



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

Eastern Regional Power Committee

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



वसुधैव कुटुम्बकम्
ONE EARTH - ONE FAMILY - ONE FUTURE

Tel. No.: 033-24239651, 24239658 FAX No.: 033-24239652, 24239653 Web: www.erpc.gov.in

सं./NO. पू.क्षे.वि.स./PROTECTION/2023/124

दिनांक /DATE: 26.04.2023

सेवा में / To,

संलग्न सूची के अनुसार / As per list enclosed.

विषय : दिनांक - 19.04.2023 को आयोजित 125 वीं पीसीसी बैठक का कार्यवृत्त ।

Sub: Minutes of the 125th PCC meeting held on 19.04.2023

Sir,

19.04.2023 को आयोजित 125वीं 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 125th PCC meeting of ERPC held on 19.04.2023 available at ERPC website (<http://www.erpc.gov.in/>).

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

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

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

This issues with approval of Member Secretary, ERPC.

भवदीय / Yours faithfully,

P.P. Jena
26.4.23.

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

LIST OF ADDRESSES:

Chief Engineer, Trans (O&M) Bihar State Power Transmission Limited, VidyutBhawan, Bailey Road, Patna-800021	Electrical Supeeerintending Engineer (CRITL) Bihar State Power Transmission Limited, VidyutBhawan,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 UrjaSancharan Nigam Limited Kusai Colony, Doranda, Ranchi-834002	Electrical Superintending Engineer (CLD) Jharkhand UrjaSancharan Nigam Limited, KusaiColony,Doranda, Ranchi-834002
Chief General Manager (O&M), OPTCL, Janpath, Bhubaneswar, Odisha – 751 022. FAX: 0674-2542932 cgm.onm@optcl.co.in	Sr. General Manager (PPA), Technical Wing, OHPCL, Orissa State Police Housing & Welfare Corpn. Bldg. VaniviharChowk, Janpath, Bhubaneswar-752022
Chief Load Dispatcher, SLDC OPTCL, P.O. Mancheswar Rly. Colony Bhubaneswar-751017	Chief Engineer (Testing), WBSETCL Central Testing Laboratory, Abhikshan, Salt Lake, Kolkata-700091 (Fax no. 2367-3578/1235)
Chief Engineer (CLD) WBSETCL, P.O.Danesh Sheikh Lane, AndulRoad, Howrah-711109	Addl. Chief Engineer (ALDC) West Bengal Electricity Distribution Company Ltd VidyutBhavan, 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, LA 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., LoknayaJaiprakashBhawan, (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	The Head Maithon Power Limited, Maithon Office, MA 5 Gogna, Dist. Dhanbad, Jharkhand State, PIN-828207
General Manager (AM), ER-II Power Grid Corporation of India Ltd., J-I-15, Block-EP, Sector-V,Salt Lake,Kolkata-91	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 (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, Angul, Odisha (FAX:011- 26139256-65)
Shri D. P. Bhagava, Chief Consultant (O&M), TeestaUrja Limited, New Delhi (FAX:011- 46529744)	Director (GM Division), Central Electricity Authority Sewa Bhawan, R. K. Puram, New Delhi-110066
Director (NPC), CEA, NRPC Building, Katwaria Sarai, 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
President , TPTL, Bhikaji Cama Place, New Delhi , 110066	



Minutes of 125th PCC Meeting

Date: 26/04/2023
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

MINUTES OF 125th PROTECTION COORDINATION SUB-COMMITTEE MEETING HELD ON 19.04.2023 AT 10:30 HRS THROUGH MS TEAMS PLATFORM

Member Secretary ERPC chaired the meeting. List of participants is attached at **Annexure A**.

PART – A

ITEM NO. A.1: Confirmation of Minutes of 124th Protection Coordination sub-Committee Meeting held on 17th Mar 2023 through MS Teams online platform.

The minutes of 124th Protection Coordination sub-Committee meeting held on 17.03.2023 was circulated vide letter dated 29.03.2023

Members may confirm.

Deliberation in the meeting

Members confirmed the minutes of 124th PCC Meeting.

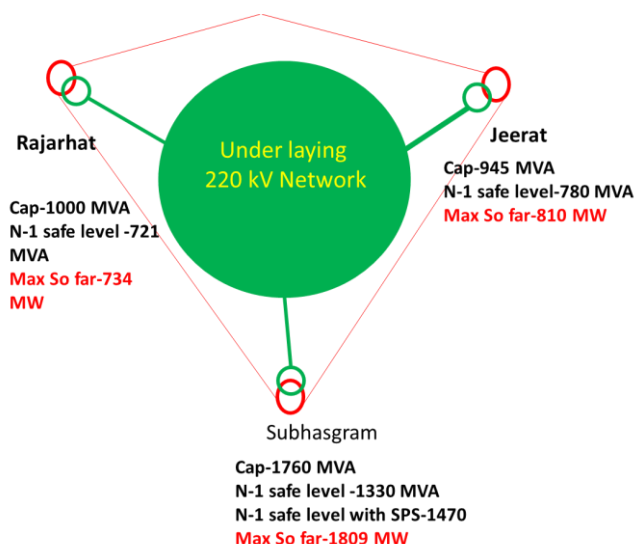
PART – B

ITEM NO. B.1: Overloading of ICTs in Subhashgram (PG)

WB peak demand has already crossed 11000 MW and still growing exceptionally. This has posed serious problem in the reliable power supply to Kolkata and North/South 24 Parganas.

Load of Kolkata and 24th Parganas are fed from following substations:

1. Rajarhat-PG (2X500MVA)
2. Subhasgram-PG (1X500MVA +4X315 MVA)
3. Jeerat-WB (4X315 MVA, only 3 in service)



The above picture depicts the power catered from each substation indicating the overloading of respective ICTs. Subhasgram ICTs are most critically loaded. On 18.04.2023 maximum loading of Subhasgram ICT touched 1809 MW as at that time, there was a contingency of tripping of 220 kV Barasat-Kasba ckt-2.

Deliberation in the meeting

ED, ERLDC presented the reliability issue of power supply to Kolkata and 24 Parganas area with help of presentation which is attached at **Annexure B.1**. He informed that loading of ICTs at Subhasgram, Rajarhat and Jeerat are either exceeding or touching the N-1 reliability limit. He added that at Subhasgram, the ICTs are loaded to more than 100% during afternoon peak hours and loading level is even crossing the safe operation limit with SPS.

Powergrid representative mentioned that two ICTs are more than 15 years old and continuous operation of ICT at 100% or near 100% may cause accelerated reduction of remaining life. Also, as the percentage impedance of ICT-1 & 2 is lesser than ICT-3 & 4, loading of ICT-1&2 are on higher side. He further added that some hotspot had been observed at ICT-1 connector and thermal overloading alarm of ICT 1 had come on 18th April 2023 during the high loading period. He requested West Bengal/CESC to do some rearrangement of load to reduce loading of Subhasgram ICTs.

CESC representative mentioned that they have met 2503 MW on 18th April 2023 and currently they have drawl restriction at Rishra (WBSETCL) as one of the 220/132 kV Transformer is out of service and drawl restriction at Titagarh (WBSETCL) which had compelled them to draw more at Kasba and Subhasgram. He expressed that no other option is available to them for drawal of power to meet their demand.

WBSETCL representative mentioned that Rishra ICT was under replacement process and it was/is expected to get restored by end of April-23.

WBSLDC representative mentioned that at Titagarh point, WBSETCL had no plan for augmentation of system for accommodating more drawal by CESC as CESC is not having long-term contract for utilizing STU network. CESC had been drawing large quantum only through short term and because of this WBSETCL was not able to get any approval from WBERC for augmentation of STU network.

Member secretary ERPC mentioned that CESC should go for long term contract with STU, so that STU could invest for building requisite infrastructure for supplying increased power demand of CESC.

WBSLDC representative mentioned that on 18th April 2023, CESC had failed to comply with SLDC instruction to restrict drawal in view of some critical exigencies and this had further aggravated the situation and led to such high loading of Subhasgram ICTs.

ED, ERLDC as well as MS, ERPC asked CESC to comply with SLDC instruction without fail, as during such critical time a small delay can cause cascading tripping and ultimately a major disturbance around Kolkata. CESC representative agreed to comply with the same.

While discussing about any marginal relief that could be provided to Subhashgram ICTs, ERLDC representative stated that when B/C was being opened at 220 kV New Town S/S of WBSETCL due to SPS operation during maximum load (which was a daily feature due to some constraints), the 220/132 kV ICT was remaining in one bus and New Town 220/33 kV load and Bantala was going in the other Bus. ERLDC representative proposed to change the bus arrangement such that the local 220/33 kV load would be shifted to Rajarhat ICT instead of Subhashgram when B/C opens. This would provide a relief of around 100 MW in Subhashgram ICTs. WBSLDC representative mentioned that based on discussion with ERLDC they had already implemented the scheme.

ED, ERLDC mentioned that all SPS near Subhasgram, Jeerat and Rajarhat ICT need to be revisited considering the unexpected load increase near Kolkata area as existing implemented SPS might not be able to take care in case of any contingency.

PCC advised CESC to have a schedule and plan for manual demand disconnection for taking immediate action in case of any contingency and non-obtaining relief from SPS. CESC was further advised to get the healthiness of the islanding scheme checked. It was also suggested to explore shifting of all crucial loads including airport, metro etc. from Subhashgram to main generation island of Budge Budge.

WBSLDC representative stated that they were resorting to demand disconnection in case of urgency and same should be applicable to CESC also.

PCC advised Powergrid to have continuous monitoring and check of the ICTs and it was agreed that in case of any issue like hot spot etc, shut down will be allowed for short duration during less load period to enable carrying out necessary maintenance. This would be required to avoid longer outage of the element.

ED, ERLDC as well as MS, ERPC emphasized on the fact that CESC and WBSETCL should ensure coordinated long-term planning in respect of all these substations.

It was concluded that after the action taken by WBSLDC as suggested by ERLDC, although there would be some relief on the loading of Subhashgram ICTs, the system would continue to be in critical situation not complying with N-1 criteria and all concerned should be on alert to act in case of contingency.

ITEM NO. B.2: Tripping of both units of 270 MW at Adhunik (APNRL) on 12.03.2023 at 20:29 Hrs

On 12.03.2023 at 20:31 Hrs, both units at Adhunik (270 MW each) got tripped. It is reported that generator differential protection got operated in unit 2 subsequently supply to all auxiliaries got failed.

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

Gen. Loss: 485 MW

Outage Duration: 04:20 Hrs

APNRL may explain.

Deliberation in the meeting

*APNRL representative explained the disturbance with help of report which is attached at **Annexure B.2.1.***

APNRL representative informed that the disturbance occurred due to a flashover in stator overhang position for unit 2. The fault resulted in carbon deposition in the area along with molted copper. Subsequently, Generator Differential protection operated and resulted in tripping of unit 2.

On enquiry from PCC regarding tripping of unit #1 at same time, he replied that supply of two out of total three CW pumps was through U#2, failure of which led to availability of only one CW pump. Consequently, vacuum pressure of U#1 became low, and U#1 also tripped.

PCC opined that the supply to the auxiliaries shall have redundancy and so that tripping one unit shall not cause tripping of auxiliaries of the station. PCC opined that the scheme for power supply to CW pumps/auxiliaries need to be modified at APNRL end and advised APNRL to take necessary action in this regard. APNRL representative replied that they are planning to implement bus transfer scheme so that such unwanted unit tripping will not be repeated in future.

On enquiry from PCC regarding restoration of unit 2, he informed that they have plan for rewinding of generator stator and rotor internal inspection by M/s GE. It is expected that restoration will be take around 70 days.

ITEM NO. B.3: Total Power failure at 220 kV Latehar and 220 kV Chatra S/s on 31.03.2023 at 18:23 Hrs.

220 kV Daltonganj-Chatra-2 LILOed at Latehar got tripped due to B phase fault, leading to total power failure at Latehar S/s. At 18:25 Hrs, 220 kV Daltonganj-Chatra-1 also got tripped subsequently total power failure occurred at Chatra S/s.

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

Load Loss: 24 MW
Outage Duration: 01:15 Hrs

JUSNL may explain.

Deliberation in the meeting

ERLDC representative informed that at 18:23 Hrs, 220 kV Daltonganj-Latehar-1 got tripped due to B phase fault. The A/R attempt was successful from Daltonganj end only. However, line tripped again after 1.5 seconds during the reclaim time. At 18:25 Hrs, 220 kV Daltonganj-Chatra-1 also got tripped due to Y_B_N fault which led to total power failure at Latehar and Chatra S/s.

On enquiry from PCC regarding non-operation of A/R at Latehar end for 220 kV Daltonganj-Latehar-1, JUSNL representative replied that there was momentarily loss of DC auxiliary supply at the station during the incident and this resulted in freezing of SAS and SCADA communication system for a short instance which might have resulted in failure of A/R operation. He further informed that even BCU, breaker and relay automation system was also not functioning at that time.

JUSNL representative further informed that as per communication with OEM M/s GE, protection settings of earth fault overcurrent protection relay in DCDB is not configured properly which led to failure of DC system. M/s GE had assured to resolve the issue by April 2023. He added that the issue has also been communicated to Powergrid for necessary rectification in DC/SCADA system.

PCC advised Powergrid to look into the issue and resolve it at the earliest.

ITEM NO. B.4: Total Power failure at 400 kV Dikchu S/s on 26.03.2023 at 04:02 Hrs.

On 26.03.2023 at 04:02 Hrs, 400 kV Rangpo-Dikchu line got tripped due to B phase fault. At the same time, 400 kV Teesta 3-Dikchu also got tripped from Teesta 3 end and subsequently total power failure occurred at Dikchu.

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

No Load Loss and Generation Loss
Outage Duration: 01:28 Hrs

Dikchu HEP may explain.

Deliberation in the meeting

ERLDC representative explained the event as follows:

- At 04:02 Hrs, a resistive B phase fault got developed in 400 kV Rangpo-Dikchu line which was cleared after 960 msec in Zone-1 of distance protection from both ends. A/r was successful from Rangpo end only.
- At Dikchu HEP end, B phase breaker got opened first however, after 360 msec other two phase also tripped. In previous tripping instance in August'22 also, the similar issue was observed.
- At the same time, 400 kV Teesta 3-Dikchu line relay at Teesta 3 end sensed the same fault in Zone-2(ideally it should sense fault in zone 3) and all three phases at Teesta 3 end got tripped instantaneously. It was observed that zone reach settings of all zones at Teesta III end are not as per ERPC protection philosophy.

On enquiry from PCC regarding issue of auto-recloser at Dikchu end and delayed opening of other two phases of breaker, Dikchu representative replied that testing of main breaker, BCU was already completed once however no issue was found. Further, they are planning to test tie circuit breaker at the earliest by taking shutdown of line.

ERLDC representative intimated that B phase voltage at Teesta-3 of 400 kV Teesta 3-Dikchu touched 400 kV (phase voltage) during the fault, however no tripping command was issued for overvoltage for which Teesta III end representative replied that they had enabled phase-phase as O/V measurement and the settings are 121 V(110 %) at first stage with time settings of 6 sec and 122 V for second stage with time settings of 100 ms.

PCC advised Teesta III to enable voltage measurement for O/V protection as phase to ground. Further the settings may be set at 110% with delay of 5-6 sec for stage 1 and 120-125 % with delay of 100 ms for stage-2. The settings may be implemented in consultation with ERLDC.

Regarding tripping of the line from Teesta III end, PCC advised the Teesta III to review the reach settings of both main-I & main-II relay as per ERPC Protection philosophy in consultation with ERLDC/ERPC. Further it was advised that relay testing may be carried out for main-2 relay(Siemens relay) to check the healthiness of relay.

TPTL representative informed on 26.03.2023 major landslide breaks out at tower no 42-43 due to heavy continues rains in the tower area. During this landslide the heavy boulders and trees and other debris were passed between the span of tower 42-43 and damaged the bottom conductor of the line and resulted in tripping of the line.

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

B.5.1: Bus tripping occurred in Eastern Region during March 2023

Element Name	Tripping Date	Reason	Utility
Biharsariff(PG) - 400KV - Bus 4	21.03.23 at 05:49 Hrs	Tie bay LBB operated in 400KV BiharSharif Varanasi Ckt-2.	PG ER-1

Powergrid ER-1 may explain.

Deliberation in the meeting

The report submitted by Powergrid is attached at **Annexure B.5.**

He explained the disturbance as follows:

- There was a R phase to Ground fault in 400 kV Biharsharif- Varanasi circuit-2. Auto-recloser of main CB was attempted however as fault was persistent in nature so three phase tripping command was issued to main as well as tie CB after one second.
- subsequently all 3 pole of main breaker got opened however due to non- opening of Y and B pole of tie CB, LBB of tie bay got operated which resulted in tripping of 400 kV Bus 4 as tie bay is connected to this bus. He further added that Y and B pole of tie CB got opened after 35 second of issue of 3 phase trip command.

Regarding remedial measure, he informed that testing of tie CB was done after the event and was found operating properly. He further informed during checking the wire terminals of density monitor, wire connected at terminal number 21 of B phase density monitor terminal was found loose which was tightened. Further auto recloser testing and operations of CB was checked and found in order..

B.5.2: Repeated Tripping of line during the month of March 2023

S.No.	Name of the Element	No. of times Tripped	Remarks	Utility
1	400 kV Binaguri-Malbase-1	4	Single Phase fault at around 125 Km from Binaguri end.	PG-ER-2/Bhutan
2	220KV-Ranchi-MTPS(DVC)-1	4	All are R-earth fault, A/R successful from Ranchi end only.	JUSNL/DVC
3	132 kV Raxaul- Parwanipur	5	Tripping on Overcurrent each time.	BSPTCL
4	132 kV Sonnagar- Nagaruntari	4	Line idle charge from Sonnagar, B phase involved in all faults.	BSPTCL/JUSNL

Concerned Utility may explain.

Deliberation in the meeting

- **Repeated tripping of 400 kV Binaguri-Malbase-1**

ERLDC representative informed that all 4 tripping incidents had occurred in Bhutan jurisdiction. As reported the faults were near to Malbase.

Bhutan representative was not available in the meeting.

It was decided that a separate mail communication will be sent to Bhutan from ERPC Secretariat to submit the details/reason for the tripping of the lines.

- **Repeated tripping of 220kV-Ranchi-MTPS(DVC)-1**

It was informed by DVC that patrolling was carried out however no physical issues was found out. The line passes though forest area and they are planning to carry out thorough patrolling of the line by availing the line shutdown.

It was intimated that autoreclosure of the line was kept disabled due to some technical issues associated with the generating units at MTPS end during the A/R operation.

ERLDC representative suggested that A/R may be enabled with higher deadtime setting at generator end i.e. dead time of Ranchi can be kept at 750-800 ms and dead time of MTPS can be kept at 1000ms. In that way, the impact of fault feeding on generating unit can be avoided during the permanent fault condition.

It was also opined that similar type of A/R scheme has already been in place in generating units of other region. DVC representative stated that they would discuss the scheme internally and will try to implement it.

PCC viewed that as per CEA construction standard regulation autorecloser scheme shall be implemented at transmission lines of 220 kV and above level. Any deviation to it shall be intimated and proper justification shall be submitted to PCC forum. Accordingly, DVC was advised to submit their difficulty at generating end with regard to implementation of autoreclosere scheme in 220 kV MTPS-Ranchi line.

- **Repeated tripping of 132 kV Raxaul- Parwanipur**

BSPTCL representative replied that repeated tripping of 132 kV Raxaul- Parwanipur had occurred due to operation of overcurrent protection in line. There was no fault in the line.

On enquiry from PCC, BSPTCL representative replied that they had kept overcurrent settings corresponding to drawal of 85 MW by Nepal and having definite time setting. Whenever Nepal drawas more power than the contracted value, the line gets tripped.

PCC advised BSPTCL to coordinate with Nepal so that drawal can be maintained within the contracted quantum and repeated tripping can be avoided.

- **Repeated tripping of 132 kV Sonenagar-Nagaruntari**

BSPTCL representative informed that 2 out of 4 faults had occurred in their jurisdiction subsequently patrolling of line was done however no issue was found out in the line section. He added that reconductoring of line has been completed and it is planned to carry out tower top patrolling of the line within April-23.

ITEM NO. B.6: Repeated Line tripping of 220 kV Ramchandrapur -Joda in April 2023

It has been observed that 220 kV Joda-Ramchandrapur had tripped 9 times in last 15 Days in which fault was in R phase for 8 no. of trippings. It is further observed that most of time A/R is successful from Joda end however it had not operated successfully from RCP end due to PLCC issue.

Details of line tripping is mentioned below

S r. N o	Element Name	Trip ping Date	Tripp ing Time	Reason	Revi val Date	Revi val Time
1	220KV-JODA-RAMCHANDRAPUR-1	17-04-2023	11:15	Joda: R-E, 75.03 KM, 1.320 KA		
2	220KV-JODA-RAMCHANDRAPUR-1	13-04-2023	13:00	Joda =Z-2,Y-ph,1.147kA,115km. Ramch=Z-1, ly=6.06kA, 14.3km,A/R unsuccessful.	13-04-2023	15:37
3	220KV-JODA-	13-	09:38	Joda=Rph,DT reciprt,Z-1,74kM,0.8kA,A/R	13-	10:4

	RAMCHANDRAPUR-1	04-2023		successful.Ram=Z-1,la-1.87kA,lb-0.35kA,lc-0.39kA,A/R unsuccessful	04-2023	5
4	220KV-JODA-RAMCHANDRAPUR-1	12-04-2023	11:10	Joda: R-Ph, 0.9 KA, 74.4 Km Ramchandrapur:Zone 1, fault in R-phase,y-phase,b-phase,la-1.82 kA,lb-0.36kA,lc-0.41 kA,distance-54.6km	12-04-2023	18:08
5	220KV-JODA-RAMCHANDRAPUR-1	12-04-2023	10:08	Joda:A/R successful, R-Ph, 0.98 kA, 3.15 km Ramchandrapur: Z-2,126.5km,la-1.63kA,R-Ph	12-04-2023	10:56
6	220KV-JODA-RAMCHANDRAPUR-1	12-04-2023	10:08	Joda:A/R successful, R-Ph, 0.98 kA, 3.15 km Ramchandrapur: Z-2,126.5km,la-1.63kA,R-Ph	12-04-2023	10:56
7	220KV-JODA-RAMCHANDRAPUR-1	11-04-2023	11:55	Joda: Y-B-Ph, ly-2.63kA, lb-3.51kA, 26.74 km; Ramchandrapur: Y-B ph, ly-2.668kA,lb-2.4kA, Z-I,94.07km,	11-04-2023	13:03
8	220KV-JODA-RAMCHANDRAPUR-1	10-04-2023	13:13	JODA end:- R_N, Zone-1 Dist.=75.39KM Fault Current: la=1.361KA	10-04-2023	15:13
9	220KV-JODA-RAMCHANDRAPUR-1	02-04-2023	14:32	RAMCHANDRAPUR - R_N , FAULT - FC -1.62 KA , FD - 59.9 KM JODA - R_N , FAULT - FC -1.4 KA , FD - 78.35 KM	02-04-2023	15:23

Members may discuss.

