सत्यमेव जयते

Agenda for 70th PCCM

Azadi Ka Amrit Mahotsav

Govt. of India
Ministry of Power
North Eastern Regional Power Committee
Shillong

North Eastern Regional Power Committee

Agenda for

70th Protection Coordination Sub-Committee Meeting

Date: 08/08/2024 (Thursday)

Time: 11:00 hrs.

Venue: NERPC conference Hall, Shillong

A. CONFIRMATION OF MINUTES

1. CONFIRMATION OF MINUTES OF THE 69th PROTECTION SUB-COMMITTEE MEETING OF NERPC.

Minutes of the 69th PCC Meeting held on 11th July, 2024 (Thursday) at NERPC Conference Hall, Shillong was circulated vide letter No.: NERPC/SE (O)/PCC/2024/1644-1688 dated 24th July, 2024.

No comments were received from constituents

The Sub-committee may confirm the minutes of 69th PCCM.

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

Background: 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.

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.

Regarding audit plan of utilities, the forum requested the utilities to furnish the list of substations and audit (internal as well as third party) schedule for FY 2024-25. NERLDC Stated that a google spreadsheet has been circulated to the constituents to provide the schedule of protection audit as well as date of last audit. The forum requested the constituents to update the spreadsheet.

In 69th and 68th PCCM, following points were discussed

1. Forum requested users to update the proposed date for Internal Audit & Third-party Audit in the spreadsheet shared by NERLDC as soon as possible.
2. AEGCL updated that the internal audit has been completed and would share the report shortly. He also updated that third party audit of most of the substations were carried out by NERPC in 2021 and in January'24 and May'24. For rest of the substations, which is 132 kV Karim Ganj, the audit is to be planned soon.
3. Mizoram stated that reports of internal audit had been shared with NERPC and schedule for external audit had been updated in the google sheet.
4. TSECL updated that internal audit of 11 substations have been done and rest to be done next month. Forum requested TSECL to plan for third party audit also.
5. Manipur updated in 68th PCCM that internal audit report had been shared with NERPC. Forum requested to plan for the external audit at the earliest subject to Law and Order situation in the State.
6. DoP Arunachal Pradesh updated that internal audit of Chimpu SS was underway and audit of Lekhi would be done by June'24. He also stated that the audit reports would be shared in due time to NERPC.
7. OTPC updated that internal and external audit reports have been shared to NERPC.
8. NTPC informed that 3rd party audit has been awarded and will be done within 3 months. NTPC asked whether the protection audit includes the audit of generator

protection or not. Forum stated that generator protection audit is also included in the audit.

Regarding audit of substations of Nagaland and adjoining substations of NERTS, Forum decided that the audit of 132 kV Dimapur (DoPN) SS, 132 kV Kohima SS, 132 kV Chiepouvozou SS132 kV Zhadima SS and 220 kV Dimapur (PGCIL) will be conducted in 1st week of August'24. Further audit of rest of the 132 kV substations of Nagaland will be conducted after end of Monsoon season.

Sub-committee may deliberate

B.2 Urgent requirement of Third-Party Protection Audit of substations of MePTCL

In 64th PCCM, MePTCL had informed that third party protection audit is urgently required at 21 substations (list provided).

In 67th PCCM, MePTCL informed that six substations, viz; Killing, Mawphlang, Mawlai, NEHU, Khliehriat and Lumshnong have been shortlisted for carrying out urgent protection audit. NERPC informed that audit at these substations will be carried out shortly. Also, NERTS requested to carry out 3rd party protection audit at Khlieriat (PG) along with Khlieriat (Meghalaya) substation.

In 69th PCCM, the forum decided that audit would tentatively be conducted on 22nd and 23rd August'24.

Sub-committee may deliberate

B.3 Detailed system study to review the protection settings of NER grid as per IEGC 2023

As per regulation 14(1) of IEGC 2023, "RPCs shall undertake review of the protection settings, assess the requirement of revisions in protection settings and revise protection settings in consultation with the stakeholders of the respective region, from time to time and at least once in a year. The necessary studies in this regard shall be carried out by the respective RPCs. The data including base case (peak and off-peak cases) files for carrying out studies shall be provided by RLDC and CTU to the RPCs"

In this regard, each State has to carry out the detailed system of their grid, once a year, in order to holistically overview the protection settings in the State and present

the study report to NERPC and NERLDC. States may use the PDMS and PSCT software platforms to carry out the studies.

In 66th PCCM, NERPC stated that the States may carry out the necessary studies by using the PSCT and PDMS software of M/s PRDC.

Assam stated that for training of the software is required to impart necessary skills to the personnel of the State.

PRDC representative assured that necessary training session will be conducted for all the States. He, further highlighted that before carrying out the studies Protection settings database of the software has to be updated.

MS, NERPC directed M/s PRDC to update the database in coordination with NERPC, NERLDC and concerned utilities.

NERLDC highlighted the need to update the database in PDMS software from time to time and also requested PRDC team to model the entire power system of NER in PSCT tool for setting calculation considering recent network changes.

States further requested that a user manual of the PSCT and PDMS software may be provided for easy reference during carrying out the studies. M/S PRDC assured to provide the same at the earliest.

In 69th PCCM, M/s PRDC updated that one training session on PSCT has been conducted on 20th June'24. Further he stated that next training session will be conducted on 18th and 19th July'24. The forum requested all the utilities to update the respective network database in the PDMS.

Sub-committee may deliberate

B.4 <u>Analysis and Discussion on Grid Disturbances which occurred in NER grid in June'24 in compliance with IEGC 2023:</u>

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 July 2024 based on the draft report prepared by NERLDC (**annexure B.4**).

Sub-committee may deliberate

Agenda from NERLDC

B.5 <u>Status of submission of FIR, DR & EL outputs for the Grid Events for the month of May'2024</u>

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 01-07-2024 to 30-07-2024 as on 30-07-2024 is given below:

Name of Utility	No of trippings	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	FIR	DR	EL
DoP, Arunachal Pradesh	18	35	31	34	28	26	29	7	4	4	80	87	88
AEGCL	44	85	73	73	15	21	21	70	52	52	18	29	29
APGCL	18	18	18	18	0	0	0	18	18	18	0	0	0
MSPCL	26	34	33	33	31	21	22	3	11	11	91	67	67
MePTCL	16	17	15	15	15	13	13	2	1	1	88	93	93
MePGCL	8	13	10	12	5	8	8	8	0	4	38	100	67
P&ED, Mizoram	1	1	1	1	0	0	0	1	1	1	0	0	0
DoP, Nagaland	20	25	20	20	11	3	3	14	14	13	44	30	35
TSECL	13	24	24	24	14	20	22	10	2	2	58	92	92
TPGCL	1	1	1	1	0	0	0	1	1	1	0	0	0
POWERGRID	32	47	45	45	41	35	36	6	5	5	87	89	89
NEEPCO	49	62	55	54	54	43	41	8	8	9	87	85	83
NHPC	12	12	11	11	2	11	10	10	0	0	17	100	100
NTPC	1	1	1	1	0	1	0	1	0	1	0	100	0
OTPC	4	4	4	4	4	4	1	0	0	0	100	100	100
IndiGrid	7	10	10	10	7	7	7	3	3	3	70	70	70
MUML	1	0	0	0	0	0	0	0	0	0	No event		
KMTL	0	0	0	0	0	0	0	0	0	0	No event		

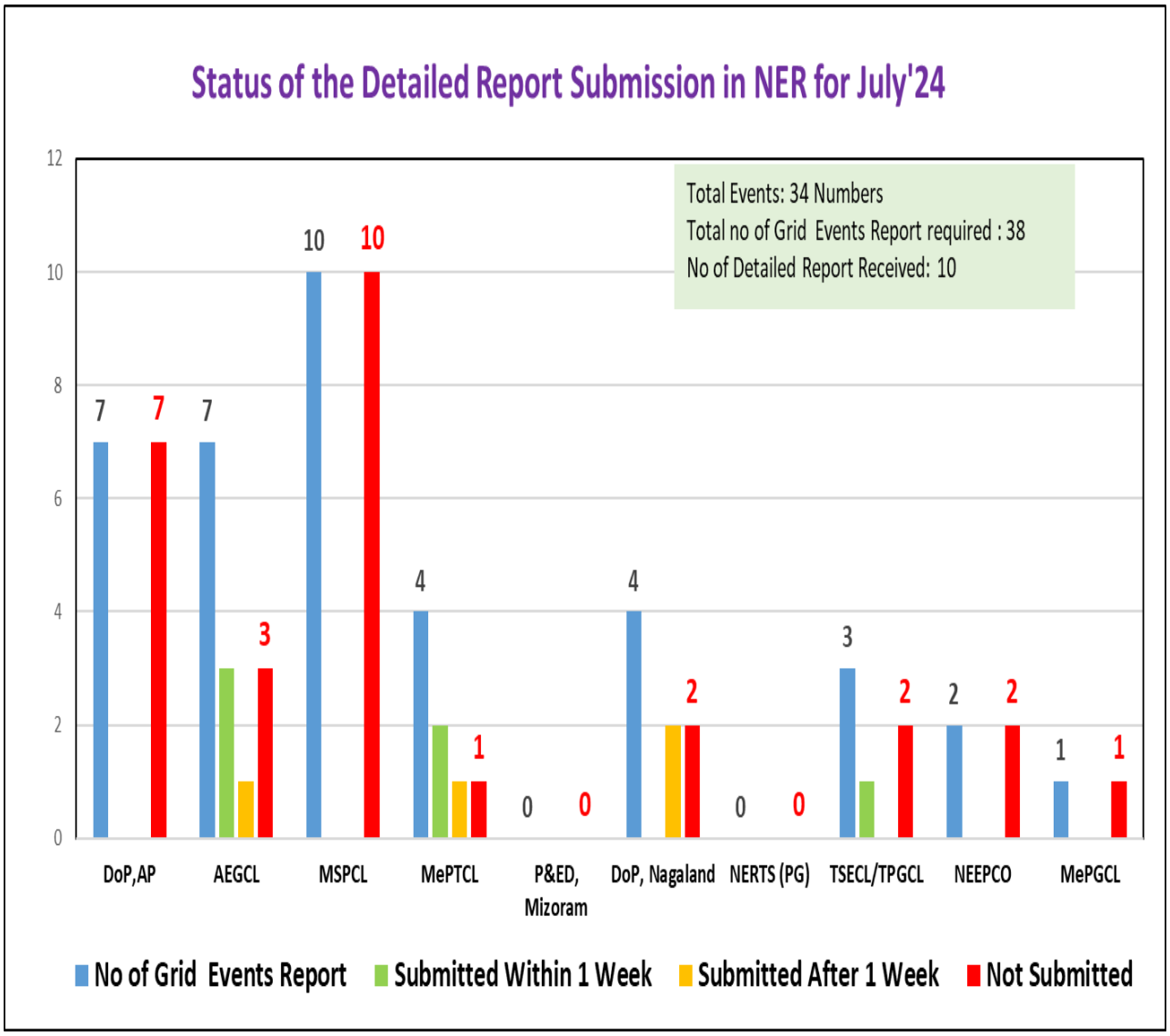
Concerned Utilities are requested to upload Disturbance Recorder (DR), Event Logger (EL) outputs for grid events along with a First Information Report (FIR) in Tripping Monitoring Portal (https://tripping.nerldc.in/Default.aspx) for analysis purpose. In light of the cybersecurity measures implemented 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.

