



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

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Azadi Ka
Amrit Mahotsav



Eastern Regional Power Committee
14, गोल्फ क्लब रोड, टॉलीगंज, कोलकाता-700033

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सं./NO. पू.क्षे.वि.स./PROTECTION/2022/189

दिनांक /DATE: 09.05.2022

सेवा में / To,

संलग्न सूची के अनुसार / As per list enclosed.

विषय : दिनांक - 12.04.2022 को आयोजित 113वीं पीसीसी बैठक का कार्यवृत्त ।

Sub: Minutes of the 113th PCC meeting held on 12.04.2022.

Sir/Madam,

12.04.2022 को आयोजित 113वीं 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 **113th PCC** meeting of ERPC held on **12.04.2022** available at ERPC website (<http://www.erpc.gov.in/>).

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

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

भवदीय / Yours faithfully,

P.P. Jena
09.05.2022

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

LIST OF ADDRESSES:

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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
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Minutes
of
113th PCC Meeting

Date: 09.05.2022
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

MINUTES OF 113th PROTECTION COORDINATION SUB-COMMITTEE MEETING HELD ON 12.04.2022 AT 10:30 HOURS

Member Secretary, ERPC chaired the meeting. The meeting was convened through Microsoft Teams online platform. List of participants is enclosed at Annexure-A.

PART – A

ITEM NO. A.1: Confirmation of minutes of 112th Protection Coordination sub-Committee Meeting held on 11th March 2022 through MS Teams online platform.

The minutes of 112th Protection Coordination sub-Committee meeting held on 11.03.2022 was circulated vide letter dated 30.03.2022.

Members may confirm the minutes of meeting.

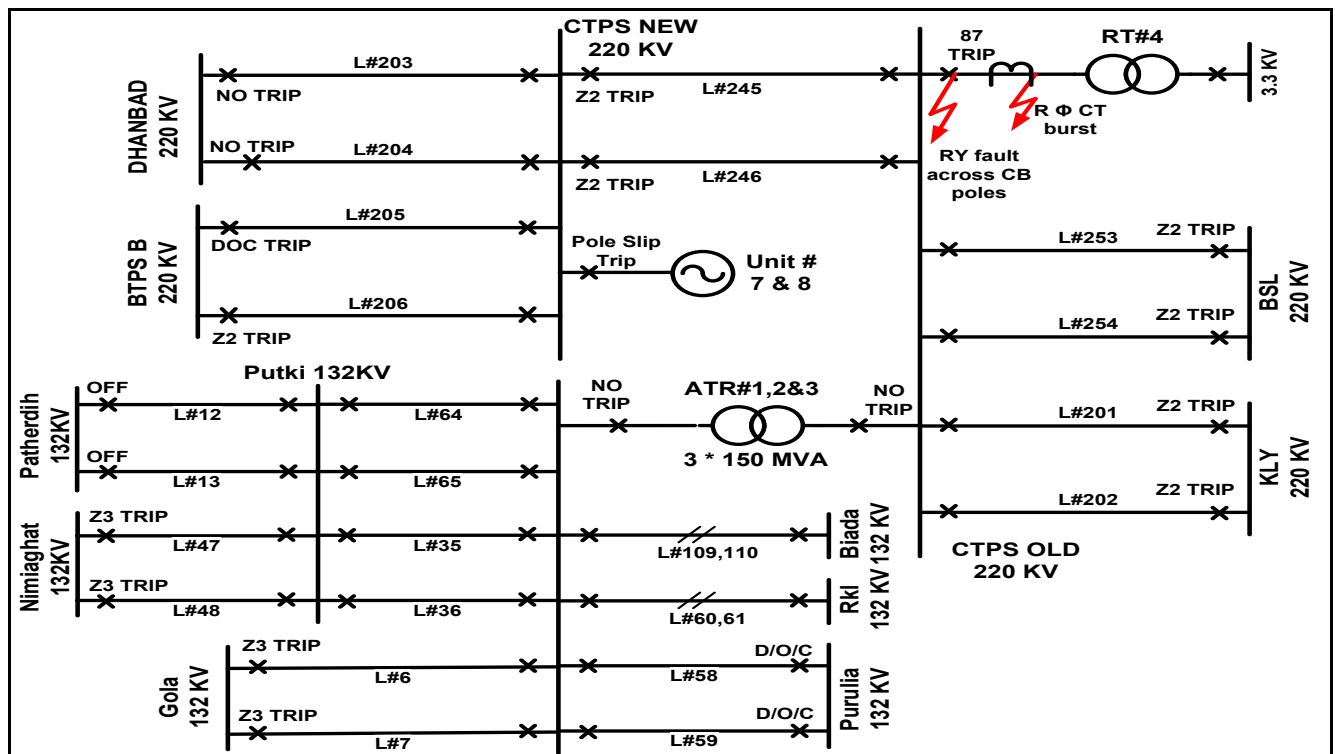
Deliberation in the meeting

Members confirmed the minutes of 112th PCC Meeting.

PART – B

ITEM NO. B.1: Disturbance at 220/132 kV CTPS A (DVC) S/s on 18.03.2022 at 20:05 Hrs

The disturbance was initiated due to bursting of R phase CT (HV side) of 220/3.3 kV 16 MVA Reserve Transformer#4 at CTPS A. Subsequently all 220 kV Lines emanating from CTPS A along with two running units at CTPS B got tripped resulting in total power failure at 220 kV CTPS A S/s.



Detailed report received from DVC is attached at **Annexure B.1**.

Load Loss: 430 MW, Gen. Loss: 450 MW
Outage Duration: 00:30 Hrs

DVC may explain.

Deliberation in the meeting

DVC representative explained the event as follows:

- *There were two faults occurred during the disturbance. First fault occurred due to bursting of R phase CT (hv side) of 220/3.3 kV 16 MVA Reserve Transformer#4 at CTPS A. The fault was cleared by operation of RT- differential protection within 60 ms.*
- *Due to bursting of CT, surrounding air got ionised which resulted in second fault of phase to phase(R-Y) nature across poles of circuit breaker. This leads to a bus fault at 220 kV Bus at CTPS A after 600 msec of the first fault. As bus bar protection is not in service for 220 kV Bus at CTPS A substation so fault was cleared by tripping of all connected feeders from remote end in zone 2.*

The tripping details are given below:

Line / Equipment	Voltage Level	From Side	From Side R/I	To Side	To Side R/I
Line # 201 & 202	220 kV	CTPS Old	No Trip	Kalyaneshwary	Z2 Trip
Line # 253 & 254	220 kV	CTPS Old	No Trip	BSL	Z2 Trip
Line # 245 & 246	220 kV	CTPS Old	No Trip	CTPS New	Z2 Trip
Line # 205	220 kV	CTPS New	No Trip	BTPS B	DOC Trip
Line # 206	220 kV	CTPS New	No Trip	BTPS B	Z2 Trip
Line # 203 & 204	220 kV	CTPS New	No Trip	Dhanbad	No Trip
ATR # 1, 2 & 3	220/132 kV	CTPS Old 220KV	No Trip	CTPS Old 132 KV	No Trip
RT # 4	220/3.3 kV	CTPS Old 220KV	87 Trip		
Line # 6, 7	132KV	CTPS Old	No Trip	Gola SS	Zone 3 Trip
Line # 58, 59	132KV	CTPS Old	No Trip	Purulia SS	D/O/C
L # 35,36,64,65	132KV	CTPS Old	No Trip	Putki SS	
Line # 47, 48	132KV	Putki SS	No Trip	Nimiaghat SS	Zone 3 Trip
CTPS Unit # 7 & 8	220KV	CTPS New	No Trip		

- *Regarding tripping of 220 kV BTPS B-CTPS B circuit-1 in zone-2 protection, it was informed that the timer setting of zone-2 was set to 300 msec. The setting has already been revised to 500msec after the disturbance.*

- After tripping of 220 kV CTPS A – CTPS B D/C and 220 kV CTPS B - BTPS B -1, turbine speed increase in both the units of CTPS which further lead to unstable power swing in system. subsequently 220 kV CTPS B - BTPS B -2 got tripped from BTPS B end in directional overcurrent protection and thereafter unit 7 and unit 8 got tripped in pole slip protection(class-C).
- Regarding tripping of feeders on 132 kV side, he informed 132 kV CTPS A – Purulia D/C got tripped in directional overcurrent protection from Purulia end whereas 132 kV CTPS A-Gola as well as 132 kV Nimiaghat – Putki got tripped on operation of zone 3 protection due to dip in three phase voltage and excess current rise in the lines. This resulted in total power failure at 132 kV Putki S/s.

DVC representative added that infeed current to 220/132 kV ICTs at CTPS was very less from 132 kV side therefore no tripping was observed for any of ICTs.

ERLDC representative informed that as per PMU plot it was observed that R-Y fault got subsequently converted to R-Y-B fault. Further from DR of 220 kV Dhanbad-CTPS line at Dhanbad end, it was observed that power swing blocking command was triggered for zone-2 operation which prevented tripping of the line during the disturbance. He apprehended that 220 kV CTPS B - BTPS B -2(L#205) was tripped on DOC instead of zone-2 due to power swing block command.

PCC advised DVC to check power swing block settings for 220 kV CTPS B - BTPS B D/c line at BTPS end. The DR at BTPS end may also be checked.

Regarding tripping of unit 7 and unit 8, ERLDC representative pointed out that during the incident combined generation of both the units i.e. 450 MW can be evacuated through 220 kV CTPS B-Dhanbad d/c line however due to operation of pole slip protection, the units got tripped before the fault clearance time i.e. 420 msec resulting in loss of generation.

PCC advised DVC to recheck the settings of pole slip protection in the CTPS units. In case the settings are in order, then study may be carried out to find out the critical clearing time for the units for a 3 phase fault at CTPS bus.

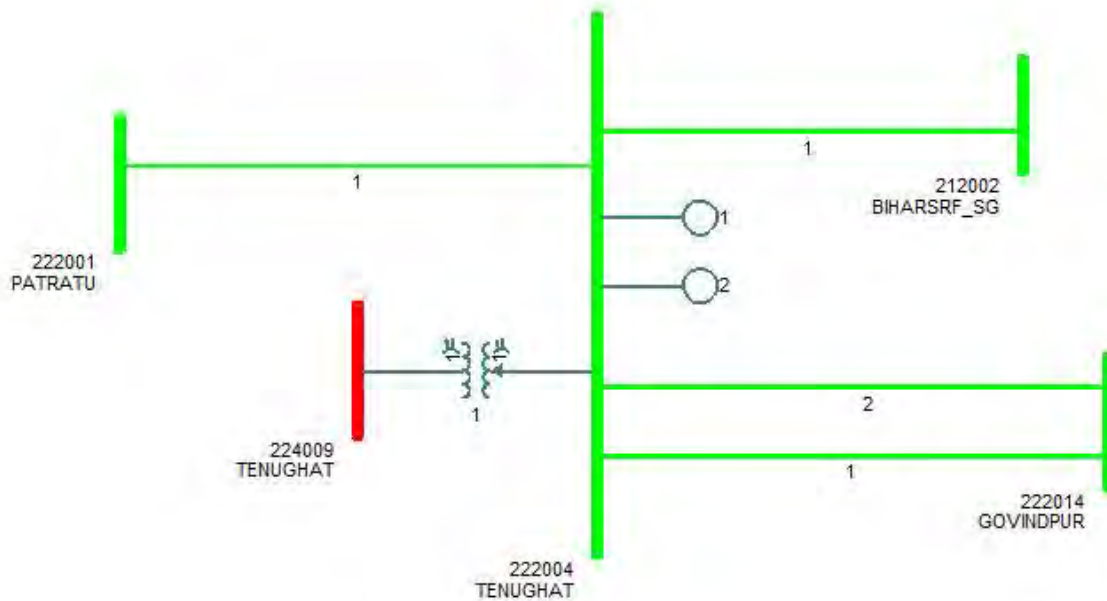
Regarding issue in DR time synchronisation, DVC informed that the renovation plan at CTPS, BTPS & DTPS are under progress and the same would be completed within a year.

Regarding status of bus bar protection at CTPS, DVC representative replied that bus bar along with LBB protection would be commissioned by July 2022.

ITEM NO. B.2: Disturbance at 220 kV Tenughat (TVNL) S/S

A. On 07.03.2022 at 05:32 hrs

On 07.03.2022 at 05:32 Hrs, all emanating lines from Tenughat along with both running units at Tenughat got tripped.



Relay Indications:

Time	Name	End 1	End 2	PMU Observations
05:32	220 kV Tenughat-Patratu	Didn't trip (Zone-4 picked up)	B_N, Zone-2, 2.53 kA	4 kV dip in B_ph voltage at Biharsharif. Fault Clearance time: 350 msec.
	220 kV Tenughat-Bihar sharif	Didn't trip (Zone-4 picked up)	Biharsharif: B_N, Zone-2, 161 km, 1.51 kA	
	220 kV Tenughat-Govindpur-1	Tenughat: B_N, Zone-4, 0.9 kA	Didn't Trip (Zone-3 picked up)	
	220 kV Tenughat-Govindpur-2	Tenughat: B_N, Zone-4, 0.9 kA	Didn't Trip (Zone-3 picked up)	
	Tenughat U#1 & U#2	O/C		

Disturbance report received from ERLDC is attached at **Annexure B2.1**.

Gen. Loss: 360 MW
 Outage Duration: 00:36 Hrs

TVNL may explain.

Deliberation in the meeting

On 07.03.2022 at 05:32 hrs, relays of all emanating lines from 220 kV Tenughat S/s sensed a B phase to ground fault in zone-4 of distance protection. 220 kV Tenughat-Govindpur D/C tripped from Tenughat end in zone-4 protection. 220 kV Tenughat-Patratu & 220 kV Tenughat-Biharsharif

tripped in zone-2 from Patratu & Biharsharif respectively. At the same time both running units of Tenughat TPS tripped on overcurrent protection leading to 360 MW generation loss.

TVNL representative informed that overcurrent setting(TSM) of GT had been revised as well as the highest has been disabled after the incident as per the 112th PCC recommendation.

Regarding fault location, he informed that no physical evidence of fault was found in the switchyard. On enquiry about PID testing of insulators, TVNL representative added that cleaning & testing had been completed for 50 % of the insulators. For rest of the insulators, it would be done subsequently.

B. On 24.03.2022 at 21:37 hrs

On 24.03.2022 at 21:37 Hrs, 220 kV Tenughat-Govindpur-2 tripped on R phase to ground fault and at the same time both running units at Tenughat also tripped on O/C E/F protection leading to total power failure at 220 kV Tenughat S/s.

Disturbance report received from ERLDC is attached at **Annexure B2.2**.

Gen. Loss: 364 MW

Outage Duration: 01:51 Hrs

TVNL may explain.

Deliberation in the meeting

Based on DR analysis it was observed that R phase to ground fault occurred in 220 kV Tenughat-Govindpur circuit-2. Tenughat end relay cleared the fault in zone-1 of distance protection whereas Govindpur end relay cleared the fault within 100 msec on receipt of carrier from Tenughat end. At the same time both units of TVNL got tripped on highest operation of overcurrent earthfault protection.

TVNL representative informed that the overcurrent earthfault setting has been revised after this incident.

Regarding fault location, JUSNL representative informed that vegetation issue was identified near fault locations & they are in process to clear it.

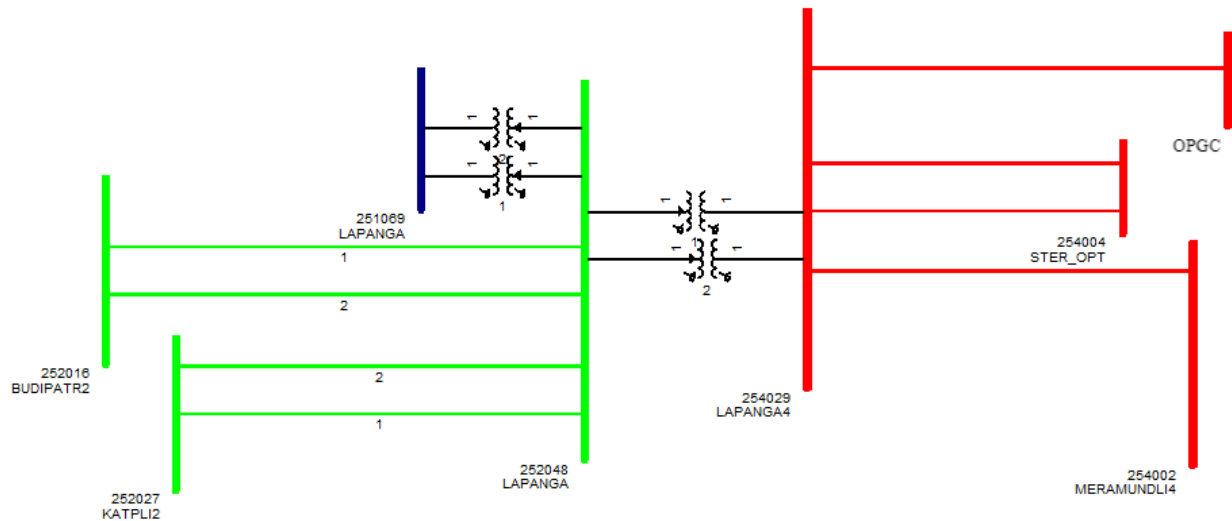
On a query from ERLDC regarding autorecloser scheme for the line, JUSNL representative informed that A/R testing was not done after charging of the line and the same has been planned in next week.

PCC advised JUSNL to complete the A/R testing for 220 kV Tenughat-Govindpur line and put the autorecloser in service at the earliest.

ITEM NO. B.3: Disturbance at 400/220 kV Lapanga (OPTCL)S/s on 27.03.2022 at 12:47 Hrs

On 27th March 2022 at 12:47 Hrs, all lines emanating from 400/220/132 kV Lapanga S/s got tripped. As reported by OPTCL, fire incident had occurred near the periphery of 400 kV Bus at Lapanga substation which resulted in fault in the switchyard. During this disturbance 1900 MW captive load of Sterlite & one running unit of OPGC also got tripped.

The event led to total supply failure at 400/220/132 kV Lapanga substation.



Disturbance report received from ERLDC is attached at **Annexure B3**.

Load Loss: 562 MW, Gen. Loss: 1900 MW(Captive Load)

Outage Duration: 01:56 Hrs

OPTCL, OPGC & Vedanta may explain.

Deliberation in the meeting

ERLDC representative informed that a special meeting was held on 04.04.2022 with OPTCL, SLDC Odisha, OPGC and Vedanta regarding this grid incident.

The brief of the event is given below:

- *Fire incident broke out outside the substation boundary of 400 kV Bus at Lapanga substation. Subsequently the fire extended towards bus extension side of 400 kV main bus which created the fault and leads to the disturbance. This fault was also high resistive in nature as observed from DR/PMU data.*
- *All feeders connected to Bus got tripped from remote end in zone 2 settings as zone 4 settings of Lapanga end was set to 1200 ms.*
- *Busbar protection did not operate during the event. Also, there was no tripping of 400/220 kV ICTs at Lapanga. With tripping of all lines from remote end, 400/220/132 kV Lapanga substation got blackout.*
- *Subsequently, one unit of OPGC got tripped on operation of LT drives due to unbalance voltage setting of 800msec. At the same time entire smelter load (around 1868 MW) of Sterlite tripped due to tripping of its 400/220 kV ICTs on earth fault over current protection from 220 kV side.*

Regarding zone 4-time settings, OPTCL representative replied that it had already been revised.

Regarding physical location of fault, OPTCL representative replied that thorough inspection was carried out and Y phase post insulator in bus extension and Corona ring of R phase and Y phase was found damaged. The same had been replaced on 9th April 2022 by taking bus shutdown.

PCC opined that as the damage was found in the bus extension portion so it is evident that the fire has affected the 400 kV bus & the fault would have initiated due to this event. Accordingly, the 400 kV busbar protection at Lapanga should have operated during the event to clear the fault.

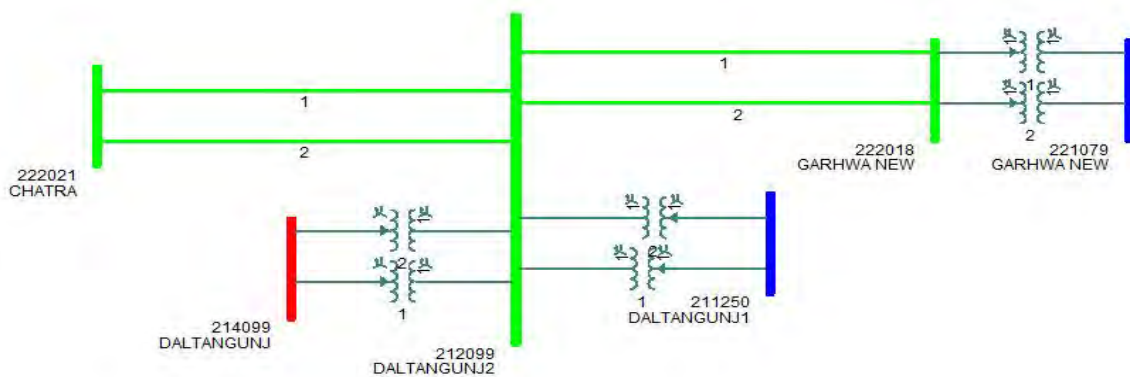
PCC advised OPTCL to test the busbar relay at the earliest opportunity to ensure stability & relay healthiness.

Vedanta representative informed that ICT protection settings were verified and reviewed at their end with help OEM and as per OEM suggestion earth fault overcurrent settings of 220 kV side of ICT and auxiliary transformer were revised with proper time coordination. On enquiry from ERLDC regarding tripping of drives, he replied that drives were tripped due to LT side voltage dip and as a remedial measure they are planning to install UPS for LT side compressor so that voltage dip can be avoided.

PCC further advised OPTCL to take corrective actions as decided in the special meeting.

ITEM NO. B.4: Total Power failure at 220 kV Garhwa(JUSNL) S/s on 30.03.2022 at 18:22 Hrs

On 30.03.2022 at 18:22 Hrs, both the circuits of 220 kV Daltonganj-Garwah line got tripped leading to total power failure at Garhwa S/s.



Relay Indications:

Name	End 1	End 2	PMU Observations
220 kV Daltonagnj-Garhwa(New)-1	Daltonganj: R_Y_N, Zone 3, IR: 975 A, IY: 904 A, Fault Distance: 172.2 Km	Didn't trip	37 kV dip in R_ph and Y_ph at Daltonganj. Phase-to-phase fault evolved to three phase fault after 500 msec.
220 kV Daltonagnj-Garhwa(New)-2	Daltonganj: R_Y_N, Zone 3, IR: 981 A, IY: 909 A, Fault Distance: 171.4 Km	Didn't trip	Fault clearance time: 870 msec

Load Loss: 10 MW
 Outage Duration: 01:42 Hrs

JUSNL may explain.

Deliberation in the meeting

JUSNL representative informed that a fault occurred on 33 kV side of 132/33 kV switchyard to which 132/33 kV transformer at Garwah got tripped to clear the fault. At the same time sparking was observed in HV side isolator of 132/33 kV of transformer and created a fault which was cleared from 220 kV Daltonganj end on zone-3(850 msec) operation. There was no tripping for 220/132 kV ICT at Garwah end.

PCC opined that for a fault at 132 kV side the 220/132 kV ICT at Garwah shall trip to clear the fault before tripping of 220 kV line from Daltonganj end and observed that there is a time coordination issue between overcurrent setting of ICT and zone-3 timing of the relay at Daltonganj end.

PCC advised JUSNL to review the ICT overcurrent setting in coordination with Powergrid. The zone-3 timer setting at Daltonganj end may be increased to 1000msec and TMS of overcurrent relay for 220/132 kV ICT at Garwah may be reduced accordingly by JUSNL.

ITEM NO. B.5: Total Power failure at 220 kV Tashiding S/s on 11.03.2022 at 23:33 Hrs

On 11.03.2022 at 23:33 Hrs, 220 kV Tashiding-Rangpo and 220 kV Tashiding-New Melli tripped from Tashiding end only. Subsequently Tashiding S/s became dead due to loss of connectivity and single running unit at Tashiding got tripped due to loss of evacuation path.

As per the PMU plot, no voltage dip was observed during the incident.

Detailed report received from Tashiding HEP is attached at **Annexure B5**.

Gen. Loss: 44 MW
Outage Duration: 01:03Hrs

Tashiding HEP may explain.

Deliberation in the meeting

Tashiding HEP representative informed that before the disturbance, unit-1 was synchronised with the grid & the disturbance occurred during back-charging of SSB with unit generation. He explained that during back-charging AC input supply changeover took place for 220V DC chargers and subsequently O/P DC contactor(s) circuitry malfunctioned for a moment causing momentary absent of DC at DC distribution board. This leads to momentary outage of SCADA workstation as well as failure of DC supply to relay circuitry momentarily.

He added that circuit breakers of both the outgoing feeders were tripped at their end during this event leading to total power failure at Tashiding HEP.

Regarding remedial measure, he informed that various systems, components and terminals involved in DC power supply to respective load points were checked however no abnormality was observed. Further, terminals tightening was carried out at all the points. Further they informed that the backcharging procedure was being followed earlier to the incident and after incident too however no such event was observed in any of the cases.

ITEM NO. B.6: Bus tripping occurred during March-2022

During March 2022, following incidents of bus bar tripping had been observed in Eastern Region.

