Agenda
for
64th Protection Coordination Sub-Committee Meeting

Date: 15/02/2024 (Thursday)

Time: 11:00 hrs

Venue: NERPC Conference Hall, Shillong

A. CONFIRMATION OF MINUTES

1. CONFIRMATION OF MINUTES OF THE 63rd PROTECTION SUB-COMMITTEE MEETING OF NERPC.

Minutes of the 63rd PCC Meeting held on 18th January, 2024 (Thursday) at Hotel Royale De'casa was circulated vide No.: NERPC/SE (O)/PCC/2023/3683-3724 dated 7th February, 2024.

No comment(s)/observation(s) were received from the constituents.

The Sub-committee may confirm the minutes of 63rd PCCM of NERPC

B. ITEMS FOR DISCUSSION

B.1 Protection Audit of NER:

As per the protection code of IEGC 2023 following roles and responsibilities, related to the subject mentioned, of constituents have been defined–

Description		Constituent	Responsibility	Timeline
Audit	Internal Audit	All users (132kV and above)	Shall conduct internal audit of protection system	Annually
			Audit report to be shared with RPC	Within 30 days of Audit
			Action plan for rectification of deficiencies to be shared with RPC	Within 30 days of Audit
	Third party Audit	All users (132kV and above)	Shall conduct audit for each SS	Once in five years
			Shall conduct audit on advice of RPC	Within three months of advice of RPC
			Audit report* to be submitted to RPC and NERLDC/SLDC	Within a month of submission of third-party audit report
			Action plan for rectification of deficiencies	Same as above
		RPC	Compliance to audit reports to be followed up regularly	Not specified
		RPC	After analysis of any event, shall identify substations where audit is required to be carried out	Conditional responsibility
	Annual audit plan	All users	Annual audit plan to be submitted to RPC by ***31st October***	Annual

In 60th PCCM the following points were discussed-

Member Secretary NERPC informed that third party protection audit has to be generally conducted by the utilities on their own. However, the 3rd party audit will be carried out by team constituted by NERPC at selected substations based on the criticality, analysis and requirement. In this regard, NERPC has already circulated an audit calendar and audit formats for reference of the constituents.

The nodal officers of respective State/power utilities have to fill the audit formats and submit to the NERPC secretariat within 1 week.

The forum decided that compliance to audit reports will be followed up regularly in PCC meeting of NERPC. NERLDC to submit a list of all 132 kV and above substations of the States to NERPC.

Information regarding substations that have already been audited will be provided by states to NERPC & NERLDC.
Forum agreed that all users (132 kV and above) have to conduct Internal Audit annually and submit audit report to RPC with action plan for rectification of deficiencies within 30 days of Audit.

AEGCL requested for a uniform guideline for maintenance of bay elements. Member Secretary requested POWERGRID to share their maintenance guideline with the states so that Assam and other utilities may adopt it after customizing to suit local requirement.

In 63rd PCCM following points were discussed

1. Audit of substations of Assam (Sarusajai, Kahilpara, BTPS) will be carried out from 29th to 31st January 2024.
2. Two different groups, each of four/five members will conduct the above audit. Group Members: NERPC, NERLDC, PGCIL & Nagaland/MeECL.
3. Boarding & Lodging arrangement at Bongaigaon and Guwahati would be provided by NTPC Limited and AEGCL respectively and local transport will be provided by Assam for both the teams.

Status of compliance of IEGC 2023 –

List of utilities that have submitted the audit plan for FY 2024-25

1. DoP Arunachal Pradesh
2. Indigrid
3. NEEPCO
4. Sterlite
5. Powergrid

MePTCL submitted a list of substations for third party protection audit. NERPC stated that protection audit at some substations of MePTCL may be conducted by NERPC team.

NERLDC stated that a google spreadsheet format for declaration of Internal/3rd party audit plan for FY24-25 has been prepared for submission of details of Audit

plan. Forum requested all remaining utilities to submit Audit plan for FY 2024-25 in the format as prepared by NERLDC.

Sub-committee may deliberate

Agenda from MePTCL

B.2 Third Party Protection Audit of substations of MePTCL

It may be informed that third party protection audit in respect of MePTCL is urgently required and the matter may be discussed in the forum. List of substations where audit is requested is attached as **Annexure B.2**

Agenda from NEEPCO

B.3 Third Party Protection Audit for ISGS

As discussed in the previous PCC meetings, 3rd Party Protection Audit for ISGS has to be carried out as per relevant clauses of IEGC-23. Accordingly, NEEPCO has submitted a plan for the same for 2024-25.

However, in the case of Generating Stations, NEEPCO feels that 3rd Party protection audit should be carried out by choosing an expert audit team through tendering route and not by engaging the protection engineers of generating stations of NER.

Our two plants viz. PLHPS & KaHPS will go for 3rd Party protection audit by choosing an expert audit team through a tendering route. However, Plant Authorities are not sure about the methodology of carrying out the audit as there will be financial involvement if the audit is carried out by an expert audit team.

Hence, it is requested that the matter may kindly be discussed in the ensuing PCC meeting and included in the MOM of the meeting so that NEEPCO can go ahead with 3rd Party protection audit at its O&M Plants in the aforementioned method.

B.4 Analysis and Discussion on Grid Disturbances which occurred in NER grid in January'24 in compliance with IEGC 2023:

TABLE 8 : REPORT SUBMISSION TIMELINE

Sr. No.	Grid Event^ (Classification)	Flash report submission deadline (users/ SLDC)	Disturbance record and station event log submission deadline (users/ SLDC)	Detailed report and data submission deadline (users/ SLDC)	Draft report submission deadline (RLDC/ NLDC)	Discussion in protection committee meeting and final report submission deadline (RPC)
1	GI-1/GI-2	8 hours	24 hours	+7 days	+7 days	+60 days
2	Near miss **event**	8 hours	24 hours	+7 days	+7 days	+60 days
3	GD-1	8 hours	24 hours	+7 days	+7 days	+60 days
4	GD-2/GD-3	8 hours	24 hours	+7 days	+21 days	+60 days
5	GD-4/GD-5	8 hours	24 hours	+7 days	+30 days	+60 days

^*The classification of Grid Disturbance (GD)/Grid Incident (GI) shall be as per the* CEA Grid Standards.

The forum may deliberate upon the GD/GI/Near miss events that occurred in January 2023 based on the draft reports prepared by NERLDC. The list of events and draft report of NERLDC is attached as **Annexure B.4**

Agenda items from NERLDC

B.5 Status of submission of FIR, DR & EL outputs for the Grid Events for the month of January'2024

In line with regulation 12 (1) of CEA Grid Standards Regulations and IEGC-23 provision under clause 37.2 (c), FIR and DR & EL Outputs for each grid events are required to be submitted by concerned utilities to NERLDC for detailed investigation and analysis.

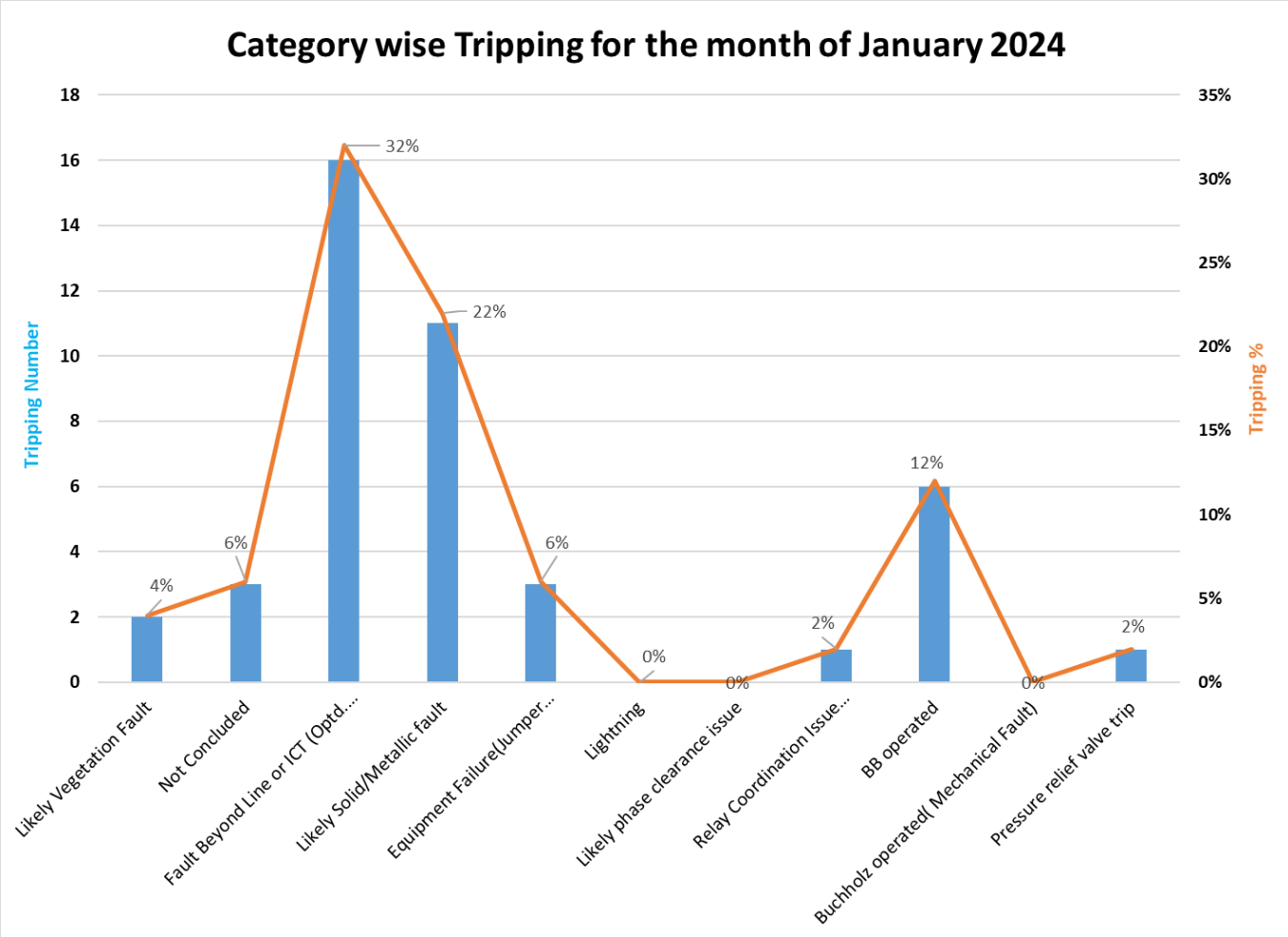
Status of uploading of FIR, DR & EL outputs in Tripping Monitoring Portal for events from 01-01-2024 to 31-01-2024 as on 09-02-2023 is given below:

Name of Utility	Total FIR/ DR/EL to be submitted	Total FIR, DR & EL submitted			Total FIR, DR & EL not submitted			% Submission of		
		FIR	DR	EL	FIR	DR	EL	FIR	DR	EL
DoP, Arunachal Pradesh	8	8	8	8	0	0	0	100	100	100
AEGCL	8	3	4	4	5	4	4	38	50	50
APGCL	2	0	0	0	2	2	2	0	0	0
MSPCL	7	7	3	4	0	0	1	100	100	83
MePTCL	2	1	1	1	1	1	1	50	50	50
MePGCL	5	0	3	3	5	0	2	0	100	60
TSECL	15	14	15	15	1	0	0	93	100	100
POWERGRID	13	13	13	10	0	0	0	100	100	100
NEEPCO	9	9	8	8	0	0	0	100	100	100
NHPC	1	1	1	1	0	0	0	100	100	100
IndiGrid	3	2	3	3	1	0	0	67	100	100

Concerned Utilities are requested to upload Disturbance Recorder (DR), Event Logger (EL) outputs for grid events along with a First Information Report (FIR) in Tripping Monitoring Portal (https://tripping.nerldc.in/Default.aspx) for analysis purpose. In light of the cybersecurity measures implemented by Grid India to safeguard sensitive information, NERLDC has created the email address nerldcso3@gmail.com . This new account has been specifically set up to facilitate the secure exchange of DR and EL files that have previously faced blockage when sent to nerldcprotection@grid-india.in.

B.6 Category wise Tripping for the month of January 2024:

There were a total of 43 numbers of Line & ICT tripping during the month of January'24. A plot showing number of tripping and tripping percentage in each category such as Likely Vegetation, Solid/metallic fault and fault beyond the line etc. is shown below. It is observed that for around 32% of tripping were due to fault beyond the line and 22% of tripping were due to solid fault. The trippings due to vegetation fault and solid fault are listed below:



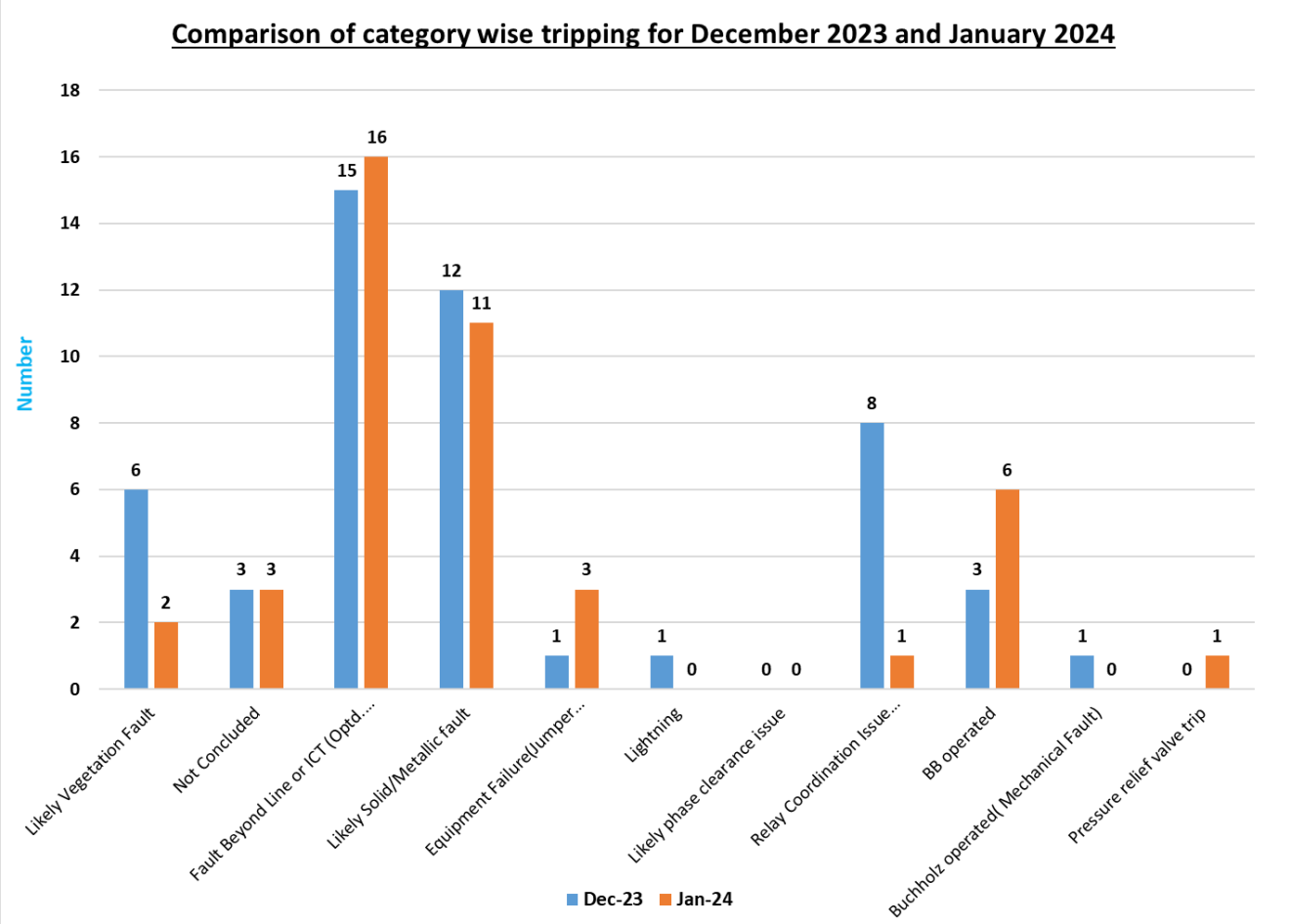
List of tripping due to Vegetation fault during January, 2024

Sl. No.	Element Name	Owner	Tripping Date & Time
1	132 kV Along - Pasighat Line	DoP, Arunachal Pradesh	01-01-2024 04:48
2	132 kV Jiribam - Tipaimukh Line	POWERGRID & MSPCL	20-01-2024 11:16

The patrolling report of AEGCL for the month of January, 2024 is attached in **Annexure B.6**

List of tripping due to Solid fault during January, 2024

Sl. No.	Element Name	Owner	Tripping Date & Time	End A	End B
1	220 kV Karbi Langpi - Sarusajai 2 Line	AEGCL	01-01-2024 11:41	No DR submitted	Fault current (in kA) B=4.6,N=4.6 Fault Voltage(in kV) : B=74,N=51 Angle between(in degrees) : -53
2	132 kV Dharmanagar - P K Bari Line	TSECL	02-01-2024 10:25	No tripping	Fault Current(in kA) : Y=5.9,B=5.8 Fault Voltage(in kV) : Y=50,B=46
3	132 kV Balipara - Tenga Line	DoP, Arunachal Pradesh	04-01-2024 22:51	Fault Current(in kA) : R=2.6,Y=2.6 Fault Voltage(in kV) : R=59,Y=54	Fault Current(in kA) : R=1.3,Y=1.3 Fault Voltage(in kV) : R=45,Y=42
4	132 kV Balipara - Tenga Line	DoP, Arunachal Pradesh	05-01-2024 00:35	Fault Current(in kA) : R=2.6,Y=2.5 Fault Voltage(in kV) : R=57,Y=52	Fault Current(in kA) : R=1.3,Y=1.3 Fault Voltage(in kV) : R=45,Y=42
5	132 kV P K Bari (Sterlite Power) - P K Bari (TSECL) Line	TSECL	08-01-2024 10:02	Fault Current(in kA) : R=5.4, B=5.6 Fault Voltage(in kV) : R=57,B=52	Fault Current(in kA) : R=4.2, B=4.1 Fault Voltage(in kV) : R=57,B=47
6	132 kV Umtru - Umiam St IV 2 Line	MePTCL	10-01-2024 05:12	Fault Current(in kA) : R=3.6,Y=3.6 Fault Voltage(in kV) : R=54,Y=53	Fault Current(in kA) : R=2.7,Y=2.7 Fault Voltage(in kV) : R=43,Y=42
7	132 kV Ningthoukhong - Churachandpur 1 Line	MSPCL	13-01-2024 13:16	Fault Current(in kA) : B=4.6,N=4.2 Fault Voltage(in kV) : B=19,N=70 Angle between(in degrees): -50	No tripping
8	132 kV Dimapur - Doyang 1 Line	POWERGRID	15-01-2024 14:34	During post fault patrolling, few pieces of roof top material which was blown due to cyclonic wind was found in between tower no. 84 & 85	
9	132 kV Dimapur - Doyang 2 Line	POWERGRID	15-01-2024 14:34		
10	220 kV Karbi Langpi - Sarusajai 2 Line	AEGCL	29-01-2024 10:16	No DR submitted	Fault Current(in kA) : B=6.6,N=6.5 Fault Voltage(in kV) : B=31, N=75 Angle between(in degrees) : -69
11	132 kV Ningthoukhong - Churachandpur 2 Line	MSPCL	31-01-2024 05:40	Fault Current(in kA) : R=3,N=2.5 Fault Voltage(in kV) : R=34, N=52 Angle between(in degrees) : -69	No tripping



B.7 Submission of Flash Report and Detailed Report by User/SLDC as per IEGC-2023:

As per IEGC-2023, all User/SLDCs are requested to prepare and share **Flash Report** and **Detailed Report** with NERLDC and NERPC following any Grid Events.

Status of submission of the same for the month of January, 2024 is shown below:

Sl. No.	GD/GI/Near Miss	Affected Areas	Date & Time	Flash/Detailed report to be submitted by User/SLDC	Flash Report By User { IEGC section 37.2 (b)}	Detailed report by User within 7 Days { IEGC section 37.2 (e)}	Detailed Report submitted By NERLDC	Root Cause	Non Compliance observed
1	GD-I	Blackout of Dharmanagar & Dullavchhera	10:25 Hrs on 02-01-2024	Tripura	Yes	No	Yes	Y-B fault with fault current 6 kA	**IEGC section 37.2 (e)- Detailed Report By User IEGC section 37.2 (c) & CEA grid Standard 15.3- DR/EL provided within 24 Hours?**
2	GI-II	Blackout of 220 kV Bus I at Kopili	16:59 Hrs on 02-01-2024	NEEPCO	No	No	Yes	Maloperation of the Bus Bar Relay	**IEGC section 37.2 (b)- Flash Report By User IEGC section 37.2 (e)- Detailed Report By User IEGC section 37.2 (c) and CEA grid Standard 15.3-DR/EL provided within 24 Hours?**
3	GI-II	Blackout of 220 kV Bus I at Kopili	17:50 Hrs on 02-01-2024	NEEPCO	No	No	Yes	Maloperation of the Bus Bar Relay	**IEGC section 37.2 (b)- Flash Report By User IEGC section 37.2 (e)- Detailed Report By User IEGC section 37.2 (c) and CEA grid Standard 15.3-DR/EL provided within 24 Hours?**
4	GD-I	Blackout of 220 kV Bus II at Kopili	17:24 Hrs on 03-01-2024	NEEPCO	No	No	Yes	Maloperation of the Bus Bar Relay	**IEGC section 37.2 (b)- Flash Report By User IEGC section 37.2 (e)- Detailed Report By User**
5	GI-II	Blackout of 220 kV Bus I at Kopili	17:04 Hrs on 05-01-2024	NEEPCO	Yes	No	Yes	Maloperation of the Bus Bar Relay	**IEGC section 37.2 (e)- Detailed Report By User**
6	GI-II	Blackout of 220 kV Bus I at Kopili	18:03 Hrs on 08-01-2024	NEEPCO	Yes	No	Yes	Maloperation of the Bus Bar Relay	**IEGC section 37.2 (b)- Flash Report By User IEGC section 37.2 (e)- Detailed Report By User**
7	GD-I	Blackout of Ningthukhong area	13:34 Hrs on 13-01-2024	Manipur	No	No	Yes	Whicle charging 132 kV Ningthoukhong - Churachandpur 2 line	**IEGC section 37.2 (b)- Flash Report By User IEGC section 37.2 (e)- Detailed Report By User**
8	GD-I	Blackout of Agartala area	16:26 Hrs on 15-01-2024	Tripura	Yes	No	Yes	All other elements connected to Agartala substation tripped from remote end on operation of ZII and ZIV initiated from Agartala end (no tripping)	**IEGC section 37.2 (e)- Detailed Report By User & IEGC section 17.3-DR Time Synchronization Issues**

 # Single Detailed Report submitted by Kopili on 5th Feb'24 for Grid Events at Kopili during the month of December 2023 and January 2024 ***(Annexure B.7)***

Sub-committee may deliberate

B.8 Submission of Protection Performance Indices by Transmission Utilities:

As per Regulation No. 15(6), Protection Code - Users shall submit the following protection performance indices of previous month to their respective RPC and RLDC on monthly basis for 220 kV and above (132 kV and above in NER) system by 10th of every month for previous month indices, which shall be reviewed by the RPC:

- The Dependability Index defined as $D = Nc/\ Nc+Nf$
- The Security Index defined as $S = Nc\ /Nc+Nu$

- The Reliability Index defined as $R = Nc\ Nc+Ni$

Where,

Nc: number of correct operations at internal power system faults

Nf: Number of failures to operate at internal power system faults.

Nu: Number of unwanted operations.

Ni: Number of incorrect operations and is the sum of Nf and Nu

NERTS, NTL, NETC & MePGCL submitted the Protection Performance Indices for the month of January, 2024 as follows:

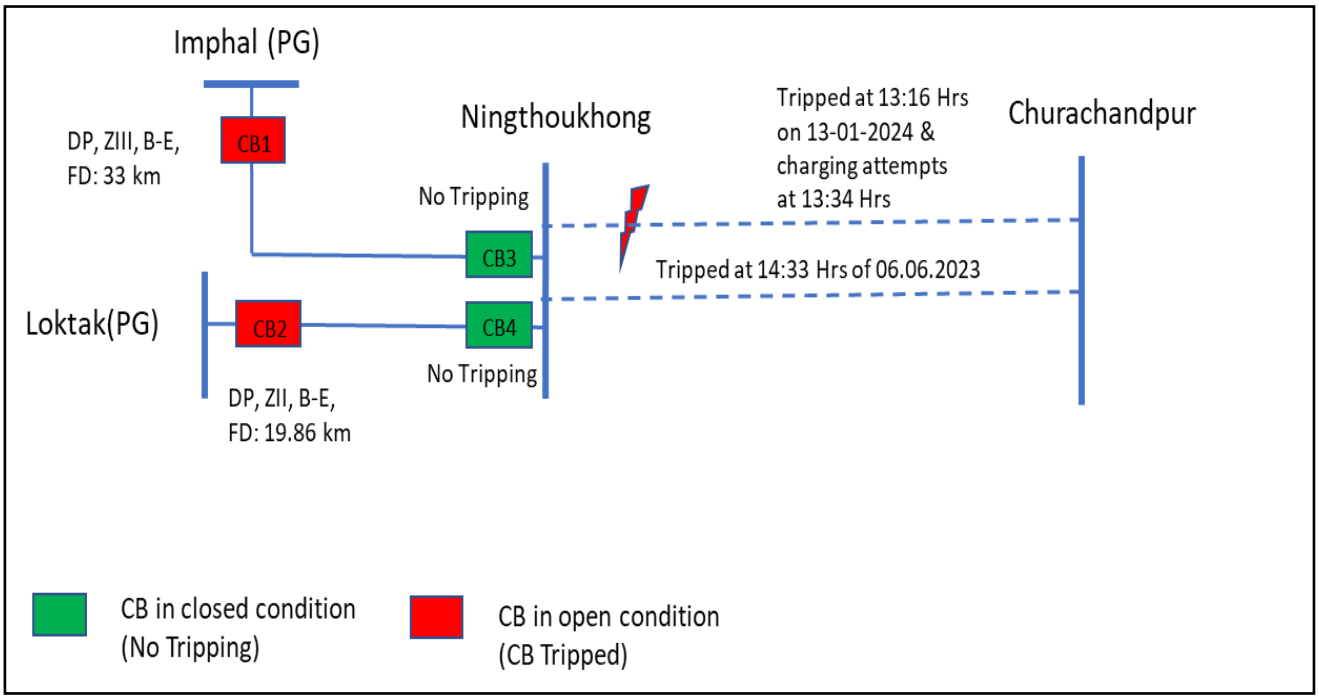
SN	Name of Transmission Licencee	D= (Nc/Nc+ Nf)	S= (Nc/Nc+Nu)	R= (Nc/Nc+ Ni)	Remakrs
1	NERTS	1	1	1	-
2	NETC	-	-	-	No bays owned by NETC
3	NTL	1	1	1	-
4	MePGCL	1	0.5	0.5	-

It has been observed that Protection Performance Indices are not being submitted by all the users. Therefore, all Users are requested to furnish performance indices (Dependability-D, Security-S, Reliability-R) with regards to the tripping of elements to NERPC & NERLDC positively by 10th of every month for previous month indices.

B.9 Repeated Grid Disturbance in Ningthoukhong and radially connected Churachandpur & Thanlon area of Manipur power system on January & February 2024:

Blackout of Ningthoukhong area:

At 13:34 Hrs of 13.01.2024, 132 kV Loktak – Ningthoukhong & 132 kV Imphal – Ningthoukhong lines tripped which led to blackout of Ningthoukhong area of Manipur power system.



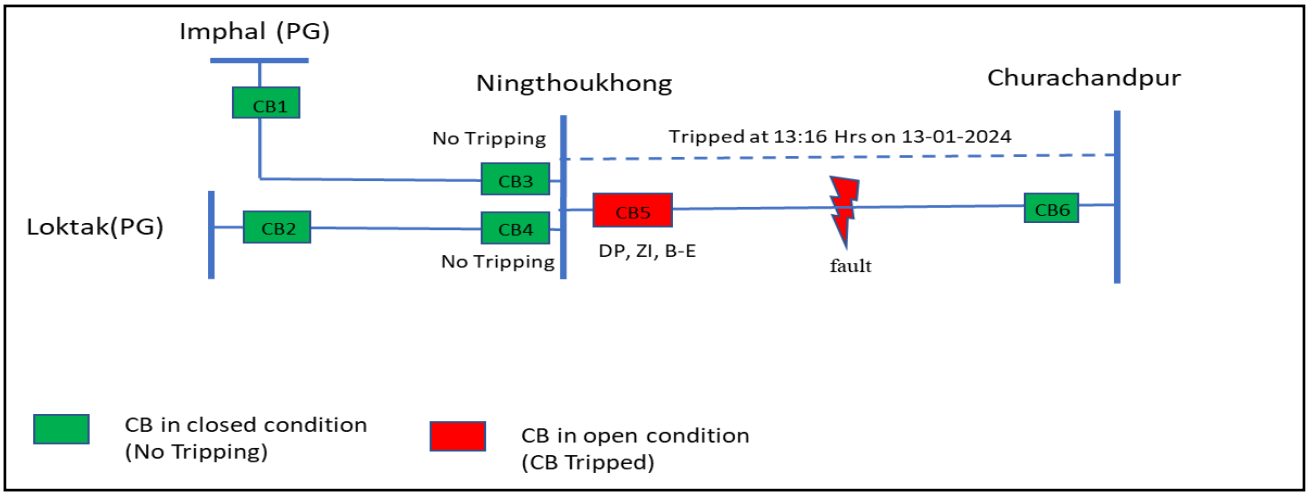
Remarks: Healthy lines tripped while taking charging attempts of the 132 kV Ningthukhong-Churachandpur 1 line at 13:34 Hrs.

Blackout of Churachandpur & Thanlon area:

Event 1: 01.02.2024, 22:47 Hrs: Load Loss: 8 MW

Event 2: 02.02.2024, 01:37 Hrs : Load Loss: 5 MW

132 kV Ningthoukhong-Churachandpur 2 line tripped which led to blackout of Churachandpur and Thanlon area of Manipur power system.



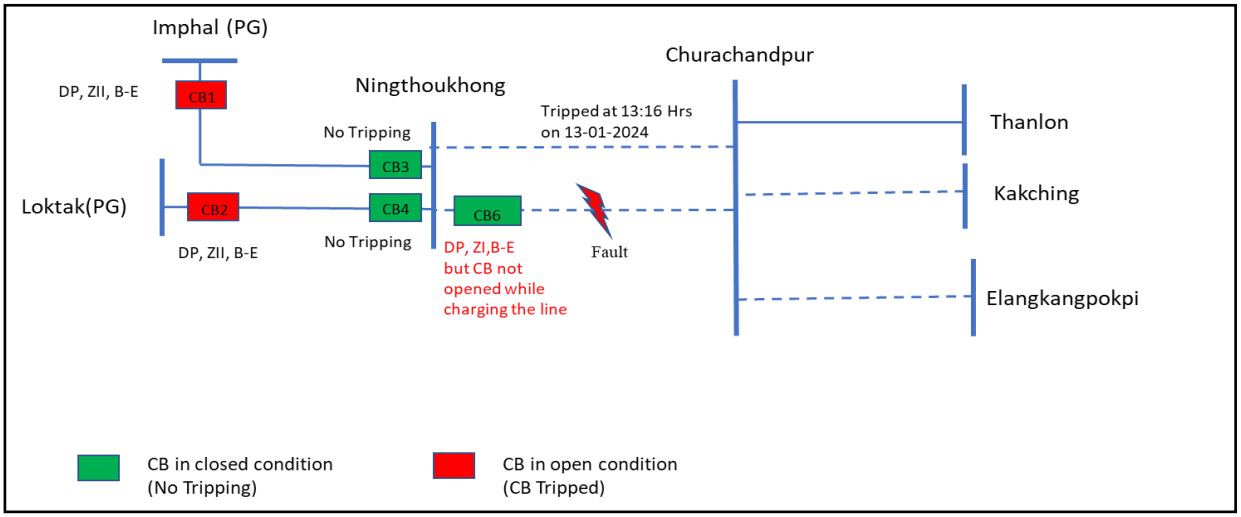
Remarks: Line tripped correctly due to Solid/metallic fault.

Blackout of Ningthoukhong and radially connected Churachandpur & Thanlon area:

Event 1: 02.02.2024,10:05 Hrs: Loss: 18 MW

Event 2: 02.02.2024,18:44 Hrs: Load Loss: 19 MW

132 kV Loktak – Ningthoukhong & 132 kV Imphal – Ningthoukhong lines tripped which led to blackout of Ningthoukhong area of Manipur power system.



Remarks: Healthy lines tripped while taking charging attempts of the 132 kV Ningthukhong-Churachandpur 2 line at 10:05 Hrs and 18:44 Hrs.

MSPCL is requested to share the root cause for repeated fault in the 132 kV Ningthoukhong-Churachandpur 2 line and remedial action taken to avoid such blackouts in the future.

B.10 Non-operation of auto recloser in Important Grid Elements for transient faults in January 2024:

Sl No	Element Name	Time	Relay End1	Relay End2	A/R not Operated	Remarks from Utility
1	132 kV Along-Pasighat Line	01-01-2024 04:48	DP, ZI, R-E, FD: 47.52 Km	DP, ZI, R-E, FD: 19.57 Km	Both ends	
2	220 kV Karbi Langpi - Sarusajai 2 Line	01-01-2024 11:41	DP, ZI, B-E, FD: 36.33 Km, No DR submitted	DP, ZI, B-E, FD: 21.3 Km	Both ends	

3	132 kV Balipara - Tenga Line	04-01-2024 22:51	DP, ZI, R-Y, FD: 40.36 Km	DP, ZI, R-Y, FD: 37.30 Km	Both ends	
4	132 kV Balipara - Tenga Line	05-01-2024 00:35	DP, ZI, R-Y, FD: 40.16 Km	DP, ZI, R-Y, FD: 37.3 Km	Both ends	
5	220 kV Samaguri - Sonapur Line	08-01-2024 10:07	DP, ZI, B-E, FD: 0.2 km, AR unsuccessful	DP, ZI, B-E, FD: 127.9 km	Sonapur	
6	220 kV AGBPP-Mariani(PG) Line	12-12-2023 12:29	DP,ZI,B-E,FD: 44.9 Km, *(No DR submitted)*	DP,ZI,B-E,FD: 110.9 KM, A/R successful	AGBPP	
7	132 kV Along - Pasighat Line	23-01-2024 05:58	DP, ZI, R-E	DP, ZI, B-E, FD: 40 km	Both ends	
8	220 kV Karbi Langpi - Sarusajai 2 Line	29-01-2024 10:16	DP, ZI, Y-E, *(No DR submitted)*	DP, ZI, Y-E	Both ends	
9	220 kV Mariani (AEGCL) - Samaguri Line	25-01-2024 13:11	DP, ZI, B-E, FD: 27.8 KM *(No DR submitted)*	DP, ZII, FD: 132 KM *(No DR submitted)*	Both ends	

B.11 UFR load profile of NER states for the period 1st Oct'23 – 31st Dec'23

NERLDC has prepared the quarterly report on UFR load profile of the NER states as mentioned in the Regulation 29.13(d) of IEGC-23 and shared with all the SLDC's & NERPC vide email dated 08-02-2024.

The quarterly report covers the stage wise UFR load profile of Assam, Meghalaya and Nagaland power system based on the SCADA data mapped for UFR load available at NERLDC.

Stage wise summary of UFR at Assam is tabulated below:

UFR Stage	Load shedding required (MW)	Maximum Load (MW)	Minimum Load (MW)	Average Load (MW)	Observations/Remarks
I	90	98	12	46	Load connected below the required quantum. Connected load reduces to the minimum level mostly during the morning Hours
II	90	115	5	55	
III	90	126	18	55	Connected load reduces to the minimum level mostly during the morning Hours.
IV	90	123	13	53	

Stage wise summary of UFR at Meghalaya is tabulated below:

UFR Stage	Load shedding required (MW)	Maximum Load (MW)	Minimum Load (MW)	Average Load (MW)	Observations/Remarks
I	25	16	0	10	Load connected below the required quantum.
II	25	5	0	3	

III	25	14	0	7	Load connected below the required quantum. *Non availability of SCADA data for 33kV Dakopgre for whole quarter & Non availability of SCADA data for 33 kV Tura-I feeder at 132/33kV Rongkhon from 1st to 16th Oct'23*
IV	25	6	0	3	Load connected below the required quantum. Non availability of SCADA data for 33 kV Tura-II feeder at 132/33kV Rongkhon from 1st to 16th Oct'23

Stage wise summary of UFR at Nagaland is tabulated below:

UFR Stage	**Load shedding required (MW)**	**Maximum Load (MW)**	**Minimum Load (MW)**	**Average Load (MW)**	**Observations/Remarks**
I	10	9	0	4	Load connected below the required quantum.
II	10	19	0	9	Adequate load connected for Stage II & III
III	10	13	2	6	
IV	10	8	0	2	Load connected below the required quantum.

Summary of the Stagewise actual load of UFR was below the Set Load in Percentage Wise as tabulated below:

	Cumulative Stage I	Cumulative Stage II	Cumulative Stage III	Cumulative Stage IV
Assam	99.9%	99.1%	96.4%	97.1%
Nagaland	100.0%	71.9%	98.2%	100.0%
Meghalaya	43.2%	100.0%	80.8%	100.0%

Member may discuss

B.12 Mapping of telemetered UFR load point in the SCADA Display for Arunachal Pradesh, Mizoram, Manipur and Tripura power system:

As per the Regulation 29.13(d) of IEGC-23, SLDC shall ensure that telemetered data of feeders (MW power flow in real time and circuit breaker status) on which UFR and df/dt relays are installed is available at its control centre. SLDC shall monitor the combined load in MW of these feeders at all times. SLDC shall share the above data with the respective RLDC in real time and submit a monthly exception report to the respective RPC. RLDC shall inform SLDCs as well as the concerned RPC on a quarterly basis, durations during the quarter when the combined load in MW of these feeders was below the level considered while designing the UFR scheme by the RPC. SLDC shall take corrective measures within a reasonable period and inform the respective RLDC and RPC, failing which suitable action may be initiated by the respective RPC.

Mapping of AUFLS feeders also discussed in the 14th Meeting of National Power Committee held on 03.02.2024, SLDCs in coordination with STU/Discoms, map the feeders for loading, breaker status etc. and create display for monitoring of all the stages. The SLDC would extend the mutually agreed displays to RLDC. SLDCs also develop the SCADA Displays Discom-wise/Sub SLDC wise as applicable as well as feeder wise for all the stages. Mapping verification between SLDC and Discom/STU to be carried out at least once in three (3) months and between RLDC and SLDCs at least once in six (6) months. SLDCs shall download the data and store it for two years. The Data should be made available to RPCs/RLDCs/CEA/CERC for further studies or analysis.

Hence, Arunachal Pradesh, Mizoram, Manipur and Tripura are requested to prioritize the UFR load mapping in the SCADA for real time UFR load monitoring.

B.13 Mock testing of the System Protection Scheme (SPS) of the NER:

New IEGC highlighted the need for mock testing of the SPS for reviewing SPS parameters & functions, at least once in a year under the regulation 16 (2) of IEGC 2023.

As per the discussion in the 63rd PCCM, NERLDC has prepared draft procedure for testing of SPS at Samaguri substation at Assam attached in **Annexure B.13**.

All the utilities are requested to share Suggestions/comments on the draft procedure.