Sub-committee may deliberate

B.6 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 as per the timeline mentioned in the cl 37.2(f).

Status of submission of the same for the month of July, 2024 as on 30-07-2024 is shown below:



All the utilities are requested to promptly share all the necessary information such as FIR, DR, EL and Reports (Flash Report & Detailed Report) as per the specified timeline mention in the Grid Code.

Sub-committee may deliberate

B.7 <u>Non-operation of auto recloser in Important Grid Elements for transient faults in July 2024:</u>

S. No	Element Name	Tripping Date and Time	RELAY_A	RELAY_B	Auto-Recloser not Operated	Remarks from Utility
1	132 kV AGTCCPP-Kumarghat Line	05-07-2024 12:45	DP, ZI, Y-B, 70.17	DP, ZI, Y-B, 30.92 Km **(AR successful)**	AGTCCPP	
2	132 kV AGTCCPP-Kumarghat Line	07-07-2024 19:37	DP, ZII, B-E	DP, ZI, B-E, 1.21 Km **(AR successful)**	AGTCCPP	
3	132 kV BNC-Gohpur Line	09-07-2024 10:43	DP, ZI, R-E, 55.63 Km, **(AR operated and TOR)**	DP, ZI, R-E (DR not submitted)	Gohpur	
4	220 kV Amguri-NTPS Line	13-07-2024 11:15	DP, ZI, 8.3 Km (DR not submitted)	Not furnished (DR not submitted)	Both ends	
5	220 kV Behiating-Tinsukia I Line	13-07-2024 15:10	DP (DR not submitted)	DP, ZI, 10.59 Km (DR not submitted)	Both ends	
6	132 kV Along-Pasighat Line	14-07-2024 09:33	DP, ZI, B-E, AR successful	DP, ZI, B-E(DR not submitted)	Pasighat	
7	132 kV Gohpur-Nirjuli Line	20-07-2024 06:43	AR successful (DR not submitted)	DP, ZI, R-E	Nirjuli	
8	132 kV Dimapur (PG)-Kohima Line	21-07-2024 12:19	DP, ZI, R-E, 2.9 Km (DR not submitted)	DP, ZI, R-E	Both ends	

S. No	Element Name	Tripping Date and Time	RELAY_A	RELAY_B	Auto-Recloser not Operated	Remarks from Utility
1	132 kV AGTCCPP-Kumarghat Line	05-07-2024 12:45	DP, ZI, Y-B, 70.17	DP, ZI, Y-B, 30.92 Km **(AR successful)**	AGTCCPP	
2	132 kV AGTCCPP-Kumarghat Line	07-07-2024 19:37	DP, ZII, B-E	DP, ZI, B-E, 1.21 Km **(AR successful)**	AGTCCPP	
9	400 kV Balipara-Bongaigaon IV Line	28-07-2024 11:34	DP, ZI, B-E, 77.9 Km (DR not submitted)	DP, ZI, B-E, 189 Km (DR not submitted)	Both ends	

Sub-committee may deliberate

B.8 <u>Submission of Protection Performance Indices by Transmission Utilities:</u>

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

It has been observed that Protection Performance Indices are not being submitted by all the users.

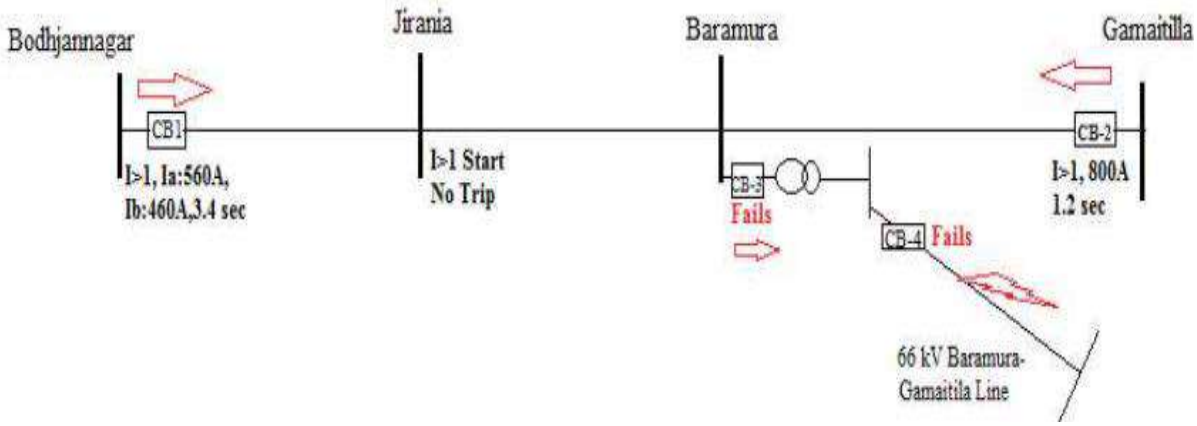
As on 30.07.2024, no user has submitted protection performance indices for the month of July'24.

Sub-committee may deliberate

B.9 Grid disturbance in Jirania area of Tripura on 07.07.2024:

Jirania area of Tripura Power System is connected with rest of NER Grid through 132 kV Budhjundnagar-Jirania & 132 kV Jirania-Baramura-Gamaitilla link.

At 16:51 Hrs of 07.07.2024, 132 kV Budhjungnagar-Jirania & 132 kV Baramura-Gamitilla lines tripped leading to blackout of Jirania area of Tripura power system. Load loss of MW occurred.



Event Analysis based on DR:

- 132 kV Budhjannagar - Jirania Line tripped from Budhjannagar on B/U OC within 3.4 sec with Ir: 560 A, Iy: 460A. There was no tripping at Jirania end.
- O/C pickup at Jirania end for 132 kV Baramura - Jirania Line. However, there was no tripping.
- 132 kV Baramura - Gamaitilla Line tripped from Gamaitilla on B/U O/C protection within 1.2 sec for fault beyond the line.

Observations:

- Fault is suspected in downstream of Baramura substation. Protection system at Baramura for downstream feeder and transformer HV side at Baramura did not operate, which resulted in delayed clearance of fault from Gamaitilla and Bodhjannagar ends.
- O/C protection at Jirania for 132 kV Jirania-Baramura line should have operated prior to Budhjungnagar end. B/U setting needs to be coordinated at Jirania for 132 kV Baramura - Jirania Line as per NER protection philosophy.

- DR time drift of 3 min at Budhjungnagar end for 132 kV Budhjungnagar-Jirania line and 10 min at Jirania for 132 kV Jirania-Baramura line recorded which needs immediate correction.

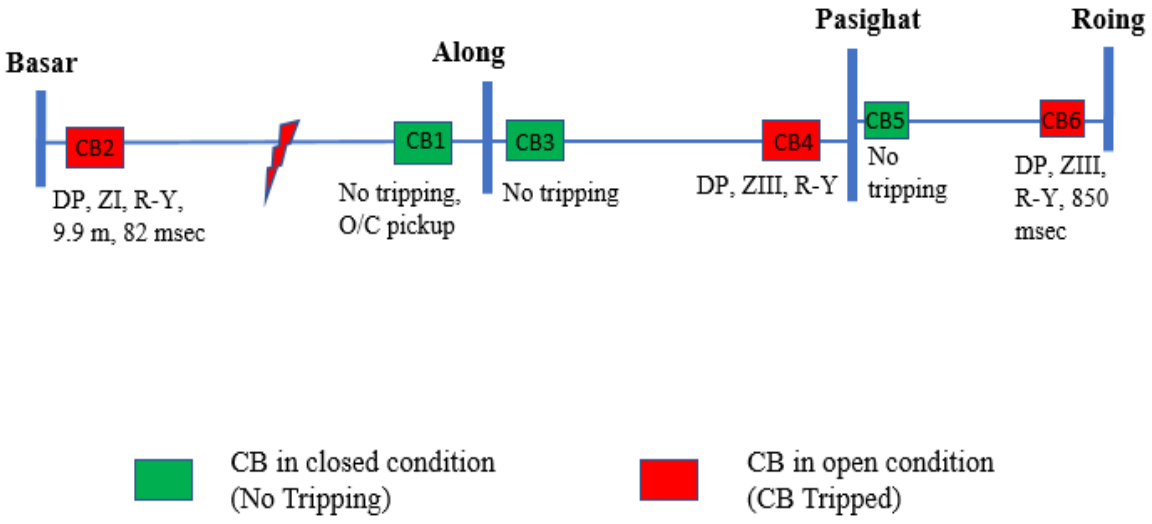
TSECL is requested to update following-

1. Root cause of tripping and remedial actions taken.
2. Reason of non-operation of protection system at Baramura for downstream feeder and transformer HV side.
3. Reason for non-tripping of Jirania CB for 132 kV Jirania-Baramura line.
4. Reason for non-submission of detailed report in compliance with IEGC 2023.

Sub-committee may deliberate

B.10 <u>Grid disturbance in Along & Pasighat areas of Arunachal Pradesh on 09.07.2024:</u>

At 12:38 Hrs of 09.07.2024, 132 kV Along - Pasighat Line, 132 kV Roing-Pasighat Line & 132 kV Along-Basar Line tripped leading to blackout of Along & Pasighat areas of Arunachal Pradesh. Load loss of 10 MW occurred.



Event Analysis: As per DR of 132 kV Along-Basar line, R-Y fault (Ir-861 A, Iy-791 A) initiated at 12:38:03.595 Hrs and cleared within 82 msec from Basar end on operation of DP, ZI. There was no tripping from Along end (I>1 pickup).

As per DR of 132 kV Roing-Pasighat line, R-Y fault cleared within 850 msec on operation of DP, ZIII from Roing. There was no tripping from Pasighat end as fault in reverse side.