Element Name	Tripping Date	Reason	Utility
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220 kV Bus-1 at Subhashgram (WB)	06-03-2022 at 17:21 Hrs	-	WBSETCL
400 kV Main Bus-1 at DSTPS (Andal)	22-03-2022 at 13:05 Hrs	Bus Fault	DVC
220 kV Main Bus-2 at Muzaffarpur (PG)	28-03-2022 at 07:12 Hrs	Gas compartment Zone trip from GIS bay of KBUNL (Future)	PG/BSPTCL
	31-03-2022 at 16:39 Hrs	LBB of 220 kV Hazipur-1 bay operated	PG
400 kV Main Bus-1 at New Duburi	28-03-2022 at 14:17 Hrs	LBB of main bay of 400 kV Meramundali-New Duburi-2 operated	OPTCL

Concerned Utilities may explain.

Deliberation in the meeting

- ***Tripping of 220 kV Bus-1 at Subhashgram (WB) on 6th March 2022 at 17:21 Hrs***

WBSETCL representative informed that on 6th March 2022, fault was developed in 220 kV Lakshmikanthpur- Subhasgram -1. At the same time, differential bus bar protection operated for 220 kV Bus-1 at Subhasgram which resulted in tripping of 220 kV Bus-1 at Subhasgram.

He explained that the fault level at 220 kV Subhasgram might have changed after charging of 400 kV Subhasgram – Rajarhat line which resulted the maloperation of busbar relay during through fault.

He informed that relay setting was revised and testing of bus bar protection was carried out and put into operation on 11th March 2022.

- ***Tripping of 220 kV Main Bus-1 at DSTPS(Andal)on 22th March 2022 at 13:05 Hrs***

DVC representative informed that there was a bus fault during the incident which leads to operation of busbar protection at 220 kV Main Bus-1 at DSTPS(Andal).

- ***Tripping of 220 kV Main Bus-2 at Muzaffarpur (PG) on 28th March 2022 at 07:12 Hrs***

Powergrid representative informed that tripping command was initiated from gas compartment zone 22 of future GIS bay of BSPTCL that resulted in tripping of 220 kV Main Bus-2 at Muzaffarpur (PG).

BSPTCL representative informed that as per the information received from site, there was no issue in gas compartment zone for their GIS bays and in contrary the pressure issue f was reported for transformer bay of Powergrid during the disturbance.

PCC advised Powergrid to confirm the reason for busbar operation at 220 kV Muzaffarpur.

- ***Tripping of 220 kV Main Bus-2 at Muzaffarpur (PG) on 31st March 2022 at 16:39 Hrs***

Powergrid representative informed that LBB of 220 kV Muzaffarpur- Hazipur -1 operated which resulted in tripping of 220 kV Main Bus-2 at Muzaffarpur (PG). On enquiry from ERLDC regarding fault in 220 kV Muzaffarpur- Hazipur -1, he intimated that there was no fault in line and LBB protection had mal-operated.

BSPTCL representative informed that as per their information, on the day of incident testing of ICT at transfer bay of Powergrid was carried out by Powergrid during which LBB had operated and DT signal received for 220 kV Muzaffarpur- Hazipur -1 at Hazipur end.

Powergrid representative replied that no testing work was done on the day of incident, however shutdown was taken for 220 kV Main Bus-1 in order to clear hotspot near isolator of bus coupler.

Powergrid was advised to look into the issue and find out the reason behind maloperation of LBB relay.

- **Tripping of 400 kV Main Bus-1 at New Duburi on 28th March 2022 at 14:17 Hrs**

OPTCL representative informed that a fault was developed in 400 kV Meramundali-New Duburi-2 for which tripping command was initiated from relay however B phase pole of circuit breaker got stuck and did not open. Subsequently LBB of 400 kV Meramundali-New Duburi-2 operated and tripped 400 kV Main Bus-1 at New Duburi.

He further informed that on investigation, mechanical issues were observed in circuit breaker. Also, both the trip coil was found in burnt condition. Thereafter the issue was rectified and the breaker was put back into operation. Further OEM has been intimated for inspection and testing of the circuit breaker.

ITEM NO. B.7: Repeated Tripping of Transmission Lines and associated issues

B.7.1: Repeated tripping of 400 kV Meramundali-Lapanga-2

400 kV Meramundali-Lapanga-2 had tripped five (5) times in the month of March'22 and it was observed that in all instances fault was in B phase.

Element Name	Tripping Date	Tripping Time	Reason	Remarks	Revival Date	Revival Time
400KV-MERAMUNDALI-LAPANGA-2	28/03/2022	13:17	Meeramundali: B Ph fault, 2.29 KA, 97.8 KM		28/03/2022	18:06
400KV-MERAMUNDALI-LAPANGA-2	27/03/2022	12:02	B phae to earth fault	b-n, zone 1, F.C 3.7 ka 74 km	27/03/2022	20:00
400KV-MERAMUNDALI-LAPANGA-2	18/03/2022	13:37	MMDL: Z1, B-N, 1.9KA, 203.7Km Lapanga: Z1, B-N, 10.31kA, 24Km		18/03/2022	17:40
400KV-MERAMUNDALI-LAPANGA-2	17/03/2022	12:40	Meramundali - (fault - B-N , FC - 2.11 kA , FD - 116.5 km) lapanga - (fault - B-N , FC - 4.4 kA , FD - 75 km)		17/03/2022	17:36
400KV-MERAMUNDALI-LAPANGA-2	16/03/2022	13:51	Meramundali - fault - B_N , fc - 2 KA , FD - 115 km Lapanga - fault - B_N , fc - 3.58 KA , FD - 84 km		16/03/2022	17:17

Deliberation in the meeting

OPTCL representative informed that tree pruning work in concerned location is in progress in coordination with appropriate authority.

PCC advised OPTCL to resolve all clearance related issues in the line at the earliest.

B.7.2: Repeated tripping of 220 kV Daltonganj-Chatra-2

220 kV Daltonagnj-Chatra-2 was tripped four (4) times in the month of March'22 and it is observed that in all the instances Y phase to B phase fault had occurred.

Element Name	Tripping Date	Tripping Time	Reason	Remarks	Revival Date	Revival Time
220KV-DALTONGANJ-CHATRA-2	29/03/2022	13:04	CHATRA: Y_B, FC=ly=625 A, Ib= 628 A, FD-113.5 KM DALTONGANJ: Y_B, Z-1, FD-64.54 KA, FC-ly= 2.07 KA, Ib= 2.05 KA		29/03/2022	14:29
220KV-DALTONGANJ-CHATRA-2	28/03/2022	12:43	Y-B phase fault	Daltongunj end: Y-B, 64.3 KM DALTONGUNJ 2.06 KA Y PHASE 2.05 KA B PHASE	28/03/2022	15:59
220KV-DALTONGANJ-CHATRA-2	20/03/2022	11:57	Daltonganj: Y-B fault, 12.5 km, ly-3.9 kA, Ib-3.9 kA		20/03/2022	18:40
220KV-DALTONGANJ-CHATRA-2	14/03/2022	13:12	Daltonganj: Y-B, Z-2, 1.21 kA, 1.20 kV, 123.9 km, Chatra: Zone-1, Fault location-26km, ia=19.2A,ib=992.4 A,ic=994.8A.		14/03/2022	15:57

JUSNL may explain.

Deliberation in the meeting

JUSNL representative informed that they were facing issues in getting permission from forest department for tree pruning work under the line. For some of the locations the tree pruning work was completed after getting due permission. For remaining locations, they are in process of getting the required permission from Forest Dept.

ITEM NO. B.8: Tripping Incidence in month of March-2022

Tripping incidents in the month of March-2022 which needs explanation from constituents of either of the end is attached.

Concerned utilities may explain.

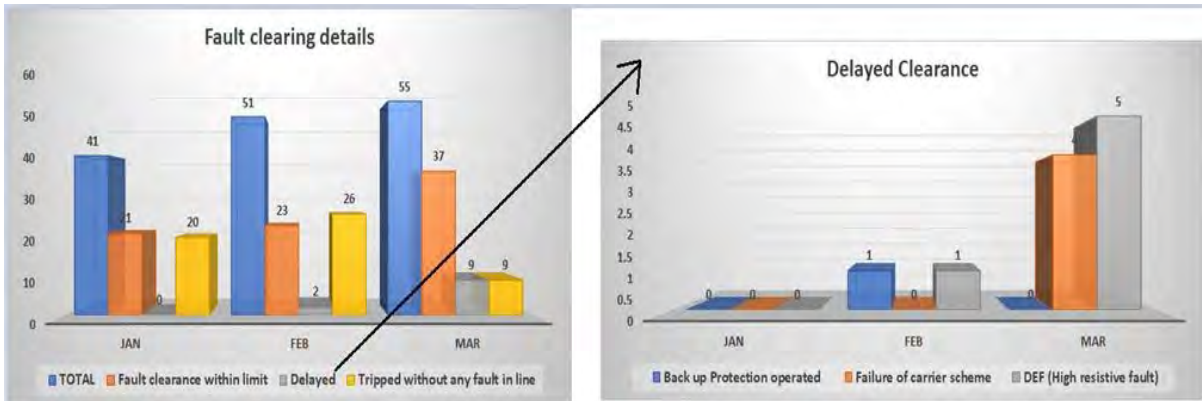
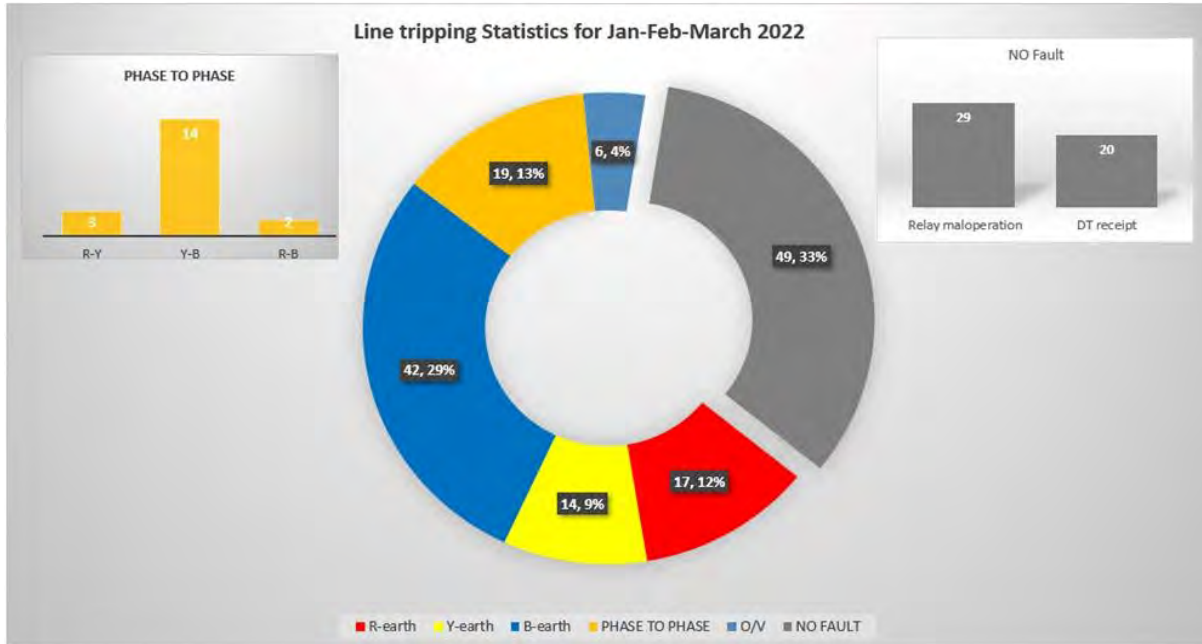
Deliberation in the meeting

*Members explained the tripping incidences. The updated status is enclosed at **Annexure B.8.***

PART-C::OTHER ITEMS

ITEM NO. C.1: Line tripping statistics for Jan'22-Mar'22

33% of total line tripping in the period (Jan 2022 to March 2022) had occurred without any fault in the line, either due to DT receipt or relay malfunction. Failure of carrier protection was also observed in many cases that had resulted in delayed fault clearance.



Members may discuss.

Deliberation in the meeting

ERLDC representative informed that 33% of total line tripping in the period (Jan 2022 to March 2022) had occurred without any fault in the line, either due to DT receipt or relay malfunction. He further added that carrier protection failure was also observed in many cases that had resulted in delayed fault clearance. He suggested for testing of PLCC and relays at regular interval so that such type of spurious incidences can be avoided.

PCC advised all concerned utilities to take appropriate action in order to reduce such spurious tripping of lines.

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

The decisions of previous PCC meetings are attached.

Members may update the latest status.

Deliberation in the meeting

*Updated status for decisions of previous PCC meetings is given at **Annexure C.2**.*

ITEM NO. C.3: Automation of Protection Settings extraction from PDMS

To facilitate protection co-ordination and protection audit, automation of protection setting extraction from the database is required. In this regard, a model excel sheet was shared with PRDC and automation of extraction of settings from PDMS was also discussed.

In 112th PCC, PRDC representative informed that their IT team is looking into it and the facility of relay data extraction from protection database is expected to be implemented by July-2022.

PRDC may update.

Deliberation in the meeting

ERPC secretariat informed that a meeting would be held on 19th April 2022 among ERPC, ERLDC & PRDC to discuss the above issue.

ITEM NO. C.4: Protection Audit in Eastern Region

In 110th PCC Meeting, ERPC Secretariat informed that third party protection audit for the year 2022 would be commenced as soon as the current covid situation gets improved.

It was further informed that protection audit of following substations in Odisha would be carried out at first.

- 765/400 kV Jharsuguda(Powergrid) S/s
- 765 kV NTPC Darlipalli S/s
- 400/220kV Lapanga(OPTCL) S/s
- 220 kV Budhipadar(OPTCL) S/s
- 220 kV IB TPS(OPGC) S/s

PCC advised the concerned utilities to verify and update existing relay data and protection settings available in PDMS for the above mentioned substations before the field visit by audit team.

PCC further advised utilities to submit their comments, if any, regarding the protection audit procedure and format for finalization of the document.

In 112th PCC, PCC informed that protection audit of mentioned substations would be carried out in tentatively in second week of April 2022 and further advised concerned utilities of Odisha to verify and update existing relay data and protection settings available in PDMS before the field visit by audit team.

Members may discuss.

Deliberation in the meeting

It was decided that the protection audit of various substations in Odisha would be carried out during last week of April-22.

ITEM NO. C.5: New Element Integration

ITEM NO.C.5.1: LILO of 400 kV Patna-NPGC D/C line at Jakkampur

As per information received at ERLDC, LILO of 400 kV Patna-NPGC D/c at Jakkampur is going to be first time charged.

Line parameters are as below:

Name	Conductor Type	Length (km)
400 kV Patna-Jakkampur D/c	Quad Moose	18.548 km
400 kV Jakkampur-NPGC D/c	Quad Moose	138.145 km

Protection Co-ordination may be reviewed as per below table:

Reason	Settings to be reviewed in	At Sub-Station	Utility	Remarks
LILO of 400 kV Patna-NPGC D/c at Jakkampur	400 kV Patna-Jakkampur D/c	Patna, Jakkampur	PG, BGCL	Protection coordination to be done for newly connected element as per ERPC guidelines.
	400 kV Jakkampur-NPGC D/c	Jakkampur, NPGC	BGCL, NPGC	Protection coordination to be done for newly connected element as per ERPC guidelines.
	400 kV Balia-Patna D/c (1 &2)	Balia	PG	Zone-2 time delay maybe set to 500 msec as shortest line from Patna will now be 400 kV Patna-Jakkampur (18.548 km).
	400 kV Chandauti-NPGC D/c	Chandauti	PMTL	Zone-3 settings maybe reviewed as adjacent longest line from NPGC will now be 400 kV NPGC-Jakkampur D/c.

ER-1 is requested to get the confirmation of protection settings from Balia end.

PLCC end to end testing confirmation for 400 kV Patna-Jakkampur D/c and 400 kV Jakkampur-NPGC D/c also to be submitted.

All constituents are requested to confirm the changes done, if any, and share the settings at the earliest to facilitate FTC of the LILO arrangement.

Concerned utilities may update.

Deliberation in the meeting

Concerned utilities were advised to share revised protection settings for their respective ends to ERPC/ ERLDC.

LIST OF PARTICIPANTS IN 113TH PCC MEETING HELD ON 12.04.2022

Full Name	Join Time	Participant ID (UPN)
ERPC Kolkata	4/12/2022, 10:15:52 AM	ERPC@KolkataMST.onmicrosoft.com
Rajendra Prasad (Guest)	4/12/2022, 10:16:00 AM	
NIRMAL MONDAL (WBSETCL) (Guest)	4/12/2022, 10:16:01 AM	
Teesta-V Power Station (Guest)	4/12/2022, 10:21:55 AM	
SMS SAHOO,DGM,OPTCL,BHUBANESWAR (Guest)	4/12/2022, 10:22:51 AM	
DEBDAS MUKHERJEE WBPCL (Guest)	4/12/2022, 10:24:49 AM	
SMS SAHOO, DGM(ELECT), OPTCL (Guest)	4/12/2022, 10:24:54 AM	
aditya jha	4/12/2022, 10:25:58 AM	
Sougato Mondal	4/12/2022, 10:25:59 AM	saugato@erldc.onmicrosoft.com
Rajib Sutradhar	4/12/2022, 10:27:02 AM	rajibsutradhar@erldc.onmicrosoft.com
Rajendra Prasad	4/12/2022, 10:27:34 AM	
ER1 (Guest)	4/12/2022, 10:28:15 AM	
Raman Bharmauria	4/12/2022, 10:28:33 AM	raman.bharmauria@opgc.co.in
GULSHAN (RONGNICHU -MBPCL) (Guest)	4/12/2022, 10:29:18 AM	
gaurav	4/12/2022, 10:30:46 AM	
S Konar, POSOCO (Guest)	4/12/2022, 10:31:50 AM	
Saurav Kr Sahay	4/12/2022, 10:32:29 AM	saurav.sahay@erldc.onmicrosoft.com
Alok Pratap Singh	4/12/2022, 10:32:30 AM	apsingh@erldc.onmicrosoft.com
Akash Kumar Modi	4/12/2022, 10:32:30 AM	akmodi@erldc.onmicrosoft.com
Dilip kant Jha Eee Bsptcl	4/12/2022, 10:32:51 AM	
Uma Kanta Mishra	4/12/2022, 10:33:05 AM	
SUDIPTA MAITI	4/12/2022, 10:33:23 AM	sudiptamaiti@dvcindia.onmicrosoft.com
DGM, EMR Division, Jajpur Road (Guest)	4/12/2022, 10:33:42 AM	
EEE TD HZB	4/12/2022, 10:34:27 AM	
Mihira Kanta Rath	4/12/2022, 10:36:21 AM	
Ashish kumar	4/12/2022, 10:36:53 AM	
Dharmbeer Singh	4/12/2022, 10:37:13 AM	
Arindam bsptcl	4/12/2022, 10:37:22 AM	
PRACHI GUPTA (Guest), AEE/SLDC/Bihar	4/12/2022, 10:38:04 AM	
Biplob Sarkar (Guest)	4/12/2022, 10:38:05 AM	
SANJEEV KUMAR (THEP) (Guest)	4/12/2022, 10:38:29 AM	
TEESTA-III VIJAY CHANDRA (Guest)	4/12/2022, 10:38:42 AM	
eee critl	4/12/2022, 10:39:13 AM	
E&M.R DIVISION,OPTCL,BURLA (Guest)	4/12/2022, 10:39:20 AM	
GULSHAN MBPCL RONGNICHU (Guest)	4/12/2022, 10:41:28 AM	
saibal erldc	4/12/2022, 10:43:11 AM	
EMR MERAMUNDALI) (Guest)	4/12/2022, 10:44:51 AM	
Rahul	4/12/2022, 10:47:01 AM	
RAVI RANJAN SINHA	4/12/2022, 10:47:02 AM	
Pritam Mukherjee	4/12/2022, 10:47:55 AM	pritam@erldc.onmicrosoft.com
TVNL (Ashish Kr Sharma) (Guest)	4/12/2022, 10:48:41 AM	

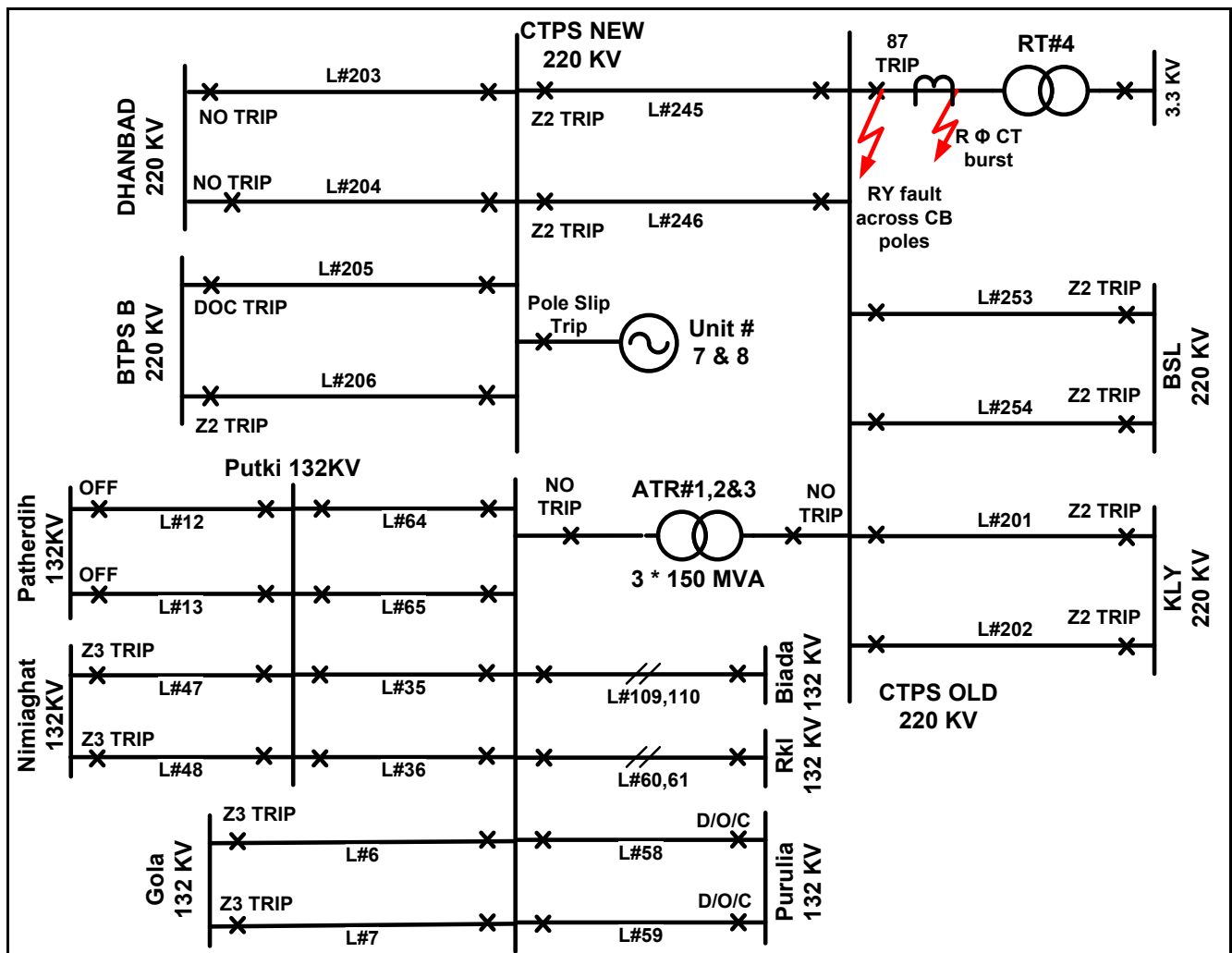
Rajiv Kumar Singh CESC	4/12/2022, 10:50:27 AM	
Rajdeep Bhattacharjee, RE, BSPHCL, Kolkata	4/12/2022, 10:51:04 AM	admin@BSPHCL317.onmicrosoft.com
DOLAGOBINDA PATEL OPTCL MERAMUNDALI	4/12/2022, 10:51:22 AM	
Piyush Lenka	4/12/2022, 10:52:06 AM	211118@vedanta.co.in
Sarfraj Akhtar Critl Bsptcl	4/12/2022, 10:56:25 AM	
Dharm Das Murmu, CRITL, JUSNL (Guest)	4/12/2022, 10:57:39 AM	
Sanjay Sharma Teesta V PS	4/12/2022, 10:58:20 AM	
Powergrid, Odisha projects (Guest)	4/12/2022, 10:58:56 AM	
Ganesh Korada	4/12/2022, 11:01:09 AM	ganesh.korada@opgc.co.in
SANJAI (Guest)	4/12/2022, 11:04:02 AM	
Smita SLDC Odisha (Guest)	4/12/2022, 11:05:13 AM	
Tashiding hydro	4/12/2022, 11:07:16 AM	
Sanjay Kumar Sharma	4/12/2022, 11:10:34 AM	admin@NhpcLimited919.onmicrosoft.com
Sucharit Mondal	4/12/2022, 11:18:59 AM	
DGM, EMR, OPTCL, JAJPUR ROAD	4/12/2022, 11:21:36 AM	
EEE TD HZB	4/12/2022, 11:25:59 AM	
Mangu Srinivas	4/12/2022, 11:45:07 AM	211321@vedanta.co.in
SANJEEV KUMAR (Guest)	4/12/2022, 12:06:54 PM	
Deepak Kumar Singh	4/12/2022, 12:10:09 PM	
DILSHAD ALAM	4/12/2022, 12:11:47 PM	
Shailendra Gautam (Guest)	4/12/2022, 12:23:21 PM	
Partha De (Guest)	4/12/2022, 1:08:22 PM	
Powergrid, Odisha	4/12/2022, 1:08:34 PM	
Sanjay Sharma Teesta V PS	4/12/2022, 1:25:56 PM	

**INVESTIGATION REPORT REGARDING SYSTEM DISTURBANCE IN CTPS 220 KV AND 132 KV SYSTEM
ALONG WITH OUTAGE OF BOTH UNITS #7 & 8 ON 18.03.2022.**

Brief History:

At about 20:05hrs of 18/03/2022, R phase 220 KV side CT of 16 MVA, 220/3.3 KV Reserve Transformer # 4 got burst. Simultaneously all 220 KV lines (Line # 201 & 202 , Line # 245 & 246 , Line # 253 & 254) emanating from 220 KV old switch yard got tripped from remote end. At the same time Line # 205 & 206 (BTPS - CTPS new) got tripped at BTPS end. However 220 KV CTPS New bus remain charged from Dhanbad end through Line # 203 & 204. Due to load throw off, both Generator # 7 & 8 tripped through Class-C (Out of step) protection. With CTPS 220KV generation gone there was widespread tripping in the CTPS 132KV system too due to lines being unable to cater to the increased loading. CTC team visited CTPS on 19/03/22 to find the root cause of the above trippings.

