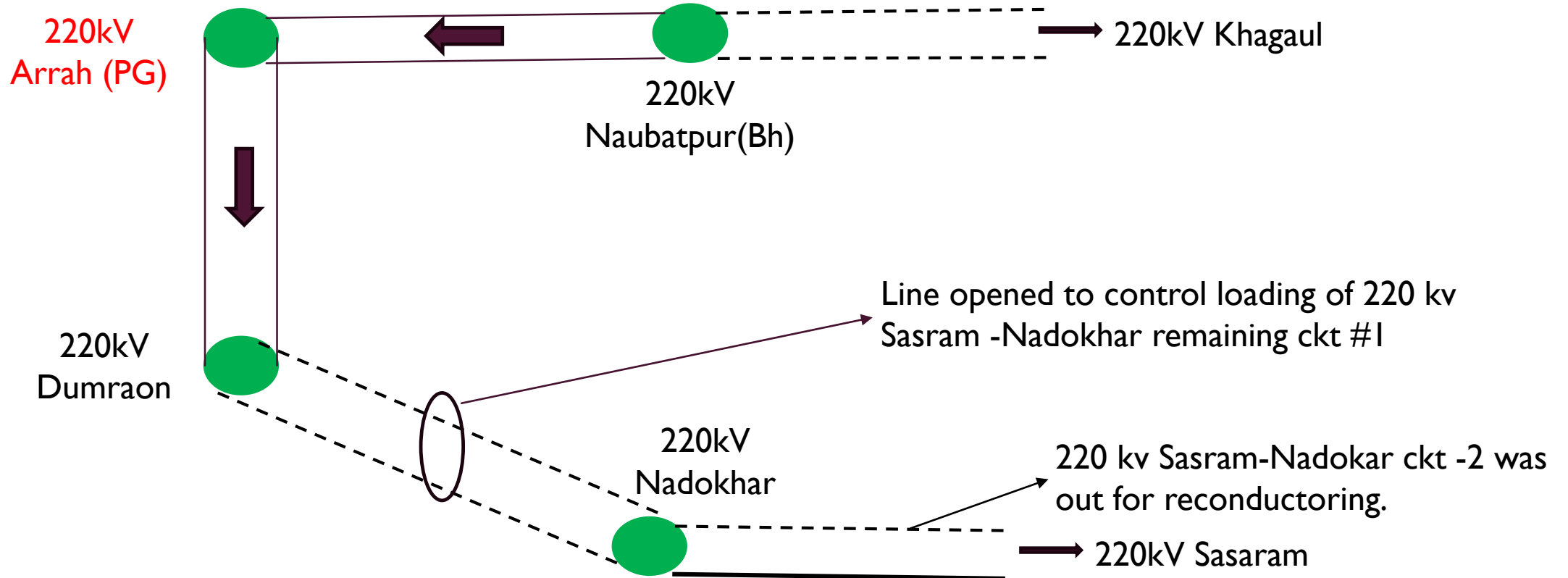


LINE TRIPPING WITHOUT ANY PHYSICAL FAULT

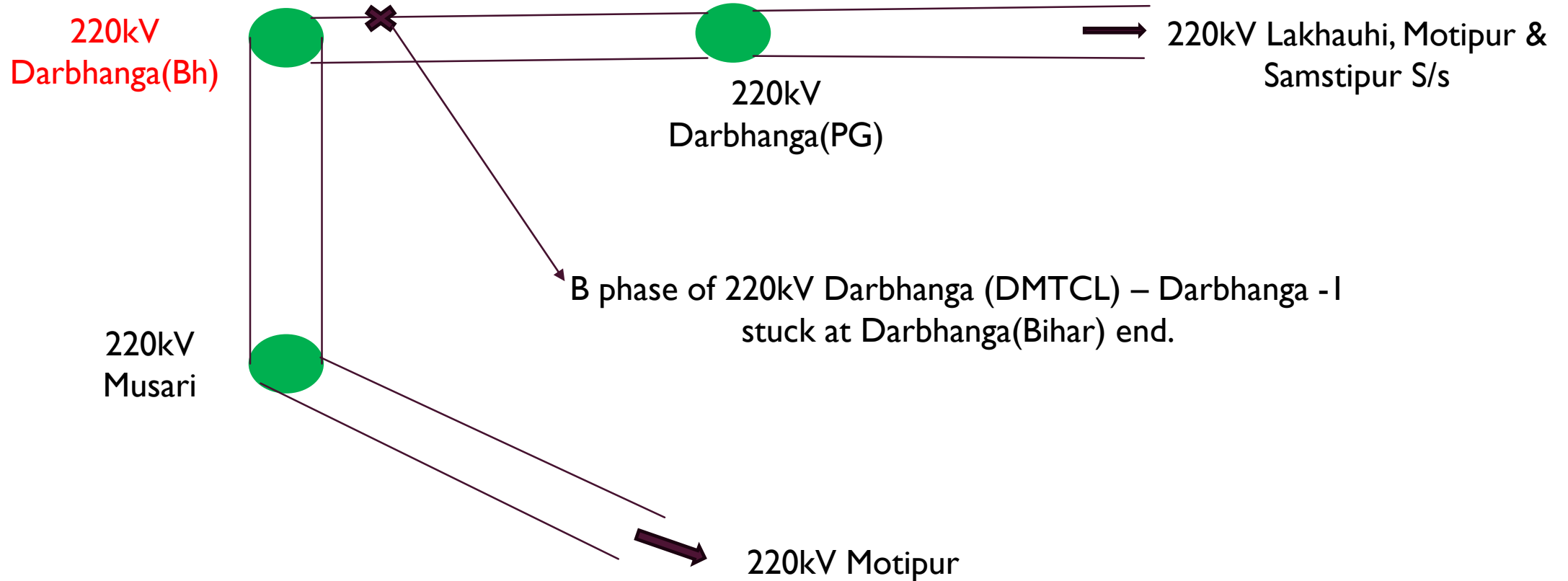
- 400 KV Farakka-Kahalgaon-2
- 400 KV Durgapur-Kahalgaon-1
- 400 KV Lakhisarai-Kahalgaon-1
- 220 KV Darbhanga (DMTCL)-Motipur-2
- 400 KV Jeerat-Sagardighi-1
- 400 KV Pusauli-BRBCL-2
- 220 KV Maithon-Dumka-2
- 220 KV Chaibasa-Chaibasa-1
- 400 KV Baharampur-Bheamara-2

Grid Disturbance at 220kV Arrah(PG) S/S(At 19:51 Hrs 09/08/2024):

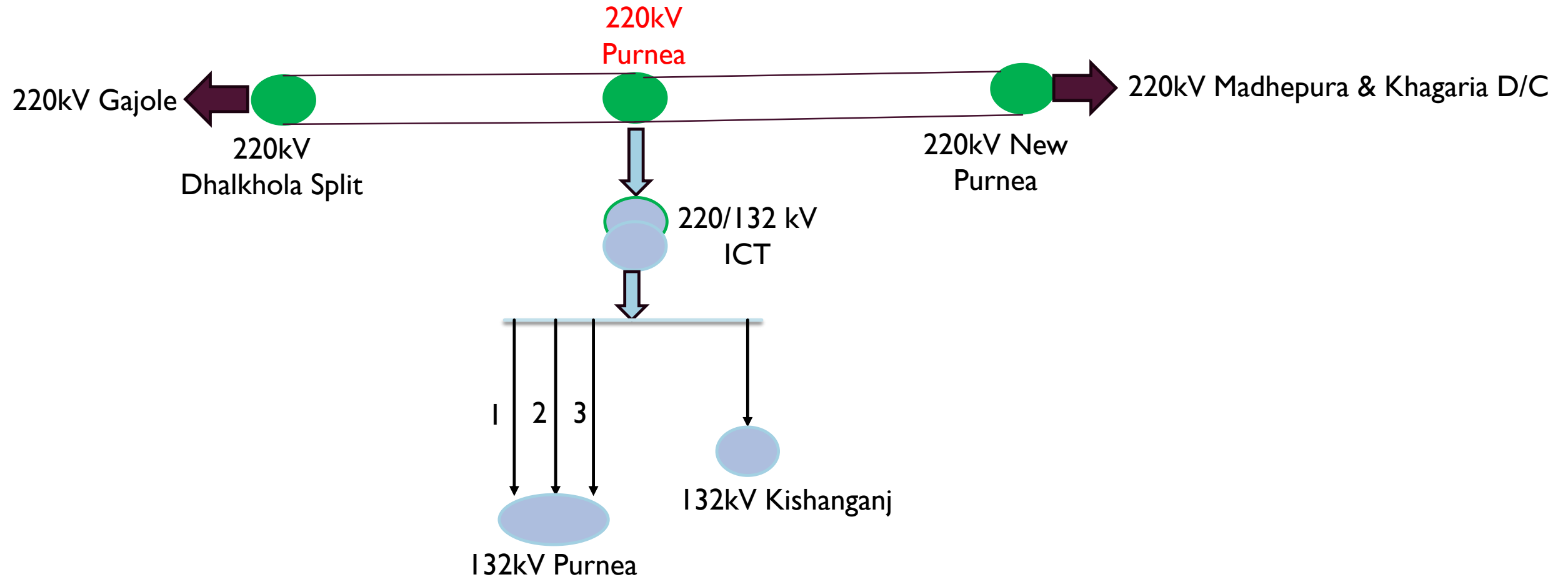
220kV Arrah(PG) Main-bus-I was under shutdown and busbar stability test



Grid Disturbance at 220kV Darbhanga (Bh) S/S (At 17:59 Hrs 01/08/2024):



Grid Disturbance at 220kV Purnea (PG) S/S(At 15:50 Hrs 01/08/2024):



CRITICAL ISSUES

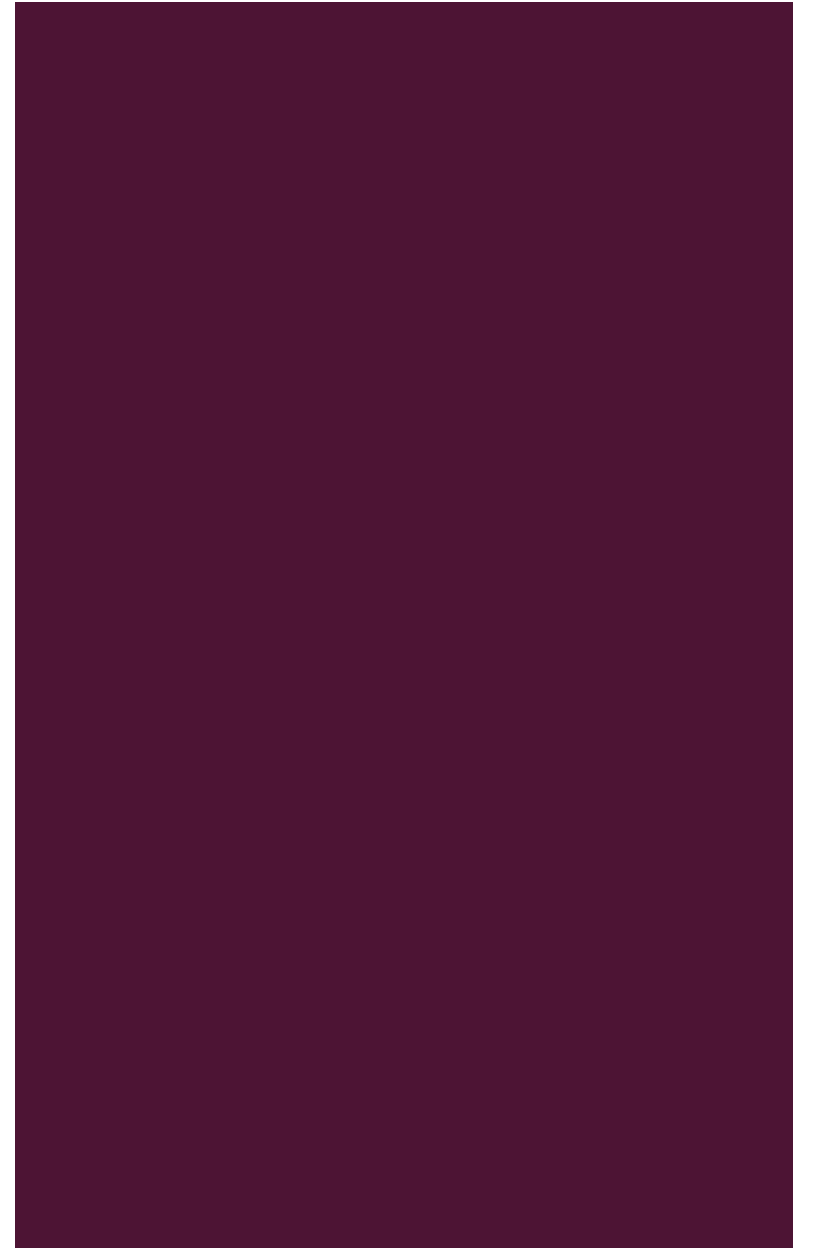
DR time synchronization and sufficient time (2.5 seconds) is not being implemented.

Around 50% of single line tripping still has some protection issues

Delayed DR and disturbance report submission

Non-submission of protection performance indices

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, टॉलिंगंज, कोलकाता - 700033
 Office : 14, Golf Club Road, Tollygunge, Kolkata - 700033
 CIN : U40105DL2009GOI188682, Website : www.erdc.in, E-mail : erdcinfo@grid-india.in, Tel.: 033 23890060/0061

पूर्वी क्षेत्र के 220/132 केवी काटापल्ली उप-केन्द्र में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event at 220/132 kV Katapalli 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):23-09-2024

1. Event Summary (घटना का सारांश):

At 06:52 Hrs, all 132 kV emanating lines from Burla PH tripped due to B_N fault in 132 kV Lapanga-Hirakud and 132 kV Lapanga-Burla at one particular location on double circuit tower which was cleared with a delay. This led to total generation loss at Burla S/S of around 225 MW due to loss of evacuation path.

Subsequently at 06:58 Hrs, a R_N fault struck 220kV-Katapalli-Hindalco ckt#2 which was cleared with a delay from Katapalli end. As reported, 220kV-Katapalli Hindalco ckt#1 also tripped as per Hindalco islanding scheme. Other emanating 220 kV lines from Katapalli tripped from remote end either in Zone-3 or Directional Earth fault. All 132 kV lines from Chiplima also tripped during this fault. This resulted in total power failure at 220kV Katapalli S/S and 132 kV Chiplima PH S/s. Around 70 MW load loss and 45 MW generation loss reported in Katapalli and Chiplima respectively. Power was restored at 220kV Katapalli S/S via 220kV -Katapalli – Lapanga 1 at 07:43 Hrs.

2. Time and Date of the Event (घटना का समय और दिनांक): 06:52 hrs of 29.08.2024

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

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

5. Report submitted by utility on: 19-09-2024

6. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
				Odisha	Odisha
Pre-Event (घटना पूर्व)	49.97	29822 MW	23796 MW	2890 MW	4943 MW
Post Event (घटना के बाद)	49.95	29750 MW	23726 MW	2630 MW	4873 MW

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

Important Transmission Line/Unit if under outage	NA.
--	-----

(महत्वपूर्ण संचरण लाइने/ विद्युत उत्पादन इकाइयां जो बंद है)	
Weather Condition (मौसम स्थिति)	Heavy rain with Wind reported

7. Load and Generation loss (लोड और जेनरेशन हानि): Generation loss: 225 MW (At 06:52 Hrs) and 45 MW (At 06:52 Hrs); Load loss: 70 MW (At 06:58 Hrs).

8. Duration of interruption (रुकावट की अवधि): 00:51 Hrs

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

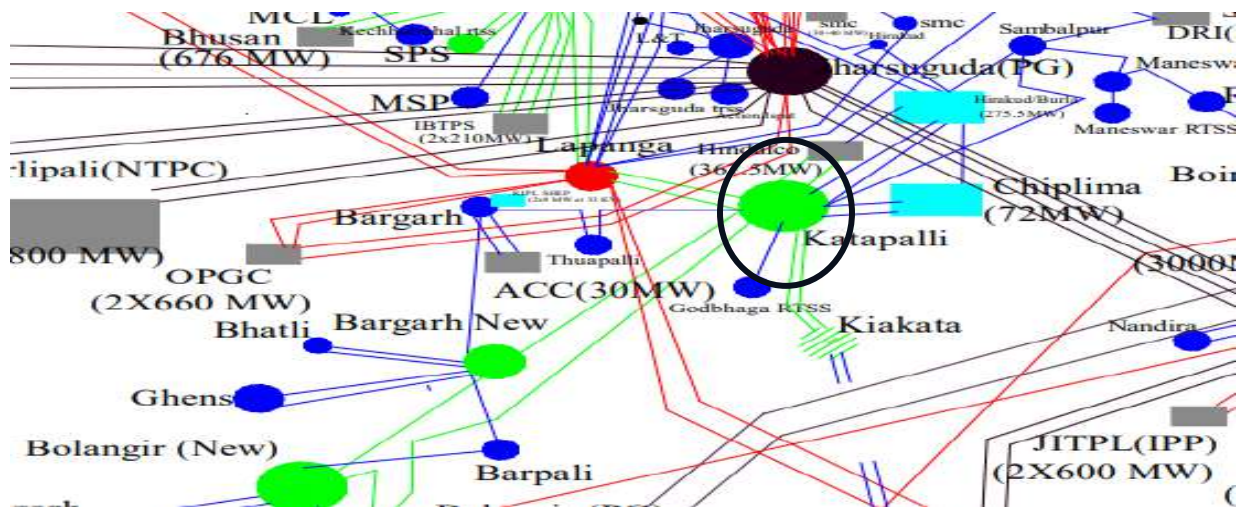


Figure 1: Network across the affected area

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

11.Major Elements Tripped (प्रमुख ट्रिपिंग):

क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	132 kV Burla -Katapalli 1	06:52	Katapalli: Didn't trip	Burla: O/c. Ia=Ib=Ic=681 A	-
2	132 kV Burla -Katapalli 2		Katapalli: Didn't trip	Burla: B_N, 20.3 km, 1.64 KA	-

3	132 kV Lapanga-Burla PH		Lapanga: O/c, E/f operated after 640 msec	Burla: B_N, Zone-1, 7.9 km, 5.52 kA	-
4	132 kV Lapanga-Hirakud PH		Lapanga: O/c, E/f, operated after 557 msec	Hirakud: B_N, Zone-1, 4.095 kA	-
5	220kV -Katapalli – Lapanga 1	06:58	Katapalli: Didn't trip	Lapanga: O/c, E/f operated after 800 msec. B_ph breaker didn't open	07:43
6	220kV -Katapalli – Lapanga 2		Katapalli: Didn't trip	Lapanga: O/c, E/f operated after 800 msec	07:43
7	220kV -Katapalli – Bargarh 1		Katapalli: Didn't trip	Bargarh: R_N, Zone-3, 1.38 kA	-
8	220kV -Katapalli – Bolangir 1		Katapalli: Didn't trip	R_N, Zone-3	08:00
9	220kV -Katapalli – Hindalco 1		Katapalli: Didn't trip	Islanded at Hindalco end with B/U & Over current (450 A).	-
10	220kV -Katapalli – Hindalco 2		Katapalli: R_N, Ir- 7.09kA, Fault duration: 737 msec. Breaker didn't open	Hindalco: Tripped in differential line protection in 70 msec in R_N fault.	-

11	132 kV – Chiplima – Katapalli 1	Katapalli: Didn't trip	Chiplima: E/f operated, In: 0.91 kA	-
12	132 kV – Chiplma – Katapalli 2	Katapalli: Didn't trip	Chiplima: E/f operated, 0.93 kA	-

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

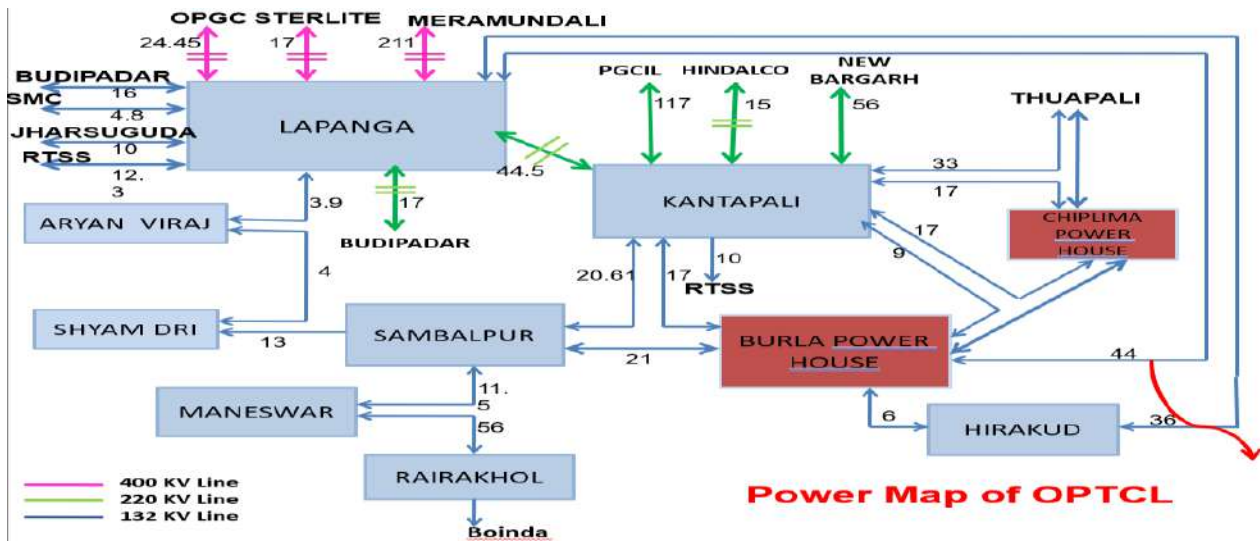


Figure 2: Odisha Network diagram (Submitted by OPTCL)

Event At 06:52 Hrs:

- At 06:52 Hrs, a fault struck B_{ph} of 132 kV Hirakud-Lapanga and 132 kV Burla-Lapanga simultaneously at a particular location on double circuit tower.
- In 132 kV Hirakud-Lapanga, line tripped immediately from Hirakud in Zone-1, however from Lapanga it was not cleared either in Zone-1 or Zone-2 rather Directional O/c and Directional E/f operated after around 640 msec.
- In 132 kV Burla-Lapanga also tripped in Zone-1 from Burla, however from Lapanga it tripped after 640 msec on Directional O/c, E/f.
- After that total power of Burla PH of around 225 MW was being evacuated through 132 kV Burla-Katapalli D/c and 132 kV Burla-Sambalpur and 132 kV Burla-Chiplima which tripped sequentially on O/c. 132 kV Burla-Chiplima tripped from Chiplima end despite flow being in reverse direction.
- Generation at Burla became zero due to loss of evacuation path.

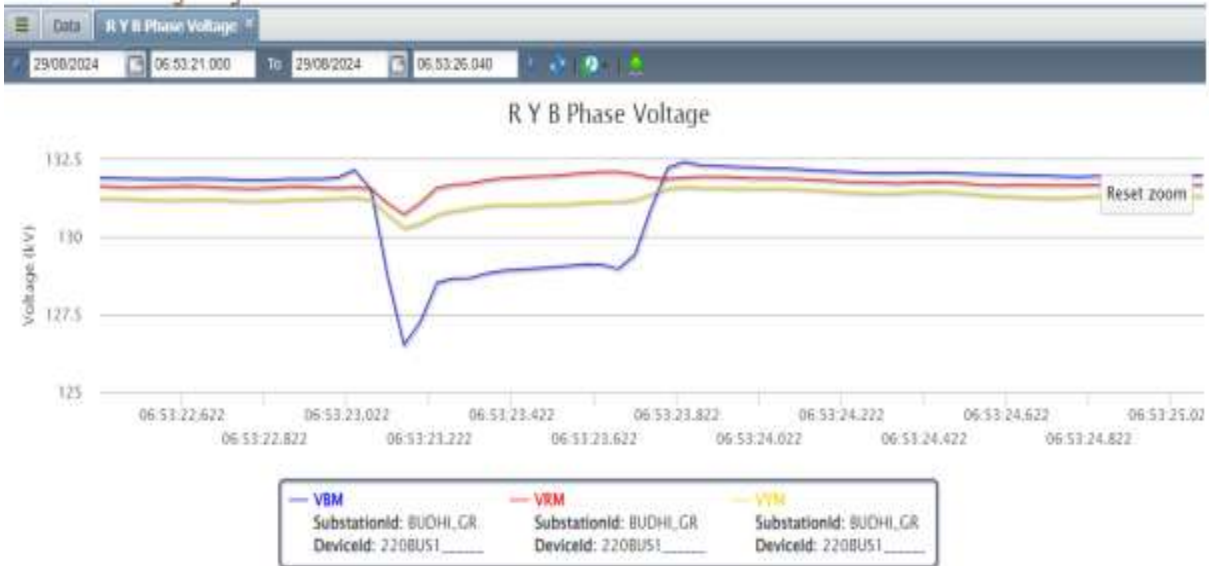


Figure 3: PMU Voltage snapshot of 220 kV Budipadar S/s

Event At 06:58 Hrs:

- At 06:58 Hrs, R_N fault struck 220 kV Katapalli-Hindalco-2. This line tripped immediately from Hindalco, however none of the protection operated at Katapalli immediately. 220 kV Katapalli-Hindalco D/c has line differential protection scheme.
- As reported, Hindalco has its islanding scheme set at 450A(O/c), 191 kV (U/V) with instantaneous islanding. Hindalco got islanded with tripping of remaining Katapalli line.
- From Katapalli end, Directional O/c operated after around 710 msec but breaker at Katapalli didn't open.
- 132 kV Katapalli-Chiplima D/c tripped in around 450 msec from Chiplima on Directional E/f, leading to total generation loss at Chiplima. Current of all three phases were almost in phase thereby increased current in neutral.
- Remaining 220 kV lines at Katapalli i.e.,
 - 220 kV Katapalli-Bolangir (PG) tripped in Zone-3 from Bolangir after 800 msec.
 - 220 kV Katapalli-Bargarh tripped in Zone-3 from Bargarh after 800 msec.
 - 220 kV Katapalli-Lapanga D/c tripped on Directional O/c and E/f after around 800 msec from Lapanga. However, B_ph of 220 kV Lapanga-Katapalli-1 didn't open at Lapanga.

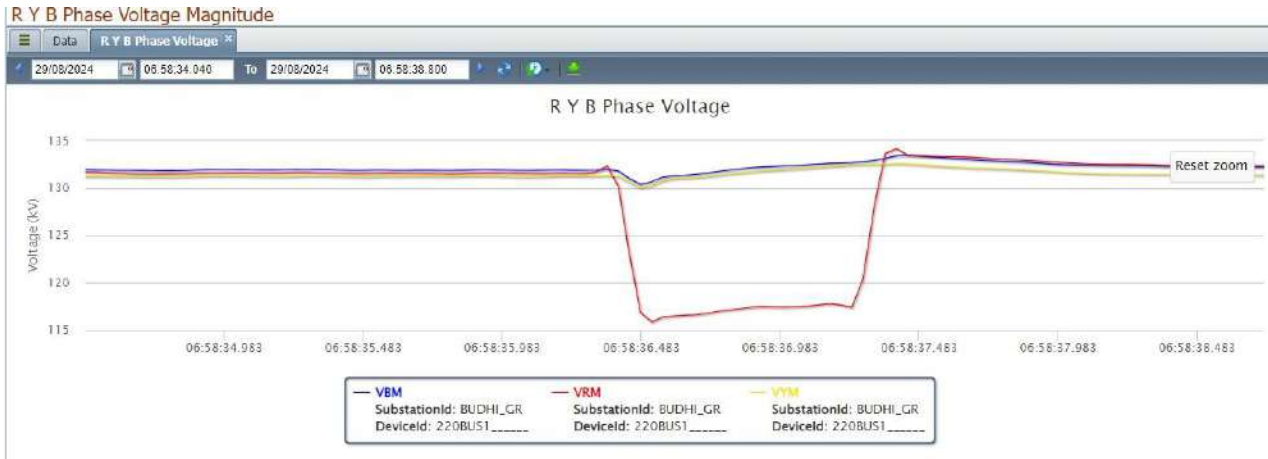


Figure 4: PMU Voltage snapshot of 220 kV Budipadar S/s

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

- 132 kV Lapanga-Burla and 132 kV Lapanga-Hirakud lines didn't trip from Lapanga end in Zone-1 or Zone-2. Later O/c and E/f operated at Lapanga after 640 msec. The reason for the same may be analyzed. O/c and E/f setting may also be reviewed.
- As reported, 132 kV Burla-Chiplima tripped from Chiplima end on O/c in reverse direction. Settings at Chiplima may be reviewed.
- O/c setting of remaining feeders from Burla i.e., Katapalli and Sambalpur may also be reviewed.
- 220 kV Katapalli-Hindalco-2 didn't trip from Katapalli despite having differential protection as Main-1 and distance protection as Main-2. Neither of the two operated. Later O/c E/f operated but at that time, breaker failed to open. LBB at Katapalli also didn't operate. Whether bus bar protection is available at Katapalli?
- A reported, islanding scheme of Hindalco has a logic of instantaneous islanding. There might be several instances of islanding in case of even transient faults in either circuit of 220 kV Hindalco-Katapalli D/c. Same may be reviewed.
- B_ph breaker of 220 kV Katapalli-Lapanga-1 didn't open at Lapanga. LBB at Lapanga didn't operate. Whether bus bar protection is available at Lapanga?
- In many 220 kV feeders O/c settings have been kept enabled despite having Main-1 and Main-2 distance protection scheme. Same may be reviewed.
- O/c E/f setting of all feeders at Chiplima, Burla need to be reviewed.
- DR of Lapanga, Katapalli, Burla, Bargarh, Chiplima are not time synchronized. DR length is also less in all feeders except distance relay of 220 kV Lapanga-Katapalli-1 at Lapanga. DR channels are not also configured properly.
- OPTCL may share the physical nature of the fault observed at the site.
- Detailed report received from OPTCL is attached at Annexure-3.