C. FOLLOW–UP AGENDA ITEMS

C.1 Submission of monthly and Quarterly progress report by respondents of NERLDC's Petition:

As per the Direction of Hon'ble commission related to the Petition No 198/MP/2020, 259/MP/2020, 535/MP/2020, 539/MP/2020 and 540/MP/2020, respective respondents has to submit the **monthly/Quarterly progress report** of the action plan prepared by the respective respondents in consultation with the Petitioner (i.e. NERLDC) to NERPC.

Order dated	**Petition No**	**Respondant**
08-Nov-2023	198/MP/2020	DoP, Arunachal Pradesh
	259/MP/2020	DoP, Nagaland
	539/MP/2020	MSPCL
27-Oct-2023	535/MP/2020	TPTL/TSECL
	540/MP/2020	P&ED, Mizoram

All the respondents are requested to share the monthly/Quarterly progress report for the month of Dec'23.

In 63rd PCCM, MS, NERPC stated that Hon'ble CERC (in above mentioned Petition) has directed the following:

NERPC shall monitor the work of the implementation of the Protection system by the Department of Power, Arunachal Pradesh; Department of Power, Nagaland, MSPCL, TPTL/TSECL, P&ED, Mizoram and shall submit a quarterly progress report to the Commission till the establishment of the Protection system at the substations identified by the NERLDC.

NERPC shall validate relay settings and conduct the Protection Audit of the associated transmission system at the substation and transmission lines, as and when required. Any issue faced during the implementation of Protection system or observed during the protection audit shall be discussed in the Protection Sub-Committee meeting at the RPC forum and sorted out. Concerned Power department /State shall identify one person from their top management as a nodal officer, who shall submit a monthly progress report on the implementation of the protection

system to the NERPC and NERLDC, till the establishment of the Protection system at the substations identified by the NERLDC.

In this regard, Member Secretary strongly urged the concerned States to appoint a nodal officer at SE and above level who shall submit a monthly progress report on the implementation of the protection system to NERPC and NERLDC. The monthly progress report will be monitored at PCC forum. He requested the states to send monthly progress report and action plan accordingly.

All the respondents are requested to provide the progress report for Dec'23 and Jan'24.

Respondents may update

C.2 Diversion of PLCC panels allotted for Salakati-Gelephu feeder to 220kV Salakati-BTPS-II feeder:

POWERGRID has procured PLCC panels to install in Salakati-Gelephu feeder at both ends. But, Bhutan Power Dept had cancelled the shutdown planned in Jan 2023 to install PLCC panels by POWERGRID as they are planning for DTPC installation at both ends. Further, even after reminders from POWERGRID & NLDC no action plan has been shared by Bhutan for DTPC installation till date. POWERGRID has planned to install the above allocated PLCC panels in 220kV Salakati-BTPS #II feeder. and there shall be no further plan to install PLCC panels in Salakati-Gelephu feeder by POWERGRID. This is for information and record.

In 63rd PCCM, POWERGRID informed that they have planned to install the PLCC panels allocated for Salakati-Gelephu feeder in 220kV Salakati-BTPS #II feeder. NERLDC informed that NLDC has already sent a letter to NLDC Bhutan about the procurement status and installation cum commissioning plan of DTPC at both Salakati and Gelephu.

The forum noted as above and decided to review in PCC meeting.

Sub-committee may deliberate

C.3 Non-Operation of A/R at Doyang HEP for 132 kV Dimapur- Doyang 1&2 line:

Sl. No.	Element Name	Time	Relay End1	Relay End2	Remarks
1	132 kV Dimapur - Doyang 1	19-09-2023 14:53	DP, ZI, R-Y-E, FD: 86.192 Kms, AR Successful	DP, ZI, R-Y-E, AR Not Operated	Lightning
2	132 kV Dimapur - Doyang 2	07-08-2023 19:35	DP, ZI, B-E, FD:23.84 kms, AR Successful	DP, ZI, B-E, AR Not Operated	Lightning
3	132 kV Dimapur - Doyang 2	19-08-2023 02:19	DP, ZII, Y-E, FD: 91.14 Kms; carrier aided, AR Successful	DP, ZI, Y-E, AR Not Operated	Lightning

Numerous instances of tripping have been noted, primarily attributed to the transient nature of the fault. The Autorecloser at the Dimapur (PG) end has consistently performed successfully. Nevertheless, it is apparent that no Autorecloser operation was recorded in the submitted Disturbance Recorder (DR) from the Doyang end, indicating that there is need of checking of Autorecloser function at Doyang HEP.

In 60th PCCM NERLDC updated the forum that CBs at Doyang are spring closed and air operated (pneumatic type). As soon as breaker gets open, air pressure goes down below 15Kg/cm2 and the breakers goes to non-operative mode. After running the compressor when air pressure is achieved to 15Kg/cm2, that condition goes off, by that time AR time becomes over. They have called CGL, OEM of the breakers, to attend the problem. The OEM has assured that they will report within this month. In case, OEM is not able to resolve this matter, all the CBs of Doyang SY needs to be replaced (CBs were procured during commissioning of the Plant i.e., 2000).
In 61st PCCM NEEPCO intimated that the OEM will visit on 08th December, 2023 and suggest the resolution. If resolution not possible then NEEPCO will replace CB. The forum requested NEEPCO to resolve the issue at the earliest.

In 63rd PCCM, NEEPCO informed that the OEM visit is planned in the coming week and the same is expected to be rectified by end of January 2024.

C.4 Requirement of SPS for 132 KV Khliehriat (PG)-Khliehriat D/C line

With expected availability of at least two machines of Kopili and one machine of Khandong during peak hours of the coming winter months of 2023-24 and considering the anticipated increase in demand, it is expected that total power flow along 132 KV Khliehriat (PG)-Khliehriat D/C line would be between 90-110 MW under different conditions. Load flow studies had been carried out by SLDC and shared with NERLDC. The matter had also been discussed with DGM, NERTS since 132 KV Khliehriat (PG)-Khliehriat line 1 is under POWERGRID. The scheme envisages shedding of 20-25 MW load at 132 KV Mustem substation in the event of tripping of any circuit of 132 KV Khliehriat (PG)-Khliehriat D/C line.

The above requirement was agreed in principle during the 205th OCC meeting and NERLDC and MePTCL were requested to develop the tripping logic and to present it in the next PCC meeting. The schematics of the SPS is attached for reference.

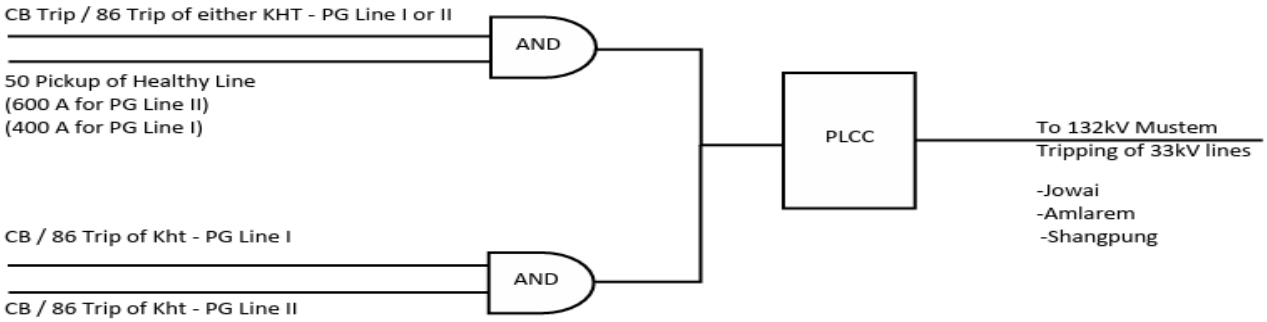
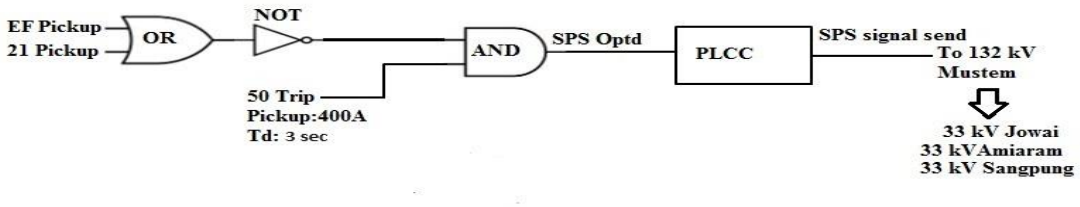


Fig: SPS Schematics at 132kV Khliehriat S/S for 132kV PG Line I & II

In 60th PCCM, NERLDC provided the modified logic (as below) and same need to be implemented by MePTCL. MePTCL agreed the same.

SPS Logic Diagram



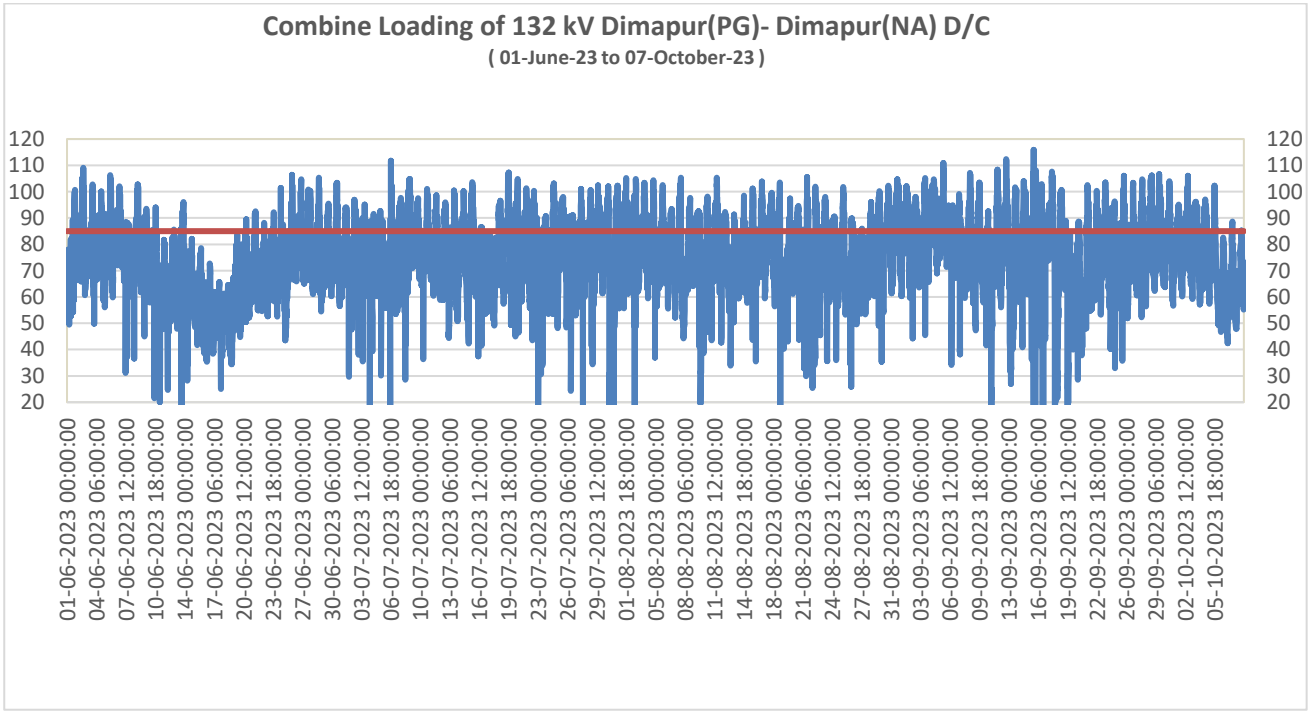
In 61st PCCM SLDC, Meghalaya informed that the scheme has been put up for approval of higher authorities and the logic will tentatively be implemented by December'23 end.

In 62nd PCCM, MePTCL updated that the SPS is implemented at Mustem, while it will be implemented at Khliehriat S/S in Jan'24.

In 63rd PCCM, Meghalaya informed that the SPS will be implemented by 6th Feb'24.

Meghalaya may update

C.5 Requirement of SPS implementation at Dimapur to for ensuring reliable power in Dimapur area of Nagaland:



Loading profile of Dimapur shows N-1 contingency of any one circuit not satisfied most of the time as the combine loading was above 85 MW for 22% of times and above 80 MW for 35% of times.

Hence, to satisfy the N-1 contingency at Dimapur (NL) and to avoid load loss in the Dimapur area, DoP, Nagaland is requested to implement suitable System Protection Scheme (SPS) with following criteria-

If the loading of any one circuit current exceeds more than 415A, the SPS will trigger and it will shed 25-30 MW load at Nagarjan area, which will increase the reliability of Nagarjan area of Nagaland system.

In 60th PCCM, DoP Nagaland updated that reconductoring of the line is under process, DPR is in final stage.

Regarding the SPS, forum requested DoP Nagaland to identify 25-30 MW load at Nagarjan area for the implementation of the SPS scheme at the earliest.

In 61st PCCM, Nagaland stated that feeders have been identified to cut around 40MW in 66kV Power House and 33kV Metha Further he stated that internal approval for the same has also been taken.

In 62nd PCCM, NERLDC informed that DoP Nagaland has identified the load and NERLDC has prepared the draft SPS. NERLDC further informed that the draft SPS has been sent to NERPC for review.

NERPC stated that the scheme will be reviewed shortly.

In 63rd PCCM, DoP Nagaland stated that the SPS has been finalized and will be enabled shortly.

DoP Nagaland may update

C.6 Non-operation of auto recloser in Important Grid Elements for transient faults in October, November and December 2023:

As updated in 63rd PCCM

Sl No	Element Name	Time	Relay End1	Relay End2	A/R not Operated	Remarks from Utility
1	220 kV NTPS - Tinsukia 1 Line	26-10-2023 16:37	DP,Z1,Earth fault,39km	B-Eph, Z-1, LA burst	No details provided	Planning completed will be implemented in Feb'24.
3	132 kV Jiribam - Pailapool Line	30-10-2023 12:47	DP, ZI, R-Y, FD: 6.49 km, AR successful	DP, ZI, R-Y	Pailapool	Will be completed by 7th Feb'24.
4	132 kV Agartala - Surajmaninagar 2 Line	17-11-2023 15:10	DP,ZI,Y-B,FD:5.81 km, AR successful	DP,ZI,R-Y,FD:11.98 KM	Surajmani nagar	Will be implemented within 6 months, PowerGrid will

						help in implementation.
5	220 kV Mariani (AEGCL) - Samaguri Line	29-11-2023 15:10	DP, ZI, B-E	DP, ZI, B-E, FD: 16 km	Samaguri	AR will be implemented by Feb'24 at Mariani (currently PSDF work is going on at Mariani so AR kept off at Samaguri)

Sl No	**Element Name**	**Time**	**Relay End1**	**Relay End2**	**A/R not Operated**	**Remarks from Utility**
2	220 kV AGBPP-Mariani (PG) Line	12-12-2023 12:29	DP,ZI,B-E,FD: 44.9 Km, NO DR submitted	DP, ZI, B-E,FD: 110.9 KM, A/R successful	AGBPP	NEEPCO need to check the AR issue and submit DR/EL.
5	132 kV Along-Pasighat Line	24-12-2023 03:07	DP, ZI, R-E	DP, ZI, R-E	Both ends	Along AR not ready due to issue with CB spring charging motor. Pashighat -CB ready status not coming in CRP/BCU

Utilities may update the status

C.7 132kV Kumarghat P.K. Bari issue

POWERGRID has commissioned Line Diff Relay for 132kV Kumarghat PK Bari feeder. During commissioning, following issues have been noted at PK Bari end: -

1. AR kept OFF at PK Bari end by Tripura, however, the same is in ON Position at Kumarghat end.
2. Due to previous experience of multiple tripping at Kumarghat because of fault in P.K. Bari-Dharmanagar feeder & non isolation of the fault by P.K. Bari end CB, previously it was decided that Zone Timer for 132kV Kumarghat-P.K. Bari feeder (at Kumarghat end) shall be kept as under: -

a. Z1 = 0 msec
b. Z2 = 200 msec
c. Z3 = 300 msec

Tripura may please confirm the healthiness of the CBs (PK Bari end CB for Kumarghat PK Bari & P.K. Bari end CB for P.K. Bari-Dharmanagar feeder) otherwise forum may allow continuing the above Time delay setting for respective Zones of Distance Protection in 132kV Kumarghat-P K Bari Line at Kumarghat end.

In 62nd PCCM, Forum approved above stated time delay setting till TSECL checks and confirms the healthiness of the CBs (PK Bari end CB for Kumarghat PK Bari & P.K. Bari end CB for P.K. Bari-Dharmanagar feeder).

TSECL assured the forum to check the healthiness at the earliest.

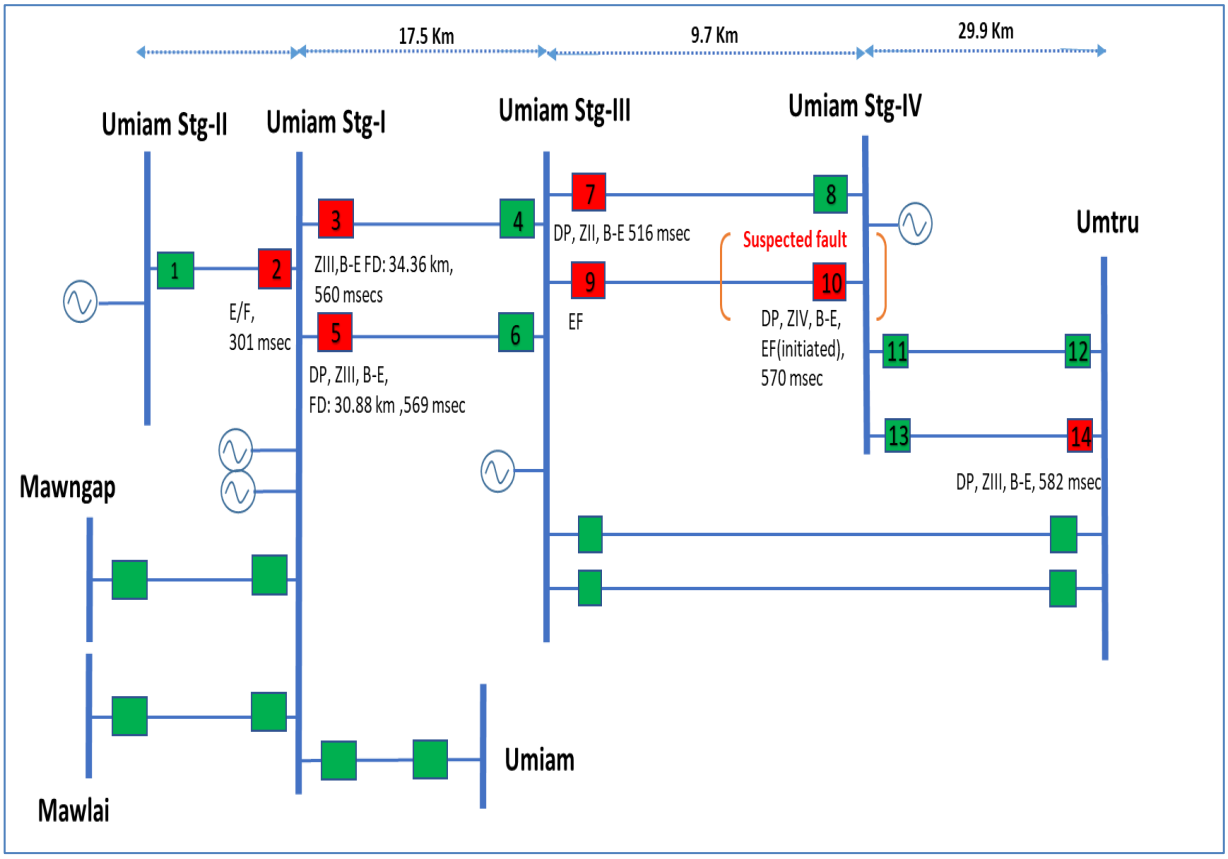
In 63rd PCCM, TSECL informed that there is some issue with CB at PK Bari for Dharmanagar. Testing equipment has been received and test will be done soon.

Forum requested TSECL to confirm CB healthiness status after testing within Feb24.

TSECL may update

C.8 Blackout of 132 kV Umiam Stg-II on 09th Dec 2023:

At 12:12 Hrs of 09-Dec-2023, the following element tripped as shown below resulting in blackout of 132 kV Umiam Stg-II:-



As per DR analysis, 132 kV Umiam Stage 1- Umiam Stage 3 Line 1 & 2 tripped from Umiam Stage 1 end in 560 msecs & 570 msecs respectively on operation of DP, ZIII indicates that fault is beyond the line.

Tripping of 132 kV Umiam Stage 3- Umiam Stage 4 Line 1 on DP, ZII from Stage 3 end and no tripping from Stage 4 end indicates the fault is not in the line. Suspected fault in 132 kV Umiam Stage 3- Umiam Stage 4 Line 2 and tripping of multiple elements occurred due to relay coordination Issues.

Following protection issues were observed:

- Tripping on DP, ZIII in 560-580 msecs indicates less time delay setting incorporated at Umiam Stage 3.
- Tripping 132 kV Umiam Stage 1 – Umiam Stage 2 on Earth Fault from Stage 2 end indicates directionality issue in the backup relay.
- Tripping of Umiam I Unit-3 & 4 and Umtru Unit-1 seems unwanted.

Meghalaya is requested to share the root cause of these tripping and remedial measures taken.

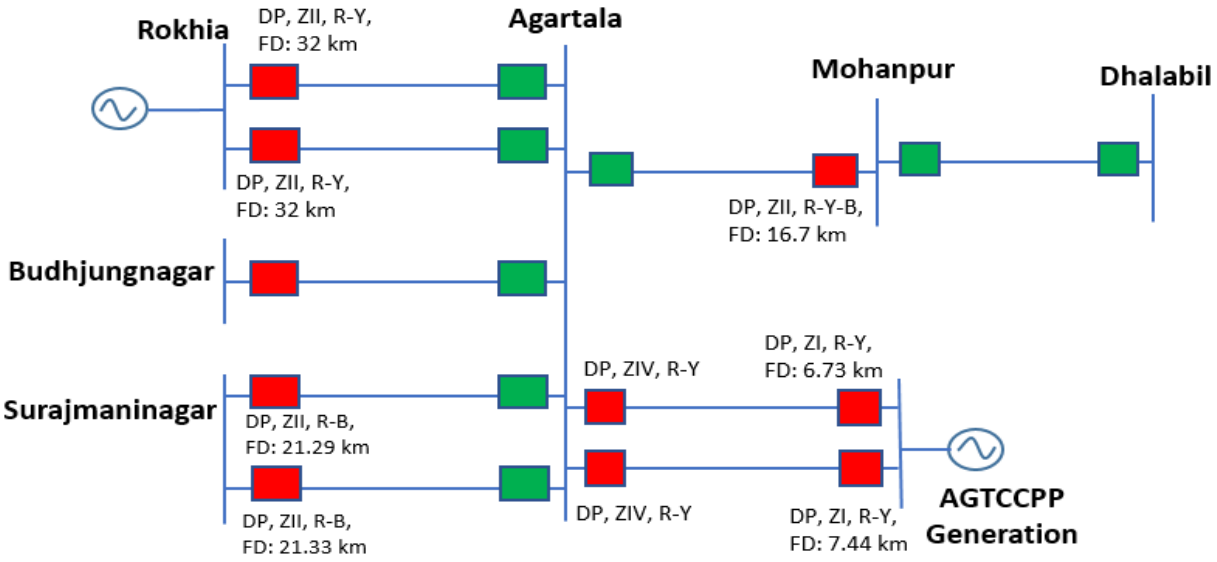
In 63rd PCCM, following actions were recommended:

1. Directionality in EF protection for Umiam stg 2 line at Umiam stg 1 has to be ensured at the earliest. Highs set EF protection to be disabled.
2. Non operation of distance protection at stg 3 for stg 4-line 2 has to be looked into.
3. Time settings for Z 3 at Umiam stg 1 for stg 3 line has to be changed to 800 msec.

Meghalaya may update

C.9 Blackout of 132 kV Agartala S/S on 15th Jan 2024:

At 16:26 Hrs of 15.01.2024, all the lines connected to 132 kV Agartala substation tripped which led to blackout at Agartala Substation of Tripura Power system which is the matter of serious concern.



As per preliminary analysis, R-Y fault detected in 132 kV AGTCCPP-Agartala D/C which was cleared on operation of Z-I from AGTCCPP end. As per information from POWERGRID, ZIV was initiated at Agartala end for both the lines which indicates that the fault is in reverse direction of Agartala.

All other elements connected to Agartala substation tripped from remote end on operation of ZII and no tripping was observed from Agartala end. Total fault clearance time as per PMU: 440 msec.

Prima facie it appears that-

1. Downstream fault is suspected at Agartala which was not cleared leading to tripping of all the elements connected to Agartala from remote end on backup protection.
2. Tripping of 132 kV Agartala-AGTCCPP D/C lines on DP, ZI (Z-1 overreach) from AGTCCPP end for fault beyond the line seems to be mis-operation. ZI reach setting needs to be reviewed by AGTCCPP to prevent re-occurrence. Line length may be confirmed by offline fault locator measurement.

Proper analysis of the event could not be done due to non-availability of FIR, DR & EL outputs by TSECL, AGTCCPP, PGCIL which violates the IEGC section 37.2 (c). Therefore, it is requested to share the root cause of the event and remedial measures taken.

In 63rd PCCM, NERLDC highlighted that double phase fault was within the switchyard of Agartala S/S as all the feeders from Agartala detected the fault in Z-IV, reverse side.

Forum requested TSECL to provide the root cause and submit the detailed report of the event as per grid code mandate.

TSECL may update

C.10 Pending Line Diff Relay issues in 132kV feeder:

a. As discussed in 62nd PCCM, CT & PT wiring check is pending at Luangmual end for 132kV Aizwal - Luangmual feeder due to which Diff function cannot be activated at both ends.

b. For 132kV Haflong - Haflong feeder, at Haflong AEGCL end CT wiring needs to be checked & rectified as Diff function cannot be activated until the wiring mismatch is rectified.

In 63rd PCCM it was updated that Mizoram will complete the CT/ PT wiring check in the next shutdown and Assam will complete the pending task by Feb'24.

Mizoram and Assam may update

C.11 PLCC issues follow up:

a. PLCC/DTPC needs to be implemented in below stated lines –

1. 132kV Dimapur Kohima
2. 132kV Nirjuli Lekhi

3. 132kV Melriat - Zemabwk

b. 400kV Mariani Kohima Ckt #2 - For 400kV Mariani-Kohima Ckt-2, ABB make PLCC Model no-ETL41 is installed at both ends. PLCC panels at both ends are owned by KMTL. At Mariani end, for PLCC Ch#1, alarm is persisting in P4LA card. KMTL had previously deputed service engineer for rectification of the issue in Oct 2022.The issue was resolved in Oct 2022. However, the same issue had resurfaced again from 24th August 2023. Repeated communication has been sent to KMTL to resolve the issue. However, rectification action is still pending.

c. 132 kV Roing - Pasighat – PLCC panels for 132kV Roing -Pasighat feeder are installed at both ends. Panels are in healthy condition at both ends. However, due to non-availability of healthy 48V dc supply at Pasighat end, PLCC panels at Pasighat are in OFF state. DoP AP is requested to arrange healthy 48V dc supply at Pasighat end.

In 63rd PCCM following points were discussed

a. 1. Dimapur-Kohima: DoP Nagaland informed that DPR for implementation of DTPC for tele-protection is under preparation.

a. 2. Nirjuli-Lekhi line: DoP Arunachal Pradesh stated that Wave trap and CVT will be provided by Ar. Pradesh and requested NERTS to provide any spare PLCC if available. Forum requested Ar. Pradesh to install DTPC if PLCC is not available. Ar. Pradesh will confirm in the next PCCM.

a. 3. Melriat – Zemabwk: Mizoram will provide WT, CVT at Zemabawk soon

b. 400kV Mariani Kohima Ckt #2: Issue could not be discussed as KMTL representative was not present.

c. Roing-Pashighat line: DoP Ar. Pradesh stated that there is no issue with the DC battery. It was decided that PGCIL will visit the substation and resolve the issue in coordination with DoP Ar.Pradesh.

Utilities may update

C.12 AR issues follow up:

a. Enabling of AR & Carrier Aided Trip at Gohpur end for 132kV Nirjuli-Gohpur feeder by AEGCL

b. 132kV Dimapur-Doyang 1&2 – At Doyang end, AR is not functional. NEEPCO may kindly look into it to enable it.

c. 132kV Dimapur-Bokajan - Auto reclose for this line is not functional at Bokajan end. AEGCL is requested to enable it at the earliest.

In 63rd PCCM following points were discussed

a. AEGCL informed that panel replacement work is going on at Gohpur. It will be enabled in new panel, tentatively by Jan'24.

b. NEEPCO informed that AR will be functional at Doyang by end of Jan'24.

c. AEGCL informed that AR has not been installed at Bokajan but they will plan to install it soon.

Forum requested all the states to send the list of lines, on which AR is working, not working, not available and also its commissioning dates to NERPC and NERLDC.

NERLDC was requested to prepare a list of lines in google spreadsheet so that utilities can update the same for smooth monitoring.

D. ITEMS FOR STATUS UPDATE

D.1. Status of auto-reclosure on *z*-1 operation for important lines:

In the discussions of the Sub-group on 12-04-2021 the following points were noted:

a. Auto-Reclosure is very much required for maintaining system stability, reliability and uninterrupted power supply.

b. Presently it will take some time for the state utilities to implement the PLCC and establish carrier communication between stations.

c. The operation of Auto-Reclosure on Z-I operation at the local end independent of carrier healthiness is required.

In the 57th and 56th PCC meeting the forum approved the implementation of Auto-Reclosure on Z-1 without carrier check for all lines except the lines with generating stations at both the ends and requested the utilities to implement the AR scheme at the earliest.

Status as updated in 63rd PCCM

Sl no	State	Important Transmission lines where AR has to be enabled at the earliest	Last status	Latest status
1.	Arunachal Pradesh	132kV Balipara-Tenga, 132kV Ziro-Daporijo-Along-Pashighat link	PLCC implementation under PSDF underway. SPAR have been enabled on the lines without PLCC 3-Ph AR will be enabled by Feb'24.	
2.	Assam	All 220kV and 132kV lines	For 220kV sub stations- At Sonapur, GIS work Completed. At Kathalguri, procurement of relays underway At Jawaharnagar, WIP	

			All works at three substations to be completed by Feb'24 For 132kV substations- 80% work completed, by Dec'23 90% to be completed Assam informed all work at three substations will be completed by Jan/Feb 2024.	
3.	Manipur	132kV Imphal-Ningthounkong	-	
4.	Meghalaya	**Annexure (D.1)**	Financial Approval of BoD pending. Will take total six month to complete the task.	
7.	Tripura	132kV Agartala-S M Nagar (TSECL), 132kV Agartal-Rokhia DC, 132kV, 132kV Agartala-Budhjungnagar	To be commissioned by Jan'24	

Utilities may update

D.2. Installation of line differential protection for short lines:

As per sub-regulation3 of Regulation 48 of Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022-

"For short line (less than 10 km) or cable or combination of overhead line and cable, line differential protection shall be used with built-in backup distance protection."

As per discussion in 61st PCC meeting the status for different STUs/ISTS licensees are as follows:

Status as updated in 63rd PCCM

Name of utility	**Last updated status (62nd and 63rd PCCM)**	**Latest status**
AEGCL	DPR sent back by PSDF secretariat. Third party protection audit reports have to attached with the DPR.	

	DPR being prepared as per new format and will be done by Jan'2024. Team is in Delhi to Discuss with PSDF secretariat.	
MSPCL	Revised DPR for 132kV Imphal-Imphal-III to be submitted. Revised DPR submitted for PSDF.	
MePTCL	Work completed Aug'21, but not commissioned yet. OPGW to be installed on some lines. LDP will be commissioned after OPGW link is established. 7 Feeder operational for rest OPGW work is pending	.
P&ED Mizoram	Lines identified viz. 132kV Aizawl - Luangmual and 132kV Khamzawl - Khawiva. DPR submitted. PSDF approval awaited. For Aizawl – Luangmual line Power grid will complete the task by Jan'23 and for other PSDF approval still awaited. DPR revised and same will be submitted soon.	
DoP Nagaland	LDP on Dimapur-Dimpaur lines completed. Regarding Doyang-Sanis line, NEEPCO to install LDR at Sanis end. Regarding Doyang-Sanis line, NEEPCO to install LDR at Sanis end will be done by Jan'24. Relay Available installation will be completed by March'24.	
TSECL	132kV 79 Tilla-Budhjungnagar. DPR to be prepared. Cost estimate	

	submitted to TIDC to arrange for ADB funding. TIDC approval is still awaited for fund.	

Utilities may update

D.3. <u>Status against remedial actions for important grid events:</u>

Status as updated in the 63rd PCCM:

Sl No	Details of the events(outage)	Remedial action suggested	Name of the utility & previous update	Latest status
1.	132 kV Balipara-Tenga line in May and June	Carrier aided inter-tripping to be implemented for 132kV Balipara-Tenga-Khupi at the earliest (PLCC has to be installed on the link. Under consideration of the higher authorities)	DoP, Arunachal Pradesh. As per previous updates, PLCC Work covered under PSDF. In progress	
2.	132 kV DoyangMokokchung line 132 kV Mokokchung - Mokochung (DoP, Nagaland) D/C lines on 30th July	Carrier inter-trip for 132kV DHEP-Mokokchung to be implemented by DoP Nagaland (NO PLCC on the line. Matter under consideration of Higher authorities)	DoP Nagaland (DPR is under preparation for PLCC.	
3.	Leshka-Khleihriat DC multiple tripping in April to September	TLSA installation along the line to be done by MePTCL	MePTCL (DPR submitted, Approval pending.)	
4.	132 kV Loktak-Jiribam line, 132 kV Loktak-Imphalline,132 kV Loktak-Ningthoukhong line, 132 kV Loktak-Rengpang line &Loktak Units 1,2 and 3 on 3rdAug	> 5MVA TRAFO (Aux. Transformer) to be repaired ->5MVA Auxiliary TRAFO panel to be repaired by NHPC	NHPC (Order will be placed by 31st March. Will take 6months after placing the order)	
5.	Grid disturbance of category GD-1 (Load	MSPCL to check the following1. Protection	MSPCL	

	loss: 13MW) occurred at Karong areas of Manipur Power System at 07:41 Hrs on 4th August'22	setting at Karong along with circuit wirings from DPR to CB mechanism 2. Z-III setting at Imphal and its healthiness of correct operation by relay testing.		
7.	Grid Disturbance at Loktak HEP on 03rd Aug'22	NHPC-Loktak informed that LBB has been included under R&U scheme and the same shall be commissioned by Mar'23	NHPC (LBB to be commissioned under R&U project and by the end of Jan'24) Forum requested NHPC to delink LBB from R& U scheme and implement the same at the earleist	
10.	Review of SPS at Monarchak (item 2.22 of the sub-group held on4th May 23)	NERLDC requested NEEPCO and Tripura to implement the revised logic at Monarchak (as provided by NERLDC) and Udaipur Rokhia ends respectively	NEEPCO, TSECL (SLDC TSECL intimated that logic 1(to be configured at Udaipur and Rokhia to send DT to Monarchak) could not be implemented as there is no PLCC/OPGW connectivity in the LILO portion of Monarchak. NERLDC requested TSECL to explore installation of PLCC/FO for smooth functioning of SPS scheme for the reliability of	

			Monarchak system)	
13.	132 kV Aizawl - Tipaimukh Line tripped at Aizawl end only on received of spurious DT signal on 16th and 26th Feb'23	rectification of PLCC issues at Tipaimukh end by MSPCL	MSPCL 48V DC battery issue. WIP Will be completed soon.	
14.	Outage of 220 KV Bus Bar Protection Scheme at 400/220/132 KV Killing SS	Bus-Bar protection of 220kV bus at Killing SS	MePTCL Order given to ABB. To be completed in 3-4 months	
15.	Retrip configuration in LBB scheme in AEGCL Hailakandi station:	In previous sub group meeting the forum opined that the retrip scheme in the LBB protection will increase reliability of the protection system and will help in preventing mal operations in connecting feeders. AEGCL agreed to the suggestion and assured that the Retrip scheme, with time delay of 100msec will be configured in the LBB scheme in Silchar-Hailakandi Ckt 1 & 2 at Hailakandi end.	AEGCL Logic finalized, need to be tested. Whole work may be completed within Nov23	
16	Non-operation of AR for various lines at Byrnihaat end on 25th and 26th June'23	Rectification of PLCC issues by MePTCL Consultation with OEM underway for resolution	MePTCL Order given to ABB.	
17	Non-operation of AR for various lines at Sonapur end in July and August	GIS related issues, coordination with OEM required	AEGCL GIS related issues, Coordination with OEM underway. WIP	

20	Tripping of 132kV Kahilipara- Sarusajai 1, 2 and 3 line, 132kV Kahilipara Main bus 1, 132kV Kahilipara transfer Bus 1 and 132kV Kahilipara-Kamalpur line on 2.08.2021	BB protection to be implemented at Kahilipara with procurement of 5 core CTs	AEGCL (will be done by April24) DPR is under preparation for PSDF.	

DATE AND VENUE OF NEXT PROTECTION SUB- COMMITTEE MEETING

The next Protection Sub-Committee meeting will be held in the month of March, 2024. The date and venue will be intimated separately.

****

Annexure B.2

Sl No	Name of Substation	Protection Audit Carried Out	Protection Audit Required	Remarks
1	132/33 kV Mawphlang	2013		
2	132/33 kV Cherra	2013		
3	132/33/11 kV Nongstion	2013		
4	132/33 kV Nangalbibra	2013		
5	132/33 kV Rongkhon	2013		
6	132/11 kV NEIGRIHM	2013		
7	132/33 kV Lumshnong	2013		
8	132/33 kV Umiam	2013		
9	132/33 kV EPIP-I	2013		
10	400/220/13 kV Killing	2013		
11	132/33 kV NEHU	2017		
12	132/33 kV Mawlai	2017		
13	132/33 kV Mendipathar	2017		
14	132/33 kV Khliehriat	2017		
15	132/33 kV EPIP-II	2017		
16	132/33 kV Ampati	Not Yet Done		
17	132/33 kV Phulbari	Not Yet Done		
18	132/33/11 kV IIM	Not Yet Done		
19	220/132/33 kV New Shilong	Not Yet Done		
20	132/33 kV Mawlyndep	Not Yet Done		
21	132/33 kV Mustem	Not Yet Done		

Annexure B.4

ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड

GRID CONTROLLER OF INDIA LIMITED

Formerly Power System Operation Corporation Limited

North Eastern Regional Load Despatch Centre, Shillong

जनवरी, 2024 माह के लिए ग्रिड घटना की विस्तृत विश्लेषण रिपोर्ट

Detailed Analysis Report of Grid Event for the month of January, 2024

Table of Contents

ग्रिड-इंडिया GRID-INDIA
ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
GRID CONTROLLER OF INDIA LIMITED
(A Government of India Enterprise)
[formerly Power System Operation Corporation Limited (POSOCO)]
उत्तर पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / North Eastern Regional Load Despatch Centre
कार्यालय : लोवर, लापालांग, शिलांग -793006
Office : Lower Nongrah, Lapalang, Shillong- 793006
CIN : U40105DL2009GOI188682, Website : www.nerldc.in, E-mail : nerldc@grid-india.in, Tel.: 0364-2537470/427, Fax: 03642537486

Detailed Report of Grid Disturbance in Dharmanagar of Tripura and Dullavcherra of Assam

{To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f))
(**आई ई जी सी** 37.2 (**एफ**) **के अनुपालन में**)}

Date (दिनांक)**: 09-02-2024**

1. Event Summary (घटना का सारांश):

Dharmanagar area of Tripura and Dullavcherra area of Assam connected with rest of the grid through 132 kV P K Bari (TPTL) - Dharmanagar (TPTL) – Dullavcherra(AEGCL)- Hailakandi (AEGCL) link.