Deliberation in the meeting

JUSNL representative replied that shutdown of the line was taken earlier for patrolling during which issue related to punctured insulators was found. The insulators have been replaced in some of the locations and for remaining locations it would be complete after availing the line shutdown.

Regarding status of commissioning of DTPC in the line, PCC advised the matter may be taken with their telecom wing for early commissioning of the same.

ITEM NO. B.7: Bus tripping at Ramchandrapur in April 2023

- **Bus tripping at 13:13 Hrs on 10/04/2023**

On 10/04/2023 at 13:13 Hrs, Bus bar differential protection operated subsequently 220 kV Main Bus-1 along with all the 220/132 kV ICTs at Ramchandrapur S/s got tripped. A total load loss of around 100 MW was observed during the event.

- **Bus tripping at 11:10 Hrs on 12/04/2023**

On 12/04/2023 at 11:10 Hrs, there was fault developed in 220 kV Joda -Ramchandrapur -1. At the same time LBB protection operated that led to bus tripping.

It has been observed that various bus bar tripping events had occurred due to mal-operation of Busbar/LBB relay protection after installation of new Busbar at Ramchandrapur.

JUSNL is requested to explain the above events. It is also requested to do the fault finding /root cause analysis as soon as possible to avoid such instances in future.

JUSNL may explain.

Deliberation in the meeting

For bus tripping on 12/04/2023, JUSNL representative informed that it was observed that for any R phase fault in 220 kV Joda -Ramchandrapur -1, R phase pole of breaker was opening from Ramchandrapur end but other two poles are opening after 200 ms through LBB protection. The operation of LBB protection led to tripping busbar.

For event on 10/04/2023, he informed that bus bar differential protection mal-operated. He added that the reason for busbar operation could not found out and at present, both LBB protection and bus bar differential protection has been kept disabled at Ramchandrapur.

Regarding investigation and analysis of the event, he submitted that bus bar differential relay is of Siemens make and the matter had been communicated to them along with DR/EL for analysis of the event.

PCC expressed concern on repeated mal-operation of busbar protection at Ramchandrapur and advised JUSNL to carry out a detail checking of the scheme as well as testing of the busbar protection in coordination with the Relay OEM. PCC further advised to reduce zone 4-time settings of all feeders at Ramchandrapur end to 250 ms till the time busbar is out of service.

ITEM NO. B.8: Tripping Incidence in month of March-2023

Single line tripping incidents in the month of March-2023 which needs explanation from constituents of either end is attached.

Members may discuss.

Deliberation in the meeting

*Explanation from constituents of either end for single line tripping incidents in March 2023 is attached at **Annexure B.8**.*

PART- C :: OTHER ITEMS

ITEM NO. C.1: Implementation of Single-Phase Auto recloser feature in DEF Relays for the 400 kV transmission lines of TPTL-(Agenda by TPTL)

In 108th PCC meeting, the proposal of implementing auto reclosure with DEF protection was discussed and after discussion it was opined that the proposal needs elaborate technical discussion and confirmation from the relay manufacturers regarding provision of the single-phase auto reclosing functionality in DEF relay for which PCC had further advised TPTL to furnish relevant document / information for further discussion in this regard.

Subsequently TPTL had contacted with the relay suppliers of 400 kV D/C Teesta III HEP – Kishanganj transmission line at Teesta III end and Kishanganj end. The supplier of P442 relay at Teesta III HEP end, i.e., M/s GE Renewable Energy has confirmed that single phase tripping and auto reclose is possible in aided DEF protection function in the P442 relay. Further, as per the relay manual of MiCOM P127 relay, supplied by M/s Areva (formerly M/s Schneider) at Teesta III end, auto reclosure feature is available in DEF protection function of the relay. At Kishanganj end it was also confirmed by the relay supplier, i.e., M/s Hitachi Energy (formerly M/s ABB Power Systems India) that single phase auto reclose is available in DEF protection function of REL670 relay.

In view of above, it is proposed to implement Single Phase Auto recloser feature in DEF Relays for the 400 kV transmission lines of TPTL.

Discussion was held in 121st PCC Meeting regarding this agenda and after detailed deliberation, the following way forward was decided:

- ERLDC to coordinate with NERLDC to get feedback regarding reliability and success rate of auto recloser scheme in DEF relay.
- TPTL to make a detailed presentation on proposed scheme & its logic and on implementation of the scheme at relay level along with wiring & communication channel detailing in next PCC meeting.
- All transmission utilities were advised to share comments to ERPC/ERLDC regarding implementation of single-phase auto reclosing feature in DEF relay.

In 122nd PCC Meeting, ERLDC representative informed that as per communication received from NERLDC, single phase auto-recloser scheme in DEF relay had been implemented in 400 kV Silchar- Imphal d/c and 400 kV Silchar- Misa d/c line and it is operating satisfactorily. He further informed that current reversal guard need to be implemented along with auto recloser scheme in DEF relay for its successful operation.

PCC advised TPTL to make a detailed presentation on proposed scheme & its logic and on implementation of the scheme at relay level along with wiring & communication channel detailing in next PCC meeting.

In 123rd PCC Meeting, TPTL representative informed that as per advice of PCC, M/s GE was communicated to submit detailed scheme with regard to implementation of single-phase auto-reclose scheme in DEF relay.

He further stated that, as intimated by M/s GE the detail scheme & its implementation will be presented in next PCC Meeting.

In 124th PCC, Powergrid representative shared case study paper of IIT Mumbai describing about mal operation of DEF protection resulting in spurious tripping of healthy line. He suggested that comments may be shared by utilities before implementing single phase auto recloser feature in DEF Relays for the 400 kV transmission lines of TPTL.

ERLDC informed that spurious tripping of healthy line is even possible if single phase auto recloser feature is disabled in DEF relays however they requested all utilities to share the observation on the proposed scheme.

TPTL representative informed that as per communication made with M/s GE, the detail scheme & its implementation will be presented at the earliest.

TPTL may update.

Deliberation in the meeting

TPTL representative informed that they had received scheme details from M/s GE and they are planning to have a discussion with the OEM before making the presentation in PCC meeting.

PCC advised TPTL to share the scheme/details as received from M/s GE to ERPC/ERLDC. The presentation on detailed logic/scheme may be made in next PCC meeting.

ITEM NO. C.2: Submission of protection settings for newly charged elements/change in network configuration

The new elements charged in ER Grid during month of March 2023 is given at **Annexure C.2**.

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

On enquiry from ERLDC regarding facility in PDMS to review the settings implemented in the relay, PRDC representative replied that settings can be extracted from PDMS and analysis/review of same can be done by simulation tool of PSCT.

It was decided that the substation-wise review of protection settings may be carried out using PDMS & PSCT for that PRDC was advised to make a presentation in this regard in PCC.

PRDC may update.

Deliberation in the meeting

It was decided that PRDC would made a presentation in next PCC meeting on protection setting coordination using PSCT & PDMS.

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 the latest status.

Deliberation in the meeting

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

ITEM NO. C.4: New Element Integration

4.1 FTC of 132 kV Rangpo- Samardong D/c

As per information available at ERLDC, 132 kV Rangpo-Samardong D/c is going to be first time charged.

Line parameters are as below:

Name	Conductor Type	Length (km)
132 kV Rangpo-Samardong D/c	Twin Moose ACSR+Cable	2.843 (Twin Moose-2.312 km, Cable-0.531 km)

Chuzachen is requested to review their Zone-2 settings accordingly and give their consent after making necessary changes to facilitate FTC of 132 kV Rangpo-Samardong D/c.

Concerned utility may update.

Deliberation in the meeting

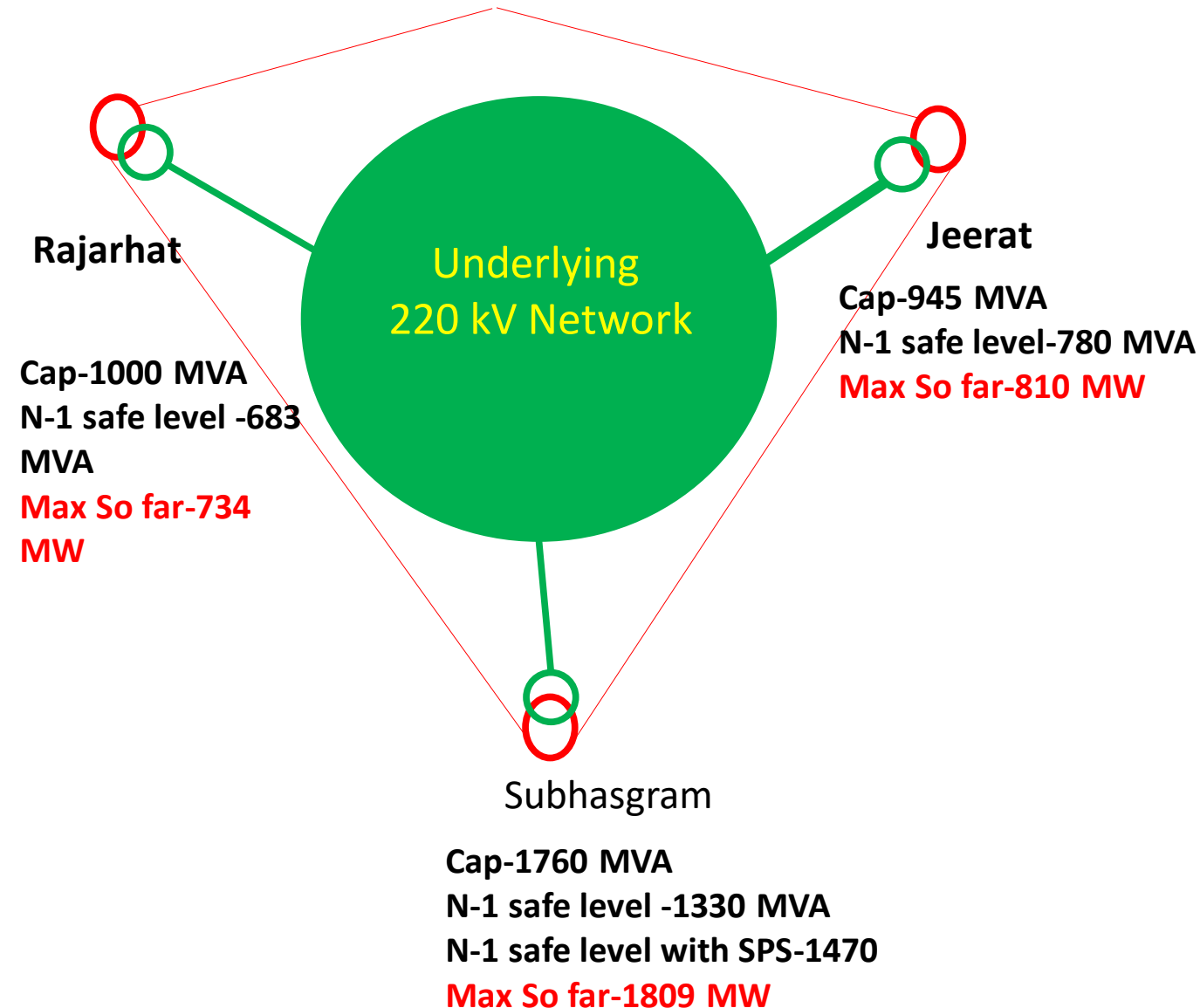
Powergrid & Sikkim were advised to submit the protection settings of respective ends to ERPC.

Name	First Join	Email
ERPC Kolkata	4/19/23, 10:15:30 AM	ERPC@KolkataMST.onmicrosoft.com
Chandan kumar	4/19/23, 10:15:36 AM	chandan@erldc.onmicrosoft.com
Abakash Adhikary DVC	4/19/23, 10:15:37 AM	
CD	4/19/23, 10:16:40 AM	
rajendra prasad (Guest)	4/19/23, 10:16:42 AM	
Mahesh	4/19/23, 10:20:12 AM	
Bilash Achari	4/19/23, 10:20:59 AM	bilash.achari@erldc.onmicrosoft.com
Senior Manager Latehar	4/19/23, 10:22:15 AM	
CHIRANJIT DEY (Guest)	4/19/23, 10:23:13 AM	
CRITL BSPTCL (Guest)	4/19/23, 10:23:35 AM	
PATRALI MONDAL (Guest)	4/19/23, 10:23:43 AM	
Aarif Md (Dikchu HEP)	4/19/23, 10:23:53 AM	
Mithun Gayen {मिथुन गायेन}	4/19/23, 10:25:52 AM	mithun.gayen@powergrid.in
Dilip kant jha EEE CRITL	4/19/23, 10:26:24 AM	
Debdas Mukherjee, WBPDC	4/19/23, 10:26:29 AM	
Alok Pratap Singh	4/19/23, 10:26:32 AM	apsingh@erldc.onmicrosoft.com
BRBCL Avinash	4/19/23, 10:26:43 AM	
Akash Kumar Modi	4/19/23, 10:27:28 AM	akmodi@erldc.onmicrosoft.com
Saibal Ghosh	4/19/23, 10:28:18 AM	saibal@erldc.onmicrosoft.com
SLDC,ODISHA (Guest)	4/19/23, 10:28:51 AM	
EMR MERAMUNDALI (Guest)	4/19/23, 10:28:56 AM	
Amresh Mallick	4/19/23, 10:29:46 AM	amareshmallick@erldc.onmicrosoft.com
ODP -1	4/19/23, 10:29:47 AM	odp-1@pgcil.onmicrosoft.com
Rajib Sutradhar	4/19/23, 10:29:52 AM	rajibsutradhar@erldc.onmicrosoft.com
Shyamal Konar	4/19/23, 10:30:14 AM	konar_s@erldc.onmicrosoft.com
Sougato Mondal	4/19/23, 10:30:15 AM	saugato@erldc.onmicrosoft.com
Saurav Kr Sahay	4/19/23, 10:31:39 AM	saurav.sahay@erldc.onmicrosoft.com
Shadab	4/19/23, 10:32:01 AM	
Dilshad Alam	4/19/23, 10:32:17 AM	
N S MONDAL	4/19/23, 10:32:47 AM	
ADWAIT KALYAN	4/19/23, 10:33:06 AM	ADWAITKALYAN@NTPC.CO.IN
Diptikanta Panda	4/19/23, 10:33:50 AM	Diptikanta.Panda@gmrgroup.in
arindam bsptcl	4/19/23, 10:33:56 AM	
shanker	4/19/23, 10:34:00 AM	
Suman Dutta, Teesta-V PS, NHPC Limited	4/19/23, 10:34:36 AM	

Pravin Ram	4/19/23, 10:34:45 AM	
NIRMAL MONDAL (WBSETCL) (Guest)	4/19/23, 10:35:01 AM	
Pinki Debnath	4/19/23, 10:35:15 AM	pinkidebnath@erldc.onmicrosoft.com
Atanu Mandal	4/19/23, 10:35:44 AM	atanumandal@erldc.onmicrosoft.com
jitesh kumar	4/19/23, 10:36:33 AM	
Rahul Kumar (Guest)	4/19/23, 10:36:51 AM	
Shabari Pramanick	4/19/23, 10:36:51 AM	shabari.pramanick@erldc.onmicrosoft.com
sudhir kumar/AEE/Chatra	4/19/23, 10:37:10 AM	
Manas Das	4/19/23, 10:37:17 AM	manasdas@erldc.onmicrosoft.com
Arunkumar k	4/19/23, 10:37:21 AM	
Prankrishna Das {प्रांकृष्णा दास}	4/19/23, 10:37:59 AM	prankrishna@powergrid.in
Chandan Mallick	4/19/23, 10:38:07 AM	chandan.mallick@erldc.onmicrosoft.com
powerhouse (Guest)	4/19/23, 10:38:23 AM	
Debarshi De (CESC)	4/19/23, 10:39:08 AM	
sks	4/19/23, 10:39:12 AM	
Arghya Ghoshal	4/19/23, 10:40:03 AM	
Shailendra Gautam (Guest)	4/19/23, 10:40:38 AM	
Baptcl	4/19/23, 10:41:04 AM	
Yamana Ayyappa	4/19/23, 10:41:29 AM	ayyappa.y@tvptl.com
Prabhat Kumar	4/19/23, 10:41:29 AM	prabhat@tvptl.com
VALLAMSETTY ANIL KRISHNA {वेलमसेठी अनिल कृ}	4/19/23, 10:42:35 AM	anil.krishna.250@powergrid.in
SUDIPTA MAITI	4/19/23, 10:42:42 AM	sudipta.maiti@dvc.gov.in
manager/Chaibasa	4/19/23, 10:44:26 AM	
Shourya Banerjee	4/19/23, 10:45:37 AM	shourya.150007@southpoint.edu.in
CHHABILA KUMAR SAHOO {छबीला कुमार साहू}	4/19/23, 10:46:23 AM	cksahoo@powergrid.in
Priyam Maity {प्रियम मैती}	4/19/23, 10:47:08 AM	pmaity@powergrid.in
EEE TD CBSA	4/19/23, 10:47:32 AM	
GM, CRITL, JUSNL	4/19/23, 10:48:10 AM	
Sourav Biswas	4/19/23, 10:50:56 AM	sbiswas@erldc.onmicrosoft.com
Ramchandrapur	4/19/23, 10:51:08 AM	
critl BSPTCL	4/19/23, 10:51:16 AM	
Debarati Basu	4/19/23, 10:51:28 AM	
Diptimayee Swain	4/19/23, 10:51:45 AM	
adityapur(rcp) (Guest)	4/19/23, 10:51:50 AM	
BIHAR GRID COMPANY	4/19/23, 10:53:19 AM	bihargridpatna@gmail.com
M K Kirtania {एम.के. किरटानिया}	4/19/23, 10:53:28 AM	malaykk@powergrid.in
Rajiv Singh CESC	4/19/23, 10:53:32 AM	

Aarif (DIKCHU HEP) (Guest)	4/19/23, 10:53:56 AM	
KUMAR AMRENDRA MADANPURI	4/19/23, 10:55:06 AM	
aditya jha	4/19/23, 10:59:13 AM	
Manager TSD Noamundi	4/19/23, 11:00:40 AM	
DGM E&MR DIV. JAJP	4/19/23, 11:02:03 AM	
Varun Vinit,ESE,CRITL,BSPTCL	4/19/23, 11:03:32 AM	
DHARMADAS TRIPATHI	4/19/23, 11:03:46 AM	dharmadas.tripathi@dvc.gov.in
Shirshendu Nandy (Guest)	4/19/23, 11:05:40 AM	
Sanjiv Choudhary	4/19/23, 11:07:00 AM	sanjivchoudhary@adhunikpower.co.in
Amiya	4/19/23, 11:09:29 AM	
gaurav	4/19/23, 11:09:40 AM	
ashwini	4/19/23, 11:14:20 AM	
Mayank Teotia	4/19/23, 11:14:39 AM	
Aman	4/19/23, 11:15:27 AM	aman@tvptl.com
Bishal	4/19/23, 11:16:48 AM	
kundan bsptcl	4/19/23, 11:21:52 AM	
bsptcl	4/19/23, 11:23:39 AM	
AEE CRITL	4/19/23, 11:23:40 AM	
Gautam Manish	4/19/23, 11:26:16 AM	Manish.Gautam@andritz.com
Nishant Kumar Shankwar	4/19/23, 11:33:05 AM	Nishant.Kumar@energy-sel.com
prabhat critl bsptcl	4/19/23, 11:50:57 AM	
Bdk	4/19/23, 11:55:16 AM	
Gulshan Rongnichu	4/19/23, 12:02:56 PM	
Malviya Rakesh	4/19/23, 12:04:45 PM	Rakesh.Malviya@andritz.com
s K Bhowmick	4/19/23, 12:05:30 PM	
Sr. Manager Daltonganj	4/19/23, 12:52:40 PM	
critl	4/19/23, 1:00:02 PM	
PM	4/19/23, 1:07:17 PM	
aditya jha	4/19/23, 1:15:57 PM	
Ashish kumar	4/19/23, 1:27:37 PM	
V Anil Krishna (Guest)	4/19/23, 1:34:54 PM	
krishna (Guest)	4/19/23, 1:39:44 PM	
Latehar	4/19/23, 1:57:55 PM	
aa	4/19/23, 5:17:59 PM	

Review of Reliability of Power Supply to Kolkata and Greater Kolkata area



➤ This year WB peak demand already cross 11000 MW mark and still growing exceptionally

Load of Kolkata and greater Kolkata area in 24th Parganas are fed from following ICT:

1. Rajarhat (2X500MVA)
2. Subhasgram(1X500MVA +4X315 MVA)
3. Jeerat(4X315 MVA, only 3 in service)

➤ Depending on the network topology in the underlying 220 kV network the sharing of load among the ICT changes .