Relevant SLD of affected area:



Tripping Details:

Line / Equipment	Voltage Level	From Side	From Side R/I	To Side	To Side R/I
Line # 201 & 202	220 kV	CTPS Old	No Trip	Kalyaneshwary	Z2 Trip

Line # 253 & 254	220 kV	CTPS Old	No Trip	BSL	Z2 Trip
Line # 245 & 246	220 kV	CTPS Old	No Trip	CTPS New	Z2 Trip
Line # 205	220 kV	CTPS New	No Trip	BTPS B	DOC Trip
Line # 206	220 kV	CTPS New	No Trip	BTPS B	Z2 Trip
Line # 203 & 204	220 kV	CTPS New	No Trip	Dhanbad	No Trip
ATR # 1, 2 & 3	220/132 kV	CTPS Old 220KV	No Trip	CTPS Old 132 KV	No Trip
RT # 4	220/3.3 kV	CTPS Old 220KV	87 Trip		
Line # 6, 7	132KV	CTPS Old	No Trip	Gola SS	Zone 3 Trip
Line # 58, 59	132KV	CTPS Old	No Trip	Purulia SS	D/O/C
L # 35,36,64,65	132KV	CTPS Old	No Trip	Putki SS	
Line # 47, 48	132KV	Putki SS	No Trip	Nimiaghat SS	Zone 3 Trip
CTPS Unit # 7 & 8	220KV	CTPS New	No Trip		

Chronology of Events and Tripping Analysis:

From the downloaded DR of the various numerical relays at CTPS and other end connected relays the following chronology of faults and subsequent line trippings could be established:

1. The first fault occurred due to bursting of HV R-Phase CT of RT#4 at CTPS Old 220 KV switchyard at around 20.05.54.867 (as per DR time of RT # 4 Differential Relay). This fault was cleared successfully by operation of RT Differential Protection (both Low-Set and Hi-Set) and subsequent tripping HV CB within about 60ms.
2. Around 600ms after clearing of the first fault, R Phase fault current was again sensed by the 87 relay which issued tripping command again via operation of 87 protection of RT # 4 relay. The cause for reappearance of this fault current might be a fire ball caused during bursting of the CT resulting in ionization of surrounding air causing short circuit of R & Y Ph of breaker pad. Visible damage of R & Y Phase of HV Side CB of RT # 4 was observed during yard inspection.
3. As this second fault became a bus fault on CTPS Old 220KV bus and as there is no busbar protection in service presently in CTPS Old 220KV S/Y, it was cleared by tripping of all 6(six) 220KV lines on CTPS Old 220KV bus from remote end via Distance Protection Zone 2 correctly.
4. CTPS NEW 220 KV bus remain charged from Dhanbad end through Line # 203 & 204. No Tripping of Line # 203 & 204 occurred at Dhanbad end as the fault was self-cleared within 420ms (as evident from Dhanbad L 203 / 204 DR data).
5. Along with tripping of L # 245 & 246 (CTPS New – Old Tie Lines), L # 205 (CTPS New - BTPS B Line 1) also tripped from BTPS B end through Distance Zone 2. This was due to the Zone 2 timer of this line relay chosen at 300ms which was equal to the distance Zone 2 timer of L # 245 & 246. This setting has been revised to 500ms to avoid such excess tripping in future..
6. After tripping of L # 245, 246 & 205 there was load evacuation problem through Dhanbad lines due to less demand on Dhanbad zone leading to turbine speed increase in both the units (Unit# 7: upto 3422 rpm, Unit#8: upto 3337 rpm). This led to unstable power swing in the system leading to tripping of L # 206 (CTPS New - BTPS B Line 2) through D/O/C protection due to symmetrical increase of current upto 2000A (in all 3 phases) and symmetrical dipping of voltages to about 102KV (in all 3 phases). Generator # 7 & 8 tripped through Class- C (Out of Step / Pole Slip) protection correctly and saved the units from any further damage.
7. Due to mismatch of frequency between Unit boards and Station boards, auto-change over through BTS did not take place.

8. All the trippings on the 132 kV side were due to overloading although the relative chronology of trippings cannot be ascertained without GPS time synchronization in relays. It is apprehended that lines 58, 59 [CTPS Purulia] were the first to trip through Directional O/C protection. Then lines 6 & 7 tripped through Distance Zone 3. From the DR read from HMI of both the Gola End relays it was clear that the 3 phase voltages had dipped to such an extent (about 60KV from healthy 76KV Phase to Neutral voltages) along with rise in 3 phase currents (about 1.4kA) that the load had encroached within Distance Zone 3 reach.
9. There was no tripping from Putki End in any of the four Putki – CTPS lines. Instead as Putki Patherdih loop was open (as per CLD recommendation), both L # 47 & 48 (Nimiaghat – Putki) tripped from Nimiaghat End through Distance Zone 3. Here also the tripping was occurring in Zone 3 due to the same reason as in Gola End i.e. the 3 phase voltages had dipped to 38KV and the current had risen to 520A approx. (as read from relay HMI). This causes TPF at Putki 132KV.
10. As all the lines of CTPS Old 220 kV tripped from remote end, all three ATR's were made OFF manually.

Remedial Action Taken:

1. All the three 220 KV CT's of RT # 4 have been replaced.
2. R & Y phase pole of 220 KV RT # 4 breaker are to be replaced.
3. Bus Bar & LBB protection of 220 KV old CTPS S/Y shall be commissioned by May 2022.

पावर सिस्टम ऑपरेशन करपोरेशन लिमिटेड

(भारत सरकार का उद्यम)

POWER SYSTEM OPERATION CORPORATION LIMITED

(A Government of India Enterprise)



Eastern Regional Load Despatch Centre: 14, Golf Club Road, Tollygunge, Kolkata-700 033.

CIN: U40105DL2009GOI188682

फ़ोन: 033- 24235755, 24174049 फ़ैक्स : 033-24235809/5029 Website: www.erldc.org, Email ID- erldc@posoco.in

घटना संख्या: 07-03-2022/1

दिनांक: 05-04-2022

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

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

At 05:32 Hrs on 07th March 2022, all emanating lines from 220 kV Tenughat (TVNL) tripped. Both running units at Tenughat also tripped. This resulted in 360 MW generation loss at Tenughat power plant.

- **Date / Time of disturbance:** 07-03-2022 at 05:32 hrs.
- **Event type:** GD - 1
- **Systems/ Subsystems affected:** 220 kV Tenughat (TVNL) S/s
- **Load and Generation loss.**
 - 360 MW generation loss reported during the event.
 - No load loss occurred during the event

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

- NIL

3. Major elements tripped (प्रमुख ट्रिपिंग)

- 220 kV Tenughat-Patratu
- 220 kV Tenughat-Biharsharif
- 220 kV Tenughat-Govindpur-D/c
- U#1 & U#2 at Tenughat

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

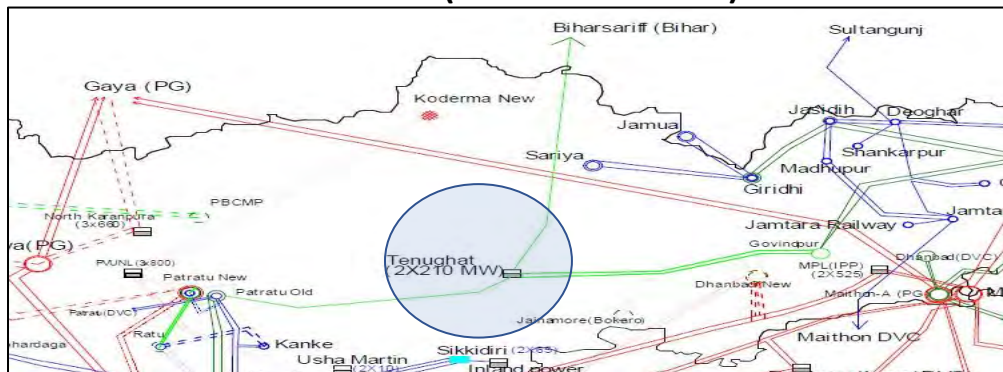


Figure 1: Network across the affected area

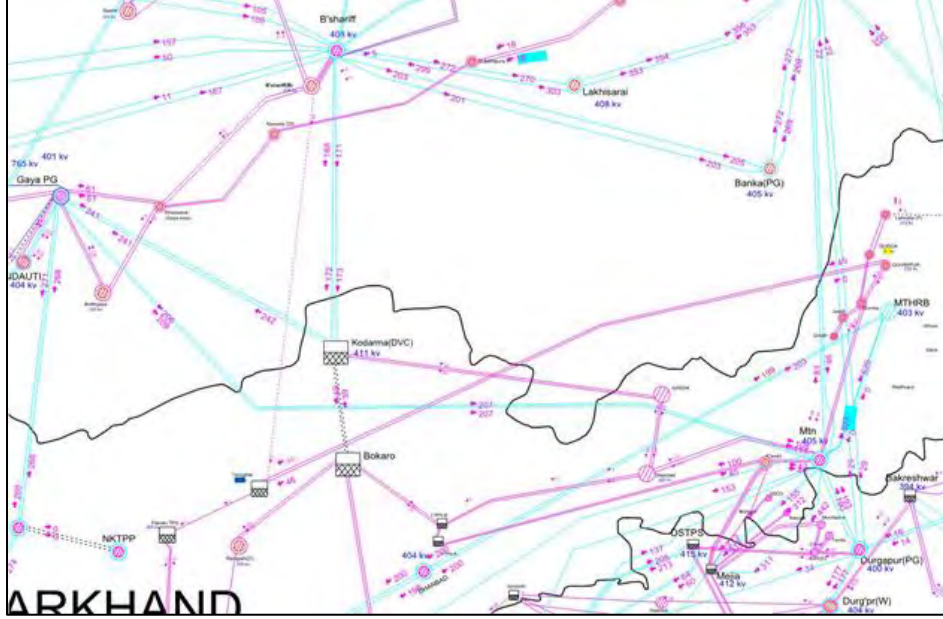
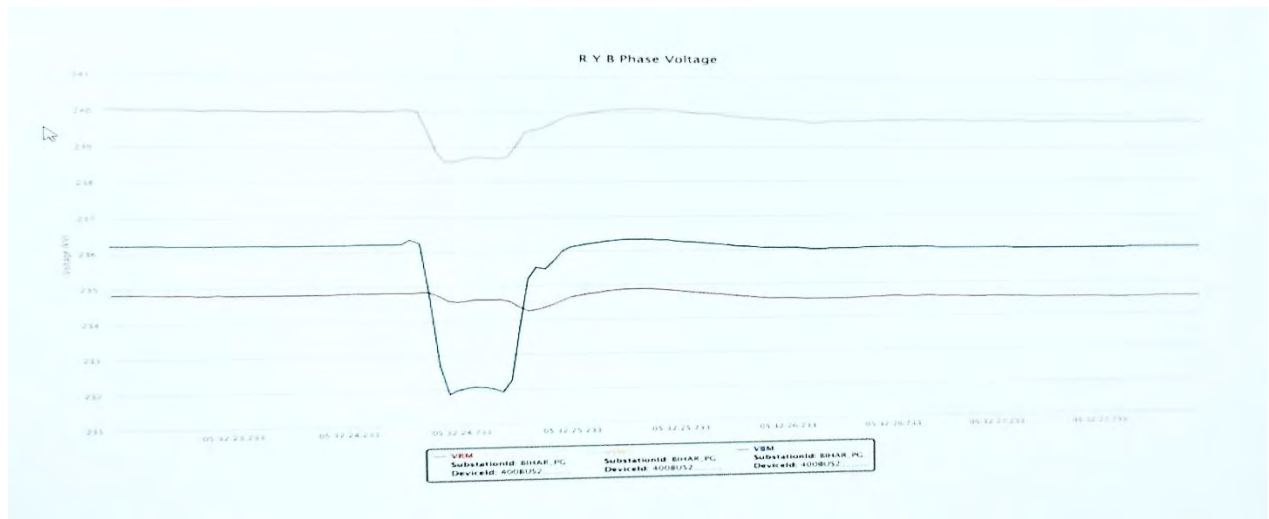


Figure 2: SCADA snapshot for of the system

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

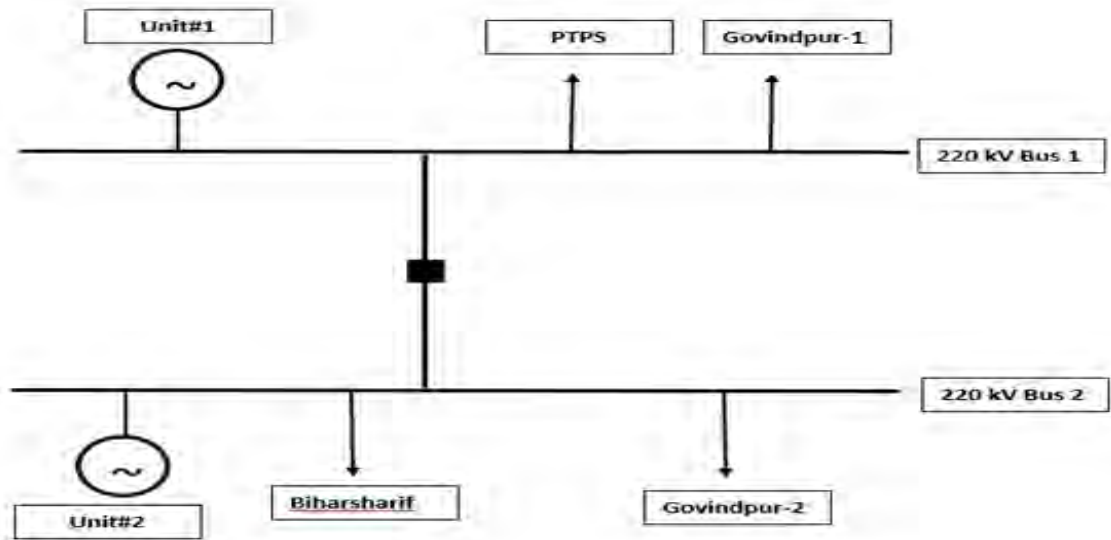
समय	नाम	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पीएमयू पर्यवेक्षण
05:32	220 kv Tenughat-Patratu	Didn't trip (Zone-4 picked up)	B_N, Zone-2, 2.53 kA	4 kV dip in B_ph voltage at Biharsharif. Fault Clearance time: 350 msec.
	220 kv Tenughat-Bihar sharif	Didn't trip (Zone-4 picked up)	Biharsharif: B_N, Zone-2, 161 km, 1.51 kA	
	220 kv Tenughat-Govindpur-1	Tenughat: B_N, Zone-4, 0.9 kA	Didn't Trip (Zone-3 picked up)	
	220 kv Tenughat-Govindpur-2	Tenughat: B_N, Zone-4, 0.9 kA	Didn't Trip (Zone-3 picked up)	
	Tenughat U#1 & U#2	O/C		



5. Restoration (पूर्वावस्था की प्रप्ति)

Transmission/Generation element name	Restoration time
220 kV Tenughat-Patratu	06:50
220 kV Tenughat-Biharsharif	06:08
220 kV Tenughat-Govindpur-1	06:05
220 kV Tenughat-Govindpur-2	11:10
Tenughat U#1	15:05
Tenughat U#2	09:45

6. Analysis of the event (घटना का विश्लेषण):



220 kV Bus arrangement at Tenughat

DR Analysis

- There was a B_N fault, which was sensed in Zone-4 by all lines emanating from Tenughat.
- 220 kV Tenughat-Patratu and 220 kV Tenughat-Biharsharif tripped in Zone-2 from Patratu and Biharsharif respectively after 350 msec.
- 220 kV Tenughat-Govindpur D/c tripped from Tenughat end only in Zone-4.
- 210 MW U#1 Tenughat: Tripped immediately within 80 msec on O/c.

7. Protection issue (सुरक्षा समस्या):

- As multiple previous instances, fault seems to be in Tenughat switchyard. TVNL may share findings.
- U#1 tripped immediately within 80 msec. **O/c Hi-set & negative sequence O/c settings maybe reviewed.**

8. Recommendations (सुझाव):

- Installation of Numerical bus bar protection scheme may be explored at the earliest as same kind of fault is causing complete outage of S/s.
- As bus bar protection has not operated even with such high fault current at Tenughat during this event, all bus bar circuitry should be properly checked along with complete bus bar scheme at Tenughat with injection kit. Besides, complete substation should also be inspected for any insulator tracking or flashover as the event had occurred during fog condition in early morning hours.
- U#2 of Tenughat has electromechanical relay. Numerical relay maybe installed for the unit to ensure security and reliability in line with CEA standard.
- DR channels should be configured properly as per DR standards ratified in PCC and these DRs should be time synchronised.

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

Issues	Regulation Non-Compliance	Utility
DR/EL not provided within 24 Hours	1. IEGC 5.2 (r) 2. CEA grid Standard 15.3	JUSNL, TVNL, BSPTCL
Incorrect/ mis-operation / unwanted operation of Protection system	1. CEA Technical Standard for Construction of Electrical Plants and Electric Lines: 43.4.A. 2. CEA (Technical standards for connectivity to the Grid) Regulation, 2007: Schedule Part 1. (6.1, 6.2, 6.3)	TVNL
Non-Availability of Numerical Bus Bar/LBB Protection at 220 kV and above S/s	1. CEA Technical Standard for Construction of Electrical Plants and Electric Lines 43.4.A 2. CEA Technical Standard for Construction of Electrical Plants and Electric Lines 43.4.C.4 3. CEA (Technical standards for connectivity to the Grid) Regulation, 2007 – 6.1, 6.4.	JUSNL, TVNL
DR/EL are not time synchronized	1. Indian Electricity Grid Code 4.6.3 2. CEA Technical Standard for Construction of Electrical Plants and Electric Lines: 43.4.D. 3. CEA (Technical standards for connectivity to the Grid) Regulation, 2007: Schedule Part 1.7.	JUSNL, TVNL, BSPTCL

10. Status of Reporting (रिपोर्टिंग की स्थिति):

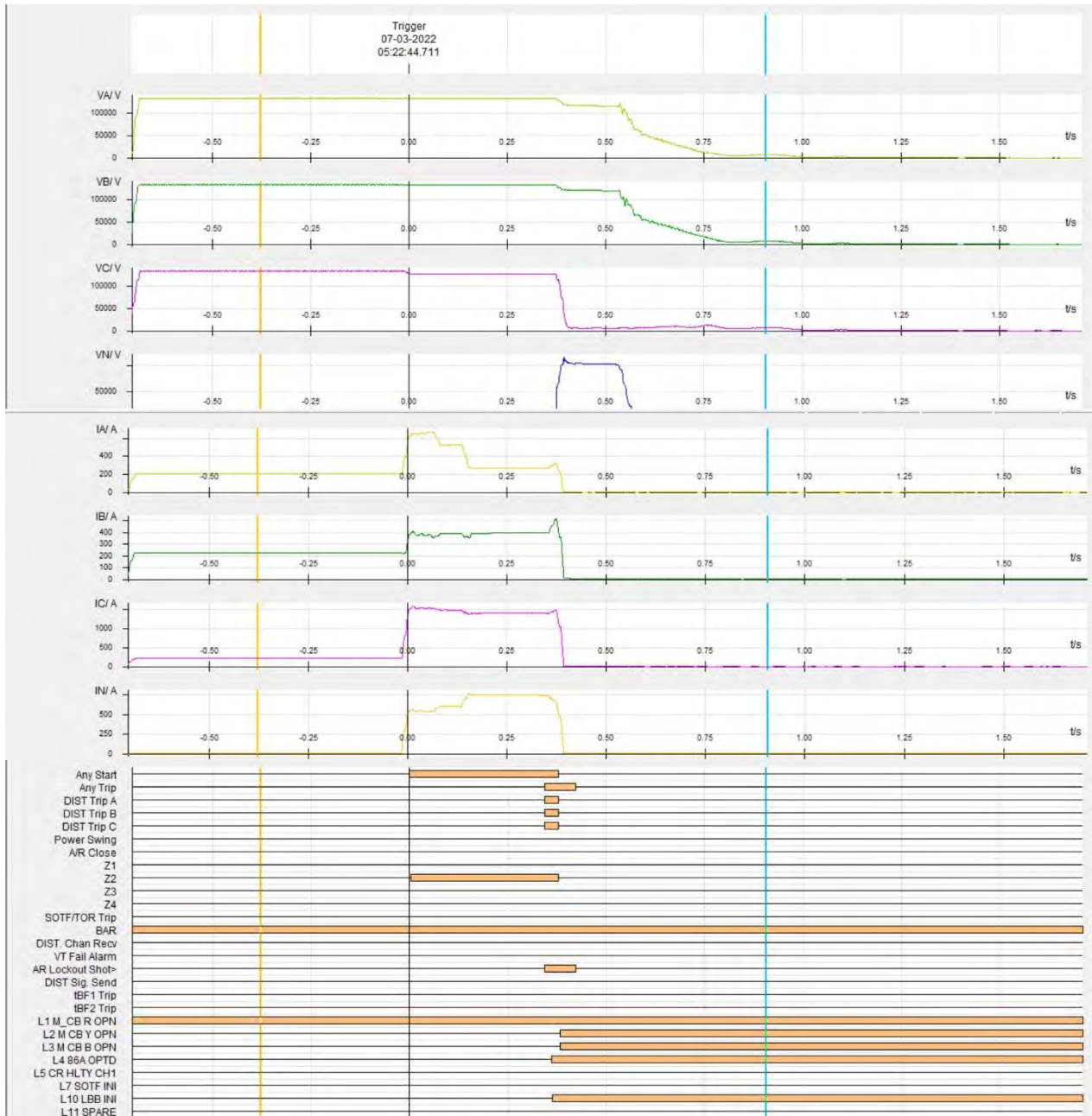
- DR/EL received from JUSNL, TVNL, BSPTCL.