Prior to the event, 132 kV Dullavcherra(AEGCL)- Hailakandi (AEGCL) line under planned S/D lead to radially feeding of the Dharmanagar and Dullavcherra from P K Bari (TPTL) substation.

At 10:25 Hrs of 02.01.2024, 132 kV P K Bari (TPTL) - Dharmanagar (TPTL) tripped which led to blackout Dharmanagar area of Tripura and Dullavcherra area of Assam.

2. Time and Date of the Event (घटना का स मय और दिनांक): 10:25 Hrs on 02-01-2024

3. Event Category (ग्रिड **घटना का प्रकार**)**:** GD-I

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र**)**: Dharmanagar and Dullavcherra area

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation(MW)	Regional Demand(MW)	State Generation(MW)	State Demand(MW)
Pre-Event (घटना पूर्व)	50.01	2117	1941	146	186
Post Event (घटना के बाद)	50.01	2115	1923	146	160

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

Important Transmission Line/Unit if under outage (before the even))महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो बंद है(	132 kV Dullavcherra(AEGCL)- Hailakandi (AEGCL) line under planned S/D
Weather Condition (मौसम स्थिति)	Normal

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 14 MW

7. **Duration of interruption (रुकावट की अवधि): 36** min

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

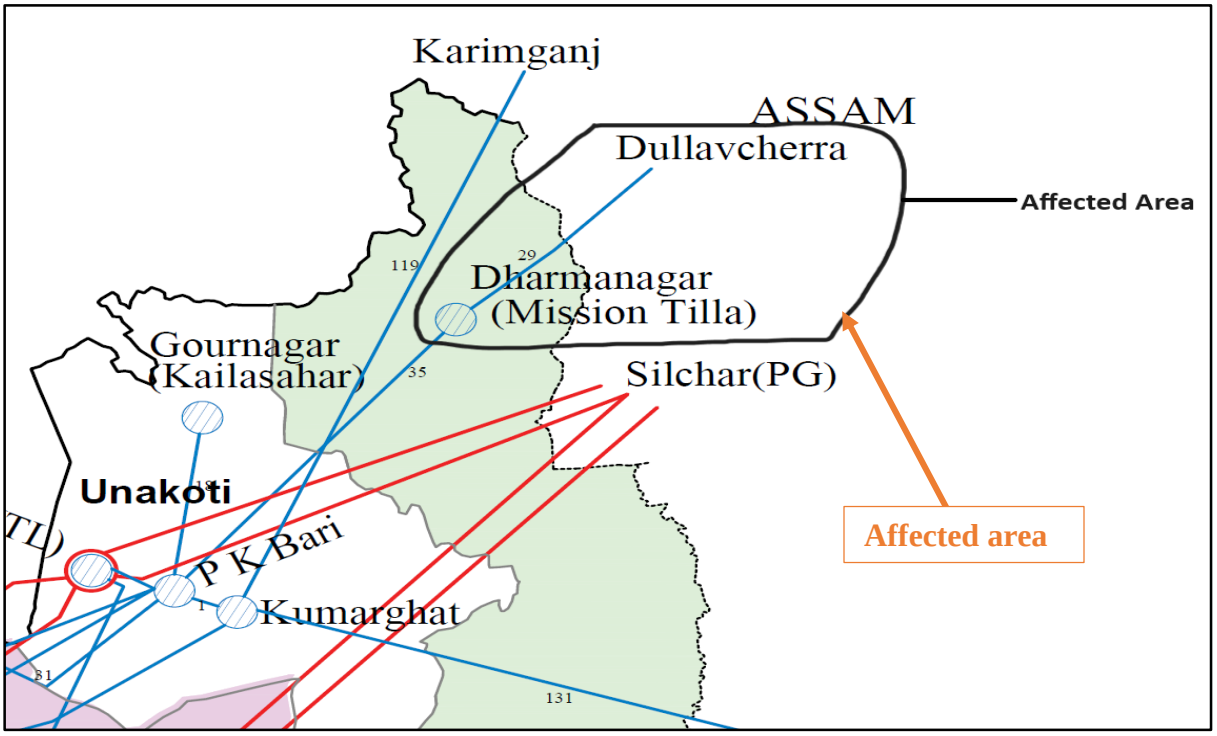


Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग):

Sl. No.	नाम	Trip time (hh:mm:ss)	Restoration time	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत
1	132 kV PK Bari -Dharmanagar	10:25	10:44	DP, ZI, Y-B,FD: 13 km	No Tripping
2	132 kV Dharmanagar- Dullavchera	No tripping	11:01	Line was radially fed via 132 kV PK Bari –Dharmanagar	

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

As per the PMU signature of PK Bari end for 400 kV Silchar – P K Bari(ISTS) line, fault initiated at 10:24:46.520 Hrs and cleared at 10:24:46.600 Hrs. Fault current of 190 A appears in R phase and 135 A appears in B-phase. Total fault clearance time around 80 msecs.

As per DR analysis of P K Bari end, Y-B fault with fault current 6 kA in Y, B phases cleared on operation of Z-I in 58 msecs.

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

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

Power was extended to 132 kV Dharmanagar S/S by charging 132 kV PK Bari -Dharmanagar at 10:44 Hrs and Dullavchera S/S by charging 132 kV Dharmanagar- Dullavchera at 11:01 Hrs of 02-01-2024.

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

Sl.No.	Issues	Regulation Non-Compliance	Utilities
1.	**Flash Report received within 8 hrs?**	IEGC section 37.2 (b)	-
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	TPTL/TSECL
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	TPTL/TSECL

4.	**DR Time Synchronization Issues**	IEGC section 17.3	-
5.	**Any other non-compliance**		-

15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

Periodic checking of clearances viz phase to phase, jumper clearance, E/W to phase conductor etc needs to be done to prevent such events.

Necessary Annexures:

Annexure 1: Sequence of Events as per SCADA

Alarm Viewer

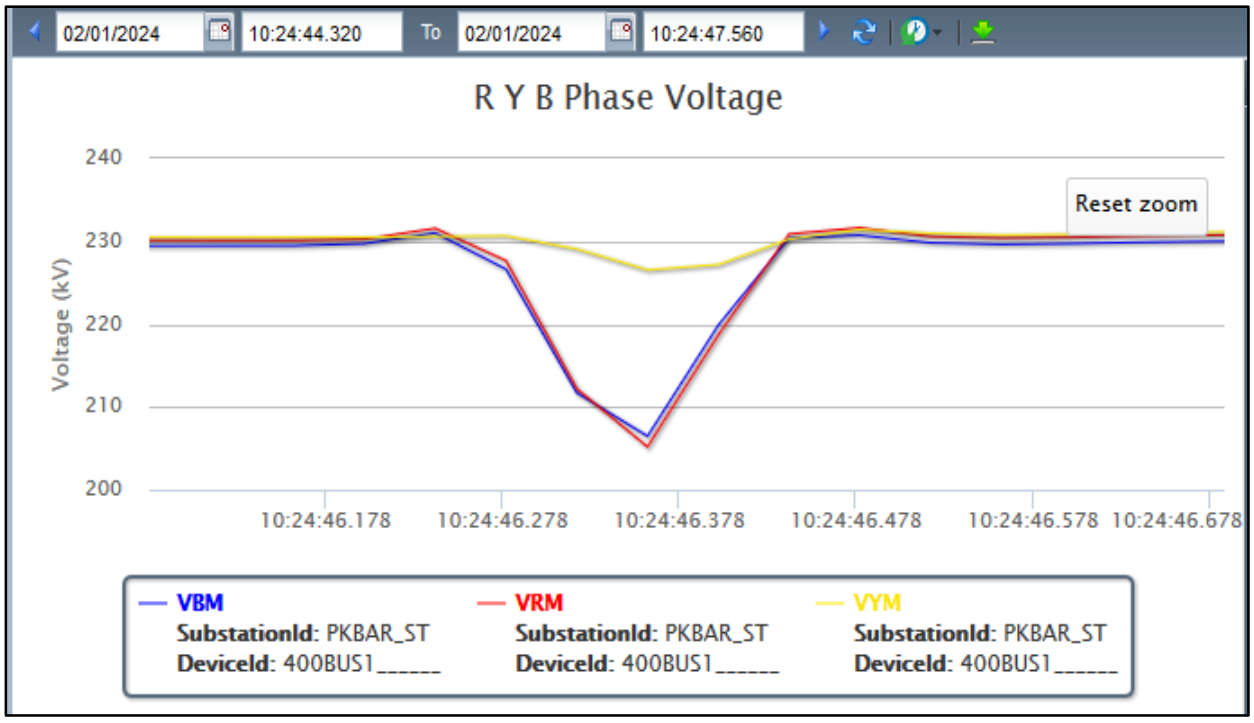
Data Source:

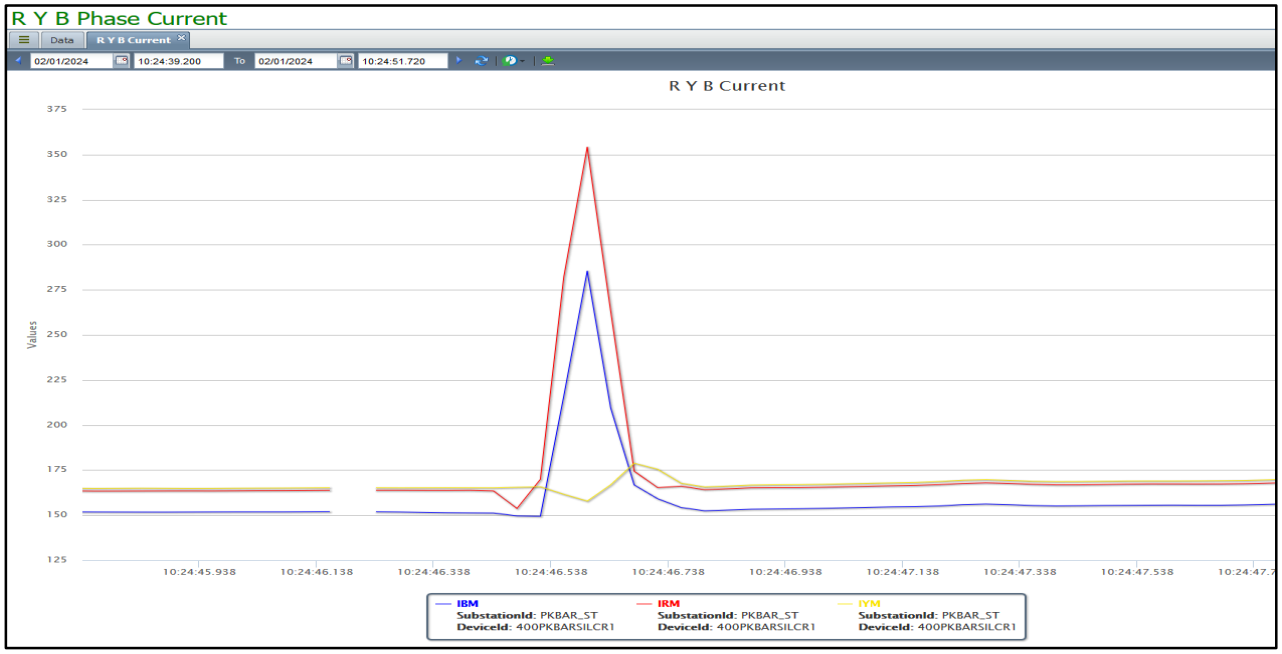
Time Range: 01/02/2024 10:07:33 - 01/02/2024 12:10:55

Category Filter: (AND) 1C

Event-Time	Text	Priority	Location
01/02/2024 10:25:02	PKBARI CB 132Kv LINE-1 TO DHARM OPEN	1	PKBAR_TE
01/02/2024 10:24:01	PAILAPOOL CB 132 KV COUPLER (01) OPEN	1	PAILA_AS
01/02/2024 10:20:59	DIPHU CB 132/33 T1 (SEC) BETWEEN	1	DIPHU_AS
01/02/2024 10:19:59	DIPHU CB 132Kv LINE TO LANKA CLOSED	1	DIPHU_AS
01/02/2024 10:19:22	LANKA (S.NAGAR) CB 132Kv LINE TO DIPHU CLOSED	1	LANKA_AS
01/02/2024 10:19:06	DIPHU CB 132/33 T1 (SEC) OPEN	1	DIPHU_AS
01/02/2024 10:18:28	PAILAPOOL CB 132 KV COUPLER (01) CLOSED	1	PAILA_AS
01/02/2024 10:17:56	NAMSAI CB REACTOR D_R1_BR CB CLOSED	1	NAMSA_PG
01/02/2024 10:17:56	NAMSAI CB 132 KV COUPLER (05) CLOSED	1	NAMSA_PG
01/02/2024 10:13:44	BALIPARA CB CB BW KAMNG 1 & BONGA 4 CLOSED	1	BALIP_PG
01/02/2024 10:12:32	BALIPARA CB MN CB BONGA LINE 4 CLOSED	1	BALIP_PG
01/02/2024 10:12:30	BONGAIGAON CB MN CB 400 KV BALIP 4 CLOSED	1	BONGA_PG
01/02/2024 10:12:03	BONGAIGAON CB CB BW ALIPU 2 & BALIP 4 CLOSED	1	BONGA_PG
01/02/2024 10:08:02	DIPHU CB 132Kv LINE TO LANKA OPEN	1	DIPHU_AS
01/02/2024 10:08:02	AGIA CB 220Kv LINE-1 TO BONGA OPEN	1	AGIA_AS
01/02/2024 10:07:34	HAILAKANDI CB 132Kv LINE TO DULLA OPEN	1	HAILA_AS
01/02/2024 10:07:34	BONGAIGAON CB 220Kv LINE-1 TO AGIA_OPEN	1	BONGA_AS

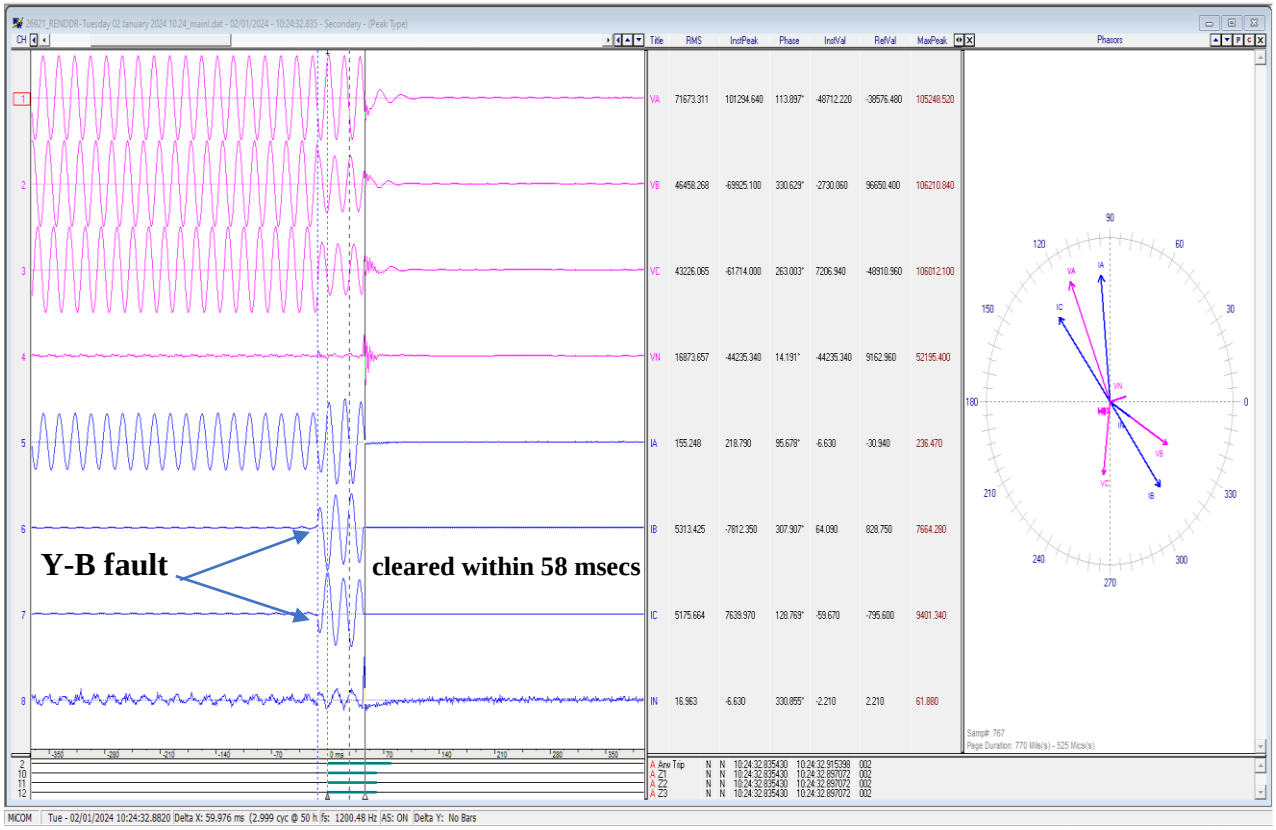
Annexure 2: PMU snapshot 132 kV P K Bari (ISTS) Bus





Annexure 3: Disturbance recorder snips showing faults and digital signals

DR Snapshot of P K Bari end for 132 kV PK Bari -Dharmanagar line



**********The End**********

ग्रिड-इंडिया GRID-INDIA
ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
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Detailed Report of Grid Incidance due to outage of 220 kV Bus I at Kopili (NEEPCO)

{To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f))

(**आई ई जी सी** 37.2 (**एफ**) **के अनुपालन में**)}

Date (दिनांक)**: 09-02-2024**

1. **Event Summary (घटना का सारांश):**

   Before the event, 220 kV Kopili-Misa 2 Line, Kopili Unit 2,3,4 & 220/132 kV 160 MVA ICT 1 are connected in 220 kV Bus I and 220 kV Kopili-Misa 3 Line & 220/132 kV 160 MVA ICT 2 are connected in 220 kV Bus II.

   At 16:59 hrs of 02-01-2024, Bus Bar protection operated at Kopili Bus I and all the connected lines to Bus I as well as Bus Coupler tripped leads to the Grid Event at Kopili.

2. **Time and Date of the Event (घटना का स मय और दिनांक):** 16:59 Hrs on 02-01-2024
3. **Event Category** (ग्रिड **घटना का प्रकार**)**:** GI II
4. **Location/Control Area (**स्थान/नियंत्रण क्षेत्र**)**: 220 kV Bus I at Kopili
5. **Antecedent Conditions (पूर्ववर्ती स्थिति)**:

	Frequency in Hz	Regional Generation(MW)	Regional Demand(MW)	Kopili Generation(MW)
Pre-Event (घटना पूर्व)	50.02	3053	2376	115
Post Event (घटना के बाद)	49.99	2997	2419	0

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

Important Transmission Line/Unit if under outage (before the even))महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो बंद है(	220 kV Misa- Kopili I under C/S/D 07:00 Hrs of 02-01-2024 to 15:00 Hrs of 12-01-2024
Weather Condition (मौसम स्थिति)	Normal

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Generation loss of 115 MW

7. **Duration of interruption (रुकावट की अवधि): 49** min

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

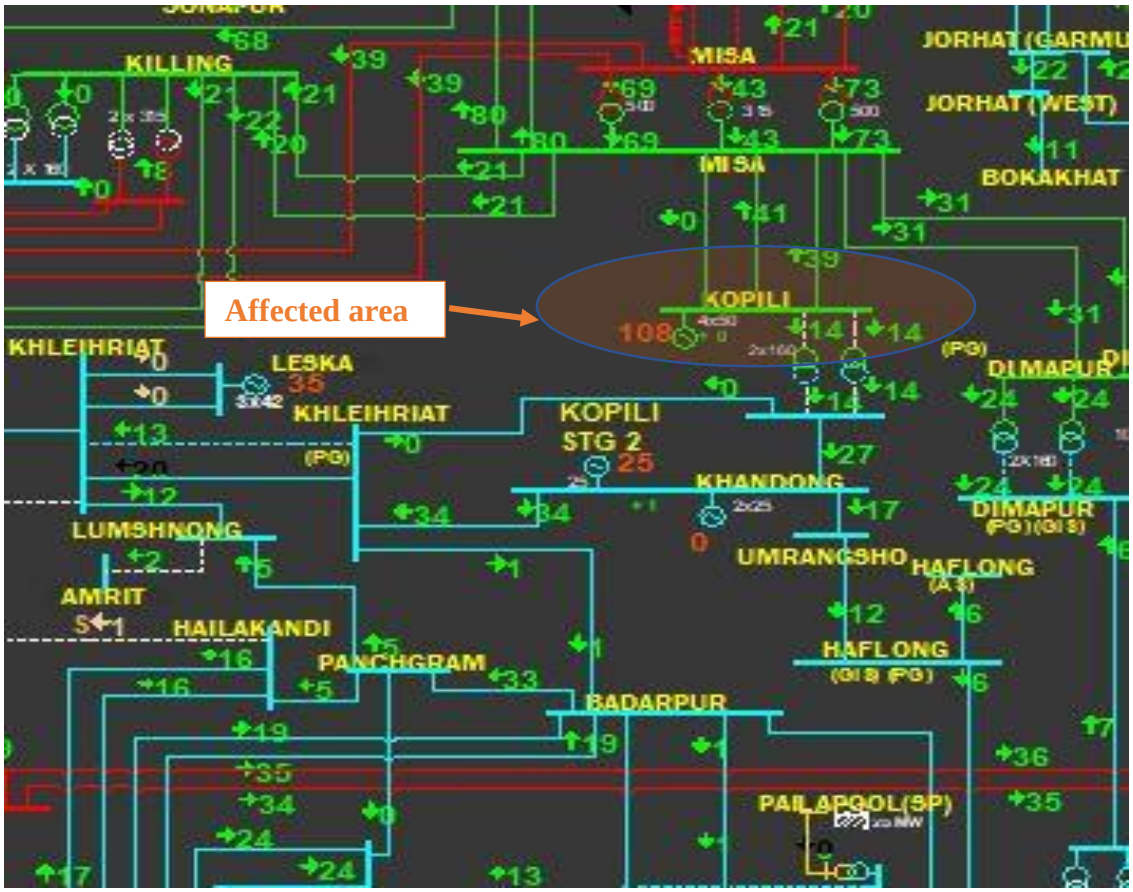


Figure 1: Network across the affected area

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

10. **Major Elements Tripped (प्रमुख ट्रिपिंग):**

Sl. No.	Transmission/Generation element name	Tripped Time	Restoration time	Relay Indication End A	Relay Indication End B
1	Kopili Unit -2	16:59	17:46	BB Protection Operated	-

2	Kopili Unit -3	16:59	17:35	BB Protection Operated	-
3	Kopili Unit -4	16:59	17:48	BB Protection Operated	-
4	220 kV Kopili-Misa 2	16:59	17:38	BB Protection Operated	DT received
5	220/132 kV 160 MVA ICT 1 at Kopili	16:59	18:36	BB Protection Operated	-
6	220 kV Bus Coupler	16:59	17:41	BB Protection Operated	-

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

PMU/DR analysis suggest there was no fault in the system and the Bus I tripped due to maloperation of the Bus Bar Relay.

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

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

Power was extended to Bus I by charging 220 kV Kopili-Misa 2 at 17:38 Hrs after the event.

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

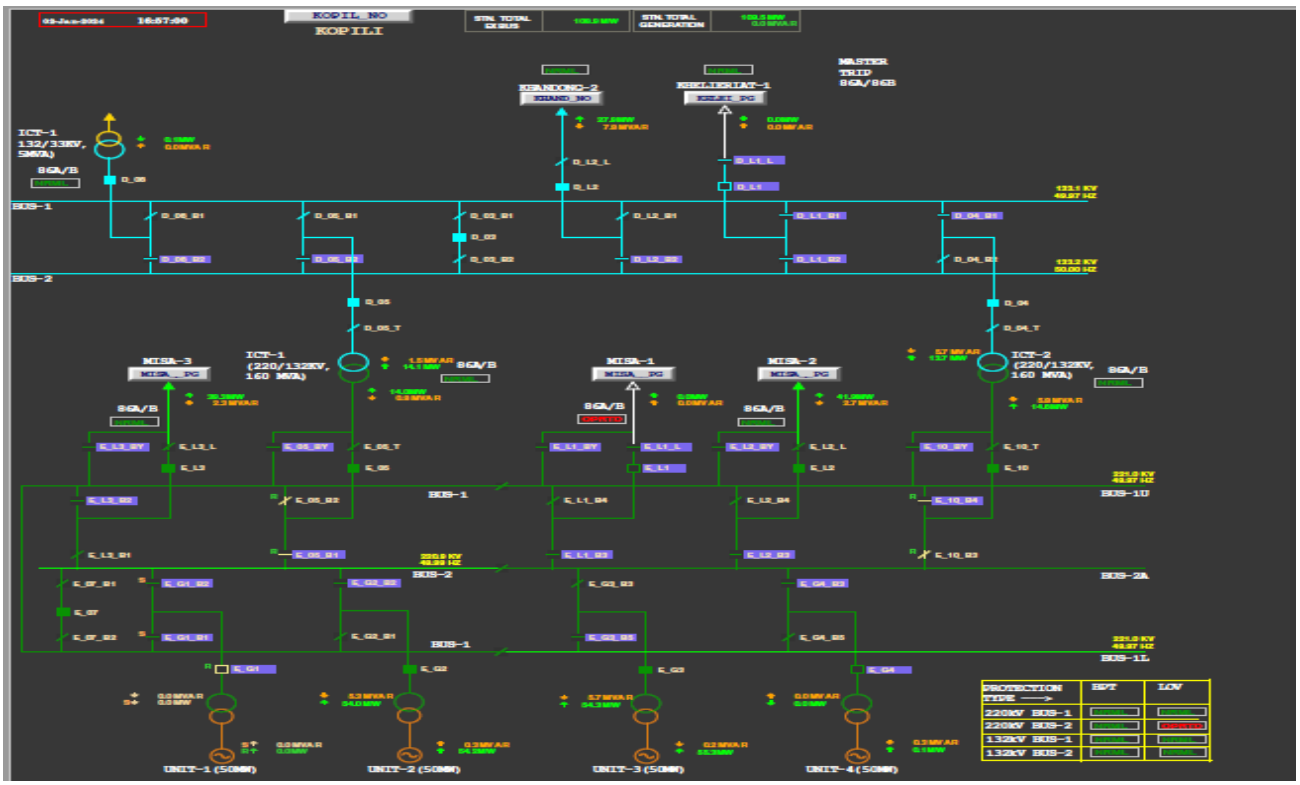
Sl.No.	Issues	Regulation Non-Compliance	Utilities
1.	**Flash Report received within 8 hrs?**	IEGC section 37.2 (b)	NEEPCO
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	NEEPCO
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	NEEPCO
4.	**DR Time Synchronization Issues**	IEGC section 17.3	-
5.	**Any other non-compliance**		-

15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

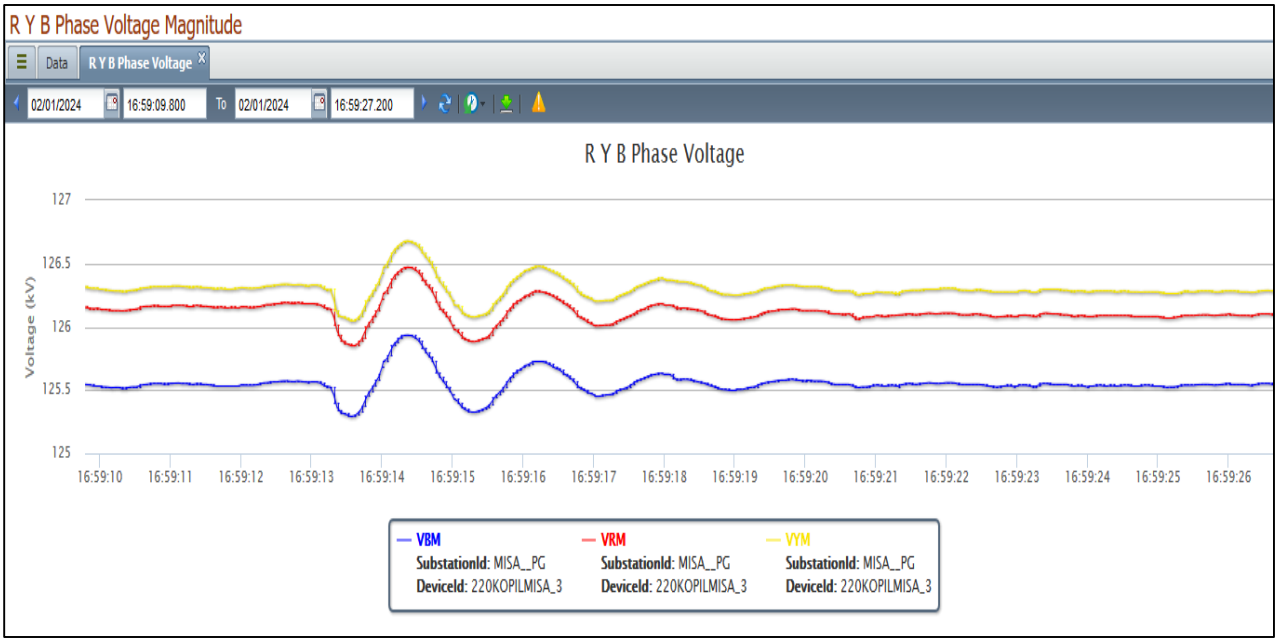
Periodic checking and ensuring the healthiness of the protection system.

Necessary Annexures:

Annexure 1: SLD of Kopili (HEP)

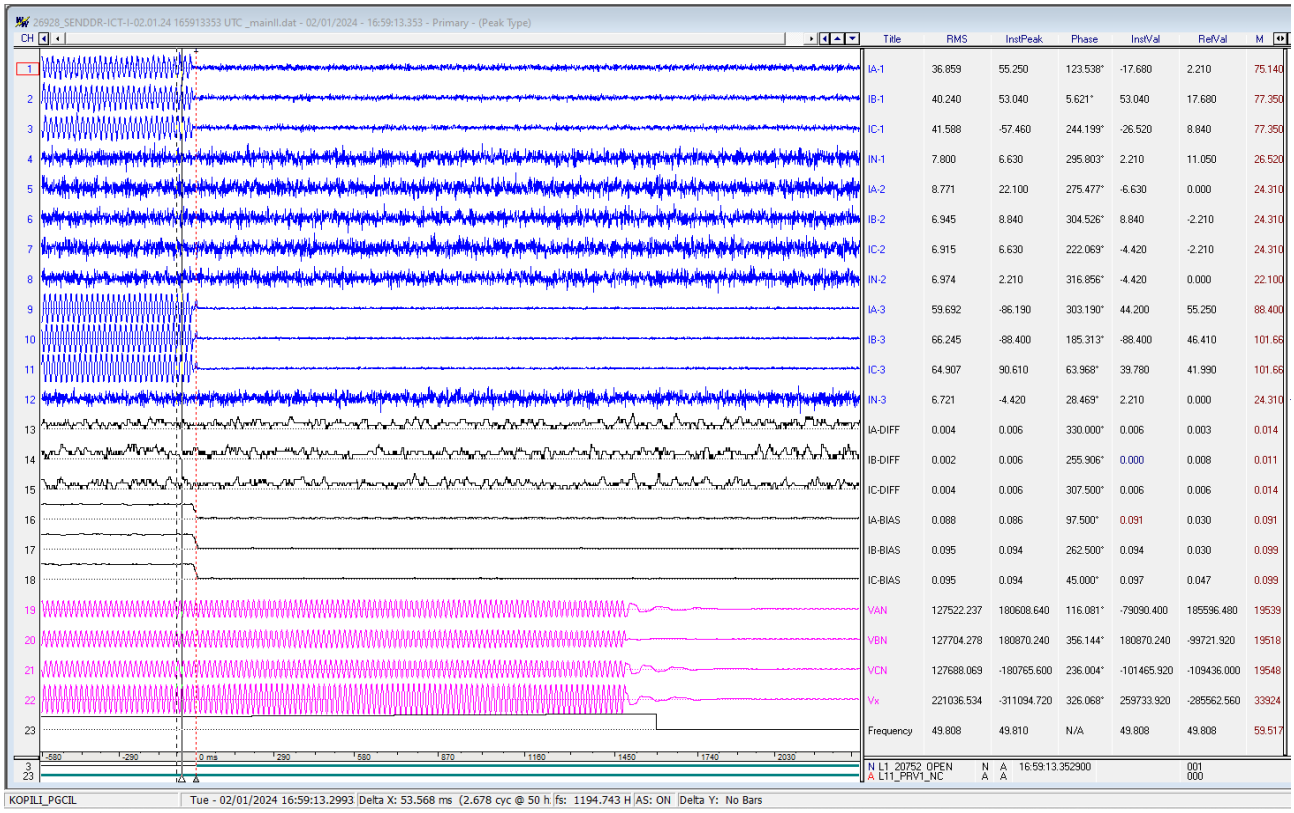


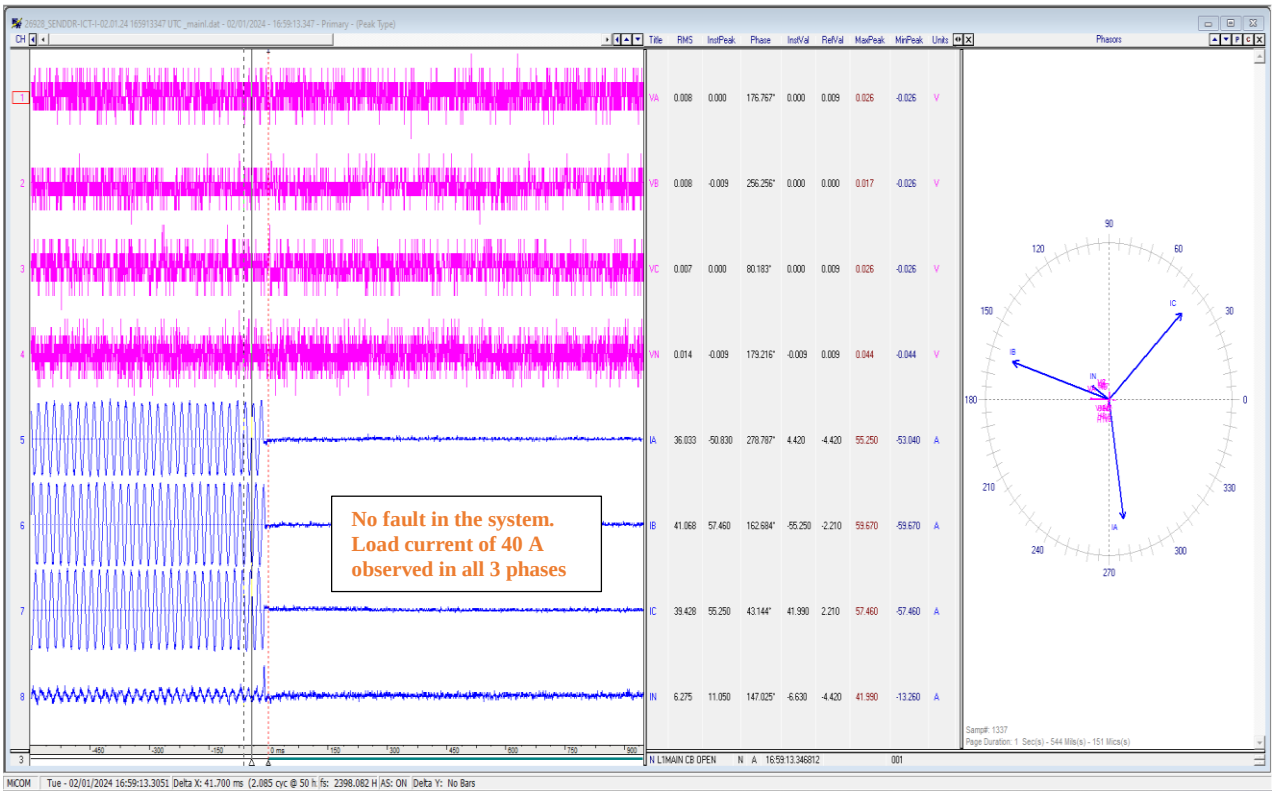
Annexure 2: PMU snapshot Kopili Bus



Annexure 4: Disturbance recorder snips showing faults and digital signals

DR Snapshot of 160 MVA, 220/132 kV ICT 1 at Kopili




No fault in the system.
Load current of 40 A
observed in all 3 phases
Phasors

**********The End**********

ग्रिड-इंडिया GRID-INDIA
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Detailed Report of Grid Incidance due to outage of 220 kV Bus I at Kopili (NEEPCO)

{To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f))

(**आई ई जी सी** 37.2 (**एफ**) **के अनुपालन में**)}

Date (दिनांक)**: 09-02-2024**

1. **Event Summary (घटना का सारांश):**

   Before the event, 220 kV Kopili-Misa 2 Line, Kopili Unit 2,3,4 are connected in 220 kV Bus I (220/132 kV 160 MVA ICT 1 tripped at 16:59 Hrs) and 220 kV Kopili-Misa 3 Line & 220/132 kV 160 MVA ICT 2 are connected in 220 kV Bus II.

   At 17:50 hrs of 02-01-2024, Bus Bar protection operated at Kopili Bus I and all the connected lines to Bus I as well as Bus Coupler tripped leads to the Grid Event at Kopili.