Fault was in 132 kV Along-Basar line due to fallen of big tree touching two phase conductor which was not cleared from Along, leading to clearing of fault by tripping of healthy 132 kV Roing-Pasighat line from ISTS substation.

DoP AP is requested to update:

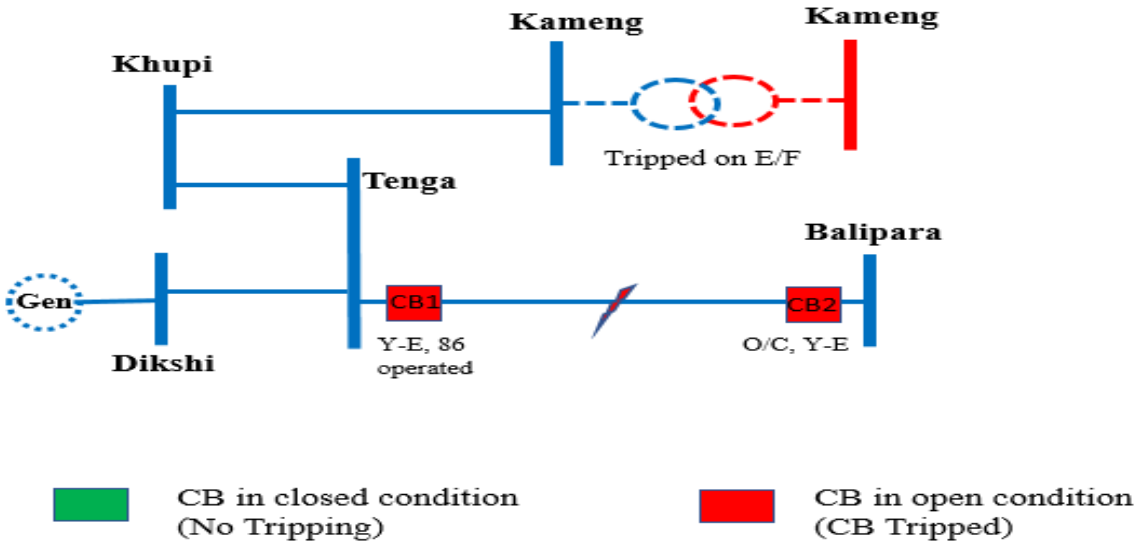
1. Reason for non-operation of protection system at Along for 132 kV Along-Basar line and its measures taken.
2. Reason for non-clearance of fault by the protection system at Pasighat for 132 kV Along-Pasighat line on B/U protection.
3. Reason for DR time drift of 2 min at Pasighat for 132 kV Along-Pasighat line and its correction.
4. Reason for non-submission of Flash report/Detailed report in compliance with IEGC 2023.

Sub-committee may deliberate

B.11 <u>Grid Disturbance in Khupi, Tenga & Dikshi areas of Arunachal Pradesh Power System:</u>

<u>Event 1: 13:42 Hrs of 09.07.2024</u>

At 13:42 Hrs of 09.07.2024, 132 kV Balipara-Tenga line and 400/132 kV, 3x40 MVA ICT at Kameng tripped leading to blackout of Khupi, Tenga and Dikshi areas of Arunachal Pradesh. Load loss of 8 MW and generation loss of 23 MW (Dikshi generation) was occurred.



Event Analysis: As per DR, resistive Y-E fault occurred in 132 kV Balipara - Tenga Line with Ib: 666A, Vbe: 75 kV, In: 598 A, fault cleared within 539 msec on B/U O/C protection from Balipara and from Tenga on 86 operation.

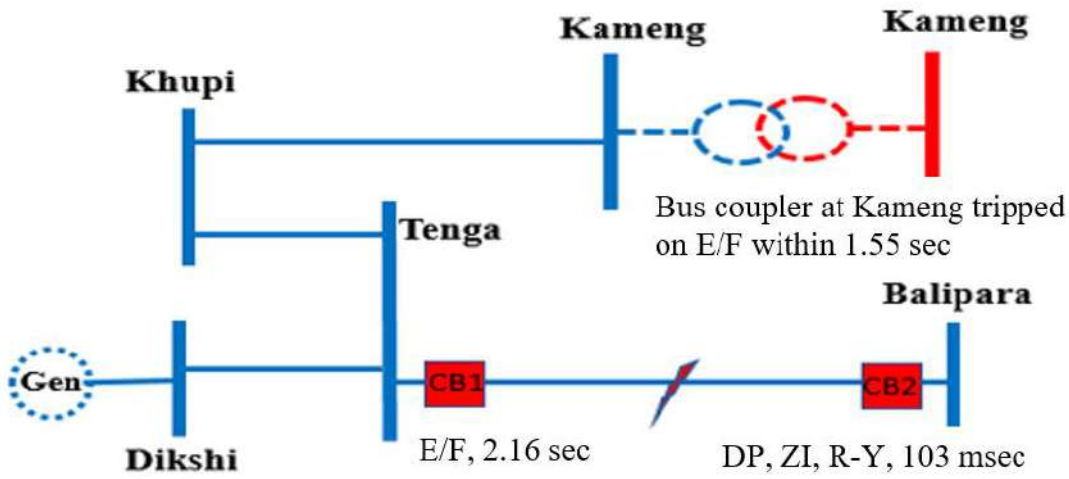
At the same time, 3x40 MVA, 400/132 kV ICT at Kameng tripped on E/F at 13:42:38.735 Hrs (Iy-193 A) which seems mis-operation.

Observations:

1. Which protection issued tripped command to CB at Tenga end is not clear from DR data. DoP, AP may update the actual protection operation.
2. Tripping of Kameng ICT on E/F for fault in 132 kV Balipara-Tenga line seems to be Unwanted. NEEPCO may update the reason for B/U EF protection operation and its corrective action (as per NERLDC observation/suggestion mail dated 15th July'24).
3. DR time needs to be standardized by NEEPCO & DoP AP:
   i) DR time duration is insufficient. It needs to be increased to 3 sec with pre fault time of 500 msec and post fault time of 2500 msec.
   ii) **Any start** digital channel needs to be configured in DR.
4. Flash report and detailed report not submitted by DoP AP, which is the violation of IEGC 2023.Reason may be updated.

Event 2: 10:43 Hrs of 19.07.2024

At 10:43 Hrs of 19.07.2024, 132 kV Balipara-Tenga line tripped. Also, 132 kV Bus Coupler at Kameng tripped which resulted in blackout of Khupi, Tenga & Dikshi areas of Arunachal Pradesh Power system. Load loss of 1 MW and generation loss of 20 MW (Dikshi)



CB in closed condition (No Tripping)

CB in open condition (CB Tripped)

Event Analysis: As per DR, R-Y fault (Ir-2.3 kA, Iy-2.1 kA) initiated at 10:42:00.106 Hrs in 132 kV Balipara-Tenga line and fault was cleared from Balipara end on operation of Z-1 within 103 msec. At Tenga end, In>1 start and In>1 tripped issued at 11:33:52.902 Hrs within 2.16 sec.

The same fault was also sensed by B/U relay of Kameng HEP bus coupler at 10:43:02.563 Hrs and tripped on Ie>1 within 1.55 sec which seems to be mis-operation.

Observations:

1. Tripping of Bus coupler at Kameng on operation of B/U E/F seems to be UNWANTED. The bus coupler setting needs to be reviewed and coordinated with B/U relay operating time of Line/ICT.
2. Neutral current of 0.249A recorded in the DR of Kameng Bus coupler which seems to be very low. The neutral current circuit needs to be checked.
3. Huge time drift of 51 minutes observed in DR of Tenga end for 132 kV Balipara-Tenga line.
4. DR needs to be standardized at Tenga.
    i) Analog neutral current needs to be configured.
    ii) Only two digital channels configured.

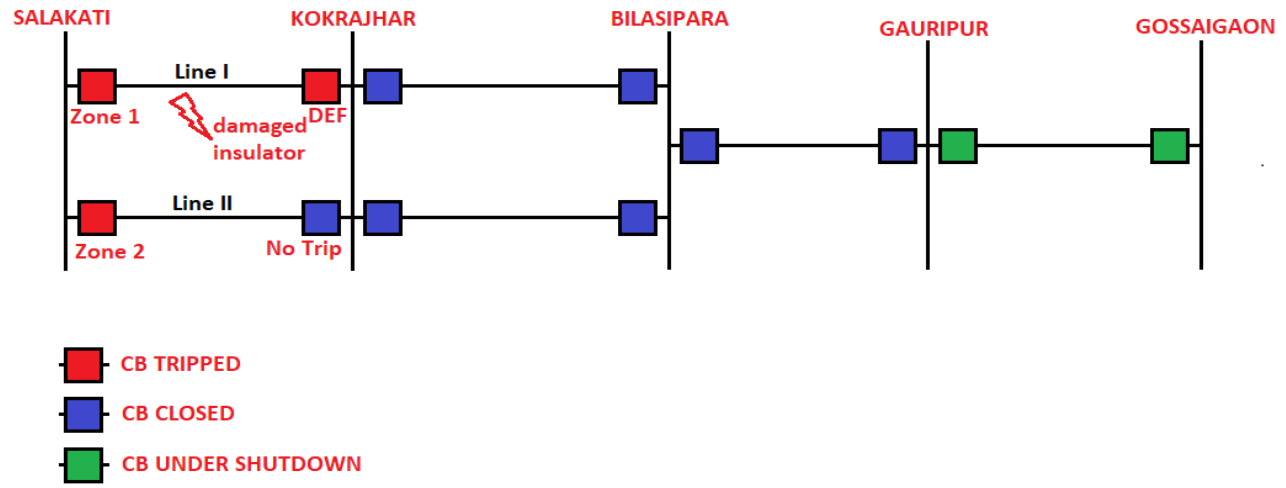
5. Protection setting from Khupi to Tenga to Balipara needs to be reviewed and coordinated as per NER protection philosophy.

NEEPCO & DoP AP is requested to update the root cause and remedial measures taken.

B.12 Grid Disturbance in Kokrajhar, Bilasipara and Gauripur areas of Assam Power System on 11.07.2024:

Kokrajhar, Bilasipara and Gauripur areas of Assam Power System were connected to NER Power system via 132 kV BTPS – Kokrajhar D/C lines. 132 kV Gauripur – Gosaigaon line was kept opened for load segregation purpose.

At 03:55 Hrs. of 11-07-2024, 132 kV BTPS – Kokrajhar I & II lines tripped leading to blackout of Kokrajhar, Bilasipara and Gauripur areas of Assam. Load loss of 25 MW occurred.