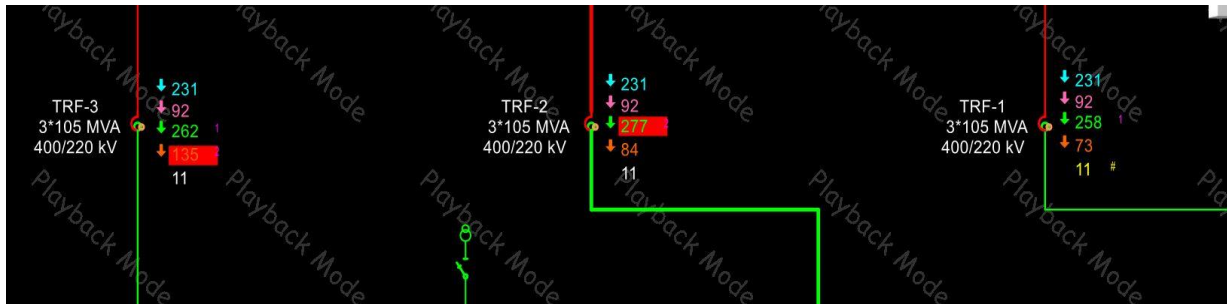
KAHALGAON			
ICT -1 (200 MVA)	↑ 31	Q 10	
ICT -2 (200 MVA)	↑ 63	Q 10	
KALABADIA			
ICT -1 (315 MVA)	↓ 134	# 16	
ICT -2 (315 MVA)	↓ 134	# 13	
ICT -3 (500 MVA)	↓ 203	# 13	
KEONJHAR			
ICT -1 (315 MVA)	↓ 11	9	
ICT -2 (315 MVA)	↓ 8	11	
KISHANGUNJ			
ICT -1 (500 MVA)	↓ 186	-5	
ICT -2 (500 MVA)	↓ 186	0	
LAKHI			
ICT -1 (200 MVA)	↓ 25	# 1	
ICT -2 (200 MVA)	↓ 26	9	
ICT -3 (315 MVA)	↓ 37	9	
RAJARHAT			
SUM	0		
ICT -1	↓ 320	9	
ICT -2	↓ 321	SM 9	

SUBHASGRAM			
SUM	1721		0
ICT -1 (315 MVA)	↓ 305	9	
ICT -2 (315 MVA)	↓ 301	9	
ICT -3 (315 MVA)	↓ 296	9	
ICT -4 (315 MVA)	↓ 296	9	
ICT -5 (500 MVA)	↓ 523	9	
TALCHER			
ICT -1 (315 MVA)	↓ 139	SM 12	
ICT -2 (315 MVA)	↓ 138	Q 12	
ALIPURDUAR			
ICT -1 (315 MVA)	↓ 124	SM 12	
ICT -2 (315 MVA)	↓ 123	Q 12	
MOTIHARI			
ICT -1 (200 MVA)	↓ 93	Q 0	
ICT -2 (200 MVA)	↓ 93	Q 0	
ICT -3 (315 MVA)	↓ 154	# 0	
BOKARO			
ICT -1	↓ 284	9	
ICT -2	↓ 284	9	

Loading of The ICTs at 15:05 hrs before tripping of 220 kV Kasba Barasat and New Town B/C open

SUBHASGRAM			
SUM	1804		0
ICT -1 (315 MVA)	↓ 319	9	
ICT -2 (315 MVA)	↓ 316	9	
ICT -3 (315 MVA)	↓ 309	9	
ICT -4 (315 MVA)	↓ 310	9	
ICT -5 (500 MVA)	↓ 551	9	
TALCHER			
ICT -1 (315 MVA)	↓ 135	SM 12	
ICT -2 (315 MVA)	↓ 132	Q 12	
ALIPURDUAR			
ICT -1 (315 MVA)	↓ 125	SM 12	
ICT -2 (315 MVA)	↓ 124	Q 12	
MOTIHARI			
ICT -1 (200 MVA)	↓ 96	Q 0	
ICT -2 (200 MVA)	↓ 96	Q 0	
ICT -3 (315 MVA)	↓ 158	# 0	
BOKARO			
ICT -1	↓ 277	9	
ICT -2	↓ 277	9	

Loading of The ICTs at 15:08 hrs after tripping of 220 kV Kasba Barasat and New Town B/C open

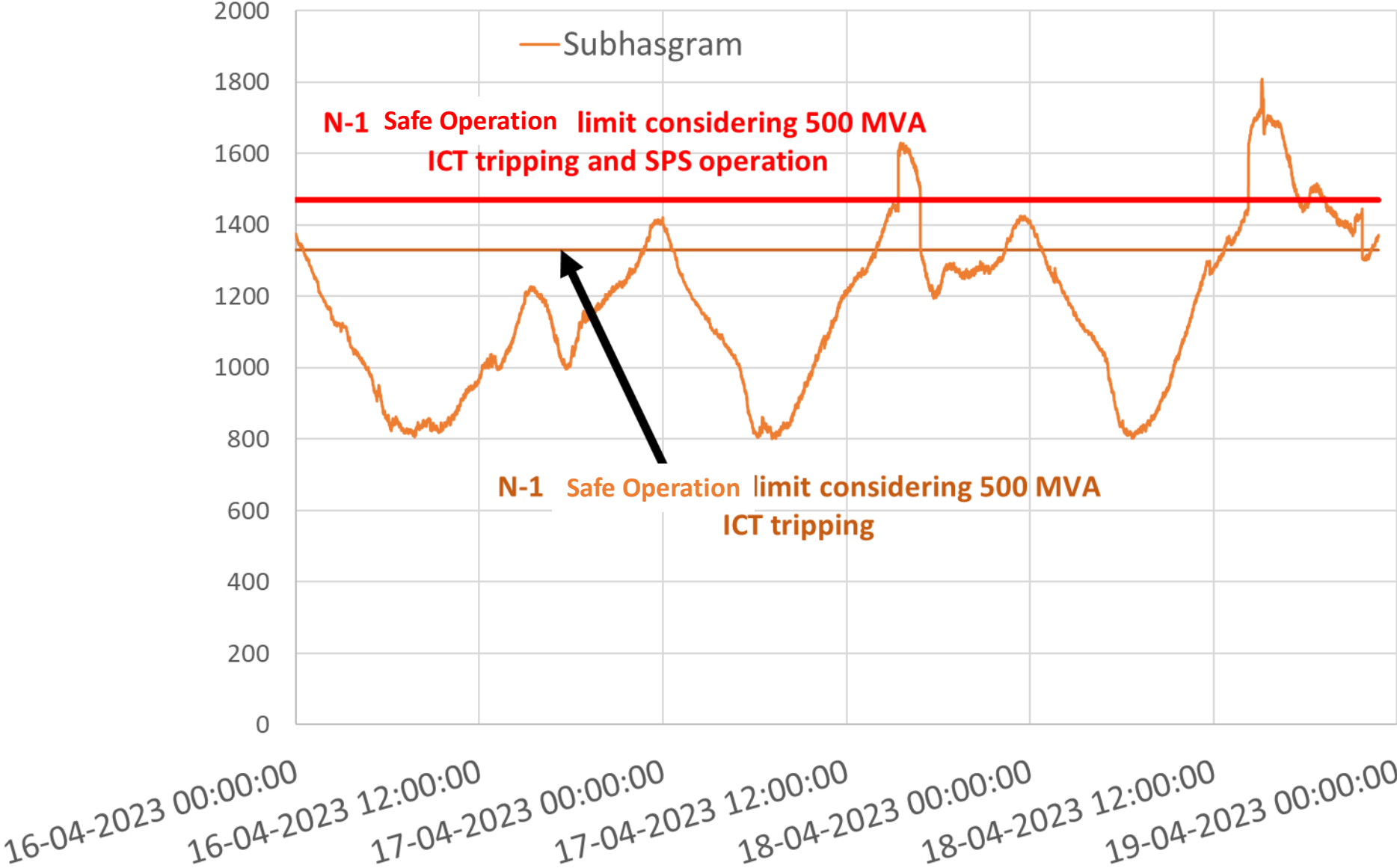


ICTs at Jeerat at 15:05

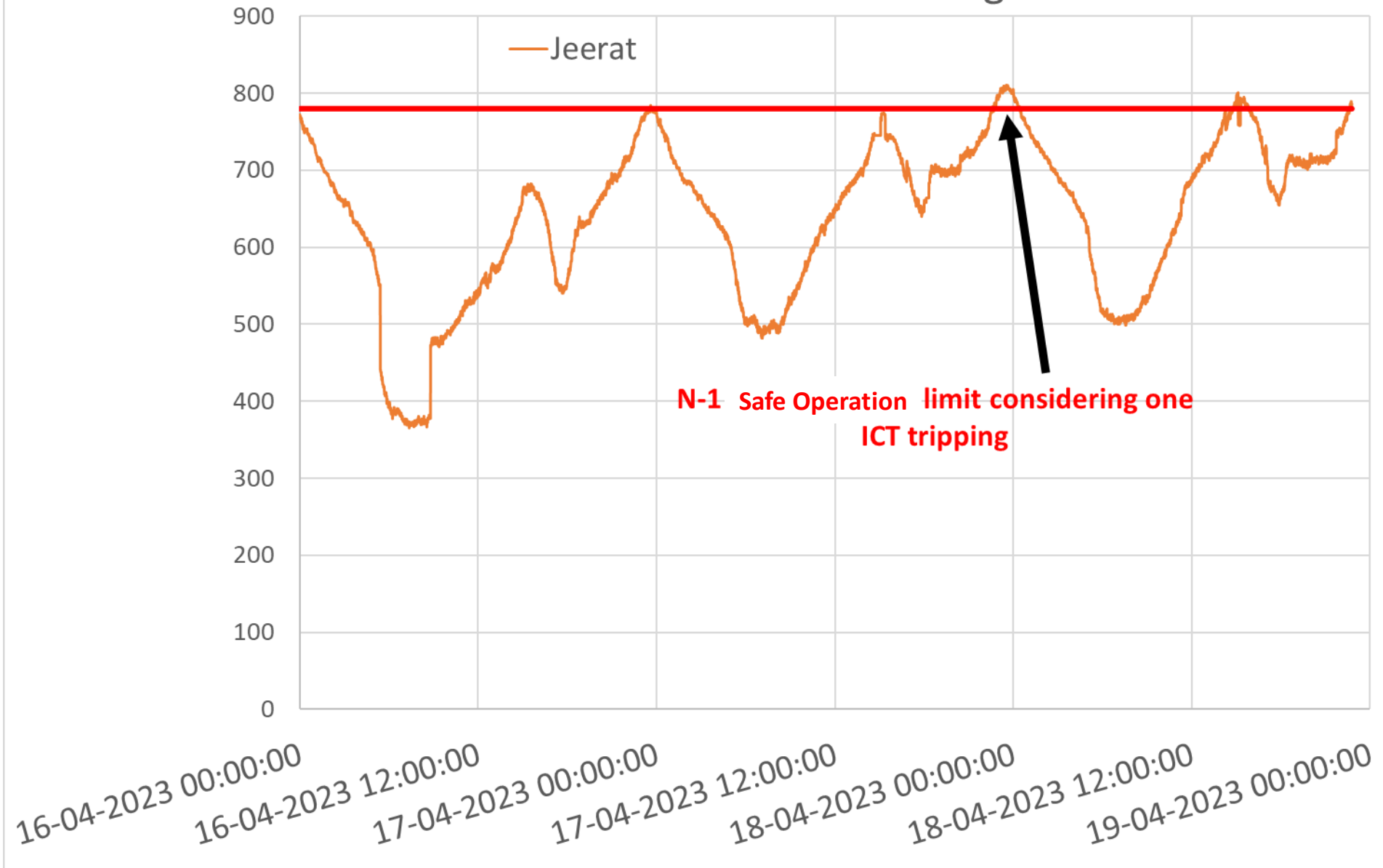


ICTs at Jeerat at 15:08

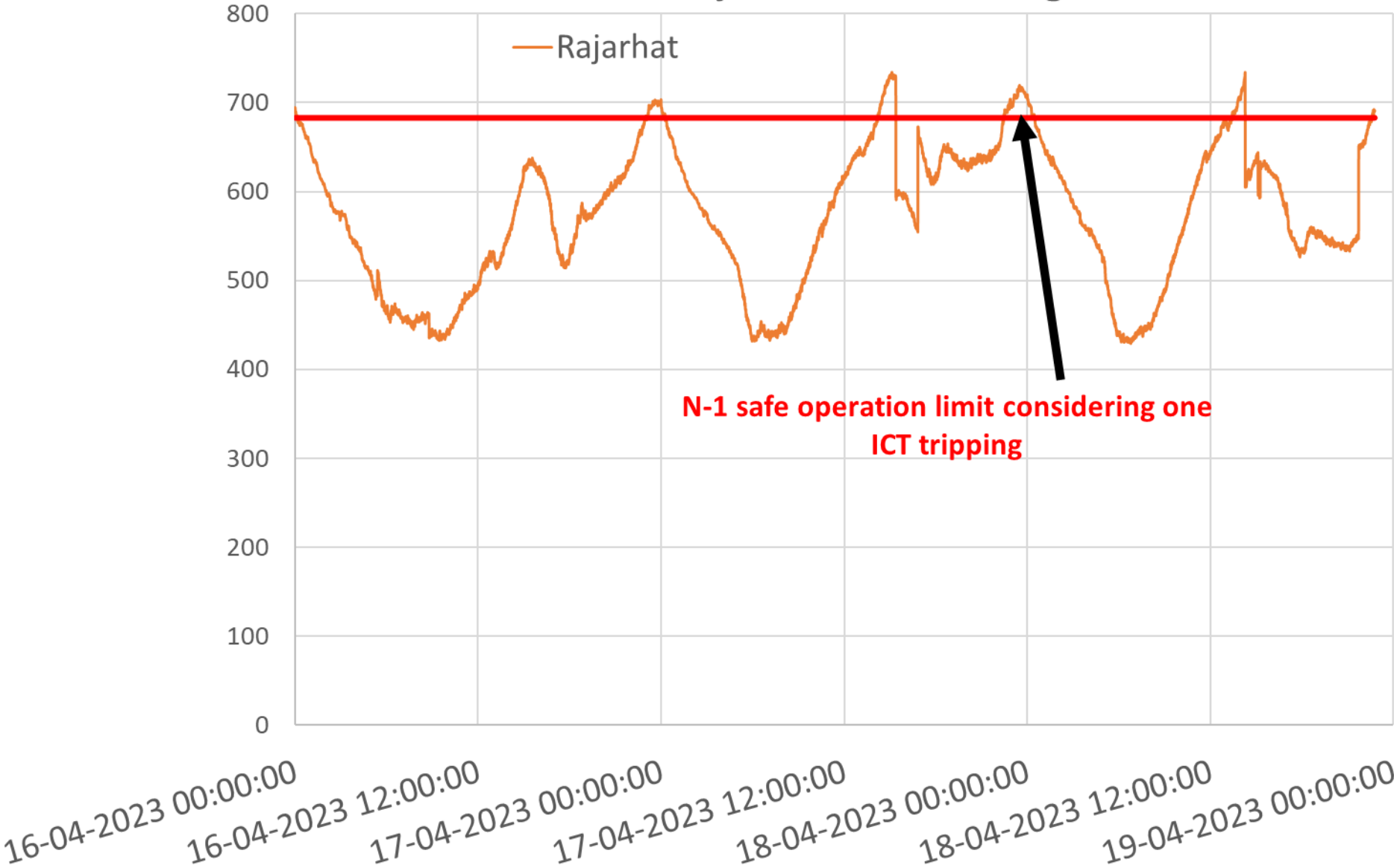
Subhasgram ICT Loading



Jeerat ICT Loading



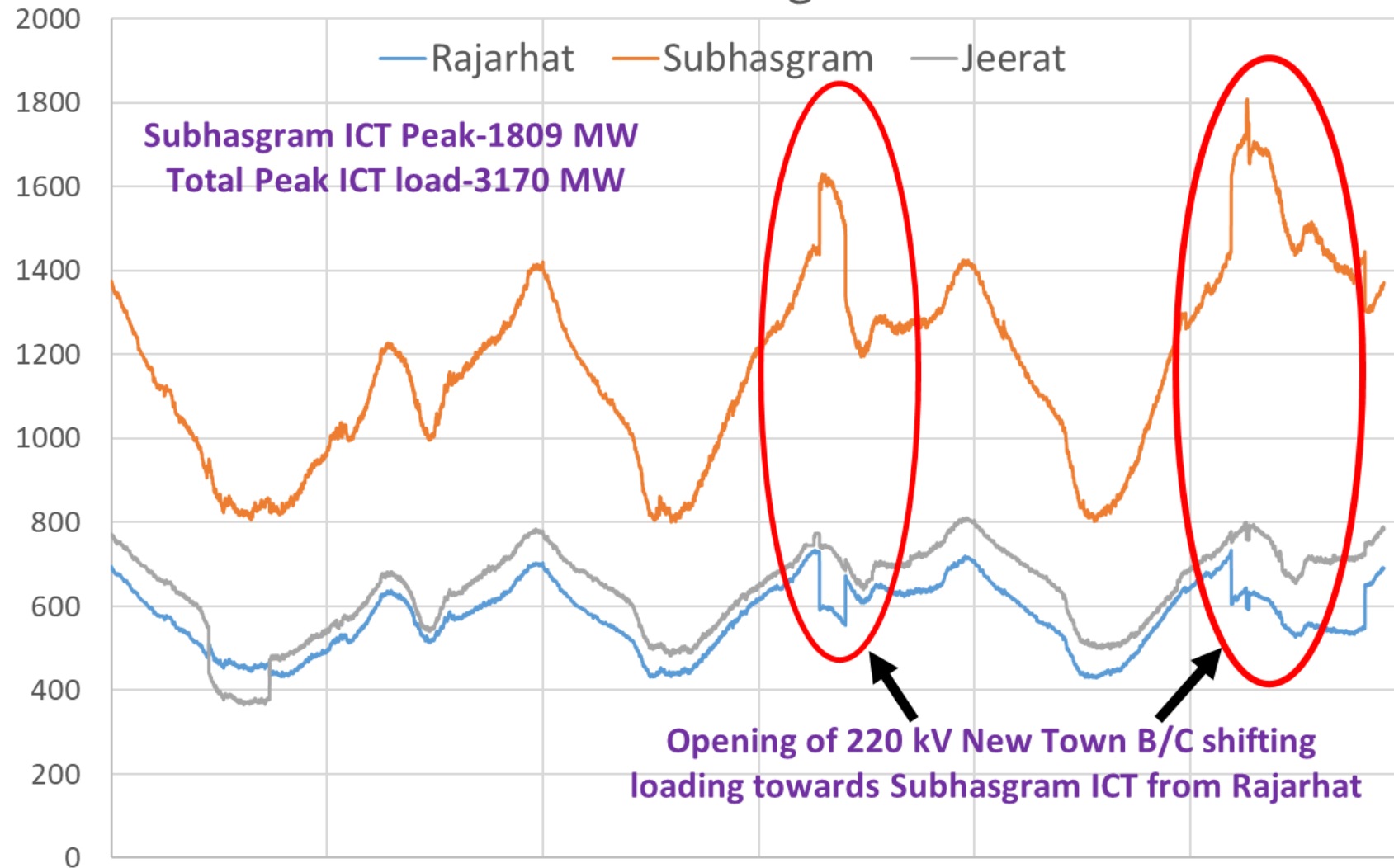
Rajarhat ICT Loading



Aggravating loading of Subhashgram: Opening of Bus Coupler at New Town

- Opening of this B/C significantly increase the loading of Subhasgram ICT.
- The B/C gets open based on 220 kV Rajarhat-New Town flow to make this line N-1 compliant. The line is re-conductor with HTLS , however the CT at New Town end is yet to be replaced with higher rating. **Due to this limitation the line capacity could not be utilized to the fullest.**

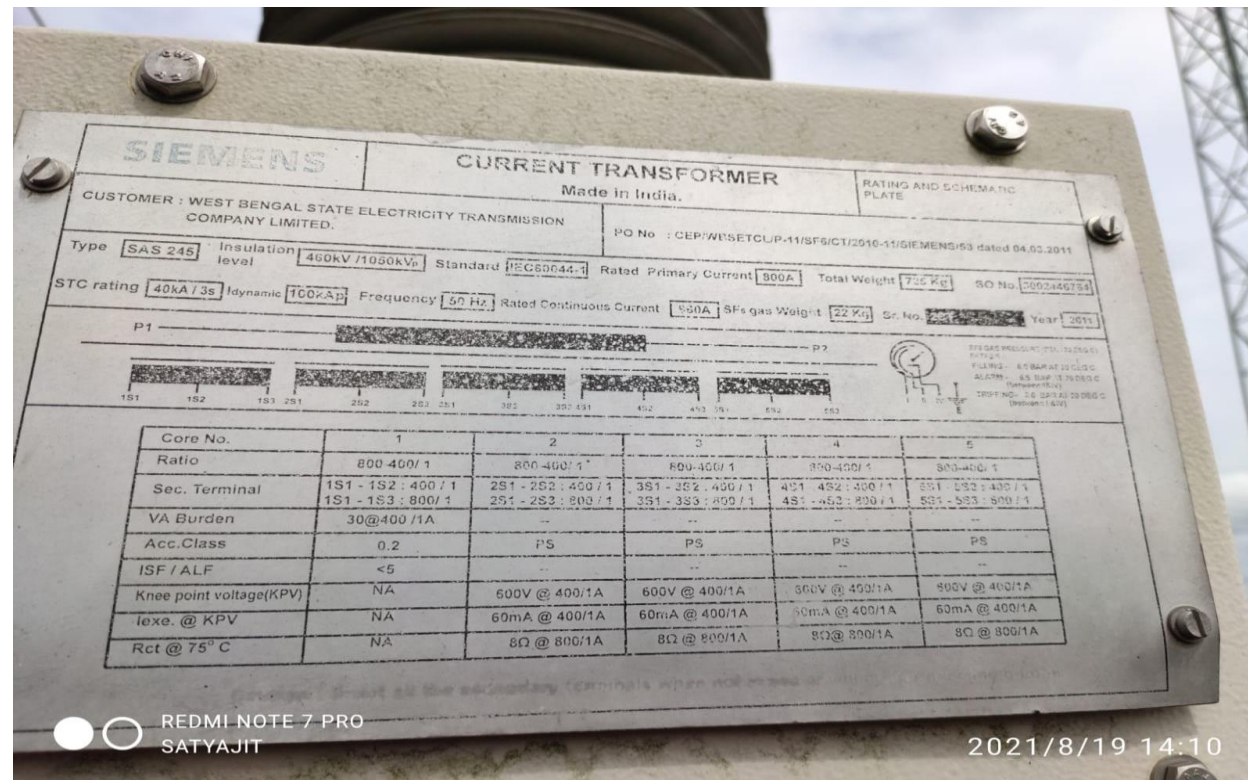
ICT Loading



16-04-2023 00:00:00
16-04-2023 12:00:00
17-04-2023 00:00:00
17-04-2023 12:00:00
18-04-2023 00:00:00
18-04-2023 12:00:00
19-04-2023 00:00:00