2. **Time and Date of the Event (घटना का स मय और दिनांक):** 17:50 Hrs on 02-01-2024
3. **Event Category** (ग्रिड **घटना का प्रकार**)**:** GI II
4. **Location/Control Area (**स्थान/नियंत्रण क्षेत्र**)**: 220 kV Bus I at Kopili
5. **Antecedent Conditions (पूर्ववर्ती स्थिति)**:

	Frequency in Hz	Regional Generation(MW)	Regional Demand(MW)	Kopili Generation(MW)
Pre-Event (घटना पूर्व)	50.02	3381	2606	109
Post Event (घटना के बाद)	49.99	3287	2611	0

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

Important Transmission Line/Unit if under outage (before the even))महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो बंद है(	220 kV Misa- Kopili I under C/S/D 07:00 Hrs of 02-01-2024 to 15:00 Hrs of 12-01-2024
Weather Condition (मौसम स्थिति)	Normal

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Generation loss of 109 MW

7. **Duration of interruption (रुकावट की अवधि): 36** min

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

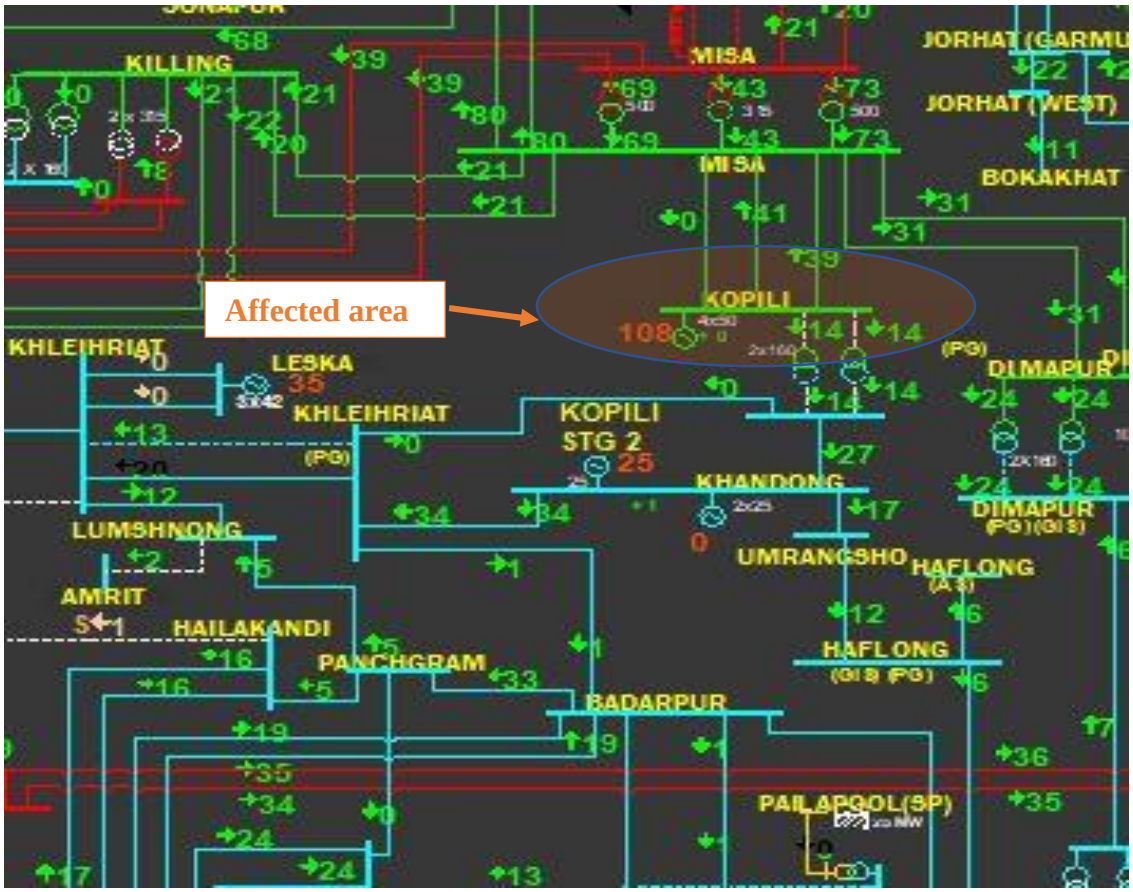


Figure 1: Network across the affected area

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

10. **Major Elements Tripped (प्रमुख ट्रिपिंग):**

Sl. No.	Transmission/Generation element name	Tripped Time	Restoration time	Relay Indication End A	Relay Indication End B
1	220/132 kV 160 MVA ICT 1 at Kopili	16:59	18:36	BB Protection Operated	220/132 kV 160 MVA ICT 1 at Kopili

2	220 kV Bus Coupler	**17:50**	18:26	BB Protection Operated	-
3	Kopili Unit -2	**17:50**	18:38	BB Protection Operated	-
4	Kopili Unit -3	**17:50**	18:26	BB Protection Operated	-
5	Kopili Unit -4	**17:50**	E/S/D availed	BB Protection Operated	-
6	220 kV Kopili-Misa 2	**17:50**	18:33	BB Protection Operated	DT received

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

PMU/DR analysis suggest there was no fault in the system and the Bus I tripped due to maloperation of the Bus Bar Relay.

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

NIL

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

Power was extended to Bus I by charging Bus Coupler at 18:26 Hrs. NEEPCO has taken ESD of Unit 4 upto 24:00 Hrs of 02-01-2024.

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

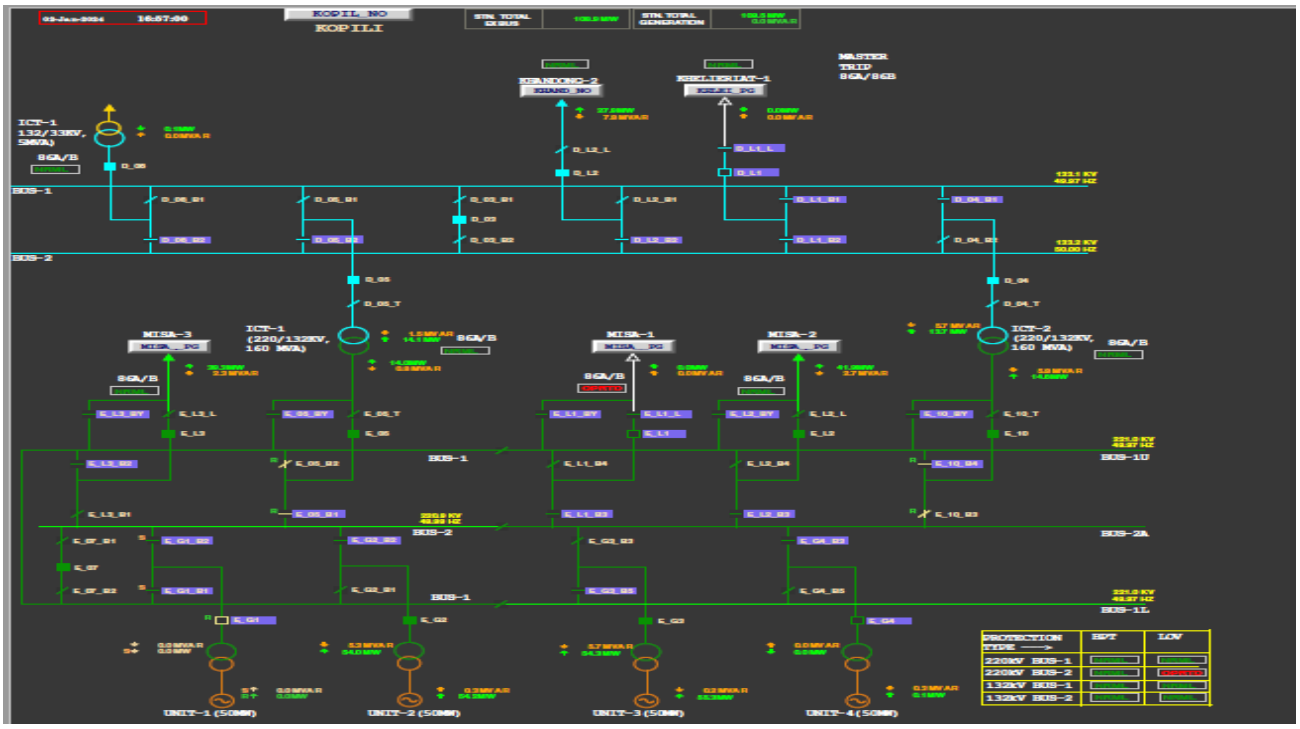
Sl.No.	Issues	Regulation Non-Compliance	Utilities
1.	**Flash Report received within 8 hrs?**	IEGC section 37.2 (b)	NEEPCO
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	NEEPCO
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	NEEPCO
4.	**DR Time Synchronization Issues**	IEGC section 17.3	-
5.	**Any other non-compliance**		-

15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

Periodic checking and ensuring the healthiness of the protection system.

Necessary Annexures:

Annexure 1: SLD of Kopili (HEP)



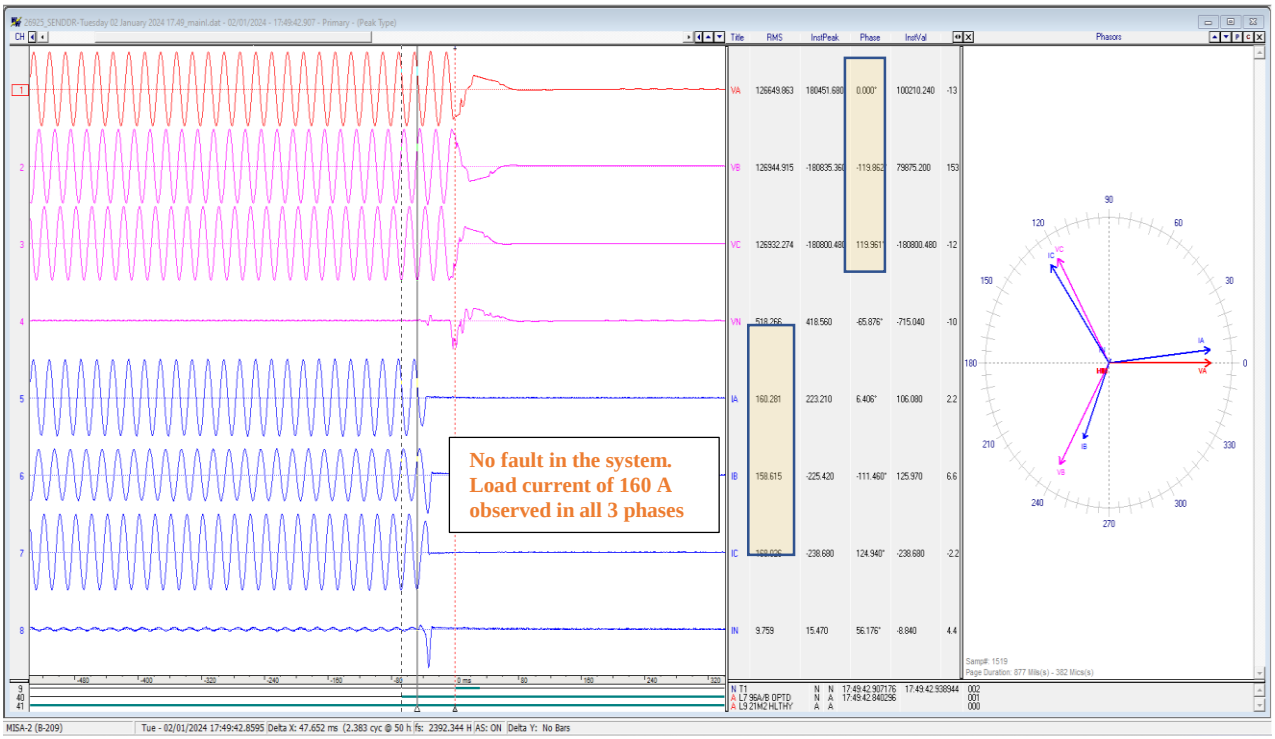
Annexure 2: Sequence of Events

Event-Time	Field-Time	Text	Priority	Location	Category	Exception
02/01/2024 18:38:46	02/01/2024 18:38:44.330	KOPILI CB 220/132 T1 (PRIM) CLOSED	1	KOPIL_NO	1C	S002
02/01/2024 18:34:28	02/01/2024 18:34:26.790	KOPILI CB 11 KV UNIT (H02) CLOSED	1	KOPIL_NO	1C	S002
02/01/2024 18:33:26	02/01/2024 18:33:25.590	KOPILI CB 220Kv LINE-2 TO MISA_ CLOSED	1	KOPIL_NO	1C	S002
02/01/2024 18:28:42	02/01/2024 18:28:41.070	KOPILI CB 11 KV UNIT (H03) CLOSED	1	KOPIL_NO	1C	S002
02/01/2024 18:26:19	02/01/2024 18:26:18.390	KOPILI CB 220 KV COUPLER (07) CLOSED	1	KOPIL_NO	1C	S002
02/01/2024 17:49:46	02/01/2024 17:49:44.609	KOPILI CB 11 KV UNIT (H04) OPEN	1	KOPIL_NO	1C	S024
02/01/2024 17:49:46	02/01/2024 17:49:44.670	KOPILI CB 11 KV UNIT (H02) OPEN	1	KOPIL_NO	1C	S024
02/01/2024 17:49:44	02/01/2024 17:49:43.110	KOPILI CB 220Kv LINE-2 TO MISA_ OPEN	1	KOPIL_NO	1C	S024
02/01/2024 17:49:44	02/01/2024 17:49:42.970	KOPILI CB 11 KV UNIT (H03) OPEN	1	KOPIL_NO	1C	S024
02/01/2024 17:49:44	02/01/2024 17:49:43.030	KOPILI CB 220 KV COUPLER (07) OPEN	1	KOPIL_NO	1C	S024
02/01/2024 17:48:17	02/01/2024 17:48:14.670	KOPILI CB 11 KV UNIT (H04) CLOSED	1	KOPIL_NO	1C	S002
02/01/2024 17:46:23	02/01/2024 17:46:21.730	KOPILI CB 11 KV UNIT (H02) CLOSED	1	KOPIL_NO	1C	S002
02/01/2024 17:41:17	02/01/2024 17:41:15.461	KOPILI CB 220/132 T1 (PRIM) OPEN	1	KOPIL_NO	1C	S024
02/01/2024 17:41:03	02/01/2024 17:41:02.710	KOPILI CB 220 KV COUPLER (07) CLOSED	1	KOPIL_NO	1C	S002
02/01/2024 17:38:54	02/01/2024 17:38:53.970	KOPILI CB 220Kv LINE-2 TO MISA_ CLOSED	1	KOPIL_NO	1C	S002
02/01/2024 17:35:47	02/01/2024 17:35:47.201	KOPILI CB 220/132 T2 (PRIM) CLOSED	1	KOPIL_NO	1C	S002
02/01/2024 17:35:16	02/01/2024 17:35:14.630	KOPILI CB 11 KV UNIT (H03) CLOSED	1	KOPIL_NO	1C	S002

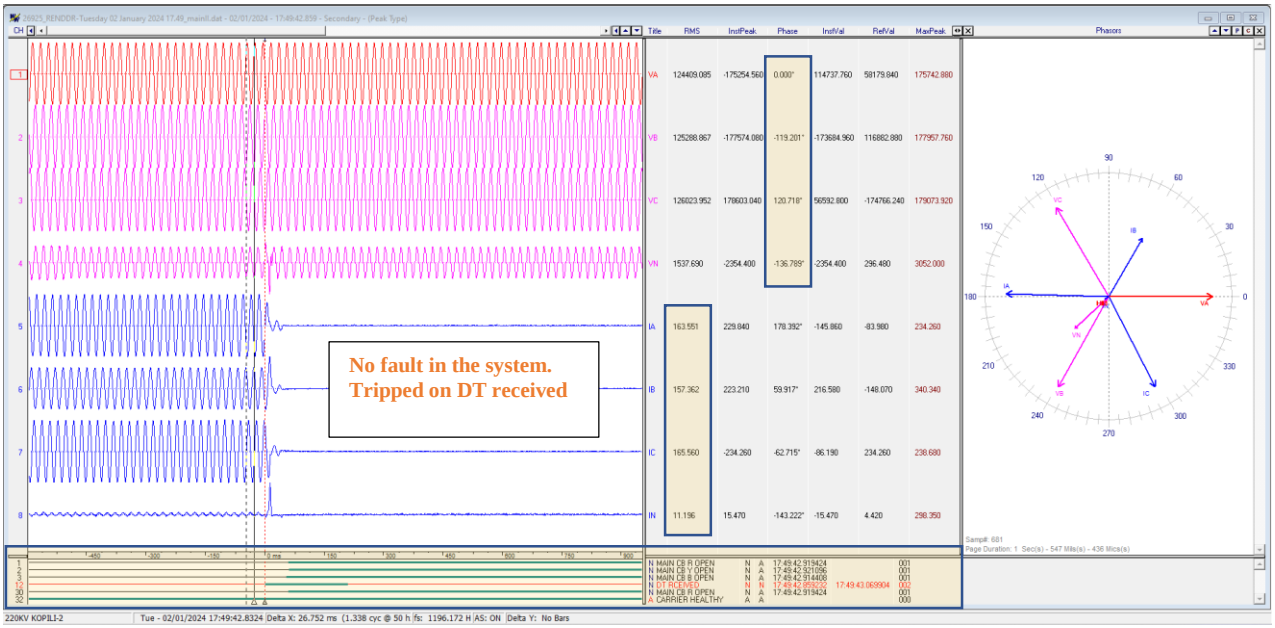
Annexure 3: PMU snapshot Kopili Bus

Annexure 4: Disturbance recorder snips showing faults and digital signals

DR Snapshot of Kopili end for 220 kV Misa – Kopili II Line



DR Snapshot of Misa end for 220 kV Misa – Kopili II Line



**********The End**********

ग्रिड-इंडिया GRID-INDIA
ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
GRID CONTROLLER OF INDIA LIMITED
(A Government of India Enterprise)
[formerly Power System Operation Corporation Limited (POSOCO)]
उत्तर पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / North Eastern Regional Load Despatch Centre
कार्यालय : लोवर, लापालांग, शिलांग -793006
Office : Lower Nongrah, Lapalang, Shillong- 793006
CIN : U40105DL2009GOI188682, Website : www.nerldc.in, E-mail : nerldc@grid-india.in, Tel.: 0364-2537470/427, Fax: 03642537486

Detailed Report of Grid Incidance due to outage of 220 kV Bus I at Kopili (NEEPCO)

{To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f))

(**आई ई जी सी** 37.2 (**एफ**) **के अनुपालन में**)}

Date (दिनांक)**: 09-02-2024**

1. **Event Summary (घटना का सारांश):**

   Before the event, **220 kV Kopili-Misa 2 Line, Kopili Unit 2, Bus Coupler and 220/132 kV 160 MVA ICT 1 are under tripped outage condition due to tripping of the 220 kV Bus I at 16:59 Hrs.**

   220 kV Kopili-Misa 3 Line, Kopili Unit 3,4 & 220/132 kV 160 MVA ICT 2 are connected in 220 kV Bus II.

   At 17:24 hrs of 03-01-2024, Bus Bar protection operated at Kopili Bus II and all the connected lines to Bus II as well as Bus Coupler tripped leads to the Grid Event at Kopili.

2. **Time and Date of the Event (घटना का स मय और दिनांक):** 17:24 Hrs on 03-01-2024
3. **Event Category** (ग्रिड **घटना का प्रकार**)**:** GD I
4. **Location/Control Area (**स्थान/नियंत्रण क्षेत्र**)**: **220 kV Bus II at Kopili**
5. **Antecedent Conditions (पूर्ववर्ती स्थिति)**:

	Frequency in Hz	Regional Generation(MW)	Regional Demand(MW)	Kopili Generation(MW)
Pre-Event (घटना पूर्व)	49.95	3150	2713	74 (Unit: 3,4)
Post Event (घटना के बाद)	49.93	3097	2712	0

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

Important Transmission Line/Unit if under outage (before the even)	220 kV Misa- Kopili I under C/S/D 07:00 Hrs of 02-01-2024 to 15:00 Hrs of 12-01-2024.

)महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो बंद है(	**220 kV Kopili-Misa 2 Line, Kopili Unit 2, Bus Coupler and 220/132 kV 160 MVA ICT 1 are under tripped outage condition due to tripping of the 220 kV Bus I at 16:59 Hrs.**
Weather Condition (मौसम स्थिति)	Normal

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Generation loss of 74 MW
7. **Duration of interruption (रुकावट की अवधि): 41 Minutes**
8. **Network across the affected area (प्रभावित क्षेत्र का नक्शा):**

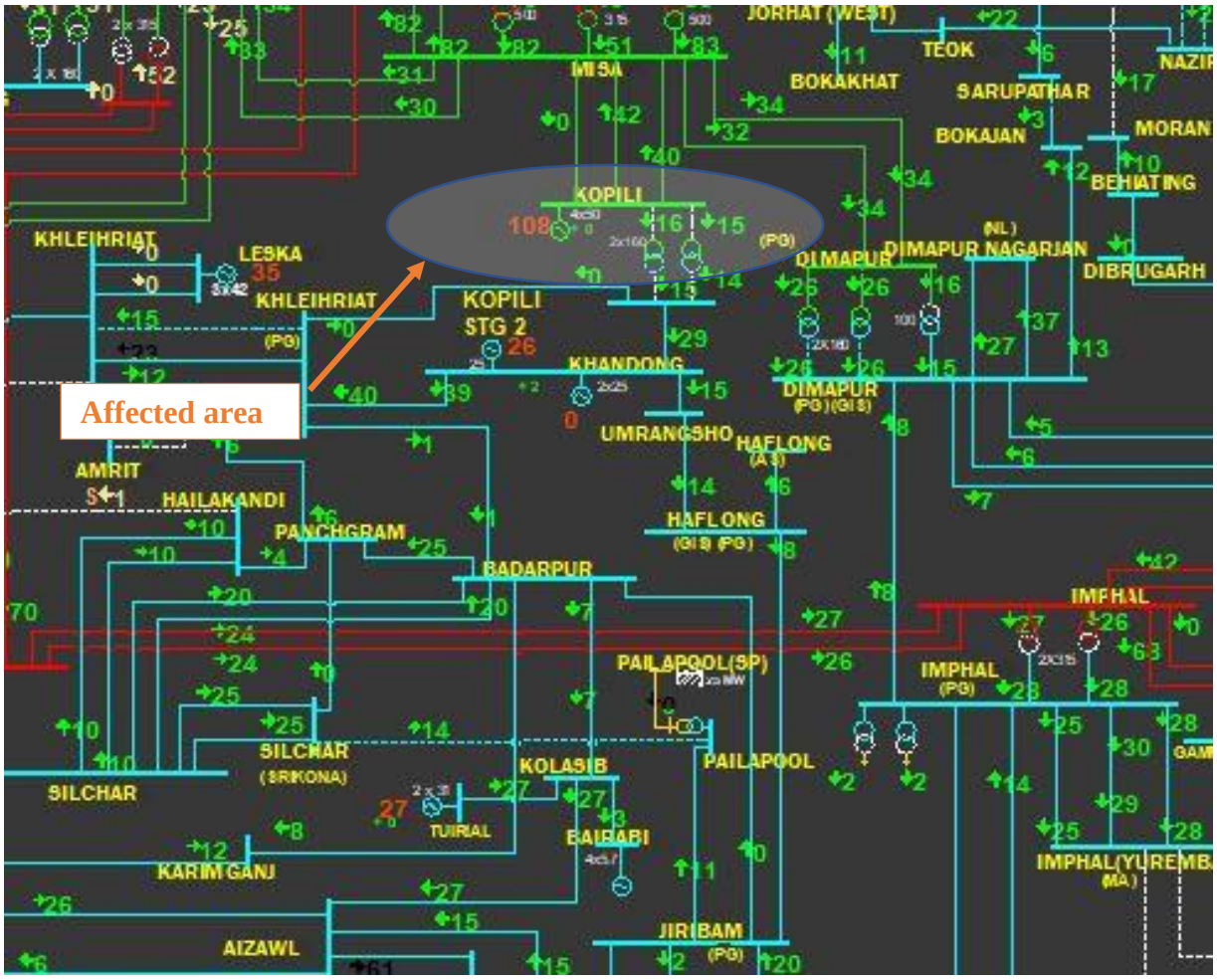


Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग):

Sl. No.	Transmission/Generation element name	Tripped Time	Restoration time	Relay Indication End A	Relay Indication End B
1	220 kV Kopili-Misa 2	16:59	**18:05**	BB Protection Operated	DT received
2	220/132 kV 160 MVA ICT 1 at Kopili	16:59	18:19	BB Protection Operated	-
3	220 kV Bus Coupler	16:59	18:14	BB Protection Operated	-
4	220/132 kV 160 MVA ICT 2 at Kopili	**17:24**	18:21	BB Protection Operated	
5	Kopili Unit -3	**17:24**	19:34	BB Protection Operated	-
6	Kopili Unit -4	**17:24**	-	BB Protection Operated	-
7	220 kV Kopili-Misa 3	**17:24**	18:07	BB Protection Operated	DT received

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

PMU/DR analysis suggest there was no fault in the system and the Bus I tripped due to maloperation of the Bus Bar Relay.

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

Frequent Maloperation of Bus Bar Relay at 220 kV Kopili Bus I.

As per Detailed Report received from Kopili, after detailed analysis jointly done with GE engineer, protection issues in Flexlogic or configurational issues of the logic were found in Main II. The LBB operated on Backtrip as Re-trip was assigned to individual elements in the logic. High differential current was observed only in Main II which was due to faulty CT polarity configuration in Bus-Coupler logic. EPF initiated by Unit 3 led to tripping of Unit 2 and vice-versa was due to reversed wiring connection.

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

Power was extended to Bus I by charging 220 kV Kopili-Misa 2 at 18:05 Hrs.

As per Detailed Report received from Kopili , Due to the frequent tripping of Busbar protection, the Main II Busbar Multilin B90 Relay was disabled after taking due permission from NERPC/NERLDC. After preliminary identification of the fault, a detailed investigation was required for which shutdown was imperative as thorough checks were possible through simulation and capturing the DR/EL. Therefore, PSD was taken on 21st and 23rd and ESD was taken on 24th, 25th and 26th 2024 and all the anomalies in the configuration were resolved one by one.

All the observed faulty conditions in wiring and configuration of logics were rectified and the system has been on service since **26.01.2024.**

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

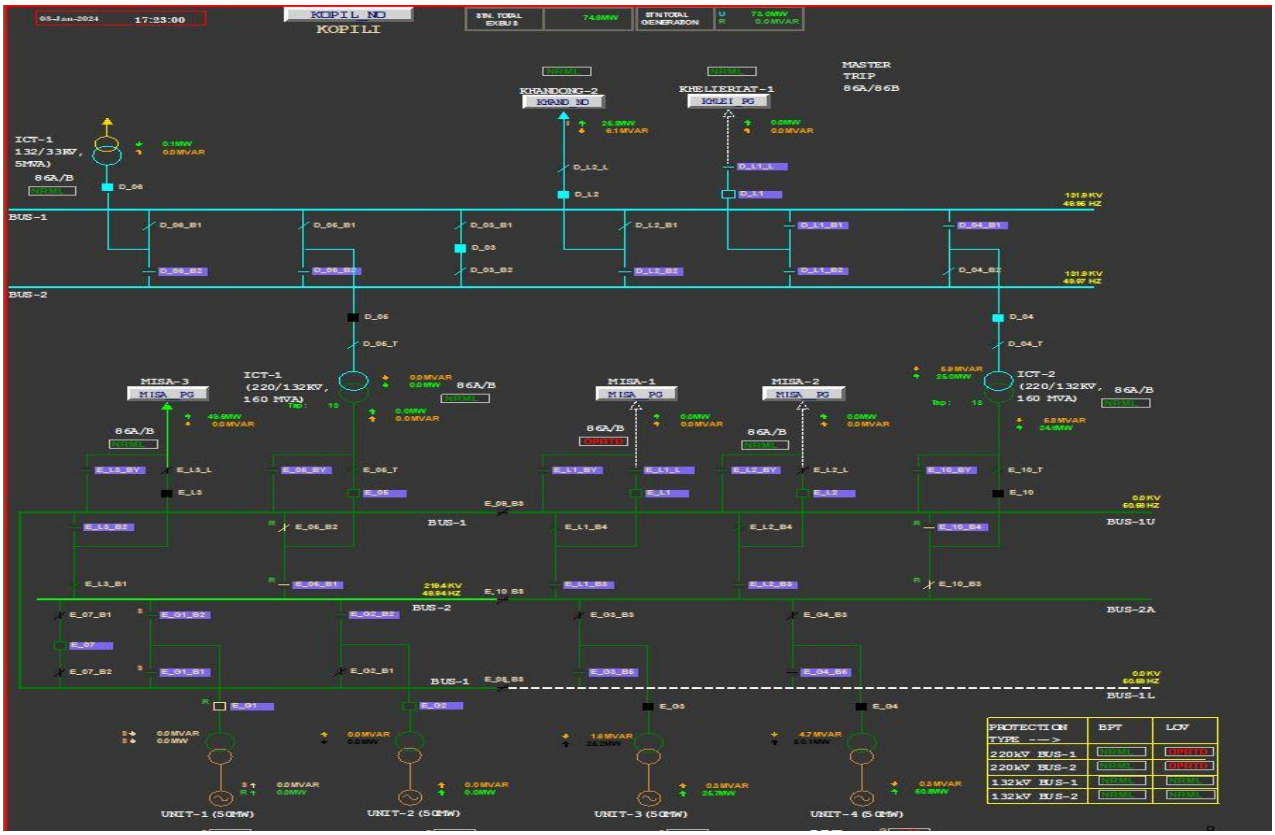
Sl.No.	Issues	Regulation Non-Compliance	Utilities
1.	**Flash Report received within 8 hrs?**	IEGC section 37.2 (b)	NEEPCO
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	-
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	NEEPCO
4.	**DR Time Synchronization Issues**	IEGC section 17.3	-
5.	**Any other non-compliance**		-

15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

Periodic checking and ensuring the healthiness of the protection system and associated wiring and configuration of logics.

Necessary Annexures:

Annexure 1: SLD of Kopili (HEP) before the event



Annexure 2: Sequence of Events

03/01/2024 18:45:38	03/01/2024 18:45:37.862	KOPILI CB 11 KV UNIT (H02) CLOSED	1	KOPIL_NO	1C	S002
03/01/2024 18:22:08	03/01/2024 18:22:07.490	KOPILI CB 220/132 T2 (SEC) CLOSED	1	KOPIL_NO	1C	S002
03/01/2024 18:21:06	03/01/2024 18:21:04.770	KOPILI CB 220/132 T2 (PRIM) CLOSED	1	KOPIL_NO	1C	S002
03/01/2024 18:19:59	03/01/2024 18:19:58.190	KOPILI CB 220/132 T1 (PRIM) CLOSED	1	KOPIL_NO	1C	S002
03/01/2024 18:14:13	03/01/2024 18:14:10.970	KOPILI CB 220 KV COUPLER (07) CLOSED	1	KOPIL_NO	1C	S002
03/01/2024 18:07:49	03/01/2024 18:07:46.970	KOPILI CB 220Kv LINE-3 TO MISA_ CLOSED	1	KOPIL_NO	1C	S002
03/01/2024 18:05:30	03/01/2024 18:05:28.670	KOPILI CB 220Kv LINE-2 TO MISA_ CLOSED	1	KOPIL_NO	1C	S002
03/01/2024 17:24:02	03/01/2024 17:24:00.110	KOPILI CB 11 KV UNIT (H04) OPEN	1	KOPIL_NO	1C	S024
03/01/2024 17:24:00	03/01/2024 17:23:58.570	KOPILI CB 220/132 T2 (SEC) OPEN	1	KOPIL_NO	1C	S024
03/01/2024 17:24:00	03/01/2024 17:23:58.510	KOPILI CB 220Kv LINE-3 TO MISA_ OPEN	1	KOPIL_NO	1C	S024
03/01/2024 17:24:00	03/01/2024 17:23:59.610	KOPILI CB 11 KV UNIT (H03) OPEN	1	KOPIL_NO	1C	S024
03/01/2024 17:24:00	03/01/2024 17:23:58.530	KOPILI CB 220/132 T2 (PRIM) OPEN	1	KOPIL_NO	1C	S024
03/01/2024 17:21:57	03/01/2024 17:21:56.510	KOPILI CB 11 KV UNIT (H03) CLOSED	1	KOPIL_NO	1C	S002
03/01/2024 16:59:33	03/01/2024 16:59:31.689	KOPILI CB 11 KV UNIT (H02) OPEN	1	KOPIL_NO	1C	S024
03/01/2024 16:59:31	03/01/2024 16:59:30.230	KOPILI CB 220Kv LINE-2 TO MISA_ OPEN	1	KOPIL_NO	1C	S024
03/01/2024 16:59:31	03/01/2024 16:59:30.070	KOPILI CB 11 KV UNIT (H03) OPEN	1	KOPIL_NO	1C	S024
03/01/2024 16:59:31	03/01/2024 16:59:30.170	KOPILI CB 220 KV COUPLER (07) OPEN	1	KOPIL_NO	1C	S024
03/01/2024 16:59:31	03/01/2024 16:59:30.170	KOPILI CB 220/132 T1 (PRIM) OPEN	1	KOPIL_NO	1C	S024
03/01/2024 16:55:43	03/01/2024 16:55:41.810	KOPILI CB 11 KV UNIT (H03) CLOSED	1	KOPIL_NO	1C	S002

Annexure 3: PMU snapshot Kopili Bus

**********The End**********

ग्रिड-इंडिया GRID-INDIA
ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
GRID CONTROLLER OF INDIA LIMITED
(A Government of India Enterprise)
[formerly Power System Operation Corporation Limited (POSOCO)]
उत्तर पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / North Eastern Regional Load Despatch Centre
कार्यालय : लोवर, लापालांग, शिलांग -793006
Office : Lower Nongrah, Lapalang, Shillong- 793006
CIN : U40105DL2009GOI188682, Website : www.nerldc.in, E-mail : nerldc@grid-india.in, Tel.: 0364-2537470/427, Fax: 03642537486

Detailed Report of Grid Incidance due to outage of 220 kV Bus I at Kopili (NEEPCO)

{To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f))
(**आई ई जी सी** 37.2 (**एफ**) **के अनुपालन में**)}

Date (दिनांक)**: 09-02-2024**

1. **Event Summary (घटना का सारांश):**

   Before the event, 220 kV Kopili-Misa 2 Line, Kopili Unit 2,3 & 220/132 kV 160 MVA ICT 1 are connected in 220 kV Bus I and 220 kV Kopili-Misa 3 Line, Kopili Unit 4 & 220/132 kV 160 MVA ICT 2 are connected in 220 kV Bus II.

   At 17:04 hrs of 05-01-2024, Bus Bar protection operated at Kopili Bus I and all the connected lines to Bus I as well as Bus Coupler tripped leads to the Grid Event at Kopili.

2. **Time and Date of the Event (घटना का स मय और दिनांक):** 17:04 Hrs on 05-01-2024
3. **Event Category** (ग्रिड **घटना का प्रकार**)**:** GI II
4. **Location/Control Area (**स्थान/नियंत्रण क्षेत्र**)**: **220 kV Bus I at Kopili**
5. **Antecedent Conditions (पूर्ववर्ती स्थिति)**:

	Frequency in Hz	Regional Generation(MW)	Regional Demand(MW)	Kopili Generation(MW)
Pre-Event (घटना पूर्व)	49.99	3086	2523	143 (Unit: 2,3,4)
Post Event (घटना के बाद)	49.98	3067	2523	48 (Unit: 4)

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

Important Transmission Line/Unit if under outage (before the even))महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो बंद है(	220 kV Misa- Kopili I under C/S/D 07:00 Hrs of 02-01-2024 to 15:00 Hrs of 12-01-2024.

Weather Condition (मौसम स्थिति)	Normal

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Generation loss of 95 MW
7. **Duration of interruption (रुकावट की अवधि):** 137 Minutes
8. **Network across the affected area (प्रभावित क्षेत्र का नक्शा):**

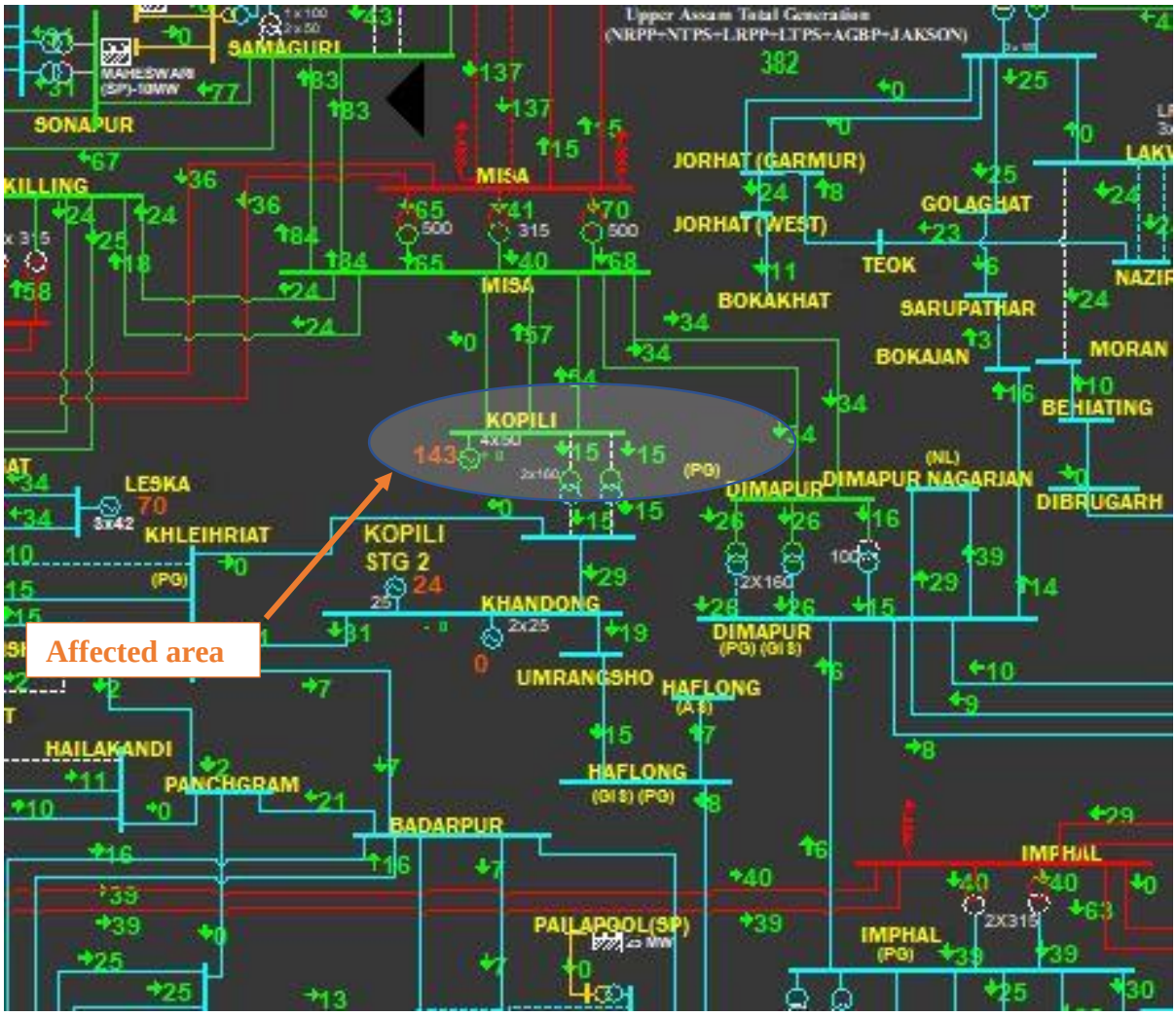


Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग):

Sl. No.	Transmission/Generation element name	Tripped Time	Restoration time	Relay Indication End A	Relay Indication End B
3	220 kV Kopili-Misa 2	17:04	20:21	BB Protection Operated	DT received
4	220/132 kV 160 MVA ICT 1 at Kopili	17:04	21:01	BB Protection Operated	-
5	220 kV Bus Coupler	17:04	**20:16**	BB Protection Operated	-
7	Kopili Unit -2	17:04	20:23	BB Protection Operated	-
8	Kopili Unit -3	17:04	06:50 Hrs of 06-01-2024	BB Protection Operated	-

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

PMU/DR analysis suggest there was no fault in the system and the Bus I tripped due to maloperation of the Bus Bar Relay.

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

Frequent Maloperation of Bus Bar Relay at 220 kV Kopili Bus.

As per Detailed Report received from Kopili, after detailed analysis jointly done with GE engineer, protection issues in Flexlogic or configurational issues of the logic were found in Main II. The LBB operated on Backtrip as Re-trip was assigned to individual elements in the logic. High differential current was observed only in Main II which was due to faulty CT polarity configuration in Bus-Coupler logic. EPF initiated by Unit 3 led to tripping of Unit 2 and vice-versa was due to reversed wiring connection.

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

Power was extended to Bus I by charging 220 kV Bus Coupler at 20:16 Hrs.

As per Detailed Report received from Kopili , Due to the frequent tripping of Busbar protection, the Main II Busbar Multilin B90 Relay was disabled after taking due permission from NERPC/NERLDC. After preliminary identification of the fault, a detailed investigation was required for which shutdown was imperative as thorough checks were possible through simulation and capturing the DR/EL. Therefore, PSD was taken on 21st and 23rd and ESD was taken on 24th, 25th and 26th 2024 and all the anomalies in the configuration were resolved one by one.