Event Analysis: As per DR, solid B-E fault occurred in 132 kV BTPS-Kokrajhar I line at 03:55:38.044 Hrs and cleared within 60 msec on DP, ZI from BTPS end. DEF operated at Kokrajhar end (no DR submitted).

Same fault was also sense by DPR at BTPS for 132 kV Kokrajhar II line and cleared within 408 msec on DP, ZII. There was no tripping from Kokrajhar end as reverse fault.

As informed by AEGCL, fault was due to failure of polymer insulator disc at Loc.26 in 132 kV BTPS-Kokrajhar I line.

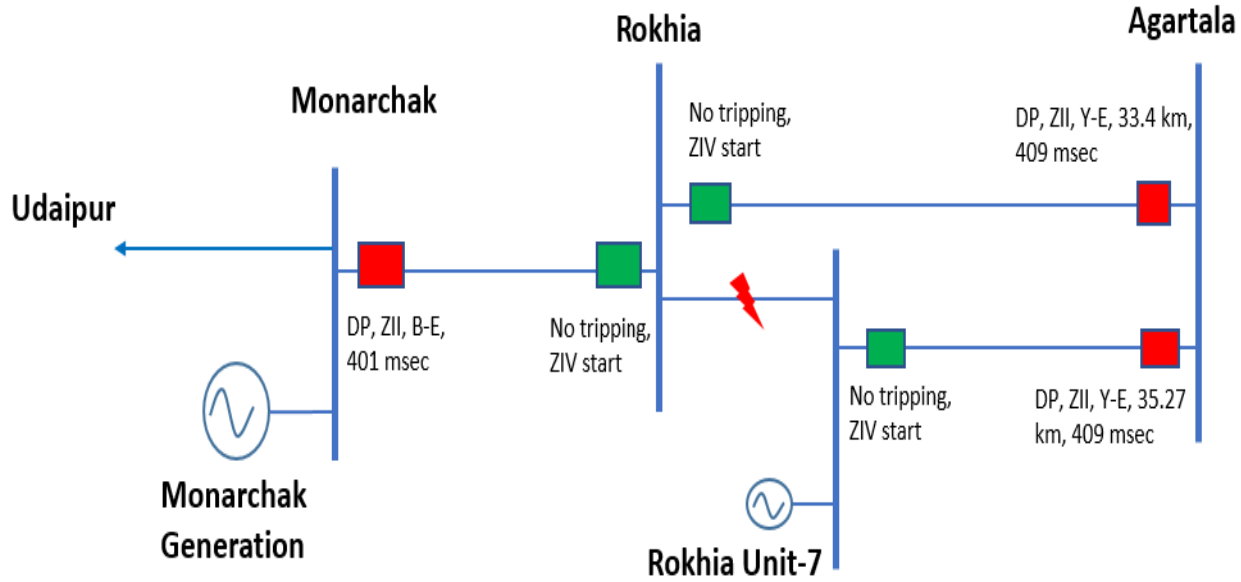
AEGCL is requested to update the reason for non-operation of distance protection at Kokrajhar for 132 kV BTPS-Kokrajhar I line and review status of DEF setting.

Similar type of GD event occurred at 12:22 hrs on 16-07-2024.

1. **Grid Disturbance in Rokhia generating station of Tripura on 13.07.2024:**

Rokhia generating station of Tripura Power System is connected with rest of NER Grid through 132 kV Rokhia-Agartala I&II and 132 kV Rokhia-Monarchak lines.

At 00:27 Hrs of 13.07.2024, 132 kV Rokhia-Agartala I&II and 132 kV Rokhia-Monarchak lines tripped leading to blackout of Rokhia S/S of Tripura. Load loss of 13 MW & Generation loss of 17 MW occurred.



Event Analysis: As per DR of 132 kV Agartala-Rokhia D/C Lines, solid Y-E fault (Iy-2.1 kA, In-1.1 kA) initiated at 00:25:58.992 Hrs and cleared within 409 msec on operation of DP, ZII from Agartala. There was no tripping from Rokhia end (ZIV pickup).

At the same time, 132 kV Rokhia-Monarchak line tripped on operation of DP, ZII from Monarchak within 401 msec. ZIV pickup at Rokhia end (no tripping)

ZIV pickup at Rokhia end for all the lines clearly indicates that fault is in switchyard of Rokhia.

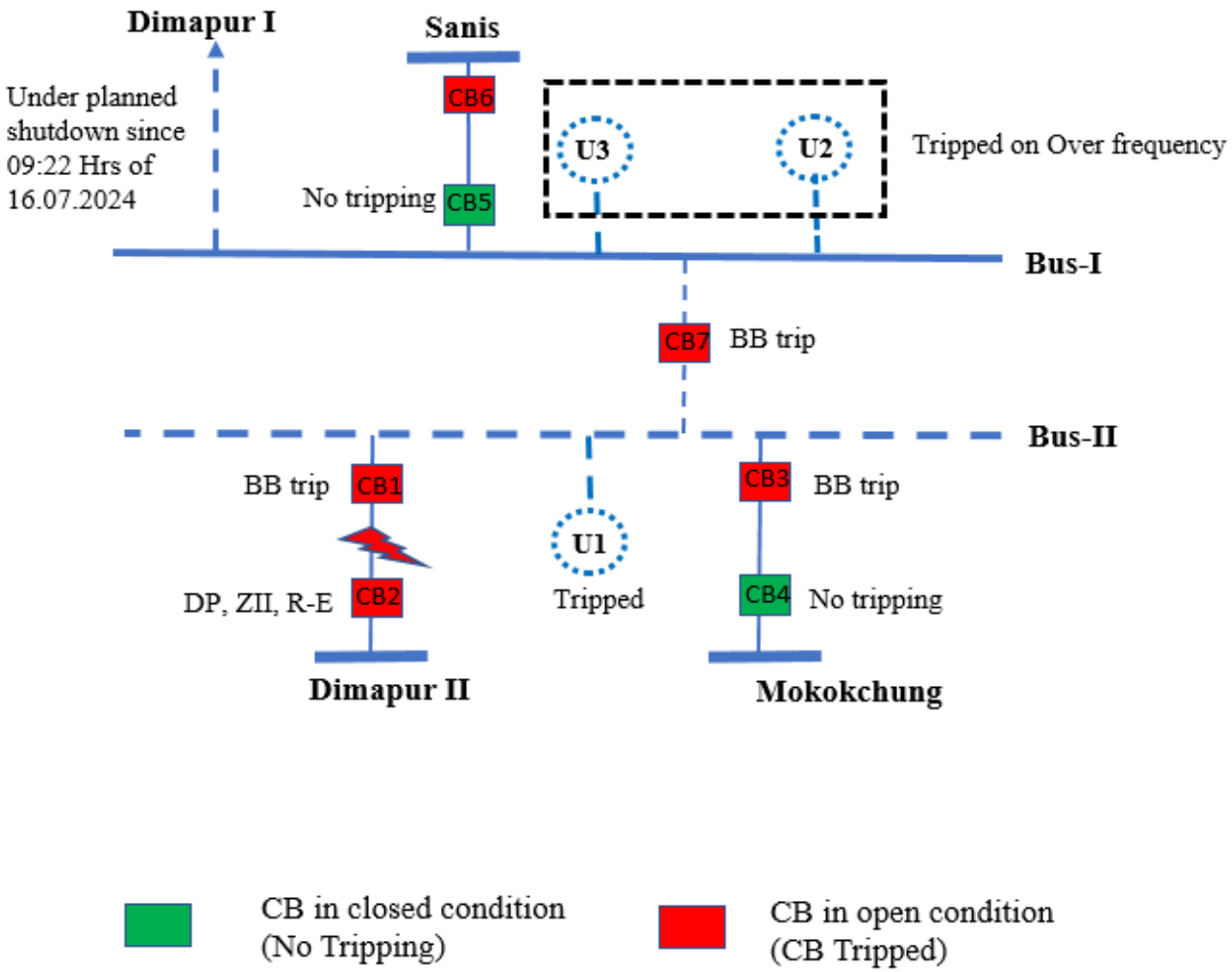
TSECL is requested to update:

1. The root cause of tripping and its remedial measures taken.
2. Update the status of installation of Line differential protection in 132 kV New Rokhia-Old Rokhia link feeder.
3. Reason for non-submission of Flash and detail report as per IEGC 2023.

Similar event occurred on 17th Nov, 2023.

B.13 <u>Grid Disturbance in Doyang generating station of NEEPCO Power System on 16.07.2024:</u>

At 10:08 Hrs of 16-07-2024, 132 kV Dimapur-Doyang II (132 kV Dimapur-Doyang I was under shutdown), 132 kV Doyang-Mokokchung and 132 kV Doyang-Sanis lines tripped. Subsequently, all three units of Doyang tripped leading to blackout in Doyang generating station of NEEPCO power system. Generation loss of 73 MW occurred.



Event Analysis: As per DR, R-E fault (Ir-1.1 kA, In-1 kA) occurred in 132 kV Dimapur-Doyang II line at 10:08:36.655 Hrs and cleared within 233 msec on operation of DP, ZII (Carrier aided trip) from Dimapur. At Doyang, R-E fault detected and Bus bar trip signal issued instantly. Y & B-phase pole of CB tripped within 52 msec. However, fault current was persisting in R-phase pole and disappeared at 10:08:36.820 Hrs on operation of ZI.

Bus coupler and 132 kV Mokokchung line tripped at Doyang on Bus bar trip leading to blackout of 132 kV Doyang Bus-II.

At the same time, 132 kV Doyang-Sanis line also tripped. There was no tripping from Doyang end (ZIV pickup). Fault current disappears within 78 msec, which may be due to tripping from Sanis end (no DR submitted by DoP)

Doyang Unit-1 tripped at 10:08:36.744 Hrs and Unit-2 & 3 tripped on over frequency.

Observations:

1. Operation of Bus bar protection at Doyang for fault in 132 kV Dimapur-Doyang II line is unwanted. Bus bar relay configuration and wiring to be checked.
2. Non-opening of R-ph CB pole at Doyang for 132 kV Dimapur-Doyang II line after issuing of BB trip.
3. Delayed ZI start after 169 msec of fault initiation at Doyang end for 132 kV Dimapur-Doyang II Line. Distance protection setting needs to be reviewed.
4. Non-tripping of Doyang Unit-1 on BB trip needs to be checked by NEEPCO. From DR data, it is not clear which protection operated.
5. DR time duration is insufficient at Doyang for 132 kV Doyang-Sanis line. It has to be increased to 3 sec with pre fault of 500 msec and post fault of 2.5 sec.