- Considering the critical situation of the reliability of power supply to the capital city of West Bengal following **immediate action** may be taken:

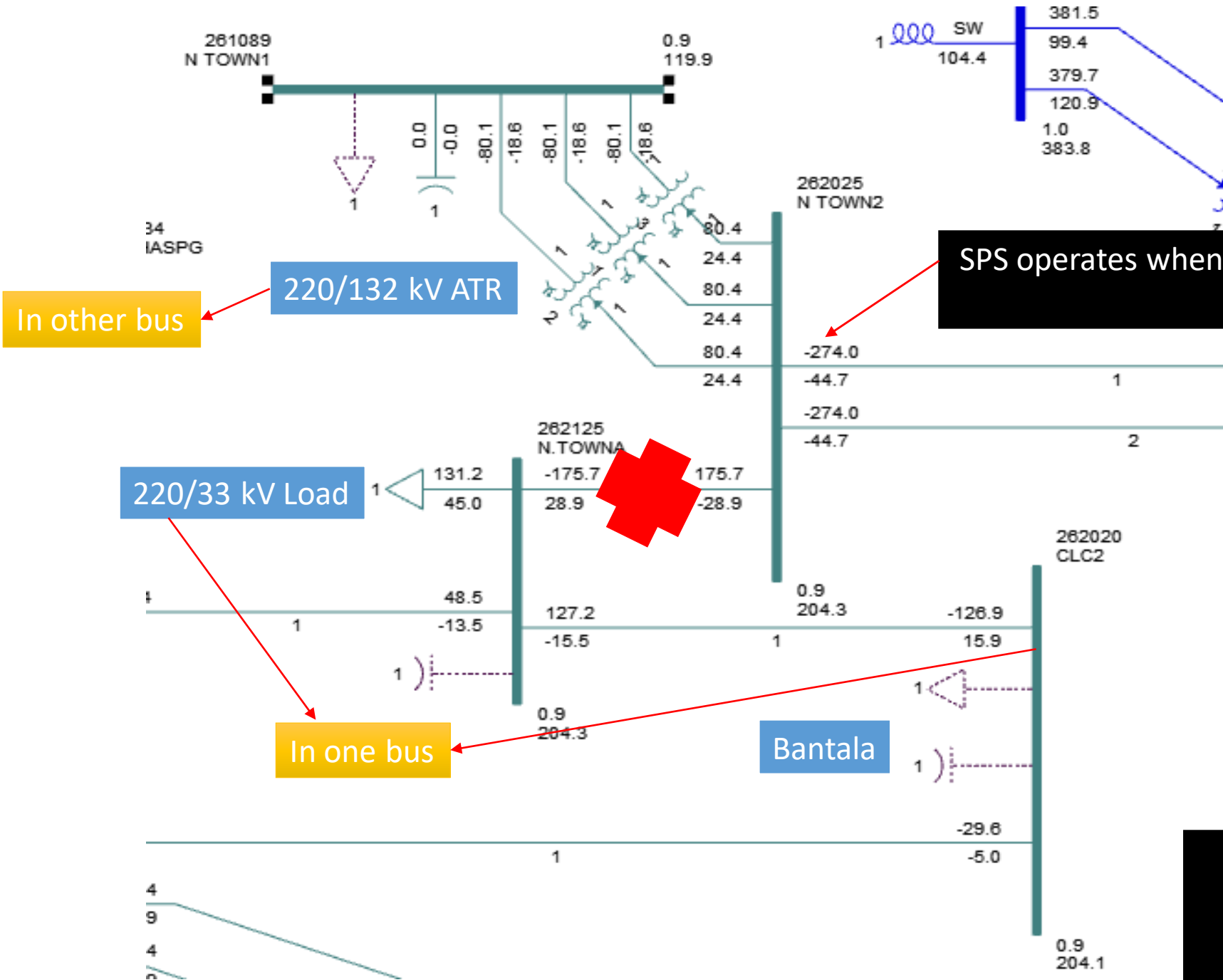
1. Present New Town B/C setting is 784 AMP based on 800/1 CT ratio. However the continuous rating of CT is 960 AMP (Nameplate attached). So if setting can be changed to 950 AMP it will be a great relief for Subhasgram ICT without causing any issue. CT replacement may be planned at the earliest with minimum outage duration.

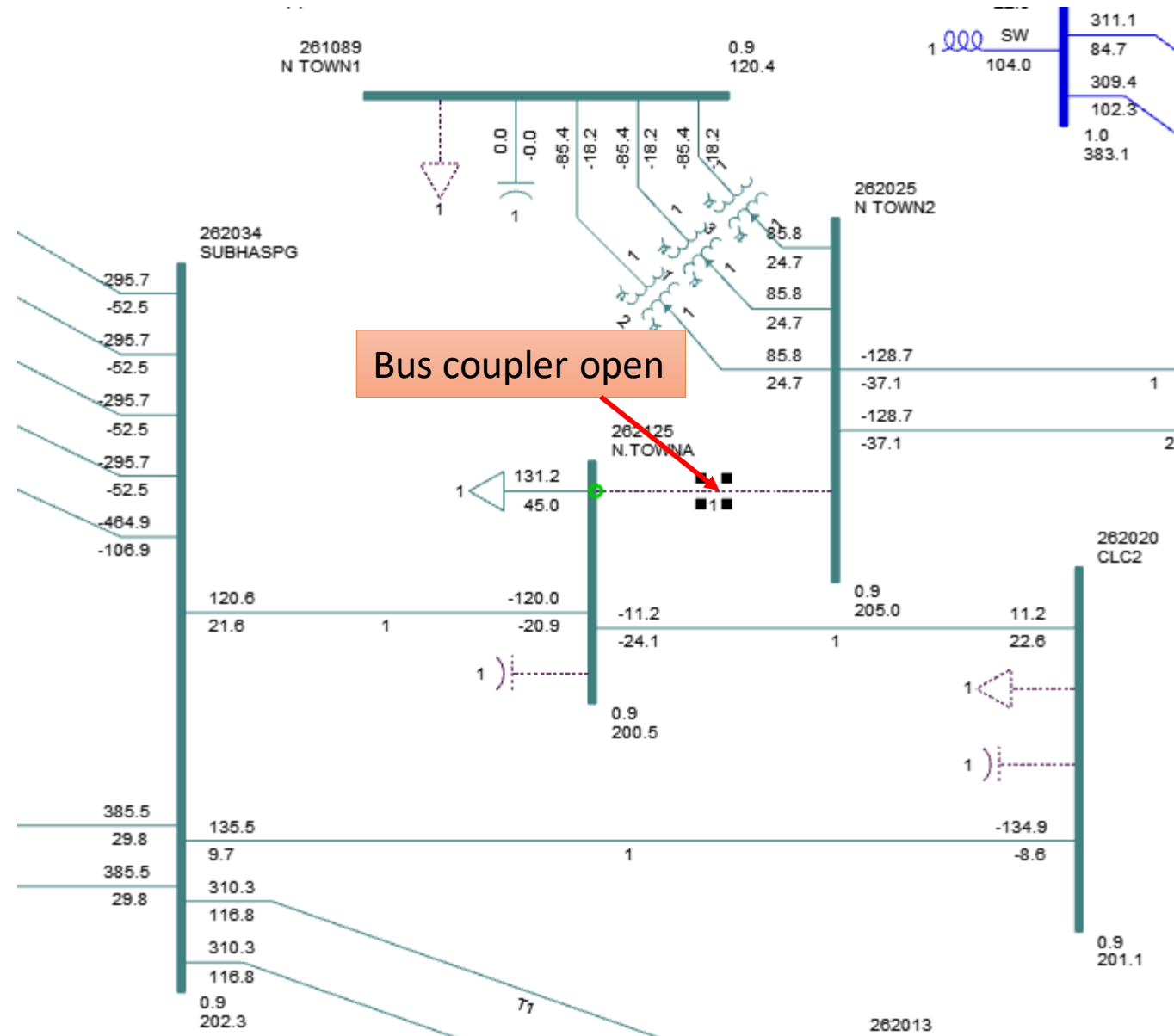


- Considering the critical situation of the reliability of power supply to the capital city of West Bengal following **immediate action** may be taken:

2. Presently When B/C opens the 220/132 kV ICT remain in one bus and New Town 220/33 kV load and Bantala goes in the other Bus. The proposed arrangement is that the local 220/33 kV load will be shifted towards the Rajarhat ICT when B/C open:

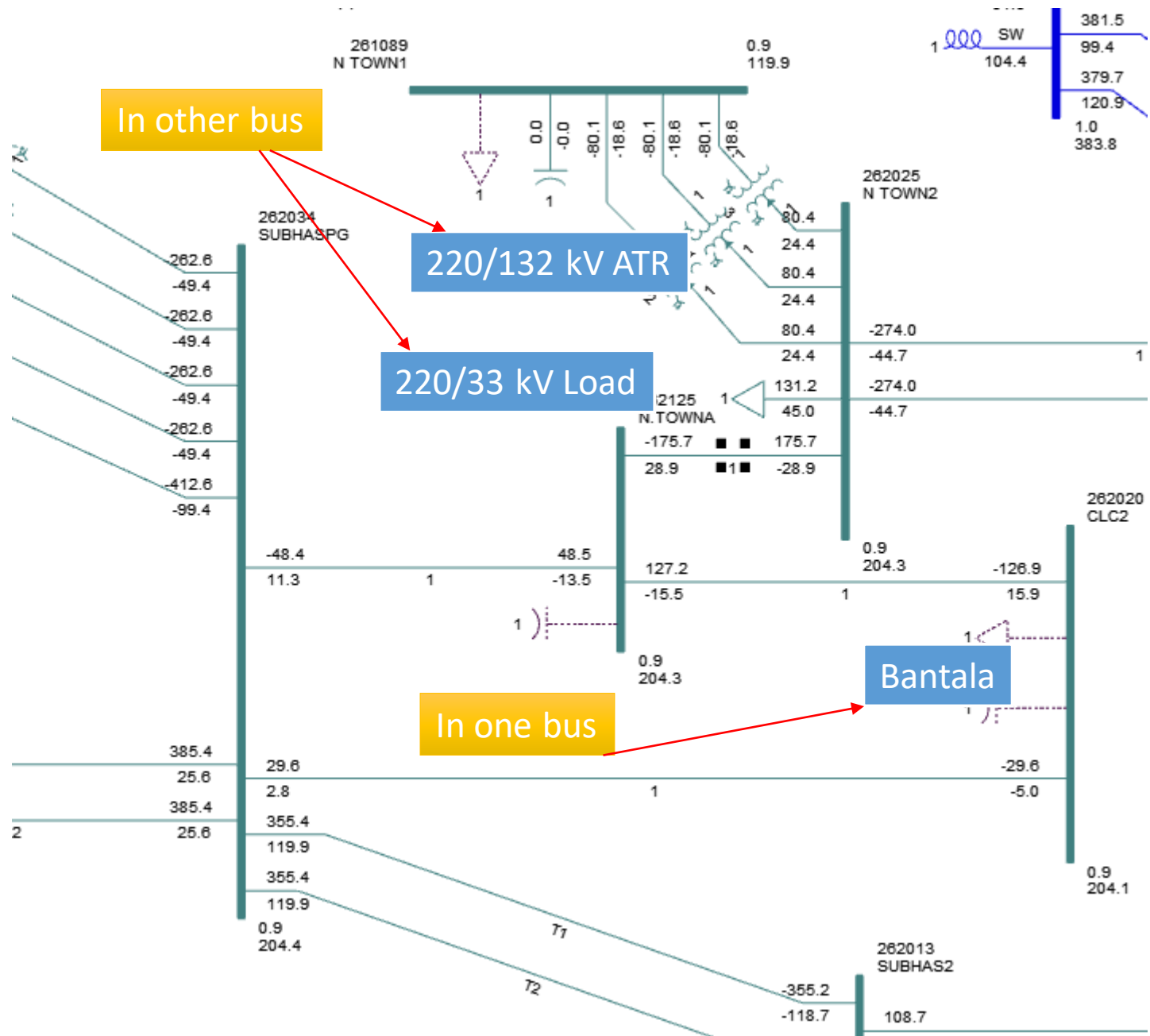
-This will reduce the transfer of load towards Subhasgram ICT when B/C of 220 kV New Town opens. The study are shown in the coming slides.





Subhasgram ICT
flow increased
by 184 MW

Present
situation



Proposed
arrangement

- Considering the critical situation of the reliability of power supply to the capital city of West Bengal following **immediate action** may be taken:

3. Review of Subhasgram SPS and other SPS of WB system near Subhasgram, Jeerat and Rajarhat area:

-It is seen that with loading pattern during peak present SPS at Subhasgram ICT will not be sufficient to bring back the loading within normal range if 500 MVA ICT trips at Subhasgram. Therefore SPS needs to be redesigned at the earliest.

- **Considering the critical situation of the reliability of power supply to the capital city of West Bengal following immediate action may be taken:**
- Another critical contingency is 220 kV Kasba-Barasat D/C line tripping. During peak condition this may lead to 115% loading of Subhasgram ICTs, yet Subhasgram ICT SPS will not work as there is an “AND” logic with ICT tripping.
- So this contingency may become critical. In this case a SPS for 220 kV Subhasgram(WB)-Kasba may act and give some relief. However it depends on 220 kV Subhasgram(WB)-Kasba line flow only rather than Subhasgram ICT.
- Therefore in case this is not operated, the same identified load may be tripped immediately to bring back the Subhasgram ICT within 100%

- Considering the critical situation of the reliability of power supply to the capital city of West Bengal following **long term action** may be taken:

1. Improve accuracy of Long term Demand forecasting:

-Upcoming system is planned based on the projected demand of the state and accuracy of forecast is extremely important.

2. Expedite the installation of Subhasgram 6th ICT and Lakshmikantpur substation.

-

घटना संख्या: 12-03-2023/1

दिनांक: 10-04-2023

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

Summary of the event (घटना का सारांश):

At 20:29 Hrs, both units at Adhunik (270 MW each) tripped. As reported, generator differential protection operated in U#2 and supply to all auxiliaries failed. Supply to two of three CW pumps was from U#2 auxiliary, tripping of which led to low vacuum pressure of U#1 and U#1 also tripped at the same time.

Date / Time of disturbance: 12-03-2023 at 20:29 hrs

- Event type: GD-1
- Systems/ Subsystems affected: 400 kV Adhunik (APNRL) S/s
- Load and Generation loss.
 - 485 MW generation loss occurred during the event.
 - No load loss occurred during the event.

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

- NIL

Major elements tripped (प्रमुख ट्रिपिंग):

- U#1, U#2 at Adhunik (270 MW each)

Network across the affected area (प्रभावित क्षेत्र का नक्शा)

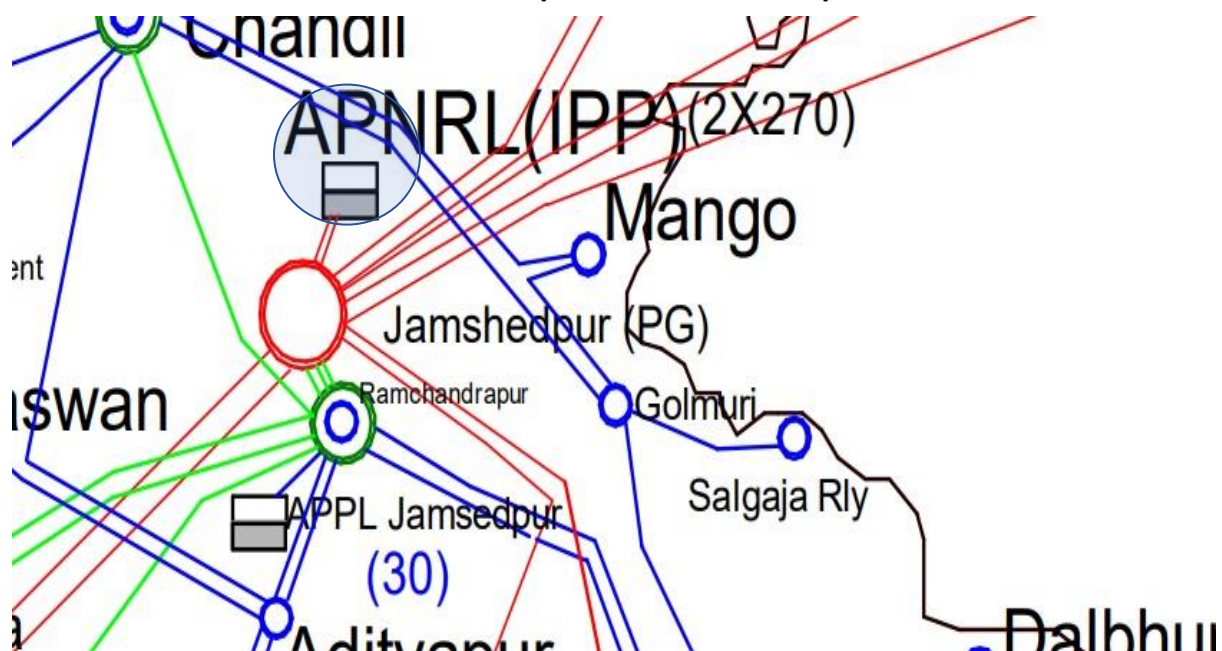


Figure 1: Network across the affected area

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

समय	नाम	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पीएमयू पर्यवेक्षण
20:29	APNRL U#1	Generator differential protection	-	15 kV dip in B_ph voltage at Jamshedpur
	APNRL U#2	Loss of auxiliary supply	-	

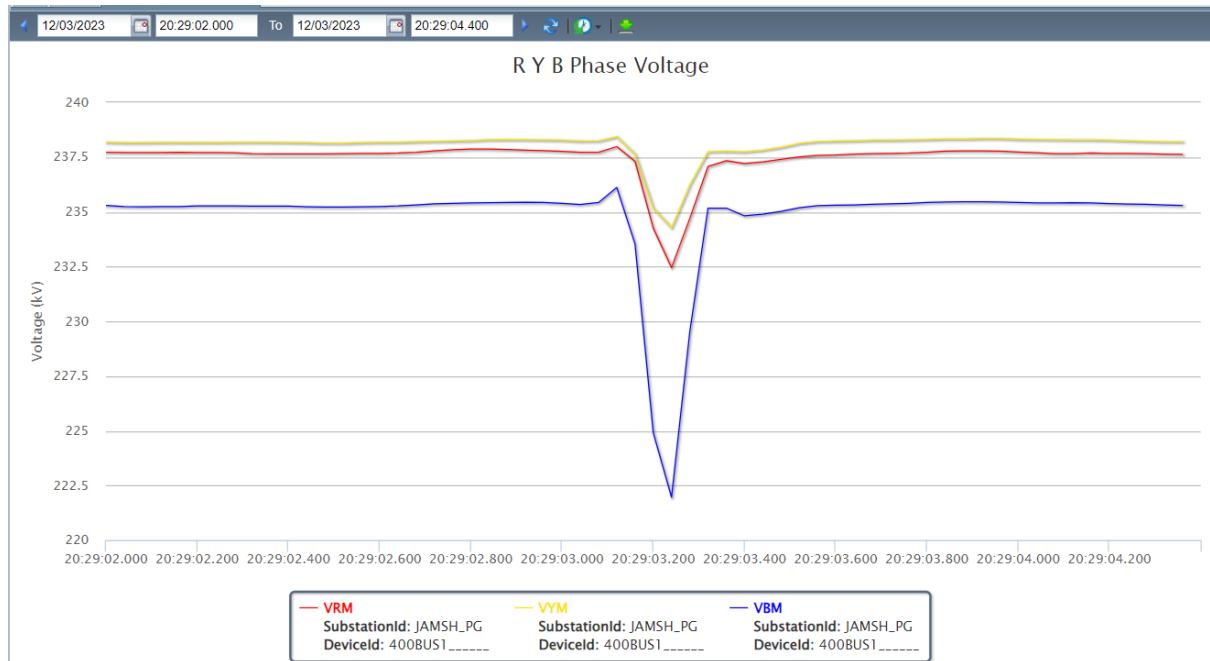


Figure 2: PMU snapshot of 400/220 kV Jamshedpur S/s (18:23 Hrs)

Restoration (पूर्वावस्था की प्रप्ति)

Transmission/Generation element name	Restoration time
APNRL U#1	00:49 (13.03.23)
APNRL U#2	Expected by 30.04.23

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

- U#2 tripped at 20:29 Hrs due to operation of generator differential protection, which led to tripping of GT.
- As GT tripped, auxiliary supply got interrupted. Two of the total three CW pumps supply was through U#2, failure of which led to availability of only one CW pump. Consequently, vacuum pressure of U#1 became low, and U#1 also tripped.
- This led to loss of 485 MW generation at Adhunik.
- Detailed analysis of U#2 tripping may be shared by APNRL.

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

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

Status of Reporting (रिपोर्टिंग की स्थिति):

- DR/EL yet to be received from APNRL.

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

Sequence of Events not recorded at the time of event.

Annexure 2: DR recorded

DR not submitted yet.

**ADHUNIK POWER AND NATURAL RESOURCES LTD.****UNIT TRIP REPORT**

1. **Unit Number: 2**
2. **Trip / Outage date:** 12.03.2023
- 3.
4. **Trip / Outage time:** 20:28:54 hrs.
5. **Unit Condition before trip / Outage:** Unit was running at 260 MW
6. **Equipment in service at the time of Outage / Trip:**

MILLS	: B,C,D,E
FANS	: ID Fan-A/B,FD Fan-A/B, PA Fan-A&B
ESP	: 31
BFP	: A, B in service.