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

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

S.No.	Issues	Regulation Non-Compliance	Utilities
2.	DR/EL not submitted within 24 hours	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	OPTCL, OHPC

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

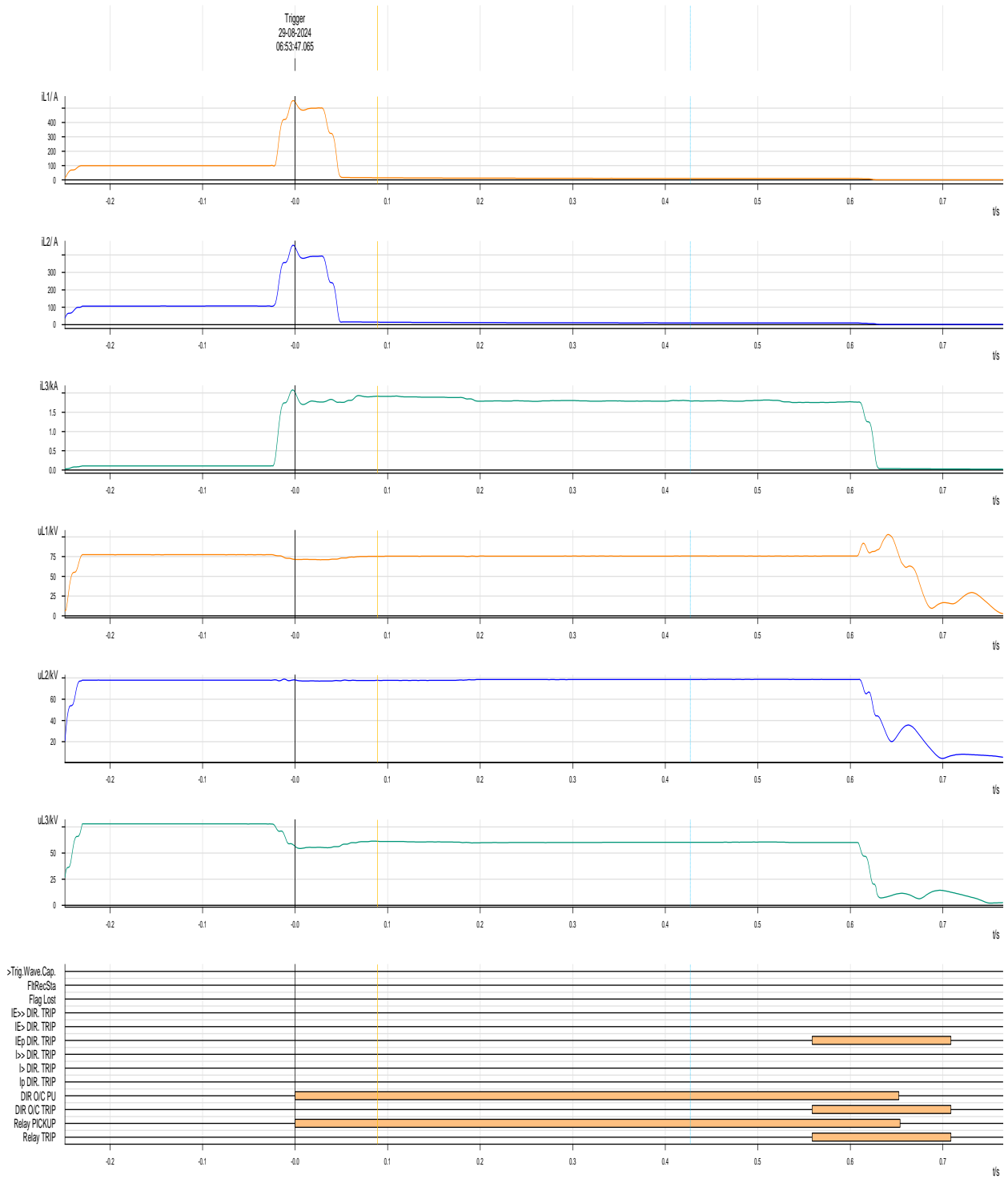
Annexure 1: (Sequence of Events-As per ERLDC SCADA)

Time	Station	Description	Status
29-08-2024 06:58:39	BOLAN_PG	220_BURLA_GR_CB	Open

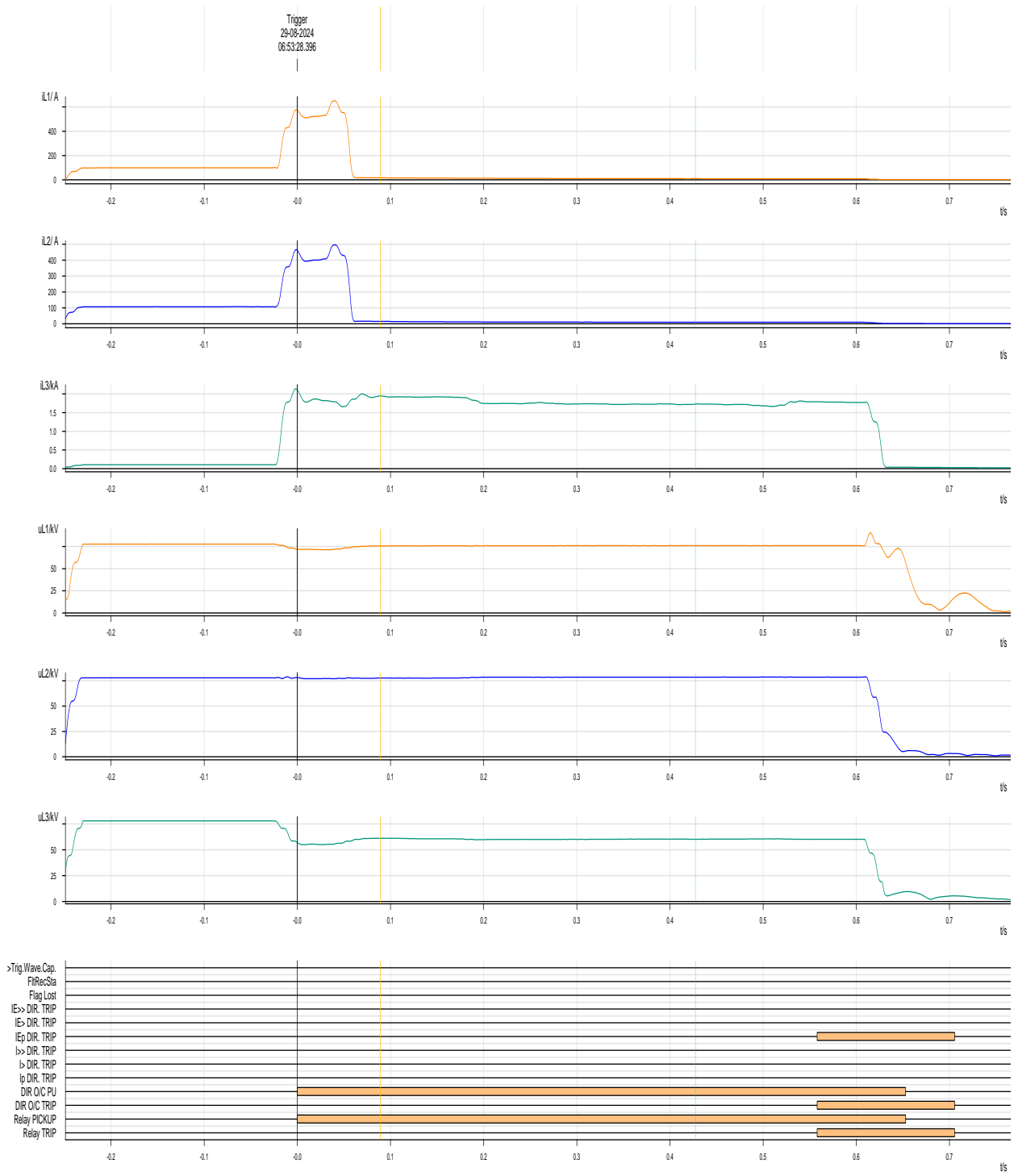
*The rest of SOE is not available at ERLDC end.

Annexure 2:

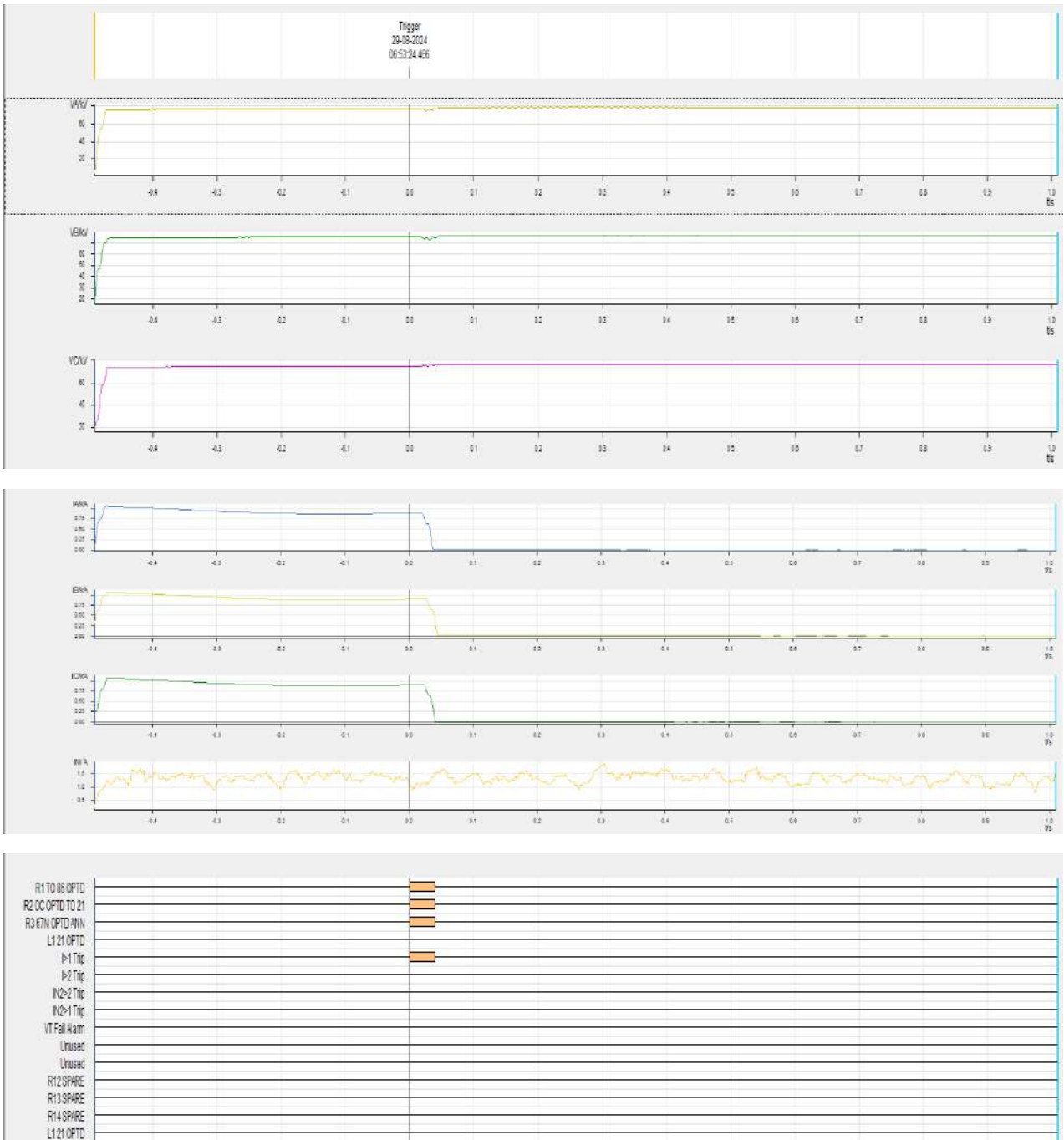
DR of 132 kV Lapanga-Hirakud (Lapanga)



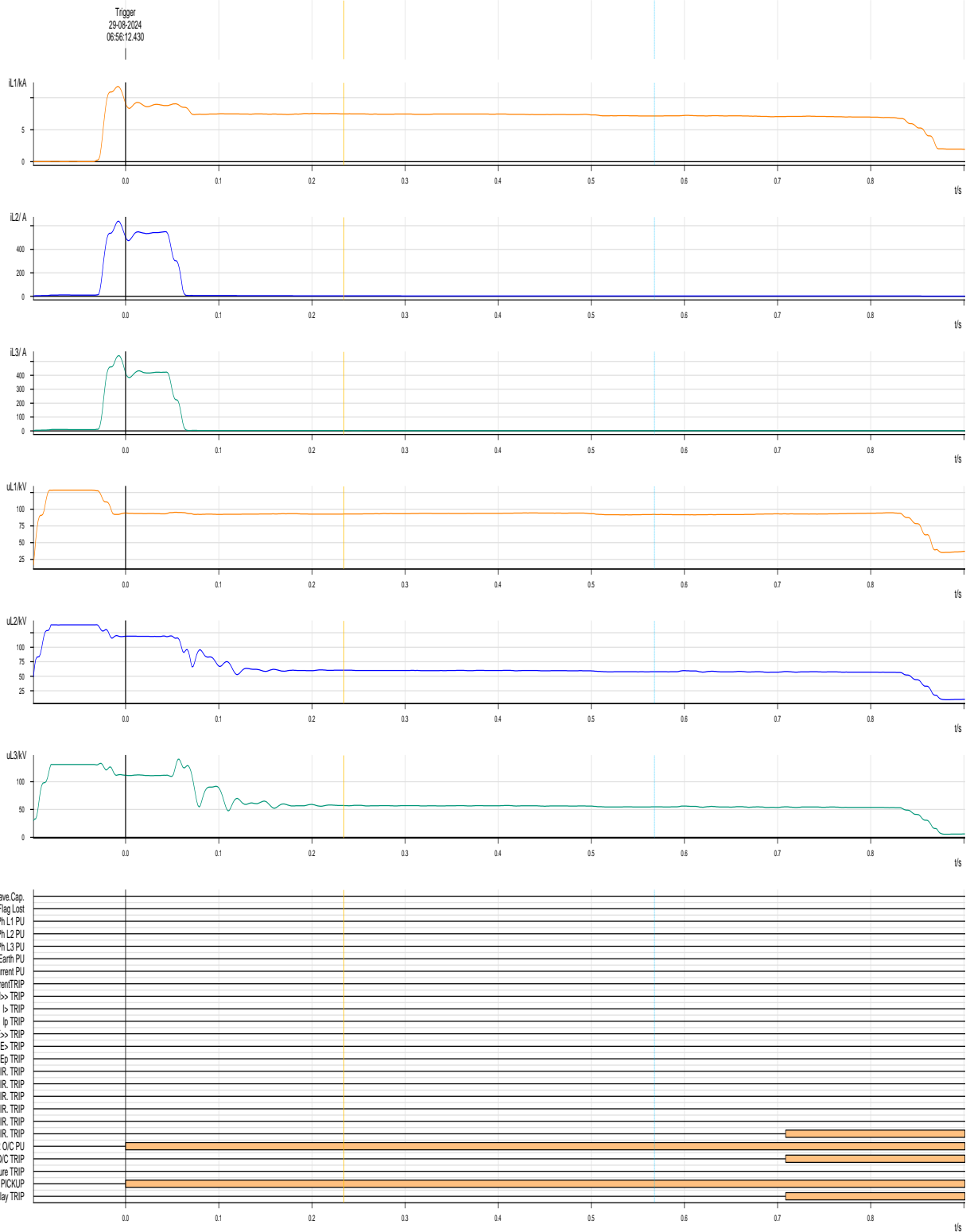
DR of 132 kV Lapanga-Burla (Lapanga)



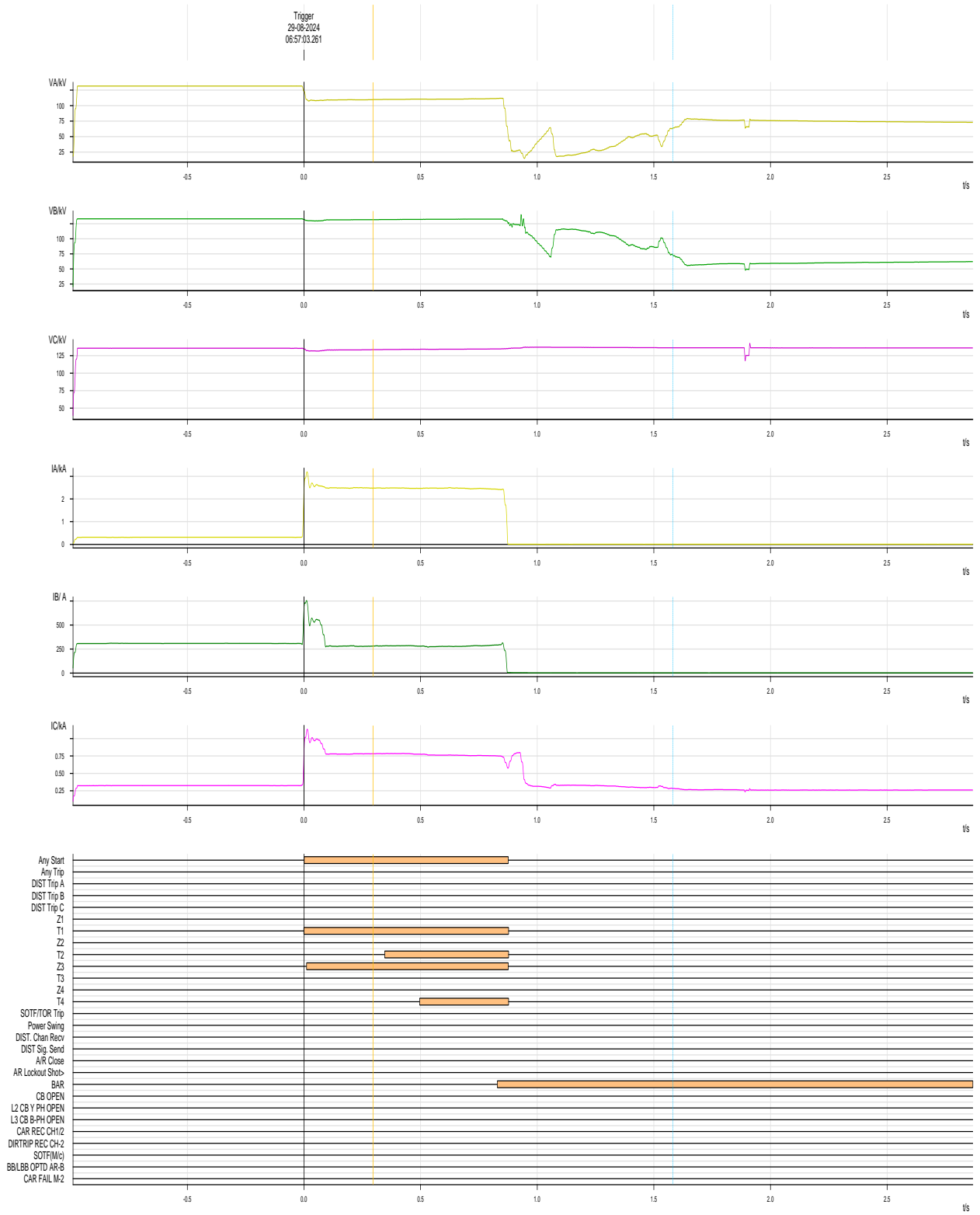
DR of 132 kV Chiplima-Burla (Chiplima)



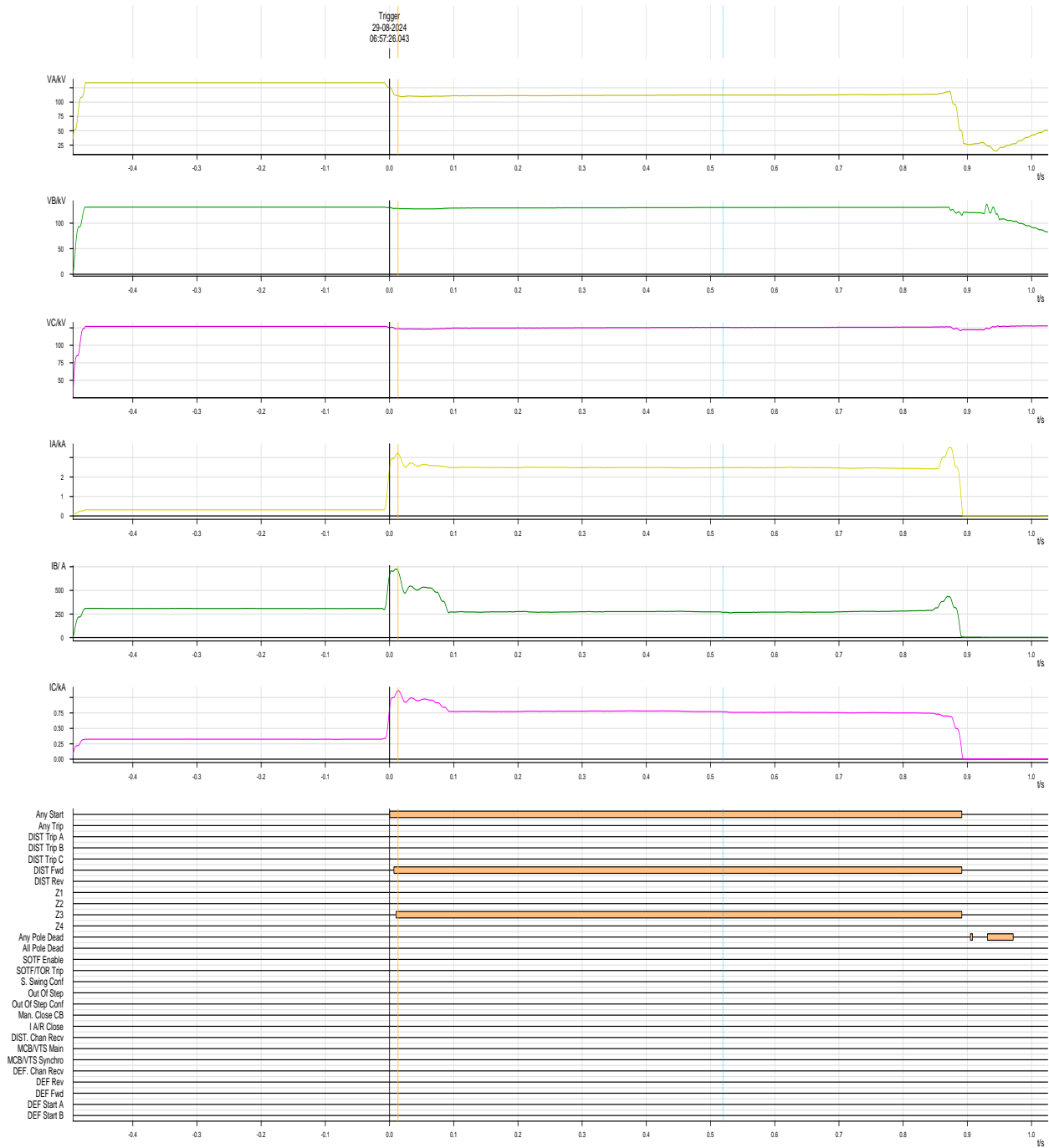
DR of 220 kV Katapalli-Hindalco-2 (Katapalli)



DR of 220 kV Katapalli-Lapanga-1 (Lapanga)



DR of 220 kV Katapalli-Lapanga-2 (Lapanga)



DR of 220 kV Katapalli-Bargarh (Bargarh)

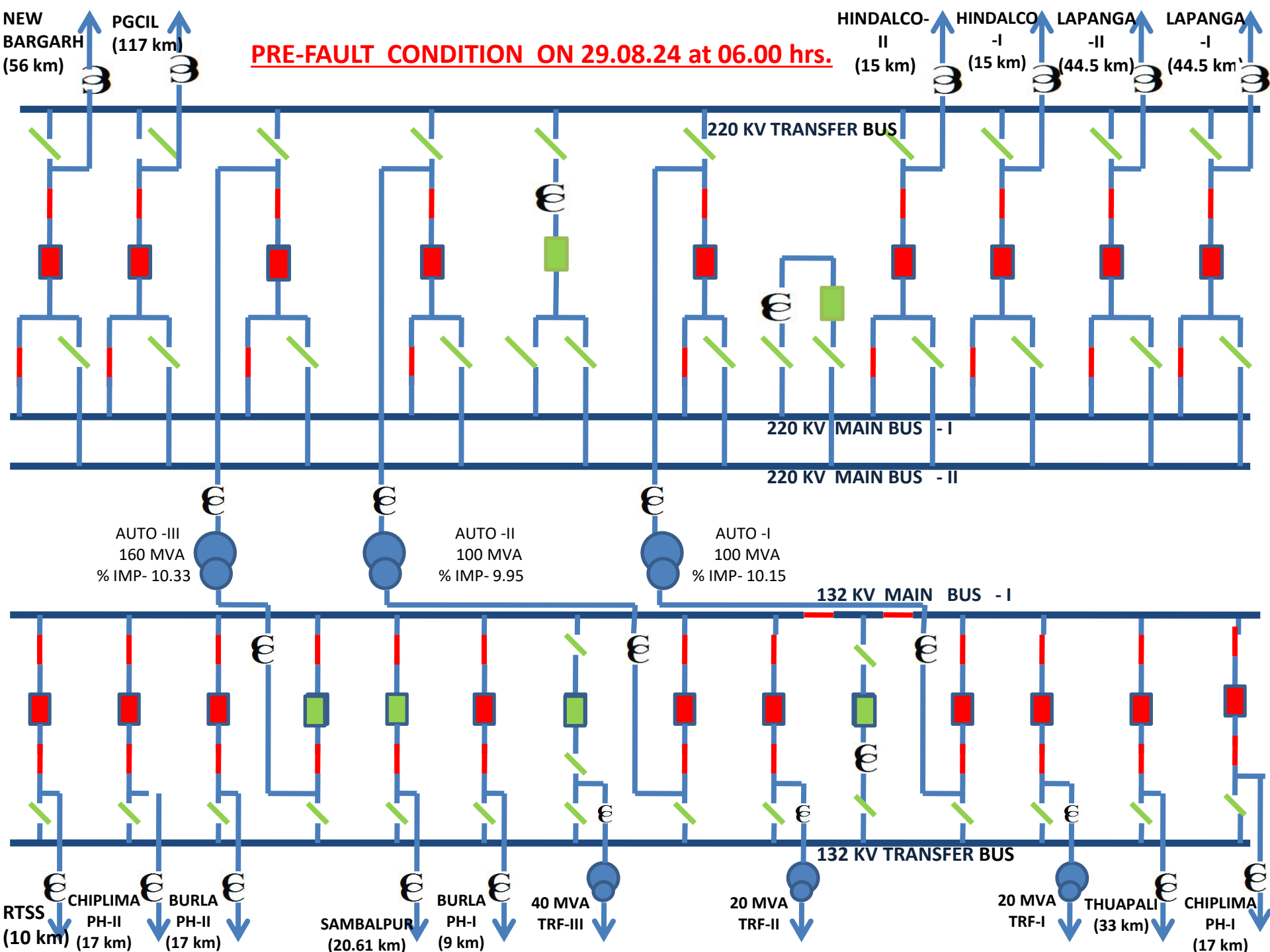


**Disturbance occurred at 220/132/33 KV Katapali GSS on
29.08.2024.**

Date 29.8.2024 ,Time- 06:52 Hrs.