NEEPCO is requested to update the root cause and remedial measures taken.

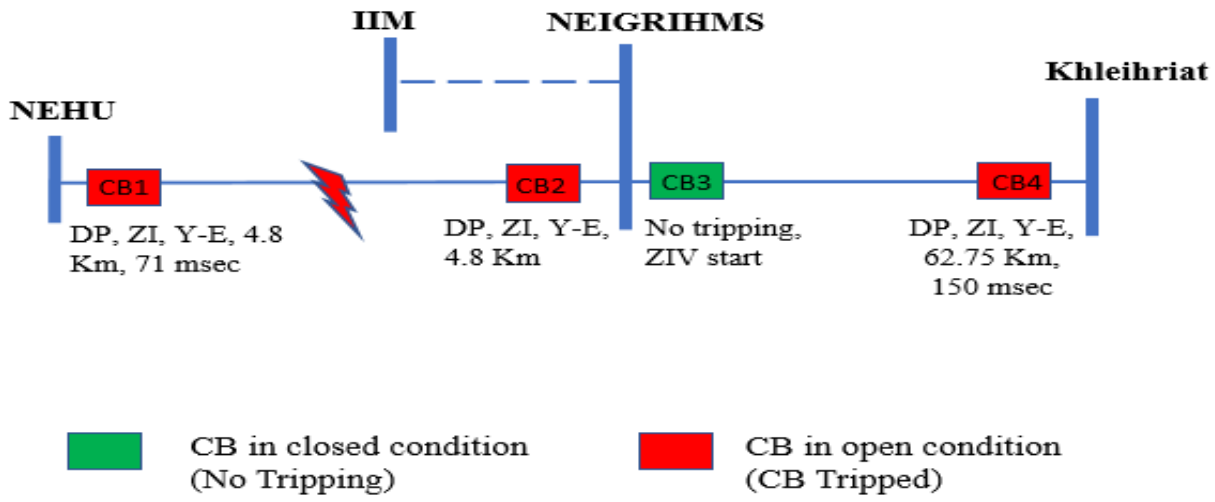
Sub-committee may deliberate

B.14 <u>Grid disturbance in NEIGRIHMS and IIM area of Meghalaya on 17.07.2024:</u>

NEIGRIHMS & IIM areas of Meghalaya power system is connected to the rest of NER grid via 132 kV NEIGRIHMS-NEHU line & 132 kV Khleihriat-NEIGRIHMS line. IIM area is radially fed from NEIGRIHMS end.

At 14:50 Hrs of 17-07-2024, 132 kV NEIGRIHMS-IIM line tripped resulting in blackout of IIM area.

At 14:56 Hrs of 17-07-2024, 132 kV NEHU-NEIGRIHMS line & 132 kV Khleihriat-NEIGRIHMS line tripped leading to blackout of NEIGRIHMS area.



Event Analysis: As per DR, Y-E fault (Ib: 5.3 kA, Vbe: 21 kV) occurred at 14:55:33.570 Hrs in 132 kV NEHU - NEIGRIHMS line at a distance of 4.844 Km from NEHU and fault cleared within 71 msec on DP, Z-1 from NEHU end. At NEIGRIHMS end, ZI operated (as per FIR, **no DR submitted**). However, fault was feeding from Khleihriat end till 150 msec.

Distance protection relay at Khleihriat for 132 kV Khleihriat-NEIGRIHMS line detected Y-E fault (Ib: 1.3 kA, Vbe: 54 kV) in ZI and cleared within 150 msec.

MePTCL is requested to provide reason for the following:

1. Tripping of 132 kV Khleihriat-NEIGRIHMS line from Khleihriat end on ZI, as fault is in 132 kV NEHU-NEIGRIHMS line. The distance protection setting needs to be reviewed by MePTCL.
2. Delayed operation of distance protection at NEIGRIHMS for 132 kV NEHU-NEIGRIHMS line and its corrective action.
3. Delay in CB opening within 100 msec after issuance of Z-I trip at Khleihriat end for 132 kV Khleihriat-NEIGRIHMS line and its remedial measures.

Sub-committee may deliberate

B.15 <u>Frequent tripping of Kopili units</u>

At 01:20 Hrs of 10.07.2024, the following elements tripped:

Sl. No.	Transmission/Generation element name	Tripped Time	Relay Indication End A	Relay Indication End B
1	132 kV Khandong-Khleihriat line	01:20 Hrs	DP, Z-1, RE, 19.57 Km, AR successful	DP, ZI, R-E, FD: 19.6 Km, A/R successful
2	Kopili Unit-3	01:20 Hrs	Ground IOC Stage 1 Operated	

Event Analysis: As per DR, solid R-E fault occurred in 132 kV Khandong-Khleihriat line, cleared within 56 msec, and Autorecloser operated successfully at both ends. Simultaneously, Kopili Unit-3 tripped due to Ground IOC operation. As per DR data, at 01:20:17.837 Hrs, Gen unbalanced pick up high was recorded with Vae: 3 kV, Vbe: 3.5 kV, Vce: 4.2 kV and CB open within 73 msec. Voltage in all phases seems to be all right as such tripping is seems to be mis-operation.

Observations:

1. It is unclear which protection issued the trip signal to the circuit breaker from DR. DR need to be standardized.
2. The settings for Ground IOC and voltage unbalance require an urgent review to prevent re-occurrence.
3. DR time duration of 1.2 seconds appears insufficient. It should be extended to 3 seconds, with a pre-fault time of 500 milliseconds and a post-fault time of 2500 milliseconds.

Similar event occurred on 13th July, 2024 & 15th July, 2024 which is the matter of great concern.

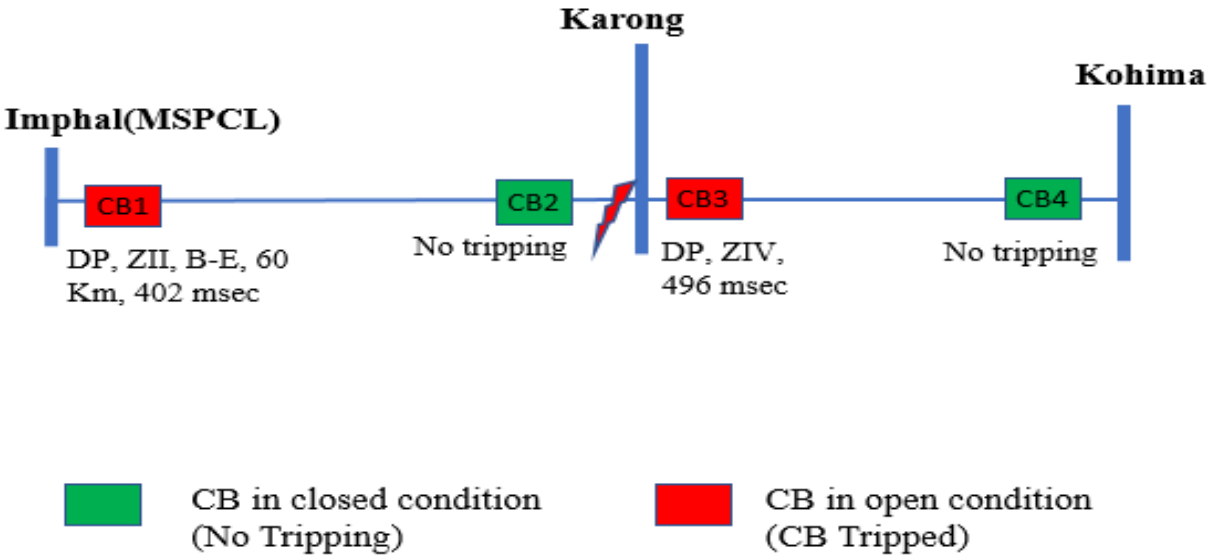
NEEPCO is requested to update the root cause corrective actions taken.

Sub-committee may deliberate

B.16 Grid Disturbance in Karong area of Manipur power system on 21.07.2024:

Karong area of Manipur Power System is connected with rest of NER Grid through 132 kV Imphal (MSPCL)-Karong and 132 kV Karong-Kohima lines. Prior to the event, 132 kV Imphal(MSPCL)-Karong line was under idle charged condition since 17:05 Hrs of 20.07.2024.

At 10:15 Hrs of 21.07.2024, while closing the breaker at Karong end for 132 kV Imphal (MSPCL)-Karong line, 132 kV Karong-Kohima Line also tripped.



Event Analysis: B-phase fault in 132 kV Imphal (MSPCL)-Karong line cleared within 402 msec on DP, ZII from Imphal (MSPCL) end.

As per EL of Karong end for 132 kV Karong-Kohima line, B-E fault cleared on operation of DP, ZIV within 496 msec from Karong end. There was no tripping from Kohima end. This clearly indicates that fault is in reverse direction.

As per information from MSPCL, tripping occurred due to tree branches coming in contact with the Bus isolator of Karong for 132 kV Imphal (MSPCL)-Karong line.

MSPCL is requested to:

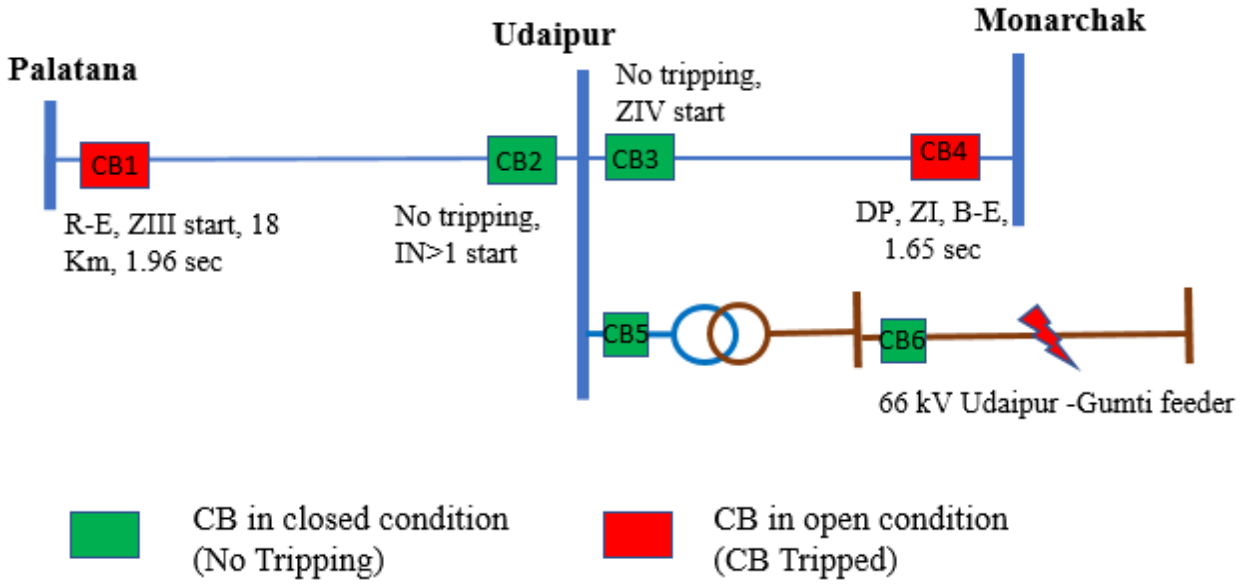
1. Furnish reason of delayed fault clearance from Karong end for 132 kV Imphal (MSPCL)-Karong line and its corrective measures.
2. Update the reason for non-submission of DR/EL of Karong end.
3. Update the reason for non-submission of Flash report/detailed report in compliance with IEGC 2023.