Sequence of Events in DCS:

At 20:28:54Hrs. Generator Electrical protection CH-1/CH-2
At 20:28:54Hrs. Generator circuit breaker open
At 20:28:54Hrs. Exciter FB open
At 20:28:54Hrs. GT main HV breaker 402/403-52
At 20:28:54Hrs. Trbine_speed_mv3
At 20:28:54Hrs. HPBP open
At 20:28:55Hrs. LSR-operated
At 20:28:55Hrs. TMR faulty
At 20:28:55Hrs. Turbine Trip CH-A/CH-B operated.
At 20:28:55Hrs. ID/FD/PA Fan LOP-system fail

Observation:

- ❖ Generator tripped on Generator differential protection.
- ❖ Generator stator earth fault 100% and Rotor Earth Fault acted.
- ❖ Generator circuit breaker opened.
- ❖ Turbine speed reached to 3316RPM.
- ❖ Turbine LSR relay operated.
- ❖ All Fans & Mills LOP tripped.
- ❖ Both APH main motor & its Support bearing & Guide bearing LOP tripped & APH air motor start from local by opening bypass line.
- ❖ All scanner shows no flame acted.
- ❖ BFP-2B/2C & CEP-2A tripped.
- ❖ Seal oil Pump –B tripped.



ADHUNIK POWER AND NATURAL RESOURCES LTD.

UNIT TRIP REPORT

Operator Action:

- ❖ DC SOP, DC EOP & DC scanner air fan started in auto & running normal.
- ❖ DG started in auto.
- ❖ Gland sealing withdrawn & its supply line from APRDS isolate by closing its MIV Vacuum breaker opened.
- ❖ All HT-drains connected to HPFT closed manually.
- ❖ MS Stop Valve MS-1 closed from DCS & MS-02 from local.
- ❖ Start both APH main motor.
- ❖ Start All Fans/Mills & Pumps LOP one by one.
- ❖ SOP-A started, after power resumed & DC-SOP stopped.
- ❖ CWP-2B started after getting clearance from EMD.
- ❖ Unit-2 side CWP interconnection valve closed.
- ❖ All APRDS drains opened, & interconnection line vents & drains opened.
- ❖ Ensure Turbine barring gear engaged @55RPM ON 21:15HRS.

Electrical Checking of Generator:-

TRIP SEQUENCE

Sl. No.	TIME	SEQUENCE OF EVENTS	DESCRIPTION	REMARKS
1	20.28.54.94 Hrs.	GENERATOR DIFFERENTIAL PROTECTION OPERATED IN GRP REALY	GENERATOR DIFFERENTIAL PROTECTION OPERATED IN GRP RELAY ALONG WITH ROTOR & 100% STATOR EARTH FAULT PROTECTION, GENERATOR IMPEDANCE AND DEAD MACHINE PROTECTION	UNIT TRIPPED
2.	20.28.54.179	GEN-02 TRIPPED AND GCB OPENED		

OBSERVATION

Sl. No.	OBSERVATION	LOGIC OF THE ALARM	ACTION TAKEN
1	Relay was healthy	Trip Alarm along with protection LED came in GR1 & GR2 Relay	1. GR1 & GR2 Relay trip on Generator Differential, 100% Stator Earth fault, Rotor Earth Fault, Generator Impedance and Dead Machine protection at 20.28.54.94 Hrs. Master trip of Group 1 and Group 2 operated and GCB, HVCB(403&402) opened at 20.28.54.421 Hrs.



UNIT TRIP REPORT

			<p>2. After seen the voltage and current trend in DCS, Relay was resetted but Stator/rotor earth fault still persisted. so we had taken IR of Stator from NGT side and found Zero Mega ohm</p> <p>3. IR value of Rotor measured from slip ring end and found Zero Mega ohm</p> <p>3. Flexible connection from IPBD to Generator was disconnected from Phase and neutral side, Insulation resistance take from Phase to phase and Phase to Earth following are the values</p> <p>IR value taken R-Y- 1.38 Giga ohm Y-B -1.16 Giga ohm B-R - 0 Mega ohm R-E- 0 Mega ohm Y-E- 573 Mega ohm B-E- 0 Mega ohm</p>
--	--	--	---

Conclusion: Generator Stator & Rotor Further Physical inspection required for Complete Assessment

Observation report after removing rotor found defect on stator side:

1, There was a flashover in Stator overhang portion at 6 o'clock position from turbine end. This had resulted in lot of carbon deposition in that area.

2, After Cleaning the Carbon deposition, it was observed that bottom bar 4&5 that were connected to bar 36 and 37 were melted to about 250mm length creating a cavity. As a consequence, molted Copper was observed in the bottom and inside of stator frame.

3, In addition to this, insulation of bar 6 & 7 was seen to be heavily damaged. Insulation of top bar 38, 39 & 40 that was besides 36 7 37 also found damaged.

4, The bottom bar 4 & 5 are of different phases where 4 is B phases (W) and 5 is R phases (U)

5. Apart from the stator, the IR values of Rotor are seen to be 0 and there is Carbon and minor Copper residue on the external portion on turbine end and possible in the cooling duct as well.

Remedial Measures / Action Plan:

Generator stator rewinding & rotor internal inspection have been planned.

घटना संख्या: 31-03-2023/1

दिनांक: 10-04-2023

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

Summary of the event (घटना का सारांश):

At 18:23 Hrs, 220 kV Daltonganj-Latehar-Chatra (220 kV Daltonganj-Chatra-2 LIL) tripped due to B_N fault. At 18:25 Hrs, 220 kV Daltonganj-Chatra-1 also tripped, leading to total power failure at Latehar and Chatra S/s. Inclement weather reported during the event around Daltonganj and Chatra. Total 24 MW load loss occurred.

- **Date / Time of disturbance:** 31-03-2023 at 18:23 hrs
- **Event type:** GD-1
- **Systems/ Subsystems affected:** 220/132 kV Chatra, Latehar S/s
- **Load and Generation loss.**
 - No generation loss was reported during the event.
 - Around 24 MW load loss reported during the event at Chatra and Latehar by Jharkhand SLDC.

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

- NIL

Major elements tripped (प्रमुख ट्रिपिंग):

- 220 kV Daltonganj-Latehar
- 220 kV Daltonganj-Chatra-1

Network across the affected area (प्रभावित क्षेत्र का नक्शा)

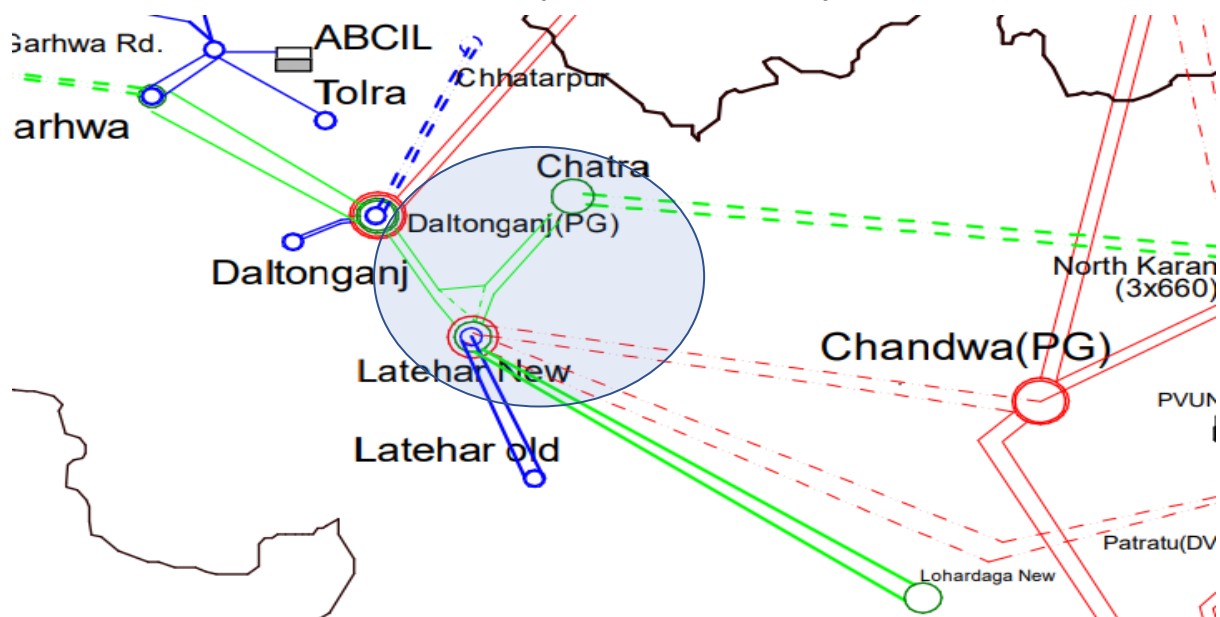


Figure 1: Network across the affected area

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

समय	नाम	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पीएमयू पर्यवेक्षण
18:23	220 kV Daltonagnj-Latehar-1	Daltonganj: B_N, 9.9 km, 5.3 kA	-	72 kV dip in B_ph voltage at Daltonganj
18:25	220 kV Daltonagnj-Chatra-1	Daltonganj: Y_B, 10.5 km, 4.8 kA, Ib: 4.8 kA	-	41 kV dip in Y_ph an 53 kV dip in B_ph voltage at Daltonganj

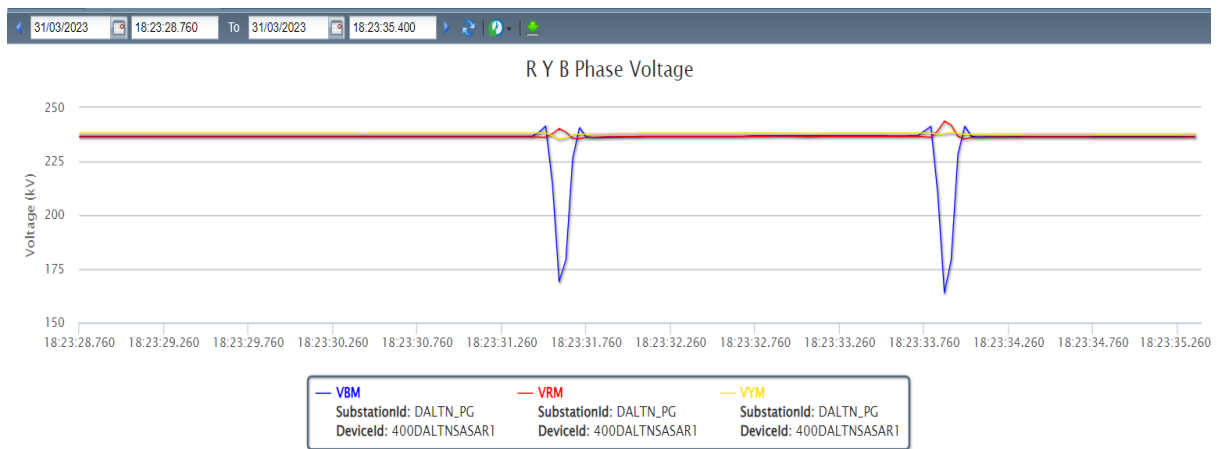


Figure 2: PMU snapshot of 400/220 kV Daltonganj S/s (18:23 Hrs)

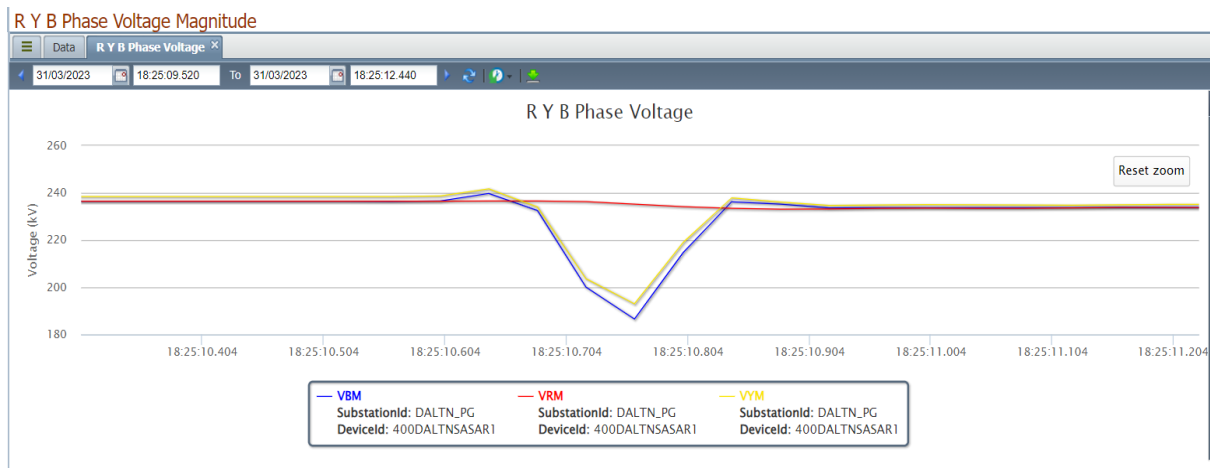


Figure 2: PMU snapshot of 400/220 kV Daltonganj S/s (18:25 Hrs)

Restoration (पूर्वावस्था की प्रप्ति)

Transmission/Generation element name	Restoration time
220 kV Daltonganj-Latehar-1	19:38
220 kV Latehar-Chatra-1	19:38
220 kV Daltonganj-Chatra-1	20:16

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

- 220 kV Daltonganj-Latehar-1 tripped at 18:23 Hrs due to B_N fault. A/r attempt was successful from Daltonganj only. However, line tripped again within reclaim time after 1.5 seconds.
- No A/r attempt was taken by Latehar for 220 kV Daltonganj-Latehar-1. JUSNL may explain.
- At 18:25 Hrs, 220 kV Daltonganj-Chatra-1 tripped due to Y_B_N fault. Consequently, Latehar and Chatra S/s became dead.

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

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

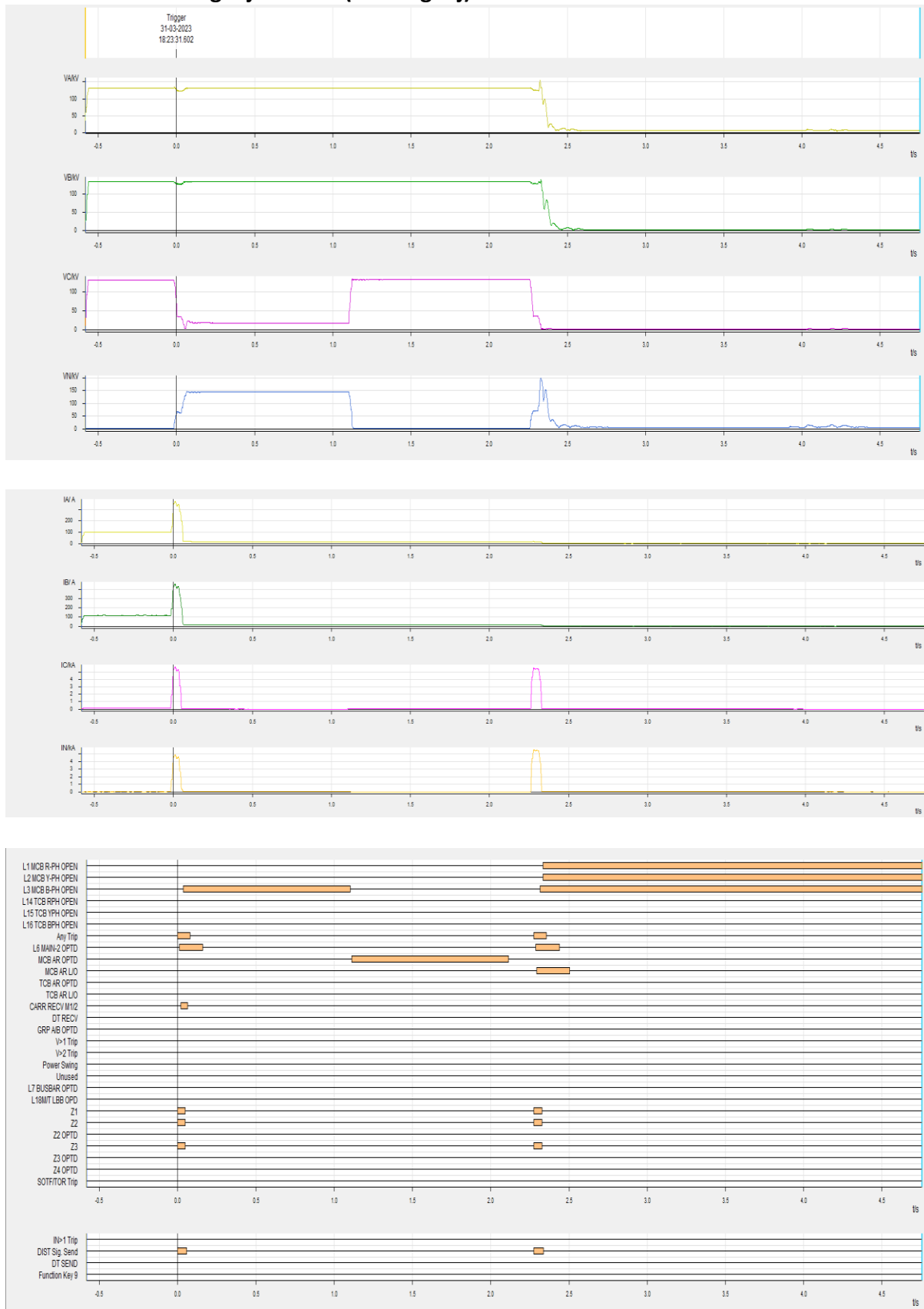
Status of Reporting (रिपोर्टिंग की स्थिति):

- DR/EL yet to be received from JUSNL.

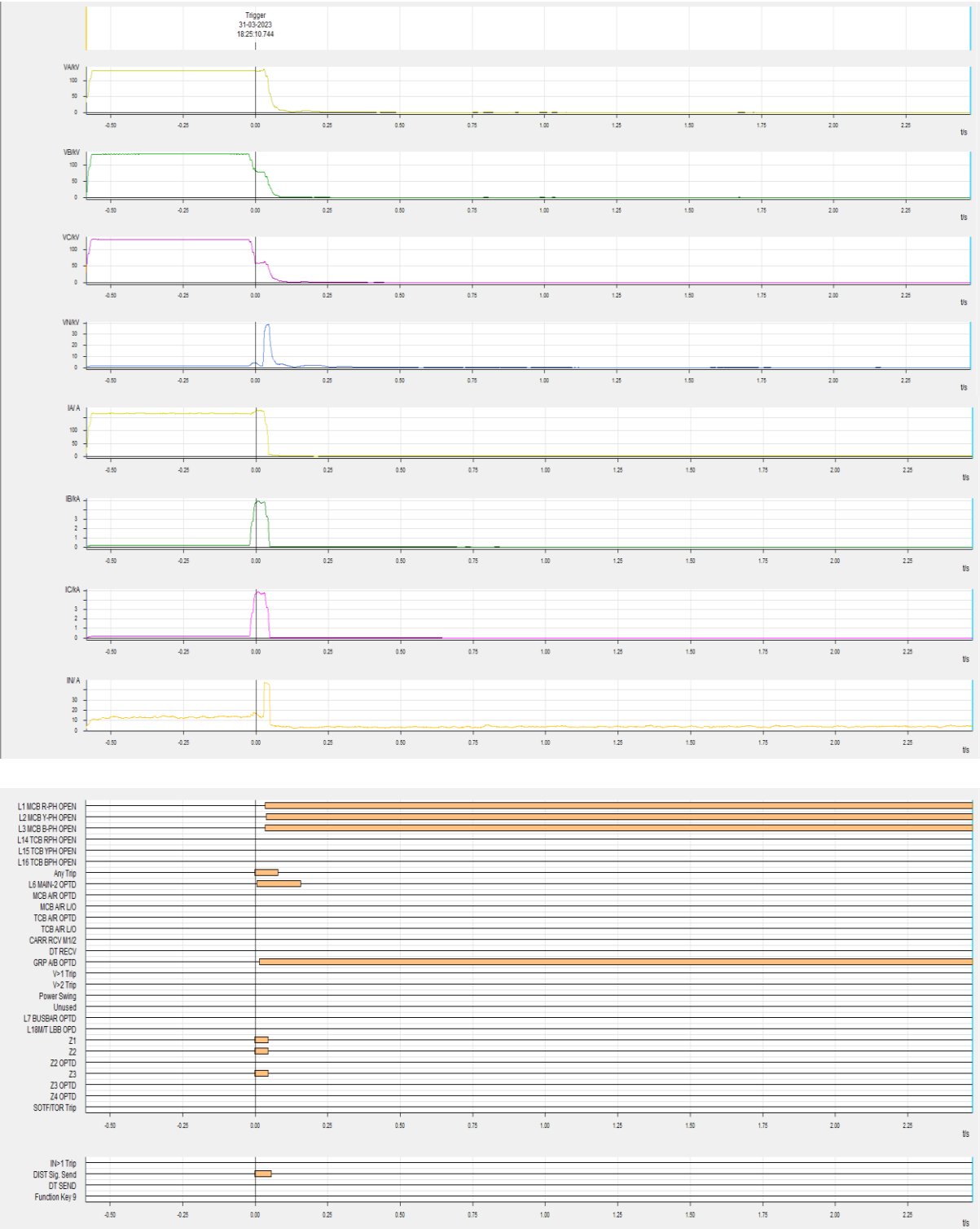
Annexure 1: Sequence of events recorded at ERLDC SCADA data at the time of the event
Sequence of Events not recorded at the time of event.

Annexure 2: DR recorded

DR of 220 kV Daltonganj-Latehar (Daltonganj)



DR of 220 kV Daltonganj-Chatra (Daltonganj)



घटना संख्या: 26-03-2023/1

दिनांक: 06-04-2023

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

1. Summary of the event (घटना का सारांश):

At 04:02 Hrs, 400 kV Rangpo-Dikchu tripped due to B_N fault. At the same time, 400 kV Teesta 3-Dikchu tripped from Teesta 3 end. This led to total power failure at Dikchu. There was no generation or load loss at Dikchu as no unit was running at that time.