All the observed faulty conditions in wiring and configuration of logics were rectified and the system has been on service since **26.01.2024.**

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

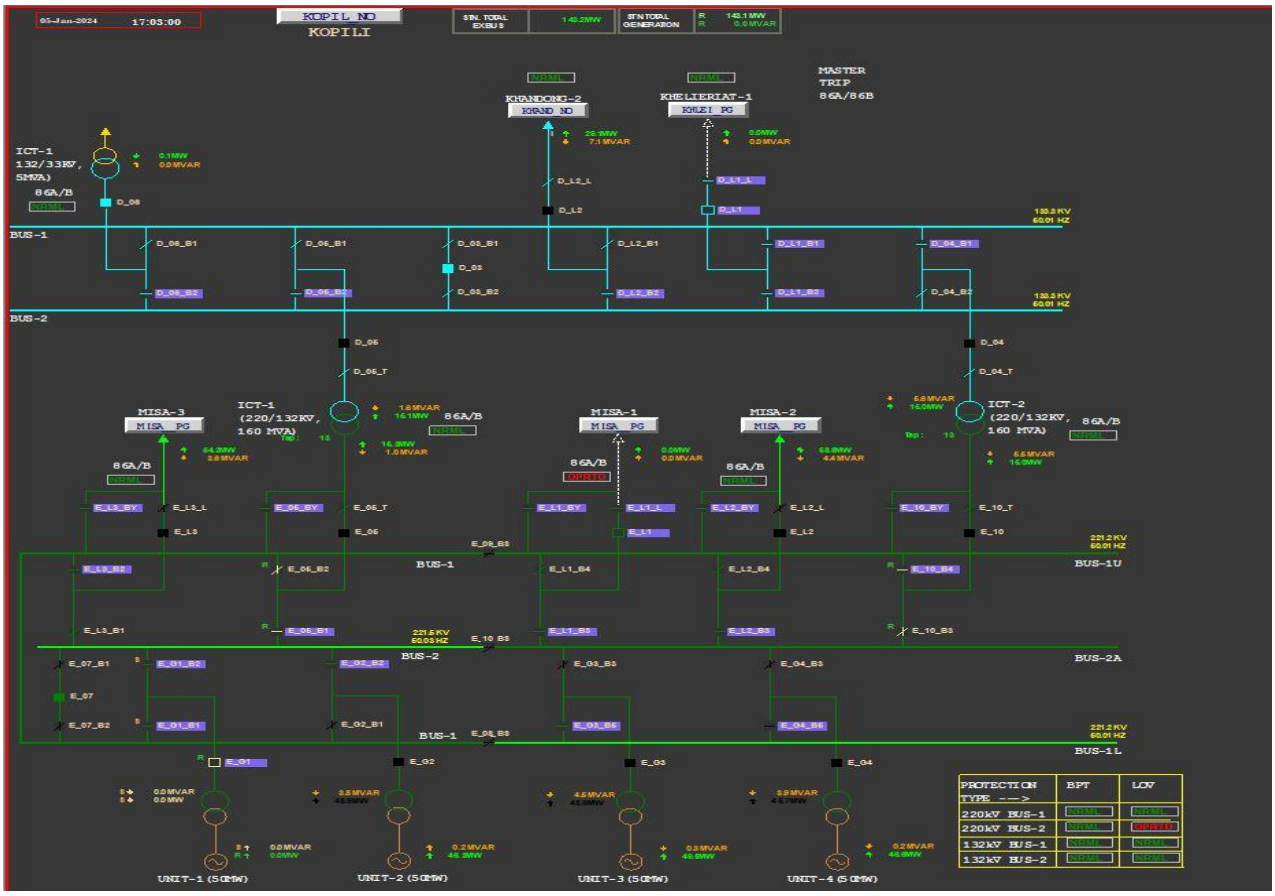
Sl.No.	Issues	Regulation Non-Compliance	Utilities
1.	**Flash Report received within 8 hrs?**	IEGC section 37.2 (b)	NEEPCO
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	-
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	NEEPCO (submitted on 05-02-24)
4.	**DR Time Synchronization Issues**	IEGC section 17.3	-
5.	**Any other non-compliance**		-

15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

Periodic checking and ensuring the healthiness of the protection system and associated wiring and configuration of logics.

Necessary Annexures:

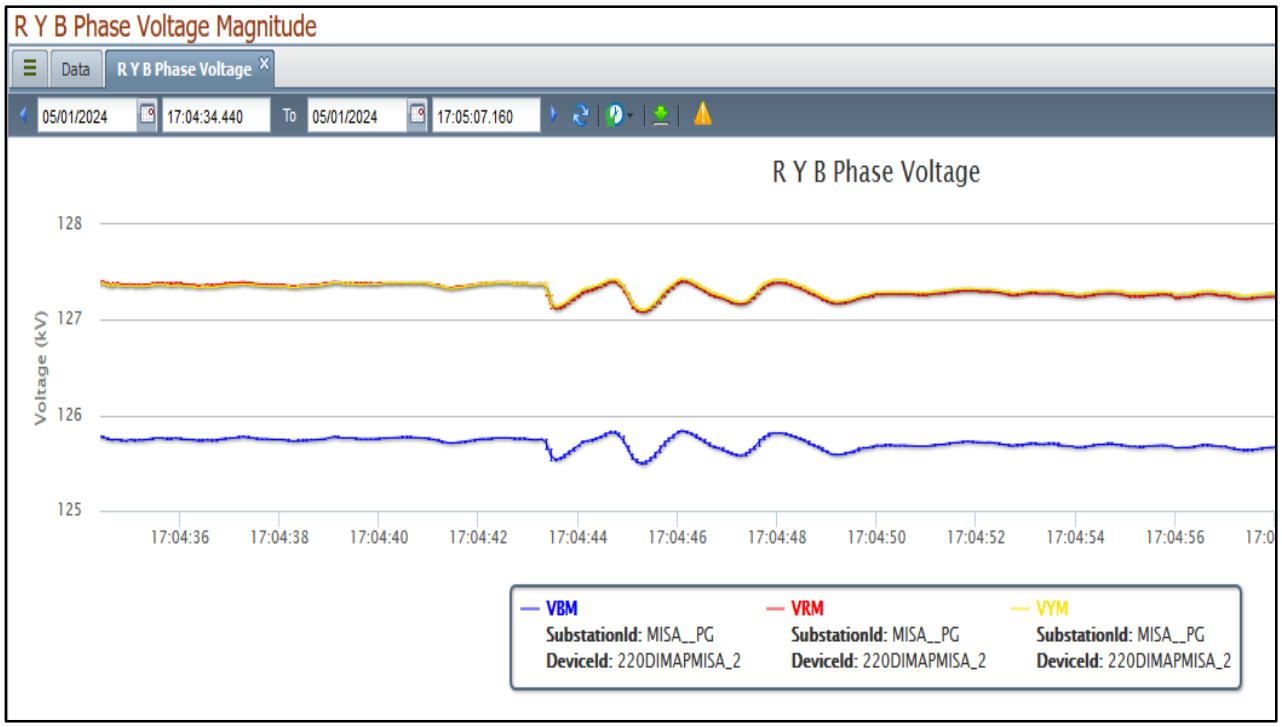
Annexure 1: SLD of Kopili (HEP) before the event

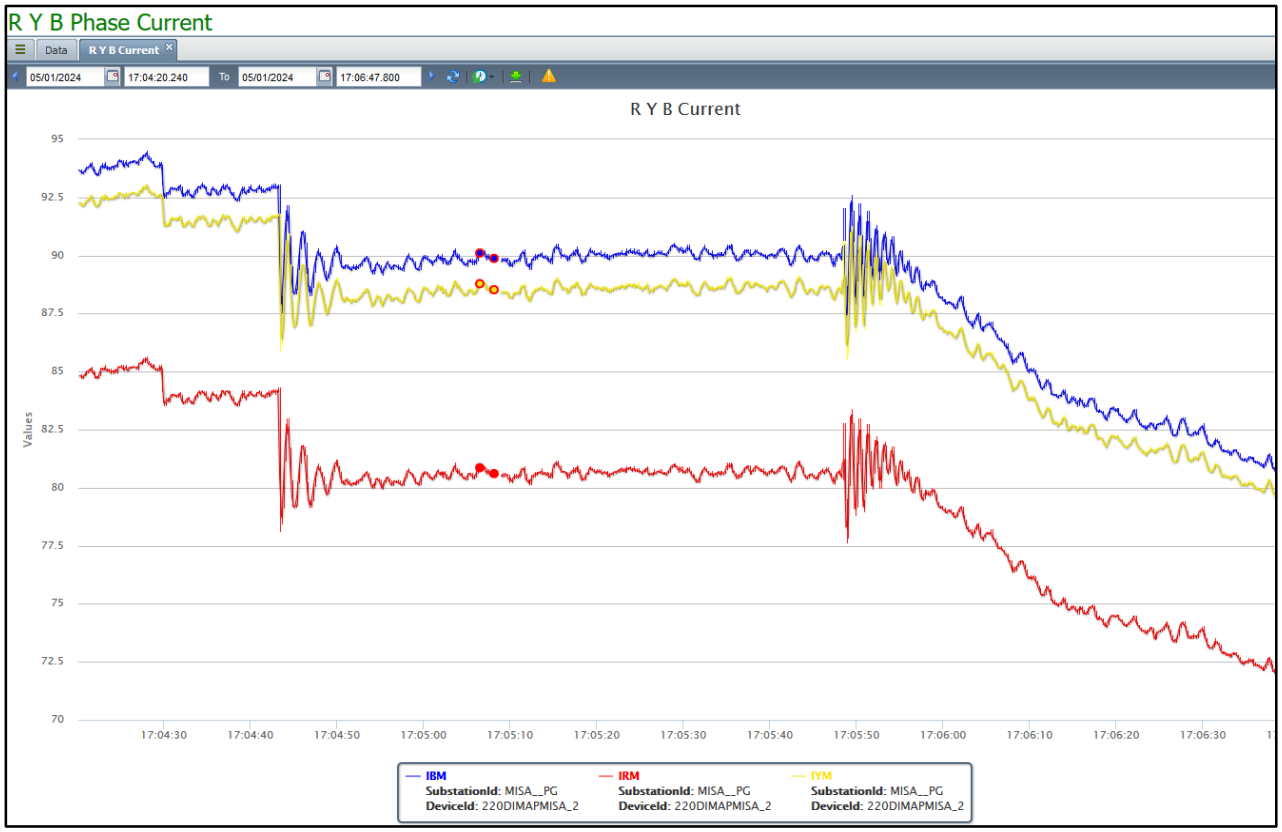


Annexure 2: Sequence of Events

CATEGO	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME
1C	KOPIL_NO	KOPILI CB 220/132 T1 (PRIM) OPEN	05 Jan 2024 17:04:45:000	05 Jan 2024 17:04:43:000
1C	KOPIL_NO	KOPILI CB 220 KV COUPLER (07) OPEN	05 Jan 2024 17:04:45:000	05 Jan 2024 17:04:43:000
1C	KOPIL_NO	KOPILI CB 11 KV UNIT (H03) OPEN	05 Jan 2024 17:04:45:000	05 Jan 2024 17:04:43:000
1C	KOPIL_NO	KOPILI CB 220Kv LINE-2 TO MISA_ OPEN	05 Jan 2024 17:04:45:000	05 Jan 2024 17:04:43:000
1C	MISA__PG	MISA CB 220Kv LINE-2 TO KOPIL OPEN	05 Jan 2024 17:04:45:000	05 Jan 2024 17:04:43:000
1C	KOPIL_NO	KOPILI CB 11 KV UNIT (H02) OPEN	05 Jan 2024 17:04:47:000	05 Jan 2024 17:04:45:000
1C	KOPIL_NO	KOPILI CB 220 KV COUPLER (07) CLOSED	05 Jan 2024 20:16:05:000	05 Jan 2024 20:16:03:000
1C	MISA__PG	MISA CB 220Kv LINE-2 TO KOPIL CLOSED	05 Jan 2024 20:20:52:000	05 Jan 2024 20:20:50:000
1C	KOPIL_NO	KOPILI CB 220Kv LINE-2 TO MISA_ CLOSED	05 Jan 2024 20:21:14:000	05 Jan 2024 20:21:14:000
1C	KOPIL_NO	KOPILI CB 11 KV UNIT (H02) CLOSED	05 Jan 2024 20:23:00:000	05 Jan 2024 20:22:59:000
1C	KOPIL_NO	KOPILI CB 220 KV COUPLER (07) OPEN	05 Jan 2024 20:55:01:000	05 Jan 2024 20:55:00:000
1C	KOPIL_NO	KOPILI CB 220 KV COUPLER (07) CLOSED	05 Jan 2024 20:55:03:000	05 Jan 2024 20:55:02:000
1C	KOPIL_NO	KOPILI CB 220/132 T1 (PRIM) CLOSED	05 Jan 2024 21:01:54:000	05 Jan 2024 21:01:52:000
1C	KOPIL_NO	KOPILI CB 11 KV UNIT (H04) OPEN	05 Jan 2024 21:32:33:000	05 Jan 2024 21:32:31:000
1C	KOPIL_NO	KOPILI CB 11 KV UNIT (H02) OPEN	05 Jan 2024 22:01:52:000	05 Jan 2024 22:01:51:000

Annexure 3: PMU snapshot Kopili Bus





**********The End**********

ग्रिड-इंडिया GRID-INDIA
ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
GRID CONTROLLER OF INDIA LIMITED
(A Government of India Enterprise)
[formerly Power System Operation Corporation Limited (POSOCO)]
उत्तर पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / North Eastern Regional Load Despatch Centre
कार्यालय : लोवर, लापालांग, शिलांग -793006
Office : Lower Nongrah, Lapalang, Shillong- 793006
CIN : U40105DL2009GOI188682, Website : www.nerldc.in, E-mail : nerldc@grid-india.in, Tel.: 0364-2537470/427, Fax: 03642537486

Detailed Report of Grid Incidance due to outage of 220 kV Bus I at Kopili (NEEPCO)

{To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f))

(**आई ई जी सी** 37.2 (**एफ**) **के अनुपालन में**)}

Date (दिनांक)**: 09-02-2024**

1. **Event Summary (घटना का सारांश):**

   Before the event, 220 kV Kopili-Misa 2 Line, Kopili Unit 2,3 & 220/132 kV 160 MVA ICT 1 are connected in 220 kV Bus I and 220 kV Kopili-Misa 3 Line, Kopili Unit 4 & 220/132 kV 160 MVA ICT 2 are connected in 220 kV Bus II.

   At 18:03 hrs of 08-01-2024, Bus Bar protection operated at Kopili Bus I and all the connected lines to Bus I as well as Bus Coupler tripped leads to the Grid Event at Kopili.

2. **Time and Date of the Event (घटना का स मय और दिनांक):** 18:03 Hrs on 08-01-2024
3. **Event Category** (ग्रिड **घटना का प्रकार**)**:** GI II
4. **Location/Control Area (**स्थान/नियंत्रण क्षेत्र**)**: 220 kV Bus I at Kopili
5. **Antecedent Conditions (पूर्ववर्ती स्थिति)**:

	Frequency in Hz	Regional Generation(MW)	Regional Demand(MW)	Kopili Generation(MW)
Pre-Event (घटना पूर्व)	50.15	3057	2648	144 (Unit: 2,3,4)
Post Event (घटना के बाद)	50.15	3007	2648	50 (Unit: 4)

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

Important Transmission Line/Unit if under outage (before the even))महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो बंद है(	220 kV Misa- Kopili I under C/S/D 07:00 Hrs of 02-01-2024 to 15:00 Hrs of 12-01-2024.

Weather Condition (मौसम स्थिति)	Normal

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Generation loss of 94 MW
7. **Duration of interruption (रुकावट की अवधि):** 25 Minutes
8. **Network across the affected area (प्रभावित क्षेत्र का नक्शा):**

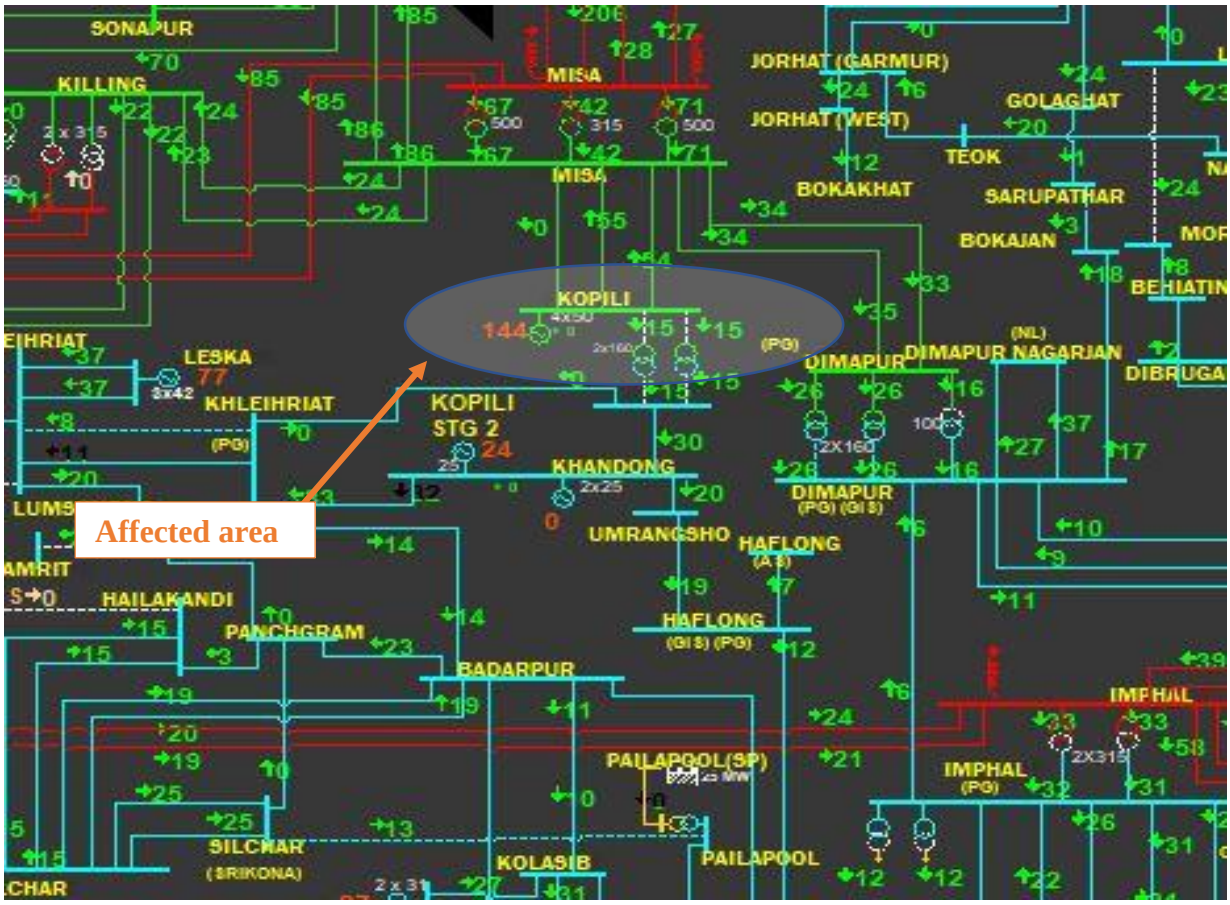


Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग):

Sl. No.	Transmission/Generation element name	Tripped Time	Restoration time	Relay Indication End A	Relay Indication End B
1	220 kV Kopili-Misa 2	18:03	18:33	BB Protection Operated	DT received
2	220/132 kV 160 MVA ICT 1 at Kopili	18:03	18:28	BB Protection Operated	-
3	220 kV Bus Coupler	18:03	18:28	BB Protection Operated	-
4	Kopili Unit -2	18:03	18:17	BB Protection Operated	-
5	Kopili Unit -3	18:03	18:37	BB Protection Operated	-

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

PMU/DR analysis suggest there was no fault in the system and the Bus I tripped due to maloperation of the Bus Bar Relay.

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

Frequent Maloperation of Bus Bar Relay at 220 kV Kopili Bus.

As per Detailed Report received from Kopili, after detailed analysis jointly done with GE engineer, protection issues in Flexlogic or configurational issues of the logic were found in Main II. The LBB operated on Backtrip as Re-trip was assigned to individual elements in the logic. High differential current was observed only in Main II which was due to faulty CT polarity configuration in Bus-Coupler logic. EPF initiated by Unit 3 led to tripping of Unit 2 and vice-versa was due to reversed wiring connection.

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

Power was extended to Bus I by charging 220 kV 220 kV Bus Coupler at 18:28 Hrs.

As per Detailed Report received from Kopili , Due to the frequent tripping of Busbar protection, the Main II Busbar Multilin B90 Relay was disabled after taking due permission from NERPC/NERLDC. After preliminary identification of the fault, a detailed investigation was required for which shutdown was imperative as thorough checks were possible through simulation and capturing the DR/EL. Therefore, PSD was taken on 21st and 23rd and ESD was taken on 24th, 25th and 26th 2024 and all the anomalies in the configuration were resolved one by one.

All the observed faulty conditions in wiring and configuration of logics were rectified and the system has been on service since **26.01.2024**.

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

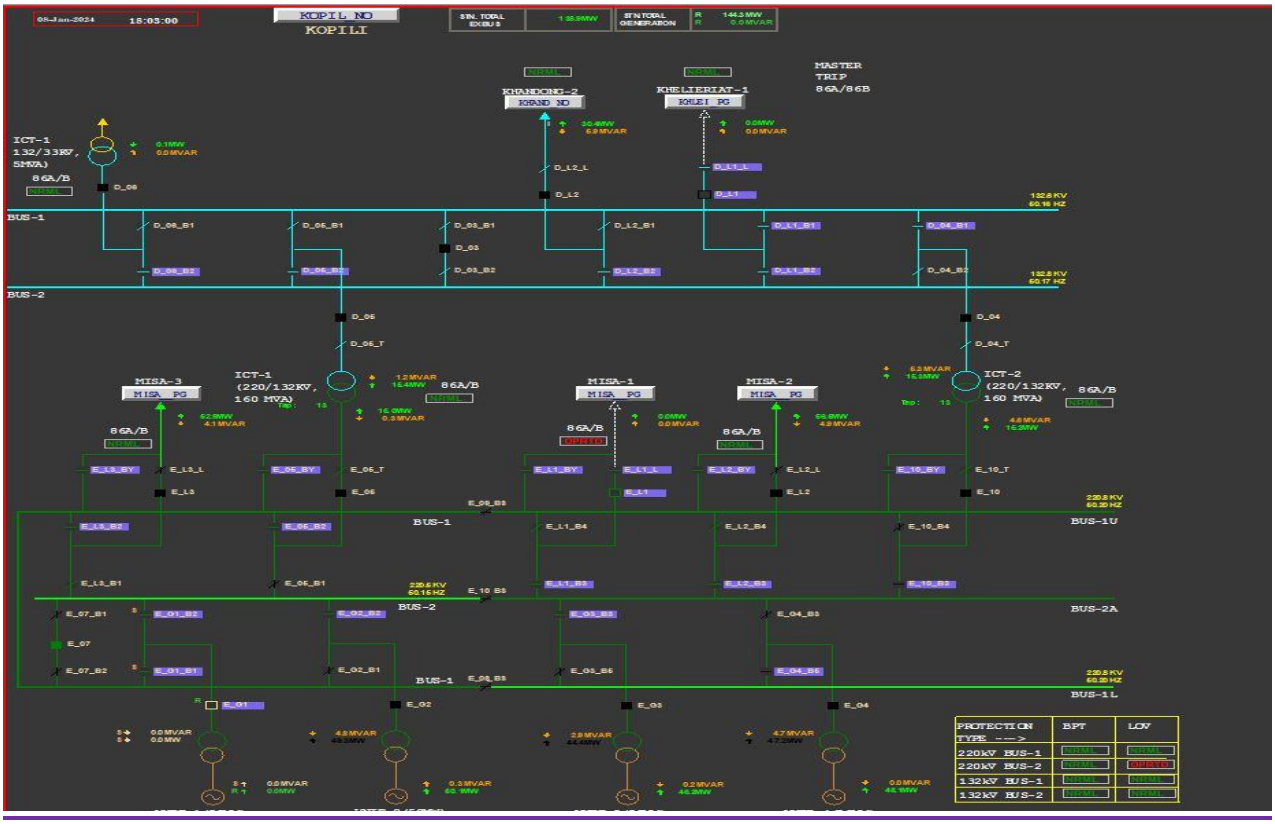
Sl.No.	Issues	Regulation Non-Compliance	Utilities
1.	**Flash Report received within 8 hrs?**	IEGC section 37.2 (b)	-
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	-
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	NEEPCO (submitted on 05-02-24)
4.	**DR Time Synchronization Issues**	IEGC section 17.3	-
5.	**Any other non-compliance**		-

15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

Periodic checking and ensuring the healthiness of the protection system and associated wiring and configuration of logics.

Necessary Annexures:

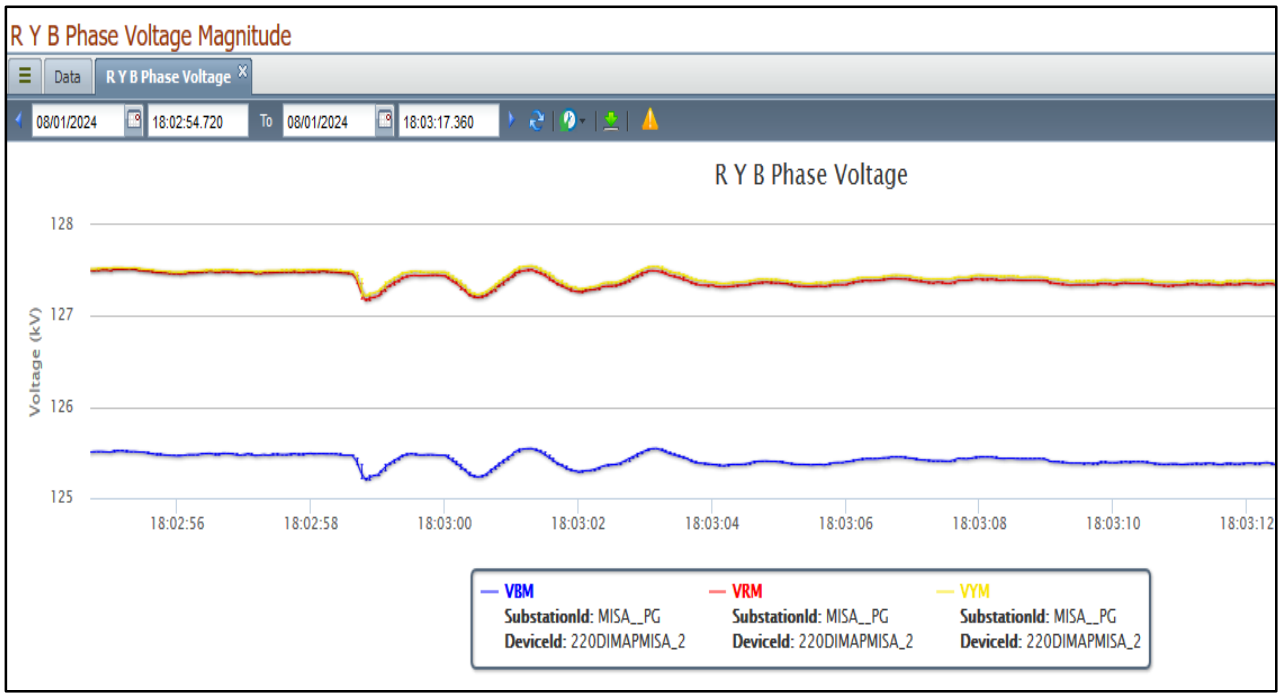
Annexure 1: SLD of Kopili (HEP) before the event



Annexure 2: Sequence of Events

LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME
KOPIL_NO	KOPILI CB 220/132 T1 (PRIM) OPEN	08 Jan 2024 18:03:01:000	08 Jan 2024 18:02:58:000
KOPIL_NO	KOPILI CB 220 KV COUPLER (07) OPEN	08 Jan 2024 18:03:01:000	08 Jan 2024 18:02:58:000
KOPIL_NO	KOPILI CB 11 KV UNIT (H03) OPEN	08 Jan 2024 18:03:01:000	08 Jan 2024 18:02:58:000
KOPIL_NO	KOPILI CB 220Kv LINE-2 TO MISA_ OPEN	08 Jan 2024 18:03:01:000	08 Jan 2024 18:02:59:000
MISA__PG	MISA CB 220Kv LINE-2 TO KOPIL OPEN	08 Jan 2024 18:03:01:000	08 Jan 2024 18:03:00:000
KOPIL_NO	KOPILI CB 11 KV UNIT (H02) OPEN	08 Jan 2024 18:03:03:000	08 Jan 2024 18:03:00:000
KOPIL_NO	KOPILI CB 11 KV UNIT (H02) BETWEEN	08 Jan 2024 18:03:01:000	08 Jan 2024 18:03:00:000
KOPIL_NO	KOPILI CB 220 KV COUPLER (07) CLOSED	08 Jan 2024 18:27:38:000	08 Jan 2024 18:27:36:000
KOPIL_NO	KOPILI CB 220/132 T1 (PRIM) CLOSED	08 Jan 2024 18:28:46:000	08 Jan 2024 18:28:44:000
MISA__PG	MISA CB 220Kv LINE-2 TO KOPIL CLOSED	08 Jan 2024 18:33:10:000	08 Jan 2024 18:33:09:000
KOPIL_NO	KOPILI CB 220Kv LINE-2 TO MISA_ CLOSED	08 Jan 2024 18:33:37:000	08 Jan 2024 18:33:35:000
KOPIL_NO	KOPILI CB 11 KV UNIT (H03) CLOSED	08 Jan 2024 18:37:39:000	08 Jan 2024 18:37:37:000
KOPIL_NO	KOPILI CB 11 KV UNIT (H02) CLOSED	08 Jan 2024 19:17:51:000	08 Jan 2024 19:17:50:000

Annexure 3: PMU snapshot Kopili Bus



**********The End**********

ग्रिड-इंडिया GRID-INDIA
ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
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कार्यालय : लोवर, लापालांग, शिलांग -793006
Office : Lower Nongrah, Lapalang, Shillong- 793006
CIN : U40105DL2009GOI188682, Website : www.nerldc.in, E-mail : nerldc@grid-india.in, Tel.: 0364-2537470/427, Fax: 03642537486

Detailed Report of Grid Disturbance in Ningthoukhong, Churachandpur and Thanlon area of Manipur power system

{To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f))
(**आई ई जी सी** 37.2 (**एफ**) **के अनुपालन में**)}

Date (दिनांक)**: 09-02-2024**

1. **Event Summary (घटना का सारांश):**

   Due to the outage of 132 kV Churachandpur- Kakching, 132 kV Churachandpur-Elangpokpi and 132 kV Ningthoukhong- Churachandpur 1&2 line, Ningthoukhong area connected with rest of the grid with through 132 kV Loktak – Ningthukhong & 132 kV Imphal – Ningthukhong lines.

   At 13:34 Hrs of 13.01.2024, 132 kV Loktak – Ningthukhong & 132 kV Imphal – Ningthukhong lines tripped while charging 132 kV Ningthoukhong- Churachandpur 1 which led to blackout of Ningthoukhong area of Manipur power system.

2. **Time and Date of the Event (**घटना का स मय और दिनांक**):** 13:34 Hrs on 13.01.2024
3. **Event Category** (ग्रिड **घटना का प्रकार**)**:** GD-I
4. **Location/Control Area (**स्थान/नियंत्रण क्षेत्र**)**: Ningthukhong area
5. **Antecedent Conditions (पूर्ववर्ती स्थिति)**:

	Frequency in Hz	Regional Generation(MW)	Regional Demand(MW)	State Generation(MW)	State Demand(MW)
Pre-Event (घटना पूर्व)	50.04	2045	1991	0	113
Post Event (घटना के बाद)	50.04	2056	1962	0	103

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

Important Transmission Line/Unit if under outage (before the even))महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो बंद है(	Following lines are under tripped condition- **1.** 132 kV Churachandpur- Kakching: 12:21 Hrs of 08.06.2023 **2.** 132 kV Churachandpur-Elangpokpi: 12:21 Hrs of 08.06.2023, **3.** 132 kV Ningthoukhong-Churachandpur I: 13:16 Hrs of 13.01.2024 **4.** 132 kV Ningthoukhong-Churachandpur II: 14:33 Hrs of 06.06.2023
Weather Condition (मौसम स्थिति)	Normal

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 10 MW
7. **Duration of interruption (रुकावट की अवधि):** **7** mins
8. **Network across the affected area (प्रभावित क्षेत्र का नक्शा):**

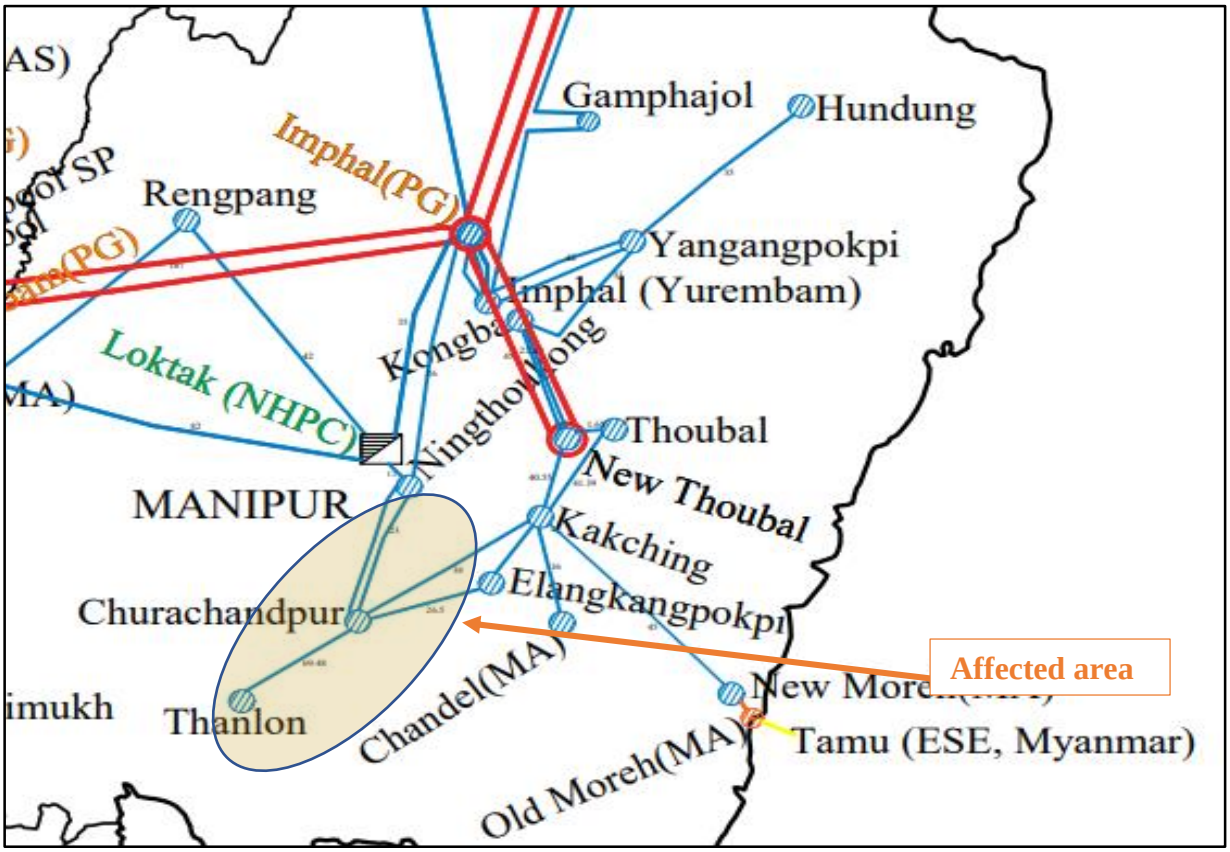


Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग):

Sl. No.	नाम	Trip time (hh:mm:ss)	Restoration time	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत
1	132 kV Loktak – Ningthukhong	13:34	20:31	DP, ZIII, B-E,FD: 19.86 km	No Tripping
2	132 kV Imphal – Ningthukhong	13:34	13:41	DP, ZII, B-E,FD: 33 km	No Tripping

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

As per DR analysis of Imphal end of 132 kV Imphal(PG)- Ningthoukhong, B-E fault with fault current 2 kA cleared on operation of Z-II in 353 msecs. As per EL analysis of Loktak end of 132 kV Loktak Ningthoukhong, B-E fault with fault current 2 kA cleared on operation of Z-III in 369 msecs. Suspected fault in the downstream of Ningthoukhong SS

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

High resistive fault in the downstream of Ningthoukhong was not cleared by the relay at Ningthoukhong end resulted in the tripping of healthy state as well as ISTS feeders.

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

Power was extended to 132 kV Ningthukhong S/S by charging 132 kV Imphal(PG) – Ningthukhong at 13:41 Hrs of 13-01-2024.

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

Sl.No.	Issues	Regulation Non-Compliance	Utilities
1.	**Flash Report received within 8 hrs?**	IEGC section 37.2 (b)	MSPCL
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	-

3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	MSPCL
4.	**DR Time Synchronization Issues**	IEGC section 17.3	-
5.	**Any other non-compliance**		-

15. <u>Key Lessons Learnt (प्रमुख अधिगम बिंदु):</u>

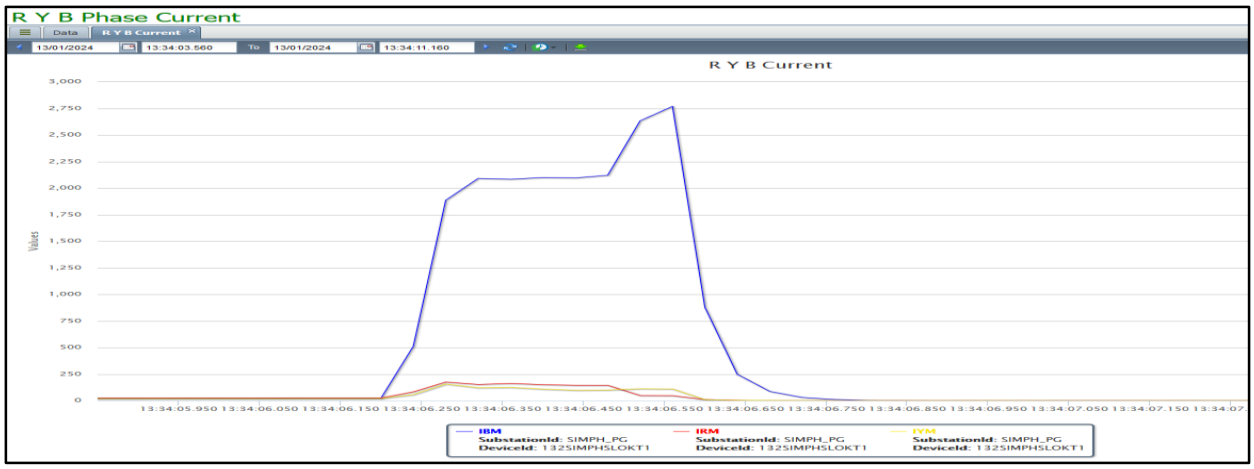
Ensuring healthiness of the protection system and condition based maintenance of CB mechanism to prevent such events.