Sub-committee may deliberate

B.17 Grid Disturbance in Udaipur area of Tripura power system on 26.07.2024:

Udaipur area of Tripura Power System is connected with rest of NER Grid through 132 kV Palatana-Udaipur & 132 kV Monarchak-Udaipur lines.

At 11:25 Hrs of 26.07.2024, 132 kV Palatana-Udaipur & 132 kV Monarchak-Udaipur lines tripped leading to blackout of Udaipur area of Tripura. Load loss of 25 MW occurred.



Event Analysis: As per DR of 132 kV Palatana-Udaipur line, high resistive R-E fault initiated at 11:12:59.566 Hrs with Ir: 145 A, In-99 A. After 1.897 sec, ZIII pickup and all poles dead within 63 msec. It is not clear which protection issued trip signal at Palatana end. At Udaipur end, IN>1 started (Ib-298 A) and no tripping from Udaipur end.

As per DR of 132 kV Monarchak-Rokhia line, B-E fault initiated at 11:25:01.992 Hrs with Ib: 405 A, In: 318 A. After 1.59 sec, ZI started and tripped within 50 msec from Monarchak end. At Udaipur end, Z-II & ZIII pickup at 11:24:41.955 Hrs for 89 msec. Again at 11:24:42.142 Hrs, ZIV pickup at Udaipur end. However, there was no tripping from Udaipur end.

Suspected fault in downstream of Udaipur which was not cleared resulting in clearance of fault by tripping of healthy 132 kV Palatana-Udaipur & 132 kV Monarchak-Udaipur lines from remote ends.

TSECL/Palatana is requested to:

1. Update the feeder's name where fault occurred.

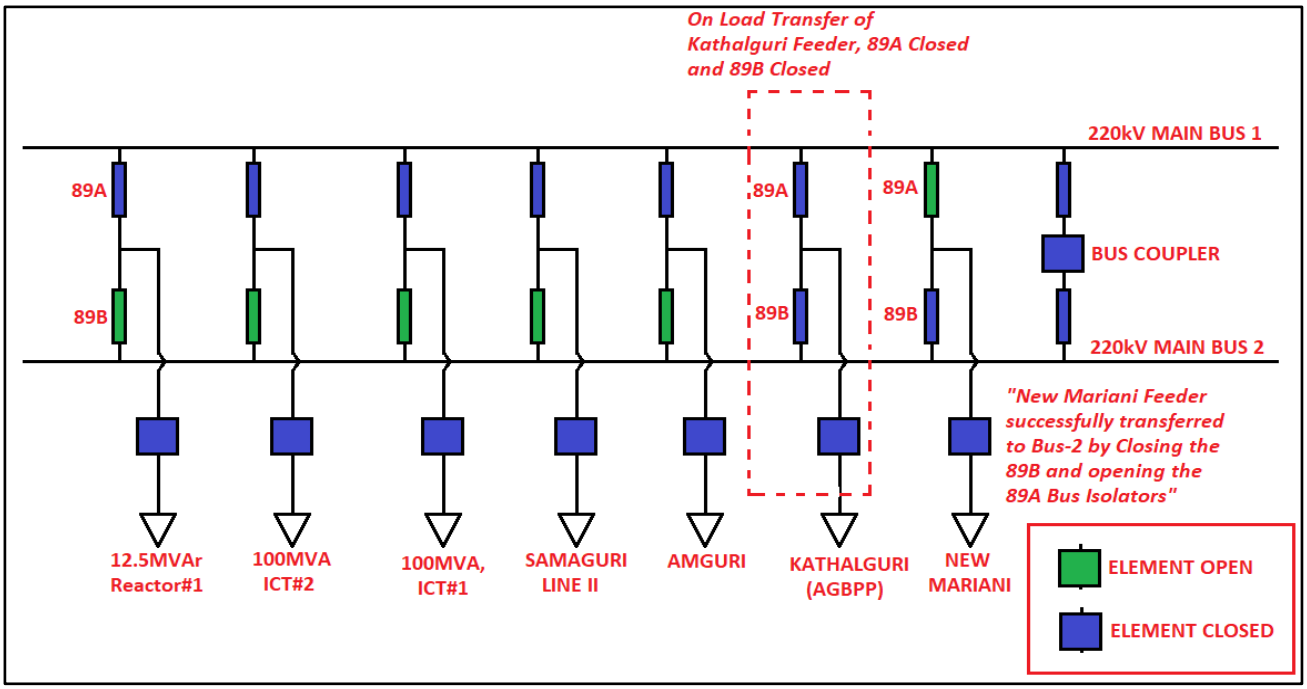
2. Furnish reason of non-operation of protection system at Udaipur for downstream feeder and transformer HV side, which led to isolation of fault from Palatana (ISGS) and Monarchak.
3. Update the Rectification status of DR time drift issue at Palatana (14 minutes time lag)

Similar downstream issue in Udaipur occurred on 31st March, 2024.

Sub-committee may deliberate

B.18 <u>Grid Disturbance (Category II) in Upper Assam on 15-07-2024:</u>

At 19:45 Hrs, R-B fault occurred at 220 kV Mariani (AS) substation while opening 89A bus isolator of 220 kV AGBPP- Mariani (AS) line from the 220 kV Bus I (following the return of ESD of 220 kV Bus II) leading to heavy flashover. This incident caused the tripping of 220 kV Mariani (AS)-Samaguri line at Samaguri on ZII (400 msecs), 220 kV AGBPP- Mariani (AS) line & 220 kV AGBPP- Mariani (AS) line at AGBPP on ZII, 220 kV Mariani (AS)- Mariani (PG) line at Mariani (AS) on Z-IV operation within 520-560 msecs. As a result, the Upper Assam power system was disconnected from the 220 kV network. Also, tripping of the 132 kV Mariani (AS)-Golaghat at Golaghat & 132 kV Along-Pasighat line at Pasighat on Overcurrent resulted in a complete blackout of Upper Assam power system.



Location/Control Area Affected: Upper Assam areas of Assam Power System and Deomali (radial from AGBPP), Pasighat, Roing, Tezu and Namsai areas of Arunachal Power System of NER.

Generation Loss: 423 MW (AGBPP:197 MW, LTPS: 55.7 MW, LRPP: 63 MW, NTPS: 17 MW, NRPP: 91 MW)

Load Loss: 324 MW (Assam: 300 MW & Arunachal-24 MW)

Protection/Operational issues observed:

- Non isolation of R-B bus fault at 220 kV Mariani (AS) Bus-I due to unavailability of Bus Bar protection, which is the non-compliance of SCHEDULE-V, Clause 4 of the CEA Technical Standards for Construction of Electrical Plants & Electrical Lines Regulation-2022. *The Bus Bar protection needs to be checked and commissioned at the earliest possible time.*
- Backup Earth fault trip for Bus Coupler at Mariani due to absence of B-Phase current. This absence may be attributed to issues in the primary B-phase path of the Bus Coupler Bay (such as hardware clamps, CB B-phase resistance etc.). *To determine the exact cause, the conductor clamps need to be inspected, and the CB static contact resistance/DCRM test should be conducted immediately.*
- Zone-III picked up at Mariani (PG) end for the bus fault at Mariani (Assam). If Zone-II at Mariani (PG) had cleared the fault within 350msec, the upstream 220 kV Kathalguri-New Mariani Line would have remained operational and the large-scale blackout may have been restricted. *The Zone-II reach setting at Mariani (PG) for 220 kV Mariani (Assam) line needs to be reviewed. The reason for any discrepancies should be identified and corrected immediately.*
- 132 kV Pasighat-Along Line tripped from Pasighat on directional OC, resulted into blackout at Chapakhowa, Roing, Tezu, Namsai & Pasighat area of Arunachal Pradesh. *OC setting at Pasighat need to be reviewed and it is to be coordinated as per NER protection philosophy.*

  There is an urgent need for Backup setting coordination for the 132 kV Rupai-Chapakhowa-Roing-Pasighat-Along-Basar-Daporizo-Zero-Paynor link due to the network changes following the commissioning of 132 kV Roing-Chapakhowa D/C.
- *The tripping of 4X50 MW Kopili generation occurred with an F>2 that needs to be reviewed. Following the V dep OC pickup, the current instantly dropped to approx. zero (Ia: 54A, Ib: 55A, Ic: 7A). The cause of this drop needs to be identified*.

According to NERLDC records, the maximum frequency during the event was 50.12 Hz. *The reasons for the relay sensing F>1 and F>2 trip should be checked and necessary correction should be made immediately.*

- One 500 MVA, ICT-I at Mariani (PG) tripped on overcurrent, with a tripping time that appears to be 516 milliseconds. *The overcurrent setting needs to be reviewed immediately, and corrective action should be taken.*
- SOE for Tripping of 132 kV Mariani (AS) - Golaghat & 132 kV Along-Pasighat not recorded in the SCADA*. The healthiness of CB auxiliary status with RTU needs to be checked and corrective action should be taken.*

AEGCL/DoP AP/POWERGRID may update

B.19 Mock testing of System Protection Scheme (SPS) related to safe evacuation of power from BgTPP(NTPC) generation:

As per Clause 16.2 of IEGC 2023, mock testing of SPS for reviewing SPS parameters & functions should be conducted at least **once** in a year.

In order to compliance the above clause, NTPC is requested to provide the tentative dates for mock testing of SPS in August'24 related to safe evacuation of power from BgTPP (NTPC) generation.

Sub-committee may deliberate

B.20 Tripping of all three ICTs at 400/220 kV Misa Substation on 29th July'24

All three 400/220 kV ICTs at Misa substation tripped at 06:11 Hrs on 29th July, which is the great concern from system reliability point of view.