Station : Katapali 220/132/33kV GSS

- 1. Total power failure occurred at 220/132/33 KV Gss, Katapali on above mentioned time stamp .**
- 2. During the event, Katapali was drawing power from Lapanga Gss(220 KV lines) , Burla PH & Chiplima PH (through 132 KV lines).**
- 3. Weather condition at katapali end : Heavy rain with Wind.**
- 4. A detail analysis has been done with the data available with OPTCL team.**



LOAD FLOW AT 06:00 Hrs for 220 KV Bus

FEEDER NAME	LOAD IN MW
220 KV LAPANGA-1	+ 49.2
220 KV LAPANGA -2	+ 49.2
220 KV HINDALCO-1	- 3
220 KV HINDALCO-2	- 3
220 KV PGCIL	- 54
220 KV NEW BARGARH	-90
220 KV AT-1	+31.6
220 KV AT-2	+31.6
220 KV AT-3	Ideal charged

LOAD FLOW AT 06:00 Hrs for 132 KV Bus

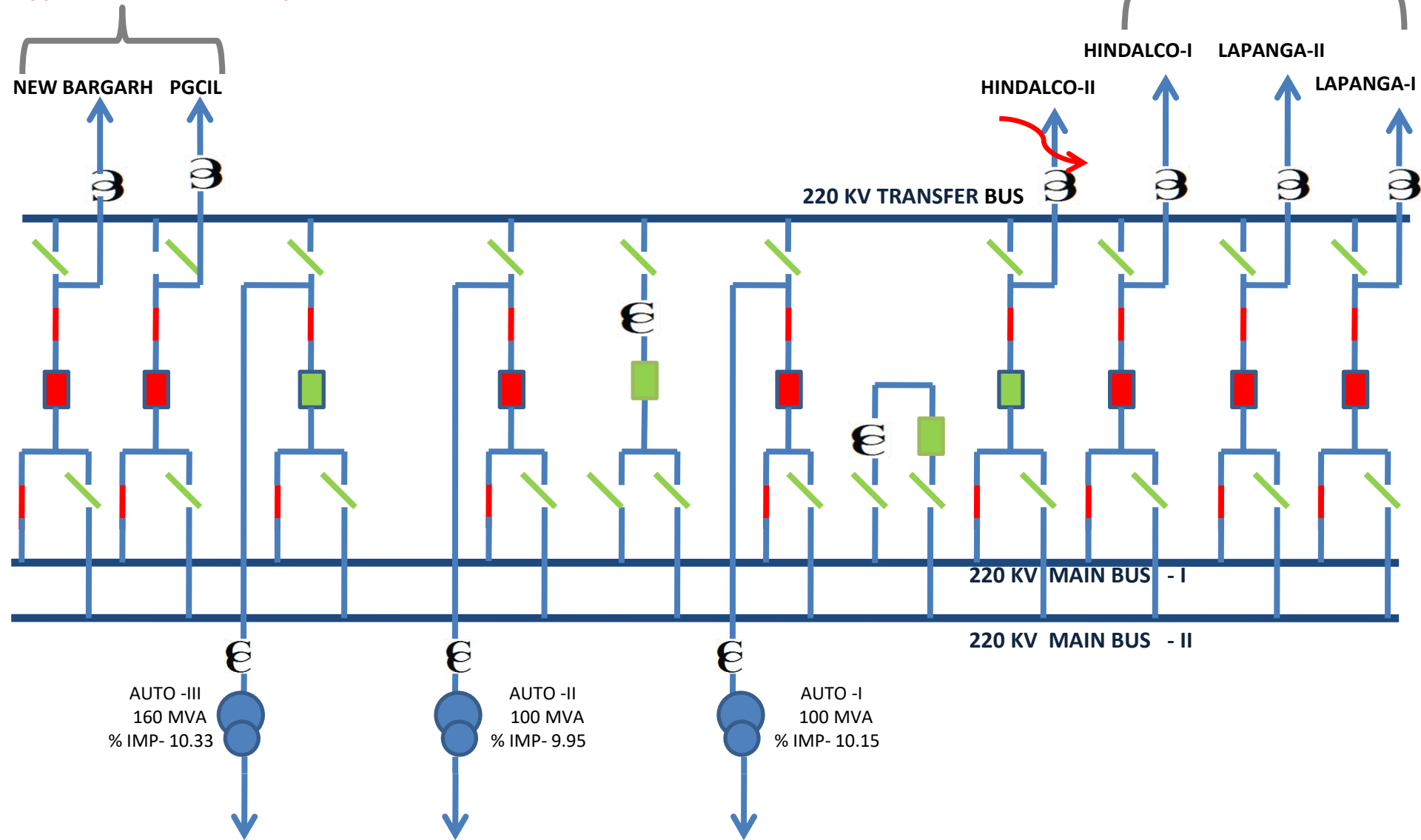
FEEDER NAME	LOAD IN MW
132 KV CHIPILIMA PH-1	+ 16
132 KV THUAPALI	-63.2
132 KV BURLA PH-1	+50.2
132 KV SAMBALPUR	Ideal charged
132 KV CHIPILIMA PH-2	+ 14
132 KV BURLA PH-2	+ 61
132 KV RTSS	5.1
132 KV Auto TFR-1	- 31.6
132 KV Auto TFR-2	- 31.6
132 KV Auto TFR-3	Not loaded
132 KV TFR-1	-6.2
132 KV TFR-2	-6.2
132 KV TFR-3	H/T

FAULT CONDITION ON 29.08.24 at 06.58 hrs

(220 KV SIDE)

Tripped at remote end only

Tripped at remote end only

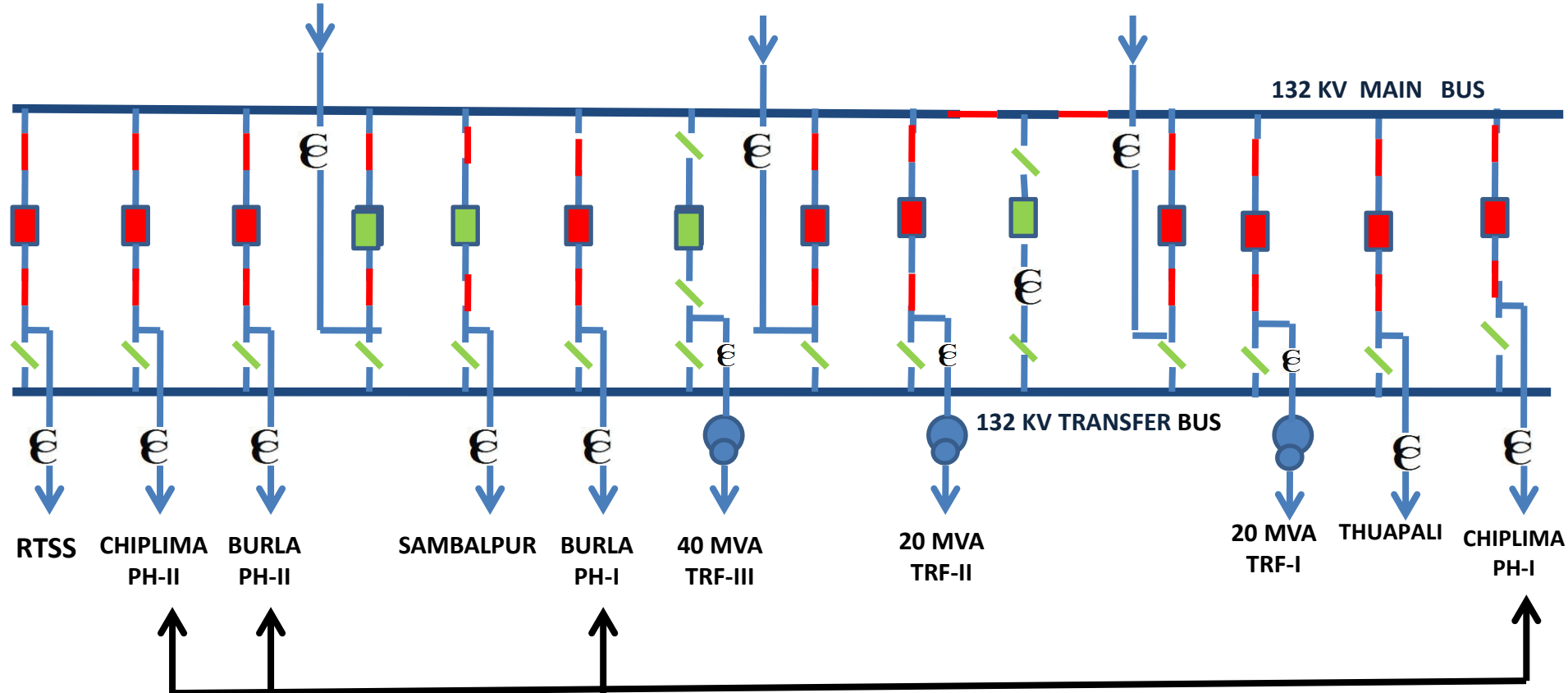


(132 KV SIDE)

132 KV side of
Auto -III

132 KV side of
Auto -II

132 KV side of
Auto -I



Tripped at remote end only

FAULT CONDITION ON 29.08.24 at 06.52 hrs

POST FAULT STATUS OF FEEDERS

FEEDER NAME	BREAKER STATUS
220 KV LAPANGA-1	Tripped at Lapanga end
220 KV LAPANGA -2	Tripped at Lapanga end
220 KV HINDALCO-1	Tripped at Hindalco end
220 KV HINDALCO-2	Tripped at both ends
220 KV PGCIL	Tripped at PGCIL end
220 KV NEW BARGARH	Tripped at New Bargarh end
220 KV AT-1	Did not trip
220 KV AT-2	Did not trip
220 KV AT-3	Ideal charged condition
132 KV CHIPILIMA PH-1	Tripped at Chipilima end
132 KV BURLA PH-1	Tripped at Burla PH end
132 KV CHIPILIMA PH-2	Tripped at Chipilima end
132 KV BURLA PH-2	Tripped at Burla PH end
132 KV RTSS	Did not trip
132 KV THUAPALI	Did not trip
132 KV SAMBALPUR	Was in Ideal charged condition from Sambalpur End

RELAY DATA

FEEDER NAME	LOCAL END	REMOTE END
220 KV LAPANGA-I	Did not tripped at Katapali end.	Distance relay Zone : 3 Picked Up Fault loop: R ph –Gnd Fault distance: 95 km Fault current: IR=2.4 kA, IY=0.289kA, IB=0.931 kA B/U Dir. E/F Optd with In= 1.5 Kamp (796 mSec).
220 KV LAPANGA –II	Did not tripped at Katapali end.	Distance relay Zone : 3 Picked Up Fault loop: R ph –Gnd Fault distance: 95 km Fault current: IR=2.4 kA, IY=0.289kA, IB=0.931 kA B/U Dir. E/F Optd with In= 1.0 Kamp (835 mSec).
220 KV HINDALCO-I	Did not tripped at Katapali end.	Islanded at Hindalco end with B/U & Undervoltage Setting.
220 KV HINDALCO-II	Back up operated IR=7.09kA, IY= 533A, IB=426.07A Fault duration: 737 ms	Tripped in differential line protection in 70 mSec.
220 KV PGCIL	Did not tripped at Katapali end.	DP operated Zone : 3 R-N Fault distance: 191 KM time > 800 mSec
220 KV NEW BARGARH	Did not tripped at Katapali end.	Fault current: Dir. E/f tripped. IR=1.38 kA, IY=0.450kA, IB=0.090 kA

FEEDER NAME	LOCAL END	REMOTE END
132 KV CHIPLIMA-I	Did not tripped at Katapali end.	Back up relay operated (Non directional) IN2>1 optd. Fault current: IR=509.213 A, IY=217.103 A, IB=181.168 A, IN=1.269A Duration : 55 mSec
132 KV CHIPLIMA-II	Did not tripped at Katapali end.	Back up relay operated (Non directional) IN2>1 optd. Fault current: IR=478.955 A, IY=232.689 A, IB=142.278 A, IN=2.045A Fault duration : 56 mSec
132 KV BURLA PH –I	Did not tripped at Katapali end.	Dir O/C OPTD. Fault current: IA: 681.7 A IB: 681.7 A IC: 692.2 A FD: 0.1 sec
132 KV BURLA PH -II	Did not tripped at Katapali end.	Fault location: -20.3 km C-N Fault current: 1.64 KA

Analysis of Fault:

1. Sequence of Tripping :

At 06.52 hrs :

- a. 132 KV Katapali-Burla PH-II has tripped first at remote end only with Distance relay optd.
- b. 132 KV Katapali-Burla PH-I has tripped at remote end only with O/C dir. Optd.
- c. Both 132 KV Katapali-Chiplima ckts has tripped at remote end with Non-directional E/f optd.

All above faults have recorded fault current in B-Ph.

d. After analyzing the power map of this region it is evident that fault was in between 132 Hirakud GIS to Lapanga Gss DC line .The DR data of other associated ckts are attached for reference.

2. As fault current of both 132 KV and 220 KV are different w.r.t Phases & time stamp also different , it is suspected that after 132 KV disturbance, line fault occurred in 220 KV system as explained below.

Analysis Continues..

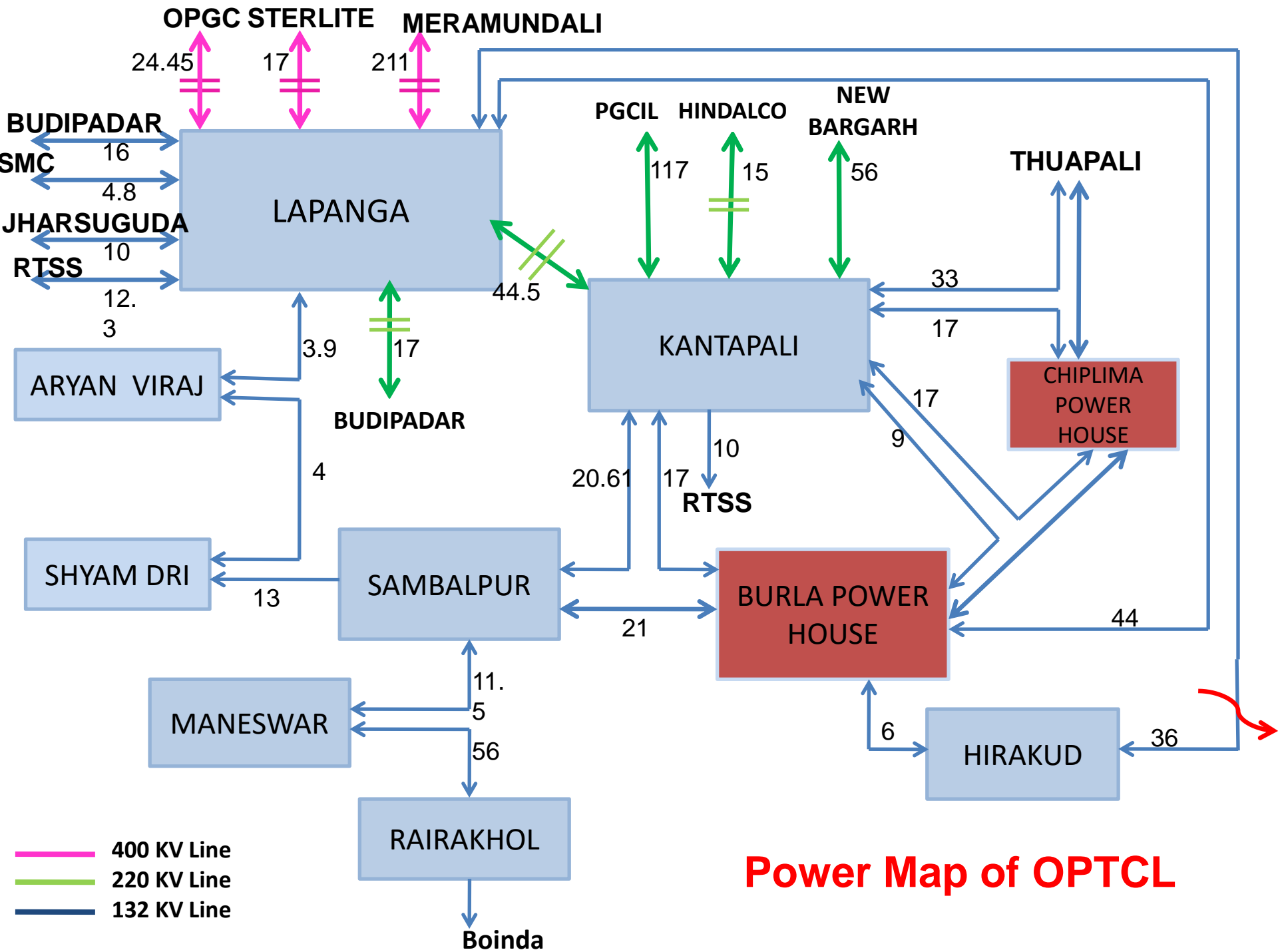
At 06.58 hrs :

3. Rph – gnd fault occurred in 220 KV Katapali – Hindalco-II line for which breaker at Hindalco end tripped in differential line protection (less than 100 mSec.) and breaker at Katapali end tripped with Back up protection in 737 ms (according to IDMT characteristic). As line differential is also present at Katapali end , it should have been also operated at katapali end but no tripping with the line differential rather tripped with O/C as explained.
4. Hindalco ckt – I tripped at remote end (islanding mode to isolate its system from fault). Setting for islanding at Hindalco is U/V with O/C (450 Amp)
5. 220 KV PGCIL tripped at remote end only (being the source) in Z-3 (as Z-3 timing is kept at 800 ms for PGCIL feeder).
6. 220 KV New Bargarh tripped at remote end only with Zone 3 .
7. Thus Total power failure occurred at Katapali End.

Relay details of 132KV Lapanga-Burla PH and 132 KV Lapanga – Hirakud feeders :

FEEDER NAME	AT LAPANGA END	AT BURLA PH END
132 KV LAPANGA – BURLA PH	Back up overcurrent Trip with DP picked up Fault distance- 80.2 km Fault loop: B ph –E IEp Dir trip win 559 mSec.	Distance relay operated Zone : 1 Fault loop: B ph –Gnd Fault distance: 7.9 km Fault current, If = 13.81 Inom

FEEDER NAME	AT LAPANGA END	AT HIRAKUD END
132 KV LAPANGA – HIRAKUD	Back up relay operated Fault current: IR=0.01 kA, IY=0.01kA, IB=1.76 kA IEp Dir trip win 557 mSec.	Distance relay operated Zone : 1 Fault loop: B ph –Gnd Fault duration: 55 ms Fault current: IR=550.928 A, IY=443.359A, IB=4.095 kA , IN=5.067 kA



Power Map of OPTCL

Remedial Actions:

1. Settings to be reviewed for ckts at Chiplima & Burla PH end along with CT star point (which side of CT is earthed in 2ndary).
2. Relay testing done for both the 220 KV Hindalco ckts at Katapali end.No abnormality observed.
3. Relay testing to be done for 220 KV Lapanga 01 & 02 at Katapali end for any abnormal tripping with respect to ERPC guidelines.
4. Relay testing at new Bargarh end to be done for any abnormal tripping.


ग्रिड-इंडिया
GRID-INDIA

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

पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / Eastern Regional Load Despatch Centre

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

**पूर्वी क्षेत्र के 220/132 केवी पूर्णिया उप-केन्द्र में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event at
 220/132 kV Purnea S/s of Eastern Region
 (To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss
 Event as per IEGC section 37.2 (f)
 (आई ई जी सी 37.2 (एफ) के अनुपालन में)**

Date(दिनांक):20-08-2024

1. Event Summary (घटना का सारांश):

At 15:50 Hrs on 01.08.2024, 220/132 kV Purnea (PG) S/s became dead due to tripping of 220 kV New Purnea-Purnea D/c and 220 kV Gazole-Dalkhola D/c (Gazole-Dalkhola-Purnea link) during a fault in downstream of 132 kV Purnea (PG). Load loss of around 110 MW occurred at Purnea.

2. Time and Date of the Event (घटना का समय और दिनांक): 15:50 hrs of 01.08.2024

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
				Bihar	Bihar
Pre-Event (घटना पूर्व)	49.94	26029 MW	22769 MW	463 MW	5352 MW
Post Event (घटना के बाद)	49.94	26024 MW	22659 MW	463 MW	5242 MW

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

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विद्युत उत्पादन इकाइयां जो बंद हैं)	220 kV Bus Coupler at Dalkhola was in open condition.
Weather Condition (मौसम स्थिति)	Inclement Weather Condition reported

6. Load and Generation loss (लोड और जेनरेशन हानि): Generation loss: NIL; Load loss: 110 MW.

7. Duration of interruption (रूकावट की अवधि): 00:23 Hrs

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

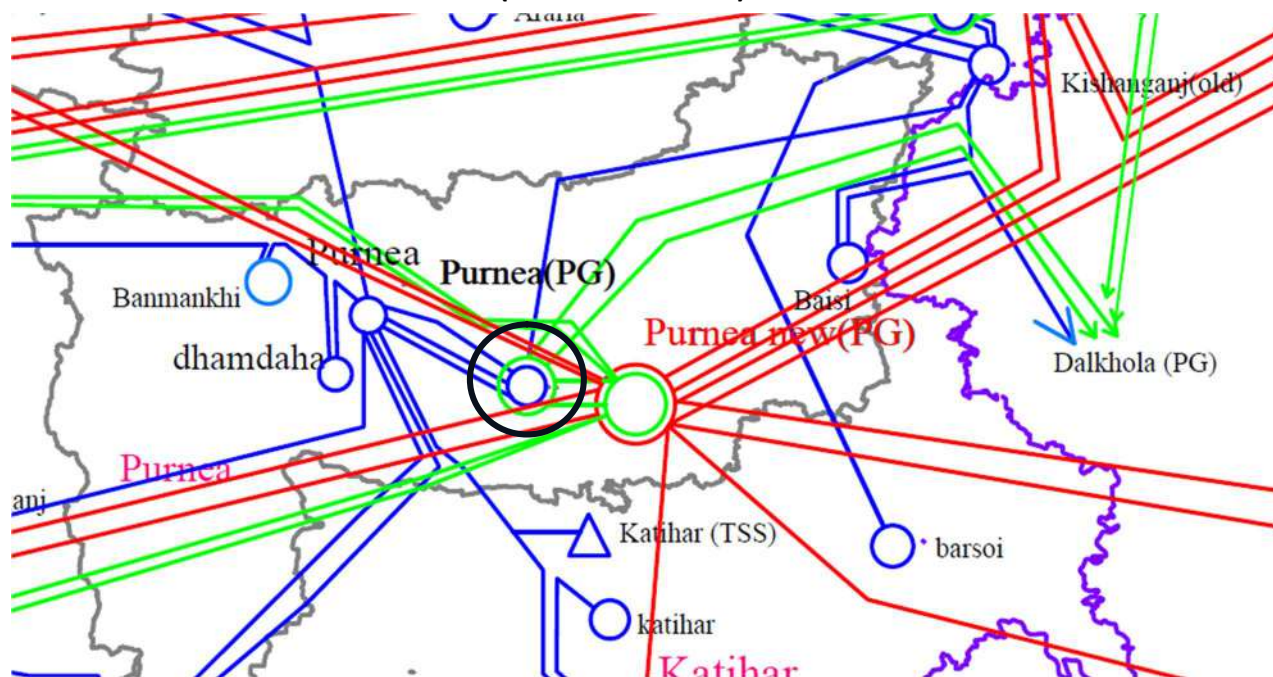


Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग):

क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220kV New Purnea-Purnea D/c	15:50:21.787	New Purnea: Back up O/c, E/f, Ib: 2.9 kA	Purnea: Didn't trip	16:13
2	132 kV Purnea(PG)-Purnea-2,3	15:50:22.890	Purnea (PG), B_N, Zone-3	Purnea: Didn't trip	17:00/17:06
3	220 kV Gazole-Dalkhola D/c	15:50:23.010	Gazole: B_N, Zone-3, Ib: 1.06 kA	Dalkhola: Didn't trip	17:12/17:15

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

- There was multiple tripping in the downstream of 132 kV Purnea S/s of Bihar between 15:40 Hrs-15:50 Hrs.

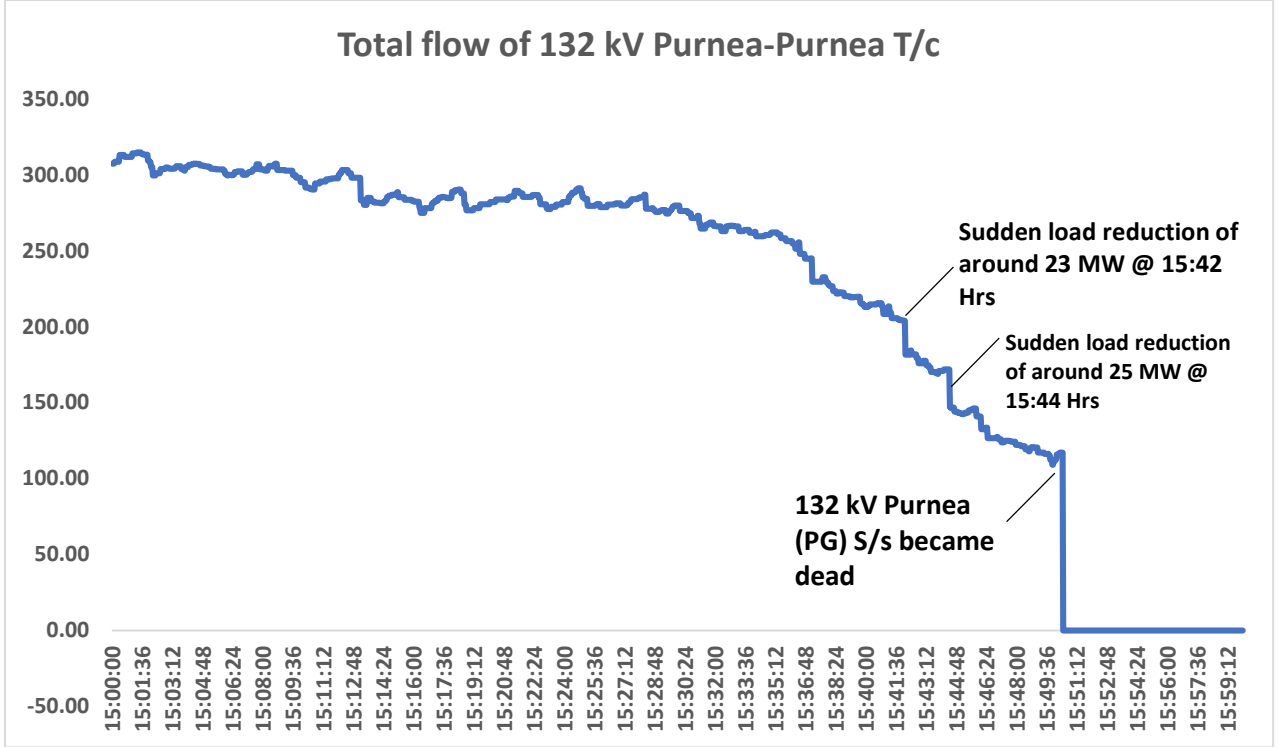


Fig 2: SCADA flow of 132 kV Purnea-Purnea T/c

- At 15:50:21.787 Hrs (**T+0**), a B_N fault struck in the downstream of 132 kV Purnea S/s. Due to paucity of PMU visibility and sufficient data, the exact location of fault couldn't be ascertained.
- At 15:50:22.141 Hrs (**T+350 msec**), 220 kV New Purnea-Purnea D/c tripped due to back Up O/c and E/f fault from New Purnea end.
- After tripping of 220 kV New Purnea-Purnea D/c, 220 kV Gazole-Dalkhola D/c started feeding the fault through 220 kV Gazole-Dalkhola-Purnea link.
- At 15:50:22.890 Hrs (**T+1150 msec**), 132 kV Purnea-Purnea-2 tripped from PG end in Zone-3.
- At 15:50:22.890 Hrs (**T+1150 msec**), 132 kV Purnea-Purnea-3 tripped from PG end in Zone-3. Back Up O/c and E/f protection also operated.
- At 15:50:23.010 Hrs (**T+1270 msec**), 220 kV Gazole-Dalkhola D/c tripped from Gazole end in Zone-3. Zone-3 at Gazole picked up after tripping of 220 kV New Purnea-Purnea D/c. This led to loss of supply at 132 kV Purnea (PG) S/s.

- 132 kV Purnea-Purnea-1 didn't trip from either end as in between Zone-3 dropped for around 120 msec and picked again. However, Back Up O/c Picked at Purnea (Bihar) at **T+1060 msec**. Direction of B_ph current also reversed at Purnea (R_Y_B convention).

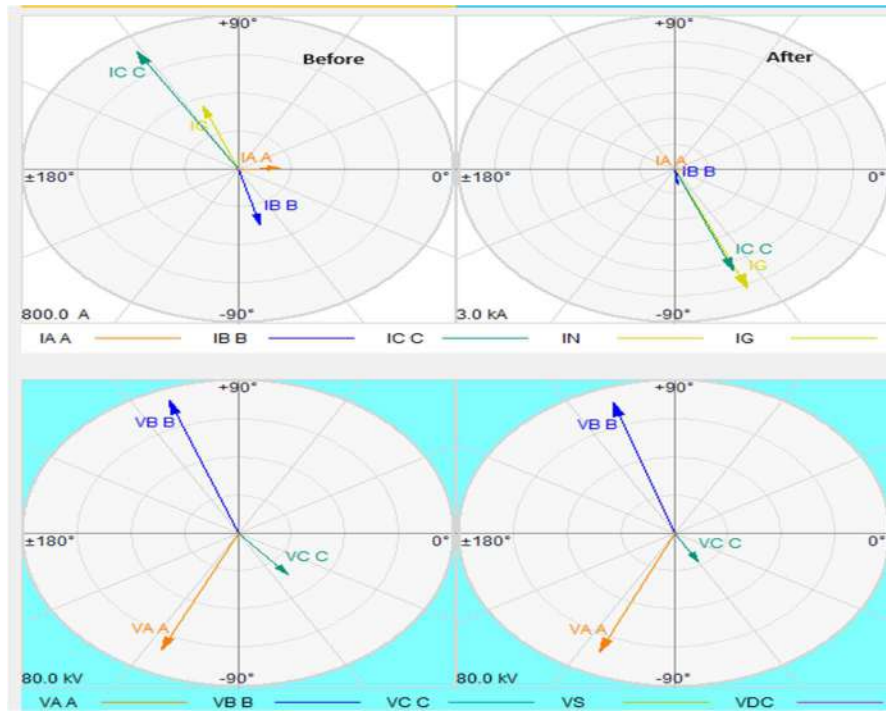


Fig 3: DR snapshot of 132 kV Prunea-Purnea-1 (Bihar end)

- This suggests that at this instance, fault developed in 132 kV Purnea-Purnea-1. All three 132 kV Purnea-Purnea feeders have differential protection scheme. Why differential protection didn't operate?