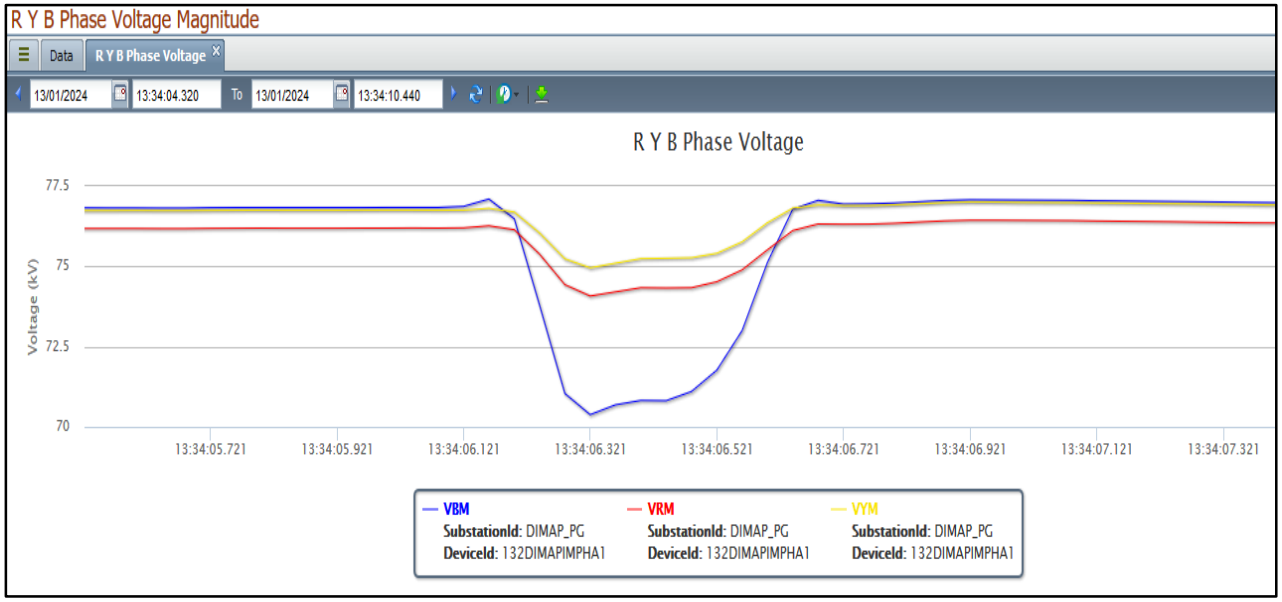
Necessary Annexures:

Annexure 1: SOE

CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME
1C	NINGT_MA	NINGTHOUKHONG CB 132Kv LINE-1 TO CHURA OPEN	13 Jan 2024 13:16:32:000	13 Jan 2024 13:16:22:000
1C	LOKTA_NH	LOKTAK CB 132Kv LINE TO NINGT OPEN	13 Jan 2024 13:34:08:000	13 Jan 2024 13:29:14:000
1C	NINGT_MA	NINGTHOUKHONG CB 132/33 T1 (PRIM) OPEN	13 Jan 2024 13:34:10:000	13 Jan 2024 13:34:05:000
1C	NINGT_MA	NINGTHOUKHONG CB 132Kv LINE-1 TO CHURA CLOSED	13 Jan 2024 13:34:10:000	13 Jan 2024 13:34:05:000
1C	NINGT_MA	NINGTHOUKHONG CB 132Kv LINE-1 TO CHURA OPEN	13 Jan 2024 13:34:11:000	13 Jan 2024 13:34:06:000
1C	NINGT_MA	NINGTHOUKHONG CB 132/33 T1 (PRIM) INVALID	13 Jan 2024 13:50:52:000	13 Jan 2024 13:50:44:000
1C	NINGT_MA	NINGTHOUKHONG CB 132Kv LINE TO LOKTA BETWEEN	13 Jan 2024 13:51:22:000	13 Jan 2024 13:51:10:000
1C	NINGT_MA	NINGTHOUKHONG CB 132 KV COUPLER (04) BETWEEN	13 Jan 2024 13:51:22:000	13 Jan 2024 13:51:10:000
1C	NINGT_MA	NINGTHOUKHONG CB 132Kv LINE TO IMPHA BETWEEN	13 Jan 2024 13:51:22:000	13 Jan 2024 13:51:10:000
1C	NINGT_MA	NINGTHOUKHONG CB 132Kv LINE-2 TO CHURA BETWEEN	13 Jan 2024 13:51:22:000	13 Jan 2024 13:51:10:000
1C	NINGT_MA	NINGTHOUKHONG CB 132/33 T2 (PRIM) OPEN	13 Jan 2024 13:52:02:000	13 Jan 2024 13:51:50:000
1C	NINGT_MA	NINGTHOUKHONG CB 132/33 T1 (PRIM) BETWEEN	13 Jan 2024 13:52:14:000	13 Jan 2024 13:52:05:000
1C	NINGT_MA	NINGTHOUKHONG CB 132/33 T2 (PRIM) BETWEEN	13 Jan 2024 13:52:14:000	13 Jan 2024 13:52:06:000
1C	NINGT_MA	NINGTHOUKHONG CB 132Kv LINE-1 TO CHURA BETWEEN	13 Jan 2024 13:59:00:000	13 Jan 2024 13:58:44:000

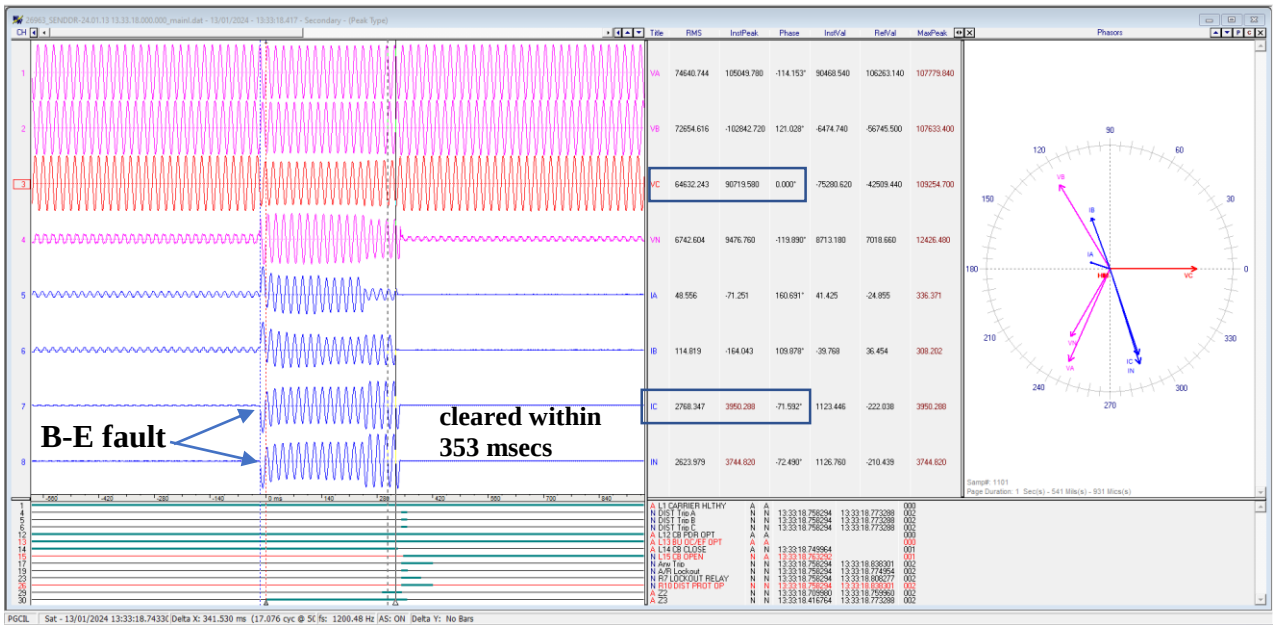
Annexure 2: PMU snapshot of Imphal(PG) end for 132 kV Imphal(PG)- Loktak Line





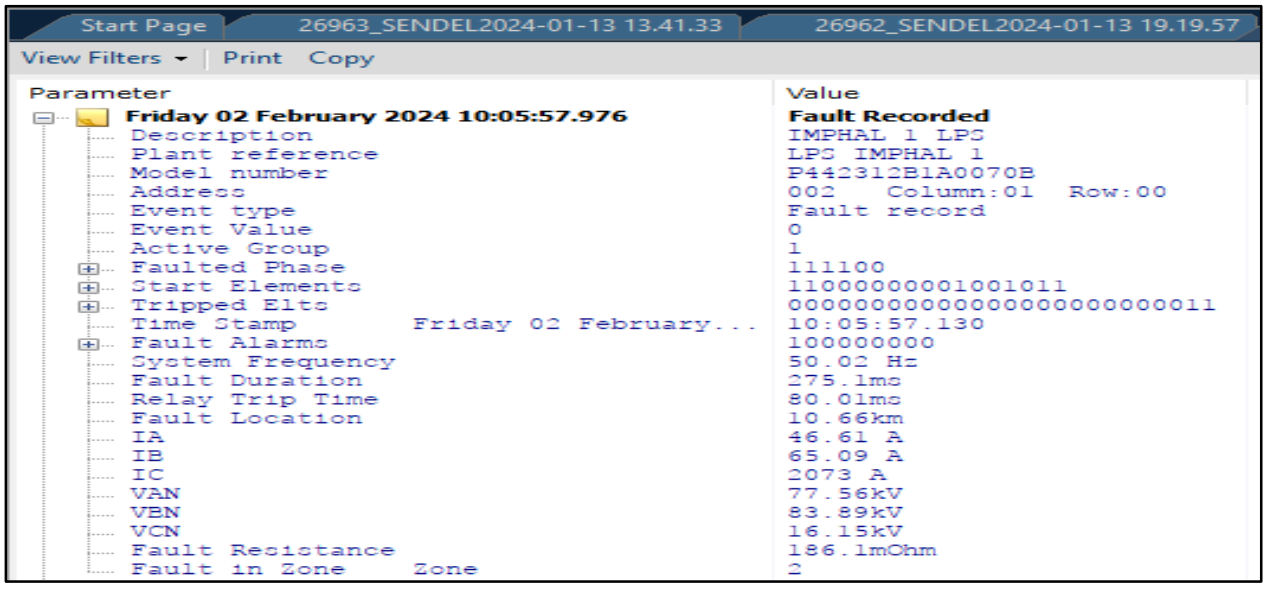
Annexure 4: Disturbance recorder snips showing faults and digital signals

DR Snapshot of Imphal(PG) end for 132 kV Imphal – Ningthukhong line

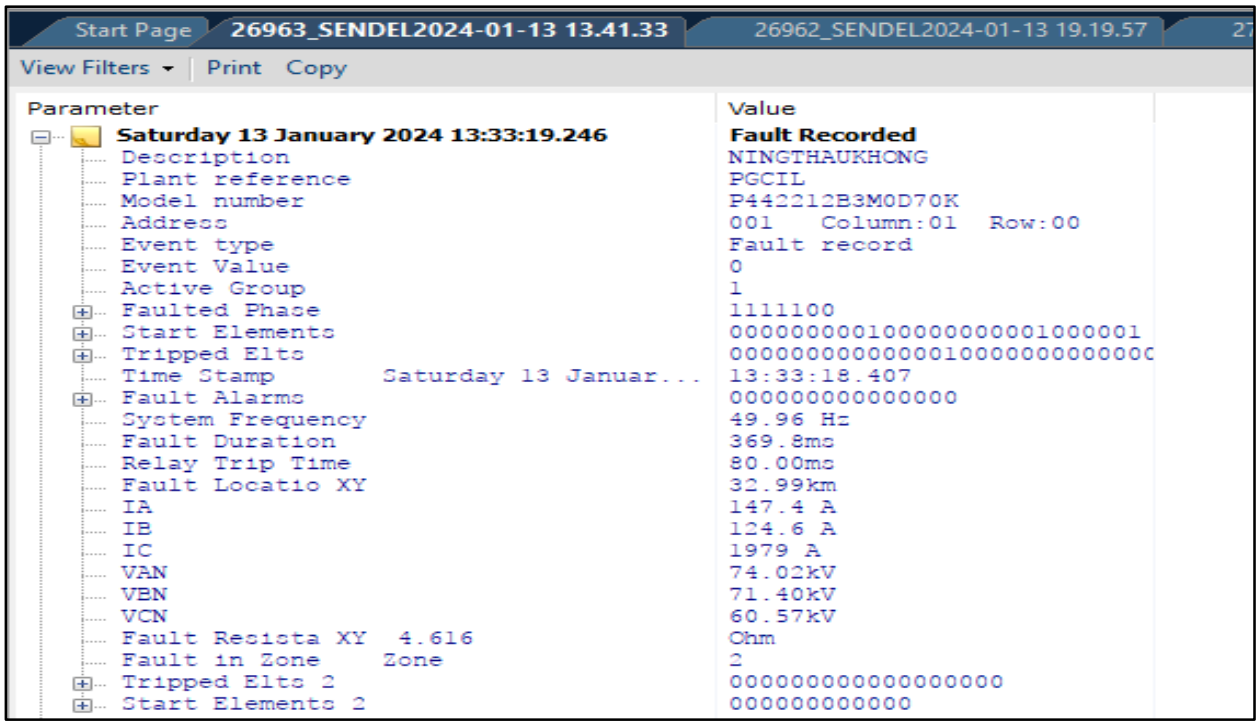


Annexure 5: Event Logger snips showing faults and digital signals

Loktak



Imphal



**********The End**********

ग्रिड-इंडिया GRID-INDIA
ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
GRID CONTROLLER OF INDIA LIMITED
(A Government of India Enterprise)
[formerly Power System Operation Corporation Limited (POSOCO)]
उत्तर पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / North Eastern Regional Load Despatch Centre
कार्यालय : लोवर, लापालांग, शिलांग -793006
Office : Lower Nongrah, Lapalang, Shillong- 793006
CIN : U40105DL2009GOI188682, Website : www.nerldc.in, E-mail : nerldc@grid-india.in, Tel.: 0364-2537470/427, Fax: 03642537486

Detailed Report of Grid Disturbance in Agartala S/S of Tripura of North Eastern Region
(To be submitted by RLDC/NLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (f))
(आई ई जी सी 37.2 (एफ) के अनुपालन में)

Date (दिनांक)**: 05-02-2024**

1. Event Summary (घटना का सारांश):

Agartala Substation of Tripura Power System is connected with the rest of the grid by 132 kV AGTCCPP-Agartala D/C lines, 132 kV Agartala-Surajmaninagar D/C lines, 132 kV Agartala-Mohanpur-Dhalabil line, 132 kV Agartala-Budhjungnagar line and 132 kV Agartala-Rokhia D/C lines.

At 16:26 Hrs of 15.01.2024, all the lines connected to 132 kV Agartala substation tripped which led to blackout at Agartala Substation of Tripura Power system due to no source available in this area.

2. Time and Date of the Event (घटना का स मय और दिनांक): 16:26 Hrs on 15-01-2024

3. Event Category (ग्रिड **घटना का प्रकार**)**:** GD-I

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Agartala area of Tripura System

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation(MW)	Regional Demand(MW)	State Generation(MW)	State Demand(MW)
Pre-Event (घटना पूर्व)	50	2153	1916	135	140
Post Event (घटना के बाद)	50	2221	1883	99	100

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

Important Transmission Line/Unit if under outage (before the even))महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो बंद है(	NIL
Weather Condition (मौसम स्थिति)	Normal

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 40 MW at Agartala. There was generation loss of 21 MW at Rokhia.
7. **Duration of interruption (रुकावट की अवधि): 31** min
8. **Network across the affected area (प्रभावित क्षेत्र का नक्शा)**

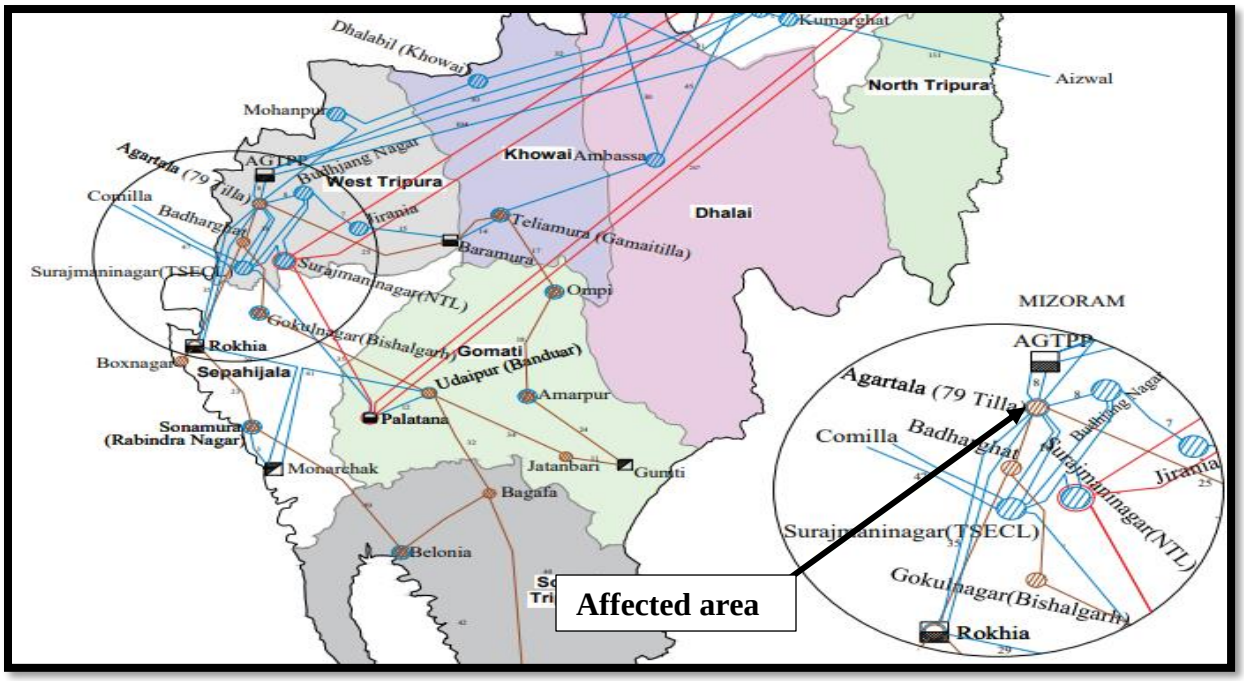


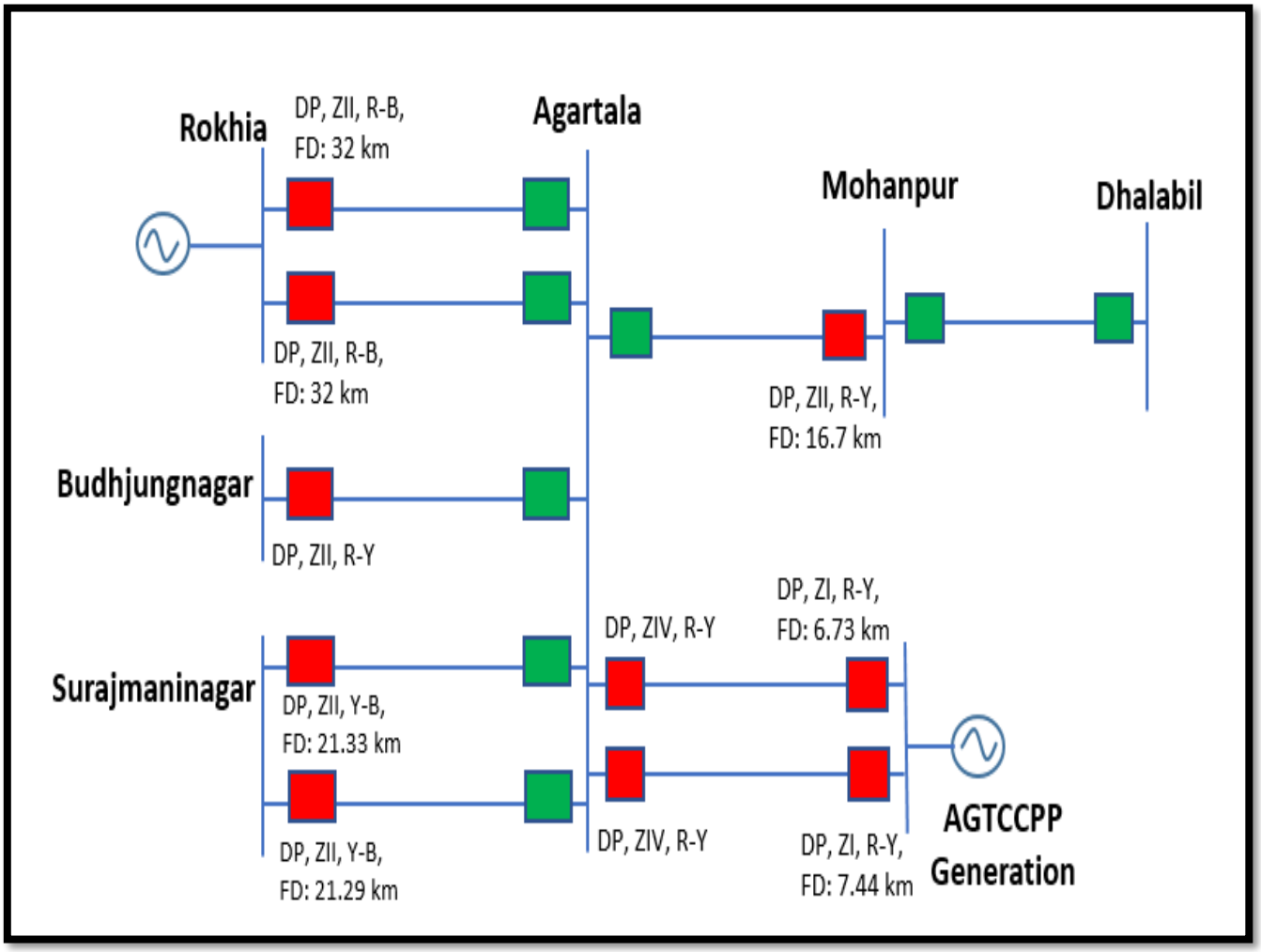
Figure 1: Network across the affected area

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

10. <u>Major Elements Tripped (प्रमुख ट्रिपिंग):</u>

Sl. No.	नाम	Trip time (hh:mm:ss)	Restoration time	उप केंद्र 1 रिले संकेत	उप केंद्र 2 रिले संकेत
1	132 kV Agartala-AGTCCPP I	16:26	17:29	DP, ZIV, R-Y	DP, ZI, R-Y, FD: 6.73 km
2	132 kV Agartala-AGTCCPP II	16:26	02:14 Hrs of 16.01.2024	No tripping (ZIV initiated)	DP, ZI, R-Y, FD: 7.44 km
3	132 kV Agartala-Budhjungnagar	16:26	17:06	No tripping (ZIV initiated)	DP, ZII, R-Y
4	132 kV Agartala-Mohanpur	16:26	18:36	No tripping (ZIV initiated)	DP, ZII, R-Y, FD: 16.7 km
5	132 kV Agartala-Rokhia I	16:26	16:57	No tripping (ZIV initiated)	DP, ZII, R-B, FD: 32 km
6	132 kV Agartala-Rokhia II	16:26	17:20	No tripping (ZIV initiated)	DP, ZII, R-B, FD: 32 km
7	132 kV Agartala-Surajmaninagar I	16:26	17:02	No tripping (ZIV initiated)	DP, ZII, Y-B, FD: 21.33 km
8	132 kV Agartala-Surajmaninagar II	16:26	17:03	No tripping (ZIV initiated)	DP, ZII, Y-B, FD: 21.29 km
9	Rokhia Unit-9	16:26	17:27	Tripped due to voltage jerk	

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



As per the PMU, fault initiated at 16:26:43 Hrs and cleared at 16:26:43.4 Hrs. Fault current of 317 A appears in Y phase. Total fault clearance time around 400 msec.

As per DR analysis, R-Y fault detected in 132 kV AGTCCPP-Agartala D/C lines which was cleared on operation of Z-I from AGTCCPP end in 88 msec. ZIV was initiated at Agartala end for both the lines which indicates that the fault is in reverse direction of Agartala.

All other elements connected to Agartala substation tripped from remote end on operation of ZII and ZIV initiated from Agartala end (no tripping).

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

- Tripping of 132 kV Agartala-AGTCCPP D/C lines on DP, ZI (Z-1 overreach) from AGTCCPP end for fault beyond the line seems to be mis-operation. ZI reach setting needs to be reviewed by AGTCCPP to prevent re-occurrence. Line length may be confirmed by offline fault locator measurement.

- DR from Rokhia recorded R-B fault whereas DR of Agartala recorded Y-B fault for 132 kV Agartala-Rokhia D/C lines. Similiarly, for 132 kV Agartala-Surajmaninagar I line, DR of Surajmaninagar recorded Y-B fault whereas DR of Agartala recorded R-Y fault. For 132 kV Agartala-Surajmaninagar II line, DR of Surajmaninagar recorded Y-B fault whereas DR of Agartala recorded R-B fault. The same needs to be corrected by TSECL for proper operation/maintenance point of view.

- Huge Time drift of about 1 hour was observed from Agartala end DR and Surajmaninagar DR for 132 kV Agartala-AGTCCPP D/C and 132 kV Agartala-Surajmaninagar II lines respectively. Also, time drift of 17 min was observed from Surajmaninagar end DR for 132 kV Agartala-Surajmaninagar I lines. The same needs to be corrected at earliest in line with Cl. 17.2.3 of IEGC regulation-2023 for proper analysis purpose.

- SOE not reported at NERLDC SCADA for tripping of 132 kV Agartala-Rokhia D/C lines. Same needs immediate attention by TSECL/ Tripura SLDC team.

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

- Power was extended to 132 kV Agartala S/S by charging 132 kV Agartala-Rokhia I at 16:57 Hrs of 15.01.2024. Subsequently, all other lines were restored.

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

Sl.No.	Issues	Regulation Non-Compliance	Utilities
1.	**Flash Report received within 8hrs?**	IEGC section 37.2 (b)	No violation
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	No violation
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**TSECL**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**TSECL**
5.	**Any other non-compliance**		**-**

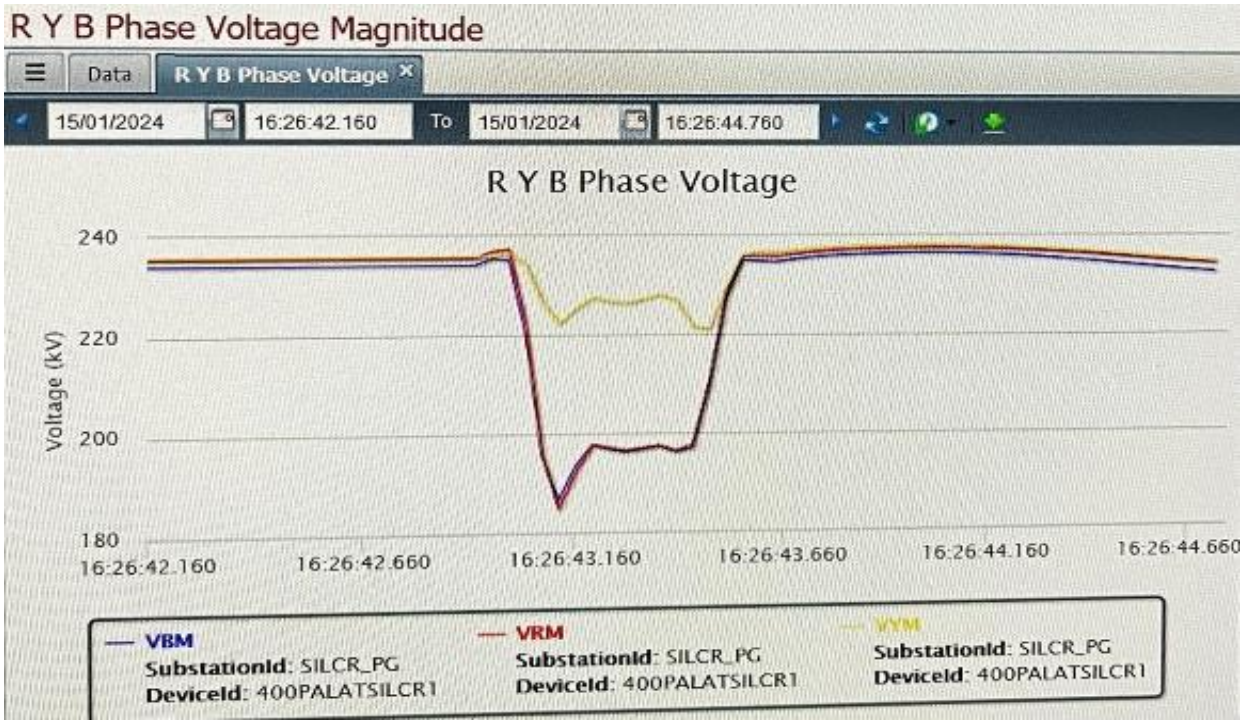
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Periodic checking of clearances viz phase to phase, jumper clearance, E/W to phase conductor etc needs to be done to prevent such events.
- Importance of periodic review of the relay settings to avoid overreach issue and tripping of important lines.

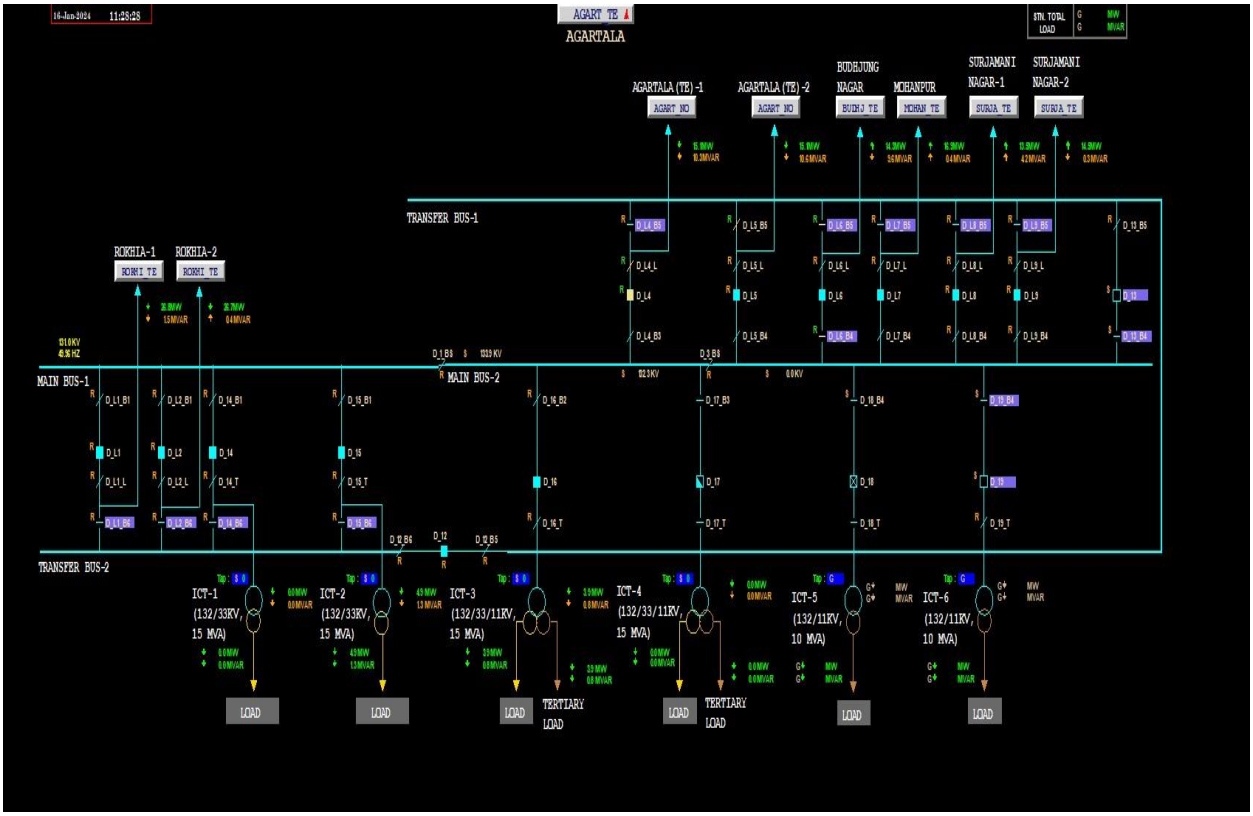
Annexure 1: Sequence of Events as per SCADA

AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
NAGALD	1C	DIMAP_PG	DIMAPUR CB 132Kv LINE-2 TO DOYAN CLOSED	15 Jan 2024 15:43:25:000	15 Jan 2024 15:43:24:000	2.52E+08
NAGALD	1C	DOYAN_NO	DOYANG CB 132Kv LINE-2 TO DIMAP CLOSED	15 Jan 2024 15:43:47:000	15 Jan 2024 15:43:40:000	2.63E+08
TSECL	1C	SURJA_TE	SURAJMANINAGAR CB 132Kv LINE-2 TO AGART OPEN	15 Jan 2024 16:26:55:000	15 Jan 2024 15:44:45:000	1.15E+08
TSECL	1C	SURJA_TE	SURAJMANINAGAR CB 132Kv LINE-1 TO AGART OPEN	15 Jan 2024 16:26:55:000	15 Jan 2024 15:44:45:000	1.23E+08
MSPCL	1C	LOKTA_NH	LOKTAK CB 132Kv LINE TO NINGT CLOSED	15 Jan 2024 15:53:23:000	15 Jan 2024 15:48:29:000	7.29E+08
AEGCL	1C	BONGA_PG	BONGAIGAON CB CB BW BR 1 & NWSLG 2 BETWEEN	15 Jan 2024 15:48:59:000	15 Jan 2024 15:48:58:000	21000000
AEGCL	1C	BONGA_PG	BONGAIGAON CB CB BW BR 1 & NWSLG 2 BETWEEN	15 Jan 2024 16:02:31:000	15 Jan 2024 16:02:28:000	2.16E+08
AEGCL	1C	BONGA_PG	BONGAIGAON CB CB BW BR 1 & NWSLG 2 OPEN	15 Jan 2024 16:02:33:000	15 Jan 2024 16:02:28:000	2.36E+08
TSECL	1C	AGART_NO	AGARTALA CB 132Kv LINE-1 TO AGART OPEN	15 Jan 2024 16:26:45:000	15 Jan 2024 16:26:43:000	1.06E+08
TSECL	1C	AGART_NO	AGARTALA CB 132Kv LINE-2 TO AGART OPEN	15 Jan 2024 16:26:45:000	15 Jan 2024 16:26:43:000	1.15E+08
TSECL	1C	MOHAN_TE	MOHANPUR CB 132Kv LINE-1 TO AGART OPEN	15 Jan 2024 16:26:50:000	15 Jan 2024 16:26:43:000	4.91E+08
TSECL	1C	ROKHI_TE	ROKHIA CB 11 KV UNIT (G9) OPEN	15 Jan 2024 16:26:51:000	15 Jan 2024 16:26:43:000	2.01E+08
TSECL	1C	BUDHJ_TE	BUDHJUNGNAGAR CB 132Kv LINE-1 TO AGART OPEN	15 Jan 2024 16:36:06:000	15 Jan 2024 16:26:44:000	3.66E+08
AEGCL	1C	BONGA_PG	BONGAIGAON CB CB BW BR 1 & NWSLG 2 BETWEEN	15 Jan 2024 16:30:10:000	15 Jan 2024 16:30:08:000	8.73E+08