- **Date / Time of disturbance:** 26-03-2023 at 04:02 hrs.
- **Event type:** GD - 1
- **Systems/ Subsystems affected:** 400 kV Dikchu S/s
- **Load and Generation loss.**
 - No generation or load loss occurred during the event.

2. Important Transmission Line/element if out (महत्वपूर्ण संचरण लाइने जो बंद हैं):

- NIL

3. Major elements tripped (प्रमुख ट्रिपिंग)

- 400 kV Teesta 3-Dikchu
- 400 kV Rangpo-Dikchu

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

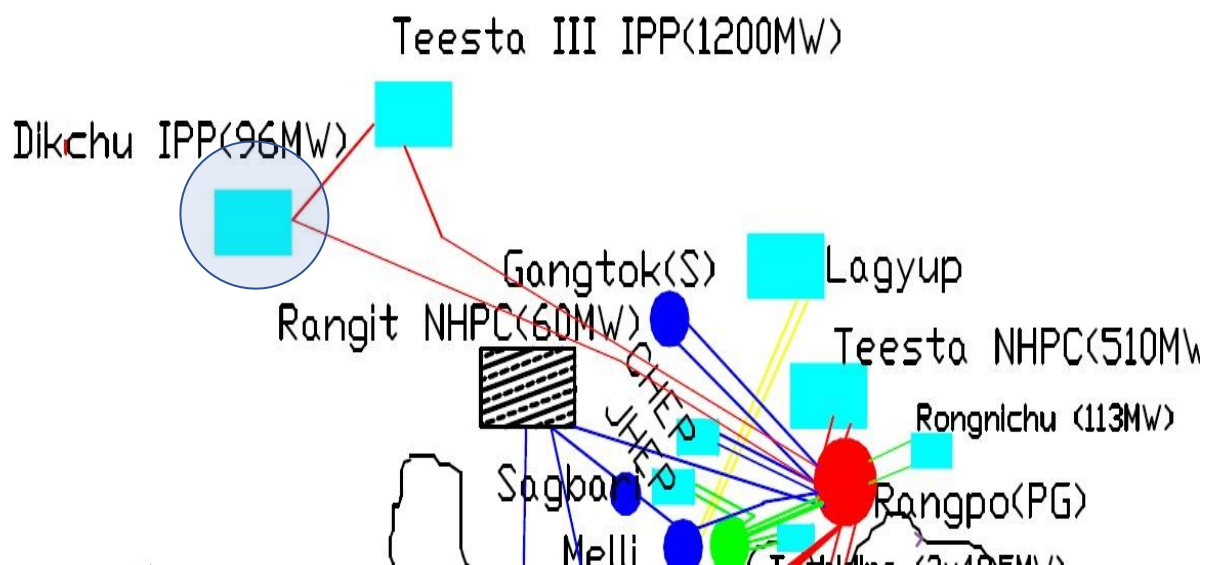


Figure 1: Network across the affected area

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

समय	नाम	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पीएमयू पर्यवेक्षण
04:02	400 kV Teesta 3-Dikchu	Teesta 3: B_N, 2.862 kA	Dikchu: Didn't trip	112 kV dip in B_ph voltage at Rangpo. Fault clearance time: 960 msec
	400 kV Rangpo-Dikchu	Rangpo: B_N, 33 km, A/r successful	Dikchu: B_N, Zone-2, 14.1 km, 1.33 kA	

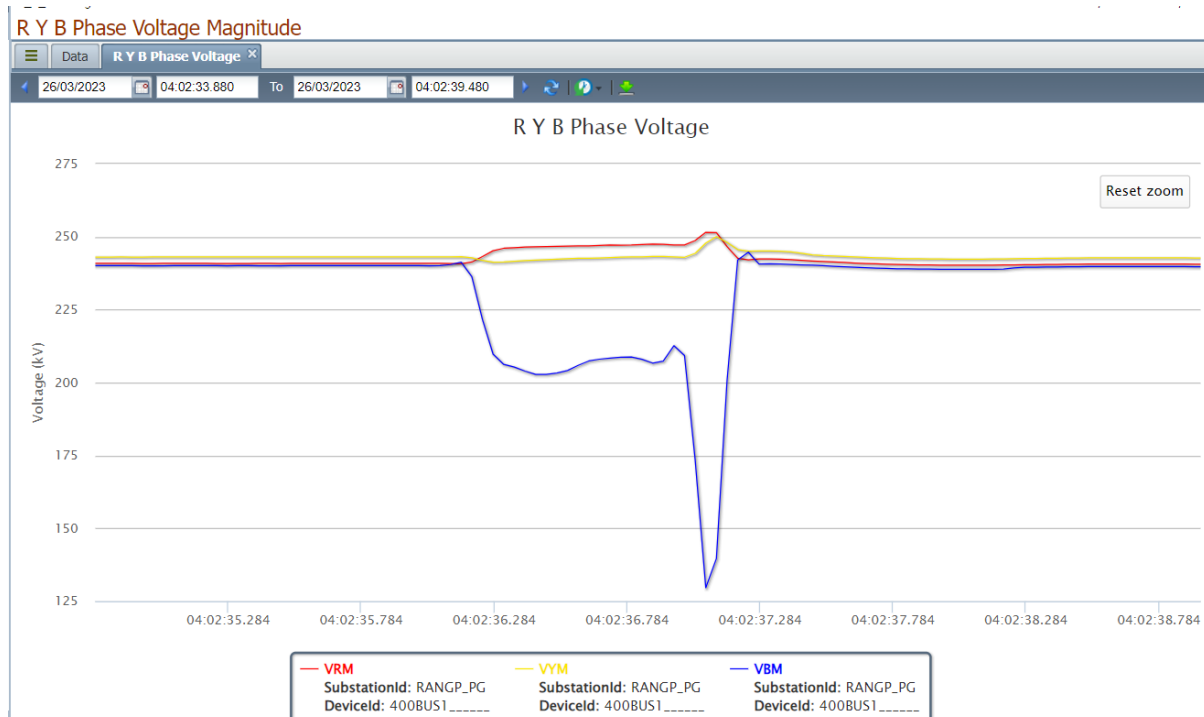


Figure 2: PMU Voltage snapshot of 400/220 kV Rangpo S/s

Figure 3: PMU snapshot of current in 400 kV Rangpo-Dikchu @ Rangpo

6. Restoration (पूर्वावस्था की प्रप्ति)

Transmission/Generation element name	Restoration time
400 kV Teesta 3-Dikchu	06:05
400 kV Rangpo-Dikchu	05:30

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

- A resistive fault struck B_ph of 400 kV Rangpo-Dikchu line. Fault was cleared after 960 msec when it came in Zone-1 of distance protection from both ends. A/r was successful at Rangpo end only.
- At Dikchu, B_ph breaker opened first, however, after 360 msec, other two phase also tripped at Dikchu. In previous tripping instance in August'22 also, this issue was highlighted. Dikchu may update.
- 400 kV Teesta 3-Dikchu sensed the same fault in Zone-2 from Teesta 3 end, however all three phases at Teesta 3 tripped instantaneously. It was also observed that zone settings of all zones are not as per ERPC protection philosophy. Teesta-3 may update on both issues.
- B_ph voltage at Teesta-3 of 400 kV Teesta 3-Dikchu touched 400 kV (phase voltage) during the fault, however no tripping command issued. O/V settings at Teesta-3 may be checked.

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

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

9. Status of Reporting (रिपोर्टिंग की स्थिति):

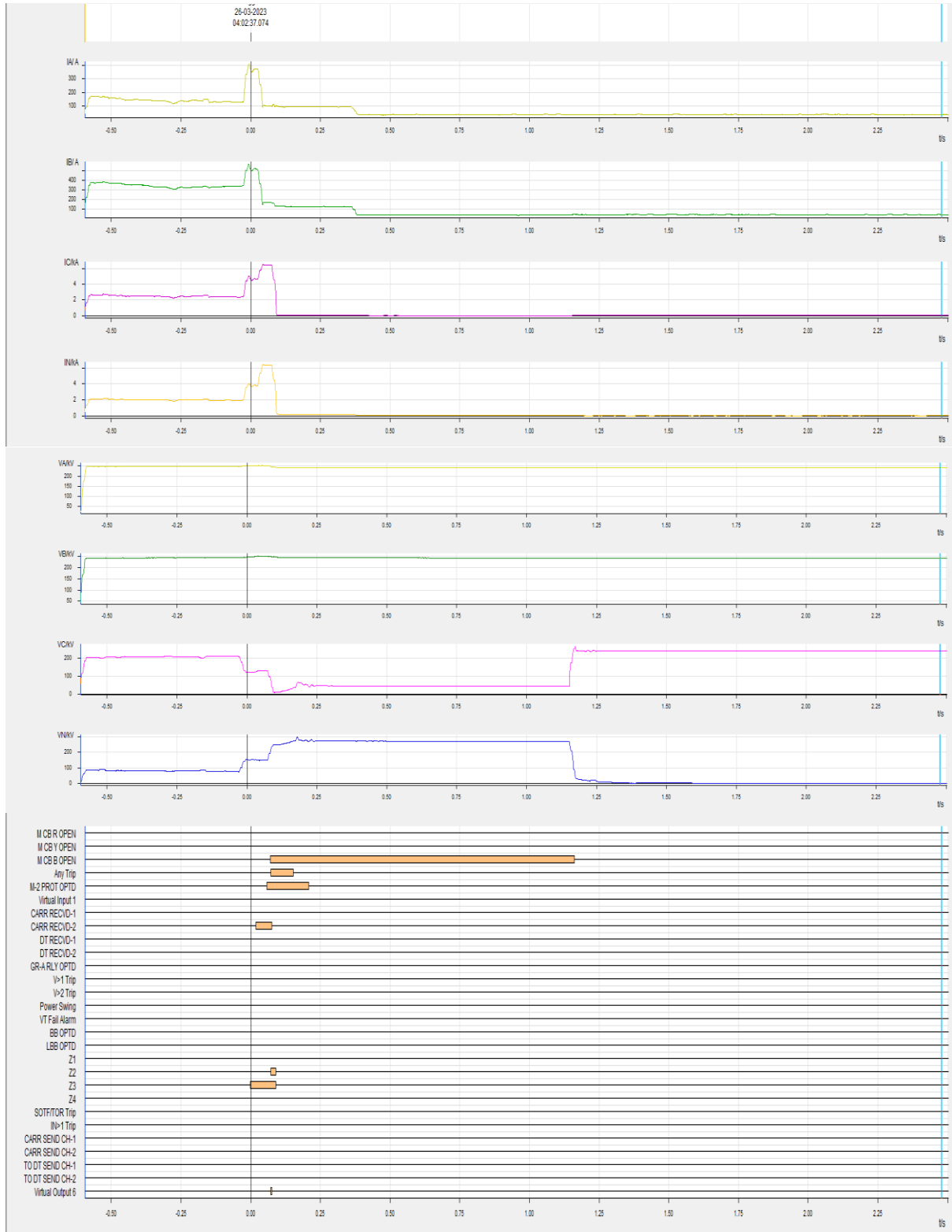
- DR/EL received from Teesta 3, Dikchu, PG ER-2

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

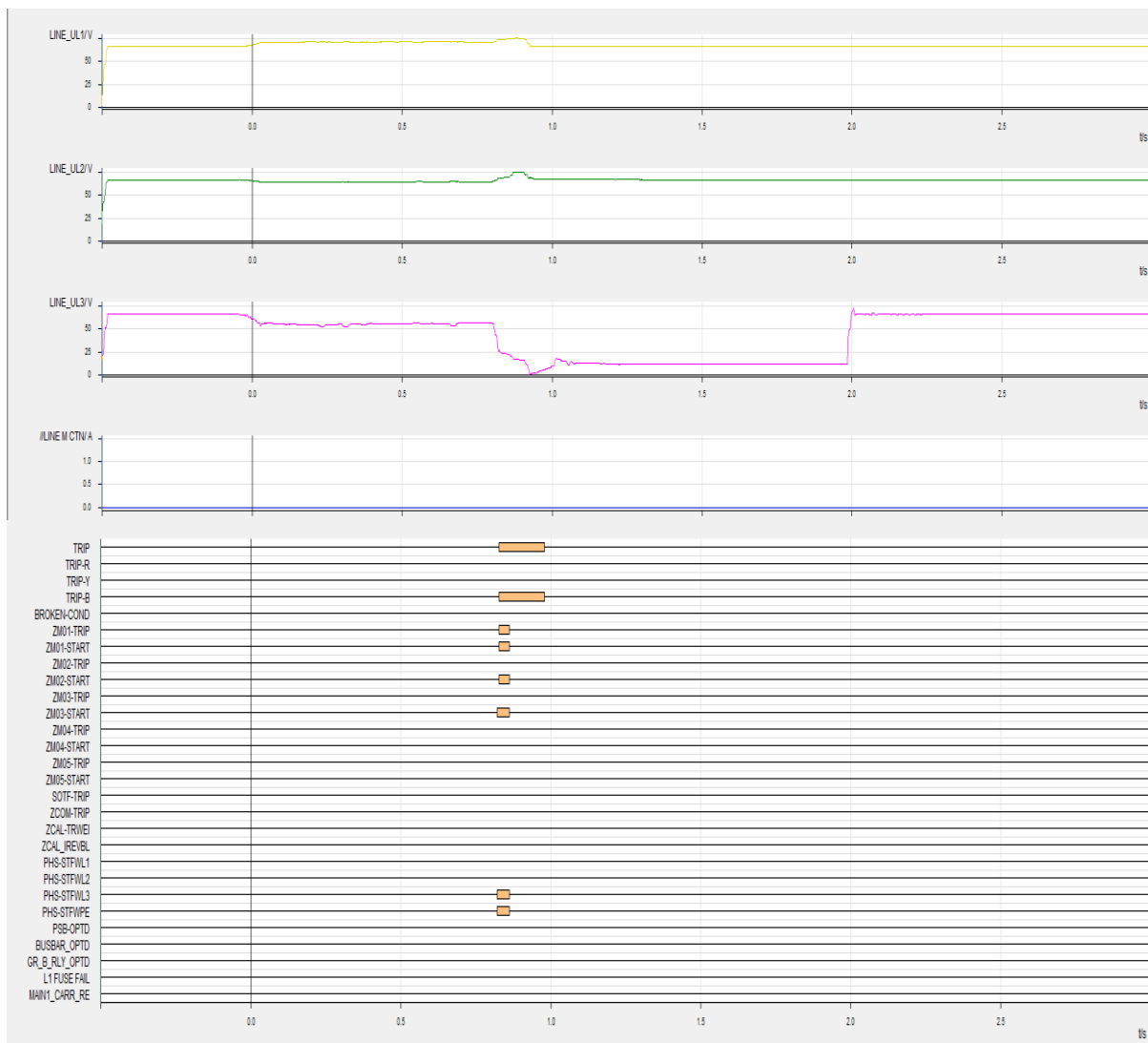
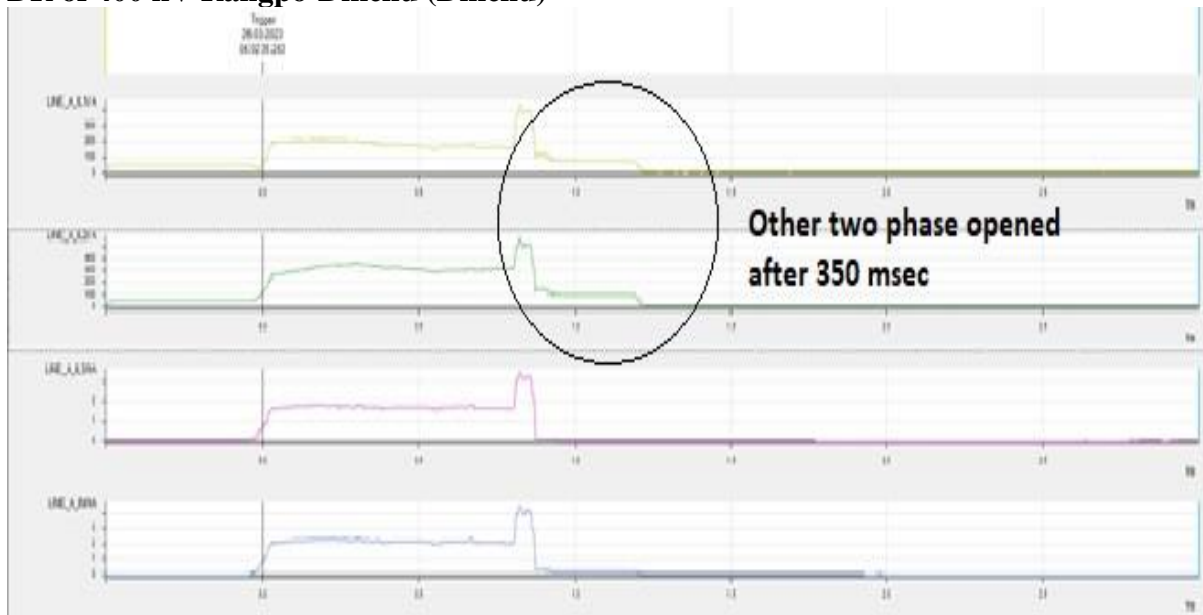
Sequence of Event not recorded at the time of event.

Annexure 2: DR recorded

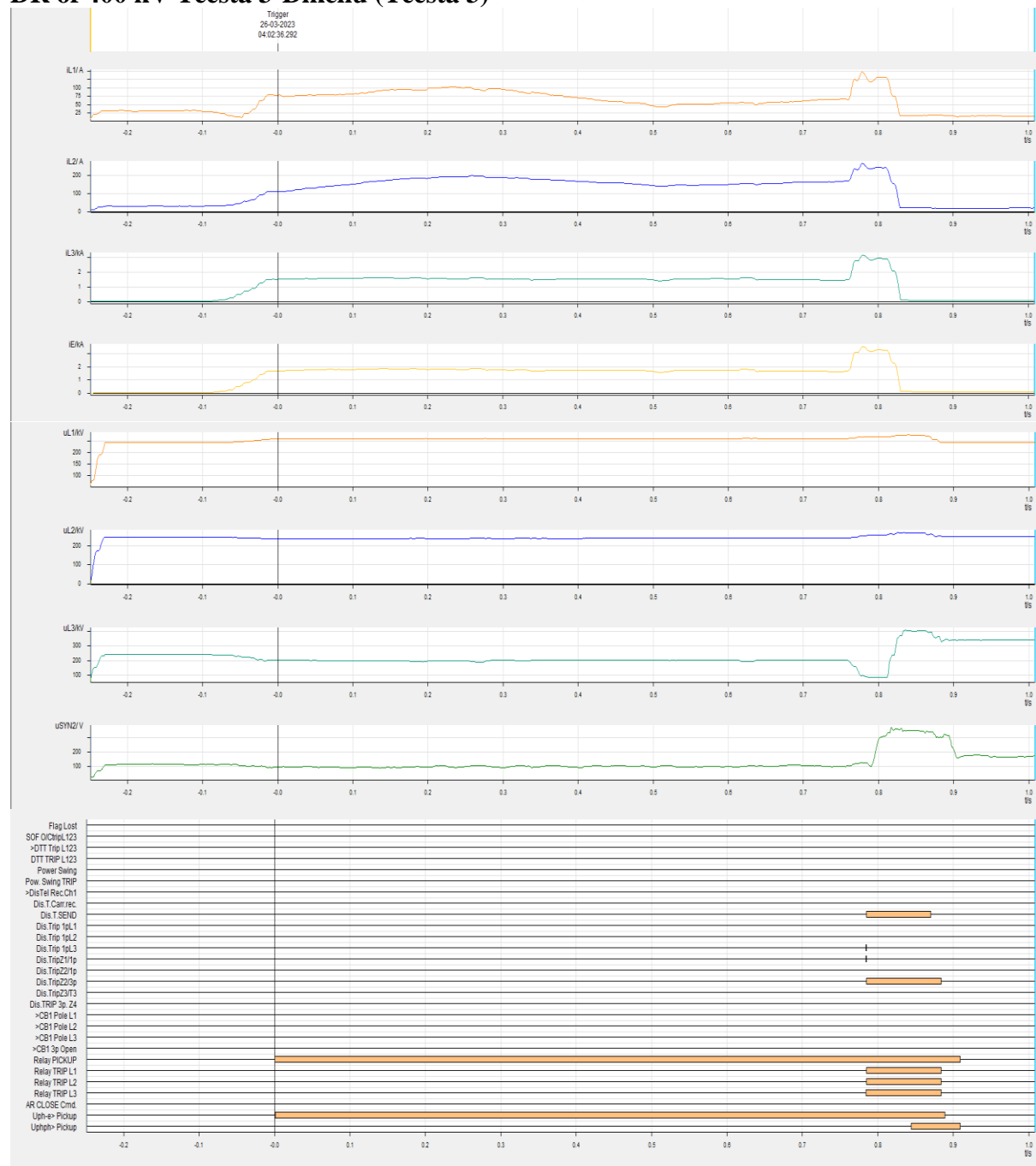
DR of 400 kV Rangpo-Dikchu (Rangpo)



DR of 400 kV Rangpo-Dikchu (Dikchu)



DR of 400 kV Teesta 3-Dikchu (Teesta 3)



Annexure B.5

REPORT ON TRIPPING OF 400KV BUS-4 AT BIHARSHARIF SS ON 21.03.2023 AT 05:49HRS.