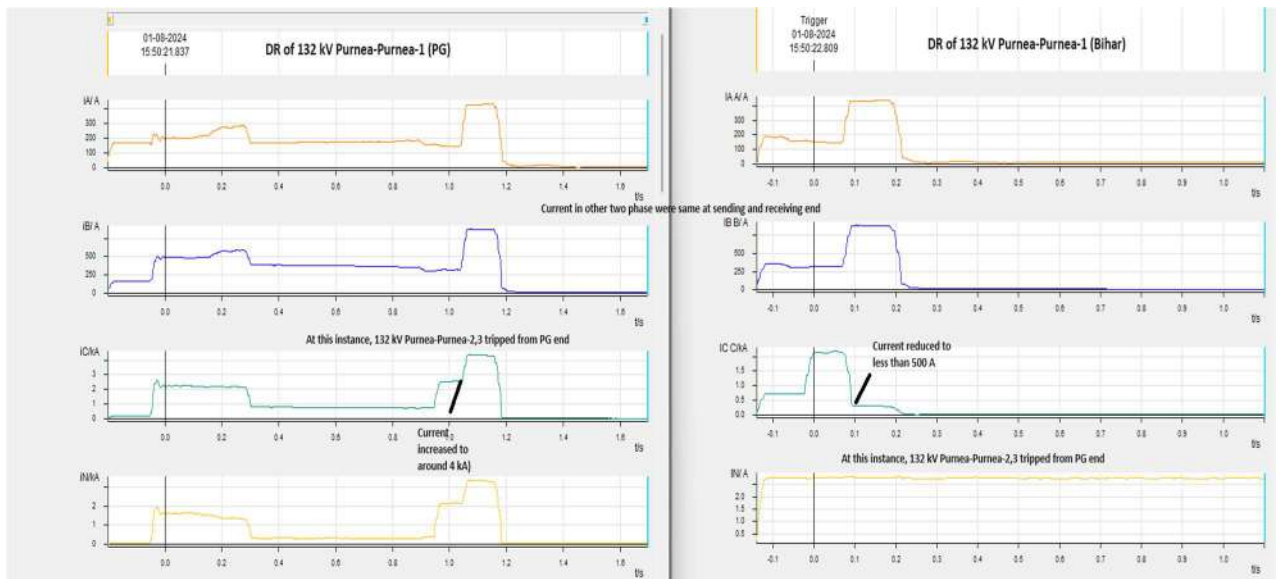


Fig 4: DR snapshot of 132 kV Prunea-Purnea-1 (Both ends)

- However, prior to the suspected fault in 132 kV Purnea-Purnea-1, DRs are suggestive of fault in 132 kV Purnea (Bihar) S/s.
- It was also seen that there were different fault currents in each circuit of 132 kV Purnea-Purnea T/c with 132 kV Purnea-Purnea-2 having highest fault current of around 7 kA in the beginning. This is because at Purnea (PG) bus configuration is as below:

Bus-1: 220/132 kV ICT-1, Purnea-1, Purnea-3

Bus-2: 220/132 kV ICT-2,3 and Purnea-2

- It is gathered that just at the beginning of fault 132 kV Bus coupler might have also tripped.
- Report received from Power Grid ER-1 is attached at Annexure 3

PMU Snapshot:

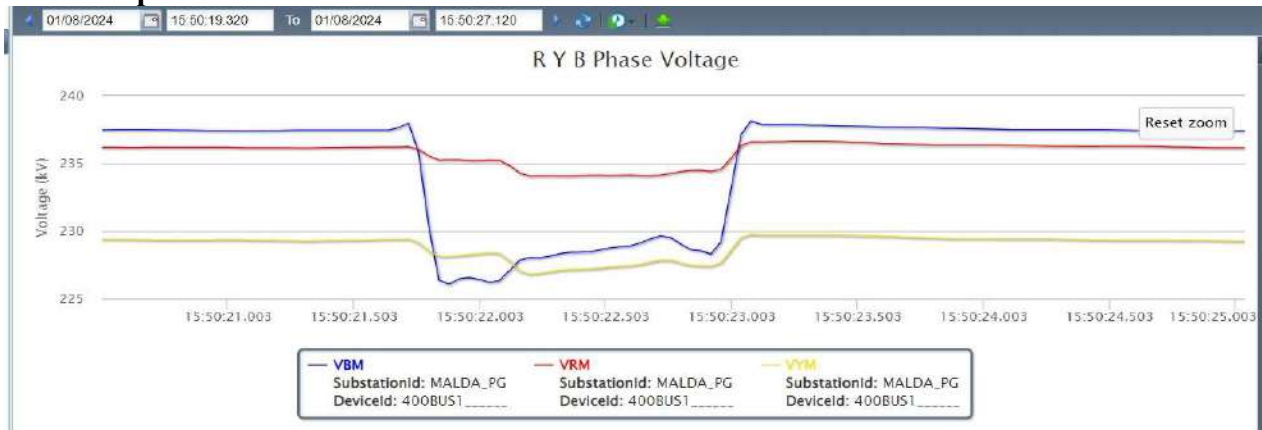


Figure 2: PMU Voltage snapshot of 400/220 kV New Purnea S/S

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

- Tripping of 220 kV New Purnea-Purnea D/c on back up O/c and E/f was not desirable. Its setting may be reviewed and co-ordinated with Back Up O/c setting of 220/132 kV ICTs. **PG may review the settings.**
- Zone-3 setting of 220 KV Gazole-Dalkhola also needs to be co-ordinated with 220 kV Dalkhola-Purnea and 220/132 kV ICTs at Purnea. **WBSETCL/PG may co-ordinate.**
- 132 kV Purnea-Purnea T/c have differential protection with distance protection as back up then distance protection should not have operated/picked up at Purnea (PG) end if differential protection was in healthy state. **PG/BSPTCL may check and confirm.**
- Differential protection didn't operate in 132 kV Purnea-Purnea-1. **PG/BSPTCL may check and confirm.**

- DR of 132 kV Purnea-Purnea-3 is not time synchronized at PG end. **PG to take necessary action.**

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

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

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

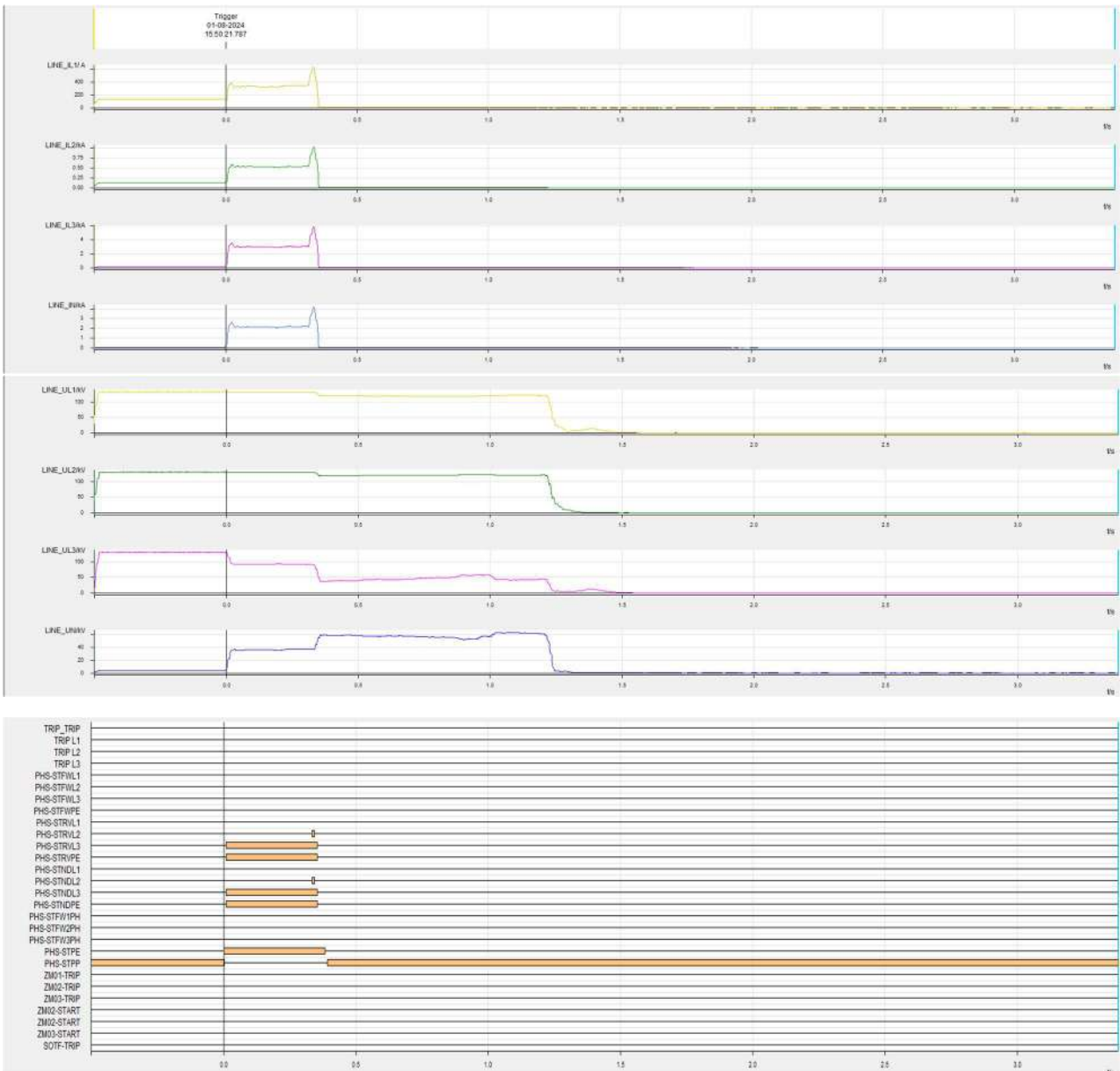
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु): Nil

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

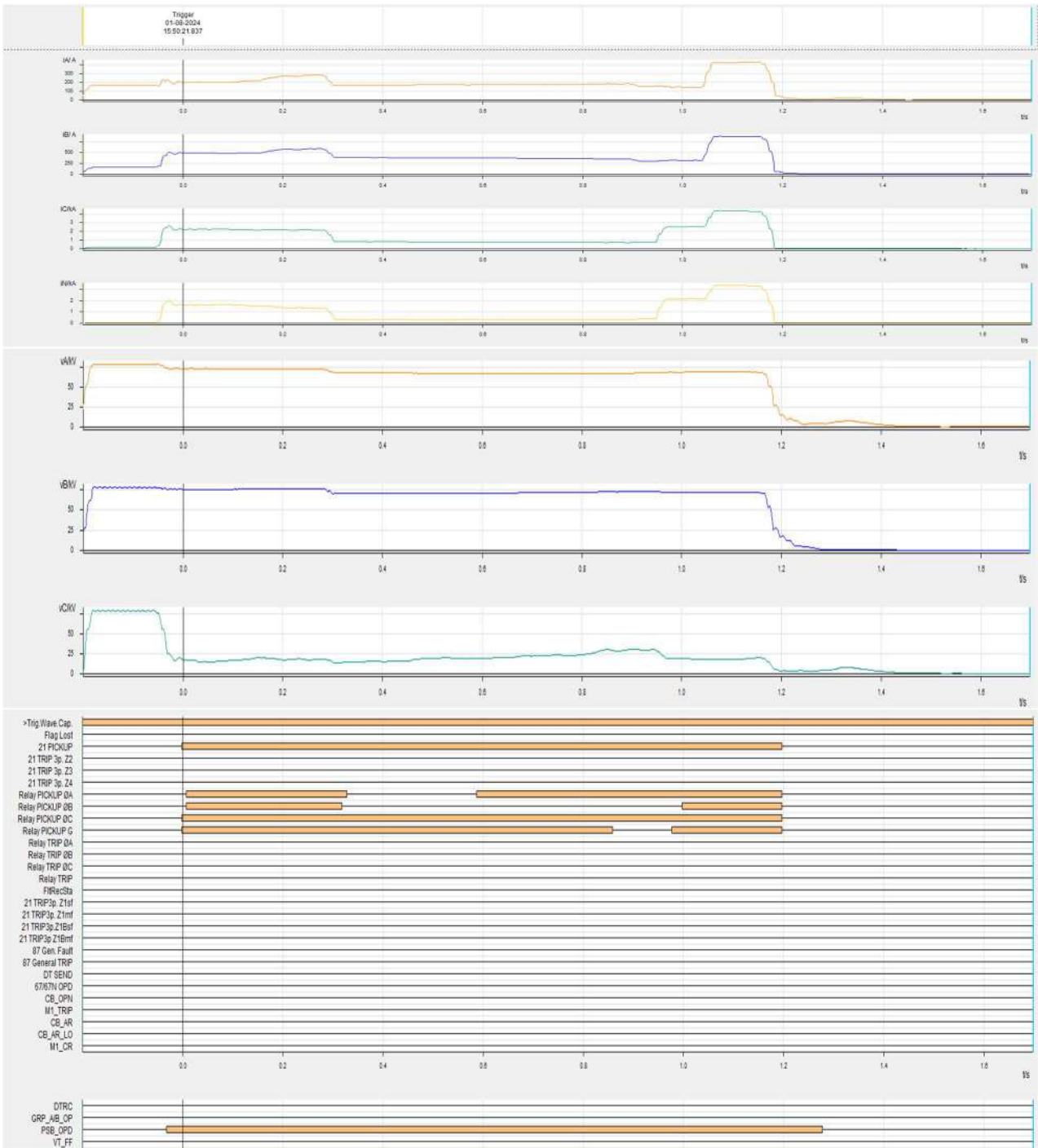
TIMESTAMP	STATION	DESCRIPTION	STATUS
15:50:22.108	NEW_PURNEA	220_PURNE_PG_2_CB	Open
15:50:22.129	NEW_PURNEA	220_PURNE_PG_1_CB	Open
15:50:22.897	PURNE_PG	132_PURNN_BH_2_CB	Open
15:50:22.898	PURNE_PG	132_PURNN_BH_3_CB	Open

Annexure 2:

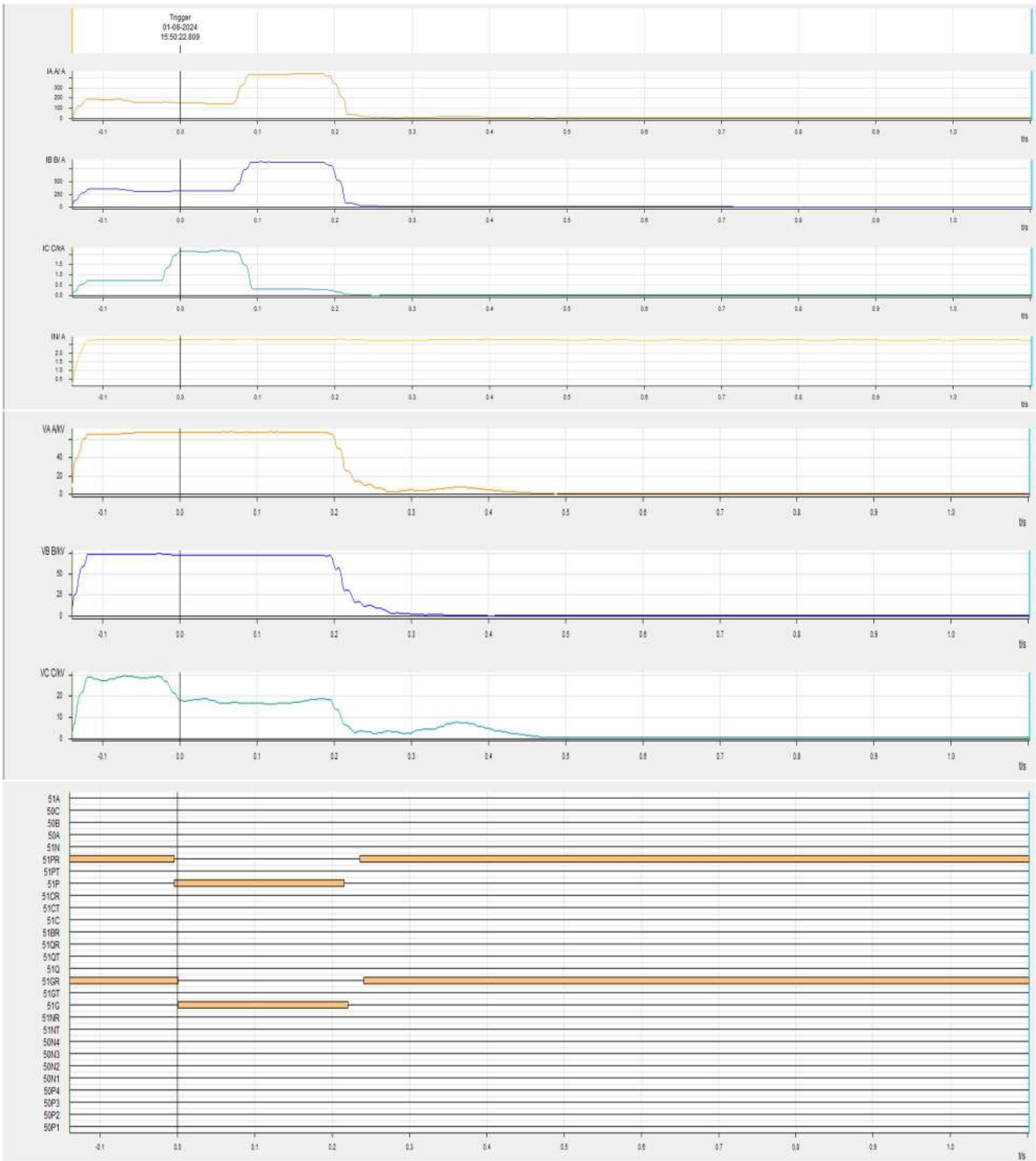
DR of 220 kV New Purnea-Purnea-1 (New Purnea)



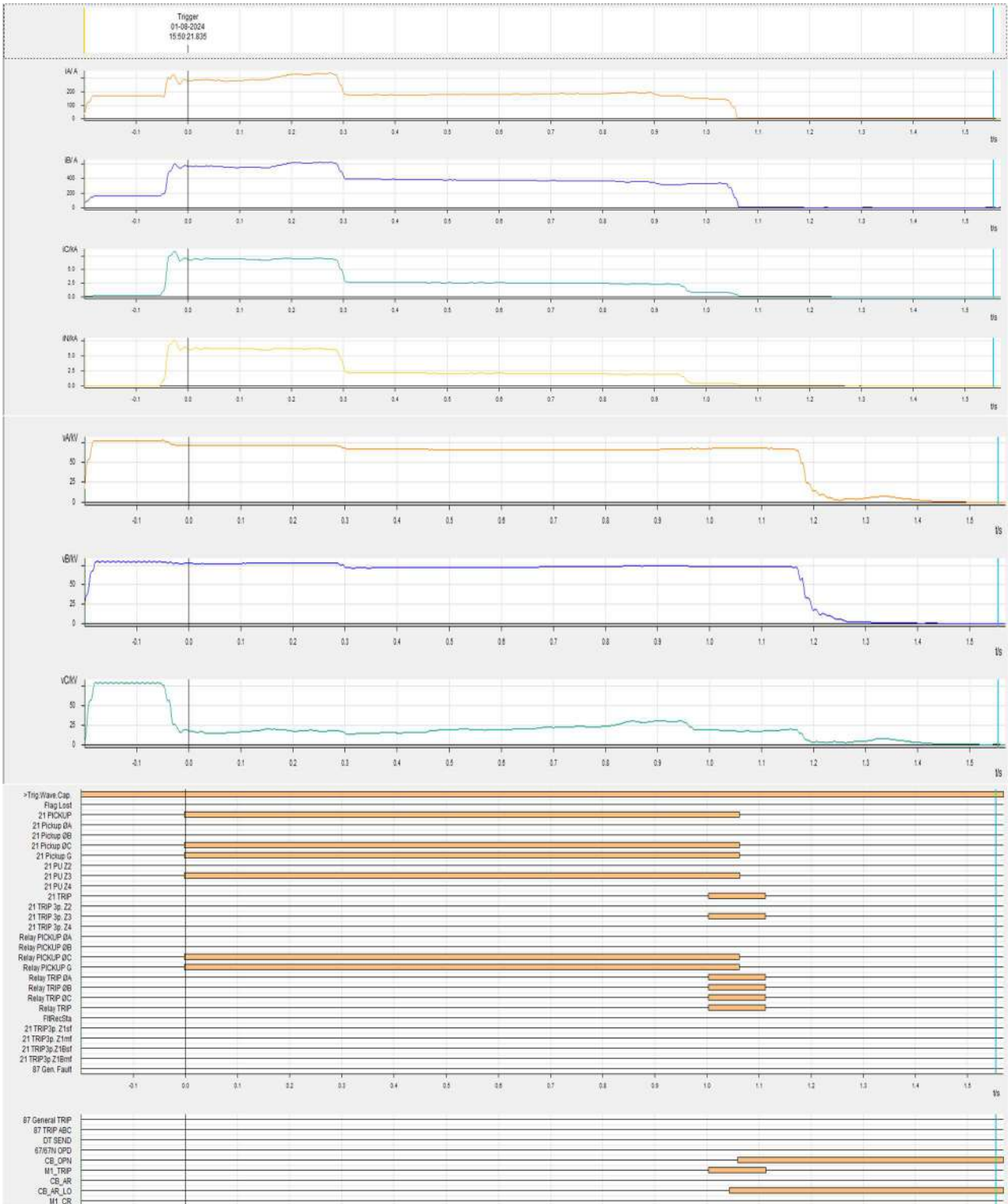
DR of 132 kV Purnea-Purnea-1 (PG)



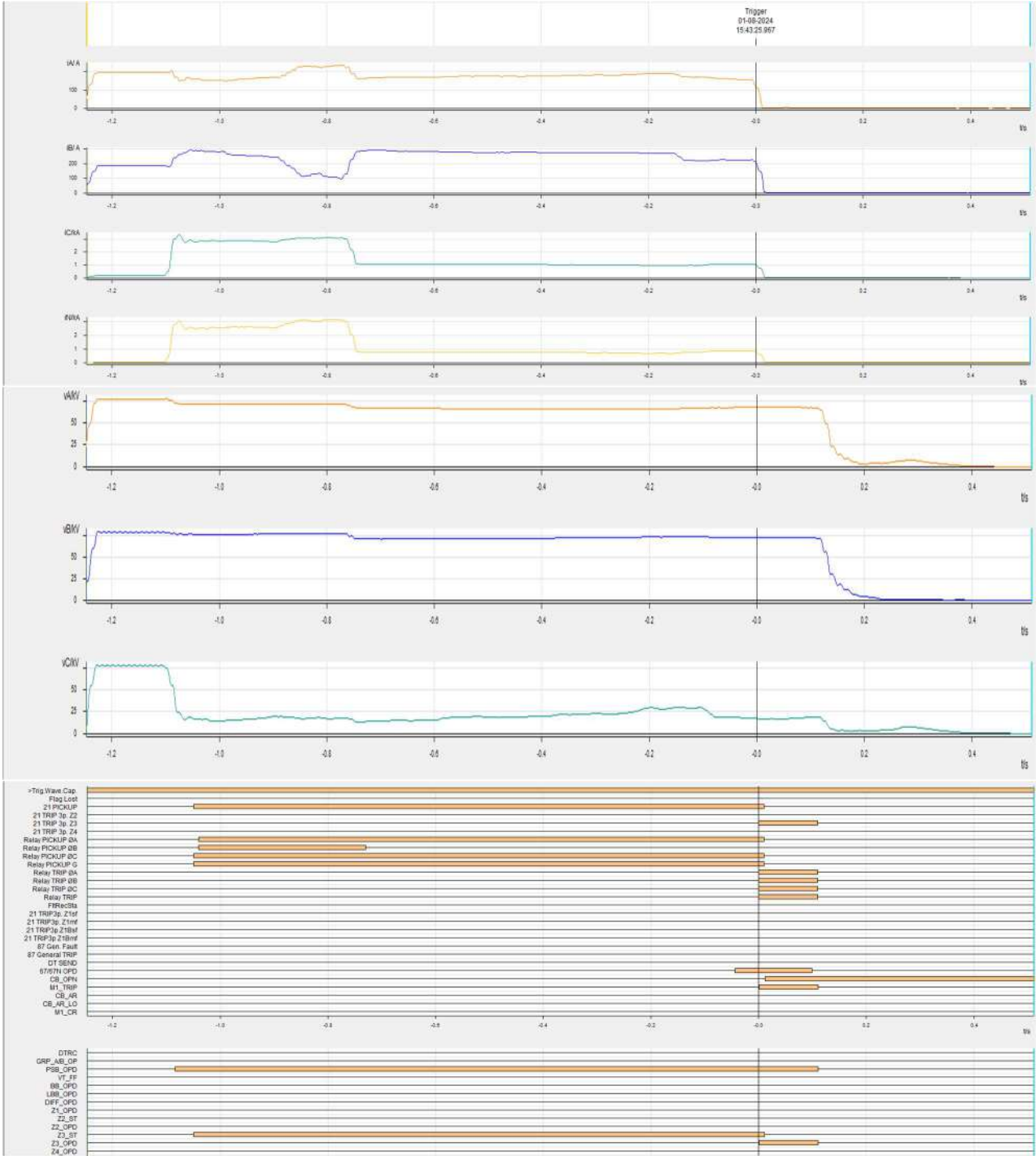
DR of 132 kV Purnea-Purnea-1 (BSPTCL)



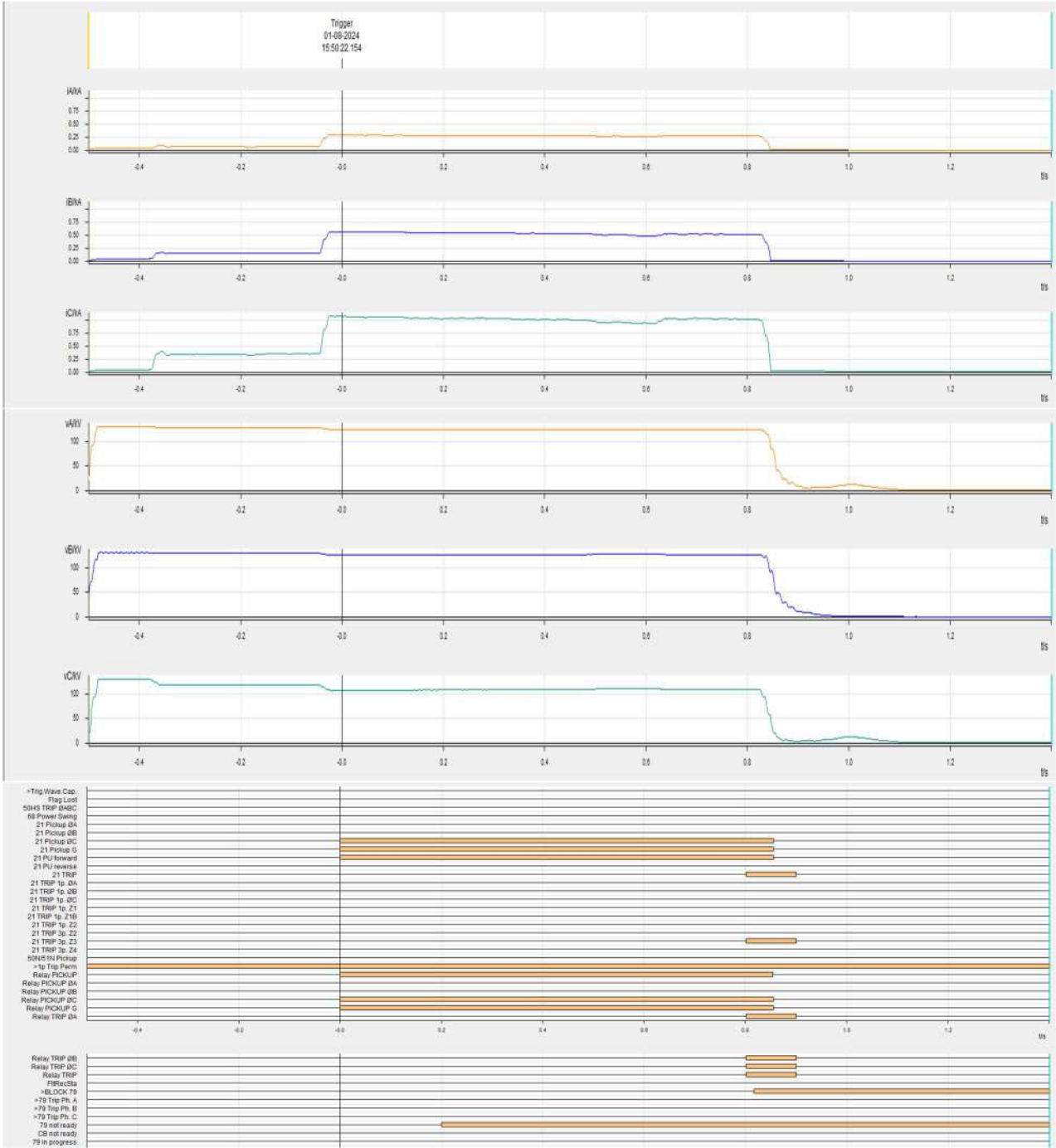
DR of 132 kV Purnea-Purnea-2 (PG)



DR of 132 kV Purnea-Purnea-3 (PG)



DR of 220 kV Gazole-Dalkhola-1 (Gazole)

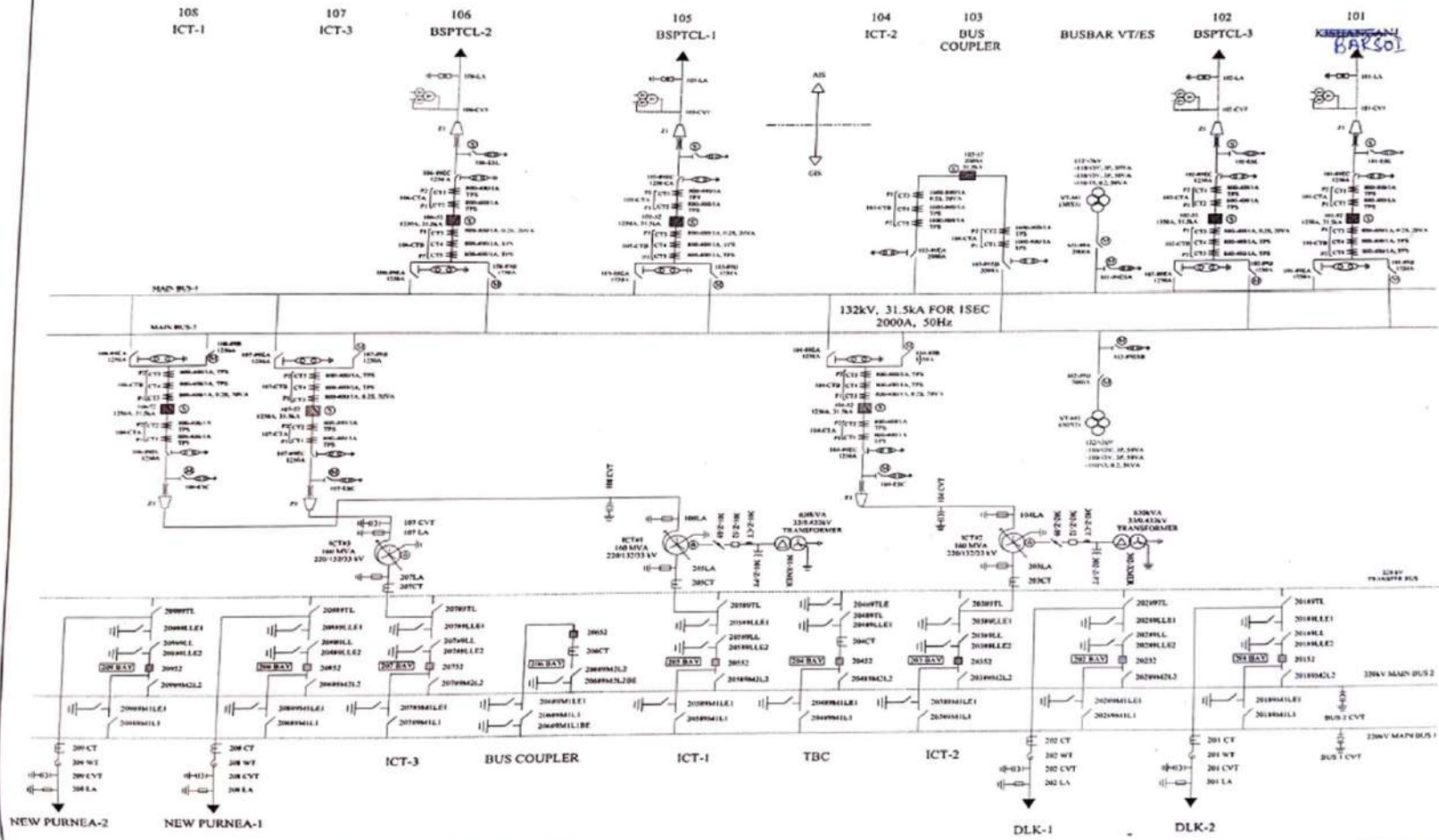


Report on Tripping of Multiple Feeders at 220/132kV Purnea SS on 01.08.24 at 15:50 Hrs



**पावरग्रीड
POWERGRID**

POWER GRID CORPORATION OF INDIA LIMITED
SINGLE LINE DIAGRAM, 220/132kV PURNEA
SUB-STATION, ER-1 BIHAR



Sequence of Events

220kV Purnea – Purnea -2 Line – Tripped only at New Purnea End at 15:50:21:940 Hrs
Due to Backup O/C & E/F Optd

220kV Purnea – Purnea -1 Line – Tripped only at New Purnea End at 15:50:21:960 Hrs
Due to Backup O/C & E/F Optd

132kV Purnea- Purnea-2 Line- Tripped at Purnea End at 15:50:22:897 Hrs due to Zone 3
Protn Optd

132kV Purnea- Purnea-3 Line- Tripped at Purnea End at 15:50:22:898 Hrs due to Zone 3
Protn Optd and Backup O/C & E/F Protn Optd.

Other Events

132kV Purnea- Purnea-1 : Backup O/C & E/F Protn Pickup

220kV Purnea- Dalkhola-1 Line – Not Tripped at Purnea End

220kV Purnea- Dalkhola -2 Line – Not Tripped at Purnea End

220/132kV ICT-1 /2 /3 – Not Tripped at Purnea End

220kV Dalkhola- Gazole – Tripped from Gazole End (Purnea- Dalkhola- Gazole)

Since all the sources got tripped, both the 220kV Bus Voltages at Purnea become dead.

As information received from BSPTCL, actual fault was occurred in 33 kV downstream feeder of 132 kV Purnea (BSPTCL) End due uprooting of Pole and the fault was not cleared from their end. Further fault was also reported in 132kV Purnea-Triveniganj Line.

Due to continues feeding of fault current from Upstream level i.e., 220kV Purnea, 220kV New Purnea and 220kV Gazole (WB) was operated by Backup Protections.

220 kV Bus at Purnea was charged at 16:13 Hrs.