Annexure 2: PMU snapshot 400 kV Palatana-Silchar I Line for Silchar end

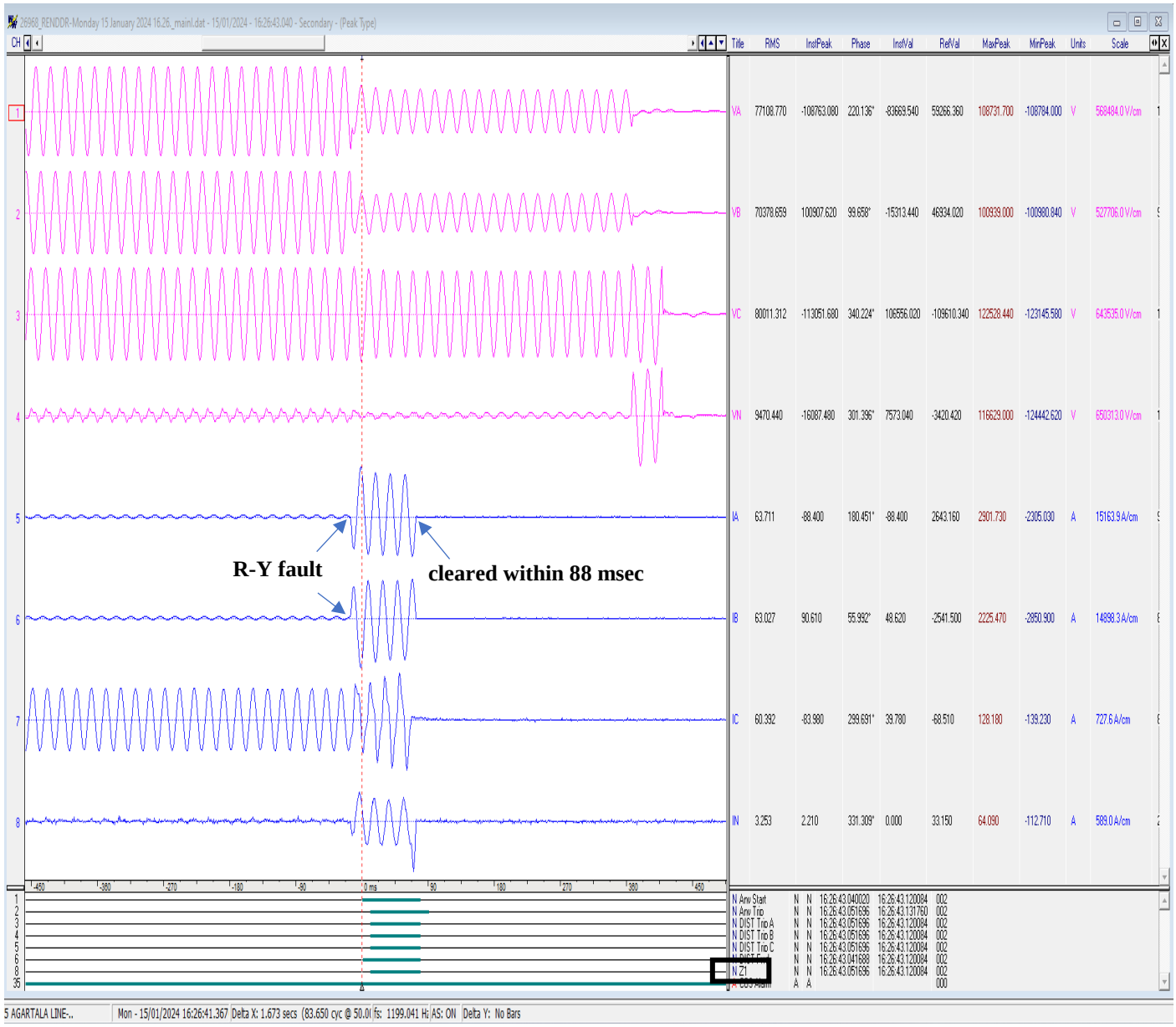


Annexure 3: SLD of the effected S/S

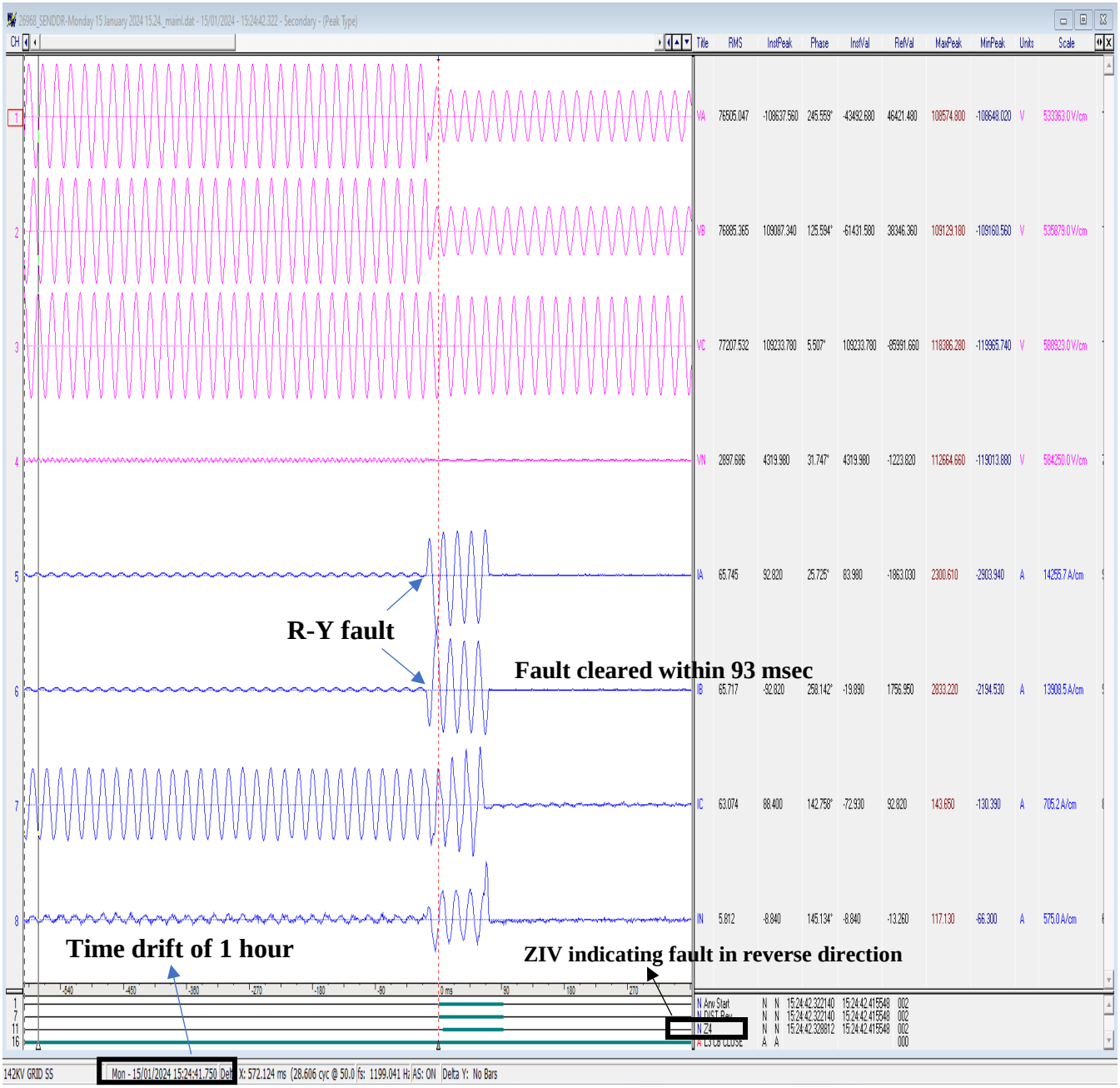


Annexure 4: Disturbance recorder snips showing faults and digital signals

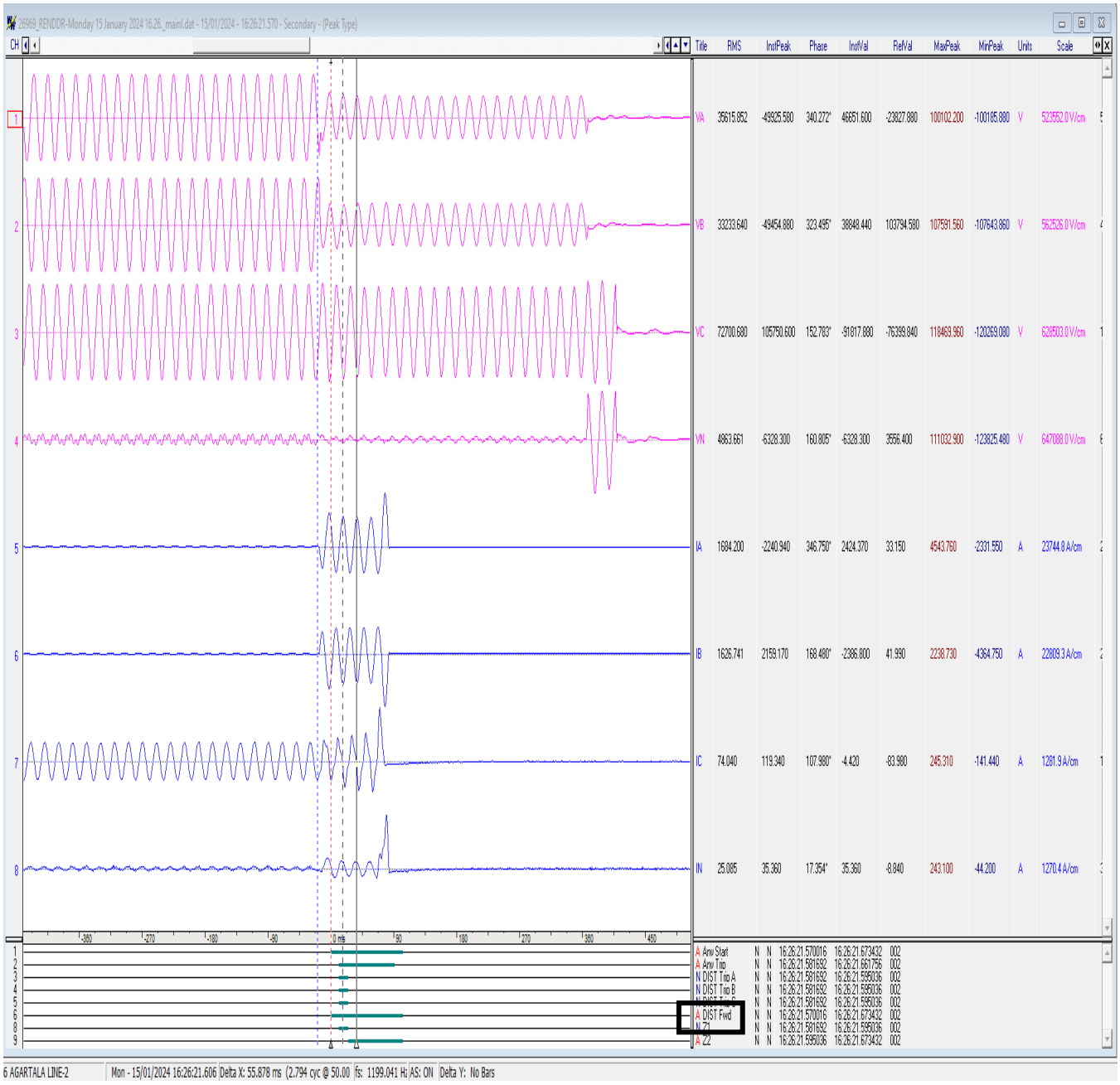
4.1. DR Snapshot of AGTCCPP for 132 kV Agartala-AGTCCPP I line



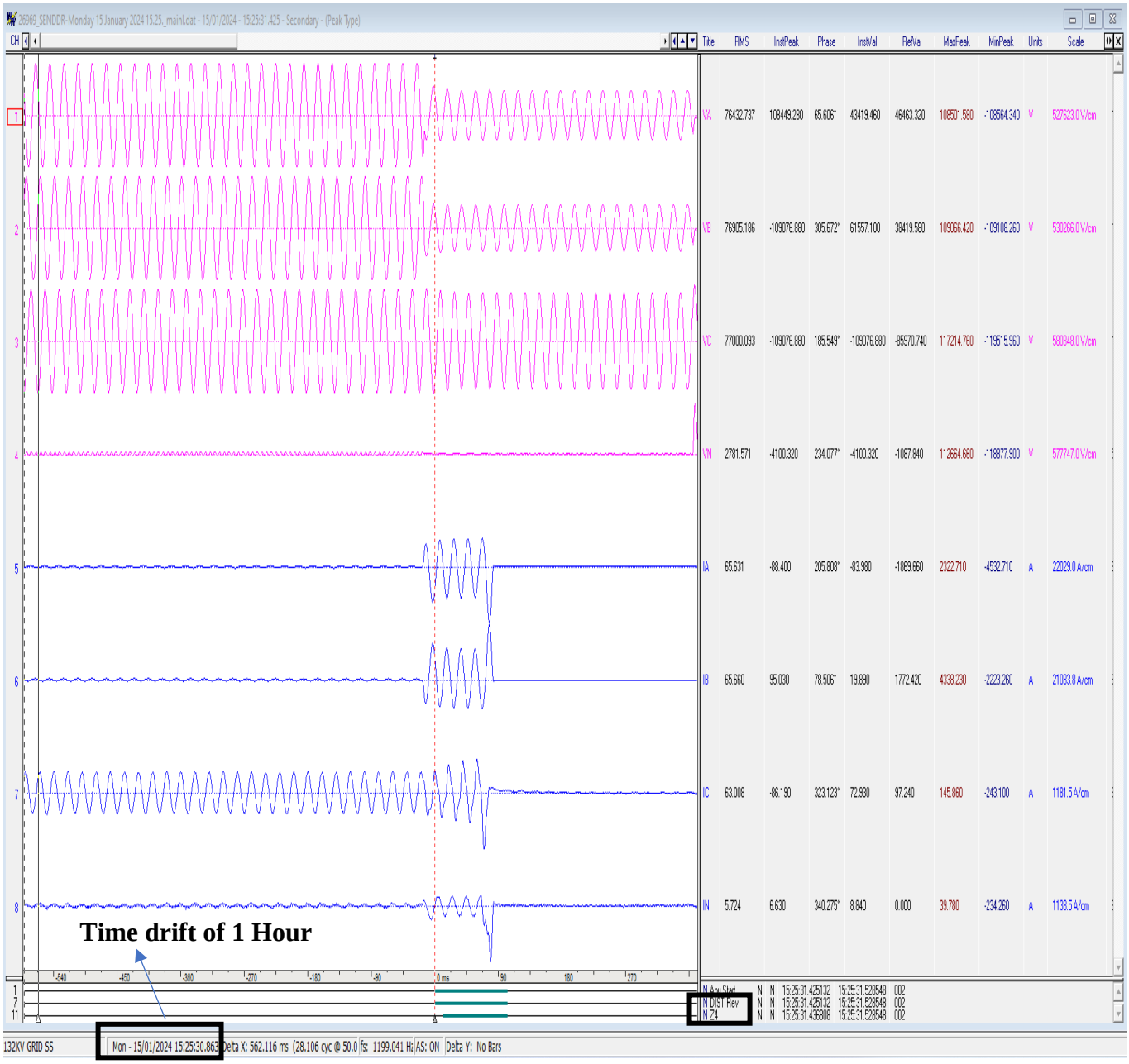
4.2. DR Snapshot of Agartala for 132 kV Agartala-AGTCCPP I line



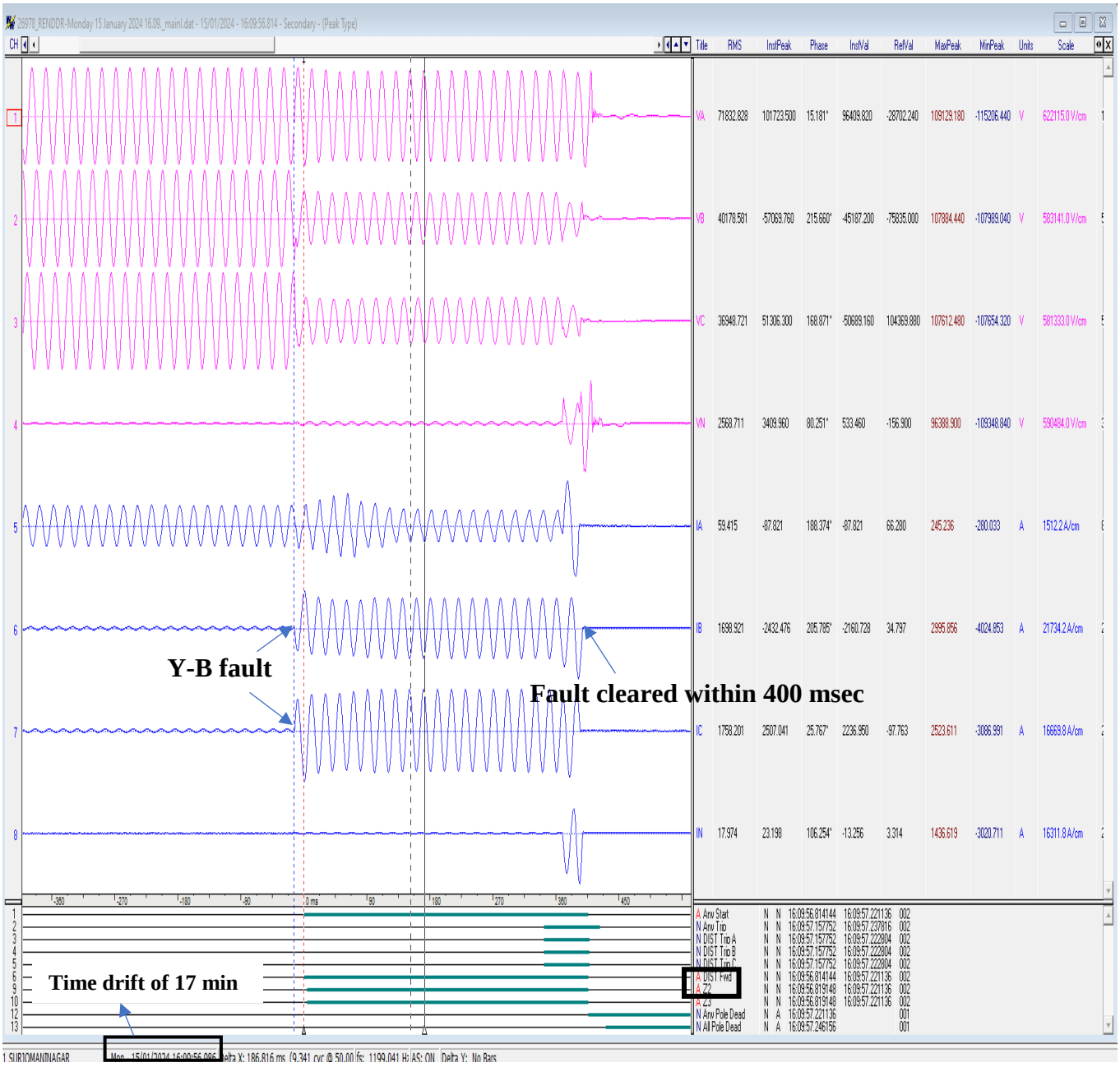
4.3. DR Snapshot of AGTCCPP for 132 kV Agartala-AGTCCPP II line



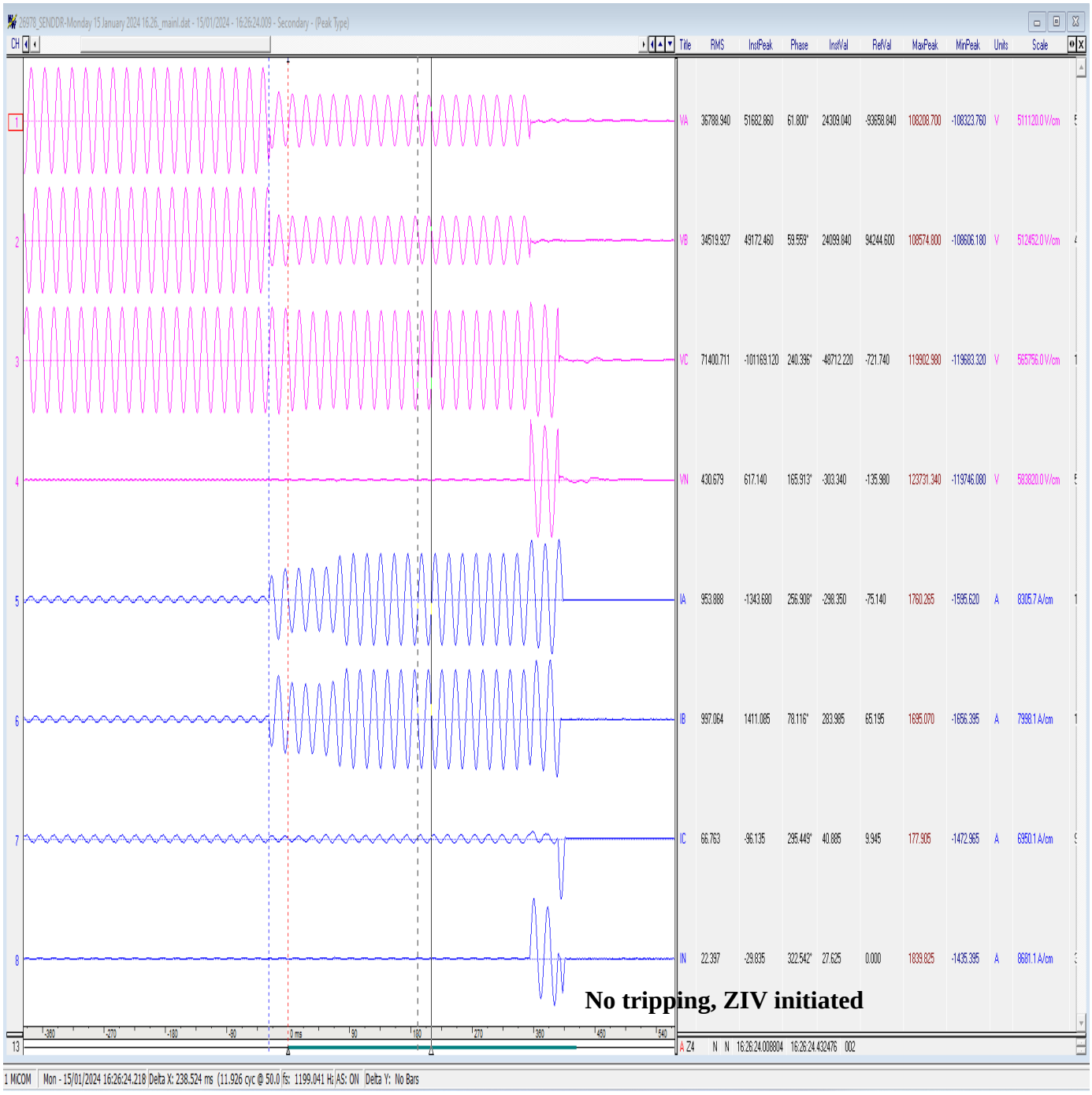
4.4. DR Snapshot of Agartala for 132 kV Agartala-AGTCCPP II line



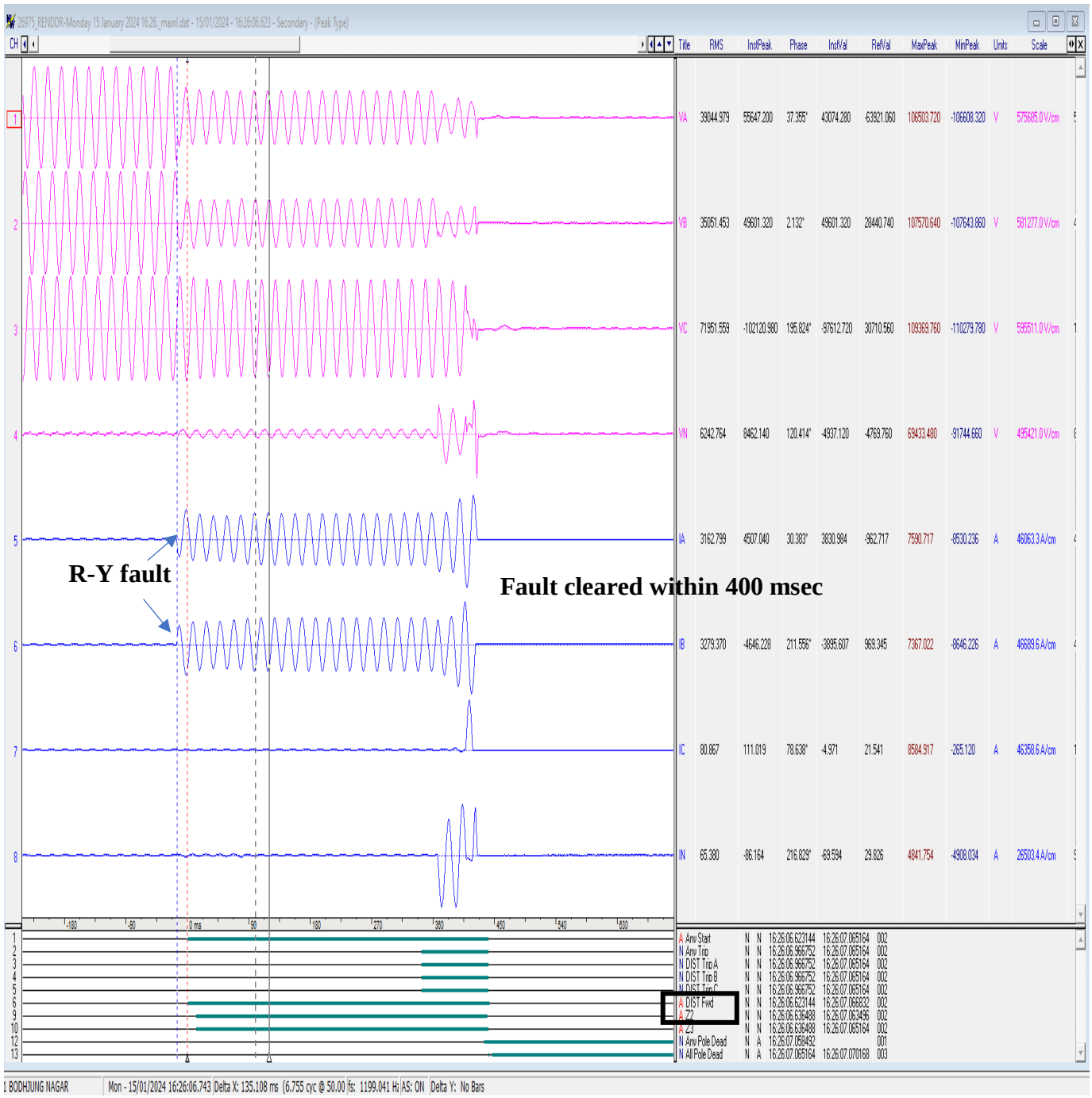
4.5. DR Snapshot of Surajmaninagar for 132 kV Agartala-Surajmaninagar I line



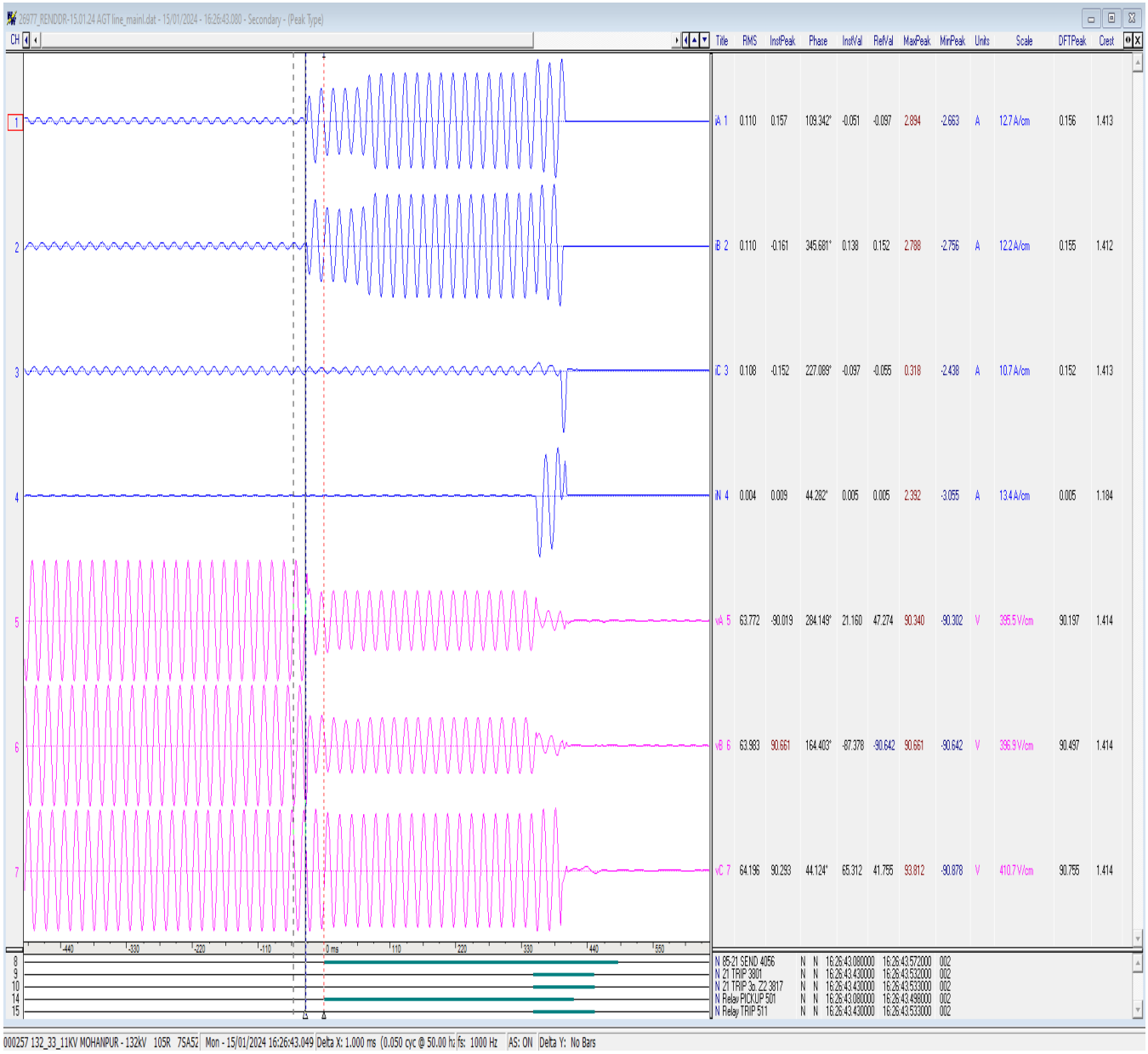
4.6. DR Snapshot of Agartala for 132 kV Agartala-Surajmaninagar I line



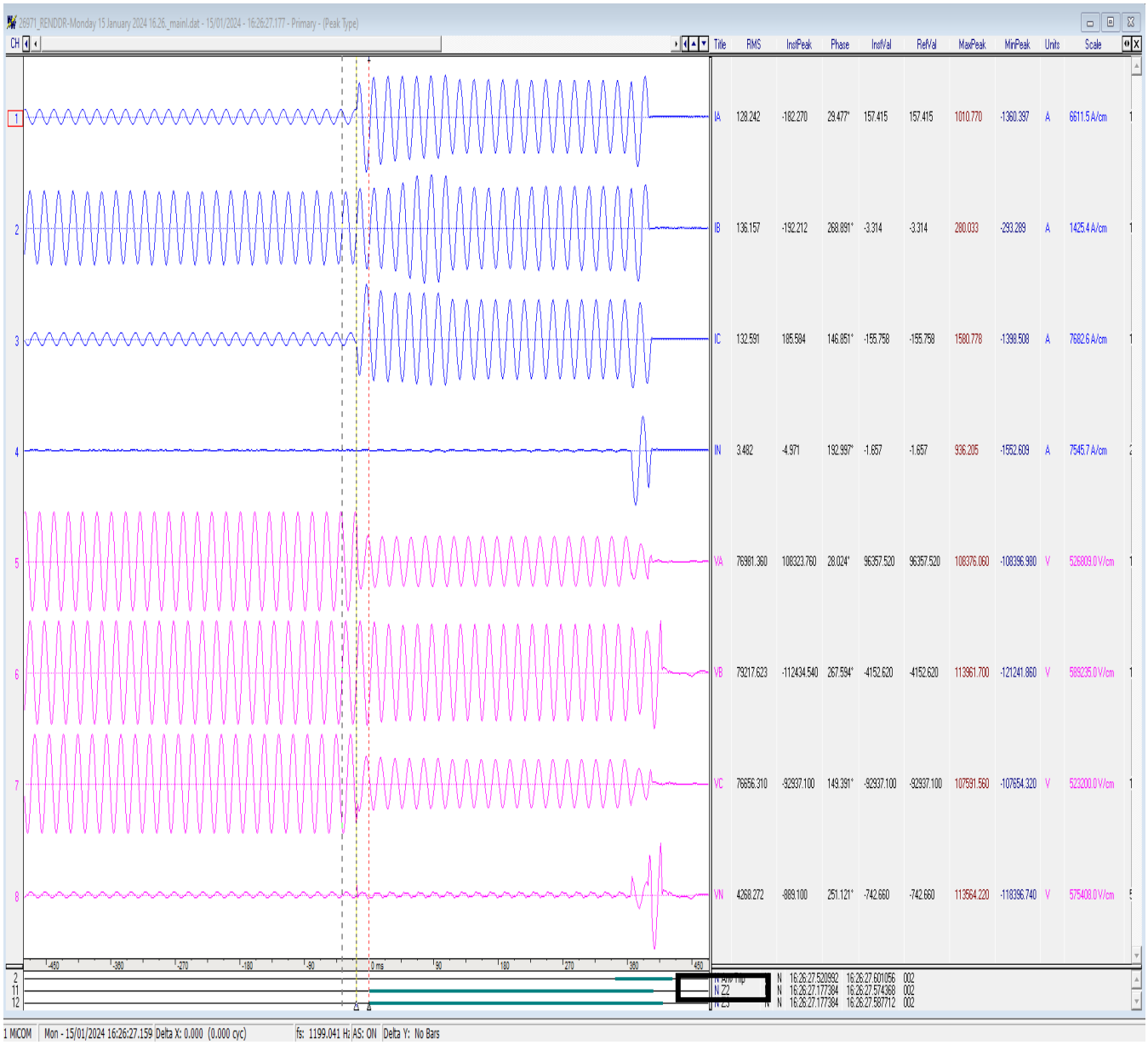
4.7. DR Snapshot of Budhjungnagar for 132 kV Agartala-Budhjungnagar line



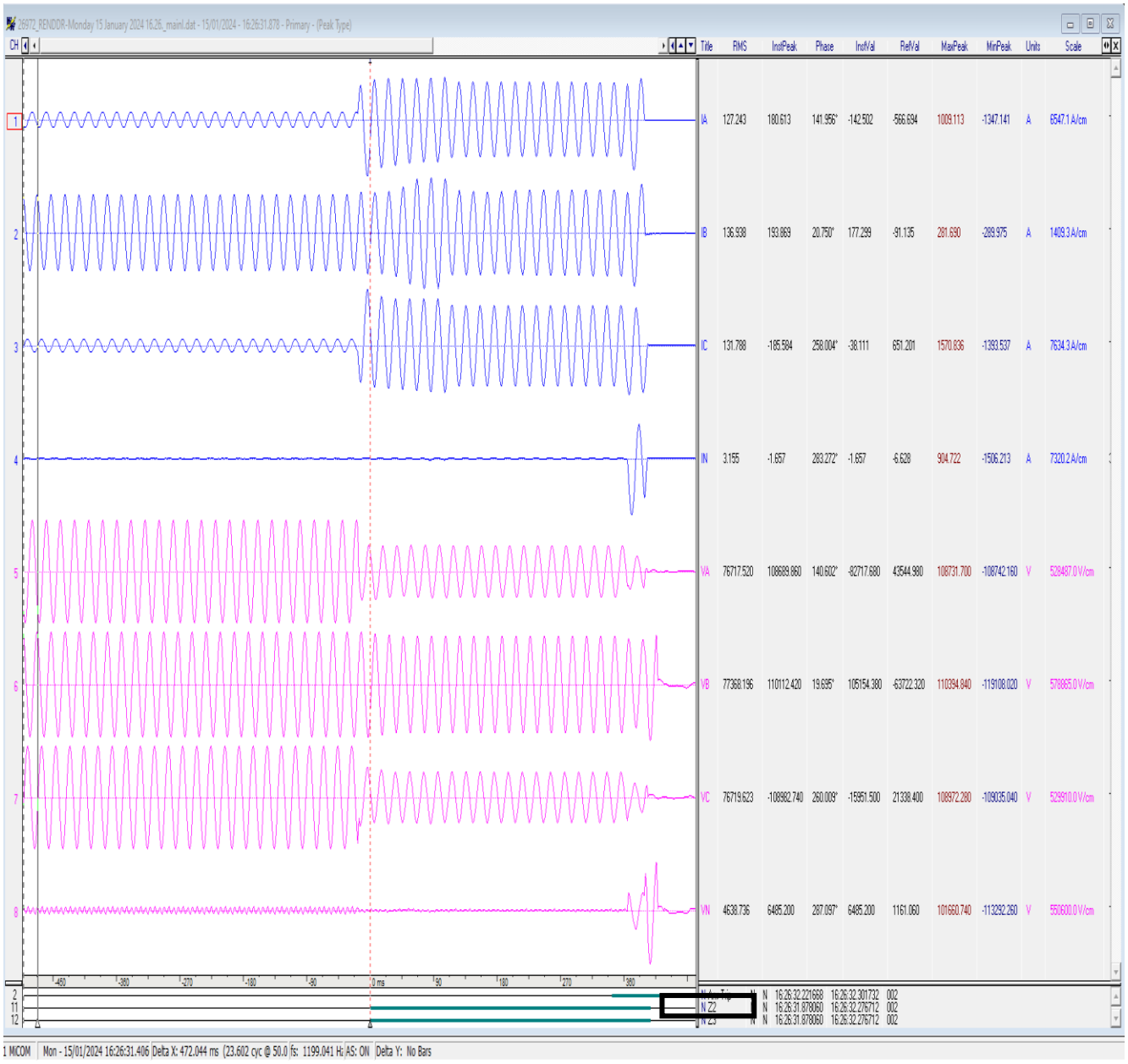
4.8. DR Snapshot of Mohanpur for 132 kV Agartala-Budhjungnagar line



4.9. DR Snapshot of Rokhia for 132 kV Agartala-Rokhia I line



4.10. DR Snapshot of Rokhia for 132 kV Agartala-Rokhia II line



**********The End**********

Annexure B.6

Line Patrolling of Transmission lines under Dhaligaon Maintenance Sub-Division

MONTHLY PATROLLING REPORT FORMAT

Approved by: xfdfsdfsd

Date of Submission: 03.02.2024
Submission of Report for the Month: January-2024
Utility: 132kV Dhaligaon GSS

SL No.	Name of the Transmission Line	Total no. of Locations	Section(s) Patrolled	Date(s) of Patrolling	Major Observations	Action Plan
1	132kV Dhaligaon-Gossaigaon S/C Line	211	01 to 145	10-01-2024 12-01-2024	Disc damaged,member rusted corridor to be cleared	Disc replacement work done , corridor cleaning work carried out
2	132kV Dhaligaon-BTPS D/C Line	75	01 to 75	13-01-2024	Stub damaged , member rusted/missing, leg damaged, corridor to be clean	Leg repairing and member replacement work in progress
3	220kV Rangia-Salakati D/C Line	125	85 to 107	25-01-2024	Corridor to be cleared	Corridor cleaning work carried out
4	132kV Gauripur-Gossaigaon Line	1 to 205	100 to 150	11.01.2024	Corridor Cleaning required	To be done
5	132kV Gauripur-Bilasipara Line	1 to 125	1 to 44	23.01.2024	Corridor Cleaning required	Corridor cleared

MONTHLY PATROLLING REPORT FORMAT

Annexure-D.8

Date of Submission:	**02/02/2024**
Submission of Report for the Month:	**Jan, 2024**
Utility:	220 kV Rangia GSS, AEGCL, Rangia

SL No.	Name of the Transmission Line	Total no. of Locations	Section(s) Patrolled	Date(s) of Patrolling	Major Observations	Action plan	Activities carried out
1	220 kV Rangia-Salakati ckt-1	203-508	508-427	17/01/2024	Corridor need to clean in Loc 500-499, 495-496, 487-486, 468-467, 444-443, 433-432	s/d availed on 25/01/24	
			427-350	20/01/2024	Corridor need to clean in Loc 412-413, 412-411, 405-406, 396-395, 391-390	s/d will be availed	
			508-427	25/01/2024		OCC approved s/d availed	Corridor cleaning activity carried out in Loc 500-499, 495-496, 487-486, 468-467, 444-443, 433-432
2	220 kV Rangia-Salakati ckt-2	203-508	508-427	17/01/2024	Corridor need to clean in Loc 506-505, 500-499, 497-496, 495-494, 490-489, 483-482, 468-467, 461-460, 433-432	s/d availed on 24/01/24	
			427-350	20/01/2024	Corridor need to clean in Loc 416-415, 405-406, 401-400, 395-394, 392-391, 384-382, 378-377	s/d will be availed	
			508-427	24/01/2024		OCC approved s/d availed	Corridor cleaning activity carried out in Loc 506-505, 500-499, 497-496, 495-494, 490-489, 483-482, 468-467
3	132 kV Rangia-Nathkuchi	01-129	96-100	01-03-2024		JCC and SLDC approved s/d availed	Corridor cleaning activity carried out 96-100
SL No.	**Name of the Transmission Line**	**Total no. of Locations**	**Section(s) Patrolled**	**Date(s) of Patrolling**	**Major Observations**	**Action plan**	**Activities carried out**
3	132 kV Nathkuchi-Barnagar	130-264	219-218	01-11-2024		JCC and SLDC approved s/d availed	Conductor repairing in Loc 219-218
			219-223	19/1/2024		JCC and SLDC approved s/d availed	Conductor repairing in 221-220 and corridor cleaning activity carried out from 219-223
4	132 kV Rangia-Sipajhar	01-129	20-51	01-02-2024		JCC and SLDC approved s/d availed	Corridor cleaning activity carried out in Loc 22-23, 26-27, 30-31, 38-39, 43-44, 50-51
			50-54	01-05-2024		JCC and SLDC approved s/d availed	Conductor repairing in 50-51 and corridor cleaning activity carried out from 50-54
			129-120	20/1/2024		JCC and SLDC approved s/d availed	Corridor cleaning activity carried out in Loc 128-129, 128-127, 127-126, 126-125, 123-124, 124-125, 122-121
5	132 kV Rangia-Tangla	64-1-72	25-42	01-04-2024	Corridor need to clean in Loc 41-40, 40-39, 39-38, 28-27, 27-26, 26-25	s/d availed on 9/1/2024	
			25-42	01-09-2024		JCC and SLDC approved s/d availed	Corridor cleaning activity carried out in Loc 41-40, 40-39, 39-38, 28-27, 27-26, 26-25
6	132 kV Sipajhar-Rowta	130-278	130-185	17/01/2024	Patrolling	s/d will be availed	
			185-239	30/1/2024	Patrolling	s/d will be availed	

MONTHLY PATROLLING REPORT FORMAT

Annexure-D.8

Date of Submission: 05/02/2024	
Submission of Report for the Month: January 2024	
Utility:ILMSD,KAHILIPARA	

SL No.	Name of the Transmission Line	Total no. of Locations	Section(s) Patrolled	Date(s) of Patrolling	Major Observations	Action Plan
1	132 kv Sarusajai-Kahilipara-Kamakya DC Transmission Line	36	14	9,10,11,12,17,18,19,20,22,23,24,27,28,29,30,31	1) HTLS reconductoring of Sarisajai-Kamakhya TL 2) tower realignment for ved vikash school at Mon Bikash Kendra. 3) Missing tower members replacement	1) HTLS reconductoring from Kahilipara to Kamakhya under progress. 2) Estimation approval progress with design. 3)Under progress
2	132 kv Kahilipara-Kamakhya-Sisugram-Kamalpur DC Transmission Line	106	45	4,5,6,7,12,18	1)HTLS reconductoring for 132kV Sarusujai-Kamakhya TL **2**) Corridor cleaning and tower creeper cleaning. 3) AAHI project at IIT 4) tower height raising for 6-lane highway 6) NHAI bridge construction height raising row issue.	1) under progress 2) ongoing. 3) survey map prepared. 4) in progress, foundation of 4 towers completed. 6) under progress
3	132 kv Kamalpur-Rangia DC Transmission Line	45	NA	04,06,07	1)corridor cleaning and tower creeper cleaning. 2)Ring road guwahati survey work	1) Ongoing. 2) Ongoing.
4	132 kv Kahilipara-MeSEB DC Transmission Line	23	4	12,13,24	1) Monopole erection and conductor stringing monitoring at Basistha	1) Monopole erection completed OPGW pending
5	132 kv Kahilipara-Capital-Narengi-Chandrapur DC Transmission Line	98	20	02,03,05,21	1)corridor cleaning and tower creeper cleaning. 2) Tower Painting and tower leg grouting required at multiple locations. 3)Ring road guwahati survey work	1) Ongoing. 2) Leg protection completed, painting pending. 3)Under progress
6	132 kv Narengi-Chandrapur-Sonapur DC Transmission Line	55	20	5,21	1) erosion at Loc-11,Loc-12 2)corridor cleaning and tower creeper cleaning. 3)Ring road guwahati survey work	1) estimate preparation in progress. 2) Completed. 3)Under progress