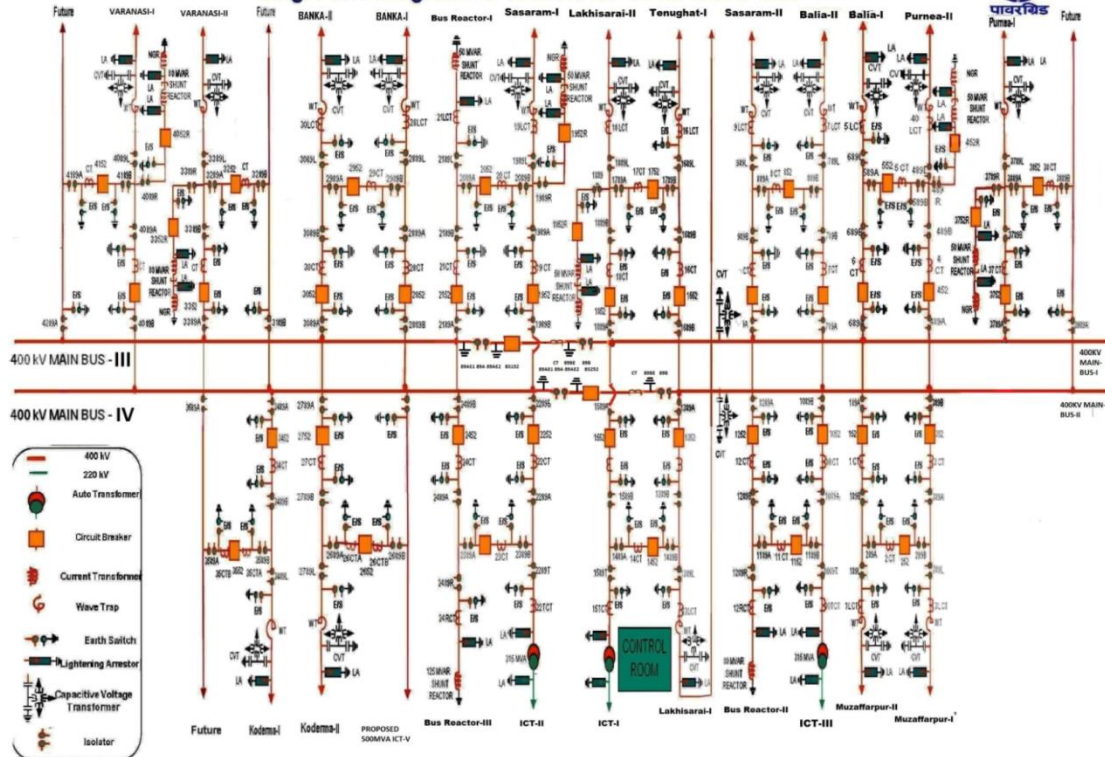
There was a persistent R-N fault in 400kV Biharsharif-Varanasi Ckt-2 at 05:59 hrs on 21.03.2023. The AR of main CB attempted after dead time of 01 second and due to persistent fault, 3-ph tripping was issued to Main as well as Tie CB. All 3-pole of Main CB opened. But due to non-opening of Y&B pole of Tie CB, the LBB of tie bay operated which resulted into tripping of 400kV Bus-4 as tie bay is directly connected to Bus-4 (Other side is future feeder). The Y & B-Pole of Tie CB got opened at 05.05.12 hrs i.e. after approx 35 sec of 3-ph trip command issuance.

Following signals were reported as per the DR and event:

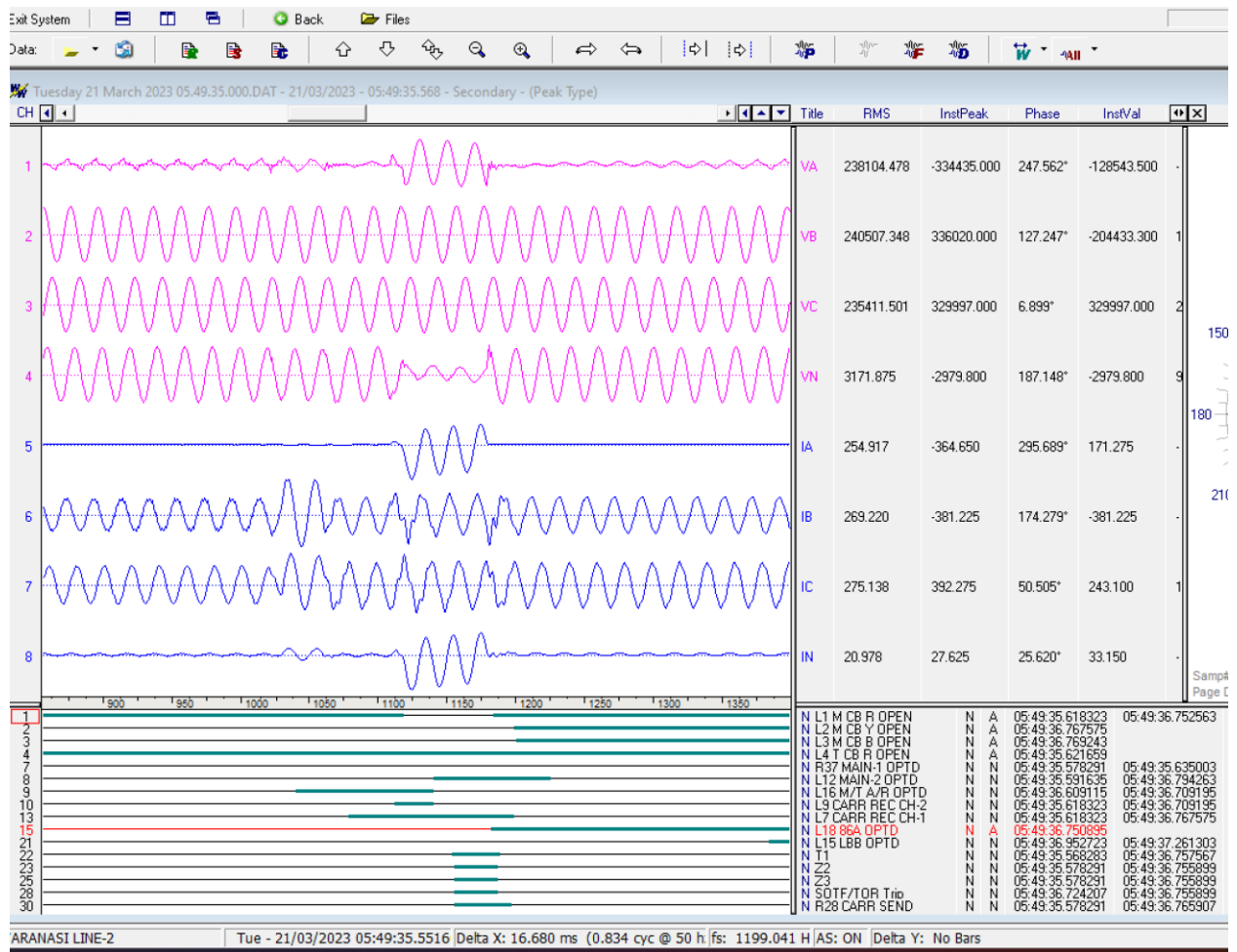
Time	Description
05:49:35:578	Main-1 Operated
05:49:35:618	Main CB R-ph open
05:49:35:621	Tie CB R-ph open
05:49:35	432CB CB Lockout Operated
05:49:35	432 CB-TC2 faulty
05:49:35	432 CB-TC1 faulty
05:49:36:609	M/T A/R operated
05:49:36:724	SOTF/TOR and A/R L/O operated & 86 A/B operated
05:49:36:770	Main CB Open
05:49:36:841	Tie LBB Re-trip command issued to Y & B pole
05:49:36:939	LBB Back-trip and consequently Bus-IV tripped
05:49:37	432CB Pole discrepancy operated
05:50:12	432 CB OPRN Lockout Reset
05:50:12	432 CB-TC2 Healthy
05:50:12	432 CB-TC1 Healthy
05:50:12	432 CB Open

SLD OF BIHARSHARIF

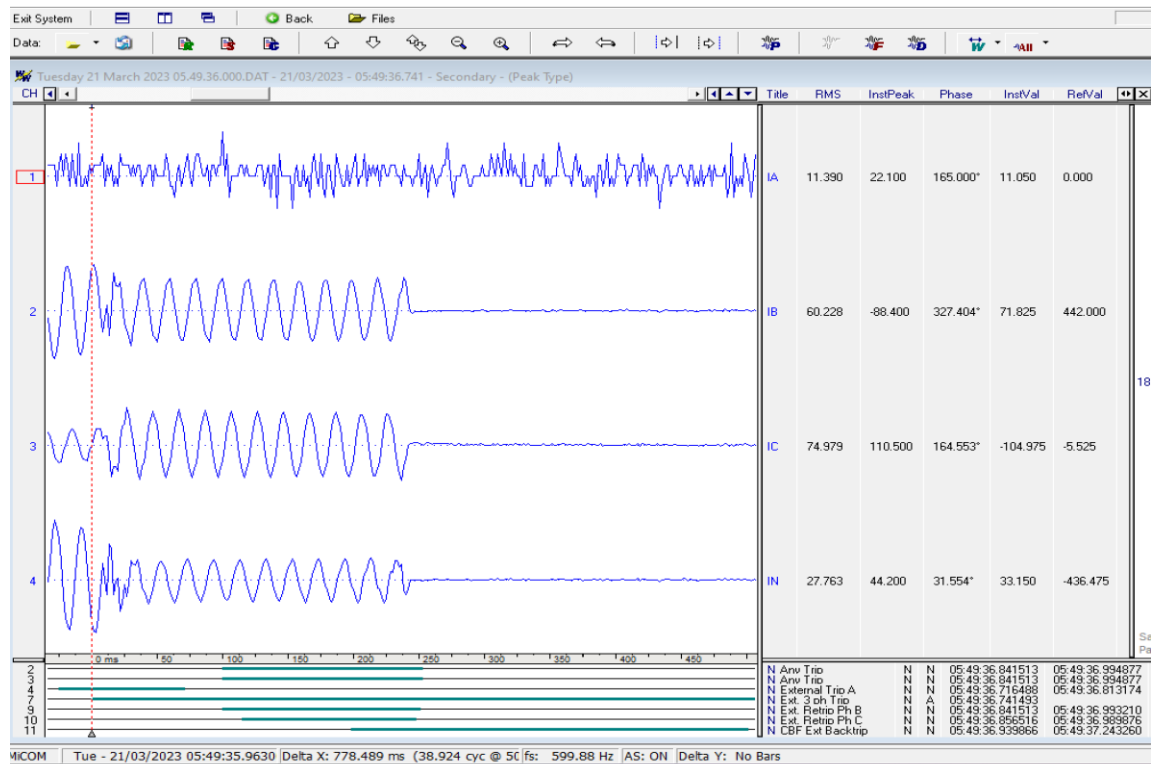
Power Grid Corporation of India Limited Single line diagram of 400/220 kV Bihar Sharif Substation




DR and Events:





























































































DR of Main-1 Relay



DR OF Tie LBB

21/03/23 05:49:36	21-Mar-2023 11:34:36: 968000000	 	BIHARSHARIF400	440	ZBR	VARANSI_LINE_1	BB1 PROTN. OPTD.
21/03/23 05:49:36	21-Mar-2023 11:34:36: 828000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	86B TRIP RLY HEALTHY
21/03/23 05:49:36	21-Mar-2023 11:34:36: 803000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	M2 DIST PROT RST
21/03/23 05:49:36	21-Mar-2023 11:34:36: 793000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	M1/2 SOTF RST
21/03/23 05:49:36	21-Mar-2023 11:34:36: 777000000	 	BIHARSHARIF400	433	CB	43352(F_VRNS7_BHRSF2)	OPEN
21/03/23 05:49:36	21-Mar-2023 11:34:36: 704000000	 	BIHARSHARIF400	433	CB	43352(F_VRNS7_BHRSF2)	CLOSE
21/03/23 05:49:36	21-Mar-2023 11:34:36: 792000000	 	BIHARSHARIF400	433	CB	43352RE_(F_33_LR3)	AR LOCKOUT RESET
21/03/23 05:49:36	21-Mar-2023 11:34:36: 780000000	 	BIHARSHARIF400	433	BIS	43389A(F_VRNS7_BHRSF2)	OPERATION PERMITTED
21/03/23 05:49:36	21-Mar-2023 11:34:36: 779000000	 	BIHARSHARIF400	433	IS	43389B(F_VRNS7_BHRSF2)	OPERATION PERMITTED
21/03/23 05:49:36	21-Mar-2023 11:34:36: 765000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	86A TRIP RLY OPT
21/03/23 05:49:36	21-Mar-2023 11:34:36: 764000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	86A TRIP RLY HEALTHY
21/03/23 05:49:36	21-Mar-2023 11:34:36: 756000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	86B TRIP RLY OPT
21/03/23 05:49:36	21-Mar-2023 11:34:36: 753000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	86B TRIP RLY UNHLTHY
21/03/23 05:49:36	21-Mar-2023 11:34:36: 753000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	86A TRIP RLY UNHLTHY
21/03/23 05:49:36	21-Mar-2023 11:34:36: 751000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	M1/2 SOTF OPTD
21/03/23 05:49:36	21-Mar-2023 11:34:36: 744000000	 	BIHARSHARIF400	433	CB	43352RE_(F_33_LR3)	AR LO OPTD
21/03/23 05:49:36	21-Mar-2023 11:34:36: 726000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	M2 DIST PROT OPTD
21/03/23 05:49:36	21-Mar-2023 11:34:36: 715000000	 	BIHARSHARIF400	433	CB	43352(F_VRNS7_BHRSF2)	AR OPERATION RESET
21/03/23 05:49:36	21-Mar-2023 11:34:36: 686000000	 	BIHARSHARIF400	433	CB	43352(F_VRNS7_BHRSF2)	CB SPRG DSCHG LOWAR
21/03/23 05:49:36	21-Mar-2023 11:34:36: 616000000	 	BIHARSHARIF400	433	CB	43352(F_VRNS7_BHRSF2)	AR OPTD
21/03/23 05:49:36	21-Mar-2023 11:34:36: 274000000	 	BIHARSHARIF400	432	CB	43252_TIE_FUTUR_VRNS7	TC 1 FAULTY
21/03/23 05:49:36	21-Mar-2023 11:34:36: 248000000	 	BIHARSHARIF400	432	CB	43252_TIE_FUTUR_VRNS7	TC 2 FAULTY
21/03/23 05:49:36	21-Mar-2023 11:34:35: 618000000	 	BIHARSHARIF400	432	CB	43252_TIE_FUTUR_VRNS7	BETWEEN
21/03/23 05:49:36	21-Mar-2023 11:34:35: 615000000	 	BIHARSHARIF400	433	CB	43352(F_VRNS7_BHRSF2)	BETWEEN
21/03/23 05:49:36	21-Mar-2023 11:34:35: 681000000	 	BIHARSHARIF400	432	CB	43252_TIE_FUTUR_VRNS7	CB LOCKOUT OPTD
21/03/23 05:49:36	21-Mar-2023 11:34:35: 671000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	M2 DIST PROT RST
21/03/23 05:49:36	21-Mar-2023 11:34:35: 652000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	M1 DIST PROT RST
21/03/23 05:49:36	21-Mar-2023 11:34:35: 608000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	M2 DIST PROT OPTD
21/03/23 05:49:36	21-Mar-2023 11:34:35: 603000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	M1 DIST PROT OPTD

21/03/23 05:50:12	21-Mar-2023 11:35:12: 808000000	 	BIHARSHARIF400	432	CB	43252_TIE_FUTUR_VRNS7	OPEN
21/03/23 05:50:12	21-Mar-2023 11:35:12: 850000000	 	BIHARSHARIF400	432	CB	43252_TIE_FUTUR_VRNS7	POL DSCRPNY OPTD RES
21/03/23 05:50:12	21-Mar-2023 11:35:12: 847000000	 	BIHARSHARIF400	432	CB	43252_TIE_FUTUR_VRNS7	TC 2 HEALTHY
21/03/23 05:50:12	21-Mar-2023 11:35:12: 838000000	 	BIHARSHARIF400	432	CB	43252_TIE_FUTUR_VRNS7	TC 1 HEALTHY
21/03/23 05:50:12	21-Mar-2023 11:35:12: 810000000	 	BIHARSHARIF400	433	LIS	43389L(F_VRNS7_BHRSF2)	OPERATION PERMITTED
21/03/23 05:50:12	21-Mar-2023 11:35:12: 810000000	 	BIHARSHARIF400	432	IS	43289B_TIE_FUTUR_VRNS7	OPERATION PERMITTED
21/03/23 05:50:12	21-Mar-2023 11:35:12: 810000000	 	BIHARSHARIF400	432	IS	43289A_TIE_FUTUR_VRNS7	OPERATION PERMITTED
21/03/23 05:50:12	21-Mar-2023 11:35:12: 783000000	 	BIHARSHARIF400	432	CB	43252_TIE_FUTUR_VRNS7	CB OPNN LOCKOUT RESET
21/03/23 05:49:39	21-Mar-2023 05:49:37: 600000000	 	BIHARSHARIF400	428	CB	42852(F_BANKA_BHRSF1)	CB COMPRESSOR ON
21/03/23 05:49:39	21-Mar-2023 05:49:36: 994000000	 	BIHARSHARIF400	428	CB	42852(F_BANKA_BHRSF1)	B PHASE OPEN
21/03/23 05:49:38	21-Mar-2023 05:49:36: 993000000	 	BIHARSHARIF400	428	CB	42852(F_BANKA_BHRSF1)	Y PHASE OPEN
21/03/23 05:49:38	21-Mar-2023 05:49:36: 993000000	 	BIHARSHARIF400	428	CB	42852(F_BANKA_BHRSF1)	R PHASE OPEN
21/03/23 05:49:38	21-Mar-2023 05:49:36: 976000000	 	BIHARSHARIF400	434	LD	KODERMA_LINE_1	AR UNSUCCESSFUL
21/03/23 05:49:37	21-Mar-2023 11:34:38: 530000000	 	BIHARSHARIF400	432	CB	43252_TIE_FUTUR_VRNS7	POLE DSCRPNY OPTD
21/03/23 05:49:36	21-Mar-2023 11:34:37: 297000000	 	BIHARSHARIF400	440	CB	44052(F_VRNS7_BHRSF1)	OPERATION PERMITTED
21/03/23 05:49:36	21-Mar-2023 11:34:37: 295000000	 	BIHARSHARIF400	440	ZBR	VARANSI_LINE_1	BB1 PROTN RESET
21/03/23 05:49:36	21-Mar-2023 11:34:37: 297000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	DT SEND CH 1/2 RST
21/03/23 05:49:36	21-Mar-2023 11:34:37: 278000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	86B TRIP RLY HEALTHY
21/03/23 05:49:36	21-Mar-2023 11:34:37: 263000000	 	BIHARSHARIF400	432	CB	43252_TIE_FUTUR_VRNS7	LBB RESET
21/03/23 05:49:36	21-Mar-2023 11:34:37: 151000000	 	BIHARSHARIF400	422	CB	42252(FEB_ICT2_P)	TC 1 FAULTY
21/03/23 05:49:36	21-Mar-2023 11:34:37: 4000000	 	BIHARSHARIF400	440	CB	44052(F_VRNS7_BHRSF1)	OPEN
21/03/23 05:49:36	21-Mar-2023 11:34:36: 996000000	 	BIHARSHARIF400	428	CB	42852(F_BANKA_BHRSF1)	OPEN
21/03/23 05:49:36	21-Mar-2023 11:34:37: 7000000	 	BIHARSHARIF400	440	IS	44089A(F_VRNS7_BHRSF1)	OPERATION PERMITTED
21/03/23 05:49:36	21-Mar-2023 11:34:37: 7000000	 	BIHARSHARIF400	440	BIS	44089B(F_VRNS7_BHRSF1)	OPERATION PERMITTED
21/03/23 05:49:36	21-Mar-2023 11:34:37: 1000000	 	BIHARSHARIF400	428	CB	42852(F_BANKA_BHRSF1)	TC 1 FAULTY
21/03/23 05:49:36	21-Mar-2023 11:34:37: 998000000	 	BIHARSHARIF400	428	BIS	42889B(F_BANKA_BHRSF1)	OPERATION PERMITTED
21/03/23 05:49:36	21-Mar-2023 11:34:37: 6000000	 	BIHARSHARIF400	428	IS	42889A(F_BANKA_BHRSF1)	OPERATION PERMITTED
21/03/23 05:49:36	21-Mar-2023 11:34:36: 974000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	DT SEND CH 1/2
21/03/23 05:49:36	21-Mar-2023 11:34:36: 966000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	86B TRIP RLY UNHLTHY
21/03/23 05:49:36	21-Mar-2023 11:34:36: 960000000	 	BIHARSHARIF400	432	CB	43252_TIE_FUTUR_VRNS7	LBB OPERATED
21/03/23 05:49:36	21-Mar-2023 11:34:36: 994000000	 	BIHARSHARIF400	434	CB	43452(F_KODRM_BHRSF1)	OPEN
21/03/23 05:49:36	21-Mar-2023 11:34:36: 999000000	 	BIHARSHARIF400	422	CB	42252(FEB_ICT2_P)	OPEN
21/03/23 05:49:36	21-Mar-2023 11:34:37: 4000000	 	BIHARSHARIF400	434	IS	43489B(F_KODRM_BHRSF1)	OPERATION PERMITTED
21/03/23 05:49:36	21-Mar-2023 11:34:37: 4000000	 	BIHARSHARIF400	434	BIS	43489A(F_KODRM_BHRSF1)	OPERATION PERMITTED
21/03/23 05:49:36	21-Mar-2023 11:34:36: 972000000	 	BIHARSHARIF400	434	CB	43452(F_KODRM_BHRSF1)	AR LO OPTD
21/03/23 05:49:36	21-Mar-2023 11:34:37: 610000000	 	BIHARSHARIF400	425	XFMR_P FEB_ICT4_P(PRIMARY)	SLCTD VT FUSE OK	
21/03/23 05:49:36	21-Mar-2023 11:34:37: 9000000	 	BIHARSHARIF400	422	IS	42289A(FEB_ICT2_P)	OPERATION PERMITTED
21/03/23 05:49:36	21-Mar-2023 11:34:37: 9000000	 	BIHARSHARIF400	422	BIS	42289B(FEB_ICT2_P)	OPERATION PERMITTED
21/03/23 05:49:36	21-Mar-2023 11:34:36: 994000000	 	BIHARSHARIF400	422	CB	42252(FEB_ICT2_P)	TC 2 FAULTY
21/03/23 05:49:36	21-Mar-2023 11:34:37: 8000000	 	BIHARSHARIF400	425	XFMR_P FEB_ICT4_P(PRIMARY)	SLCTD VT FUSE FL ALM	
21/03/23 05:49:36	21-Mar-2023 11:34:36: 990000000	 	BIHARSHARIF400	425	BIS	42589B(FEB_ICT4_P)	OPERATION PERMITTED
21/03/23 05:49:36	21-Mar-2023 11:34:36: 988000000	 	BIHARSHARIF400	425	CB	42552(FEB_ICT4_P)	OPEN
21/03/23 05:49:36	21-Mar-2023 11:34:36: 990000000	 	BIHARSHARIF400	425	IS	42589A(FEB_ICT4_P)	OPERATION PERMITTED
21/03/23 05:49:36	21-Mar-2023 11:34:36: 968000000	 	BIHARSHARIF400	440	ZBR	VARANSI_LINE_1	BB1 PROTN. OPTD.
21/03/23 05:49:36	21-Mar-2023 11:34:36: 828000000	 	BIHARSHARIF400	433	ZBR	VARANSI_LINE_2	86B TRIP RLY HEALTHY