Tripping of 220kV Purnea- New Purnea-1 & 2 Lines at New Purnea End

Main : Line Differential ABB Make RED670 - Not operated

Both the Lines were tripped due to Backup O/C & E/F Relay operated (Backup)

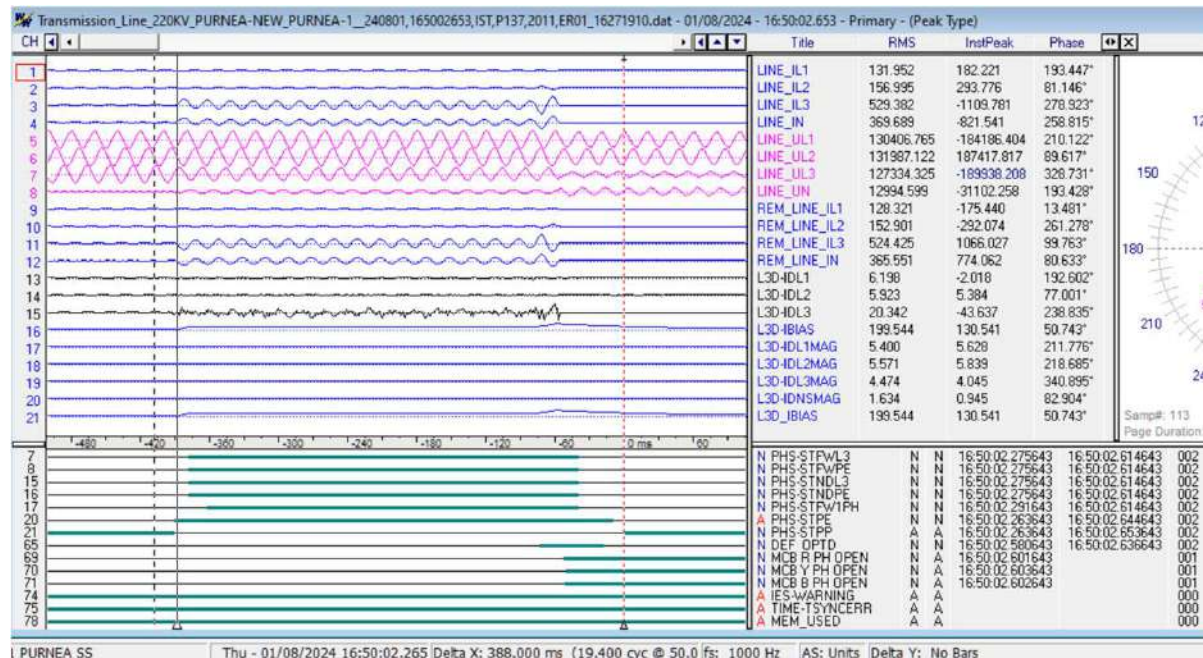
Make & Model: Alstom CDD Type

Settings: O/C – Pickup – 1A (800/1), TMS – 0.05 Sec,

E/F – Pickup – 0.2A , TMS- 0.15 Sec

Fault Current: Line-1 – 2.9kA , Line -2 – 2.9kA

Calculate Time - **0.352 Sec** , Actual Operated Time - **0.332 Sec** from New Purnea End. Further the line was in charged condition from Purnea End.



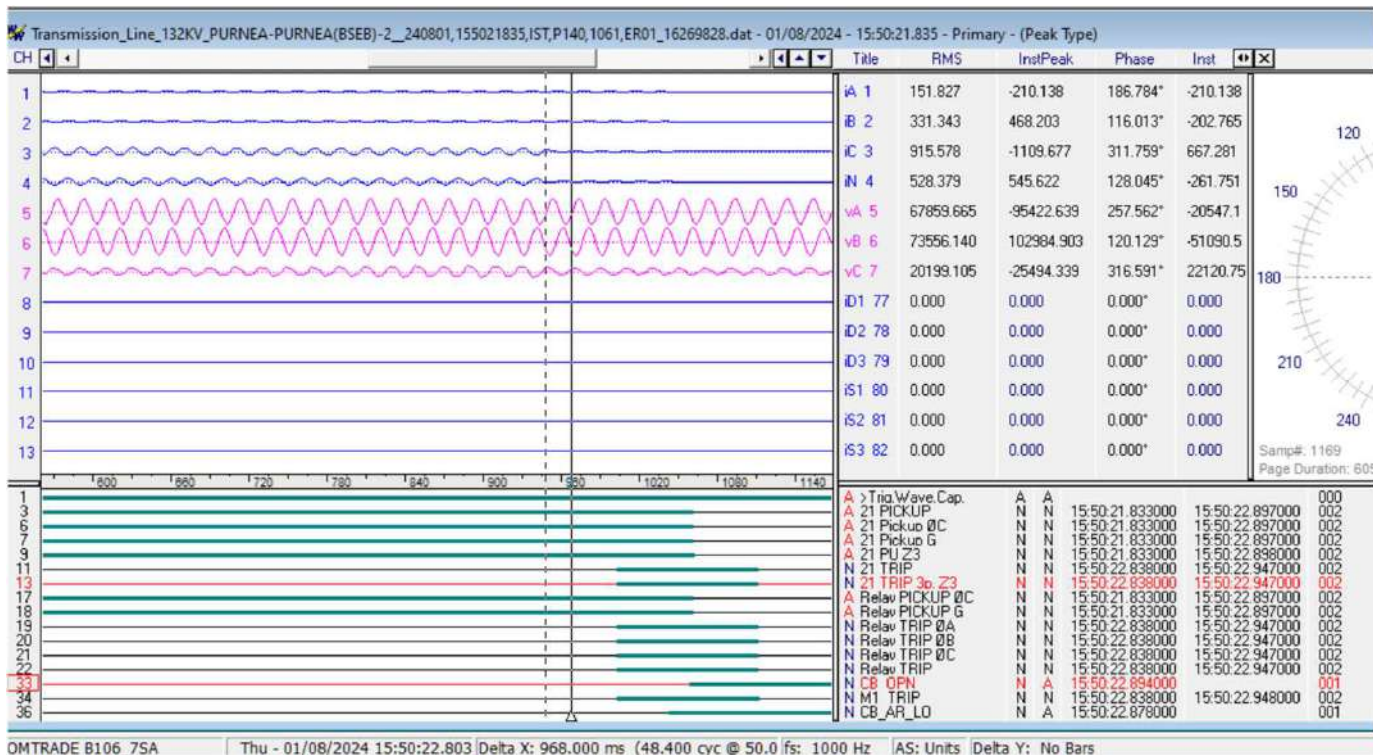
Tripping of 132kV Purnea- Purnea- 2 Line at Purnea End

Purnea-2 Line was tripped due to Zone -3 Protn Optd in Main Line Differential Relay.

Fault Current: 0.79kA, Fault Distance- 5.3kM. Zone-3 Settings: 1.0 Sec and optd time: **1.01 Sec**

Also, it is observed that Backup O/C & E/F Protection got picked up.

As per DR Observation, Initially the fault was detected as 7.0kA and after the tripping of 220kV Purnea – New Purnea 1 & 2 Line after 0.3 Sec the fault current reduced to 2.6kA.



Tripping of 132kV Purnea- Purnea- 3 Line at Purnea End

Purnea-3 Line was tripped due to Zone -3 Protn Operated in Line Differential Relay (Main) and Backup O/C & E/F Protection (Backup)

Main-1: Fault Current: 0.84kA, Fault Distance- 81.8kM.

Zone-3 Settings: 1.0 Sec and operated time: 1.05 Sec

Backup Protection: Fault Current: 1.06kA, (Setting: 67N- Pickup- 0.2A, TMS- 0.3 Sec)

E/F Calculated Time: 1.02 Sec and Operated Time: 1.08 Sec.

As per DR Observation, Initially the fault current was detected as 2.3kA and after the tripping of 220kV Purnea – New purnea 1 & 2 Line after 0.3 Sec the fault current changed to 0.7KA.

Major Observation and Conclusion

The Actual fault was occurred in 132kV & 33kV Feeder at downstream of 132kV Purnea BSPTCL end and the fault was not cleared.

As the fault current was continuously fed from the sources, 220kV Purnea- New Purnea 1 &2 lines Backup O/C & E/F protection operated as per settings adopted.

The Fault was also detected in 132kV Purnea – Purnea 1,2,3 Lines, Only 2 & 3 Ckts are tripped and Ckt 1 was under picked up condition. Meanwhile 220kV Purnea- Dalkhola also tripped (already one source was tripped and only Dalkhola source was available) by 1.2 Sec the Ckt -1 E/F Protection got Reset.

Once the all sources (New Purnea and Dalkhola) of 220kV Purnea tripped from upstream level led to entire Bus outage at 220kV Purnea Station.

It is proposed that the settings of O/C and E/F Fault Protection in 132kV Purnea- Purnea (BSPTCL) feeders may be advanced and 220kV Purnea – New Purnea Feeders may be increased to provide the downstream level to clear the fault.

Report on Tripping of Multiple Feeders at 220/132kV Purnea SS on 01.08.24 at 15:50 Hrs

Sequence of Tripping

220kV Purnea – Purnea -2 Line	15:50:21:940	Tripped only at New Purnea Due to Backup O/C & E/F Optd
220kV Purnea – Purnea -1 Line	15:50:21:960	Tripped only at New Purnea Due to Backup O/C & E/F Optd
132kV Purnea- Purnea-2 Line-	15:50:22:897	Tripped at Purnea End due to Zone 3 Protn Optd
132kV Purnea- Purnea-3 Line-	15:50:22:898	Tripped at Purnea End due to Zone 3 Protn Optd and Backup O/C & E/F Protn Optd.

Other Events

132kV Purnea- Purnea-1	Backup O/C & E/F Protn Pickup and Zone-3 Picked up and Reset - Not Tripped
220kV Purnea- Dalkhola-1 Line	Not Tripped at Purnea End
220kV Purnea- Dalkhola -2 Line	Not Tripped at Purnea End
220/132kV ICT-1 /2 /3 at Purnea	Not Tripped at Purnea End
220kV Dalkhola- Gazole	Tripped from Gazole End (Purnea- Dalkhola- Gazole)
Since all the sources got tripped, both the 220kV Bus Voltages at Purnea become dead.	

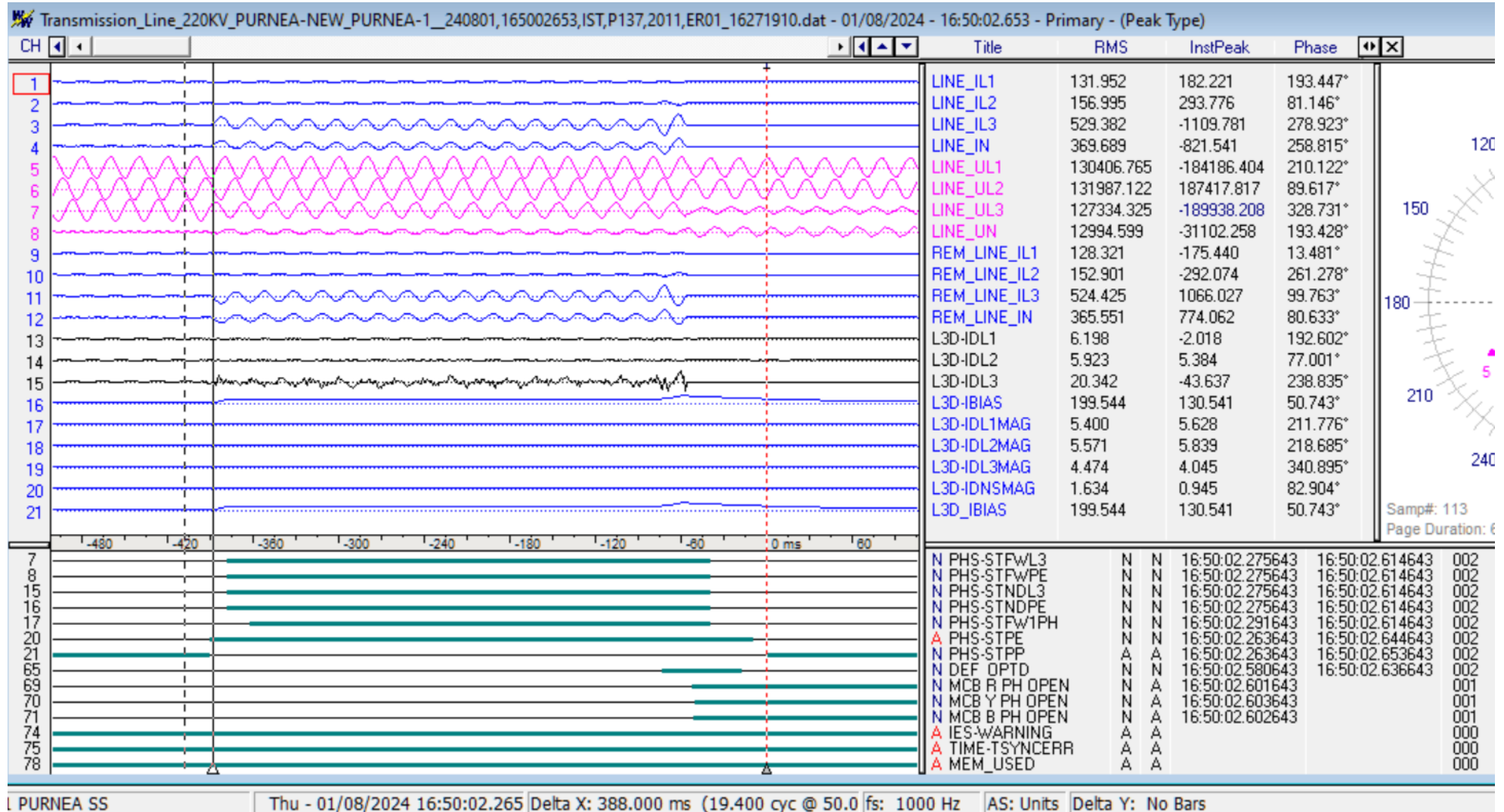
As information received from BSPTCL, actual fault was occurred in 33 kV downstream feeder of 132 kV Purnea (BSPTCL) End due uprooting of Pole and the fault was not cleared from their end.

Due to continues feeding of fault current from Upstream level i.e., 220kV Purnea, 220kV New Purnea and 220kV Gazole (WB) was operated by Backup Protections.

220 kV Bus at Purnea was charged at 16:13 Hrs.

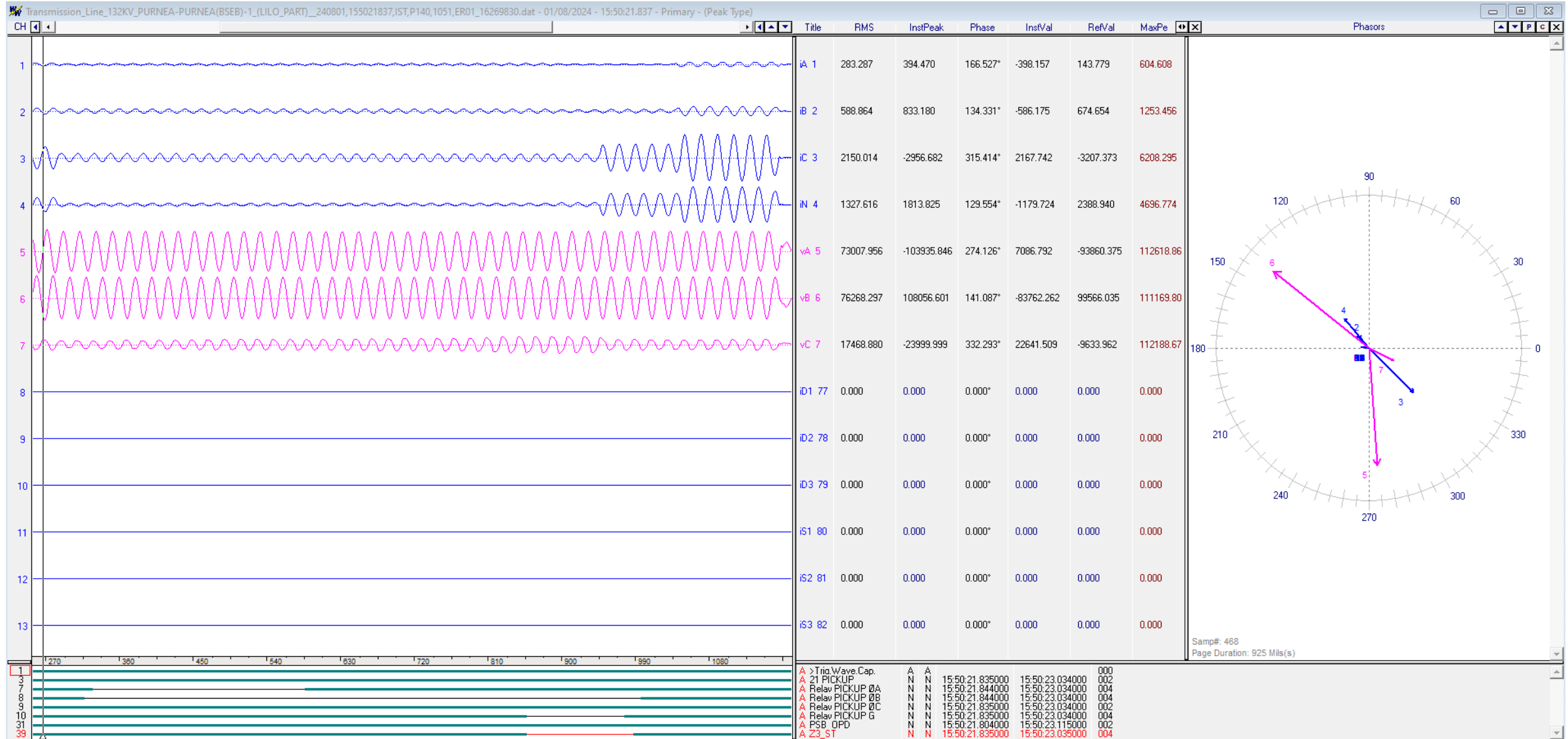
220kV Purnea- New Purnea-1 & 2 Lines at New Purnea End

Both the Lines were tripped due to Backup O/C & E/F Relay operated (Backup) - Time - **0.332 Sec**



132kV Purnea- Purnea-1

Backup O/C & E/F Protn Pickup and Zone-3 Picked up and Reset - Not Tripped



• Major Observation and action plan

The Actual fault was occurred in 33kV Feeder at downstream of 132kV Purnea BSPTCL end and the fault was not cleared.

As the fault current was continuously fed from the sources, 220kV Purnea- New Purnea 1 &2 lines Backup O/C & E/F protection operated as per the settings adopted.

The Fault was also detected in 132kV Purnea – Purnea 1,2,3 Lines,

Only Ckt 2 & 3 Ckts are tripped and Ckt 1 was under picked up condition.

Meanwhile 220kV Purnea- Dalkhola also tripped by 1.2 Sec the Ckt -1 E/F Protection got Reset.

Once the all sources (New Purnea and Dalkhola) of 220kV Purnea tripped from upstream level led to entire Bus outage at 220kV Purnea Station.

Recommendation

Review the settings of O/C and E/F Fault Protection in 132kV Purnea- Purnea (BSPTCL) feeders to operate in advance 220kV Purnea – New Purnea Feeders may be increased to provide the downstream level to clear the fault.

ERPC Observation	Action Plan
<p>Tripping of 220 kV New Purnea-Purnea D/c on back up O/c and E/f was not desirable. Its setting may be reviewed and co-ordinated with Back Up O/c setting of 220/132 kV ICTs. PG may review the settings.</p>	<p>The settings are reviewed and shared to site for implementation</p>
<p>132 kV Purnea-Purnea T/c have differential protection with distance protection as back up then distance protection should not have operated/picked up at Purnea (PG) end if differential protection was in healthy state. PG/BSPTCL may check and confirm.</p>	<p>Even though the differential protection is in healthy state, all the zones (except Zone1) will operate as B/U protection.</p>
<p>Differential protection didn't operate in 132 kV Purnea-Purnea-1. PG/BSPTCL may check and confirm.</p>	<p>Will be tested during next Opp SD</p>
<p>DR of 132 kV Purnea-Purnea-3 is not time synchronized at PG end. PG to take necessary action</p>	<p>Done</p>



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, टॉलिंगंज, कोलकाता - 700033
Office : 14, Golf Club Road, Tollygunge, Kolkata - 700033
CIN : U40105DL2009GOI188682, Website : www.erfdc.in, E-mail : erfdinfo@grid-india.in, Tel.: 033 23890060/0061




पूर्वी क्षेत्र के 220/132 केवी दरभंगा उप-केन्द्र में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event at 220/132 kV Darbhanga 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):16-08-2024

1. Event Summary (घटना का सारांश):

At 17:59 hrs on 01.08.2024, a fault stuck B phase of 220kV Darbhanga (DMTCL) – Darbhanga -1 closer to BSPTCL end. Due to failure of opening of Circuit Breaker at Darbhanga end all other circuit connected to Darbhanga (BSPTCL) opened from remote end in Zone-2 time which led to total power failure at 220kV Darbhanga (BSPTCL) S/s. Total load loss of around 80 MW was reported. Power was extended through 220 kV Darbhanga – Mushari–2.

2. Time and Date of the Event (घटना का समय और दिनांक): 17:59 hrs of 01.08.2024

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

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

5. Report submitted by Utility on: 13-08-2024

6. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
				Bihar	Bihar
Pre-Event (घटना पूर्व)	50.18 Hz	28309 MW	22666 MW	413 MW	4922 MW
Post Event (घटना के बाद)	50.18 Hz	28309 MW	22586 MW	413 MW	4842 MW

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

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

7. Load and Generation loss (लोड और जेनरेशन हानि): Generation loss: NIL; Load loss: 80 MW.

8. Duration of interruption (रूकावट की अवधि): 00:35 Hrs

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

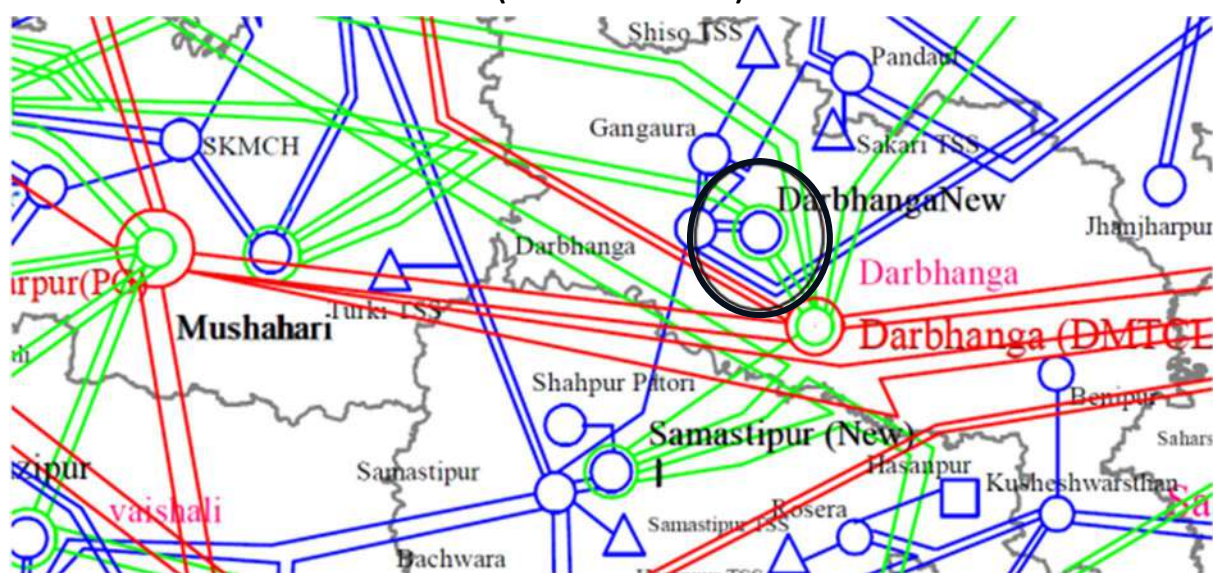


Figure 1: Network across the affected area

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

11. Major Elements Tripped (प्रमुख ट्रिपिंग)

क्र०सं०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220kV Darbhanga-Darbhanga (DMTCL)-1	17:59	Darbhanga: B_N, Zone-1, FC- 8.751 kA; Breaker didn't open	DMTCL – B_N, Z-2, FD-3.26 KM, FC-7.8 KA	20:49
2	220kV Darbhanga-Darbhanga (DMTCL)-2		Darbhanga : B_N, Zone-4, didn't trip	DMTCL – B_N, Z-2, FD-4.42 KM, FC- 6.2 KA	20:40
3	220 kV Darbhanga-Mushari-1		-	Mushari -B_N, Zone-2, 2.51 KA	18:45
4	220 kV Darbhanga-Mushari-2		Darbhanga: B_N, Zone-4, 1.6 kA	Mushari -B_N, Zone-2, FC – 1.2 KA	18:34

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

- At 17:59 Hrs a B_N fault struck 220kV Darbhanga (DMTCL)–Darbhanga -1 which was sensed in Zone 1 at Darbhanga (BSPTCL) end as per Event Recorder, but circuit breaker did not open at Darbhanga (BSPTCL), While at DMTCL end fault was sensed in Zone -2.
- At BSPTCL end, Zone-4 picked up momentarily in 220 kV Darbhanga (DMTCL)-Darbhanga-2 and then DEF Rev picked up. Since bus bar protection is not available at BSPTCL end. Zone-4 time delay was kept at 250 msec. Still breaker didn't open as Zone-4 remained high for less than 50 msec.
- Since the fault wasn't cleared from BSPTCL end, all connected circuits at the 220kV Darbhanga (BSPTCL) tripped from remote end in Zone-2 time delay of around 400 msec to clear the fault, resulting in total power failure of 220 kV Darbhanga (BSPTCL) leading to a Load loss of 80 MW.
- At 18:34 Hrs, Power was extended through 220 kV Darbhanga-Mushari-2.

PMU Snapshot:

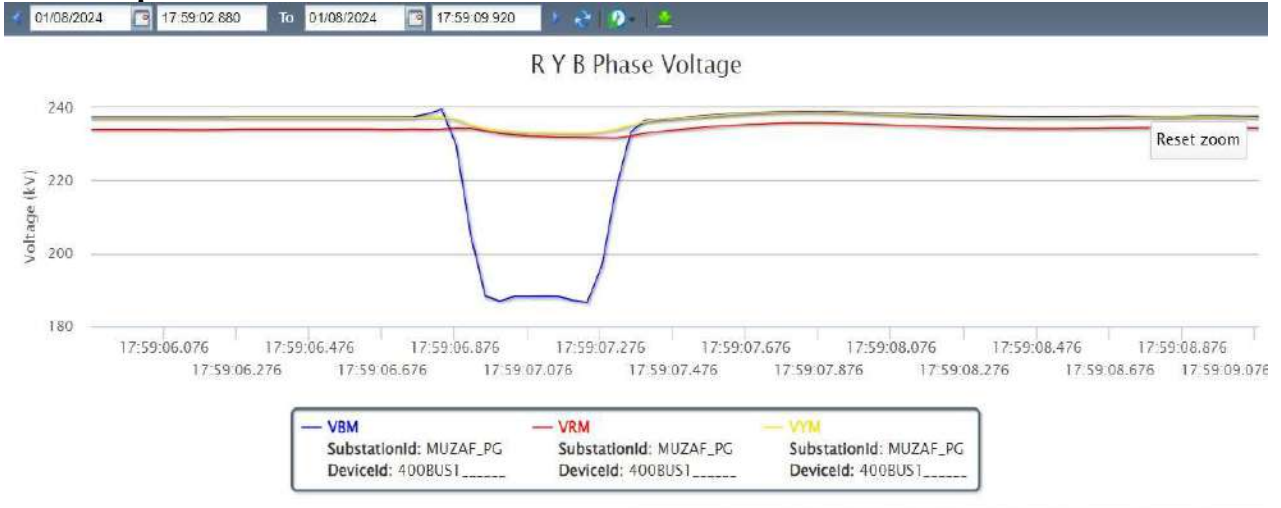


Figure 2: PMU Voltage snapshot of 400/220 kV Muzaffarpur S/S

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

- Even though the fault was detected in Zone 1 at the Darbhanga end, the Circuit Breaker failed to trip (operate) to clear the fault. Carrier signal was also not sent to remote end and line from DMTCL end in Zone-2. Reason for non-opening of breaker and carrier signal not being sent from BSPTCL end may be analyzed.

- In 220 kV Darbhanga (DMTCL)-Darbhanga-2, fault was seen in reverse Zone-4 for around 50 msec only. Later DEF (rev) picked up. The reason for Drop of Zone-4 may be investigated and reverse DEF may be disabled.
- DR channels are not configured properly at BSPTCL end, even when the fault was recorded in Zone 1, the corresponding signal did not trigger (become high).
- DRs at Darbhanga (BH) are not time synchronized.