NOTE:- Manpower engaged in ERS at site-

SL	TL Details	Dates of engaged
1	NA	NA

MONTHLY PATROLLING REPORT FORMAT

Annexure-D.8

Date of Submission:	01-02-2024
Submission of Report for the Month:	Jan-24
Utility:	220KV Salakati GSS, AEGCL

SL No.	Name of the Transmission Line	Total no. of Locations	Section(s) Patrolled	Date(s) of Patrolling	Major Observations	Action Plan
1	132KV Kokrajhar-Bilashipara I & II	79	75-69, 52-40, 37-24	03-01-2024	No Major issues	
2	132KV BTPS-Kokrajhar I & II	39	20-28	04-01-2024	No Major issues	
3	220KV BTPS-Rangia I & II	86	30-40 76-80	08-01-2024 24-01-2024	No Major issues	
4	220KV BTPS-Agia I & II	160	120-141 95-110	05-01-2024 19-01-2024	No Major issues	

MONTHLY PATROLLING REPORT FORMAT

Annexure-D.8

Date of Submission: 03/02/2024
Submission of Report for the Month: January,2024
Utility: AEGCL

SL. No.	Name of the Transmission Line	Total no. of Locations	Section(s) Patrolled	Date(s) of Patrolling	Date(s) of Shutdown	Major Observations	Action Plan
1	220KV Agia -BTPS-I/ BTPS-II	52 (Agia Jurisdiction)	Loc. No. 169 to 154	01.01.2024	-	Vegetation found	
2	220KV AGIA-BTPS I	52 (Agia Jurisdiction)	-	-	02.01.2024	-	Cleared
3	220KV AGIA-BTPS II	52 (Agia Jurisdiction)	-	-	03.01.2024	-	Cleared
4	220KV Agia -Mirza/ Boko TL	106 (Agia Jurisdiction)	Loc no. 12 to 42	06.01.2024	-	Vegetation found	
5	220KV AGIA-BOKO	106 (Agia Jurisdiction)	-	-	08.01.2024	-	Cleared
6	220KV AGIA-MIRZA	106 (Agia Jurisdiction)	-	-	09.01.2024	-	Cleared
7	220KV Agia -BTPS-I/ BTPS-II	52 (Agia Jurisdiction)	Loc. No. 191 to 170	17.01.2024	-	Vegetation found	
8	220KV AGIA-BTPS II	52 (Agia Jurisdiction)	-	-	18.01.2024	-	Cleared
9	220KV AGIA-BTPS I	52 (Agia Jurisdiction)	-	-	19.01.2024	-	Cleared
10	220KV Agia -Mirza/ Boko TL	106 (Agia Jurisdiction)	Loc no. 51 to 83	24.01.2024	-	Vegetation found	
11	220KV AGIA-MIRZA	106 (Agia Jurisdiction)	-	-	25.01.2024	-	Cleared
12	220kV Agia-Boko Line	106 (Boko Jurisdiction)	Tower no. 205 to Tower no. 195	08-01-2024		Vegetation cleared	
13	220kV Agia-Mirza Line	106 (Boko Jurisdiction)	Tower no. 104 to Tower no. 115	09-01-2024		Vegetation cleared	
14	220kV Agia-Mirza & Agia-Boko Line	106 (Boko Jurisdiction)	Tower no. 116 to Tower no. 130	17-01-2024		Vegetation cleared	
15	220kV Agia-Mirza & Agia-Boko Line	106 (Boko Jurisdiction)	Tower no. 131 to Tower no. 143	24-01-2024		Vegetation cleared	
16	220kV Agia-Mirza Line	106 (Boko Jurisdiction)	Tower no. 150 to Tower no. 160	25-01-2024		Vegetation cleared	
17	220kV Agia-Boko Line	106 (Boko Jurisdiction)	Tower no. 170 to Tower no. 180	30-01-2024		Vegetation cleared	
18	132 kV Agia- Hatsingimari line	203 (Hatsingimari Jurisdiction)	Loc no. 387 to 288	16.01.2024		Clean	
19	132 kV Agia- Hatsingimari line	203 (Hatsingimari Jurisdiction)	Loc no. 288 to 186	17.01.2024		Clean	
20	132 kV Agia- Hatsingimari line	203 (Hatsingimari Jurisdiction)	Loc no. 387 to 288	30.01.2024		Clean	
21	132 kV Agia- Hatsingimari line	203 (Hatsingimari Jurisdiction)	Loc no. 288 to 186	31.01.2024		Clean	

Annexure-D.8

MONTHLY PATROLLING REPORT FORMAT

Date of Submission:	02.02.2024
Submission of Report for the Month:	Jan-24
Utility:	AEGCL

SL No.	Name of the Transmission Line	Total no. of Locations	Section(s) Patrolled	Date(s) of Patrolling	Major Observations	Action Plan
1	400kV Mirza-Silchar Line	14	1,2,3,4,	05.01.2024		
			5,6,7,8,	11.01.2024		
2	400kV Mirza-Bongaigaon Line		9,10,11,	18.01.2024		
			12,13,14	24.01.2024		
3	132kV Mirza-Azara Line	29	1,2,3,4,5,6,7	05.12.2023	Routine Patrolling Done	
			8,9,10,11,12,13	14.12.2023		
			14,15,16,17,18,19,20,21,22	19.12.2023		
			23,24,25,26,27,28,29 & Gantry Tower	27.12.2023		

MONTHLY PATROLLING REPORT FORMAT

Annexure-D.8

Date of Submission: 03-2-2024

Submission of Report for the Month: Jan' 2024

Utility: AEGCL

SL No.	Name of the Transmission Line	Total no. of Locations	Section(s) Patrolled	Date(s) of Patrolling	Major Observations	Action Plan
1	132kV Chandrapur-Baghjap T.L.	129	Loc No. 19-25, 70-85	09-01-2024		
2	220 kV D/C Langpi-Sarusajai T.L.	290	Loc No. 279-285	02-01-2024	Trees & Bamboo trees	Cleared during Shutdown
			Loc No. 79,78,77,76,75	11-01-2024		
			Loc No. 233-234	30-01-2024		
			Loc No. 221,224,226,229,230	30-12-2023		
3	220 kV Samaguri-Jawaharnagar T.L.	127	Loc No. 51-47	03-01-2024	Trees & bamboo	Cleared
4	220 kV Sonapur-Sarusajai T.L.	141	Loc No. 42-45, 1-4	12-01-2024	Trees & bamboo	Cleared
5	220 kV Sonapur-Samaguri T.L.	73		12-01-2024	Trees & bamboo	Cleared

MONTHLY PATROLLING REPORT FORMAT

Annexure-D.8

Date of Submission:	03-02-2024
Submission of Report for the Month:	January
Utility:	Sarusajai Division, AEGCL

SL No.	Name of the Transmission Line	Total no. of Locations	Section(s) Patrolled	Date(s) of Patrolling	Major Observations	Action Plan
1	220kV Sarusajai - Khanapara 4ckt Tr line	40	loc no 1 (QC+6) to 13 (QB+0)	05-01-2024		
			loc no 27 (QA+0) to 35(QB+0)	08-01-2024		
			loc no 13 (QB+0) to 25(QC+0)	11-01-2024		
			loc no 1 (QC+6) to 35(QB+0)	24-01-2024		
2	220kV Sarusajai - Mirza D/C Tr line	81	loc no 352(B+3) to 368(B+0)	06-01-2024		
			loc no 404(B+0) to 398(B+0)	11-01-2024		
			loc no 368(B+0) to 384(B+0)	25-01-2024		
			loc no 313(B+0) to 284(B+3)	30-01-2024		
3	220kV Mirza -Boko and Mirza-Agia D/C Tr line section upto loc no 209	123	loc no 328(B+0) to 307(B+0)	06-01-2024		
			loc no 209(B+0) to 247(B+3)	09-01-2024		
			loc no 307(B+0) to 298(B+0)	25-01-2024		
			loc no 263(B+0) to 271(B+0)	30-01-2024		
4	220kV Sarusajai - Sonapur and GIS Jawaharnagar -Samaguri D/C CTPS section Tr line	74	loc no 74 to 66	02-01-2024		
			loc no 1 to 17	03-01-2024		
			loc no 40 to 35	05-01-2024		
			loc no 17 to 27	08-01-2024		
			loc no 42 to 52	12-01-2024		
			loc no 52 to 65	20-01-2024		

MONTHLY PATROLLING REPORT FORMAT

Annexure-D.8

Date of Submission: 06.02.2024

Submission of Report for the Month: January'2024

Utility: TL under PSSD, Panchgram, AEGCL

SL No.	Name of the Transmission Line	Total no. of Locations	Section(s) Patrolled	Date(s) of Patrolling	Major Observations	Action Plan
1	132 kV Srikona-Pailapool Line	129	11 no's (Loc. No. 77-78, 133-137, 169-175)	05.01.2024 19.01.2024	Soil erosion near the tower base at Loc. No. 173.	As per the suggestion of AGM(i/c) Civil, vegetation done near the tower base to avoid further soil erosion.
2	132 kV Panchgram-Srikona Line	66	8 no's (Loc. No. 6-7, 10-17)	20.01.2024	Tower Loc. no. 03 collapsed and sank in Barak river in 2018.	Estimate prepared and submitted from this end for the restoration work.
3	132 kV Panchgram-Lumshnong Line	95	19 no's (Loc. no. 350-351, 355-358, 365-366, 371-377, 379-381, 383-384, 392-396, 403-404)	08.01.2024 27.01.2024 31.01.2024	No Major observations	NA
4	132 kV Panchgram-Hailakandi Line	82	6 no's (Loc. no. 19-22, 30-33)	11.01.2024	No Major observations	NA
5	132 kV Hailakandi-Dullavcherra line	107	10 no's (Loc. No. 140-144, 147-148, 152-154, 175-178)	02.01.2024	soil erosion near the tower base at Loc. no. 102, 104 & 109.	1. Temporary tower base strengthening work using bamboo palisade with gunny bags filled with sand/red soil has been completed at tower loc. no. 102 on 26.07.2022. 2. Vegetation has been done near the tower base of loc. no. 104 & 109 to avoid further soil erosion. 3. Tower schedule along with other relevant documents in connection to the shifting of the tower 102, 104 & 109 has been forwarded.
6	132 kV Panchgram-HPC	10	3 no's (Loc. 6-9)	22.01.2024	No Major observations	NA
7	132 KV DULLAVCHERRA-DHARMANAGAR (INTERSTATE) TL	100 nos. (LOC 189 TO 288 UNDER AEGCL)	loc 284 to 288 (5 nos span)	22-01-2024	Ground wire tear in between (284 to 285)	Estimate will be submitted soon
			loc 238 to 242 (5 nos span)	23-01-2024	4 Nos Leg RCC & PCC work required in tower no 241	
			loc 235 to 239 (5 nos span)	24-01-2024	No Major Observations	

Date Of Submission:	07.02.2024
Submission Of Report For The Month:	January
Utility:	132 kV Lines under Depota GSS

Sl No	Name Of The Transmission Line	Total No. Of Locations	Section(s) Patrolled	Date Of Patrolling	Major Obsevation	Action Plan
1	132kV Dhekaijuli-Rowta	24		09-01-2024	Trees, Bamboo & creapers	Cleared
2	132kV Tangla-Rowta	24	146-170	11-01-2024	Trees, Bamboo & creapers	Cleared
3	132kV Depota-Rowta		170-200	27-01-2024	Trees, Bamboo & creapers	Cleared
4	132kV Dhekaijuli-Rowta	26	200-226	30-01-2024	Trees, Bamboo & creapers	Cleared

MONTHLY PATROLLING REPORT

Annexure-D.8

Date of Submission:06.02.2024
Submission of Report for the Month: January 2024
Utility: Nagaon T&T Division , AEGCL, Samaguri

SL No.	Name of the Transmission Line	Total no. of Locations	Section(s) Patrolled	Date(s) of Patrolling	Major Observations	Action Plan
1	132kV Samaguri-Khaloigaon-D/C transmission line	1 to 75	Loc No:- 1 to 50	30.01.2024	Tree branches & Bamboo sagging observed in different Location across the line	Line checking and patrolling work
2	220KV Samaguri-Sonabil D/C transmission line	1 to 153	Loc No:-120 to 153	20.01.2024		
3	220KV Samaguri-Sonabil D/C transmission line		Loc No:-120 to 153	24.01.2024		
4	132kV Lanka-Diphu S/C transmission Line	1 to 128	Loc No:-70 to 128	02.01.2024		
5	132kV Lanka-Diphu S/C transmission Line		Loc No:-1 to 64	03.01.2024		
6	132kV Lanka-Diphu S/C transmission Line		Loc No:-1 to 128	17.01.2024		
7	220KV Samaguri-Moriani Ckt-2 transmission line	1 to 193	Loc No:-120 to 153	18.01.2024		
8	220KV Samaguri-Sonabil D/C transmission line		Loc No:-120 to 153	19.01.2024		

MONTHLY PATROLLING REPORT

Annexure-D.8

Date of Submission: 07.01.2024
Submission of Report for the Month: January 2024
Utility: 220 kV GSS , AEGCL, Samaguri

SL No.	Name of the Transmission Line	Total no. of Locations	Section(s) Patrolled	Date(s) of Patrolling	Major Observations	Action Plan
1	220kV Samaguri - Sonapur line & 220kV Samaguri - Jawaharnagar Line	(151 nos.) (162- 313)	313-162 174-313 162-309 313-170	03-01-2024 04-01-2024 11-01-2024 29-01-2024	*Missing minor members- 186,246,310	*minor tower members are required to attach
2	132kV Samaguri - Sankardevnagar D/C Line	(207 nos) 1-207	01-128 207-01 54-207 200-64 01-185	05-01-2024 10-01-2024 12-01-2024 17-01-2024 20-01-2024	*Leg Foundation Partially damaged-174 *Missing minor members-54,64,100	*PCC works required along with repairing of bracings and bituminous painting of towers *minor tower members are required to attach

MONTHLY PATROLLING REPORT	
Annexure-D.8	
Date of Submission:	**06-02-2024**
Submission of Report for the Month:	**January,2024**
Utility:	**Upper Assam Region, AEGCL**

Dibrugarh T&T Circle

SL No.	Name of the Transmission Line	Total no. of Locations	Section(s) Patrolled	Date(s) of Patrolling	Major Observations	Action Plan
1	132kV Dibrugarh-Tinsukia line(S/C)	183 (49.33km)	4	10-01-2024	Corridor cleaning at Loc.No.92 to Loc.No.102 and Loc.No.150 to Loc.No.155	Routine line inspection of 132 KV Dibrugarh-Tinsukia line without shut down.
2	132kV Dibrugarh-Behiating line(S/C)	40 (8.95km)				
3	132kV Behiating-Moran line(Up to Gammon Bridge)(S/C)	70 (23.4km)	3	06-01-2024	Creepers plants and tower footing cleaning at Loc.No. 67-75	Routine line inspection of 132 KV Behiating-Moran line without shut down.
			5	11-01-2024	Corridor cleaning at Loc.No.33 to Loc.No.36 and Loc.No.60 to Loc.No.65	Routine line inspection of 132 KV Behiating-Moran line without shut down.
4	132kV Behiating-BCPL 1 & 2 line(D/C)	29 (7.96km)	2			
5	132kV D/C Rly Dibrugarh TSS-Behiating Transmission line	37 (8.957 km)	1	04-01-2024	1st leg RCC casting at loc No.24/0 (D+0).	Supervision of newly civil constructed Rly Transmisson line bay work at Behiating GSS.
			1	05-01-2024	2nd leg RCC casting at loc No.24/0 (D+0).	Supervision of newly civil constructed Rly Transmisson line bay work at Behiating GSS.
			1	06-01-2024	column foundation work.	Supervision of newly constructed Rly bay at Behiating GSS.
			1	24-01-2024	1st & 2nd leg RCC casting at loc No.25/0 (D+0).	Supervision of newly constructed Rly Transmisson line.
6	220 KV D/C Tinsukia-Behiating (Khanikar) Transmission line	203 (53 Km)	8	25-01-2024	Throughly line checking from Loc. No.15/0 to Loc.No.22/0	Line inspection of newly constructed line.
			9	29-01-2024	Throughly line checking from Loc. No.11/0 to Loc.No.15/0	Line inspection of newly constructed line.
			9	30-01-2024	Throughly line checking from Loc. No.6A/0 to Loc.No.11/0	Line inspection of newly constructed line.
7	132KV Moran Lakwa	L234-L169			No such abnormalities observed.	line checking & also corridor clearance along the line
			LILO Point to L-212	25-01-2024		
			L-169 to L-104			
			L-169 to L-105			
			L-169 to L-106			
			L-169 to L-107			
			L-169 to L-108			
			L-169 to L-109			
8	132KV Moran Behiating	L169-L84	L-170 to L-128	04-01-2024		line checking & also corridor clearance along the line
			L-165 to L-164 ,L-159 to L-160 , L-160 to L-161 ,L-129 to L-130 , L-130 to L-131	11-01-2024		
9	220kV Tinsukia-Kathalguri D/C line	82	LOC 8- LOC 40	04-01-2024		Line patrolling and Corridor clearing done
			LOC 42- LOC 82	12-01-2024		Line patrolling and Corridor clearing done
10	220kV Tinsukia-NTPS	136	LOC 1- LOC 57	20-01-2024		Line patrolling and Corridor clearing done
			LOC 83- LOC 124	30-01-2024		Line patrolling and Corridor clearing done
11	220kV Tinsukia-NRPP	136	LOC 1- LOC 57	20-01-2024		Line patrolling and Corridor clearing done
			LOC 83- LOC 124	30-01-2024		Line patrolling and Corridor clearing done
12	132KV Tinsukia- Rupai Line	108 (From LILO Pt to Rupai)	Loc 105 to Loc 108	23-01-2024	During Shutdown of 132KV Tinsukia-Rupai line taken for corridor cleaning of big trees near the side of 132KV Tinsukia-Rupai line cutting done.	During the month of Feb'24 to take a routine checking of the corridor .
		39 (From LILO Pt to Tinsukia)	Loc 1 to Loc 39	18-01-2024	Checking done and removed trees fallen under the corridor.	
			Loc 12 to Loc 20	23-01-2024	During Shutdown of 132KV Tinsukia-Rupai line taken for corridor cleaning of big trees/ bamboos near the side of 132KV Tinsukia-Rupai line cutting done.	
13	132KV Rupai-Chapakhowa line	159	Loc 65 to Loc 82	02-01-2024	Checking done and removed trees fallen under the corridor.	
			Loc 01 to Loc 64	13-01-2024	Checking done and removed trees fallen under the corridor.	
			Loc 76 to Loc 79	20-01-2024	During Shutdown of 132KV Rupai-Chapakhowa line taken by T&C, Tinsukia for routing testing, corridor cleaning of bamboos near the side of 132KV Rupai-Chapakhowa line cutting done.	
14	132Kv Tinsukia-Margherita D/C Line	180	Loc no.26 to 33	03.01.24		Line patrolling and corridor cleaning work done
			Loc no.36 to 45	06.01.24		Line patrolling and corridor cleaning work done
			Loc no.48 to 53	19.01.24		Line patrolling and corridor cleaning work done
			Loc no.53 to 61	20.01.24		Line patrolling and corridor cleaning work done
			Loc no.175 to 177	21.01.24		Line patrolling and corridor cleaning work done, Tower cleaning work done at loc No.176
			Loc no.96 to 104	29.01.24		Line patrolling and corridor cleaning work done

Jorhat T&T Circle

SL No.	Name of the Transmission Line	Total no. of Locations	Section(s) Patrolled	Date(s) of Patrolling	Major Observations	Action Plan
1	132kV Jorhat-Mariani Circuit No. I	77	Loc 1 to Loc 40	01-11-2024	Corridor cleaning done without taking shutdown and by maintaining safe working distance. All observation reports with estimates for the line	
2	132kV Jorhat-Mariani Circuit No. II	77				
3	132KV JORHAT - TEOK - NAZIRA FDR	114	Loc 33 to Loc 67	22/1/2024	Corridor cleaning done from Loc 33 to 67. No fresh major observation noticed.	
4	220KV Mariani-Samaguri-1	2	494-495	03.01.2024		Corridor cleaning
5	220KV Mariani-Samaguri-2	4	420-419, 401-400	18.01.2024		Corridor cleaning with S/D
6	220KV Amguri-NTPS	3	130-129-128	08.01.2024		Corridor cleaning with S/D
		2	110-109	09.01.2024		Corridor cleaning with S/D
7	220KV Amguri-Mariani	6	413-412, 354-353, 349-348	11.01.2024		Corridor cleaning with S/D
8	132KV Nazira-Teok Fdr	120	200 to 235	03.01.2024	1. Chimney required:- At Loc. No. 201, 206, 207, 229 & 230 2. Corridor Cleaning Requied:- Between Loc No. 220 to 223	Repairing works is in progress
9	132KV LTPS-Mariani SC Fdr	122	282 to 236	04.01.2024	1. Chimney construction reqd.:-At Loc. No. 251 2. Beam Constructionreqd at Loc. No. 280,273,272,264,254, 248, 247, 238, 237A 3. Earthing of one leg reqd at LOC 237A, 280 4. Rusted Legs need to replaced at LOC 247, 253, 264 5. Tower Protection Works at LOC 270	Repairing works is in progress
10	132KV LTPS-Mariani SC Fdr	122	209 to 162	30.01.2024	1. Chimney construction reqd.:- At Loc. No. 196, 2. Beam Constructionreqd at Loc. No. 209 3. Earthing of one leg reqd at LOC 162, 163, 168, 175, 183	Repairing works is in progress
11	LILO of 132KV Jorhat - Nazira Ckt at Teok GSS	7	LOC 001-007;	09.01.2024	NIL	-
12	132kV Jorhat(West)-Bokakhat Line	194 (LOC No. 109-LOC No. 302)	LOC No.285 - LOC No.294	04-01-2024	NIL	NIL
			LOC No.264 - LOC No.285	05-01-2024	NIL	NIL
			LOC No.152 - LOC No.199	06-01-2024	Some bamboos and tree branches were found to be approaching the line.	A line shutdown was taken on 19.01.2024 & those bamboos & tree branches in the line corridor were cleared.
			LOC No.115 - LOC No.167	19-01-2024	NIL	NIL
13	132 kV Lanka - Diphu line	128-248	152-160	03-01-2024	Bamboos, Big trees & wild vegetation spotted.	Cleared on the same day
			160-173	09-01-2024	Wild vegetation spotted.	Cleared on the same day
			173-178	24-01-2024	Wild vegetation spotted.	Cleared on the same day
14	66 kV Bokajan - Diphu line	01-158	70-75	06-01-2024	Bamboos & wild vegetation spotted.	Cleared on the same day
			35-40	12-01-2024	Bamboos & wild vegetation spotted.	Cleared on the same day
			65-70	30-01-2024	Wild vegetation spotted.	Cleared on the same day
15	132 KV Bokajan-Dimapur Line	73	Loc. no. 367 to Loc.406	09.01.2024 & 22.01.2024	a) Encroachement within the ROW of 132 KV Bokajan-Dimapur Line.	Regarding encroachment information given to the DC of Dimapur District, Nagaland vide letter No.RE/BKJ/AEGCL/T-56/2021/113, Dt.21/06/2021 given & a public notice had been served by DC office Dimapur vide letter No. REV-11/2009-D/4291-93, Dt.04/10/2021
					b) 1 no. cross arm bend at loc. no.390	Matter informed to Division vide letter No.RE/BKJ/AEGCL/T-56/2016/278, Dt.20/08/2016 & work was passed in ZPC but no one cotractor was interested to do the work at Dimapur, Nagaland due to encroachment under the line.
					c) Ground clearance bet loc. 370(B)-371(B) is low which was measured only 4.3 mtrs.	Survey done for tower height extension purpose with the help of surveyor from Trans N Techno Associate. Kolkata on Dt. 19.12.2023.
					d) Found rusting of tower legs due to water logging & soil deposit at loc. no. 378, 392, 394, 395, 396 & 401	Tower leg stub repairing, mufflering & painting works done on emergency basis.
					e) Some trees & bamboos were growing within the corridor.	All growing trees & bamboes were cutting done on same day.
16	132 KV Bokajan-Dimapur Line	73	Loc. no. 01 to 14 & 348 to 366	02.01.2024 & 22.01.2024	a) Encroachement within the ROW of 132 KV Bokajan-Dimapur Line.	Regarding encroachment information given to the SDO (Civil) of Bokajan Sub-Divison, K/A vide letter No.RE/BKJ/AEGCL/T-56/2021/135, Dt.13/07/2021 .
					b) Found rusting of tower legs due to water logging & soil deposit at loc. no. 351	Tower leg stub repairing, mufflering & painting works done on emergency basis.
					c) Some trees & bamboos were growing within the corridor.	All growing trees & bamboes were cutting done on same day.
17	132 KV Bokajan-Sarupathar Line	100	Loc. no. 1 to 14 & 263 to Loc.348	11.01.2024 & 24.01.2024	a)Encroachement within the ROW of 132 KV Bokajan-Sarupathar Line.	Regarding encroachment information given to the SDO (Civil) of Bokajan Sub-Divison, K/A vide letter No.RE/BKJ/AEGCL/T-56/2021/135, Dt.13/07/2021 .
					b) Found rusting of tower legs due to water logging & soil deposit at loc. 271, 293, 309, 310, 315, 327 & 329.	Tower leg stub repairing, mufflering & painting works done on emergency basis on 06.07.2023, 07.07.23, 08.07.23, 10.07.23 & 26.07.2023
					c) Some trees & bamboos were growing within the corridor.	All growing trees & bamboes were cutting done on same day.
18	132kV GARMUR-JORHAT(WEST)	108 + 9 LILO TOWERS	LOC NO.1 - LOC NO. 64	03-01-2024	Few bamboos, climbers and trees need to be cut on very next S/D	Without shut down corridor cleaning drives were performed to clear the proximity of the line corridor and remaining vegetations will be cleared on very next s/d.
19	132kV GARMUR-JORHAT(WEST)	108 + 9 LILO TOWERS	LOC NO.65 - LOC NO. 108	12-01-2024	Few bamboos, climbers and trees need to be cut on very next S/D	
20	132kV Golaghat-Mariani	173	Loc No. 01---152	05-01-2024		Line Inspection and Corridor cleaning works
21	132kV Golaghat-Mariani	173	Loc No. 01---152	11-01-2024		Thermal Inspection of line done
22	132kV Golaghat-Sarupathar	134	Loc. No. 235---153	10-01-2024		Line Inspection and Corridor cleaning works
23	132kV Golaghat-Sarupathar	134	Loc. No. 262---153	19-01-2024		Thermal Inspection of line done

Lakhimpur T&T Circle

SL No.	Name of the Transmission Line	Total no. of Locations	Section(s) Patrolled	Date(s) of Patrolling	Major Observations	Action Plan
1	132KV Gohpur-Nalkata D/C Transmission Line	Total LOC=249; Maintenance of LOC by Nalkata GSS Maintenance Team= 149 nos (LOC 100-249) Maintenance of LOC by Gohpur GSS Maintenance Team= 100 nos (LOC 1-100)	Along the line (Nalkata GSS to Gohpur GSS)	03.01.2024 04.01.2024 05.01.2024 10.01.2024 11.01.2024	1. Corridor need to be cleaned. 2. Broken insulator disc replacement required.	Shutdown of Ckt- I taken on 04.01.2024, 05.01.2024 for broken insulator disc replacement work at LOC 51, 57, 60, 110, 118 & 139 and work completed succesfully & Ckt- II taken on 10.01.2024 & 11.01.2024 for broken insulator disc replacement work at LOC 57, 118, 139, 142, 150, 156 & 188 and completed succefully.
2	132KV Nalkata-Dhemaji S/C Transmission Line	Total LOC=198; Maintenance of LOC by Nalkata GSS Maintenance Team= 102 nos (LOC 01-102)	Along the line upto Subansiri. (LOC 01 to 102)	12.01.2024 13.01.2024	Corridor need to be cleared.	Opportunity Shutdown of Dhemaji Line taken on 13.01.2024 for line maintenance work.
3	132KV Nalkata-Majuli S/C Transmission Line	Total LOC=150; Maintenance of LOC by Nalkata GSS Maintenance Team= 117 nos (LOC 01-117)	Along the line upto Subansiri. (LOC 01 to 117)	08.01.2024	Corridor need to be cleared.	Opportunity S/d of Majuli Line taken on 08.01.2024 for Corridor cleaning purpose.
4	132KV North Lakhimpur-Dhemaji Transmission line	Total no. of locations= 198 (60.7 KM) Total no. of locations under 132KV Dhemaji GSS= LOC 103- LOC 198 (29.88 KM)	LOC 1-198	11-01-2024, 12-01-2024, 17-01-2024, 18-01-2024, 24-01-2024, 30-01-2024	1) 6 no. of discs has been damaged at LOC 4 2) Corridor need to be cleared at required LOCs 3-4, 11-12, 44-45, 48, 69-70, 83. 3) Rusting observed due to waterlogging condition at LOCs 94, 77, 74, 35, 34, 33, 32, 30, 28, 24, 18, 14, 8. 4) Member pieces found missing at LOCs 12, 11, 4	1) Corridor cleaning done at required locations on 13-01-2024. 2) Work order has been issued for replacement of missing tower members. 3) Estimates to be submitted for tower leg repairing and replacement of damaged discs.
5	132 KV Nalkata- Majuli S/C line.	Total No. of locations: 150 (Total KM=44.709) Total no of locations under 132KV Majuli GSS=118-150 (9.5KM)	LOC 118-150	03-01-2024 17-01-2024, 24-01-2024.	Ok	Corridor cleaned at required locations during Shutdown period on 08-01-2024.
6	132KV Dhemaji-Silapathar D/C line	Total No. of locations: 123 (Total KM=35.86 KM)	LOC 1-123	NIL	Ok	NIL

Annexure B.7

Detailed Report of grid event in < Kopili Power Station > of NER

(To be submitted by User/SLDC during Grid Disturbances/Grid Incidents/Near Miss Event as per IEGC section 37.2 (e))

Date: 05-02-2024

1. **Event Summary:** Busbar Protection (LBB) operated leading to tripping to multiple elements
2. **Time and Date of the Event:** Dec 2023 and Jan 2024
3. **Event Category:** Grid Disturbance Category 1
4. **Location/Control Area:** Kopili HEP
5. **Antecedent Conditions:**

	Frequency	State Generation (MW)	State Demand (MW)	ISGS Generation (MW)	ISTS Licensee (Voltage in kV)
Pre-Event					
Post Event					

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

Important Transmission Line/Unit if under outage (before the event)	Not Applicable
Weather Condition	Fair

6. **Load and Generation loss (in MW and MU):**
7. **Duration of interruption:**
8. **Network across the affected area:**
9. **Details of Equipment Failure (if any during the event):** Not Applicable
10. **Major Elements Tripped:** Bus I, II, Bus-Coupler, Unit 2, Misa 1,2,3 and ICT I and II

Sl no	Name	Trip time (hh:mm:ss)	Restoration time (hh:mm:ss)	Relay End 1	Relay End 2
1	Unit II				
2	Misa 1				
3	Misa II				
4	Misa III				
5	Bus Coupler				

6	Unit IV				
7	ICT I				
8	ICT II				

11. **Event Analysis (Based on PMU, SCADA & DR):** In the month of Dec 2023, Busbar protection was due to operation of end fault protection caused by faulty 'Y' Phase pole of Unit #3 GCB. The same had been replaced by a healthy pole on Dec 20th 2023.

    In the month of Jan 2024, the Main II operated the Bus 2 in LBB Back Trip leading to the tripping of all the elements connected to the Bus. In addition to this, Unit 2 connected to Bus A also got tripped due to EFP initiated by Unit 3.

12. **Protection/Operational issues observed:** After detailed analysis jointly done with GE engineer, protection issues in Flexlogic or configurational issues of the logic were found in Main II. The LBB operated on Backtrip as Re-trip was assigned to individual elements in the logic. High differential current was observed only in Main II which was due to faulty CT polarity configuration in Bus-Coupler logic. EPF initiated by Unit 3 led to tripping of Unit 2 and vice-versa was due to reversed wiring connection.

13. **Action Taken/Remedial Measures:** Due to the frequent tripping of Busbar protection, the Main II Busbar Multilin B90 Relay was disabled after taking due permission from NERPC/NERLDC. After preliminary identification of the fault, a detailed investigation was required for which shutdown was imperative as thorough checks were possible through simulation and capturing the DR/EL. Therefore, PSD was taken on 21st and 23rd and ESD was taken on 24th, 25th and 26th 2024 and all the anomalies in the configuration were resolved one by one.

    The DR and EL has already been uploaded in the tripping portal as and when such spurious tripping occurred.

    All the observed faulty conditions in wiring and configuration of logics were rectified and the system has been on service since 26.01.2024.

14. **Key Lessons Learnt:** All the tripping were spurious except for the month of Dec 2023 and is attributable to contact output configurational issues in the logic of Enervista UR Setup and hard wiring of LBB initiation in Main II only.

Manas Pratim Sharma
Sr Manager (E/M)
Kopili Power Station

Copy to:

1. **NERLDC**
2. **Affected utilities / user**
3. **MS, NERPC**

Annexure 1: Sequence of Events as per SCADA

Annexure 2: SLD of the affected Sub-station/Connectivity Diagram

Annexure 3: Disturbance recorder snips showing faults and digital signals

MOCK TEST PROCEDURE FOR SPS OPERATION SIMULATION FOR 220kV SAMAGURI – MISA CKT I & II

SPS LOGIC DEFINITION:

On event of loss of double circuits of 220kV Samaguri – Misa I & II, the power import to Samaguri will be shifted to substations in Guwahati Capital Area. To ensure stability of the network, the following elements are to be tripped at Samaguri substation:

i) 132kV Samaguri – SD Nagar Line I

ii) 132kV Samaguri – SD Nagar Line II

An average of 70MW load will be curtailed and stability of the grid will be ensured.

As per the SPS logic designed, the loss of the circuit will be recorded in the relay when all the three poles of the Circuit Breaker are found open. As such two cases are established for initiation of SPS:

CASE A: When both CBs are tripped at Samaguri end

CASE B: When both CBs are tripped at Misa end while AR is successful at Samaguri end

SPS SIMULATION:

a. A shutdown of 220kV Samaguri – Misa Line I & II and 132kV Samaguri – SD Nagar Line I & II will be availed by the respective utility in discussion with SLDC and NERLDC
b. The isolators of all the above four lines will be kept open at Samaguri, Misa and SD Nagar and thereafter, the CBs will be closed manually. The GPS time synch at the local SCADA and concerned IEDs are to be verified
c. CB of Samaguri – Misa I will be opened at Samaguri end. There will not be any SPS operation at this step (AND LOGIC verified)
d. Thereafter, CB of Samaguri – Misa II will be opened at Samaguri end. SPS would instantaneously operate and the CBs of Samaguri – SD Nagar Line I & II will be tripped at Samaguri end.
e. The event log/trip log created in the SAS and relays will be verified and instantaneous operation will be ensured.

f. Following the successful verification of 1st Case, the CBs of all the four concerned lines will be closed, with the isolators kept open at Samaguri end.

g. The healthiness of the PLCC Panel of Misa Line will be ensured. (The PLCC panel which is included in the SPS implementation)

h. The CB of Misa – Samaguri ckt I will be tripped at Misa end. No SPS operation will be ensured

i. Following this, the CB of Misa – Samaguri ckt II will be tripped at Misa. SPS would operate instantaneously and a "Direct Trip" command will be received at Samaguri. On receipt of the DT, the CBs of Samaguri – SD Nagar ckt I & II will be opened at Samaguri

j. The Sequence of events will be verified at Samaguri and Misa end (From SAS and relays)

k. On verification of the above two cases successfully, all the CBs of the lines at concerned substation will be opened and the shutdown will be returned.

l. Any discrepancy found during simulation of SPS will be recorded and rectification will be made during next scheduled shutdown.

Sl No.	**CHECKLIST**	**YES/NO**	**REMARKS**
1	Shutdown of Samaguri – Misa I at both ends		
2	Shutdown of Samaguri – Misa II at both ends		
3	Shutdown of Samaguri – SD Nagar I at both ends		
4	Shutdown of Samaguri – SD Nagar II at both ends		
5	Isolators of all concerned lines kept open at respective ends		
6	GPS Synch ensured at for all concerned substations at SAS and relays		
7	**SPS (CASE A) VERIFICATION START**		
7.1	CBs of all lines closed locally at all concerned substations		
7.2	CB of Samaguri – Misa I opened at Samaguri end and no SPS operation or spurious signals noticed		
7.3	CB of Samaguri – Misa II opened at Samaguri end and tripping of CBs of Samaguri – SD Nagar Line I & II observed at Samaguri end		
7.4	Verification of SOE/EL/Trip log/DR at Samaguri end		

7.5	Instantaneous operation hence verified successfully and no mal-operations observed		
8	**SPS (CASE B) VERIFICATION START**		
8.1	All CBs for the concerned lines are closed locally at the substations		
8.2	Healthiness of PLCC of Misa Line (including SPS DT logic) verified at Samaguri and Misa		
8.3	CB of Misa – Samaguri Line I opened at Misa end and no SPS operation observed		
8.4	CB of Misa – Samaguri Line II opened at Misa and instantaneous SPS operation observed		
8.5	CBs of Samaguri – SD Nagar Line I and II are tripped at Samaguri end as per SPS logic		
8.6	Verification of SOE/EL/Trip log/DR at Samaguri end		
8.7	Instantaneous operation observed and hence verified successfully and no mal-operations observed		
9	All the CBs are tripped manually after verification of the SPS scheme		
10	Shutdown of the concerned lines are returned successfully by the utility		
REMARKS (if any):			

Signatures of Members Present:

Annexure C.1

Name of the line	Status as updated in 56/57th PCC meeting	Latest Status
132 kV Agia - Mendipathar	PLCC works completed. AR operation configuration to commence from March'22. Latest Status to be intimated.	
132 kV EPIP II - Byrnihat D/C		
132 kV EPIP II - Umtru D/C		
132 kV Kahilipara - Umtru D/C		
132 kV Khliehriat – Mustem		
132 kV Mustem - NEHU line		
132 kV Khliehriat (MePTCL) - Khliehriat (PG) Ckt#II		
132 kV Khliehriat- NEIGRIHMS		
132 kV NEHU – Mawlai		
132 kV Mawlai - Umiam Stage I		
132 kV Mawphlang - Nongstoin		
132 kV Mawphlang - Umiam Stg I D/C		
132 kV Mawphlang- Mawlai		
132 kV Mendipathar – Nangalbibra		
132 kV Myntdu Leshka - Khleihriat D/C		
132 kV Nangalbibra – Nongstoin		
132 kV NEHU – NEIGRIHMS		
132 kV NEHU – Umiam		
132 kV Sarusajai - Umtru D/C		
132 kV Umiam - Umiam St I	By March'22	
132 kV Umiam St I - Umiam St II		
132 kV Umiam St I - Umiam St III D/C		
132 kV Umiam St III -Umiam St IV D/C		
132 kV Umiam St III - Umtru D/C		
132 kV Umtru - Umiam St IV D/C		