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

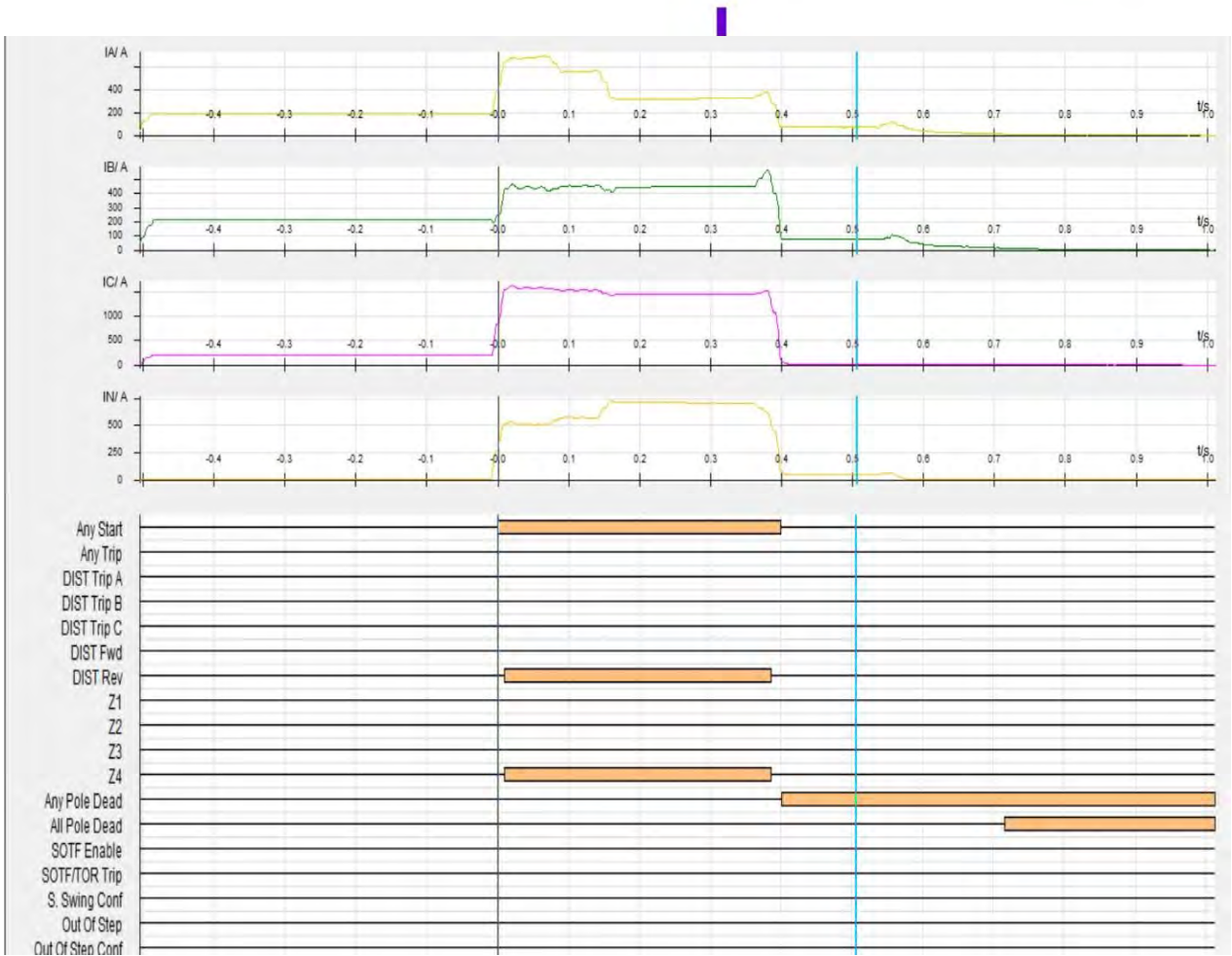
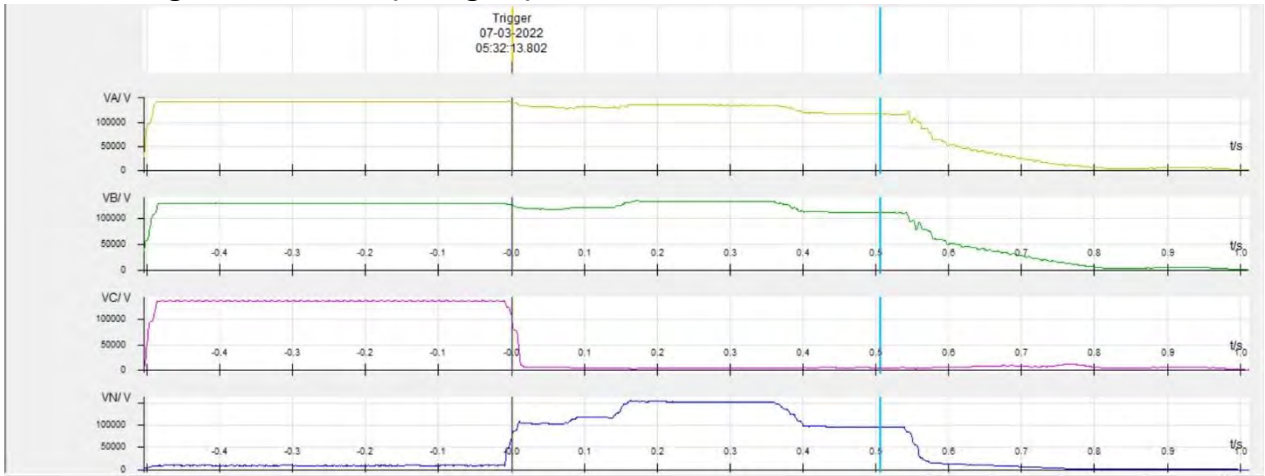
Sequence of event not recorded at time of event.

Annexure 2: DR recorded

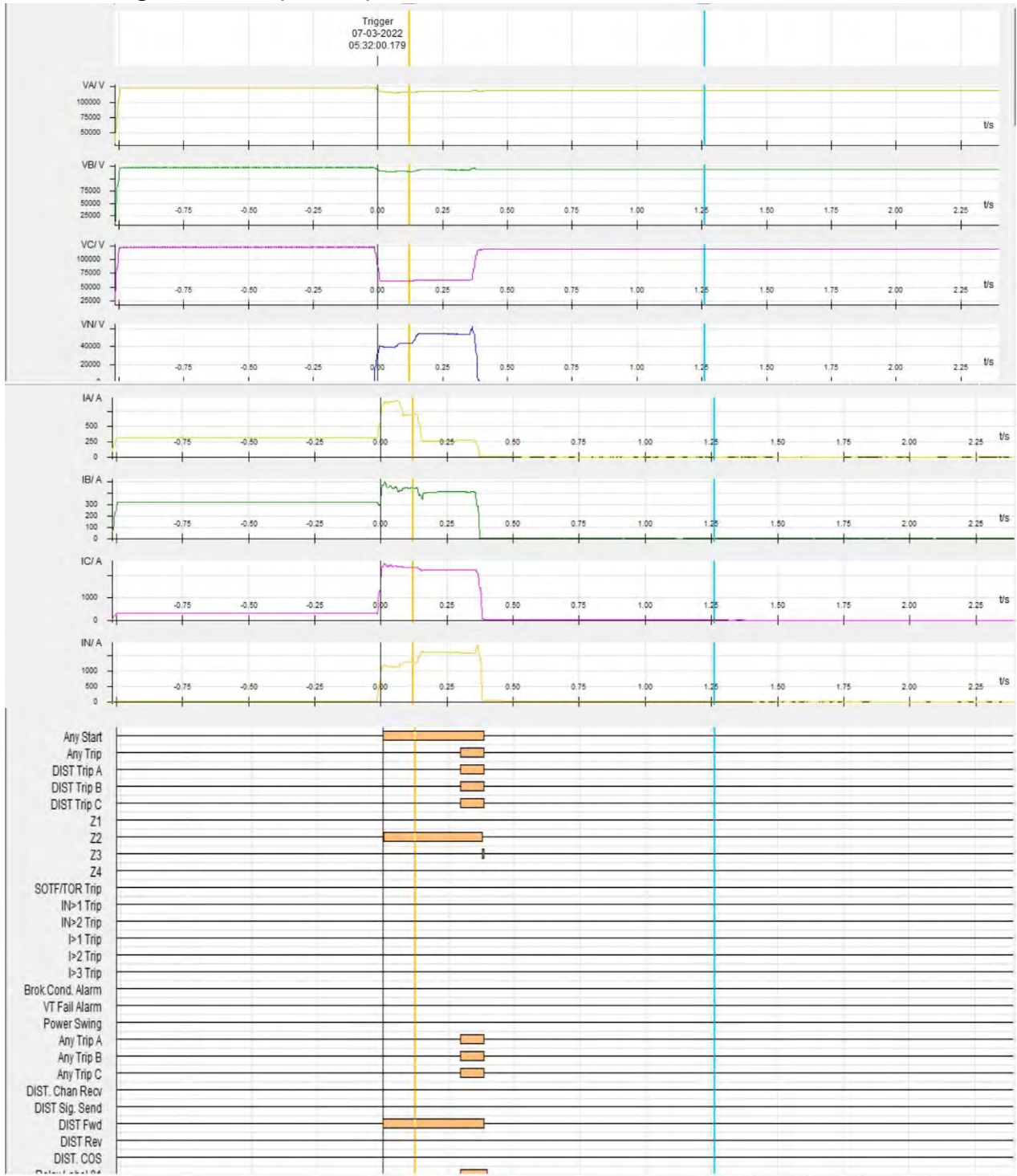
220 kV Tenughat-Biharsharif (Biharsharif)



220 kV Tenughat-Biharsharif (Tenughat)

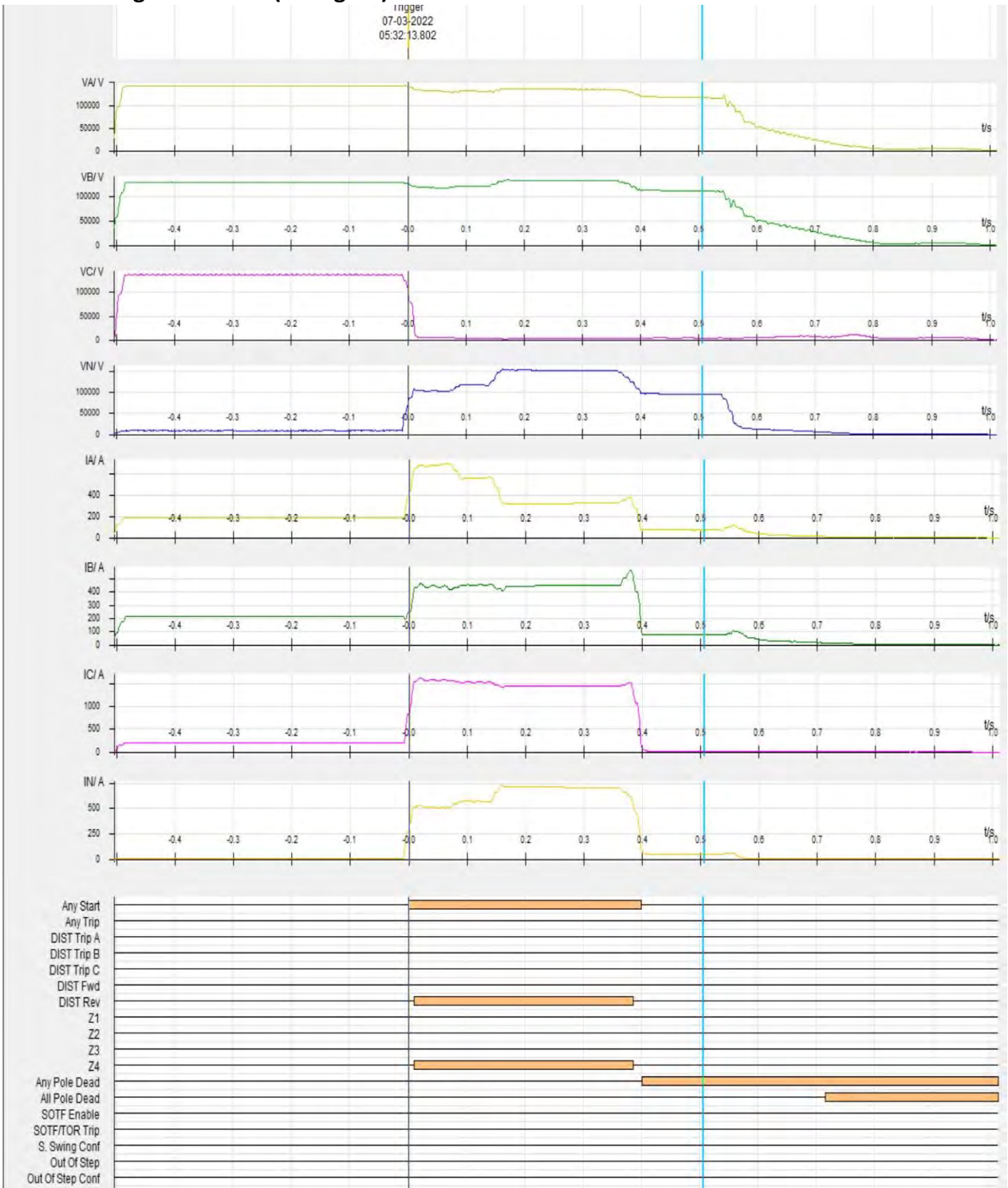


220 kV Tenughat-Patratu (Patratu)

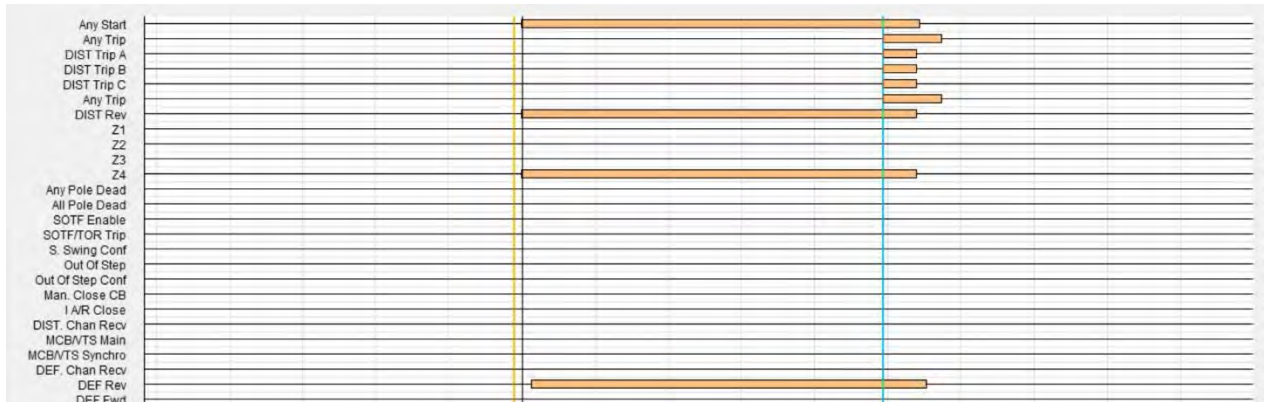
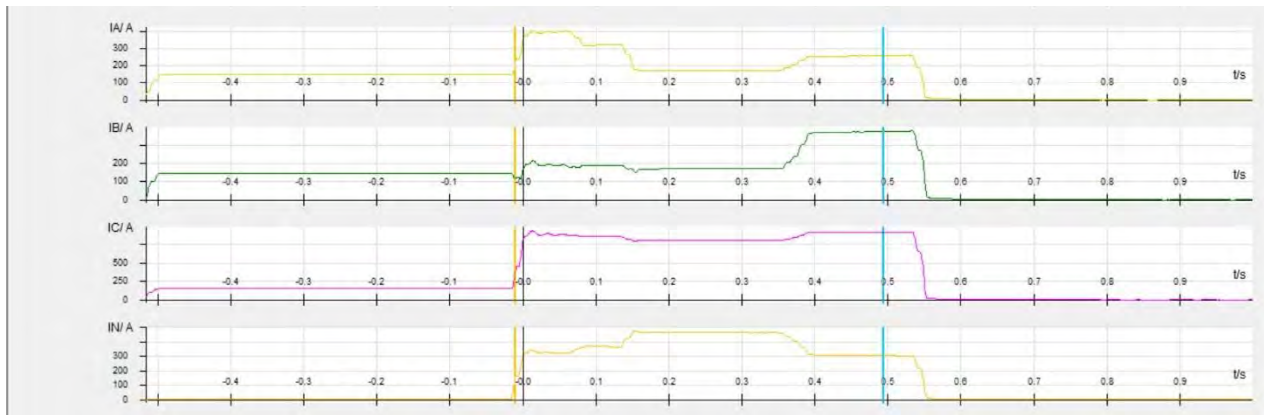
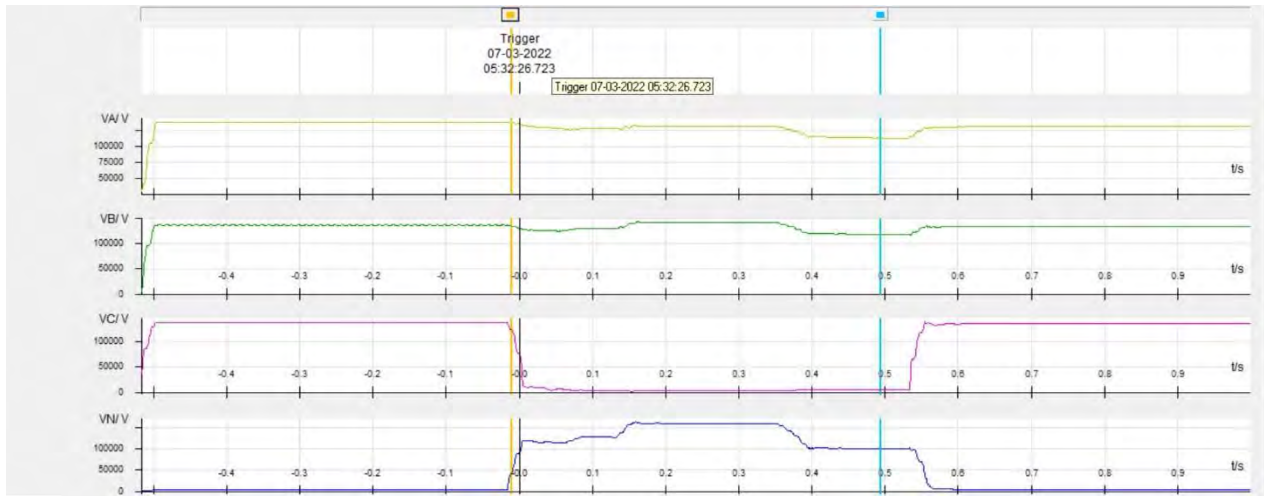


220 kV Tenughat-Patratu (Tenughat)

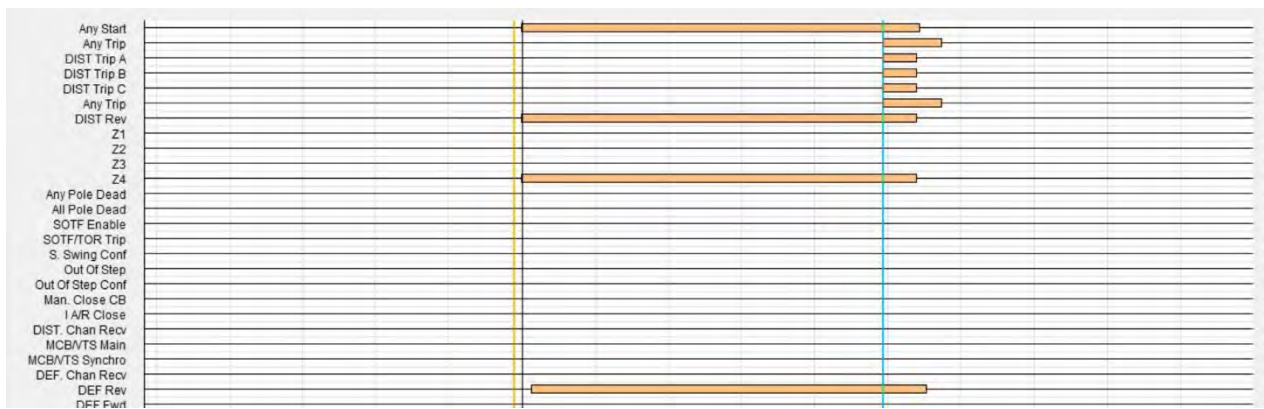
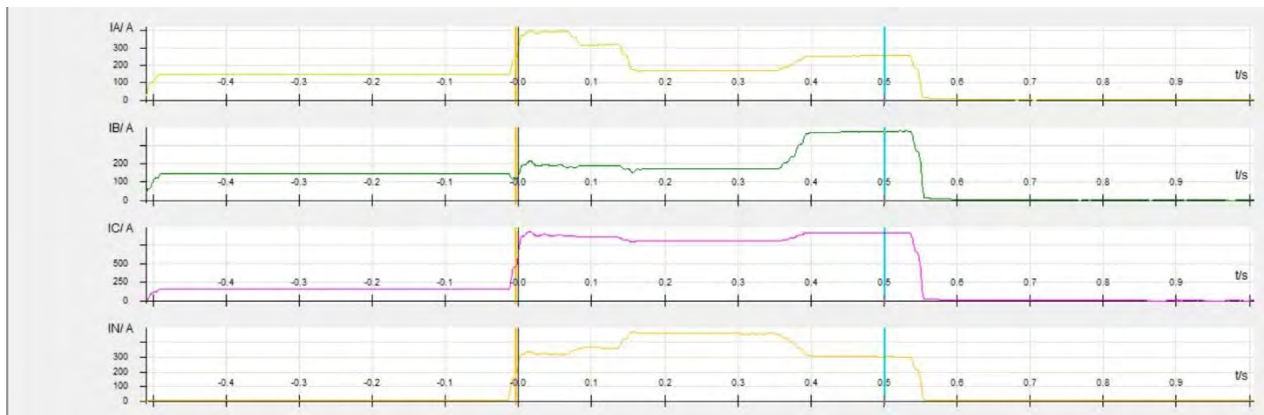
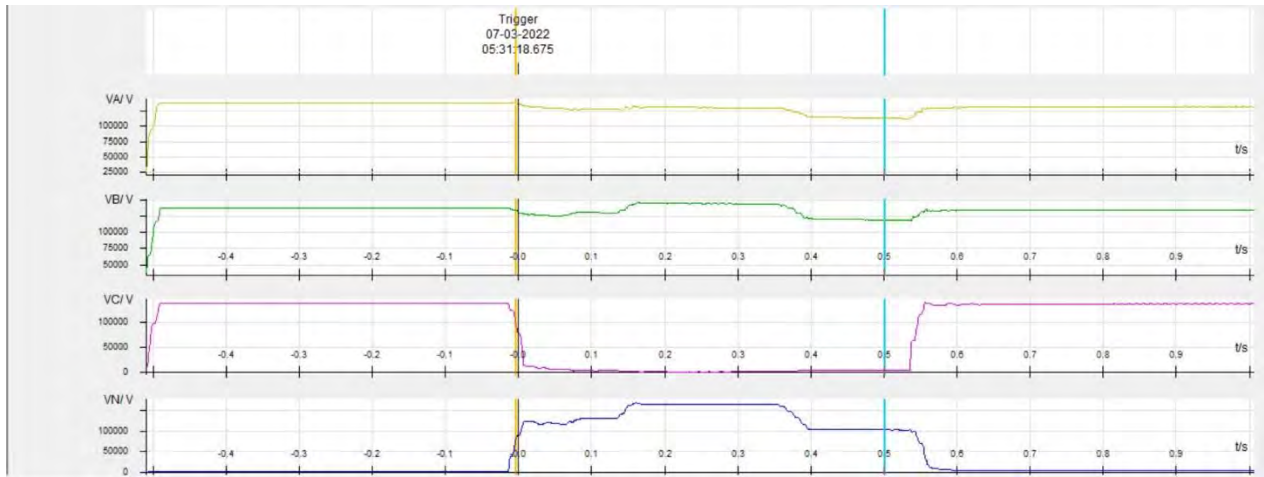
Trigger
07-03-2022
05:32:13.802



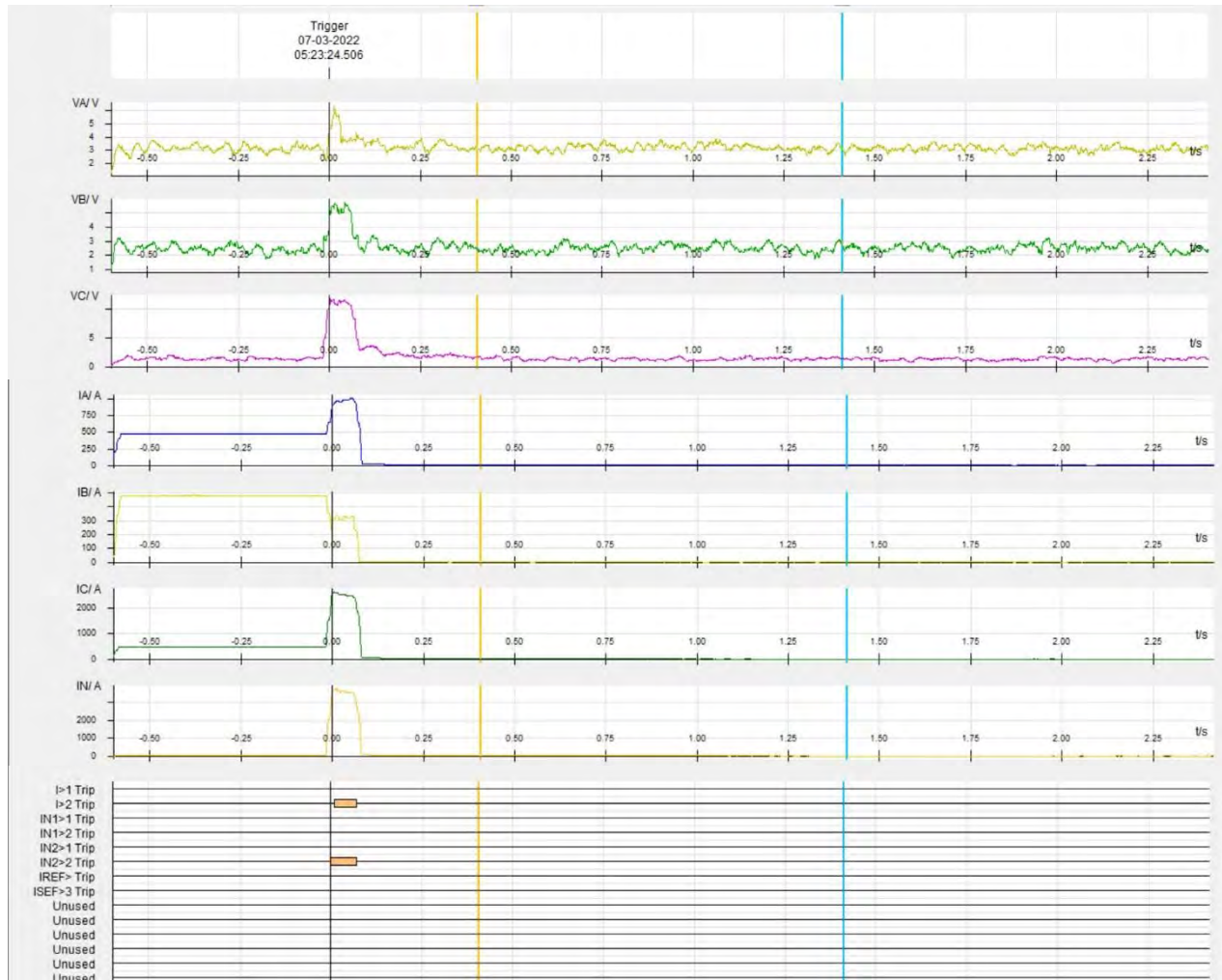
220 kV Tenughat-Govindpur-1 (Tenughat)



220 kV Tenughat-Govindpur-2 (Tenughat)



210 MW U#1 (Tenughat)



पावर सिस्टम ऑपरेशन करपोरेशन लिमिटेड

(भारत सरकार का उद्यम)

POWER SYSTEM OPERATION CORPORATION LIMITED

(A Government of India Enterprise)



Eastern Regional Load Despatch Centre: 14, Golf Club Road, Tollygunge, Kolkata-700 033.