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

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

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

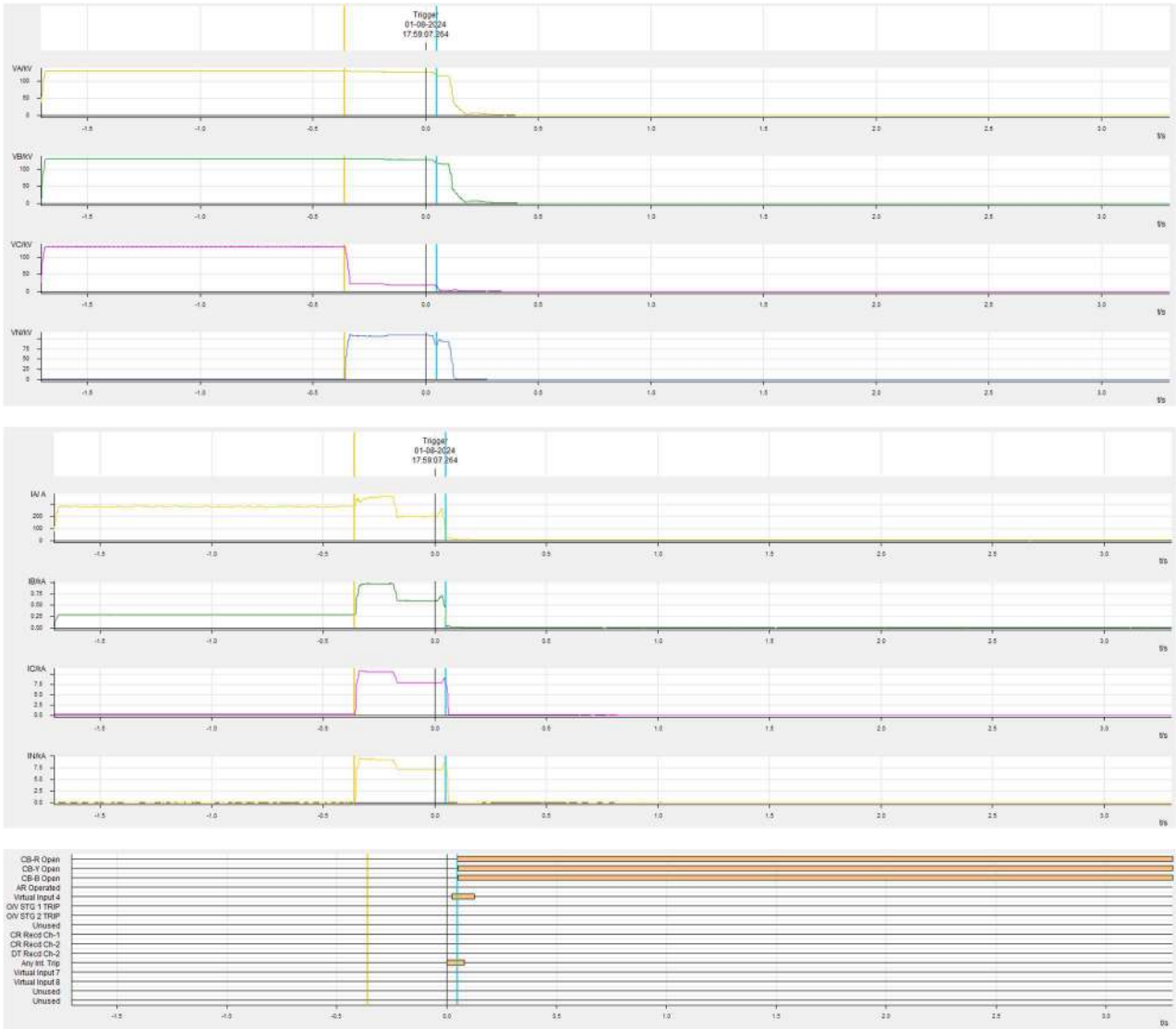
16. Key Lessons Learnt (प्रमुख अधिगम बिंदु): Nil

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

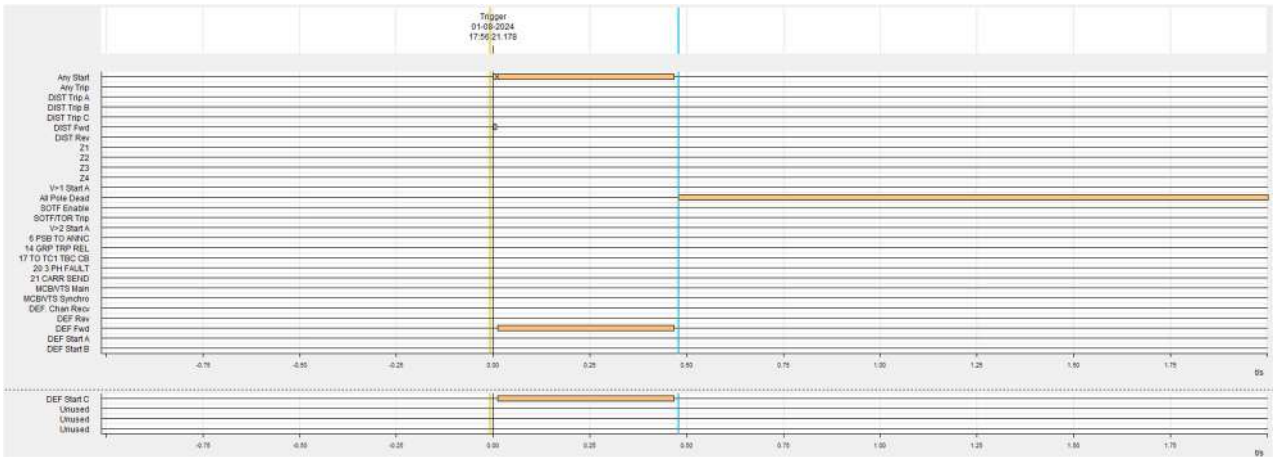
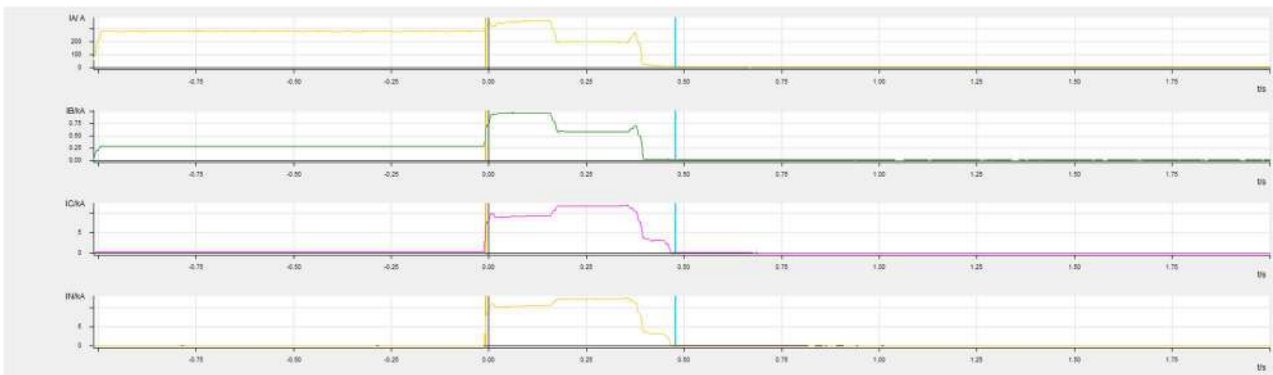
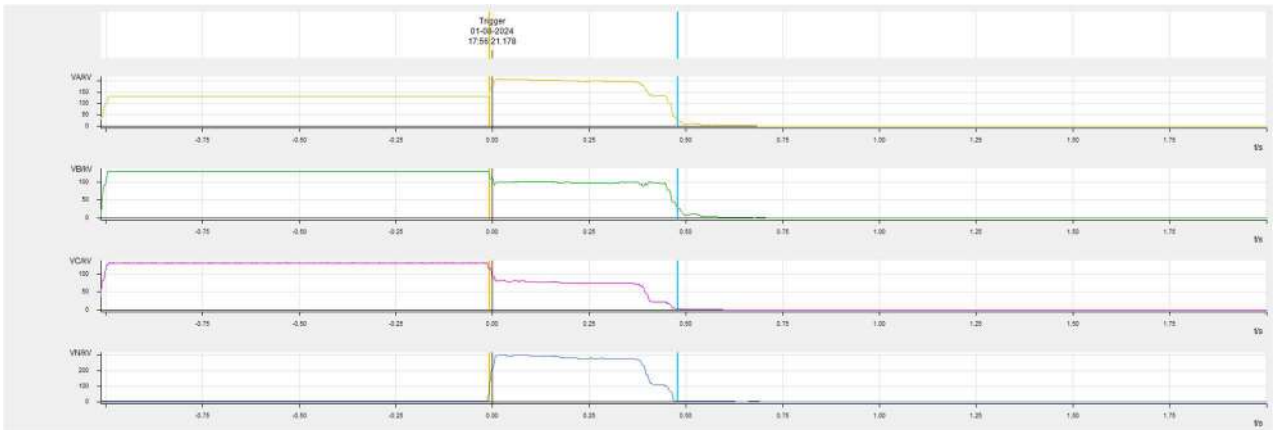
Time	Station	Description	Status
17:59:07.316	DARBH_DMTCL	220_DARB2_BH_2_CB	Open
17:59:07.317	DARBH_DMTCL	220_DARB2_BH_1_CB	Open

Annexure 2:

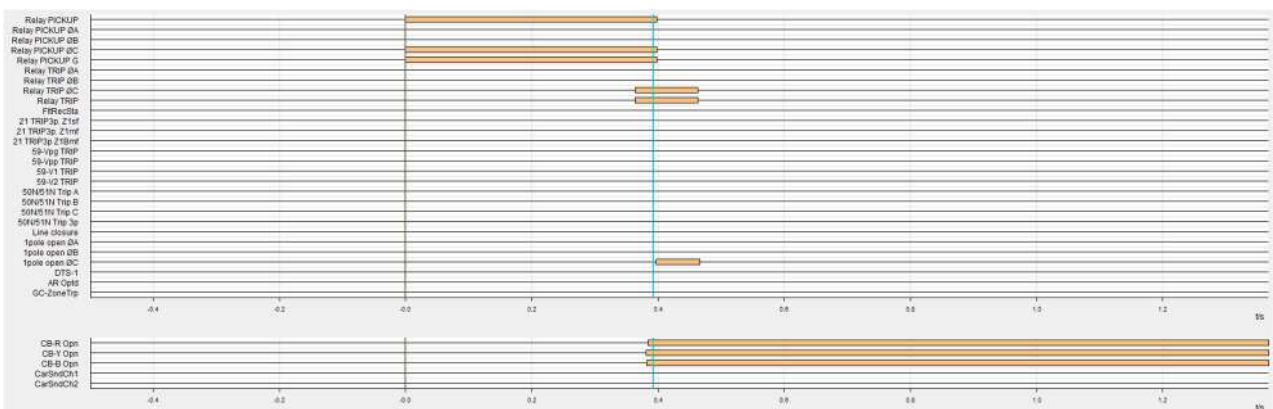
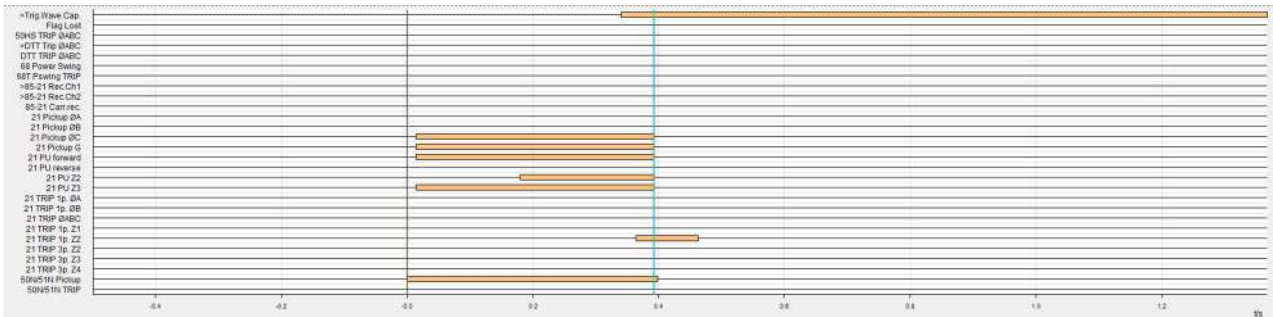
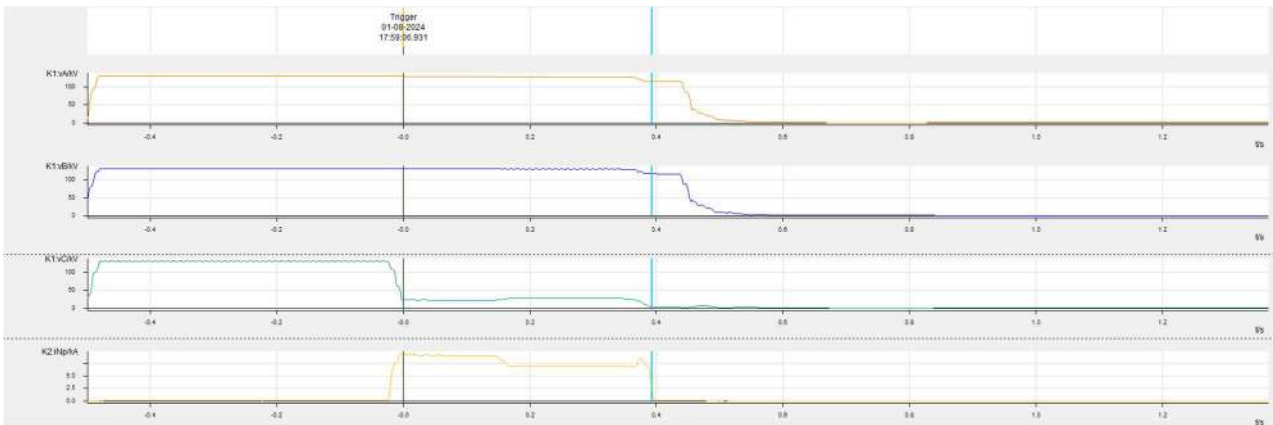
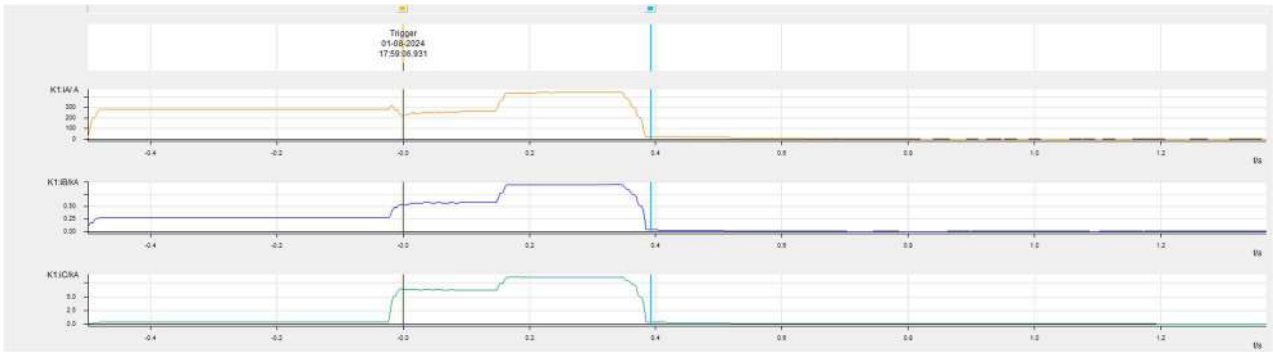
DR of 220 kV Darbhanga – DMTCL -ckt 1 (DMTCL)



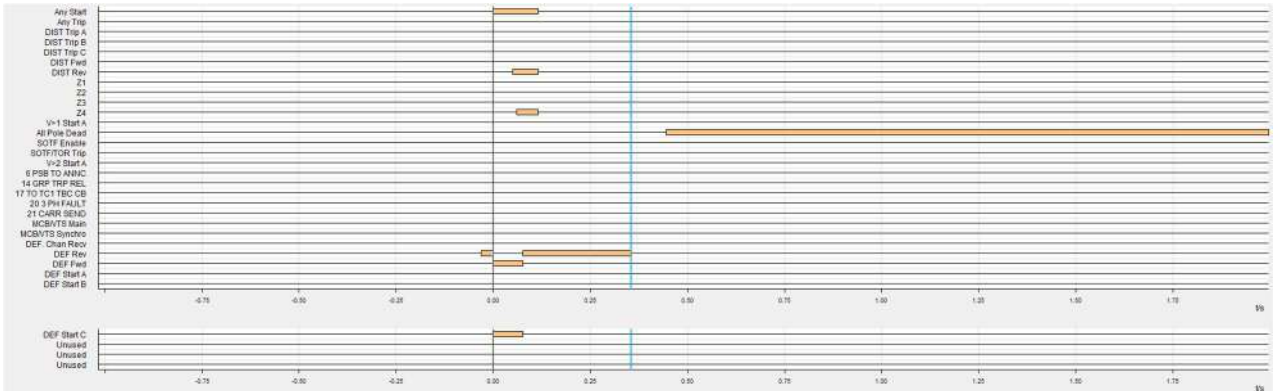
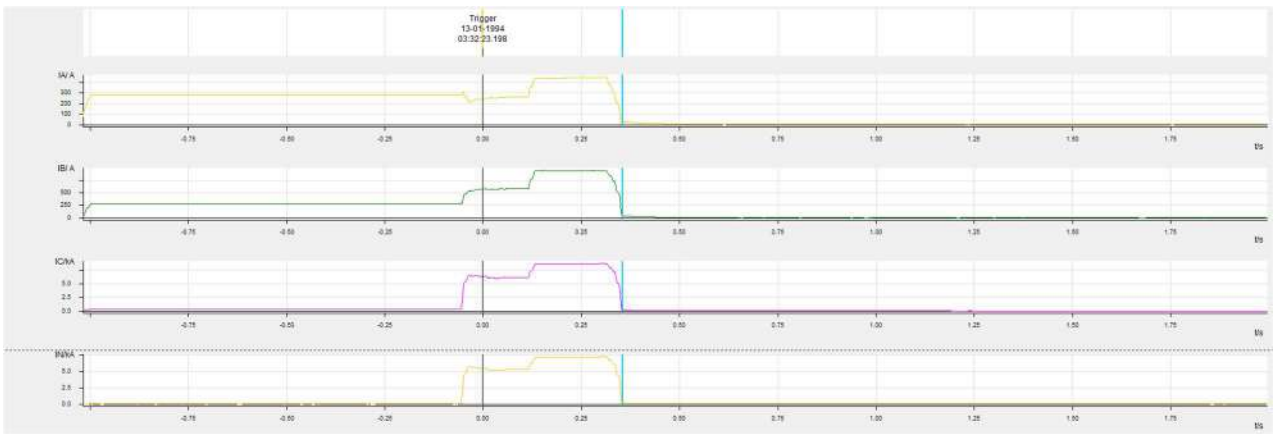
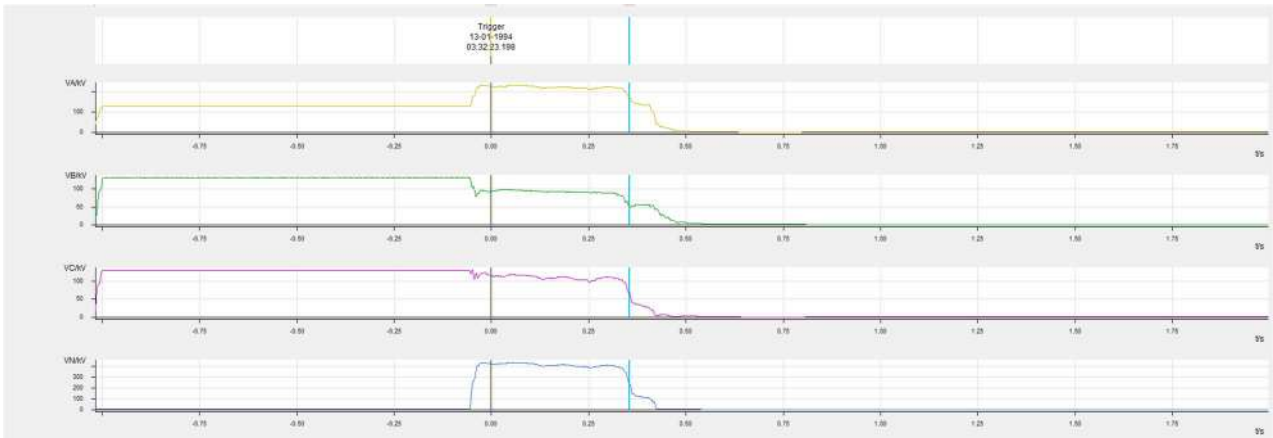
DR of 220 kV Darbhanga – DMTCL -ckt 1 (Darbhanga)



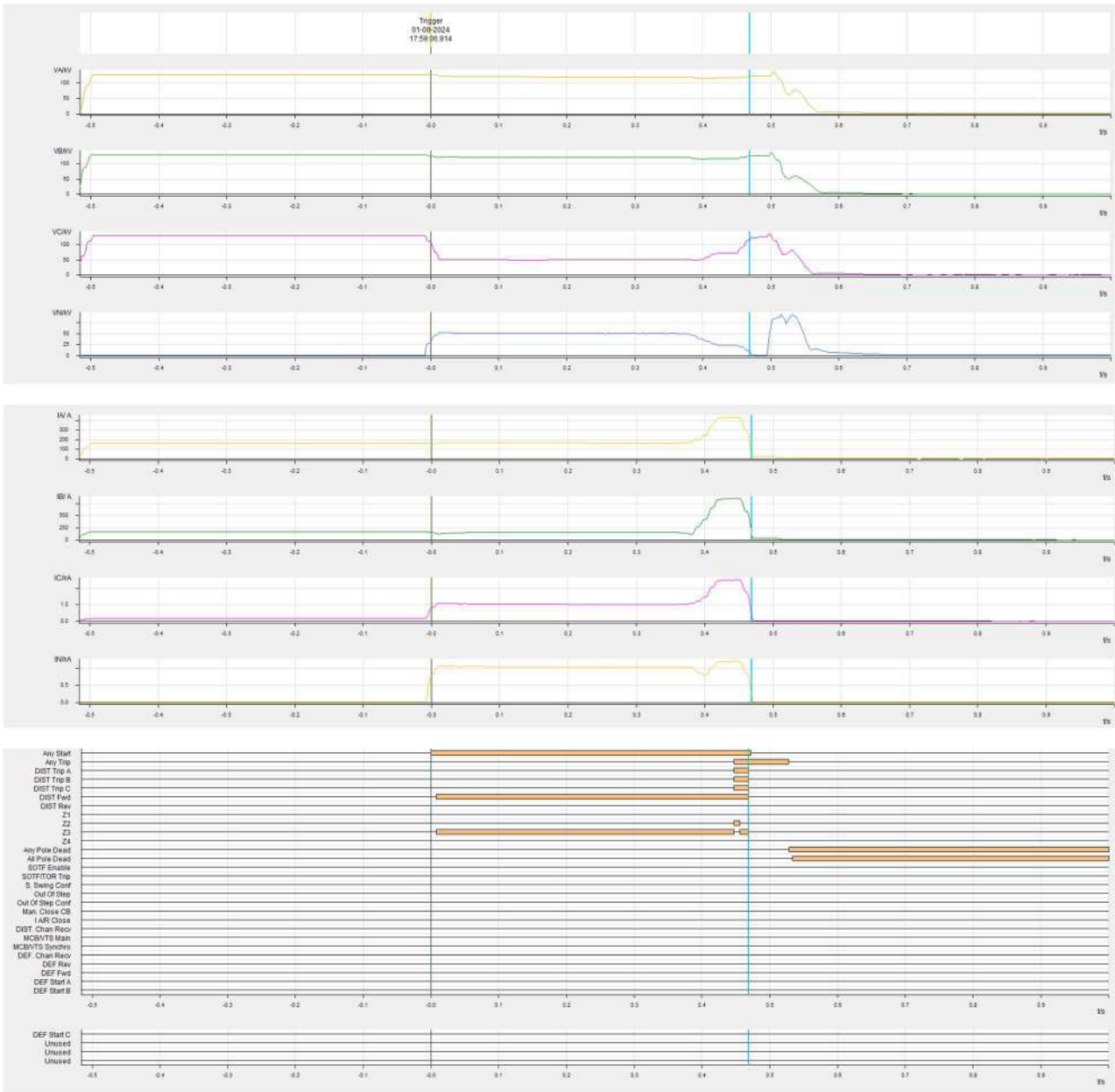
DR of 220 kV Darbhanga – DMTCL -ckt 2 (DMTCL)



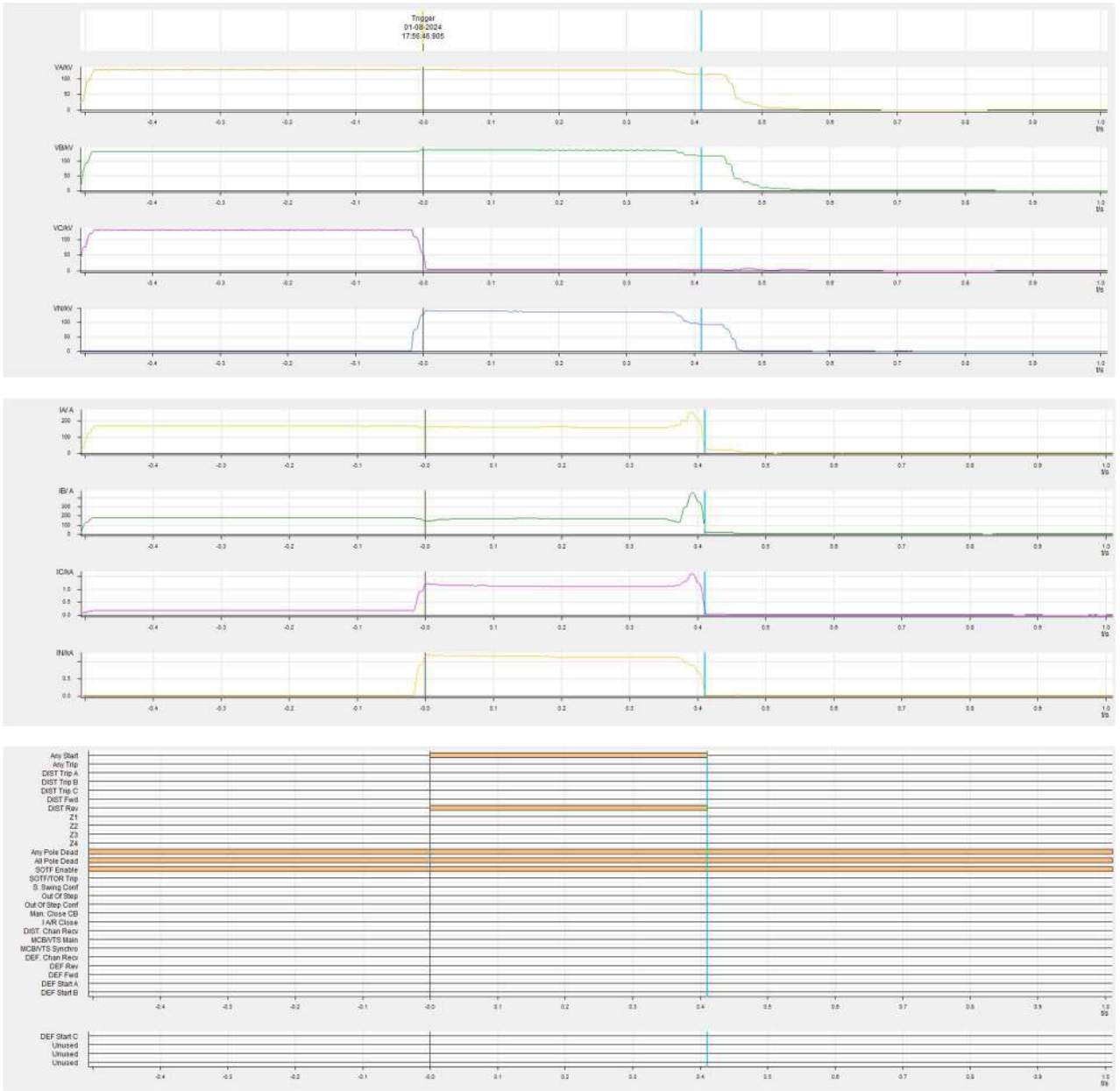
DR of 220 kV Darbhanga – DMTCL -ckt 2 (Darbhanga)



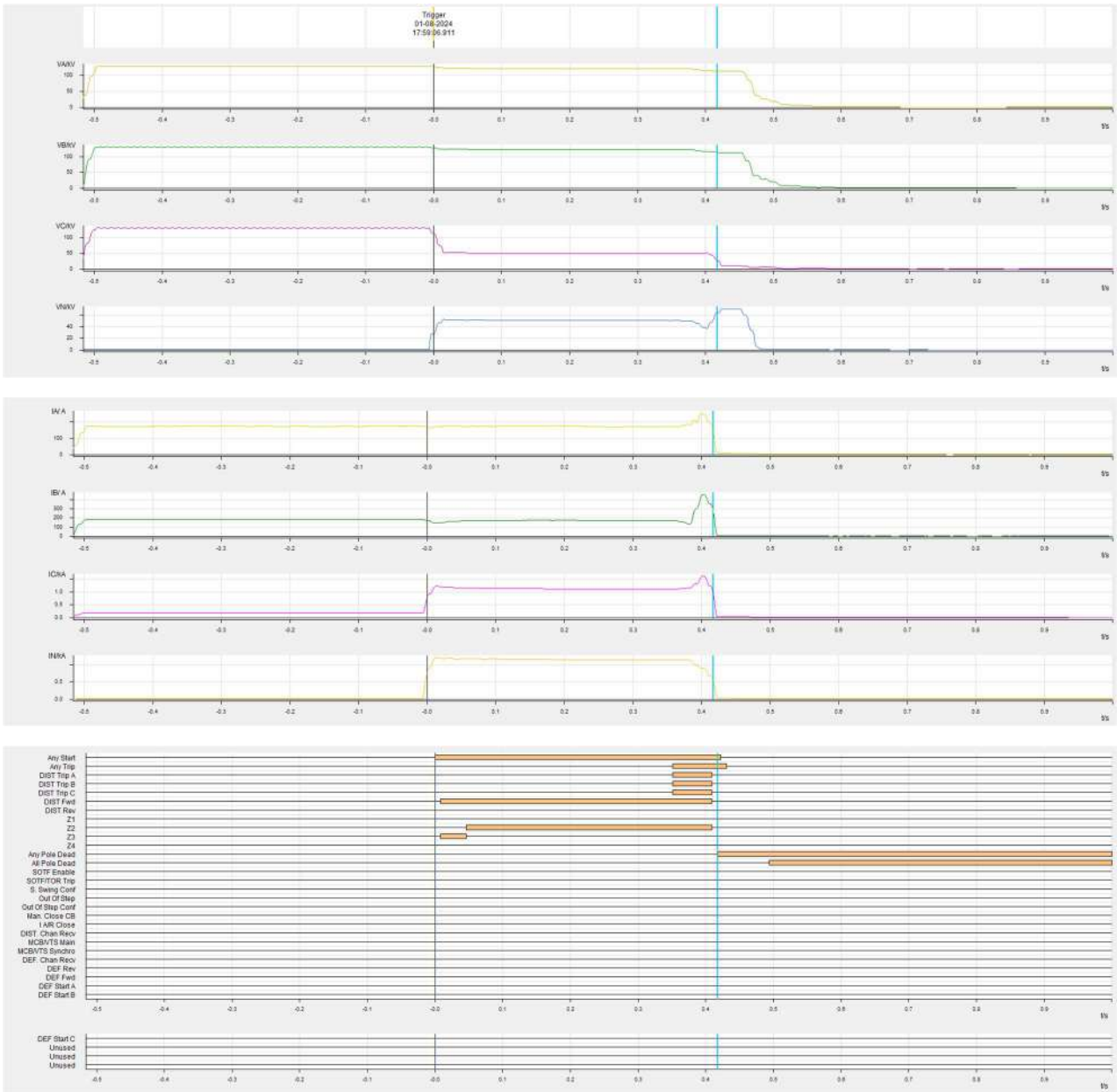
DR of 220 kV Darbhanga-Mushari-1 (Mushari)



DR of 220 kV Darbhanga-Mushari-2 (Darbhanga)



DR of 220 kV Darbhanga-Mushari-2 (Mushari)




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, टॉलिंगंज, कोलकाता - 700033
 Office : 14, Golf Club Road, Tollygunge, Kolkata - 700033
 CIN : U40105DL2009GOI188682, Website : www.erfdc.in, E-mail : erfdinfo@grid-india.in, Tel.: 033 23890060/0061

**पूर्वी क्षेत्र के 220/132 केवी आरा उप-केन्द्र में ग्रिड घटना पर विस्तृत रिपोर्ट / Detailed Report of grid event at
 220/132 kV Arrah 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):23-08-2024

1. Event Summary (घटना का सारांश):

At 19:51 Hrs on 09.08.2024, 220 kV Bus-2 at 220/132 kV Arrah S/s tripped during bus bar stability testing of 220 kV Bus-1. This led to total power failure at Arrah S/s. Load loss of 294 MW reported at Arrah and Dumraon which was radially fed through Arrah S/s. 220 kV Bus-2 at Arrah was charged via Nadokhar lines at 20:11Hrs and power extended to Arrah and Dumraon.