Event Analysis:

Sl No	Name of Elements	DR Analysis	Observation
1	3X105 MVA ICT-I	At 06:10:28:985 Hrs, Differential protection operated with Ia-2:14.4kA, Ib-2:287A, Ic-2:16.3 kA and Ia-diff: 0.026 A, Ib-diff: 0.747A, Ic-diff: 0.741A and tripped the CB.	Bus fault in 33 kV side of ICT-1 should be isolated by the 33 kV Incomer CB.

2	500 MVA ICT-II	06:10:25.210 Hrs, tripped on I>3 with Ia: 1.26 kA, Ib: 0.211 kA & Ic: 1.67 kA, Vae: 106kV, Vbe: 212 kV, Vce: 142 kV within 50 msec.	Tripping on I>3 with 1670 A fault current within 50 msec seems mis-operation.
3	500 MVA ICT-III	At 06:10:25.152 Hrs, Differential protection operated with Ia-diff: 5 kA, Ib-diff: 2.54kA, Ic-diff: 2.55 kA and tripped the CB.	As the bus fault is in 33 kV side of ICT-1, tripping of ICT-3 on differential protection need to be checked

As informed by PGCIL, the fault occurred due to a bus fault on the 33 kV side of ICT-I at Misa.

POWERGRID is requested to:

1. Update root cause of 33 kV bus fault and remedial measures taken.
2. Update the reason of non-clearance of fault by opening of 33 kV incomer CB.
3. Update the tripping of ICT-II instantly on O/C and its corrective action (Review of IDMT O/C and high set setting).
4. Elaborate the reason of tripping of ICT-III at Misa on differential protection, as bus fault is in 33 kV side of ICT-I.

Sub-committee may deliberate

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 have 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	Respondent
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.

In 67th PCCM, AEGCL updated that Nodal officer for submission of work progress report has been nominated. Forum requested DoP Arunachal Pradesh to submit the nomination of Nodal officers to NERPC.

DoP Nagaland stated that work progress for the months of March'24 and April'24 have been submitted to NERPC.

NERPC stated that the quarterly work progress report has been prepared and will be sent to CERC shortly.

In 68th PCCM, MS, NERPC stated that the quarterly work progress report has already been sent to CERC.

DoP Ar. Pradesh updated that the nodal officer had been nominated and the details would be intimated to NERPC shortly.

In 69th PCCM, NERLDC highlighted the non-submission status of AP & Nagaland till date.

MS, NERPC stated that 2nd quarterly progress report (April-June'24) would be prepared shortly. He requested the concerned States and NERLDC to submit the monthly progress report, till June'24, to NERPC at the earliest.

Sub-committee may deliberate

C.2 Status on remedial measures actions on non-operation of auto recloser in Important Grid Elements for transient faults occurred in last few months:

As updated in 69th PCCM

Sl No	Element Name	Time	Relay End1	Relay End2	A/R not Operated	Remarks from Utility (69th PCCM)

1	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	PLCC and funding issue. AR without carrier to be enabled within one month.

SL No	Element Name	Tripping Date and Time	Relay Details_A	Relay Details_B	AR not Operated	Remarks from utility (69th PCCM)
2	220 kV Byrnihat - Misa 2 Line	23-02-2024 04:39	DP,ZI, Y-E, FD: 59.54 Km	DP,ZI, Y-E, FD: 81.019km (AR Successful)	Byrnihat	OEM arrived, work going on, to be completed by Jul end.

SL No	Element Name	Tripping Date and Time	Restoration Date and Time	Relay _A	Relay _B	Auto-Recloser not Operated	Remarks as per 69th PCCM
3	132 kV Tenga - Khupi	26-03-2024 07:35	26-03-2024 12:25	DP, ZI, R-B-E, FD: 30km	DP, ZI, R-B-E, FD:4.9 km	Khupi	B/U relay disabled, to be replaced this month
4	220 kV Mawngap - New Shillong 1	26-03-2024 12:22	26-03-2024 19:31	DP, ZI, Y-E, FD: 27.82 Km	DP, ZI, Y-E	Mawngap	BB mal-operation issue. Coordination with NERPSIP underway.
5	132 kV Dimapur - Doyang 2	29-03-2024 13:10	29-03-2024 13:31	DP, Z1, R-Y, FD: 72.6km	DP, Z1, R-Y	Doyang	CB procurement underway. By March'25

S. No	Element Name	Tripping Date and Time	RELAY_A	RELAY_B	Auto-Recloser not Operated	Remarks from Utility
6	220 kV AGBPP - Mariani (PG) Line	01-05-2024 03:12	Z1, B-N, 24.97 Kms	DP, ZI, B-E, FD: 131.4 KM, Operated Sucessfully	AGBPP	Checking by OEM to be done. By July end
7	132 kV Badarpur - Karimganj Line	05-05-2024 13:48	DP, ZII, Y-E, FD:27.25 KM, Carrier Aided tripping & AR Operated Successfully	DP, ZI, Y-E, FD: 0.2km	Karimganj	Testing to be done. Shutdown required for checking AR block issue. Shutdown yet to be planned.
8	132 kV Aizawl - Tipaimukh Line	05-05-2024 21:54	DP,ZI,B-E,FD:72.73KM	Details awaited	Aizawl	AR was blocked due to multiple carrier fail alarm, DC supply issue at Tipaimukh end. Manipur to check the DC supply. Area lying in buffer zone, difficult to reach due to Law-and-Order issue.

S. No	Element Name	Tripping Date and Time	RELAY_A	RELAY_B	Auto-Recloser not Operated	Remarks from Utility
9	132 kV Pare-North Lakhimpur 1 Line	13-06-2024 16:00	DP,ZI,R-E,FD: 7.46KM	DP,ZI,R-E,FD: 20km,1.6kA	Pare HEP(NEEPCO) & North Lakhimpur	Neepco – will check. MUML -absent. Forum requested to keep AR in Enable condition at Pare HEP for all lines.
10	132 kV Badarpur - Karimganj Line	17-06-2024 08:01	DP,ZII,B-E, FD: 22.93Kms, Carrier aided Tripping (**AR operated & ToR**)	Z1, OC, 5.04Kma, 3 ph	Karimganj (AEGCL)	AR internally blocked. To be checked during next shut down
11	400 kV P K Bari - Silchar 1 Line	18-06-2024 12:21	DP,ZI,Y-E,FD:26.19KM	DP, ZI,B-E, FD:111.62 KM **(AR Successful)**	P K Bari (INDIGRID)	AR not attempted due to carrier failed and some issues in the PLCC. To be investigated
12	220 kV AGBPP - Mariani (AEGCL) Line	26-06-2024 09:15	DP, ZI, R-E, FD:46.47 km	DP, ZI, R-E, FD:11.27 km (AR Successful)	AGBPP(NEEPCO)	Service engineer to visit shortly to investigate the matter. NERLDC highlighted that at AGBPP, Main-1: Any Trip, Virtual output

S. No	Element Name	Tripping Date and Time	RELAY_A	RELAY_B	Auto-Recloser not Operated	Remarks from Utility
						7/13, dist sig send, AR close within 306 msec high recorded but CB not reclosed

Utilities may further update

C.3 PLCC issues follow up:

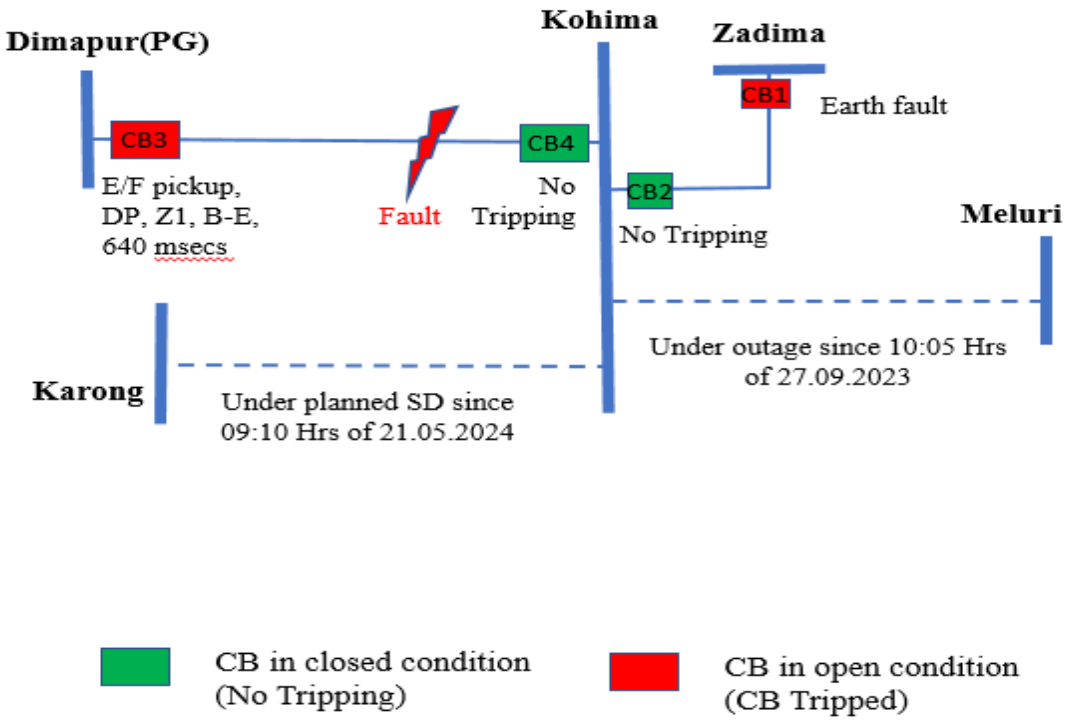
Update as provided by utilities in 69th PCCM

Sl. No	Line	Utility	Update
1	132 kV Dimapur-Kohima	DoP Nagaland	DPR is complete except for budgetary offer. Offer to be tentatively provided by July end.
2	132 kV Melriat-Zemabawk	Mizoram	NERTS updated that PLCC is available, Mizoram stated that CVT is available and WT has to be procured. Mizoram further updated that DTPC is being planned instead of PLCC. Forum suggested to ensure both PLCC and DTPC. POWERGRID shall install only the PLCC. CVT installed & got approval for Wave Trap at Zemabwk end, Mizoram likely to buy in 2 months.
4	132 kV Roing-Pashighat	DoP Ar. Pradesh	DoP Ar. Pradesh updated that there was issue with 48 V battery which would be replaced by July'24. (last status as DoP Ar.P – absent)

Utilities may further update

C.4 Grid disturbance in Kohima area of Nagaland on 21-May-24:

At **16:42 Hrs of 21.05.2024**, 132 kV Dimapur (PG) - Kohima line and 132 kV Kohima-Zadima Line tripped resulting in blackout of Kohima S/S. Load loss of 15 MW occurred.