CIN: U40105DL2009GOI188682

फ़ोन: 033- 24235755, 24174049 फ़ैक्स : 033-24235809/5029 Website: www.erldc.org, Email ID- erldc@posoco.in

घटना संख्या: 24-03-2022/1

दिनांक: 06-04-2022

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

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

At 21:37 Hrs on 24th March 2022, 220 kV Tenughat-Govindpur-2 tripped due to R_N fault. Both running units at Tenughat also tripped at the same time. This resulted in 364 MW generation loss at Tenughat power plant.

- **Date / Time of disturbance:** 24-03-2022 at 21:37 hrs.
- **Event type:** GI - 1
- **Systems/ Subsystems affected:** 220 kV Tenughat S/s
- **Load and Generation loss.**
 - 364 MW generation loss reported during the event.
 - No load loss reported during the event

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

- NIL

3. Major elements tripped (प्रमुख ट्रिपिंग)

- 220 kV Tenughat-Govindpur-2
- U#1 and U#2 at Tenughat

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

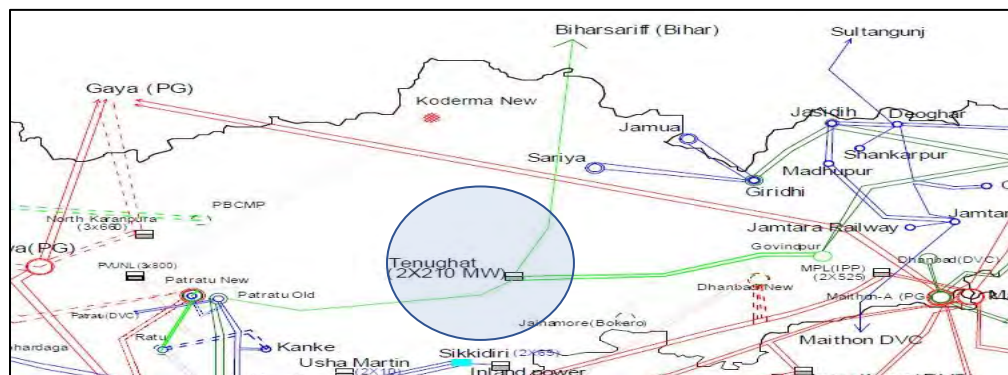


Figure 1: Network across the affected area

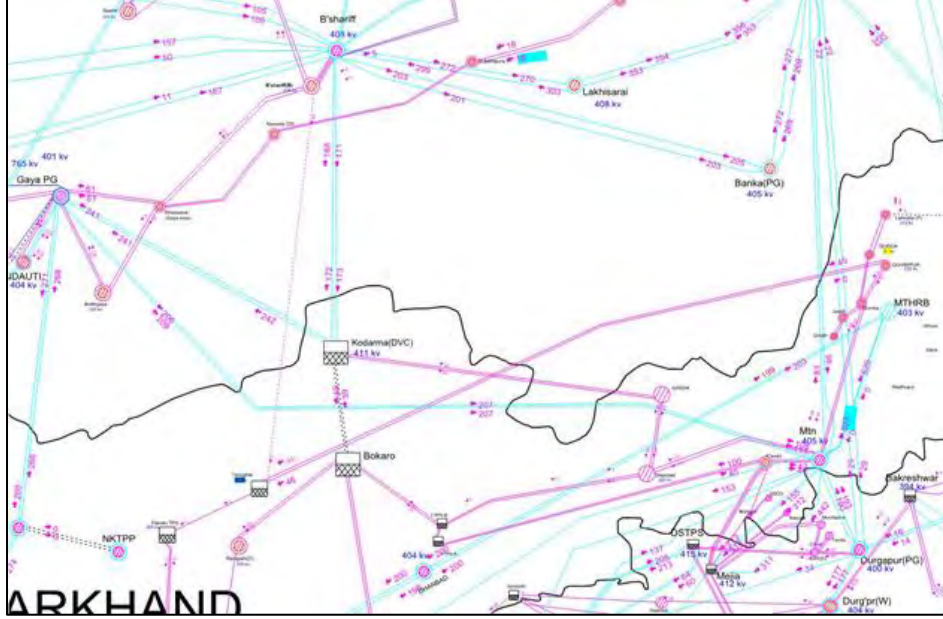


Figure 2: SCADA snapshot for of the system

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

समय	नाम	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पीएमयू पर्यवेक्षण
21:37	220 kV Tenughat-Govindpur-2	Tenughat: R_N, 1.73 km, 3.56 kA, Z-1, carrier received, Three phase trip.	Govindpur: R_N, 1.32 kA, Zone 1, carrier received, A/R successful	4 kV dip in R_ph at Biharsharif
	Tenughat U#1	Negative sequence O/c		

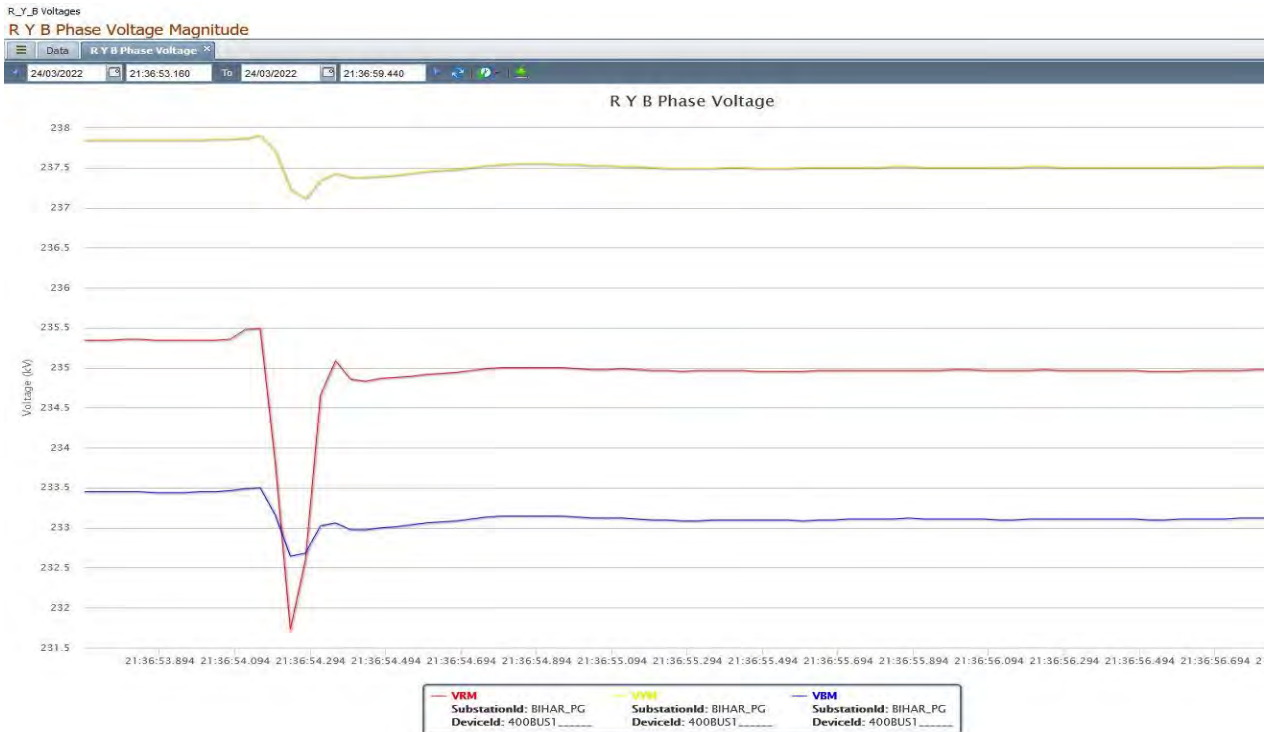


Figure 3: PMU voltage snapshot of 400/220 kV Bihar sharif S/s

5. Restoration (पूर्वावस्था की प्रप्ति)

Transmission/Generation element name	Restoration time
220 kV Tenughat-Govindpur-2	10:09
Tenughat U#1	12:15
Tenughat U#2	14:45

6. Analysis of the event (घटना का विश्लेषण):

DR Analysis

- **220 kV Tenughat-Govindpur-2**
 - Tenughat: Fault in R_ph. All three phases tripped within 100 msec.
 - Govindpur: Fault in R_ph was seen in Zone-2, carrier received and fault was cleared within 100 msec. A/R successful after 800 msec.
- **210 MW U#1 at Tenughat:** Tripped within 80 msec on Negative sequence O/c protection.

7. Protection issue (सुरक्षा समस्या):

- Three phase tripping occurred at Tenughat end for single phase fault during the 220 kV Tenughat-Govindpur 2 circuit. **TVNL may explain**
- U#1 tripped immediately within 80 msec. **O/c Hi-set and negative sequence O/c settings maybe reviewed.**

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	TVNL, JUSNL
Incorrect/ mis-operation / unwanted operation of Protection system	1. CEA Technical Standard for Construction of Electrical Plants and Electric Lines: 43.4.A. 2. CEA (Technical standards for connectivity to the Grid) Regulation, 2007: Schedule Part 1. (6.1, 6.2, 6.3)	TVNL
Non-Availability of Numerical Bus Bar/LBB Protection at 220 kV and above S/s	1. CEA Technical Standard for Construction of Electrical Plants and Electric Lines 43.4.A 2. CEA Technical Standard for Construction of Electrical Plants and Electric Lines 43.4.C.4 3. CEA (Technical standards for connectivity to the Grid) Regulation, 2007 – 6.1, 6.4.	TVNL

DR/EL are not time synchronized	<ol style="list-style-type: none">1. Indian Electricity Grid Code 4.6.32. CEA Technical Standard for Construction of Electrical Plants and Electric Lines: 43.4.D.3. CEA (Technical standards for connectivity to the Grid) Regulation, 2007: Schedule Part 1.7.	JUSNL, TVNL
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9. Status of Reporting (रिपोर्टिंग की स्थिति):

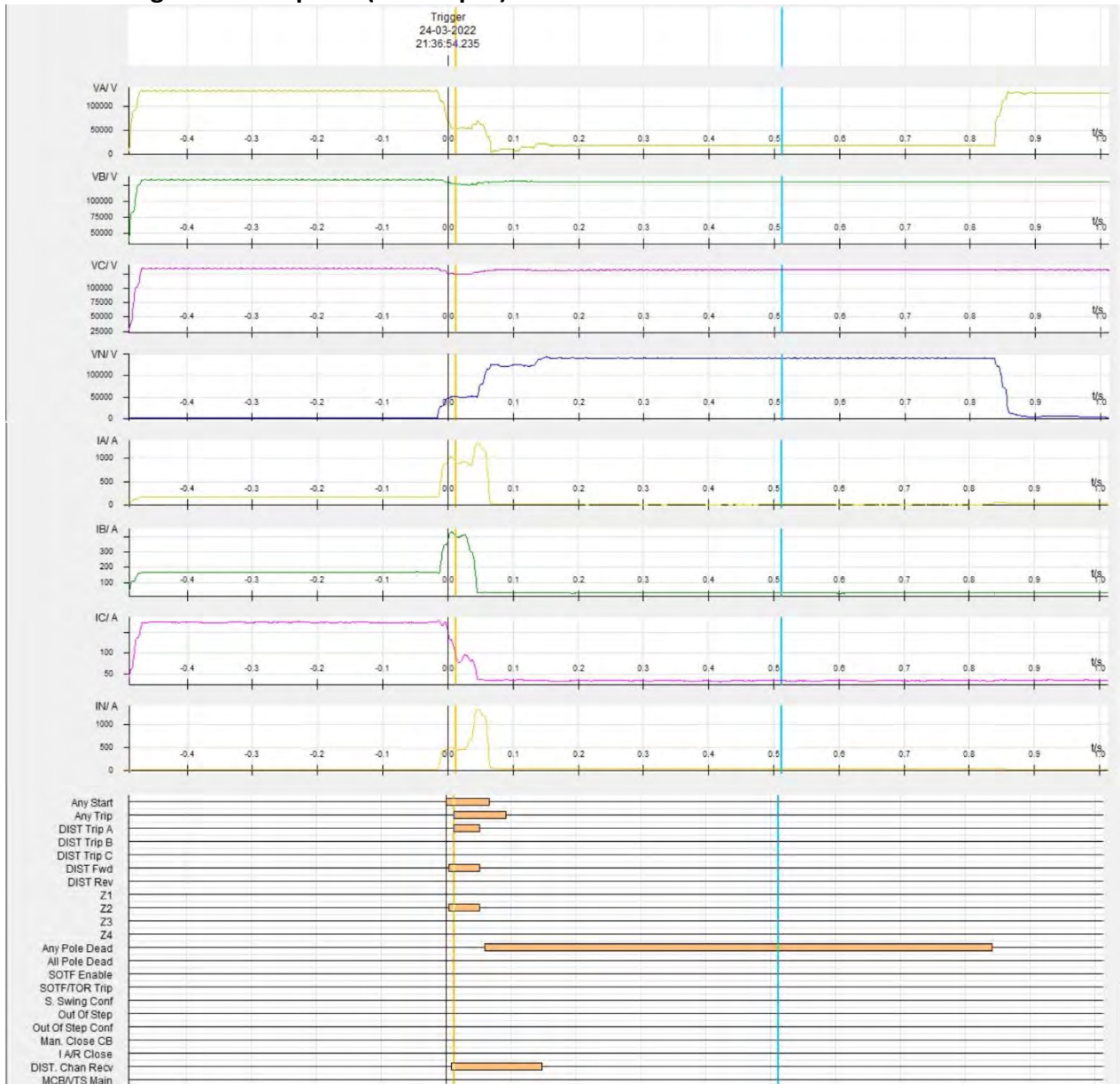
- DR/EL received from JUSNL, TVNL.

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

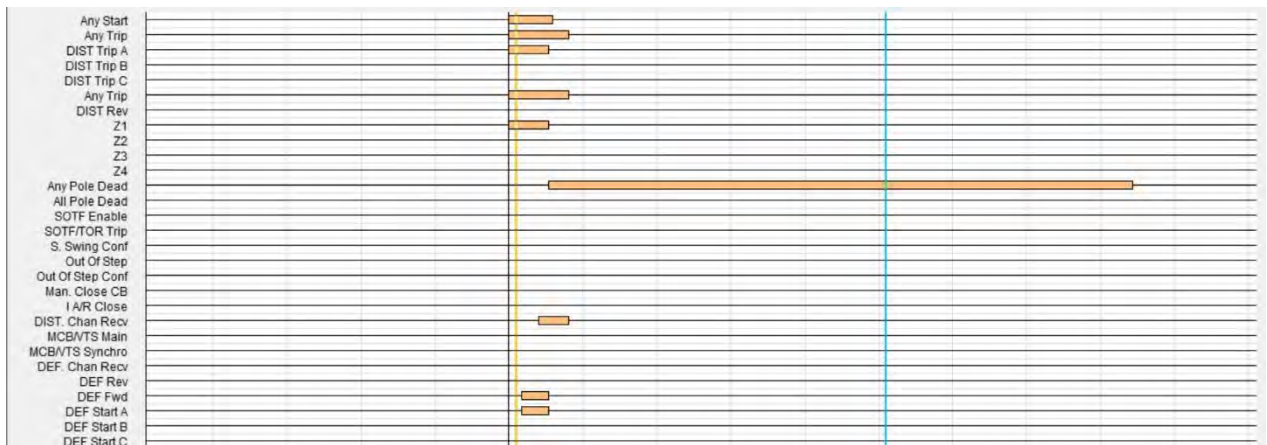
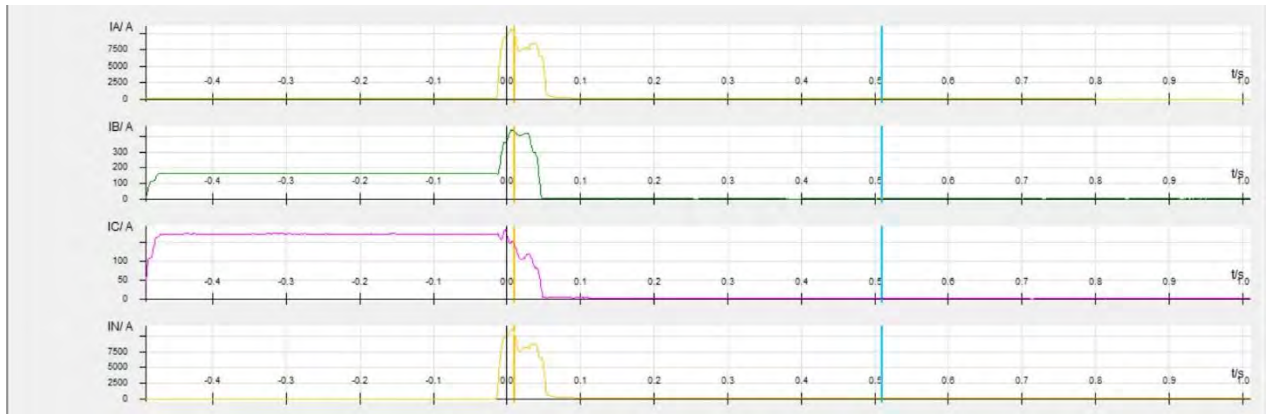
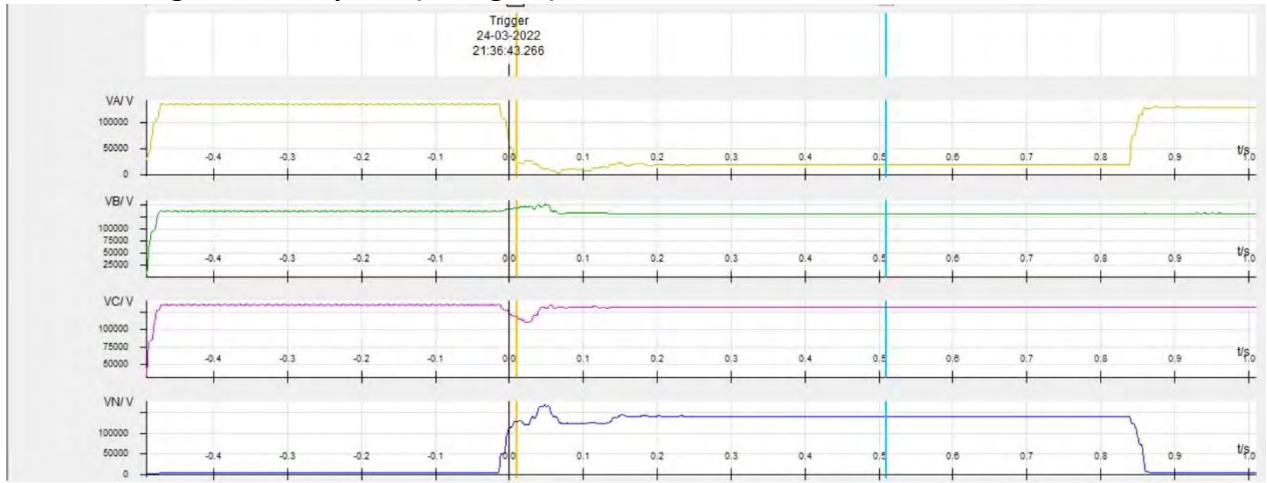
Sequence of event not recorded at time of event.

Annexure 2: DR recorded

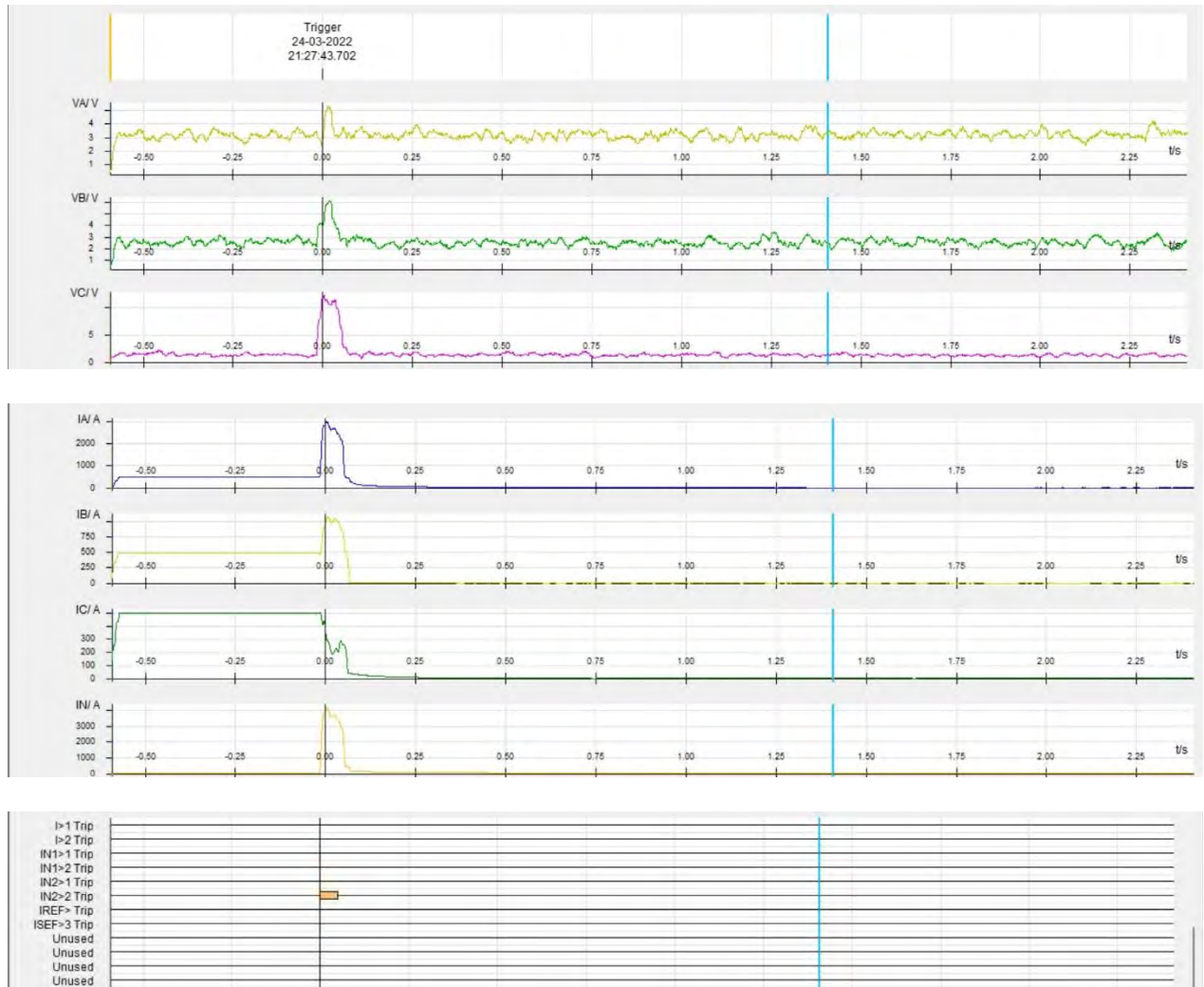
220 kV Tenughat-Govindpur-2 (Govindpur)



220 kV Tenughat-Govindpur-2 (Tenughat)



210 MW U#1 (Tenughat)



पावर सिस्टम ऑपरेशन करपोरेशन लिमिटेड

(भारत सरकार का उद्यम)

POWER SYSTEM OPERATION CORPORATION LIMITED

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Eastern Regional Load Despatch Centre: 14, Golf Club Road, Tollygunge, Kolkata-700 033.

CIN: U40105DL2009GOI188682

फ़ोन: 033- 24235755, 24174049 फ़ैक्स : 033-24235809/5029 Website: www.erldc.org, Email ID- erldc@posoco.in

घटना संख्या: 27-03-2022/1

दिनांक: 06-04-2022

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

Summary of the event (घटना का सारांश):

At 12:47 Hrs on 27th March 2022, all lines emanating from 400/220/132 kV Lapanga S/s got tripped. As reported by OPTCL, fire incident occurred near the periphery of 400 kV Bus at Lapanga substation. This has resulted in fault in the switchyard however, bus bar protection didn't operate, and all lines tripped from remote ends. At the same time, 1900 MW captive load of Sterlite, one running unit of OPGC also got tripped. The event led to total supply failure at 400/220/132 kV Lapanga substation.

Date / Time of disturbance: 27-03-2022 at 12:47 hrs.