2. Time and Date of the Event (घटना का समय और दिनांक): 19:51 hrs of 09.08.2024

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

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

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation	Regional Demand	State Generation	State Demand
				Bihar	Bihar
Pre-Event (घटना पूर्व)	49.99 Hz	31443 MW	26690 MW	462 MW	6716 MW
Post Event (घटना के बाद)	49.99 Hz	31443 MW	26396 MW	462 MW	6422 MW

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

Important Transmission Line/Unit if under outage (महत्वपूर्ण संचरण लाइने/ विद्युत उत्पादन इकाइयां जो बंद हैं)	1. 220 kV Main Bus-1 at Arrah (under s/d for bus bar stability test) 2. 220 kV Pusauli-Nadokhar-2(Under s/d for reconductoring) 3. 220 kV Nadokhar-Dumraon D/c opened to control loading of 220 kV Pusauli-Nadokhar-1
Weather Condition (मौसम स्थिति)	Normal weather

6. Load and Generation loss (लोड और जेनरेशन हानि): Generation loss: NIL; Load loss: 294 MW

7. Duration of interruption (रूकावट की अवधि): 00:20 Hrs

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

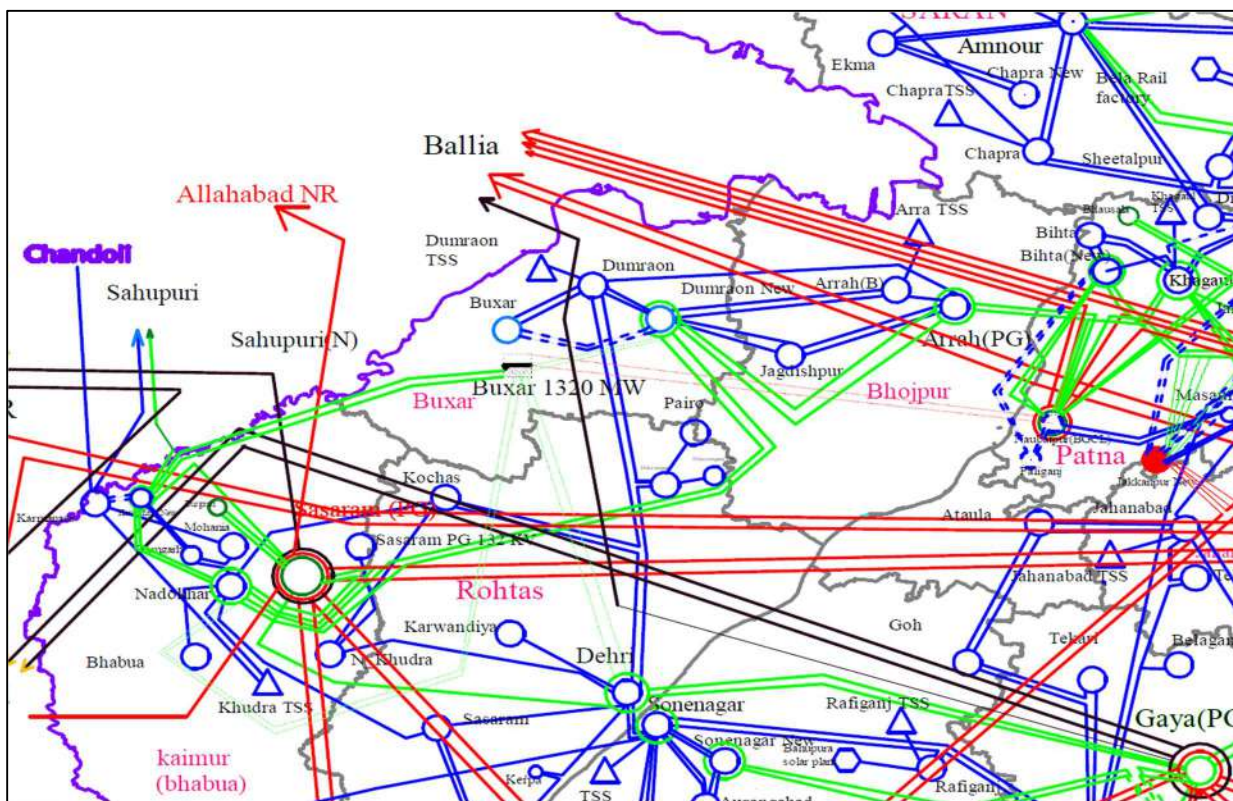


Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग):

क्र०स०	नाम	Trip time (hh:mm:ss)	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	Restoration time
1	220 kV Bus-2 at Arrah		Bus bar protection operated		20:11
2	220 kV Arrah-Naubatpur D/c	19:51:35	Arrah: Bus bar protection operated	-	20:11/20:35
3	220 kV Arrah-Dumraon D/c			-	20:41/20:40

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

- 220 kV Main Bus-1 at Arrah was under shutdown for bus bar stability test. During testing, bus bar protection of 220 kV Bus-2 operated which led to total supply failure at Arrah.
- Dumraon was fed radially through 220 kV Arrah-Dumraon as 220 kV Dumraon-Nadokhar was kept open to reduce loading of 220 kV Pusauli-Nadokhar-1.

PMU Snapshot:



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

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

- There was no physical fault. Reason of operation of bus bar protection of 220 kV Bus-2 at Arrah while performing bus bar stability test of 220 kV Bus-1 may be submitted.

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

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

S.No.	Issues	Regulation Non-Compliance	Utilities
2.	DR/EL provided not within 24 Hours?	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	BSPTCL, PG ER-1, BGCL

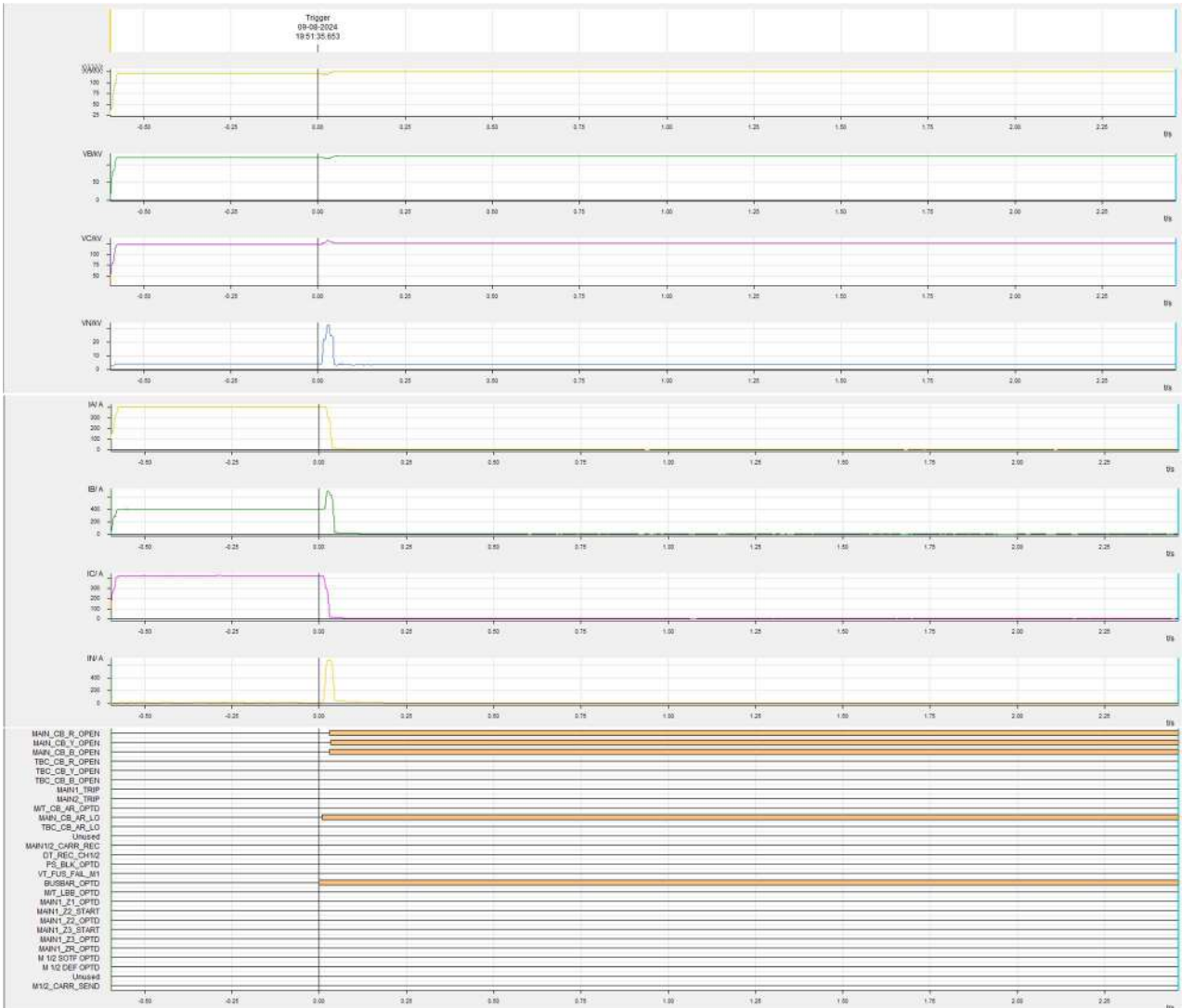
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु): Nil

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

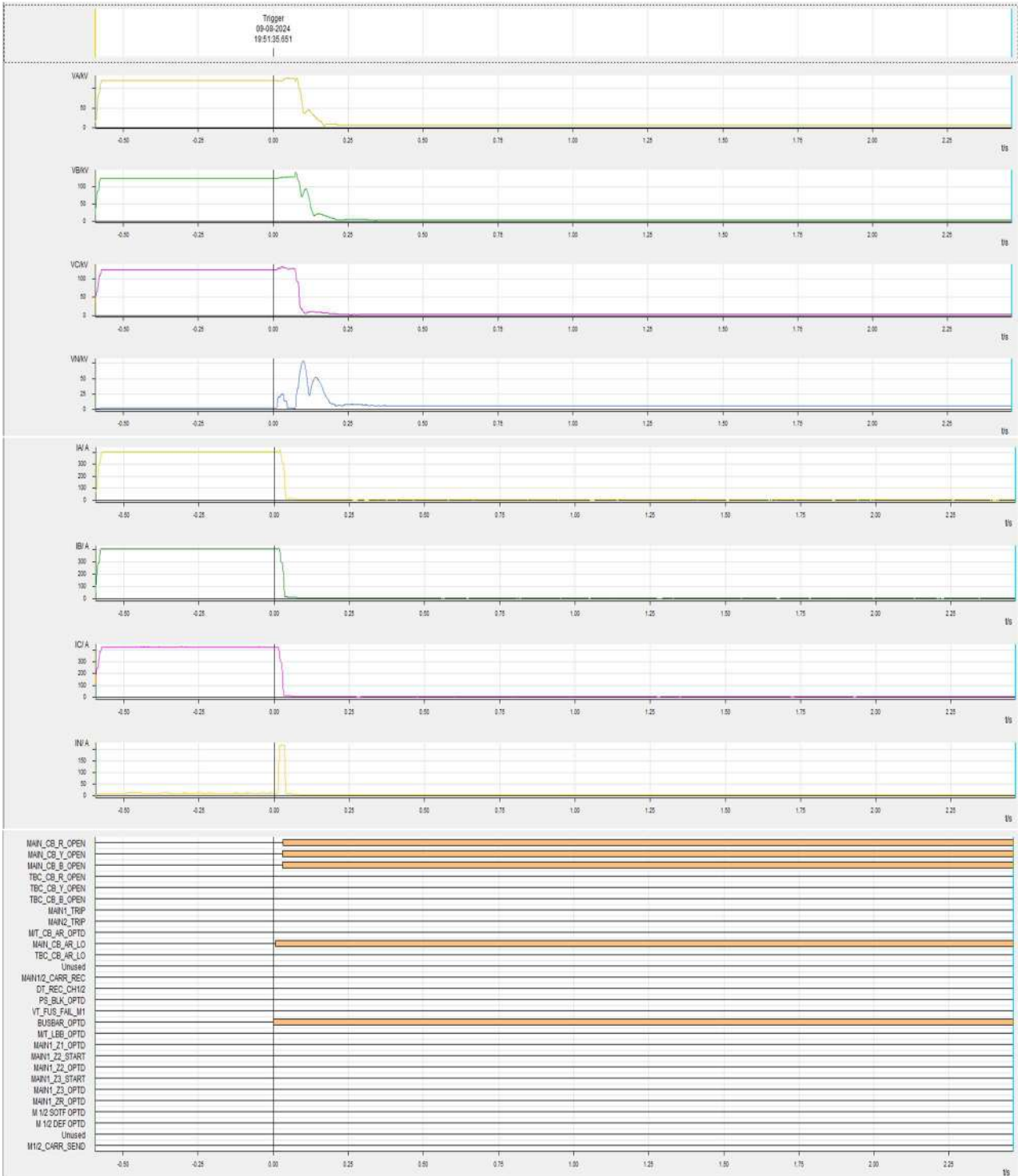
Time	Station	Description	Status
19:51:35.677	ARRAH_PG	220_ICT2_CB	Open
19:51:35.678	ARRAH_PG	220_DUMRA_BG_1_CB	Open
19:51:35.678	ARRAH_PG	220_Transfer_BC_CB	Open
19:51:35.678	ARRAH_PG	220_ICT1_CB	Open
19:51:35.680	ARRAH_PG	220_DUMRA_BG_2_CB	Open
19:51:35.680	ARRAH_PG	220_NAUBA_BH_2_CB	Open
19:51:35.682	ARRAH_PG	220_NAUBA_BH_1_CB	Open
19:51:35.690	ARRAH_PG	132_ICT2_CB	Open
19:51:35.691	ARRAH_PG	132_ICT1_CB	Open
19:51:35.693	ARRAH_PG	220_ICT3_CB	Open
19:51:35.706	ARRAH_PG	132_ICT3_CB	Open

Annexure 2:

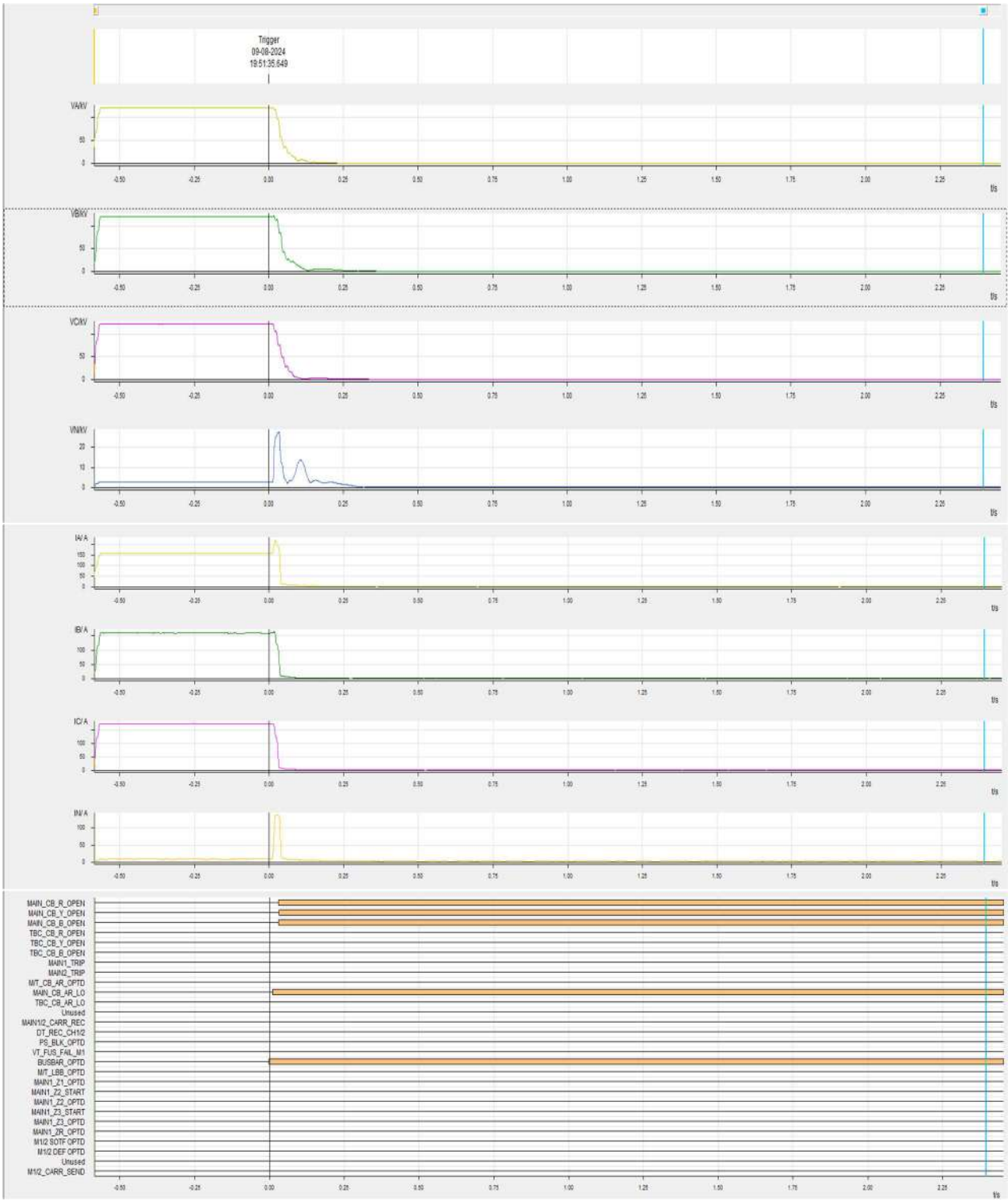
DR of 220 kV Arrah-Naubatpur-1 (Arrah)



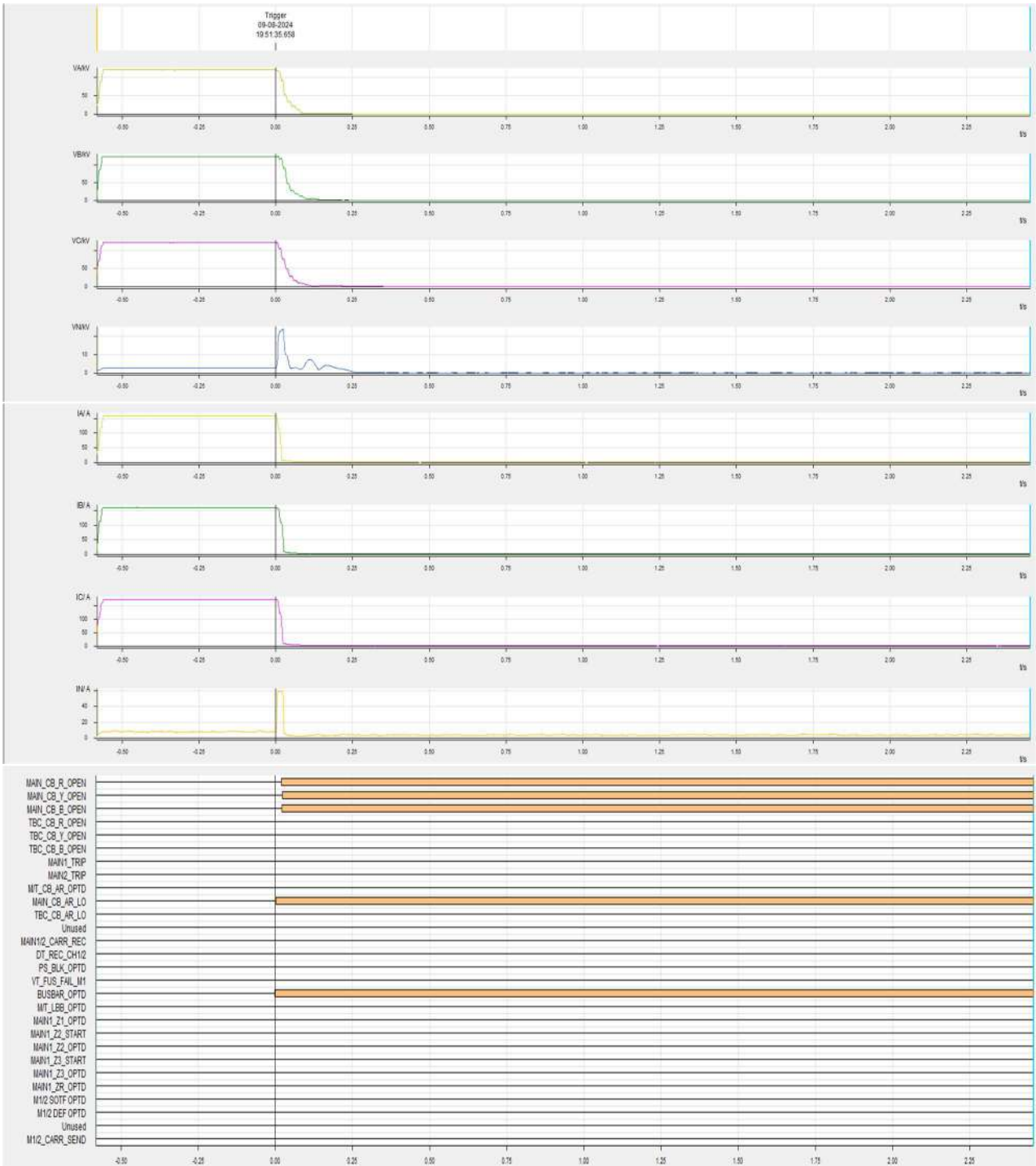
DR of 220 kV Arrah-Naubatpur-2 (Arrah)



DR of 220 kV Arrah-Dumraon-1 (Arrah)



DR of 220 kV Arrah-Dumraon-2 (Arrah)

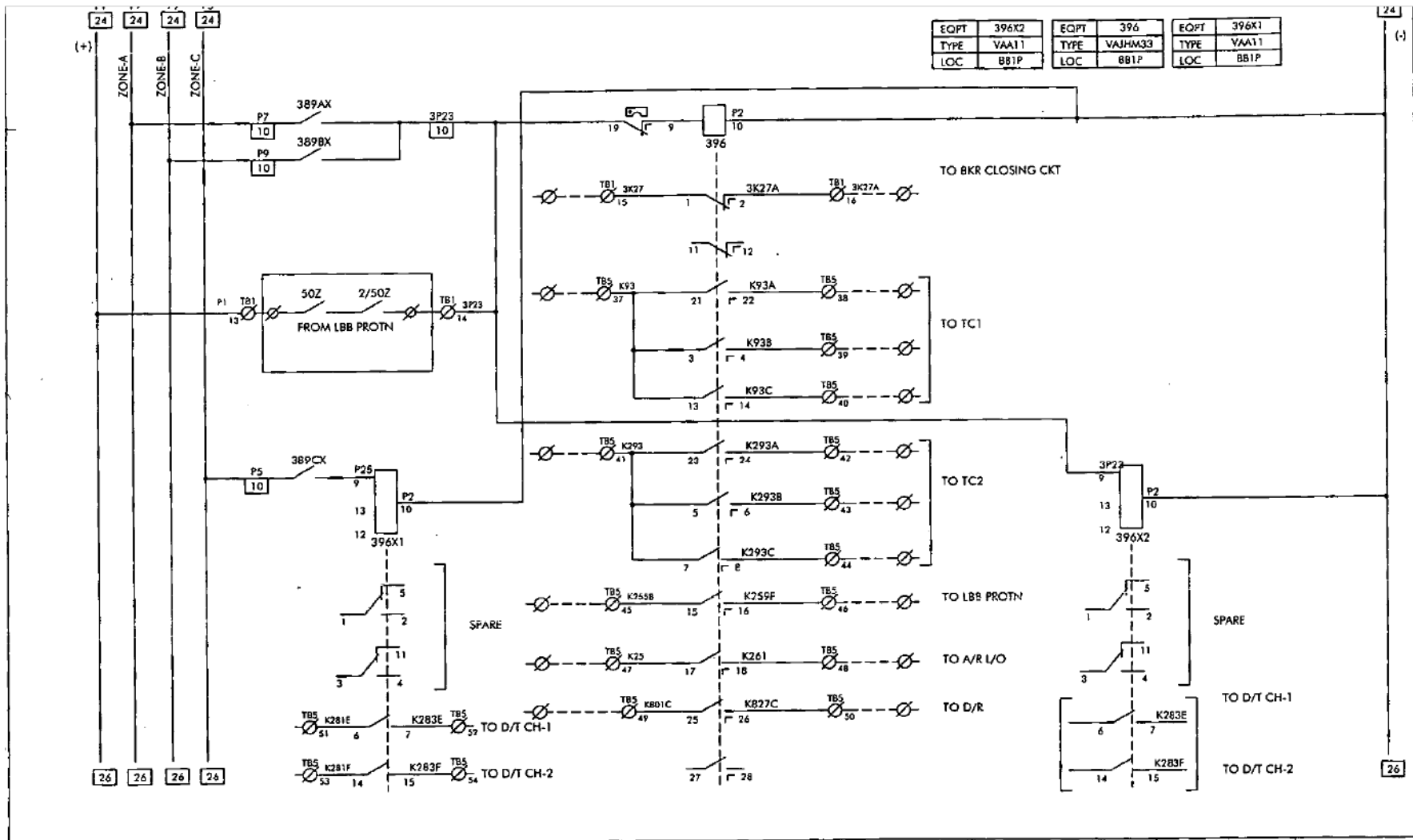


Report on Tripping of 220 kV Bus-2 at Ara SS during testing of Bus-1 on 09.08.2024 at 19:51 Hrs

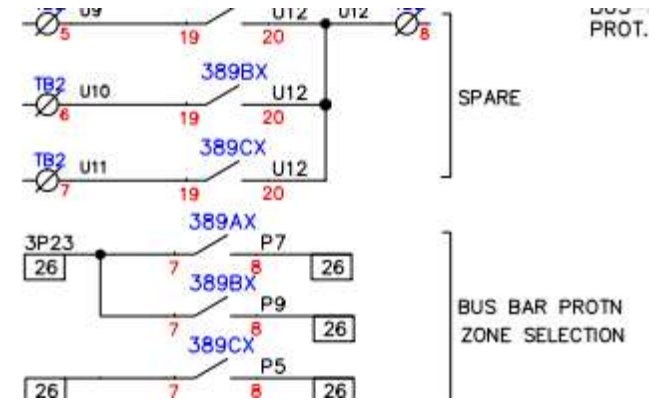
- 220kV Bus 1 was under shutdown from 10:10 hrs on 09.08.2024 for Bus Bar stability works under Bay Extn works.
- All the 220kV elements were connected in 220kV Main Bus 2.
- In order to eliminate any chance of tripping of Bus 2, CT Switching Relay (Alstom Make VAJC11) 389BX(Relay used for Selection of zone-B by 203 ICT4 upcoming bay) and 989BX(Relay used for Selection of zone-B by 209) was racked out.

Tripping Analysis

- As per existing scheme, Back trip from LBB of 203 bay (ICT4) extended the +ve to TB1 14.
- This made the +ve available at relay terminal number 7 of CT switching relay of Bus 1 (389AX) and Bus 2 (389BX) as per existing scheme.
- CT Shorting NO Contact having terminal no 7 and 8 is used for extending the +ve from LBB to tripping Bus.
- On Racking out, the terminal no 7 and 8 shorted and the circuit was through. NO Contact confirmation could not be confirmed as –ve was present on both terminals no 7 and 8.
- This +ve was extended by 389AX and 389BX to both tripping bus of Zone-A and Zone-B.
- This led to tripping of 220kV Bus 2 on checking of back trip.



EQPT	396X2	EQPT	396	EQPT	396X1
TYPE	VAA11	TYPE	VAJHM33	TYPE	VAA11
LOC	BB1P	LOC	BB1P	LOC	BB1P



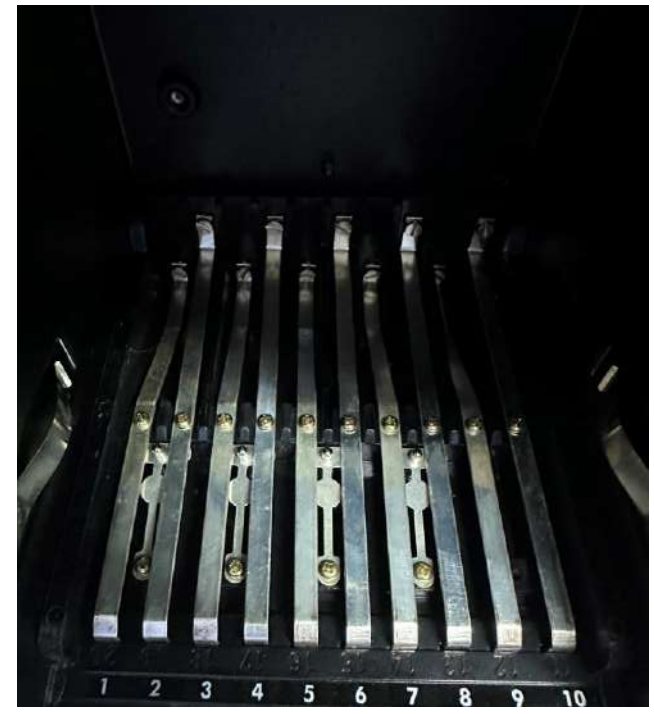
FOR ALSTOM REF: ENGG. REF. NO.: KC95
 SCHEME TYPE: BUSBAR
 CLIENT: POWER GRID CORP. OF INDIA LTD.
 SALES ORDER: 2033300060

CUSTOMER: LARSEN & TOUBRO LIMITED
 PROJECT: ARRAH S/S-PGCIL
 P.O. NO.: C02120/EP/00006
 Dated 27/01/2003

ALSTOM
 ALSTOM LIMITED - T&D - CONTROL PANEL UNIT
 PALLAVARAM, CHENNAI 600043

SCHEMATIC DRAWING
 PANEL TYPES: BB1P BB2P
 TITLE: 220KV BUSBAR PROTECTION
 LINE FUTURE TRIP RELAY CKT. - BAY 03
 FILE: DC952525

PREPARED BY: SPS
 CHECKED BY: AJ
 APPROVED BY: KSV
 DRG. NO.: CPD KC95 SC25 SMT 25 OF 37
 REVISION: ZB
 DATE: 05-05-2005
 SCALE: ..