Tie CB Details:

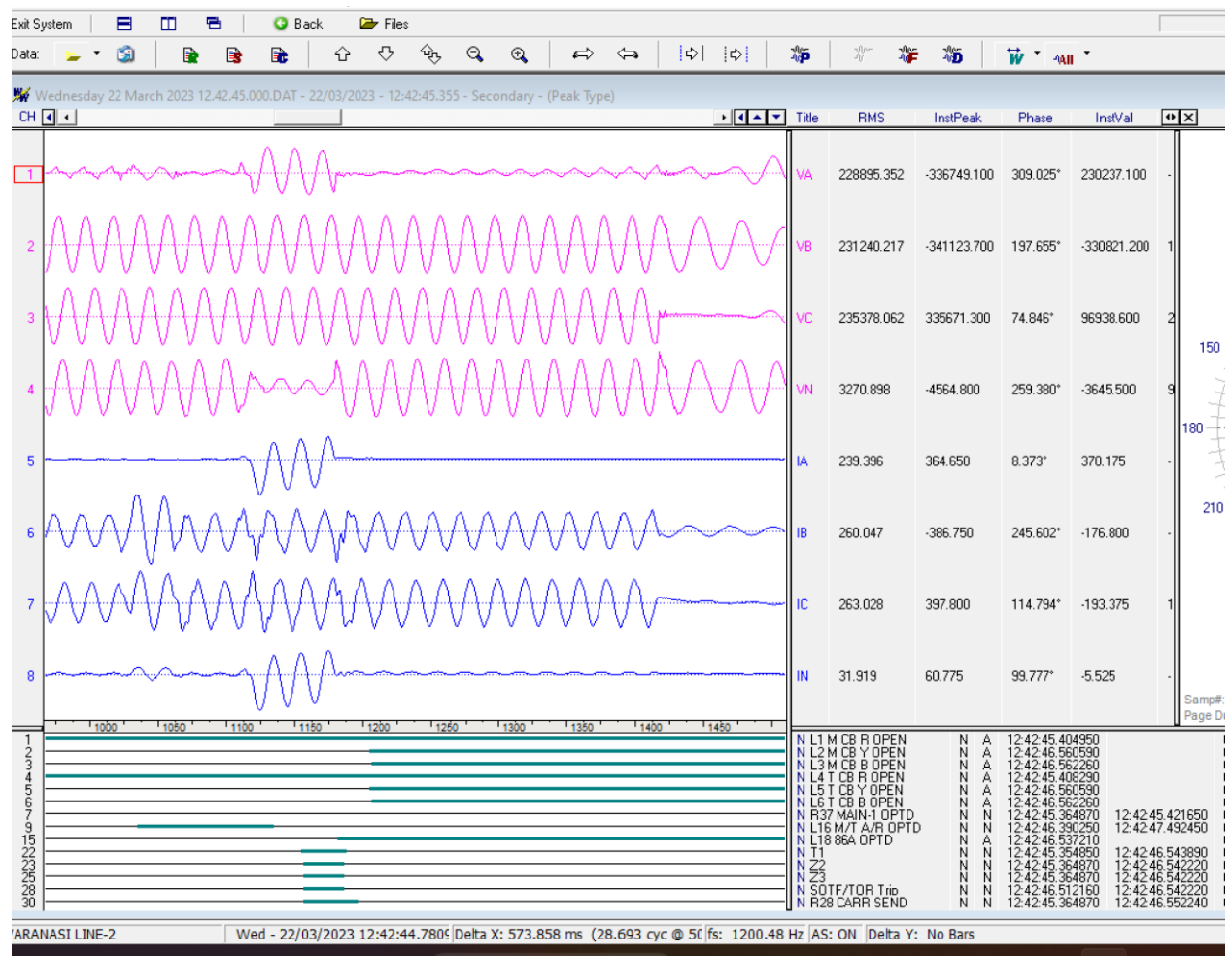
Make-SIEMENS, TYPE-3AP3FI, YOM:2012

Testing of Tie CB:

After the incident, operational checks of Tie CB was carried out and found operating properly. Timing Test and DCRM Test have were performed and results were in order. The PD test for open and close operation were also checked for all phases and found OK.

Protection checks and Transplay of Fault:

On 22.03.2023, S/D of Line was availed for rectification of Transmission Line defects. During this S/D, the operation of Tie Circuit Breaker through operation of Protection system was carried out and found operating normal. The fault during the Bus tripping incident was also transplayed through Relay test kit and the operation of Main and Tie CB was found OK on A/R attempt on persistent fault. Tripping of CB through protection circuit of 1-phase tripping Relay, Group trip relay, A/R L/O relay were also checked and found OK.



DR after Transplay of the same fault

Issue found during CB Wiring checks:

Upon ensuring that the CB is tripping through all the protection circuits, it was suspected for any issue in CB panel side. Not opening of CB even after PD operation (as per SOE) during the incident also indicating the same.

While analyzing the SOE, it was observed that the signal “CB LOCKOUT OPTD” has come and also TC1 & TC2 faulty has appeared after R-pole opening of Tie CB. This signal was back traced from BCU to CB panel and it was found that this has been taken from “K10” contactor of CB MB. The “K10” contactor will normally remain in pick-up condition and its “NO” contact has been used for post close TC supervision circuit as well as TC1 & TC2 tripping circuit.

The wires terminated at terminals of Density monitor of all three phases were checked physically and by removing it from terminal. All the wires were found fixed in the terminal. However one of the wires connected at terminal no 21 of B-phase density monitor terminal was found loose. While removing wire from terminal 21 of any Density Monitor contact, the same SOE of “CB LOCKOUT OPTD” and “TC1 & TC2 faulty” has been observed. It is suspected that due to non-proper contact issue of wires terminated at Density monitor contacts, the “K10” contactor has dropped out intermittently, which caused for non-opening of CB through both TC1 and TC2 circuits.



CONTACT GEOMETRY OF S1 & S16 SWITCH

Y1 - CLOSING SOLENOID
Y3, Y4 - OPENING SOLENOID

CLOSING	ANTI-PUMPING	ANTI-PUMPING	ANTI-PUMPING	TRIP SYNCHRONISING
13, 14 (1)	13, 14 (1)	13, 14 (1)	13, 14 (1)	13, 14 (1)
21, 22 (1)	21, 22 (1)	21, 22 (1)	21, 22 (1)	21, 22 (1)
31, 32 (1)	31, 32 (1)	31, 32 (1)	31, 32 (1)	31, 32 (1)
41, 42 (1)	41, 42 (1)	41, 42 (1)	41, 42 (1)	41, 42 (1)
51, 52 (1)	51, 52 (1)	51, 52 (1)	51, 52 (1)	51, 52 (1)
61, 62 (1)	61, 62 (1)	61, 62 (1)	61, 62 (1)	61, 62 (1)
71, 72 (1)	71, 72 (1)	71, 72 (1)	71, 72 (1)	71, 72 (1)
81, 82 (1)	81, 82 (1)	81, 82 (1)	81, 82 (1)	81, 82 (1)
91, 92 (1)	91, 92 (1)	91, 92 (1)	91, 92 (1)	91, 92 (1)
101, 102 (1)	101, 102 (1)	101, 102 (1)	101, 102 (1)	101, 102 (1)

NOTE: WRITING IN THE DOTTED LINES INDICATE THE WIRING CIRCUITS INSIDE THE CONTROL CURBIC (A, B, C)

- K77 - AUXILIARY CONTACTOR FOR MANUAL TRIP
- 10/11/12 - LOCKING LAMP ON/OFF/SPRING CHARGE
- S20/S21 - ON/OFF PUSH BUTTON
- F10 - DC MCB
- S15 - LOCAL/REMOTE SWITCH
- K18 - ON DELAY TIMER FOR EXTENDED TRIPPLE POLE OPERATION
- D4 - DENSITY MONITOR

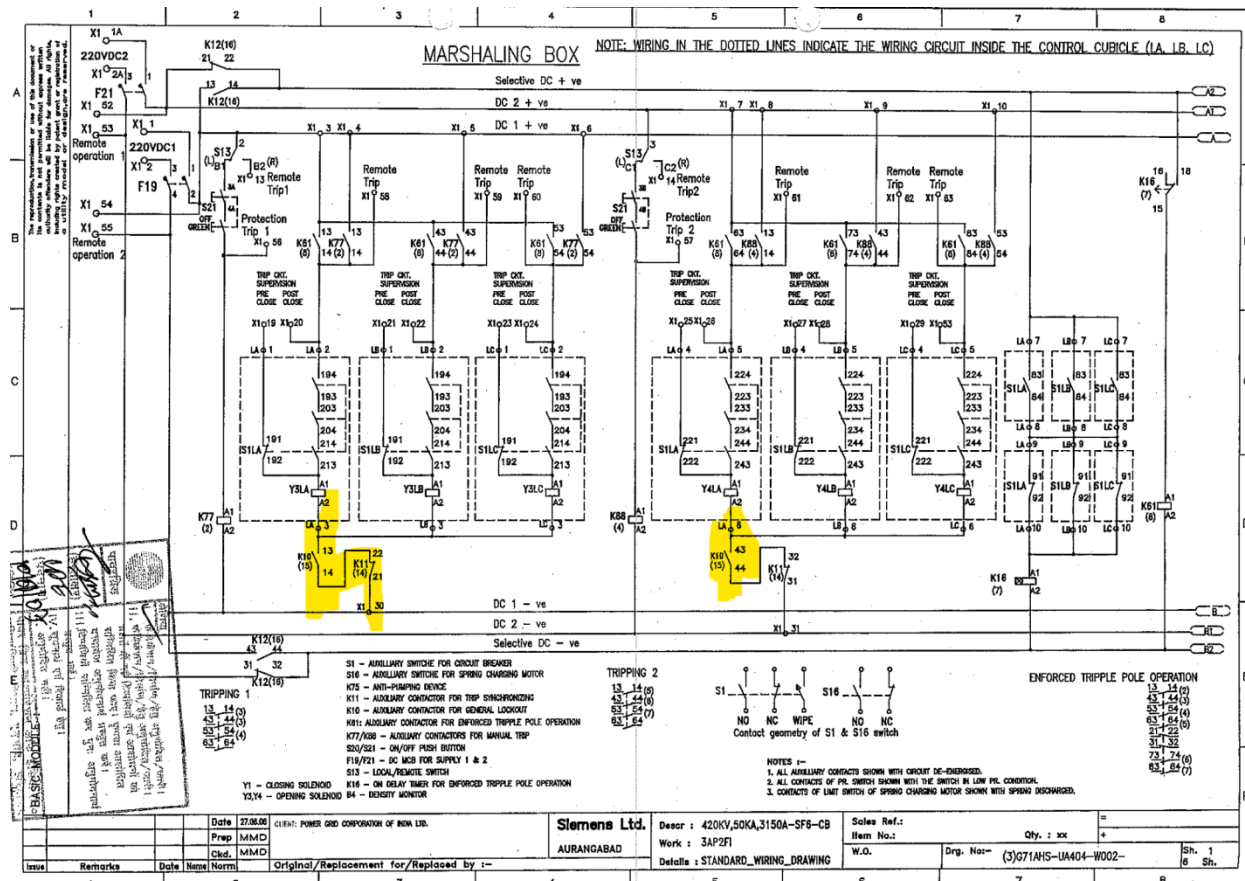
NOTES :-

- ALL AUXILIARY CONTACTS SHOWN WITH CIRCUIT ARE DE-ENERGISED.
- ALL CONTACTS OF P.S. SWITCH SHOWN WITH THE SWITCH IN LOW P.S. POSITION.
- CONTACTS OF LAMP SWITCH OF SPRING CHARGING MOTOR SHOWN WITH SPRING DISCHARGED.

BASIC MODULE : :-

Date	27/10/01	Drawn	27/10/01	Checked	27/10/01	Approved	27/10/01
Prep	MMD	Drawn	MMD	Checked	MMD	Approved	MMD
Rev	1	Rev	1	Rev	1	Rev	1
Remarks	Original/Replacement for/Replaced by :-						
Issue	1	Issue	1	Issue	1	Issue	1

Siemens Ltd.	Desec : 420KV, 50KA, 3150A-SF6-G8	Scale Ref. :	Qty. xx	Sh. 2
AURANGABAD	Work : 3AF2FI	Item No. :		Sh. 8
	Details : STANDARD WIRING DRAWING	Dwg. No. :-	(3)G71AH5-UM404-W002-	



Measures taken for preventing such incidents:

- 1) All the terminal contacts and wire lugs connected at Density Monitor terminal and contactors haven been cleaned and tightened properly and CRC has been applied.
- 2) 25-30 operations of CB and AR testing in all phases has been checked and found operating successfully as per the scheme.

Restoration: 400 kV Bus-4 was taken into service on 21.03.2023 at 07.51 Hrs after isolating the Tie CB.

Tie CB taken into service on 22.03.2023 at 20.41 Hrs after aforesaid testing and checking works.

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

Sl. No.	LINE NAME	TRIP DATE	TRIP TIME	RESTORATION DATE	RESTORATION TIME	Relay Indication LOCAL END	Relay Indication REMOTE END	Reason	Fault Clearance time in msec	Remarks	DR Configuration Discrepancy	DR/EL RECEIVED FROM LOCAL END	UTILITY RESPONSE	
1	400 KV MEERAMUNDALI-NEW DUBURI-2	03-03-2023	07:00	03-03-2023	08:21	Meeramundali: DT received	New Duburi: Didn't trip	No fault	NA	OPTCL may explain.		Yes	NA	Binary output got high and DT extended to Meramundali. Issue resolved now.

2	220 KV SUBHASGR AM(PG)- BANTALA-1	09-03-2023	04:25	09-03-2023	04:43	Subhshgram: Didn't trip	Bantala: DT received	No fault	NA	Problem in DTPC panel at Bantala. WBSETCL		NA	Yes	Card of ABB make DTPC module faulty. Presently, DT signal wire kept open.
3	220 KV SUBHASGR AM(PG)- BANTALA-1	09-03-2023	18:42	09-03-2023	18:56	Subhshgram: Didn't trip	Bantala: DT received	No fault	NA			NA	Yes	
4	220 KV SUBHASGR AM(PG)- BANTALA-1	10-03-2023	12:07	10-03-2023	12:50	Subhshgram: Didn't trip	Bantala: DT received	No fault	NA			NA	Yes	
5	220 KV CHANDIL- RANCHI-1	15-03-2023	13:40	15-03-2023	14:02	Chandil: AR successful	Ranchi: B_N, Zone- 2, 84.5 km, 2.15 kA	B- Earth	350	Tripped in Zone-2 time from Ranchi	Only cfg file uplo aded from Chan dil	Yes	No	Carrier signal not sent from Chandil. JUSNL to check the issue
6	220 KV DALTONGA NJ- LATEHAR(J USNL)-2	16-03-2023	14:52	16-03-2023	16:26		Latehar: R_N, Zone- 1, 1.78 kA	R-Earth	100	Three phase tripping at Latehar for single phase fault. A/r successful from Daltonganj		No	Yes	A/r not working at Latehar. JUSNL to identify and rectify the issue

7	400 KV JAKKANPUR(BH)- PATNA-2	17-03-2023	14:54	17-03-2023	15:36	Jakkanpur: DT received	Patna: Didn't trip	No fault	NA	PG ER-1 may explain.		No	NA	PLCC card issue. PLCC panel belongs to BGCL. Expected to be rectified by next month
8	220 KV RAJARHAT- BARASAT-1	19-03-2023	14:49	19-03-2023	23:21	Rajarhat: DT received	Barasat: Master trip operated	No fault	NA	R_ph control cable monitoring gas pressure at Barasat was faulty, which led to energization of master trip at Barasat and DT sent to remote end		Yes	NA	Control cable used for GAS status monitoring (LOW, LOCK-OUT) of Line side Busduct chamber damaged in cable gland which causes operation of K27 contractor used for DT send to far end and energisation of master trip relay of own bay. Resolved

9	400 KV PPSP-BIDHANNA GAR-1	19-03-2023	21:37	19-03-2023	22:58	PPSP: Didn't trip	Bidhannagar: O/V St.1	O/V St.1	NA	Tripped from Bidhannagar on O/V St.1. As per DR, voltage touched 255 kV in Y_ph. However, PMU voltage at Durgapur was 236 kV in Y_ph		No	Yes	O/V st. 1 appeared at Bidhannagar
10	400 KV JAKKANPUR(BH)-PATNA-2	20-03-2023	12:11	20-03-2023	13:22	Jakkanpur: DT received	Patna: Didn't trip	No fault	NA	PG ER-1 may explain.		No	NA	PLCC card issue. PLCC panel belongs to BGCL. Expected to be rectified by next month
11	400 KV BARIPADA-JAMSHEDPUR-1	23-03-2023	16:04	23-03-2023	16:28	Baripada: Didn't trip	Jamshedpur: DT received	No fault	NA	Powergrid may explain		NA	No	DT extended during shutdown work at Baripada in its dia element
12	220KV RANCHI-HATIA-1	26-03-2023	12:31	26-03-2023	15:38	Ranchi: B_N, 6.75 km, 9.6 kA , A/r successful	Hatia: B_N, 4.10 kA	B-Earth	100	Three phase tripping at Hatia		No	Yes	PLCC not working at Hatia. DTPC under procurement

13	220 KV-NEW MELLI- TASHIDING- 1	29-03-2023	17:58	29-03-2023	18:38	New Melli: R_Y, Zone-2, 21.02 km, Ir = 5.74 kA, Iy = 5.743 kA		R-Y	350	Tripped in Zone-2 time from New Melli		Yes	No	Carrier not received at New Melli
----	---	------------	-------	------------	-------	---	--	-----	-----	--	--	-----	----	--------------------------------------

Annexure C.2

SL NO	MONTH	UTILITY	ELEMENT	DETAILS OF ELEMENT	REMARKS
1	OCC_MAR_2023	NTPC		NTPC Barh Stage Unit #2, 24 kV, 660 MW is yet to be synchronized	Data required
2	OCC_MAR_2023	NTPC	GT(3*260MVA)	400kV GT#2 of NTPC Barh	Data required
3	OCC_MAR_2023	BGCL	ICT-1	400/220/33kV ICT 1 500MVA at Naubatpur SS	Data required
4	OCC_MAR_2023	OPTCL	T/L	400 kV GMR - Meramundali-B S/C Line after LILO work of 400 kV GMR - Meramundali-A Line at Meramundali-B SS	Data required
5	OCC_MAR_2023	OPTCL	T/L	132kV 2 PH S/C LINE, 132kV GSS, KAMAKHYANAGAR FOR EXTENTION OF P/S TO RTSS KAMAKHYANAGAR	Data required
6	OCC_MAR_2023	OPTCL	T/L	400kV GMR-MERAMUNDALI-B SC LINE & MERAMUNDALI-B TO MERAMUNDALI-A LINE AFTER LILO OF GMR-MERAMUNDALI-A SC LINE MERAMUNDALI-B GIS	Data required
7	OCC_MAR_2023	OPTCL	ICT	132/33kV 20MVA POWER TR NO-2 AND 1 132kV FEEDER BAY GSS BIRMAHARAJPUR	Data required
8	OCC_MAR_2023	BSPTCL	T/L	220kV BIHARSARIFF-TTPS S/C(RECONDUCTING)	Data required
9	OCC_MAR_2023	BSPTCL	T/L	132kV SONENAGAR(OLD)-NAGARUNTARI TSS,SCTL(RECONDUCTING)	Data required
10	OCC_MAR_2023	BGCL	ICT	500MVA ICT-1 400/220/132/33kV ,NAUBATPUR	Data required
11	OCC_MAR_2023	BGCL	T/L	132kV KHAGAIL-BIHITA NEW(BGCL) S/L	Data required
12	OCC_MAR_2023	BGCL	T/L	132kVBIHITA NEW(BGCL)-DIGHA(BSPTCL)	Data required
13	OCC_MAR_2023	BSPTCL	T/L	132kV RAJGIR ASTHAWAN CKT1&2	Data required

SI No.	Name of the incidence	PCC Recommendation	Latest status
124th PCC Meeting			
1.	Total Power Failure at 220 kV Barauni, Hazipur, Amnour and Mokama S/s on 22.02.2023 at 18:11 Hrs	It was observed that DRs at Hazipur end is not time synchronized accordingly BSPTCL was advised to rectify it at the earliest.	<i>No update in 125th PCC Meeting.</i>
2.	Tripping of 400 kV GMR-Meramundali line and Outage of GMR unit 3 on 28.02.2023	<p>PCC advised OPTCL following:</p> <ul style="list-style-type: none"> • To disable SOTF & TOR in the relay for 400 kV Meramundali-A-Meramundali B line. • Relay OEM may be contacted for reducing the current threshold value in SOTF setting and for implementation of AND condition with manual closing for triggering of SOTF. • To remove T-connection for the lines connected among 220 k V Meramundali A/220 kV Meramundali B & 220 kV Goda, 220 kV Duburi at the earliest. • To implement line differential protection for 400 kV Meramndali A-Meramundali B line. 	<i>OPTCL representtaive was not available in 125th PCC meeting.</i>