- **Event type:** GD - 1
- **Systems/ Subsystems affected:** 400/220 kV Lapanga S/s
- **Load and Generation loss.**
 - 532 MW generation loss at OPGC
 - 1900 MW load loss at Sterlite captive power plant

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

- 400 kV Lapanga-Meramundali-2
- 220 kV Budhipadar-Lapanga-2

Major elements tripped (प्रमुख ट्रिपिंग):

- 400 kV Lapanga-Meramundali-1
- 400 kV Lapanga-OPGC (IB Thermal) D/c
- 400 kV Lapanga-Sterlite D/c
- 220 kV Budhipadar-Lapanga-1
- 220 kV Budhipadar-Katapalli D/c
- 132 kV Lapanga-SMC
- 132 kV Lapanga-Budhipadar
- 132 kV Lapanga-Jharsuguda
- 132 kV Lapanga-Aryan Ispat

Network across the affected area (प्रभावित क्षेत्र का नक्शा)

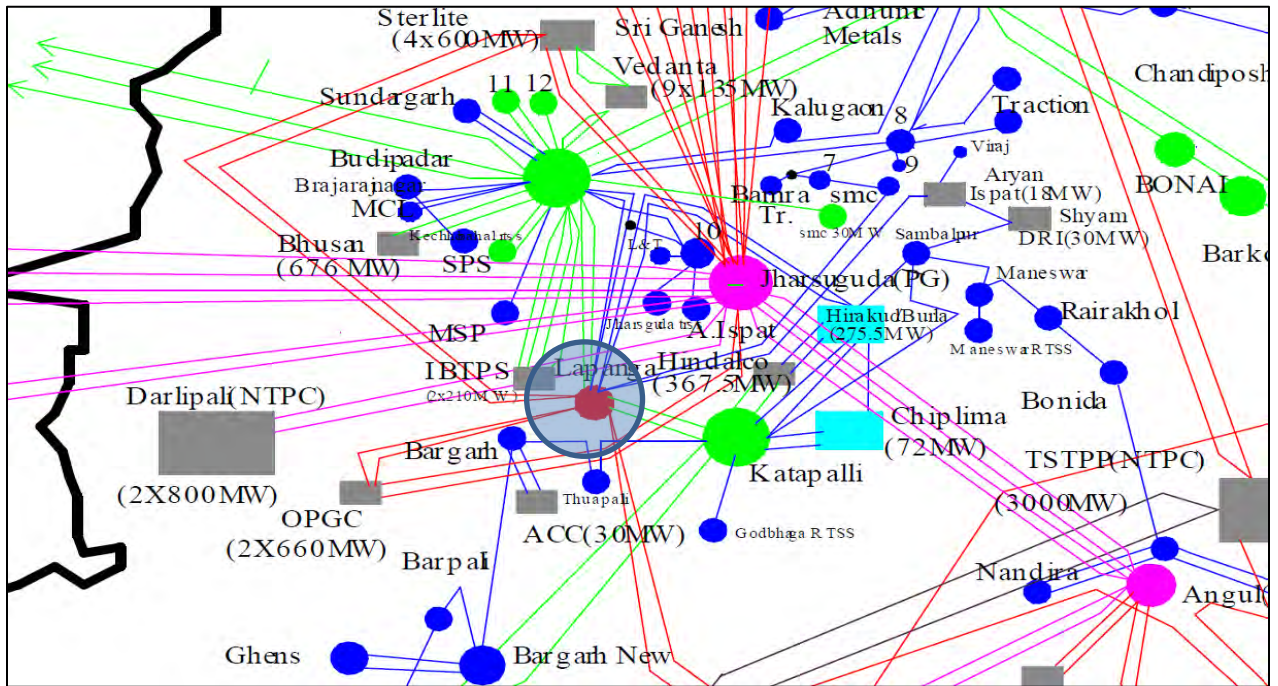


Figure 1: Network across affected area

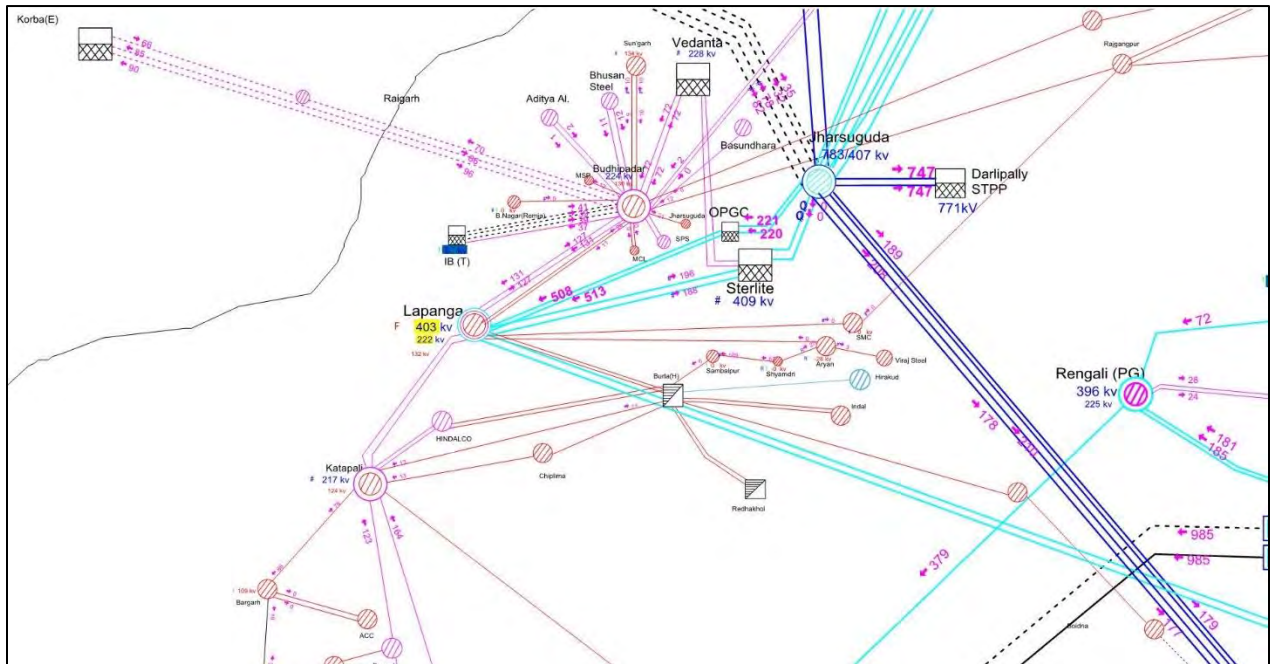


Figure 2: SCADA snapshot of the system

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

समय	नाम	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत	पीएमयू पर्यवेक्षण
12:47	400 kV Lapanga-Meramundali-1	Didn't trip from Lapanga	Zone-2	Fault persisted for around 1.7 seconds. 73 kV dip in Y_ph at Jharsuguda persisted till 400 msec. After 400 msec, fault converted to R_Y_N fault.
	400 kV Lapanga-OPGC-1		O/c in R_ph & Y_ph	
	400 kV Lapanga-OPGC-2		O/c in R_ph & Y_ph	
	400 kV Lapanga-Sterlite-1		Zone-2	
	400 kV Lapanga-Sterlite-2		Zone-2	
	220 kV Lapanga-Katapalli-1		O/c in R_ph & Y_ph	
	220 kV Lapanga-Katapalli-2		O/c in R_ph & Y_ph	
	220 kV Lapanga-Budhipadar-1		-	
	132 kV Lapanga-SMC		O/c	
	132 kV Lapanga-Budhipadar		O/c	
	132 kV Lapanga-Jharsuguda		O/c	
	132 kV Lapanga-Aryan Ispat		O/c	

R_Y_B Voltages

27/03 12:46 - 29/03

R Y B Phase Voltage Magnitude



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

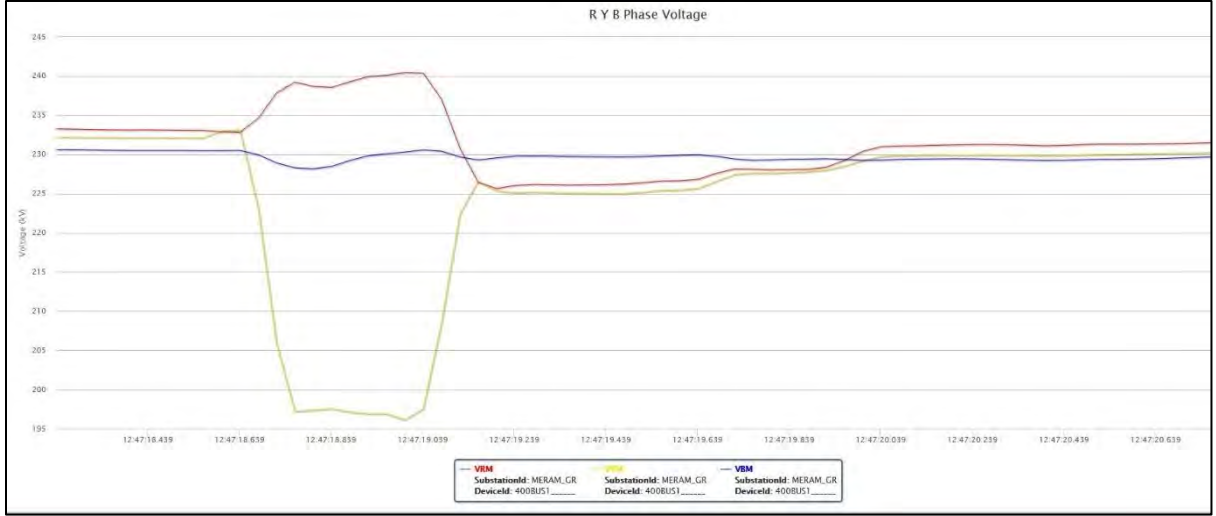


Figure 3: PMU voltage snapshot of 400/220 kV Meramundali S/s

Restoration (पूर्वावस्था की प्रप्ति):

Sl. No.	Name of the Element	Restoration Time
1	400 kV Bus-1 & Bus-2	14:43 Hrs
2	400 kV Lapanga-Meramundali-1	20:09 Hrs
3	400 kV Lapanga-OPGC-D/c	15:15/15:46 Hrs
4	400 kV Lapanga-Sterlite D/c	18:21/18:38 Hrs
5	400/220 kV ICT-1 & ICT-2	14:43/14:49 Hrs
6	220 kV Bus-1 & Bus-2	13:27 Hrs
7	220 kV Lapanga-Katapalli D/c	15:44 Hrs
8	220 kV Lapanga-Budhipadar-1	13:27 Hrs
9	220/132 kV ATR-1 & ATR-2	13:27 Hrs
	OPGC Unit 3	15:37
All 132 kV lines charged by 16:26 Hrs		

Analysis of the event (घटना का विश्लेषण):

- As reported, there was a fire incident just outside the switchyard of Lapanga, which entered into the grid boundary up to the switchyard fence. The entire switchyard was covered with dense smoke.
- Y_ph fault struck the 400 kV Lapanga bus which further evolved into a R_Y_N fault after 400 msec. However, exact location of fault on the bus could not be ascertained. During the fault, bus bar protection has not operated. Due to this All lines tripped from remote end. No protection operated at Lapanga end.
- Fault persisted till 1.7 seconds till all 220 kV and 132 kV lines tripped from remote ends.
- 400/220 kV and 220/132 kV ATRs at Lapanga remained closed from both HV and LV sides.

- During the event 1900 MW captive load loss occurred at Sterlite due to tripping of 400/220 kV ICTs at Sterlite.
- In addition to this, one running unit of 400 kV OPGC power plant also got tripped.

Sequence of Events (घटनाक्रम):

- 400 kV Lapanga-Meramundali-2 tripped after 350 msec from Meramundali in Zone-2
- 400 kV Lapanga-Sterlite D/c tripped after 350 msec from Sterlite end in Zone-2
- 400 kV Lapanga-OPGC D/c tripped after around 1000 msec from OPGC end on O/c
- 220 kV Lapanga-Katapalli D/c tripped after 1.3 seconds from Katapalli on O/C E/f
- 220 kV Lapanga-Budhipadar-1 tripped from Budhipadar on distance protection.

Protection issues (सुरक्षा समस्या):

Lapanga end:

- All 400 kV lines saw the fault in Zone-4, suggesting bus fault. Why Bus bar protection not operated at Lapanga need to be checked by OPTCL in detail? OPTCL may try to locate the spot of the fault and assess whether it is coming in zone of bus bar protection or not.
- Zone-4 time of all lines were set around 1200 msec. Zone-4 picked up, but breaker didn't open as fault cleared from remote ends well before 1200 msec. As reported, Zone-4 delay modified to 500 msec. **OPTCL to check Zone 4 setting at all its 400 kV and 220 kV substations in their system and confirm ERLDC/ERPC.**

OPGC end:

- Both lines saw the fault in Zone-3. However, power swing block also triggered. Line tripped after 1 second on O/C in R_ph and Y_ph. Power swing logic maybe checked and modified to ensure for such fault it should not result in delay in operation. OPTCL may study the above aspect with OPGC and check for suitable measures to avoid any delay in fault clearance.

Sterlite end:

- 400/220 kV ICTs tripped within 350 msec. O/C directionality maybe ensured and settings maybe time co-ordinated. Further, LT/HV switchgear and motor protection should be coordinated to avoid unwanted operation when grid side fault is cleared within adequate time.

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

Issues	Regulation Non-Compliance	Utility
Incorrect/ mis-operation / unwanted operation of Protection system	1. CEA Technical Standard for Construction of Electrical Plants and Electric Lines: 43.4.A. 2. CEA (Technical standards for connectivity to the Grid) Regulation, 2007: Schedule Part 1. (6.1, 6.2, 6.3)	OPTCL
DR/EL not provided within 24 Hours	1. IEGC 5.2 (r) 2. CEA grid Standard 15.3	OPTCL, OPGC

<p>DR/EL are not time synchronized</p>	<ol style="list-style-type: none"> 1. Indian Electricity Grid Code 4.6.3 2. CEA Technical Standard for Construction of Electrical Plants and Electric Lines: 43.4.D. 3. CEA (Technical standards for connectivity to the Grid) Regulation, 2007: Schedule Part 1.7. 	<p>JUSNL, TVNL, BSPTCL</p>
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Status of Reporting (रिपोर्टिंग की स्थिति):

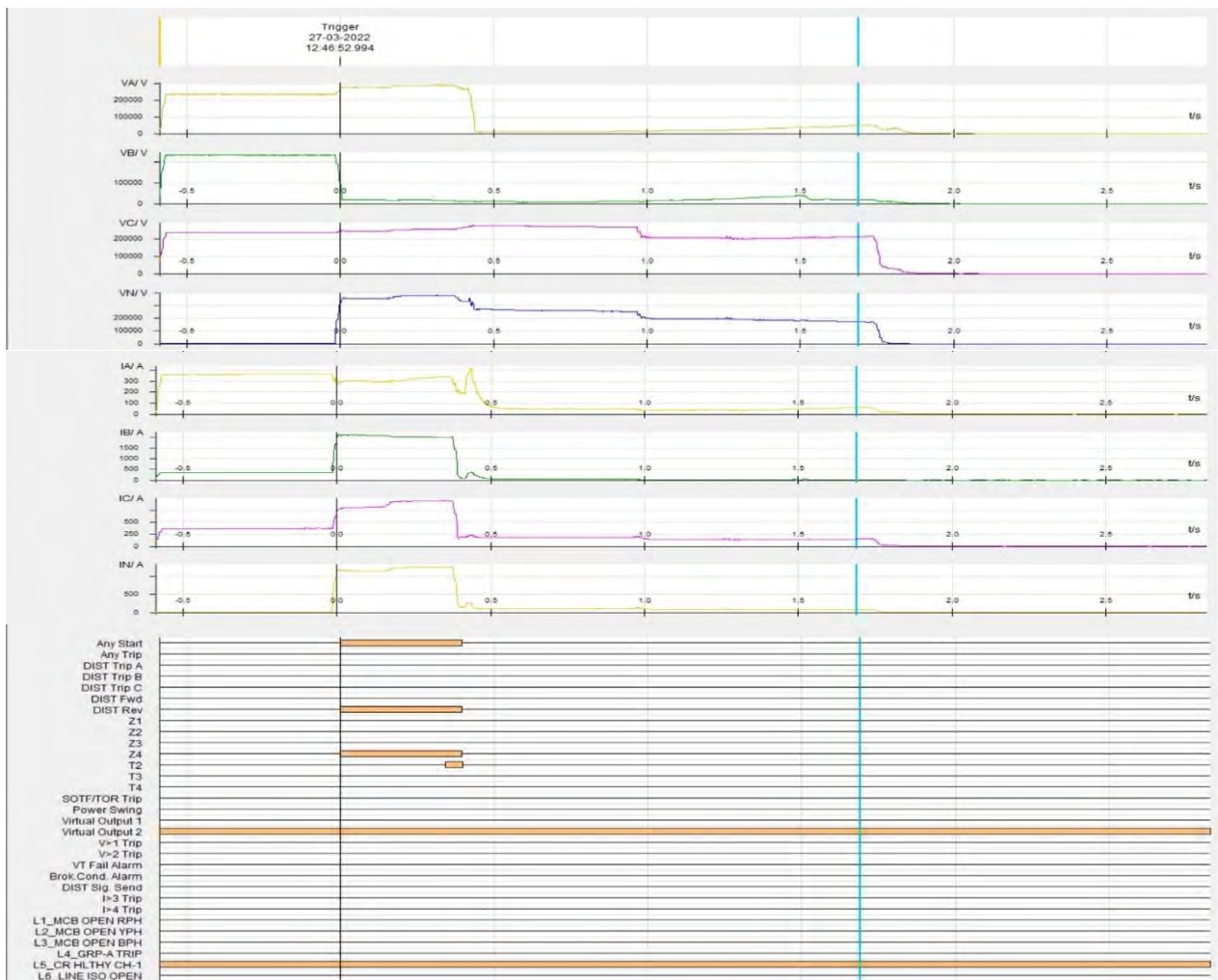
- DR/EL received for all elements except 220 kV Budhipadar-Lapanga-1
- DR/EL for 132 kV lines are not available
- Status of islanding of 132 kv captive loads connected from Lapanga may kindly be shared.

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

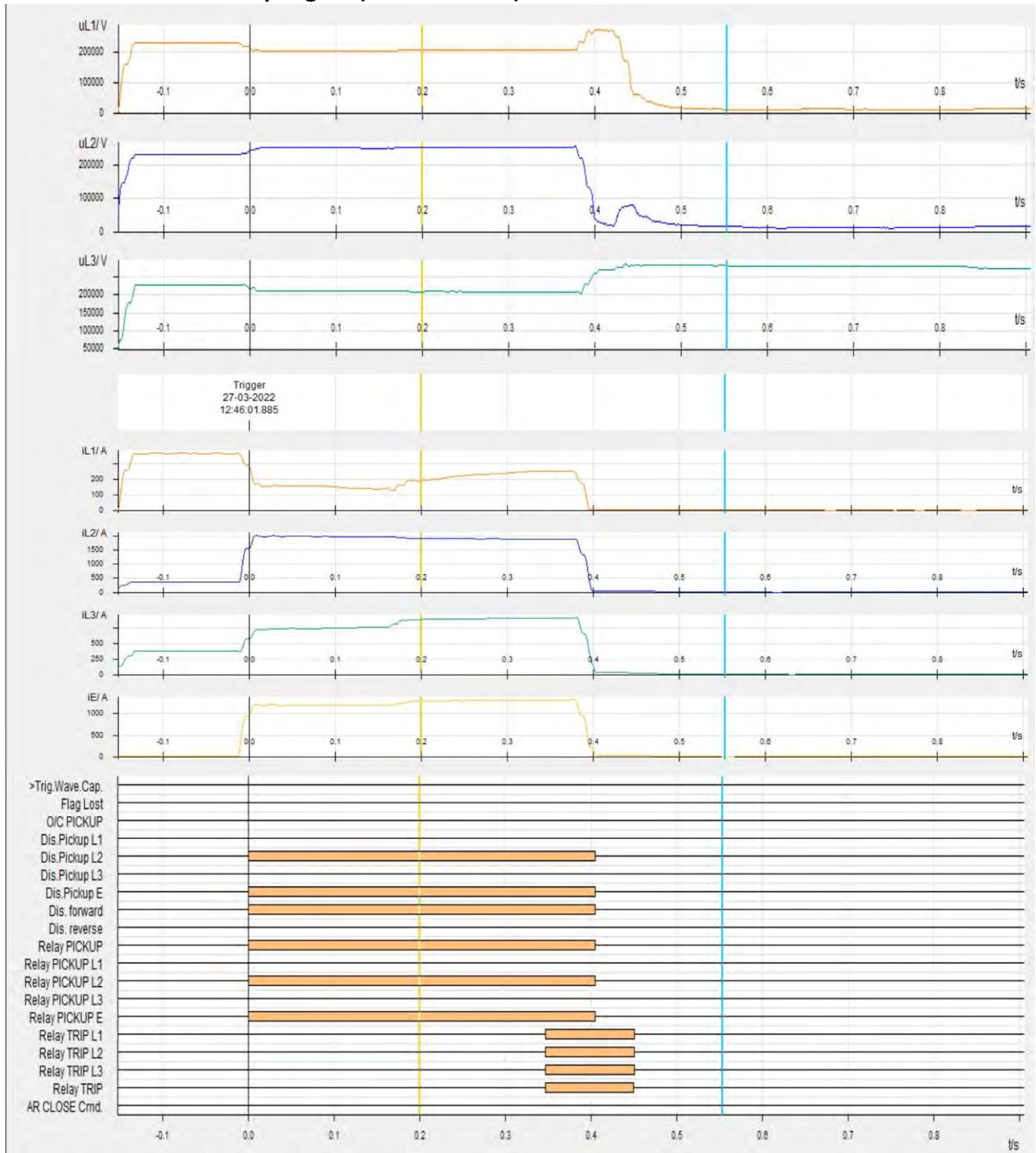
Sequence of event not recorded at ERLDC.