Report on Tripping of 220 kV Bus-2 at Ara SS on 23.08.2024 at 12:09 Hrs

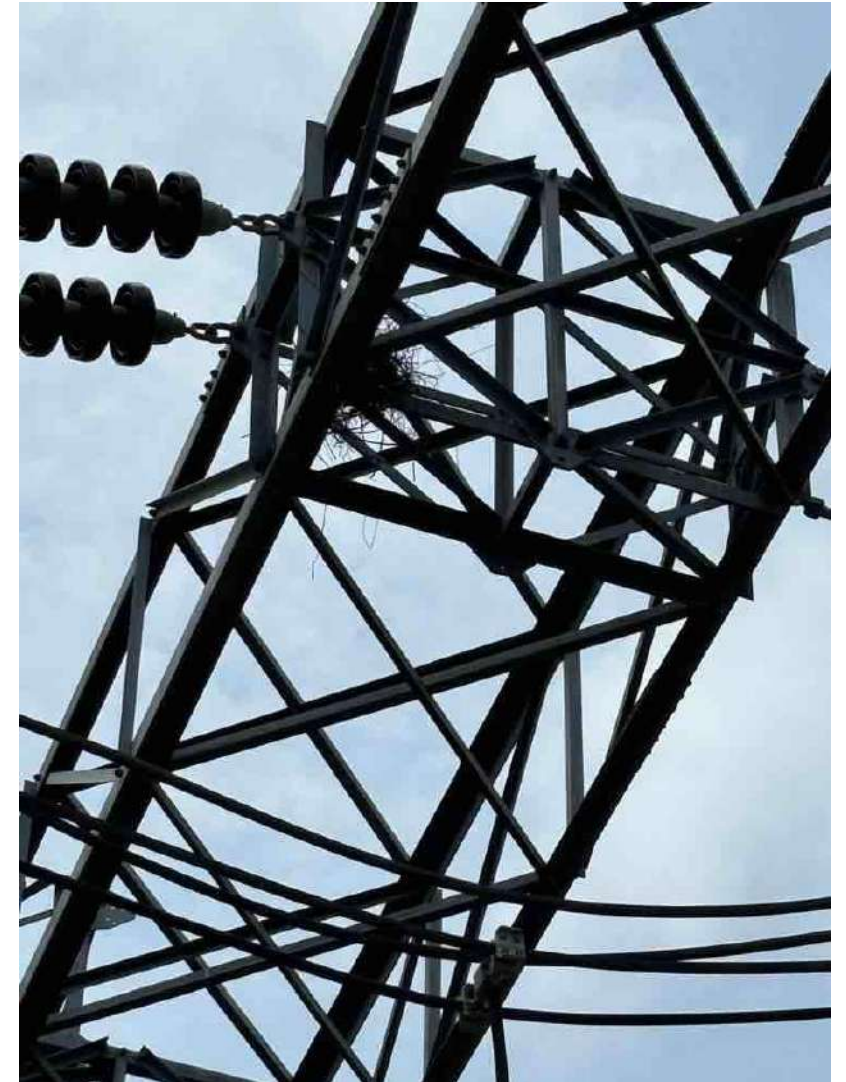
- 200MVA ICT-4,100 MVA ICT-2 ,220kV New Dumraon ckt 2 line and 220 kV Ara Naubatpur ckt 2 line were charged through 220kV Main Bus 2.
- 100MVA ICT-1,160 MVA ICT-3 ,220kV New Dumraon ckt 1 line and 220 kV Ara Naubatpur ckt 1 line were charged through 220kV Bus 1.
- There was load of around 117 MW in 132 kV side

Tripping Analysis

- Primary Fault current was around 13kA as calculated from Relays of individual feeders.
- Visual inspection of Main Bus-II has been carried out .No abnormalities was observed.
- Physical inspection of all Bus elements was done.
- IR measurement of all three phase of Bus-II done and the test results were found within permissible limit.
- Few flashover marks were observed in Y phase jumper.



- In and around the Sub-station lots of birds are habituated. Birds used to make nest regularly on the tower and gantry structure inside the sub-station. These nest are cleared as a regular activity to prevent any disturbance.
- Fault have happened due to short circuit path created by GI wire from the gantry structure to the Y-phase conductor by a bird . Some whitish mark is found on the conductor of Y-phase also which is suggesting the same.
- This incidence led to tripping of 220kV Bus-II which isolated all the elements connected with Bus-II.



Annexure B.7

List of important transmission lines in ER which tripped in August-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 END -1	DR Configuration Discrepancy END -2	DR/EL RECEIVED FROM LOCAL END	DR/EL RECEIVED FROM REMOTE END	UTILITY RESPONSE
1	220KV-RANGPO-NEW MELLI-1	01-08-2024	08:52	03-08-2024	20:25	Rangpo end- Y_N, Z-1, FD-19.9 km, FC-9.86 kA ,	New Melli: Y_N, Z-1, FD-1.69 km, FC-2.19 kA. Conductor snapping reported between Loc 43-44	R_N	100 msec	No A/R attempt taken at Rangpo end while A/R failed at New melli end , Powergrid may explain			DR of New Melli uploaded	YES	AR was successful at Rangpo end. However, AR failed at new Melli end. As observed from DR, AR command was issued by the BCU. However, close pulse goes through hardwired path where interlock is checked in LCC panel of GIS. CMR used for interlock status failed and close command was not executed. Hence, CB did not reclose at New Melli end. Same has been replaced and AR scheme tested successfully.
2	220KV-NEW PURNEA-MADHEPURA-2	01-08-2024	11:34	01-08-2024	13:09	New Purnea: B_N, 5.16 kA, 7.1 Km	Madhepura - B_N	B_N	400 msec	Tripped in Zone -2 at Madehpura end while A/R successful at New Purnea , , BSPTCL may explain		DR is not Time Synchronized & DE length needs to be increased	NO	YES	PLCC issue will be rectified after getting shutdown
3	220KV-RAJARHAT-BARASAT	02-08-2024	13:01	02-08-2024	13:23	Rajarhat: B_N, 8.61 kA, 5.29 Km	Barasat: B_N, 6.33 kA, 16.92 Km	B_N	100 msec	After B_ph tripping from Rajarhat DT was sent to remote end resulting in three phase tripping from both ends. Powergrid may explain			YES	NO	PG ER 2: AR start initiation was not received by BCU due to failure aux relay contact. Hence, AR LO operated. Same has been rectified and tested properly. WBSETCL : Circuit tripped with Zone-1, Blue phase, A/R in progress. But with in 105 ms DT receive from Rajarhat end and 3-phase trip occurs.
4	DARBHANGA(DMTCL)-LAUKAHI	02-08-2024	20:40	04-08-2024	21:04	Darbhanga (DMTCL): Y-B, Iy: 3.26 kA, Ib: 3.24kA, 63.5 Km	Laukahi : Y_B, Iy-4.405, kA, Ib-4.427 kA, 22.02 Km	Y_B	100 msec	Phase to phase fault		DR is not Time Synchronized	YES	YES	PLCC issue at GSS Laukahi
5	220KV-MAITHON-DHANBAD	03-08-2024	18:36	03-08-2024	19:03	Maithon: R_N, 5.3 kA, 26.5 km		R_N	100 msec	A/r successful from Dhanbad only while 3 phase tripped from maithon end. PG ER-2 may explain.	DR is not Time Synchronized		YES	YES	The bay is presently kept in TBC for CB replacement work in main bay. TBC has old static type AR relay. Due to failure of old relay, AR failed at Maithon SS. Same will be replaced as soon as the TBC bay is free after CB replacement work.

6	DARBHANGA (DMTCL)-MO	06-08-2024	03:30	06-08-2024	09:04		Tripped from Motipur End	No fault	NA	No fault observed in line. Line tripped from motipur only. BSPTCL may explain			NO	NO	Cable of SF6 Pressure switch got damaged and it created short circuit which cause tripping of breaker pole. Tripping on low SF6 Gas pressure was in scheme. It has been revised ,now only Alarm and Lockout provision has been made in case of low pressure of SF6 of Breaker pole
7	220KV-SUBHASGRAM(PG)-NEW TOWN-1	10-08-2024	11:25	10-08-2024	11:49	Subhasgram: Y_N, 10.97 kA, 1.26 Km		Y_N	100 msec	3 phase tripping for single phase fault powergrid and wbsctcl may explain			COULD NOT BE DOWNLOADED	NO	Due to carrier fail in PLCC, 3 ph trip happened at Subhasgram end.
8	220KV-KHAGARIA-NEW PURNEA-1	11-08-2024	01:14	11-08-2024	01:38		New Purnea: B-N, IB :2.53 kA, 83.7 km	B_N	400 msec	Tripped in zone 2 from New Purnea end , BSPTCL & powergrid may explain		DR length needs to be increased	NO	YES	PLCC issue will be rectified after getting shutdown
9	220KV-DARBHANGA (DMTCL)-MOTIPUR-1	11-08-2024	09:51	11-08-2024	10:34	Darbhang: B_N, 1.82 kA, 87.8 Km	Motipur : B_N, 0.38 kA	B_N	100 msec	A/R Successful from Motipur end , DMTCL may explain whether A/R was failed from there end or no attempt was taken at Darbhanga end as the same can not be determined due	DR length needs to be increased		YES	YES	As per event data received from substation DMTCL(D) the carrier has been received each time at DMTCL(D) end during single phase fault condition (B-N) on dated 11.08.2024 and 30.08.2024 and the auto recloser was successful at GSS Motipur end.
10	220KV-MAITHON(PG)-DUMKA-2	11-08-2024	23:43	12-08-2024	00:05		Tripped from Dumka end only	No fault	NA	No fault observed in line , tripped from dumka end only , JUSNL may explain		DR is not time synchronized at Dumka end	NO	YES	There was no fault also no relay had operated. Only R- ph & Y-ph tripped and B- ph tripped on pole discrepancy, this might be occurred due to malfunction of trip circuit. No physical fault was found; PG ER-2: No issue at Maithon end.
11	220KV-NEW TOWN(AA-III)-SUBHASGRAM(PG)-1	13-08-2024	11:10	13-08-2024	19:12	New Town: R-N, 8.5 kA, 8.85 km	Subhasgram: R-N, 9.7 km, 12.17 kA	R_N	100 msec	A/R failed after 1 second		DR is not time synchronized at New town end	COULD NOT BE DOWNLOADED	YES	DT received at the instant of AR attempt.

12	400KV-NEW PPSP-NEW RANCHI-1	15-08-2024	15:11	15-08-2024	15:52	New PPSP : B-N, 1.966 kA, 96.82 km	New Ranchi: B_N, 6.15kA, 36.7 Km	B_N	100 msec	A/R failed at PPSP end while A/r was Successful at ranchi end , WBSETCL may explain			NO	YES	Testing team attended the fault on 24/08/24 and rectify the problem. The timer relay of pole discrepancy relay was faulty as it oprates with in 850 to 900 ms though settings are 1.5 sec. Replaced the same on 24/08/24 and now it is ok.
13	220KV-CHAIBASA(PG)-CHAIBASA(JUSNL)-1	15-08-2024	16:51	15-08-2024	19:24	Chaibasa (PG): DT received, Maloperation of SF6 CT at Chaibasa (JUSNL) end		No fault	NA	NO Fault observed in PMU , DT received at Chaibasa (PG) JUSNL may explain	DR is not time synchronized at Biharsariff end		NO	YES	Minor leakage of SF6 gas observed in B phase CT, which has been rectified after the incident.
14	400KV-NEW JEERAT-SUBHASGRAM(PG)-1	17-08-2024	03:51	17-08-2024	17:34	New Jeerat : B-N, 3.6 kA, 6.3 km	Subhasgram : B_N, 12.16 kA, 13km	B_N	100 msec	A/R Failed after 1 sec			YES	YES	Tripped due to persisting fault during AR attempt.
15	220KV-MAITHON(PG)-DUMKA-1	17-08-2024	10:52	17-08-2024	11:30	Maithon : B_N, 4.29 kA ,8.8 Km	Dumka : B_N, 1.16 kA, 58.32 Km	B_N	100 msec	3 phase tripping from Maithon end for single phase fault. A/R Failed after 1 sec at Dumka. JUSNL & powergrid may explain			YES	YES	Due to carrier fail in PLCC, 3 ph trip happened at Maithon end.
16	400KV-ALIPURDUAR (PG)-PUNASANGCHUN-2	17-08-2024	14:58	17-08-2024	15:45	Alipurduar: DT received		B_N	100 msec	Initially on B_N fault B phase tripped from both end subsequent remaning 2 phases also tripped from both end . At Alipurduar end R & Y phase was tripped on DT receipt while at			YES	-	Z2 started & carrier received and single phase opened at Alipurduar end. However, DT received immediately from remote end and 3 phases opened at Alipurduar end.
17	400KV-MAITHON(PG)-DUMKA-1	22-08-2024	20:16	22-08-2024	20:57	Maithon: R_N, 2.3 kA, 56km (A/R Successful)	Dumka: R_N, 3.32 km, Ir= 4.37 kA	R_N	100 msec	3 phase tripping from Dumka end for single phase fault ,A/R successfull at maithon end , JUSNL may explain	DR is not time synchronized at Maithon end end		YES	YES	3 Ph tripping for single phase fault. Carrier is unhealthy.

18	400KV-BAHARAMPUR-BHERAMARA-2	23-08-2024	13:53	23-08-2024	17:52		DT receive (channel-1) from the remote end. Only the Bheramara end circuit breaker tripped.	NO FA UL T	NA	Trip only at Bheramara end on DT Receipt			NO	NO	No fault detected at Berhampore end. Further, PLCC counter for DT was not increased at Berhampore end.
19	220KV-RAJARHAT-BARASAT-2	24-08-2024	23:49	25-08-2024	17:13	Rajarhat : Y-N, 7.70 kA, 11.706 km	Barasat: Y_N, 8.75 kA, 6.2 Km	Y_N	100 msec	A/R Failed after 1 sec at Rajarhat while No A/R attempt taken at Barasat end , WBSETCL may explain			YES	NO	No issue at Rajarhat end as protection operation is as desired. WB: Zone-1, Blue phase fault. A/R in progress and A/R close successfully after 1.0 Sec. As fault again occurs with in Re-claim time, three phase trip occurs.
20	220KV-MAITHON(PG)-DUMKA-2	25-08-2024	00:26	25-08-2024	10:06	MAITHON: B-N, 2.96 kA, 69.2km	DUMKA:-B-N, 1b-5.2 kA, 1.77 Km	B_N	500 msec	Tripped in Zone 2 from Maithon end , JUSNL & powergrid may explain	DR length needs to be increased		YES	YES	Z2 started at maithon SS & carrier was not received at Maithon SS. PLCC belongs to JUSNL.
21	220KV-MAITHON-DHANBAD-1	25-08-2024	11:47	25-08-2024	12:17	Maithon : B_N, 3.12 kA, 46.6 km		B_N	100 msec	3 phase tripping for single phase fault at Maithon end while A/r Successful at Dhanbad end , power grid may explain			YES	NO	The bay is presently kept in TBC for CB replacement work in main bay. TBC has old static type AR relay. Due to failure of old relay, AR failed at Maithon SS. Same will be replaced as soon as the TBC bay is free after CB replacement work.
22	400KV-KHSTPP-LAKHISARAI-1	26-08-2024	12:07	26-08-2024	16:51		Lakhisarai : 50 MVA r kAhalgaon Line Reactor-1 along with Line got tripped on REF.	NO FA UL T	NA	No fault observed as per PMU , powergrid may explain			NO	YES	REF might have operated due to loose wiring. No abnormalities found.
23	220KV-DARBHANGA (DMTCL)-MOTIPUR-1	30-08-2024	13:27	30-08-2024	13:51	Darbhang: B-N, 1.74 kA, 68.3 km	Motipur: B-N, 8.7km (A/R successful)	B_N	100 msec	3 phase tripping for single phase fault , BSPTCL & DMTCL may explain	DR length needs to be increased		YES	NO	As per event data received from substation DMTCL(D) the carrier has been received each time at DMTCL(D) end during single phase fault condition (B-N) on dated 11.08.2024 and 30.08.2024 and the auto recloser was successful at GSS Motipur end.

24	220KV-DARBHANGA(DMTCL)-LAUKAHI-1	02-08-2024	20:40	04-08-2024	21:04	Darbhanga (DMTCL): Y-B, Iy: 3.26 kA, Ib: 3.24kA, 63.5 Km	Laukahi : Y_B, Iy-4.405, kA, Ib-4.427 kA, 22.02 Km	Y_B	100 msec	Phase to phase fault	DR is not Time Synchronized	YES	YES	PLCC issue at GSS Laukahi
25	220KV-SAHARSA(PMTL)-KHAGARIA(NEW)-1	17-08-2024	01:53	18-08-2024	19:23	Saharsa: B-N,4.1km, 12.9kA	Khagaria: B-N, 1.93kA, 66 km	B_N	100 msec	A/R Failed after 1 sec		YES	NO	carrier send from Khagaria new end.
26	220KV-TENUGHAT-BIHARSARIFF-1	15-08-2024	10:39	15-08-2024	11:13	Tenughat: B_N, 119.4 km, 373.3 A	Biharsariff : B_N, 1.766 kA, 58.7 km	B_N	100 msec	3 Phase tripping for single phase fault , BSPTCL & TVNL may explain	DR is not time synchronized at Biharsariff end	NO	YES	PLCC Panel erected at BSF end while PLCC not available at TTPS end Hence Auto reclose doesnot work
27	220KV-TENUGHAT-BIHARSARIFF-1	09-08-2024	21:46	09-08-2024	22:37	TENUGHAT : R_N, 1.103 kA	Biharsariff : R_N, 1.8 kA	R_N	100 msec	3 Phase tripping for single phase fault , BSPTCL & TVNL may explain	DR is not time synchronized at Biharsariff end	NO	YES	PLCC Panel erected at BSF end while PLCC not available at TTPS end Hence Auto reclose doesnot work
28	220KV-KHAGARIA-NEW PURNEA-1	15-08-2024	12:56	15-08-2024	13:21	New Purnea: B-N, 2.31 kA, 85.9 Km	Khagaria: A/R SUCCESSFUL	B_N	100 msec	Tripped in zone 2 from New Purnea end , BSPTCL & powergrid may explain	The Time need to increase to 3 sec in DR	NO	YES	PLCC issue will be rectified after getting shutdown
29	400KV-JEERAT-BAKRESWAR-1	30-08-2024	10:19	30-08-2024	10:45	Jeerat: R-N, 2.67kA, 148 km	Bakreswar: R-N, 5.34 kA, 29.89 km	R_N	500 msec	Tripped in Zone 2 from Jeerat end , WBSPTCL & WBPDCCL may explain		NO	NO	No carrier receive from far end causes Zone-2 time delay tripping.A/R switch made Off due to OPGW laying work .

SI No.	Name of the incidence	PCC Recommendation	Latest status
138th PCC Meeting			
1.	Disturbance at 220 kV Bokaro (DVC) S/s on 20.07.2024 at 19:38 Hrs	<p>DVC representative replied that old MOCB breaker is present at BTPS B which failed to open during the disturbance therefore it is planned to replace all old MOCB breaker by Sep 2024.</p> <p>DVC representative informed that at present there is no independent set of batteries however during renovation work at CTPS & BTPS-B, two independent set of batteries will be installed.</p> <p>PCC opined that for DR recording, there should be independent supply system so that in case of total power failure at substation DR should be captured for which DVC was advised to comply same.</p> <p>PCC advised all utilities to submit their observation regarding DR retrieving feature for relays of different make being used by them in case of DC supply failure to ERPC/ERLDC.</p> <p>PCC advised DVC representative to replace the Old High Impedance Bus bar scheme with low impedance Bus Bar Scheme for enhancing the stability of the protection as per IEGC guideline.</p> <p>PCC advised DVC representative to share status of renovation/upgradation work to ERPC/ERLDC on periodic basis.</p>	<p><i>Regarding old MOCB breaker, DVC representtaive replied that procurement process had been started and it will be implemeneted by Dec 2024.</i></p> <p><i>Regarding two set of batteries, DVC representative informed that two DC sources are kept at S/s however DCCB is fed from only one source at present. He further added that complete switchyard at Bokaro S/s will be renovated by one and half year during which numerical relay, two independent sources etc issue will be reolved.</i></p> <p><i>On enquiry from ERLDC, DVC representative submitted that since additional independent source is available so in case of failure of connected DC source , it can be replaced manually by additional source hence similar issue of DC power failure will not be observed.</i></p> <p><i>PCC advised all utilities to submit their observation regarding DR retrieving feature for relays of different make being used by them in case of DC supply failure to ERPC/ERLDC.</i></p> <p><i>PCC advised DVC representative to replace the Old High Impedance Bus bar scheme with low impedance Bus Bar Scheme for</i></p>

		<p>DVC representative replied that DC system will be rectified along with enabling of bus bar protection by 10th Sep 2024.</p>	<p><i>enhancing the stability of the protection as per IEGC guideline.</i></p> <p><i>PCC advised DVC representative to share status of renovation/upgradation work to ERPC/ERLDC on periodic basis.</i></p> <p><i>On enquiry from ERPC representative regarding rectification of DC system along with enabling of bus bar protection, DVC representative replied that DC system had been rectified along with enabling of bus bar protection,</i></p>
<p>2.</p>	<p>Total Power Failure at 220 kV Chatra (JUSNL) S/s on 08.07.2024 at 13:10 Hrs.</p>	<p>On enquiry from PCC regarding non operation of relays at Chatra end, JUSNL representative replied that fault had not been captured in DR. He further added that testing of relay is planned in first week of Sep 2024. He also informed that at present, only single relay is present and procurement of main 2 relay is already done and it is expected that it will be installed by 30th Aug 2024.</p> <p>PCC advised JUSNL representative to test distance protection & DEF protection relays at Chatra end along with review of DEF settings & distance protection settings and submit report to ERPC/ERLDC. It further advised JUSNL representative to check DR triggering criteria for relays and revise it as per ERPC guidelines.</p>	<p><i>JUSNL representative informed that testing of relay had been done and relay was found healthy. He further informed that main 2 relay had been implemented at Chatra.</i></p> <p><i>On enquiry from ERLDC representative regarding DR, JUSNL representative replied that DR triggering is checked for relays and found ok.</i></p>

3.	Repeated tripping of 220KV RANCHI-MEJIA (MTPS)-1	PCC advised ERLDC representative to share scheme details along with case description where such scheme had been implemented to DVC and Powergrid so that this can be internally discussed with higher authorities of DVC as well Powergrid jointly and scheme can be implemented after receiving due approval.	<p><i>DVC representative informed that since 3 phase PT is not present at S/s for said line hence this scheme can not be implemented. Further, here are only 4 channels for carrier for main 1 and main 2 relay (2 for both) with single PLCC panel with so one channel/pole needs to be kept disabled/sacrificed for implementing this scheme.</i></p> <p><i>PCC opined that since implementation of scheme is difficult hence it advised DVC to do preventive maintenance activities in line on periodic basis to avoid such tripping incidents.</i></p>
4.	Repeated tripping of 400KV LAPANGA-STERLITE-2	On enquiry from PCC regarding reason behind non operation of auto-recloser, Sterlite representative submitted that issue will be checked and report for A/r will be shared to ERPC/ERLDC along with insulator replacement report by 2 days.	<i>Sterlite representative informed that shutdown of line is planned as weather condition improves in order to test A/r however no tripping had been observed recently.</i>
5.	Tripping of ICTs during the month of July'24	PCC advised all utilities to share preventive practices that are followed by them to avoid maloperation of mechanical relays associated with ICTs to ERPC/ERLDC so that these practices can be compiled and guidelines can be prepared.	<i>PCC advised all utilities to share preventive practices that are followed by them to avoid maloperation of mechanical relays associated with ICTs to ERPC/ERLDC so that these practices can be compiled and guidelines can be prepared.</i>

6.	Mock Testing of SPS	<p>ERLDC representative further added that SPS mock test for JITPL is planned on 30th Aug 2024.</p> <p>Regarding SPS testing for 220 kV EMSS-Shubhasgram D/C, ERLDC representative informed that as per CESC, loading had not been decreased till date to carry out testing however as soon as loading of lines will be reduced, Mock test of SPS will be carried out.</p> <p>PCC advised Powergrid representative to submit report for testing of SPS at Rajarhat to ERPC/ERLDC</p>	<p><i>ERLDC representative informed that SPS of JITPL had operated on 5th Sep 2024 which shows that it is healthy.</i></p> <p><i>He further added that report from CESC has been received regarding SPS testing for 220 kV EMSS-Shubhasgram D/C done on 31st Aug 2024.</i></p> <p><i>PCC advised Powergrid representative to submit report for testing of SPS at Rajarhat to ERPC/ERLDC</i></p>
137th PCC Meeting			
7.	Disturbance at 220 kV Budhipadar(OPTCL) S/s and 220 kV Ib-TPS (OPGC) S/s on 05.06.2024 at 04:11 Hrs	<p>PCC advised SLDC Odisha to coordinate with CPPs and share islanding scheme details to ERPC/ERLDC.</p> <p>OPTCL representative replied that due to non availability of shutdown & testing kit, testing of auto-recloser was not done however it is expected to be completed within 10 days and report will be shared to ERPC/ERLDC.</p> <p>PCC advised OPTCL to test relays at earliest and submit observation to ERPC/ERLDC.</p> <p>PCC advised OPTCL to conduct testing of breaker also and submit observation to ERPC/ERLDC.</p> <p>PCC advised OPTCL representative to review zone 3</p>	<p><i>OPTCL representative informed that testing of relay of Korba- 1 is done and testing of relay of raigarh will be done by Sep 2024.</i></p> <p><i>Regarding DR length, OPTCL representative replied that it had been increased to 3 seconds for ALSTOM make relays however for Siemens relays they are facing difficulty.</i></p> <p><i>PCC advised OPTCL representative to share further plan of testing with ERPC/ERLDC.</i></p>

		<p>time & reach settings of relay at Budhipadar end for 132 k V Budhipadar- Lapanga.</p> <p>PCC advised OPTCL representative to increase in DR length to 3 seconds.</p> <p>It further advised OPTCL representative to prepare annual maintenance plan and outage plan of each S/s and share to ERPC/ERLDC.</p>	
8.	Disturbance at 400 kV Meeramundali B (OPTCL) S/ s and 400 kV GMR S/s on 20.06.2024 at 19:18 Hrs	PCC advised OPTCL & GMR to carry out testing of the carrier communication jointly and submit observation to ERPC/ERLDC.	<i>OPTCL representative informed that testing of carrier communication had not been done due to non availability of shutdown of GMR unit.</i>
9.	Repeated tripping of 400kV-KHSTPP-BARH-1	<p>She further informed that shutdown of bus 2 is also planned on 31st July 2024 to revive tie bay for Banka -1 as Barh and Banka are in same tie subsequently no issue will occur further.</p> <p>ERLDC representative further enquired that auto-reclose is not getting successful from their end for barh circuit -2 for which she replied that issue will be checked in planned shutdown of line.</p> <p>NTPC representative replied that they are planning to replace faulty relays by Oct 2024 subsequently these issues will be resolved.</p> <p>PCC advised NTPC representative to resolve auto-recloser & DR issue at earliest</p>	<p><i>NTPC KhSTPP representative was not available in the meeting.</i></p> <p><i>ERPC representative requested NTPC Barh representative to take update from site and share to ERPC/ERLDC.</i></p>

10.	SPS Scheme for 220 k V Maithon Dumka D/C	PCC advised JUSNL representative to share details of feeder identified for providing load relief of 160 MW to ERPC/ERLDC within a week.	<i>PCC advised Powergrid representative to help JUSNL in technical issues in implementing SPS. It further advised JUSNL to implement SPS at earliest.</i>
136th PCC Meeting			
11.	Disturbance at 765/400 kV Jharsuguda (Powergrid) S/s and tripping of units at Darlipalli STPP (NTPC) and OPGC on 21.05.2024 at 17:02 Hrs	<p>NTPC representative replied that already team is deployed for reviewing settings and OEM support is also required for review of these settings for which communication is already made with OEM and updates will be shared with ERPC/ERLDC.</p> <p>PCC advised OPGC representative to coordinate with OEM (M/s BHEL and M/s Siemens) to review LSR settings (slope, time delay etc) and update status to ERPC/ERLDC.</p> <p>PCC further advised to share slope of LSR ramp settings and protection scheme to ERPC/ERLDC.</p>	<p><i>No representative was present from NTPC Darlipalli.</i></p> <p><i>No representative was present from OPGC.</i></p> <p><i>ERPC representative requested NTPC Barh representative to coordinate with NTPC Darlipalli to share update with ERPC/ERLDC.</i></p>
12.	Disturbance at 400 kV Haldia (HEL) S/s on 29.05.2024 at 12:38 Hrs	<p>PCC advised Powergrid representative to coordinate with OEM in order to find root cause behind tripping of zone 2 fault in zone 1 and share the analysis received from OEM to ERPC/ERLDC. PCC further advised PG representative to share DR of the event to ERPC/ERLDC.</p> <p>PCC advised HEL representative to coordinate with OEM in order to find reason behind operation of DEF protection.</p>	<i>HEL representative informed that protection settings, DR, EL etc had been shared to OEM and report will be submitted to ERPC/ERLDC after receiving from OEM.</i>

13.	Disturbance at 220 kV Tenughat (TVNL) S/s on 29.05.2024 at 12:57 Hrs	<p>PCC advised JUSNL representative to rectify auto-reclose issue at Govindpur end by next week and intimate to ERPC/ERLDC.</p> <p>TVNL representative informed that settings at their end had been implemented by CRITL, JUSNL team and he further assured that O/C E/F settings will be revised at the earliest after consultation with CRITL, JUSNL team.</p> <p>PCC advised CRITL, JUSNL team to test auto-reclose and carrier at both Govindpur as well as Tenughat end.</p>	<i>JUSNL representative informed that work order for auto-reclose will be issued by 10th Oct 2024 for Govindpur end and will be done for Tenughat end and Dumka end soon.</i>
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135th PCC Meeting

14.	Total Power Failure at 220 kV Chatra (JUSNL) S/s on 06.04.2024 at 14:05 Hrs	<p>JUSNL was advised following:</p> <ul style="list-style-type: none"> ➤ Disturbance Recorders of all the relays at Chatra end may be reconfigured as per the PCC guidelines and compliance of the same shall be intimated to ERLDC/ERPC at the earliest. ➤ The relays at Chatra end may be tested for their healthiness in phased manner. ➤ Submit the event analysis report after site visit of CRITL team 	<i>JUSNL representative informed that relay implementation work had been completed.</i>
15.	Total Power Failure at 220 kV Pratapsasan (OPTCL)S/s on 23.04.2024 at 14:22 Hrs	PCC opined that blocking of isolator and CB status should not cause busbar relay operation and suggested that this event of mal-operation of busbar relay shall be consulted with relay OEM and logic	<i>OPTCL representative replied that communication had been already made with OEM however no response had been received from OEM.</i>

		of busbar relay may be reviewed. PCC advised the issue may be resolved within a month.	<i>PCC advised OPTCL representative to share update to ERPC/ERLDC after communicating with OEM.</i>
133rd PCC Meeting			
16.	Review of SPS at Sterlite (Vedanta)	SLDC Odisha representative informed that the meeting to discuss the modalities of implementation of proposed SPS scheme will be convened within a week.	<i>Vedanta representative replied that SPS scheme will be implemented by end of Oct 2024.</i>