Annexure 2: DR Recorded

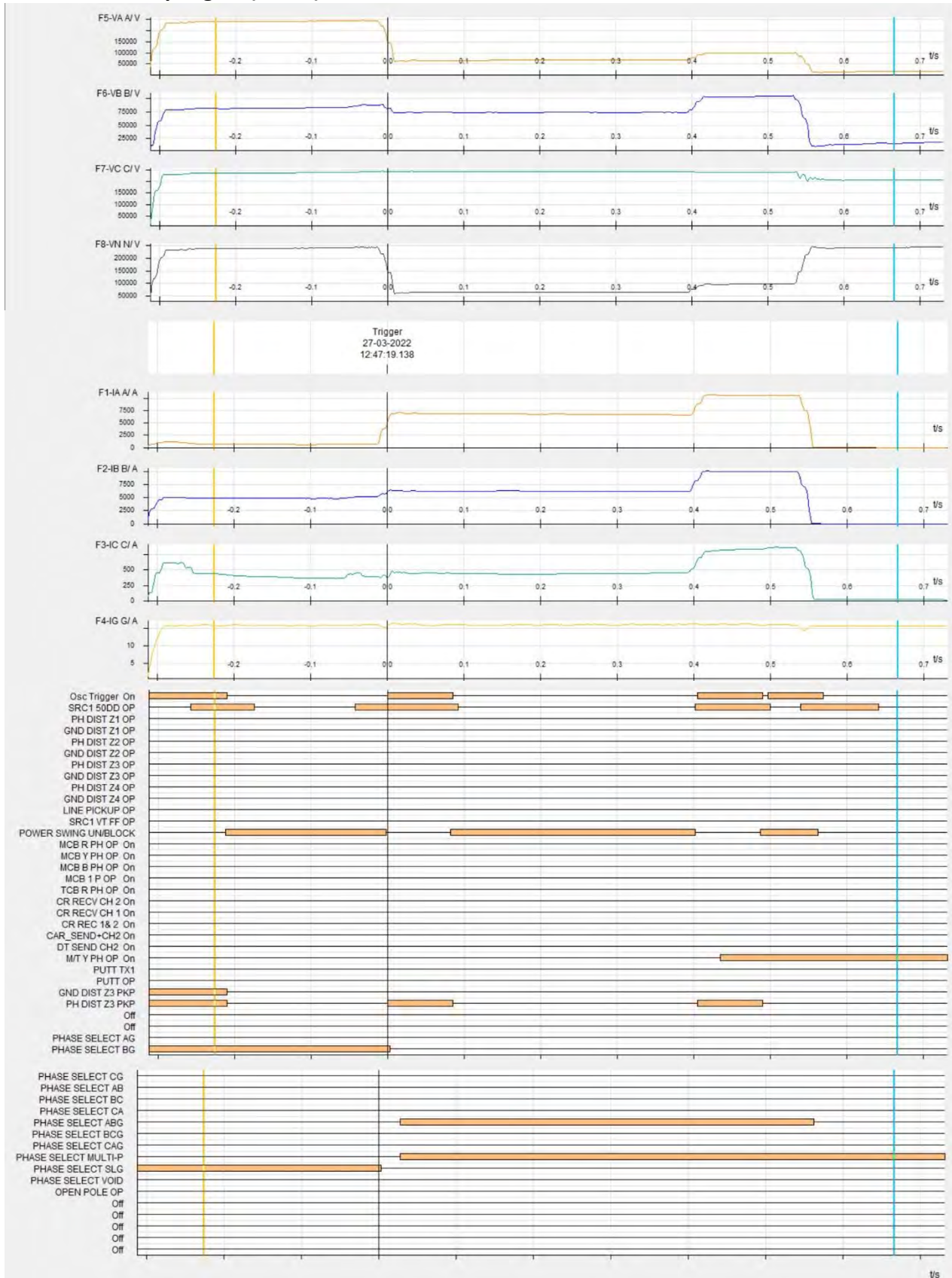
400 kV Lapanga-Meramundali-1 (Lapanga end)



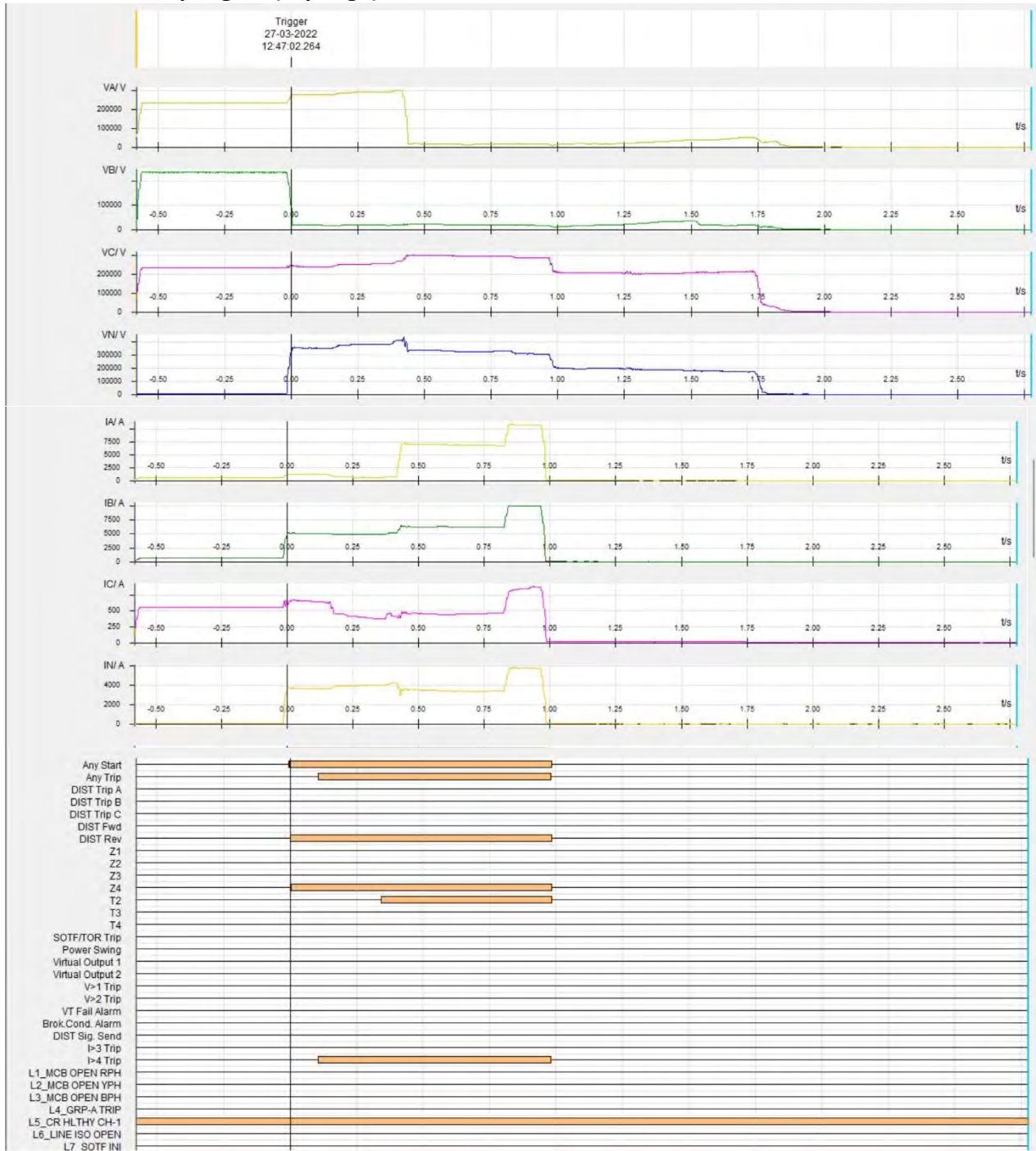
400 kV Meramundali-Lapanga-1 (Meramundali)



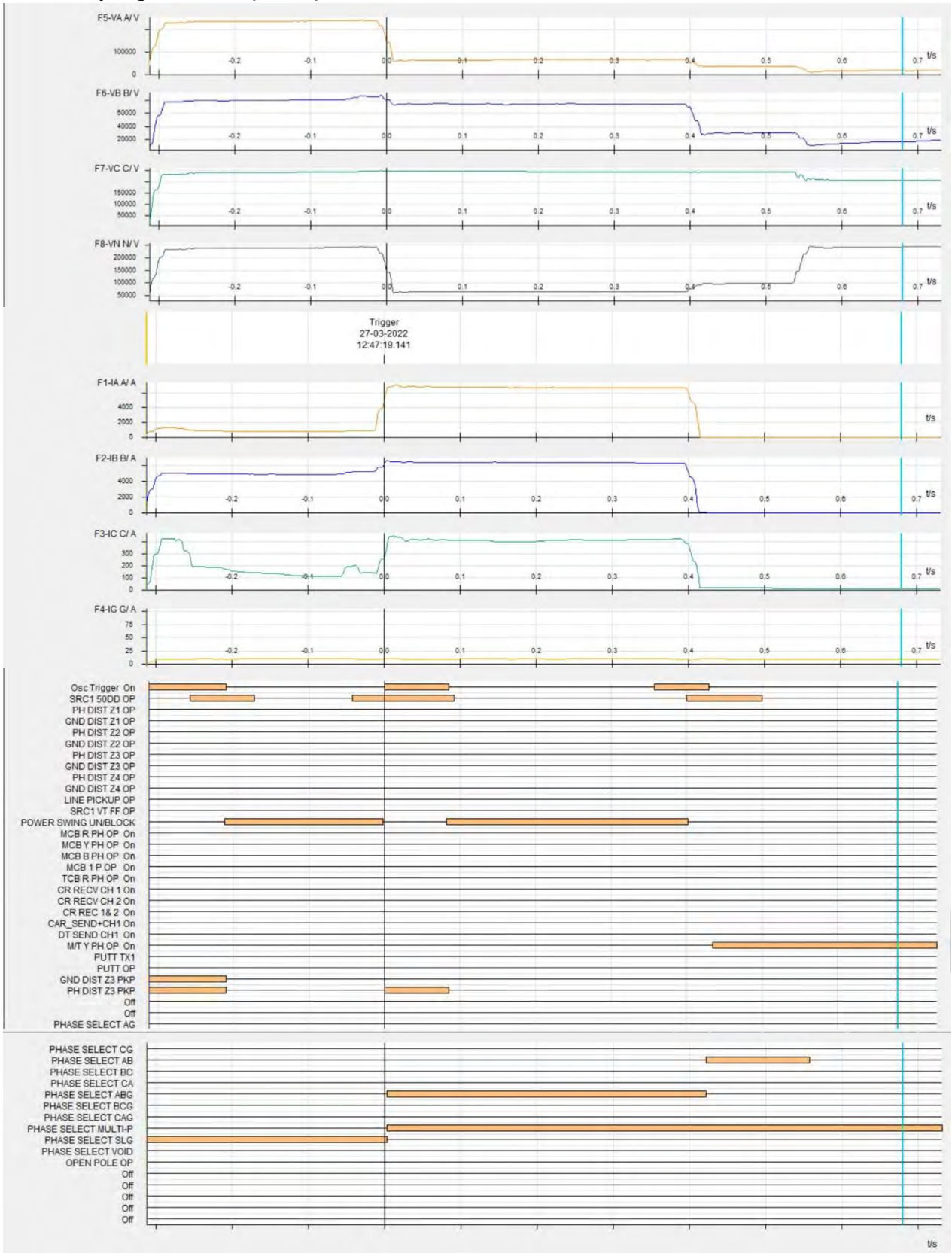
400 kV OPGC-Lapanga 1 (OPGC)



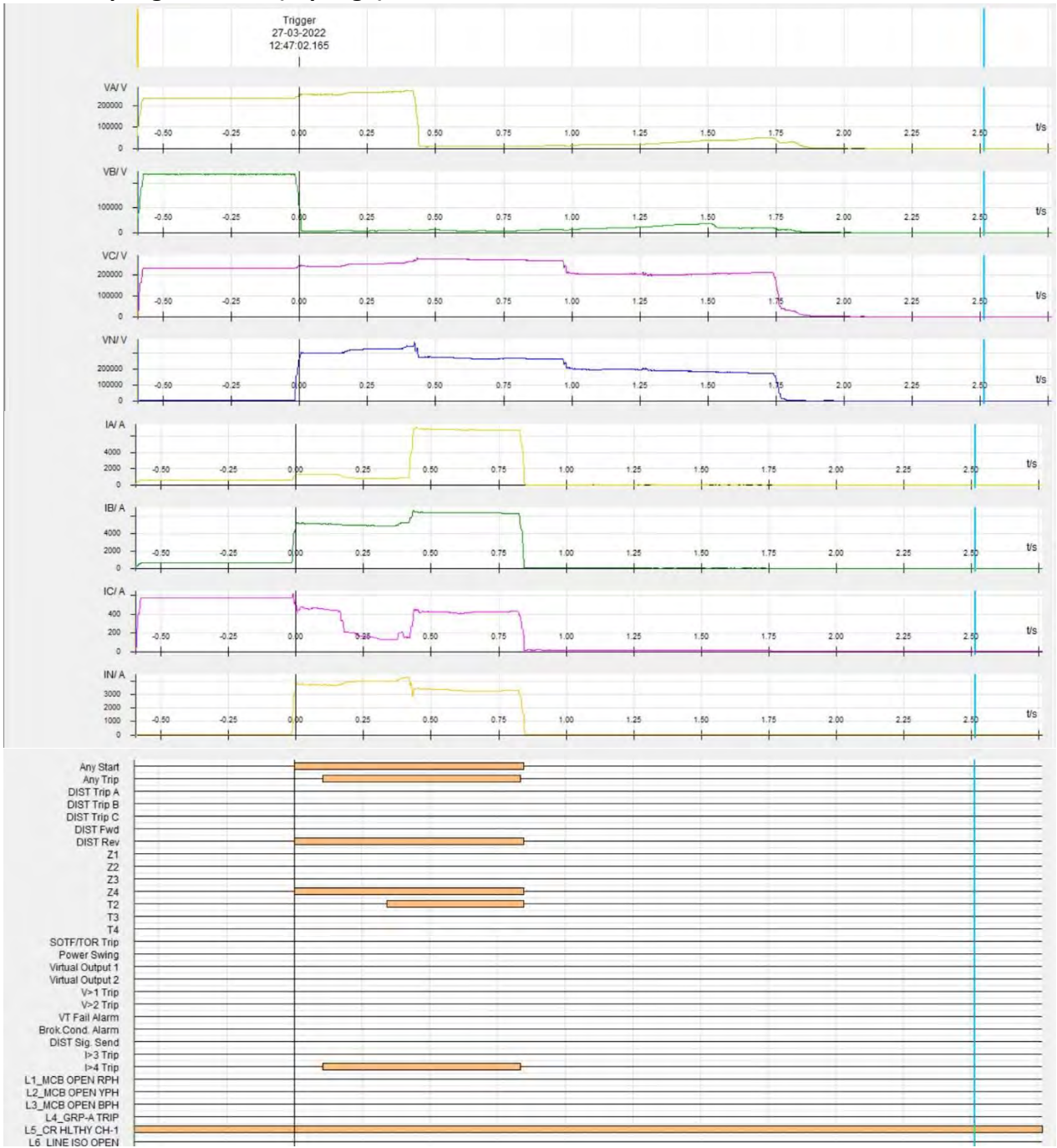
400 kV OPGC-Lapanga-1 (Lapanga)



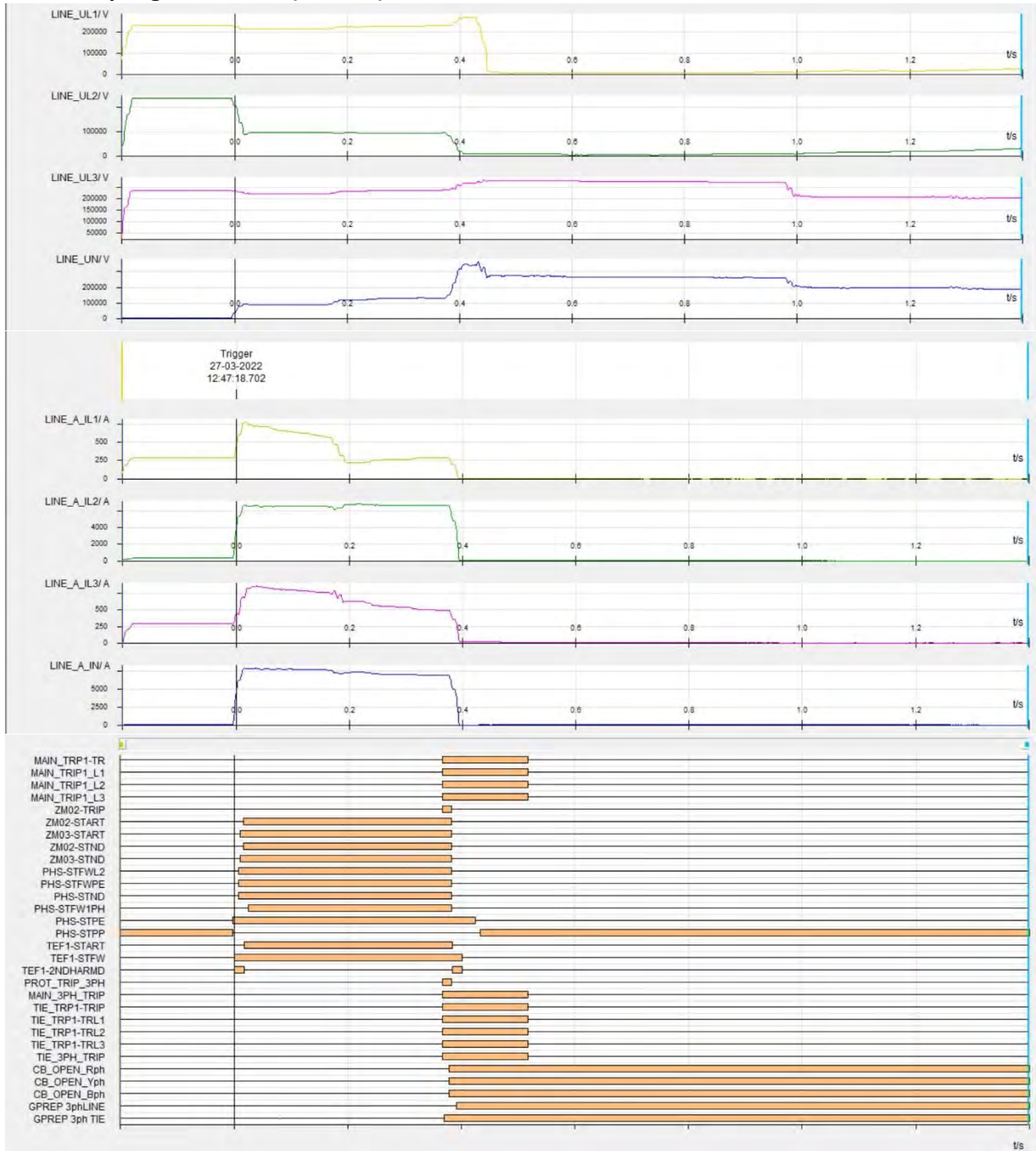
400 kV Lapanga-OPGC-2 (OPGC)



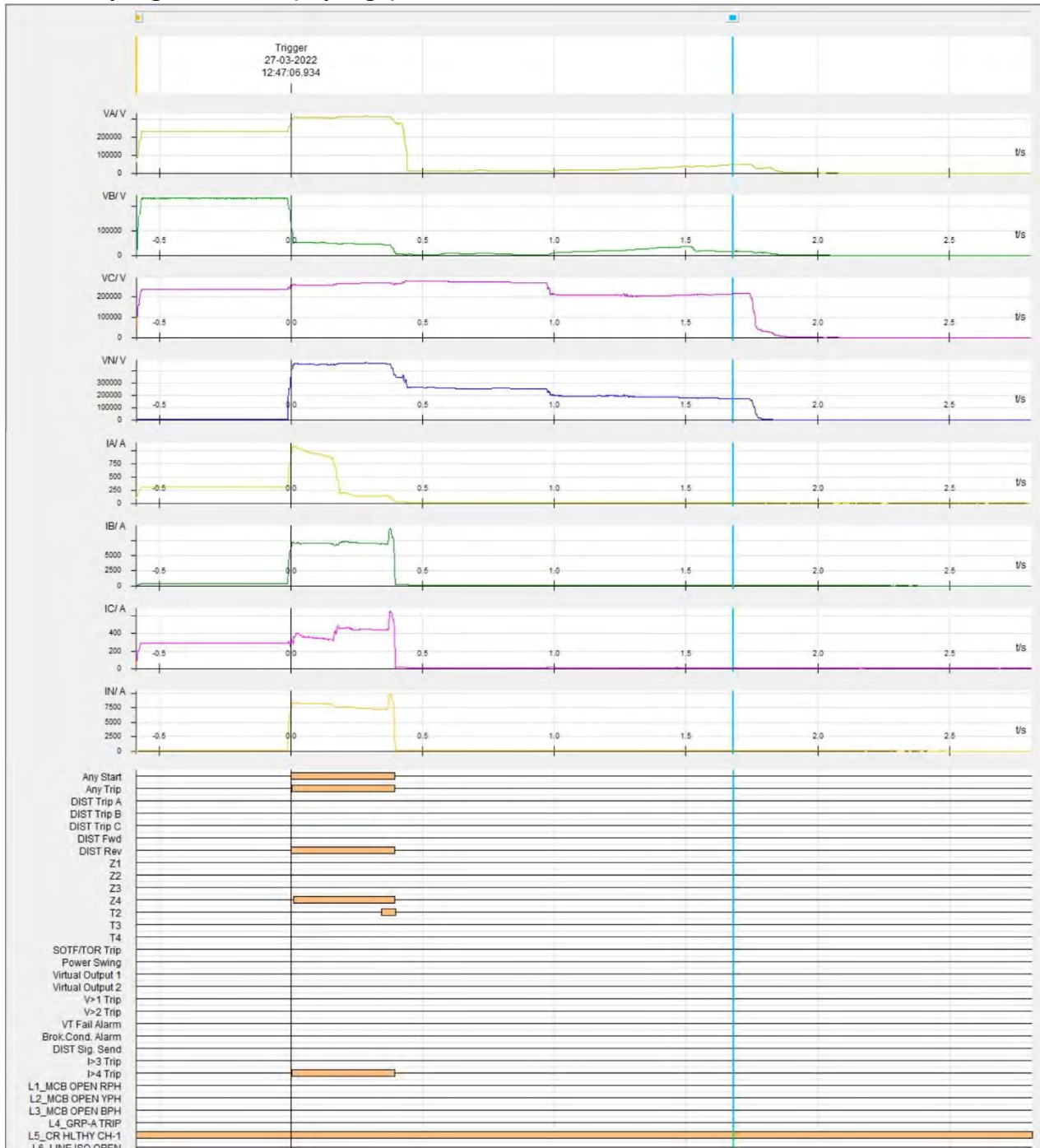
400 kV Lapanga-OPGC-2 (Lapanga)



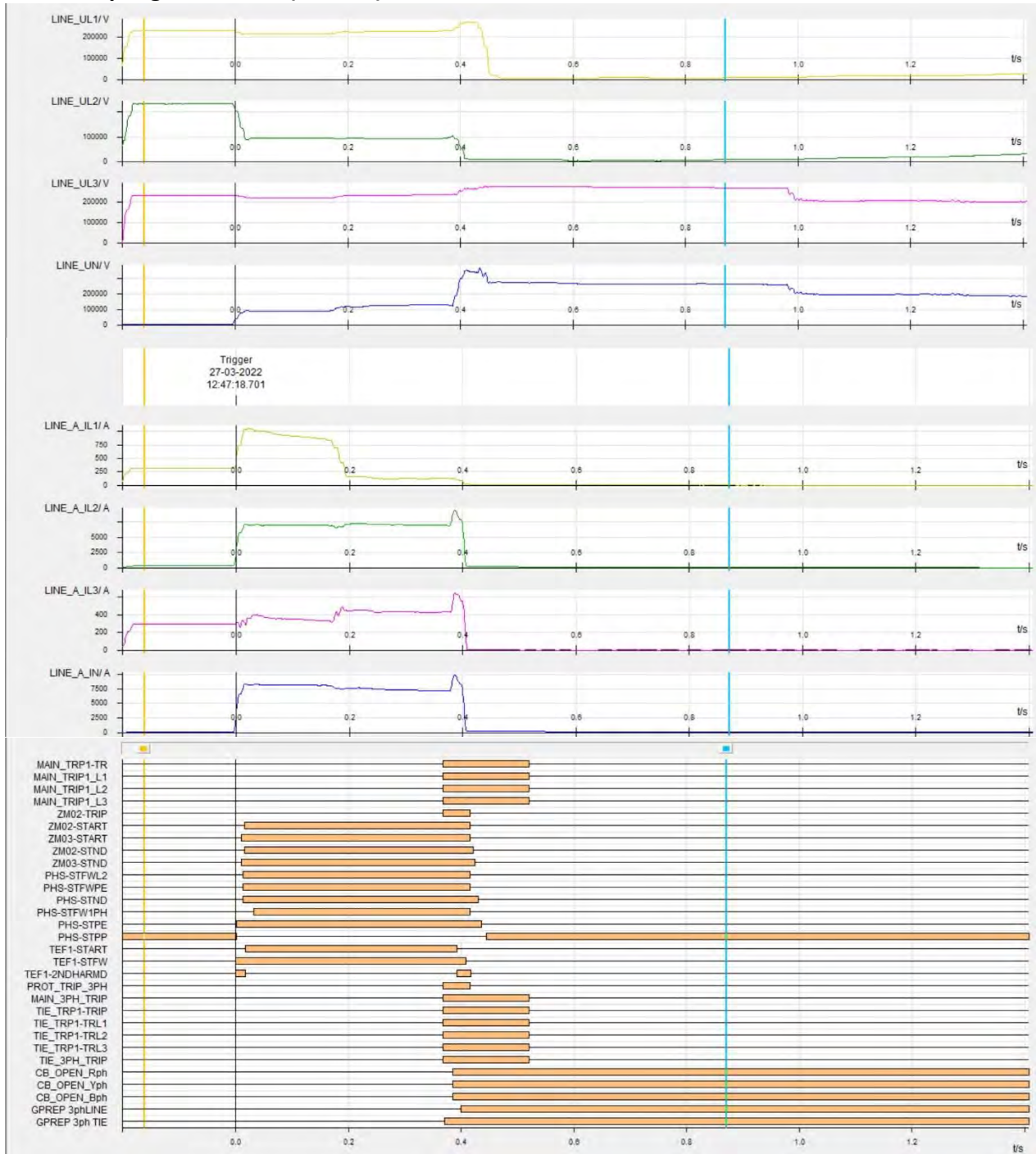
400 kV Lapanga-Sterlite-1 (Sterlite)



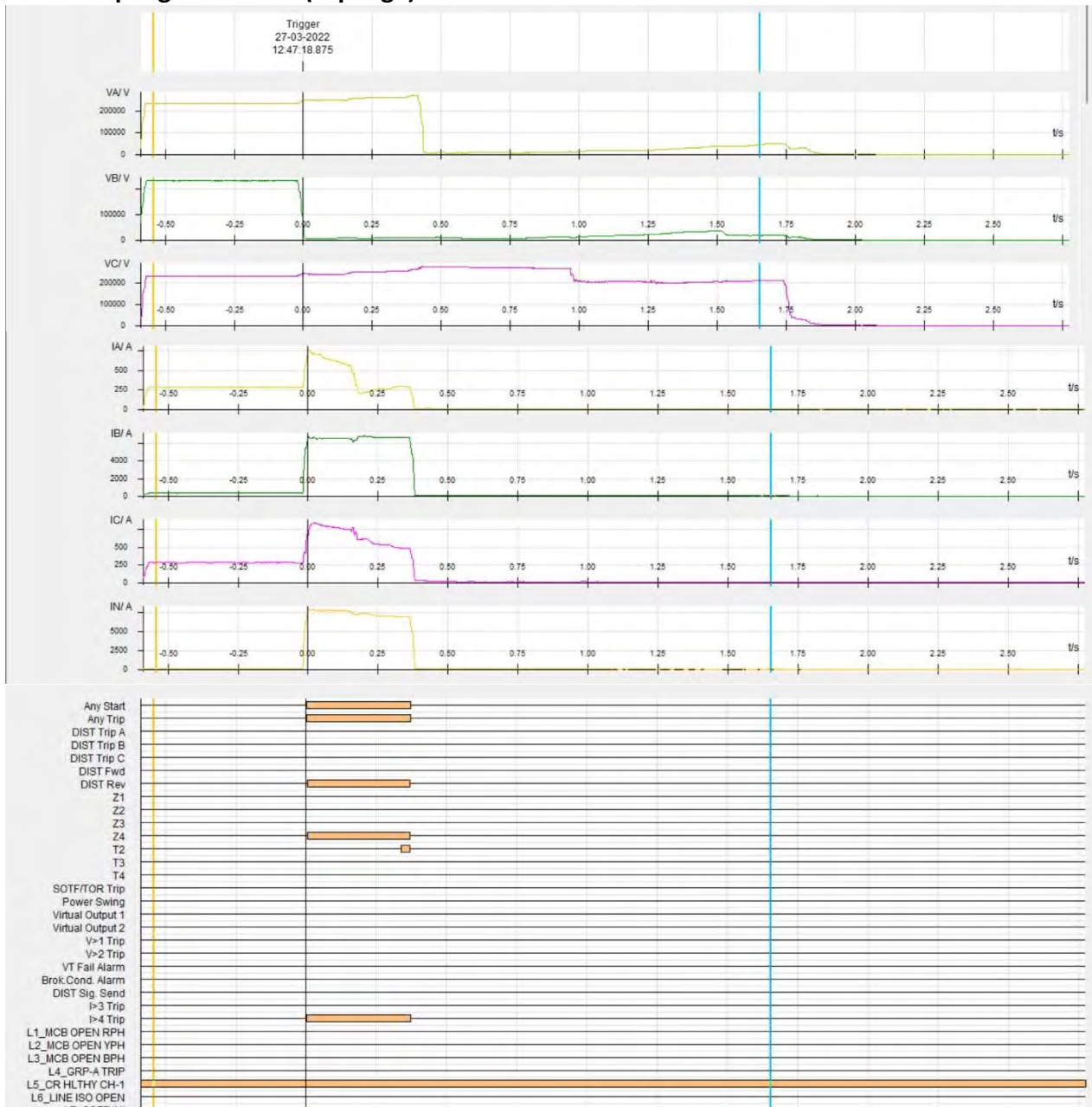
400 kV Lapanga-Sterlite-1 (Lapanga)



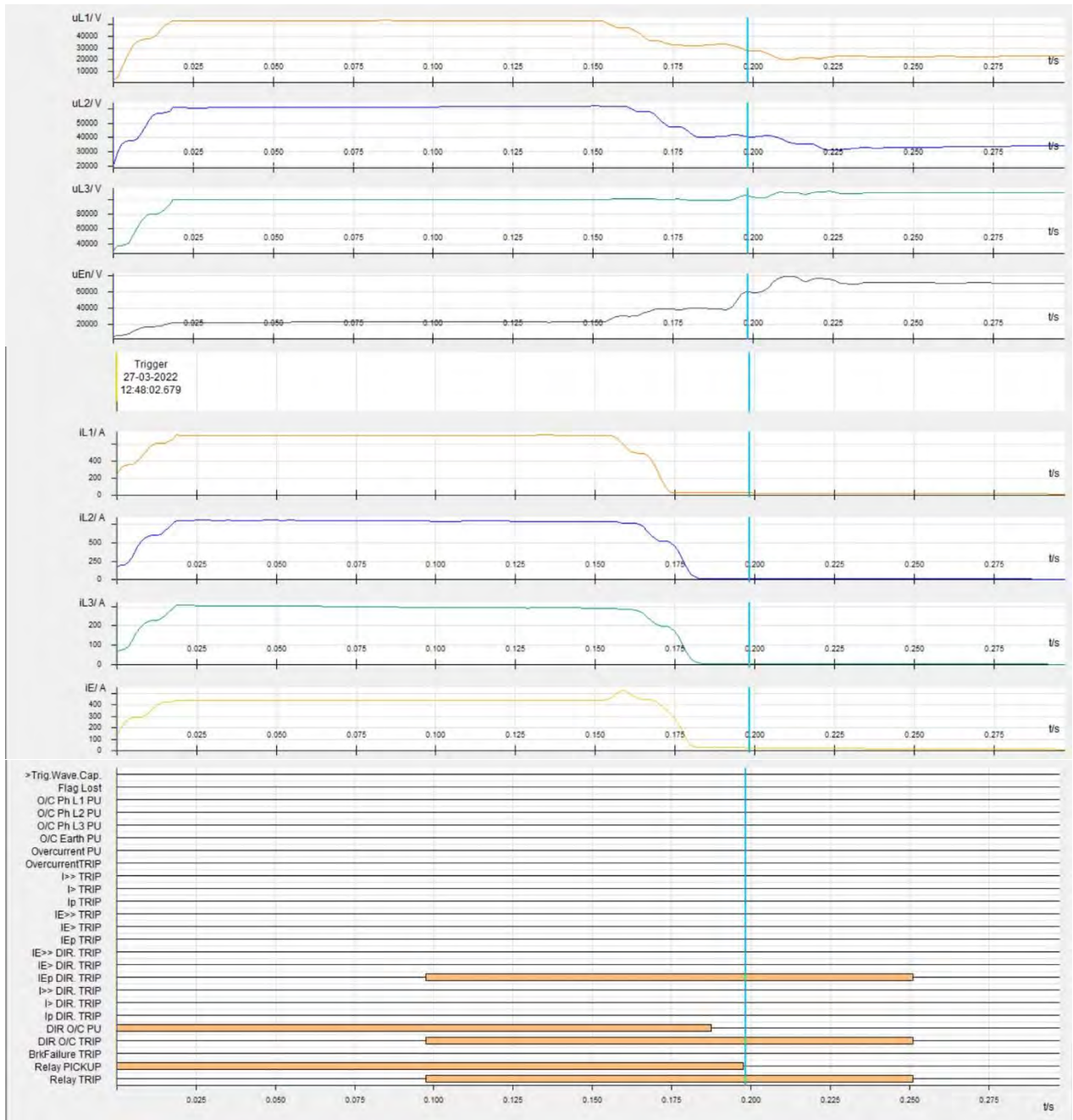
400 kV Lapanga-sterlite-2 (Sterlite)



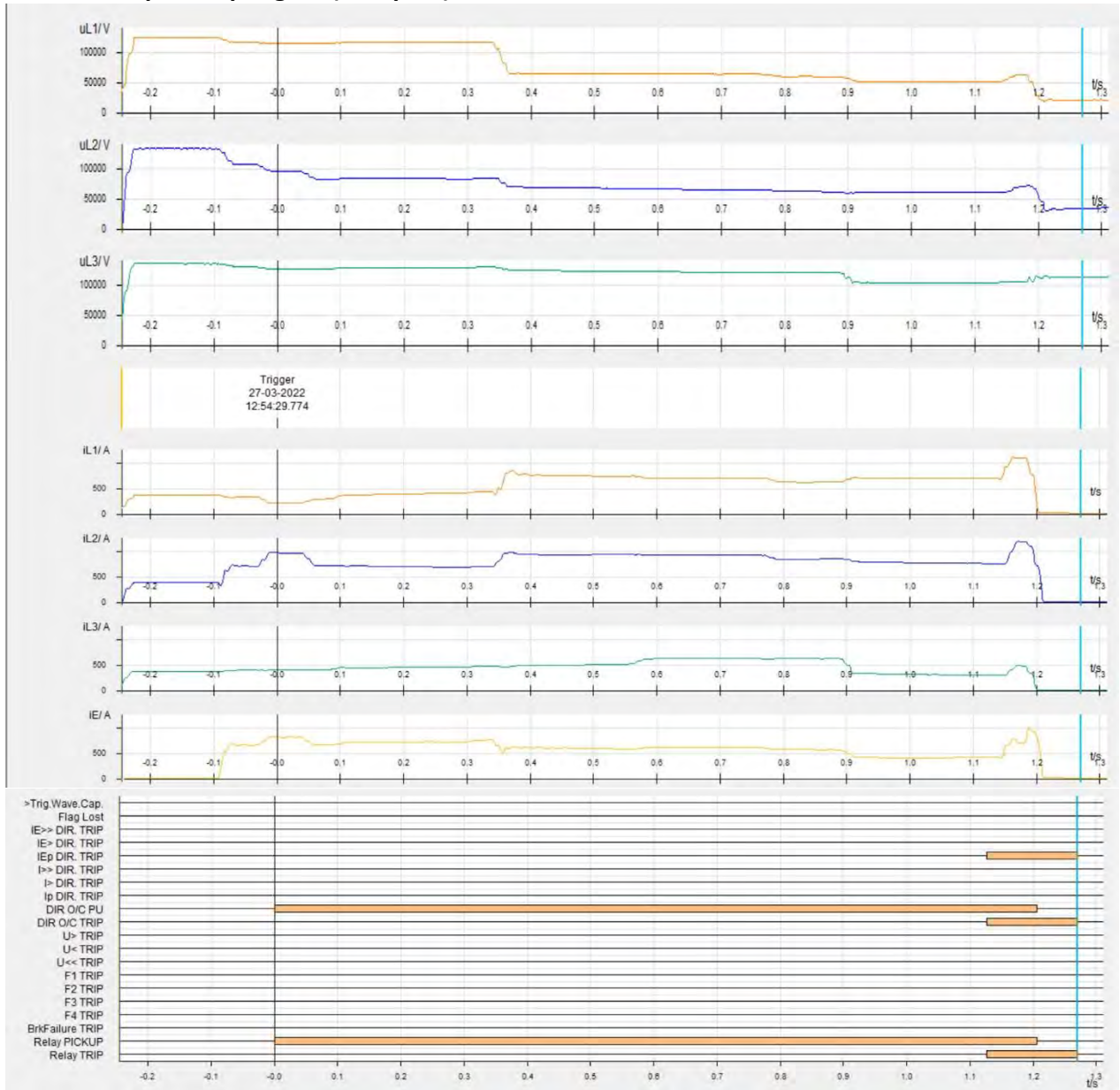
400 kV Lapanga-sterlite-2 (Lapanga)



220 kV Katapalli-Lapanga-1 (Katapalli)



220 kV Katapalli-Lapanga-2 (Katapalli)



SHIGA ENERGY PRIVATE LIMITED

2 X 48.5 TASHIDING HYDRO ELECTRIC PROJECT

Date: 09-04-22

Summary of the Events:

On 11th March-22 at 23:31 hrs, Unit-1 was successfully synchronized with Grid as per schedule and was running at 5.0MW. Unit-2 was under maintenance (at Standstill).

Till this time Plant DC system and AC auxiliary supply was in Healthy condition. Moreover Battery charger-2 was under maintenance and DCDB's bus coupler was in closed condition.

As a normal practice of SSB backcharge with Plant's generation; process of back charging was started at about 23:31:30 hrs. and back charging was successfully completed at about 23:32 hrs. No problem was observed neither at SSB's nor at UAB's feeder; but

At or after moment of back charging; complete blackout of plant occurred with following events simultaneously-

- All workstations in CR went OFF,
- Both units Controller watchdog fault appeared,
- 220KV THEP-Rangpo S/C TL (Line-1) and 220 KV THEP-New Melli S/C TL (Line-2) circuit breakers opened at Tashiding end; remote ends CBs were remain in Closed condition. Moreover no disturbances/faults were recorded in protection relays at local (Tashiding end) and remote end (New Melli & Rangpo end).
- ESD occurred in Unit-1(running) and Unit-2 (at Standstill condition) due to Controller Watchdog fault.
- CR power supply became OFF momentarily,
- CR power supply restored within few second.

Station DG was started manually to support Unit auxiliaries and Unit-1 was normalized.

Note: No Events or Alarms were recorded in CR-SCADA due to stopping of all workstations at the moment.

Load / Generation Loss: 44 MW (Scheduled).

Restoration:

1. 220KV THEP-Rangpo S/C TL (Line-1) Circuit breaker closed at 00:36 hrs.
2. 220 KV THEP-New Melli S/C TL (Line-2) Circuit breaker closed at 00:49 hrs.
3. Unit-1 Synchronized with Grid at 01:05 hrs.

Analysis of the Events:

- On 11th March-22 at about 23:27 hrs, initial conditions to Start machine was OK. Unit-1 was started in GEN mode from CR-SCADA with no abnormality observed during sequence/steps execution and Unit-1 successfully synchronized with Grid as per schedule and was running at 5.0MW.
- Unit-2 was under scheduled maintenance (at Standstill).
- Till this time, Plant's DC system and AC auxiliary supply was in Healthy condition.

As a normal practice of SSB backcharging with Plant's generation; Process of back charging was started at about 23:31:30 hrs. and back charging was successfully completed at about 23:32 hrs and at local level, no problem was observed; neither at SSB's nor at UAB's feeder but

as during the process of back charging, 220V DC chargers AC input supply changeover took place; O/P DC contactor(s)/related circuitry malfunctioned for a moment causing momentary absent of DC at DC distribution board. Consequent to this momentary loss of DC supply at DCDB- following events occurred-

- Both the Inverters failed momentary and consequent to this CR-SCADA workstations went OFF. Moreover CR luminaries' power supply (that is taken from same inverters) also went OFF.
- Unit-1 and Unit-1 Controllers restarted due to momentary absent of power supply.
- Transmission lines circuit breakers opening occurred most probably due to "**Protection Polarity Failure**"; other reasons due to which TL CBs could opened was not observed or recorded. Circuit breaker trip coil power supply goes through the "NC" contact of the Protection Polarity Monitoring relay- Its NC contact remain in open condition when DC supply is present. When power supply went, relay's NO contact become NC and when power supply restored, CBs trip coil was energized for short time before relay's NC contact again changes to NO and consequent to this Circuit breakers of both the lines opened; although time legging should be very brief.

Remedial Action Taken: Various systems, components and terminals involved in DC power supply to respective load points were checked but no abnormality was observed. However terminals tightening was carried out at all the points.

List of important transmission lines in ER which tripped in March-2022

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	LOCAL END UTILITY	REMOTE END UTILITY	UTILITY RESPONSE
1	220kV-CHAIBASA(PG)-CHAIBASA(JUSNL)-1	08-03-2022	23:30	09-03-2022	00:21	Didn't trip	CT SF6 low, tripped only JUSNL end	No fault	NA	Repeated tripping from JUSNL end on SF6 low	PG ER-1	JUSNL	CT leakage issue. Resolved after bolt tightening
2	220kV-CHAIBASA(PG)-CHAIBASA(JUSNL)-1	09-03-2022	10:58	09-03-2022	11:51	Didn't trip	Maloperation of CT SF6 density monitor at JSEB end	No fault	NA		PG ER-1	JUSNL	
3	220kV-CHAIBASA(PG)-CHAIBASA(JUSNL)-1	09-03-2022	13:45	09-03-2022	17:35	Didn't trip	Maloperation of CT SF6 density monitor at JSEB end	No fault	NA		PG ER-1	JUSNL	
4	220kV-BUDHIPADAR-KORBA-2	11-03-2022	12:52	11-03-2022	14:46	Budhipadar B_N Ib-5.03kA		B-Earth	150	Three phase tripping for single phase fault	OPTCL	WR	Tree came near conductor while cutting by villagers. Cleared now
5	400kV-LAPANGA-OPGC (IB THERMAL)-2	13-03-2022	12:39	13-03-2022	13:19	Lapanga: R_N Z-1, 5km Ir- 13.67 kA, A/R successful ;	OPGC: R_N Z-1, 19.5km Ir- 11 kA	R-Earth	100	A/r succesful from Lapanga end only.	OPTCL	OPGC	Lapanga to check
6	220kV-CHANDIL-STPS(WBPDCL)-1	15-03-2022	11:29	15-03-2022	16:19	Chandil: B_N Z-2 97.7km, Ib-0.78kA.	STPS B_N Z1 12.4km	B-Earth	100	Three phase tripping for single phase fault	JUSNL	WBPDCL	PLCC scheme enabled on 25th March22
7	315 MVA 400/220 KV ICT-3 AT ARAMBAGH	15-03-2022	12:30	15-03-2022	19:10	Differential relay operated		B-Earth	100	WBSETCL may explain	WBSETCL	NA	B_ph insulator puncture
8	400kV-SUBHASGRAM-HALDIA-1	15-03-2022	17:05	15-03-2022	20:43	DT received at Subhasgram	Master Trip Relay Operated at Haldia end ,	No fault	NA	HEL may explain.	PG ER-2	HEL	One interposing relay of optical fiber panel malfunctioned due to sulphation.
9	400kV-MERAMUNDALI-LAPANGA-2	16-03-2022	13:51	16-03-2022	17:17	Meramundali: B_N, 115km, Ib-2 kA	Lapanga: B_N , 84km, Ib-3.58kA	B-Earth	100	A/r failed after 1 second. Tie bay A/r attempt after failure of main bay A/r at Lapanga	OPTCL	OPTCL	To be resolved after visit by GE personnel
10	400kV-BIHARSARIF(PG)-LAKHISARAI(PG)-1	16-03-2022	20:02	16-03-2022	21:14	Due to LBB mal operation of its tie bay at Biharsharif (under shutdown)		No fault	NA	LBB of tie bay operated, which was under shutdown. PG ER-1 may explain	PG ER-1	PG ER-1	Auxiliary output contact found burnt. Relay replaced.
11	400/220 kV ICT-1 at Biharsharif	16-03-2022	20:02	16-03-2022	21:31			No fault	NA		PG ER-1	BSPTCL	
12	400kV-MERAMUNDALI-LAPANGA-2	17-03-2022	12:40	17-03-2022	17:36	Meramundali: B-N 116.5km Ib-2.11 kA	Lapanga: B-N, 75km Ib- 4.4 kA	B-Earth	100	A/r failed after 1 second. Tie bay A/r attempt after failure of main bay A/r at Lapanga	OPTCL	OPTCL	To be resolved after visit by GE personnel
13	500 MVA 400/220 KV ICT-2 AT NAUBATPUR	17-03-2022	18:56	18-03-2022	16:57	Differential relay operated		No fault	NA	No fault observed in PMU. BGCL may explain	BGCL	NA	Differential relay operated due to wrong setting. Settings revised
14	400kV-MERAMUNDALI-LAPANGA-2	18-03-2022	13:37	18-03-2022	17:40	Meramundali:B-N, Z1 203.7km , Ib- 1.9kA	Lapanga: B-N, Z1 24km Ib-10.31kA	B-Earth	100	A/r failed after 1 second. Tie bay A/r attempt after failure of main bay A/r at Lapanga	OPTCL	OPTCL	To be resolved after visit by GE personnel
15	220kV-BUDHIPADAR-KORBA-2	19-03-2022	10:16	19-03-2022	11:21	Budhipadar: B_N Z-1	Korba: B_N Z-1, 140.6 km, 1.064 kA	B-Earth	100	Three phase tripping for single phase fault	OPTCL	WR	Tree came near conductor while cutting by villagers. Cleared now
16	220kV-BUDHIPADAR-KORBA-2	19-03-2022	16:07	19-03-2022	19:04	Budipadar: Y_B_N, Z-I, 25.06km Ib: 8.72 kA, Ib: 8.77 kA,		Y-B-Earth	100	Phase to phase fault	OPTCL	WR	Tree came near conductor while cutting by villagers. Cleared now
17	220kV-BARIPADA-BALASORE-2	20-03-2022	10:53	20-03-2022	11:49	Baripada: DT received	Balasore: Did not trip	No fault	NA	OPTCL/PG Odisha may explain	PG Odisha Projects	OPTCL	No DT sent from Balasore end. OPTCL to check PLCC panels at Baripada.
18	220KV-CHANDIL-STPS(WBPDCL)-1	25-03-2022	02:20	25-03-2022	16:56	Chandil: B_N, 66 km, Ib1.3 kA		B-Earth	100	Three phase tripping for single phase fault	JUSNL	WBPDCL	PLCC scheme enabled on 25th March22
19	400KV-MERAMUNDALI-LAPANGA-2	27-03-2022	12:02	27-03-2022	20:00	Meramundali: B_N, 2.5 kA	Lapanga: B_N, 3.7 kA, 74 km	B-Earth	100	A/r failed after 1 second. Tie bay A/r attempt after failure of main bay A/r at Lapanga	OPTCL	OPTCL	To be resolved after visit by GE personnel
20	400 KV MERAMUNDALI-LAPANGA-2	28-03-2022	13:17	28-03-2022	18:06	Meramundali: B_N, 97.8 km, 2.29 kA		B-Earth	100	A/r failed after 1 second. Tie bay A/r attempt after failure of main bay A/r at Lapanga	OPTCL	OPTCL	To be resolved after visit by GE personnel

Sl No.	Name of the incidence	PCC Recommendation	Latest status
112th PCC Meeting			
1.	Disturbance at 220 kV Jayanagar (OPTCL) S/s on 27.02.2022 at 11:17 hrs	<p>PCC advised OPTCL to restore LBB/bus bar protection at 220 kV Jayanagar S/s at the earliest and till the timethe busbar protection is put back into service, the zone-4 time settings of all 220 kV feeders may to be reduced 250 msec.</p> <p>OPTCL was also advised to review resistive reach settings as per the guidelines finalized in 100th PCC meeting.</p>	<p><i>OPTCL representative informed that zone 4 time settings had been revised to 250 msec. Regarding bus bar protection, he informed that meeting with M/S Siemens was already held at headquarter where M/s Siemens representative had informed that they would visit site at the earliest.</i></p> <p><i>OPTCL was advised to review resistive reach settings as per the guidelines finalized in 100th PCC meeting.</i></p>
2.	Disturbance at 220 kV Tenughat (TVNL) S/s on 04.02.2022 at 05:53 Hrs	<p>In 112th PCC, PCC advised TVNL to revise the unit overcurrent settings immediately.</p> <p>Regarding nonoperation of busbar protection, TVNL was advised to test the busbar relay at the earliest & the report may be submitted to ERPC/ERLDC.</p>	<p><i>TVNL representtaive informed that overcurrent settings of units had been revised.</i></p> <p><i>Regarding bus bar protection, TVNL representative informed that they have taken up with OEM(M/s GE) to test the busbar relay.</i></p>
3.	Tripping of 220 kV Dumka- Godda line on 03.02.2022 at 07:37 Hrs and 04.02.2022 at 02:30 Hrs	In 112 th PCC, PCC advised JUSNL to implement revised overvoltage settings at the respective substations at the earliest.	<i>JUSNL representative informed that revised overvoltage settings at the respective substations had been implemented.</i>
4.	Total Power Failure at Teesta III S/s on 25.02.2022 at 13:27 Hrs	In 112 th PCC, PCC advised Dikchu HEP to share DR of the event along with distance protection settings of the line with ERPC/ERLDC.	
5.	Multiple Tripping at 400/220 kV Jamshedpur	In 112 th PCC, PCC advised DVC to resolve the carrier related issue in	<i>DVC representative updated that DT was not sent from</i>

	S/s	PLCC in coordination with Powergrid.	<i>their end to Powerrgid end during the incident.</i>
111th PCC Meeting			
6.	Total Power Failure at 220 kV Tenughat (TVNL) S/s on 01.01.2022 at 05:58 Hrs	<p>In 111th PCC, PCC advised TVNL following:</p> <ul style="list-style-type: none"> • to implement numerical busbar relay at 220 kV Tenughat S/s. • to configure the DR as per the guidelines finalized in 74th PCC meeting. • to check and rectify time synchronisation issues in the relays <p>to submit Generator/GT overcurrent settings for review.</p>	<i>Regarding DR configuration and time synchronisation, he infomed that some relays are old for which it is not possible to do DR configuration and time synchronisation , howver for new relays it would be done at the earliest.</i>
7.	DEF protection setting review in Sikkim complex in view of LILO of 400 kV Teesta 3-Kishanganj at Rangpo	<p>In 111th PCC, PCC decided that M/s PRDC would carry out the study for DEF relay setting coordination for Sikkim Complex with revised configuration of transmission network. PRDC was advised to coordinate with ERLDC for necessary information related to the study.</p> <p><i>In 112th PCC, PRDC was advised to coordinate with ERLDC for necessary information related to the study.</i></p>	<i>PRDC was advised to coordinate with ERLDC for necessary information related to the study.</i>
106th PCC Meeting			

8.	Tripping of Bus-1 at 220 kV Ramchandrapur on 20/08/2021 at 20:24 Hrs	<p>In 106th PCC Meeting, PCC advised JUSNL following:</p> <ul style="list-style-type: none"> ➤ To restore the busbar protection at 220 kV Ramchandrapur S/s within a month. <p>In 109th PCC Meeting, JUSNL informed that they are in process to place fresh tender for implementation of PLCC as well as bus bar protection and it is expected that implementation of both would be completed by April 2022.</p> <p><i>In 112th PCC Meeting, JUSNL representative informed that card had been installed for bus bar protection. However cable laying work is required to complete the busbar restoration work The Purchase order has been placed & the work will be started soon.</i></p>	<p><i>JUSNL representative informed that cable laying work had been completed. He further added that shutdown had been applied to SLDC for bus bar implementation work.</i></p> <p><i>PCC advised JUSNL to intimate ERPC/ERLDC once implementation work is completed.</i></p>
9.	Total Power Failure at Dumka S/s on 15/05/2021 at 12:01 Hrs	<p>JUSNL intimated that there was card issue in PLCC panel. The OEM (M/s ABB) had been communicated regarding the issue and the same would be resolved by September' 21.</p> <p>In 110th PCC Meeting, JUSNL informed that approval had been received from higher authority and they are in process to issue the tender. They further informed that PLCC link would be restored by March-2022.</p>	

10..	Grid event at 132 kV Motihari (DMTCL) S/S on 21-04-2021 at 20:19 hrs	<p>In 109th PCC Meeting, PMTL representative informed that they are in process of placing the work order with TBEA authorized partners. The quotation has been received and work order would be placed by end of December 2021.</p> <p>In 110th PCC Meeting, PMTL representative informed that LOA had been awarded to vendor in last week of December 2021. The material supply is expected by first week of March 2022 and restoration work would be completed by end of March 2022.</p>	<i>PMTL representative informed that material had been dispatched from source and it will reach site by 25th April 2022.</i>
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