As per DR analysis of 132 kV Dimapur-Kohima line, high resistive B-E fault occurred at 16:42:46.534 Hrs and cleared within 640 msec from Dimapur end. E/F relay pickup at Dimapur end and after around 600 msec, distance protection detected the fault and ZI operated in 40 msec. There was no tripping from Kohima end.

CB at Zadima tripped on Earth fault.

In 68th PCCM, DoP Nagland updated that the fault occurred in 132 kV Dimapur-Kohima line due to vegetation issue. Also, Fourm requested DoP Nagaland to review the Backup E/F setting at Zadima for 132 kV Kohima-Zadima line and coordinate with ZIII as per NERPC protection philosophy.

In 69th PCCM, DoP Nagaland updated that 900 ms setting for Backup E/F setting at Zadima for 132 kV Kohima-Zadima will be done by next week.

Nagaland may update

C.5 Frequent Grid disturbances in Myndtu Leshka HEP of Meghalaya Power System:

132 kV Myntdu Leshka - Khlieriat D/C lines play a crucial role in power evacuation from Leshka Generation. In the recent past, it has been observed that 132 kV Myntdu Leshka-Khleihriat 1 & 2 lines has tripped **four** times during May 2024.

The details of tripping are as follows:

Sl No.	Name of element	Date and Time of tripping	DR Analysis(End A)	DR Analysis(End B)
1	132 kV Myntdu Leshka - Khleihriat 1 Line	02-May-2024 00:45 Hrs	No tripping	Phase to E fault with Z-2, B-N, Ib: 2.3 kA, FD: 29.2 Kms and tripped within 209 msec.
	132 kV Myntdu Leshka - Khleihriat 2 Line			Phase to E fault with Z-2, B-N, Ib: 2.2 kA, FD: 36.2 Kms and tripped within 210 msec.
2	132 kV Myntdu Leshka - Khleihriat 1 Line	02-May-2024 04:10:00 Hrs	DP, ZI, R-N and tripped within 60 msec	Phase to E fault with Z-2, R-N, Ia: 2.3 kA, FD: 34.32 Kms and tripped within 198 msec.
	132 kV Myntdu Leshka - Khleihriat 2 Line	02-May-2024 04:11:00 Hrs	No tripping	Phase to E fault with Z-1, R-B-N, Ia: 2.2 kA,Ic:2.5 kA, In:1.6 kA, FD: 21.62 Kms and tripped within 65 msec.
3	132 kV Myntdu Leshka - Khleihriat 1 Line	05-May-2024 16:05:00 Hrs	DP, ZI, R-B-N and tripped within 56 msec	Phase to E fault with Z-1, R-B-N, Ia: 2.9 kA,Ic:1.8 kA, In:1.4 kA and tripped within 73 msec.
	132 kV Myntdu Leshka - Khleihriat 2 Line		DP, ZI, R-B-N and tripped within 56 msec	Phase to E fault with Z-1, R-B-N, Ia: 2.9 kA,Ic:4.2 kA, In:2.0 kA and tripped within 65 msec.
4	132 kV Myntdu Leshka - Khleihriat 1 Line	23-May-2024 14:05:00 Hrs	No tripping	Phase to E fault with Z-1, R-B-N, Ia: 2.8 kA,Ic:2.4 kA, In:1.8 kA and tripped within 66 msec.
	132 kV Myntdu Leshka - Khleihriat 2 Line			Phase to E fault with Z-1, R-B-N and tripped within 66 msec.

Following observations needs to be addressed:

1. There was no Auto reclose attempt observed. The auto-reclose (A/R) scheme should be inspected and activated to ensure the safe evacuation of Leshka generation by reclosing the line in case of single-phase fault.
2. ZII time delay need to be reviewed as per NERPC protection philosophy.
3. DR channels needs to be standardized both ends:

- DR time duration appears to be insufficient at Leshka. It should be extended to 3 seconds, with a pre-fault time of 500 milliseconds and a post-fault time of 2.5 seconds.
- DR time not synchronised, exhibiting time drift issue at Leshka & Khliehriat.
- CB status is currently not allocated in the DR digital channel. It's essential for MePTCL and MePGCL to include CB ON/OFF status in DR channels at both ends for fruitful analysis of events.

4. MePGCL is requested to ensure that patrolling related activities are undertaken as per CEA (Grid Standard) Regulation, 2010 on regular basis and measures may be identified and implemented at the earliest so as minimize tripping of these lines.

MePGCL informed in 68th PCCM, that a meeting will be held with State protection Committee regarding implementation of Auto recloser in 132 kV Leshka-Khliehriat D/C lines.

MePGCL informed in 69th PCCM that meeting of State protection Committee would be held before next PCCM.

MePGCL may further update

C.6 Grid Disturbance in Lumshnong area of Meghalaya on 30-05-2024:

Lumshnong area of Meghalaya Power System is connected to the rest of NER Grid through 132 kV Lumshnong-Panchgram and 132 kV Lumshnong-Khliehriat lines.

Event 1:

Prior to the event, 132 kV Lumshnong-Khleihriat line tripped at 06:10 Hrs of 02.05.2024.

At 07:01 Hrs of 02.05.2024, 132 kV Lumshnong-Panchgram line tripped resulting in blackout of Lumshnong area of Meghalaya.

As per DR analysis, R-E fault (Ir-1.8 kA, In-1.4 kA) initiated at 07:00:11.821 Hrs in 132 kV Lumshnong-Panchgram line cleared within 151 msec on operation of DP, ZII from Panchgram end only. ZIV start at Lumshnong end which inferred that fault is in reverse direction.

Fault is suspected in 132 kV Amrit or 132 kV Adhunik Cement line.

Event 2:

Prior to the event, 132 kV Lumshnong-Panchgram line tripped at 03:02 Hrs of 30.05.2024 from Panchgram end.

At 06:39 Hrs of 30.05.2024, 132 kV Lumshnong-Khliehriat line tripped resulting in blackout of Lumshnong area of Meghalaya.

As per DR analysis of Khliehriat end, solid R-Y-B fault (Ir-2.2 kA, Iy-2.4 kA, Ib-2,4 kA) initiated at 06:38:48.098 Hrs and fault current disappeared within 64 msec. Again, at 06:38:48.322 Hrs, Y-E fault (Iy-1.5 kA, In-1.3 kA) reappeared and fault current disappeared within 471 msec. **DP, ZIII** pickup at Khliehriat end. There was no tripping from Khleihriat end.

As per SOE, CB tripped at Lumshnong end. However, as per EL of Lumshnong end, **IN>1** started and **all pole dead ON** after 488 msec.

It is unclear as to which protection system operated and cleared the fault. MePTCL may update.

MePTCL is requested to –

i) Share the root cause and remedial measures taken.

ii) Protection setting coordination for 132 kV Amrit & 132 kV Adhunik Cement needs to be done by MePTCL.

In 69th PCCM, AEGCL updated that ZII time delay at Panchgram has been increased to 250 msec.

Also, MePTCL updated that –

1.High set for B/U protection for Amrit and Adhunik feeder will be enabled next week

2.that Y Pole CB at Lumshnong will be replaced shortly in the upcoming shutdown

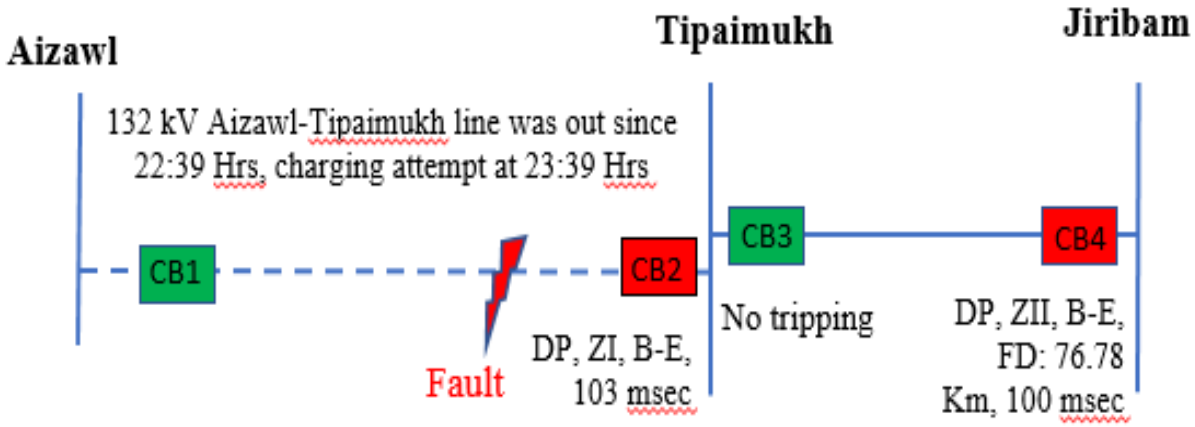
3.LBB time delay will be modified shortly.

MePTCL may further update

C.7 Grid Disturbance in Tipaimukh area of Manipur on 17-April-24:

Tipaimukh area of Manipur power system is connected to the rest of the grid via 132 kV Jiribam(PG)-Tipaimukh and 132 kV Aizawl-Tipaimukh lines. Prior to the event, 132 kV Aizawl-Tipaimukh line tripped twice at 21:54 Hrs & 22:39 Hrs of 05.05.2024.

At 23:39 Hrs of 05-05-2024, while taking charging attempt of 132 kV Aizawl-Tipaimukh line, 132 kV Jiribam(PG)-Tipaimukh line tripped resulting in blackout of Tipaimukh S/S of Manipur.



As per DR analysis of 132 kV Jiribam(PG)-Tipaimukh line, solid B-E fault initiated at 23:41:33.831 Hrs and cleared on operation of DP, ZII within 100 msec from Jiribam end.

As per DR analysis of 132 kV Aizawl-Tipaimukh line, B phase fault cleared within 103 msec on operation of DP, ZI from Tipaimukh end.

Following observations:

i) Tripping of healthy 132 kV Jiribam(PG)-Tipaimukh line due to delayed fault clearing at Tipaimukh end (more than 100 msec) for 132 kV Aizawl-Tipaimukh line.

ii) 132 kV Jiribam-Tipaimukh line tripped from Jiribam end in 100 msec on operation of DP, ZII. ZII time delay setting needs to be reviewed and set as per NER Protection philosophy.

MSPCL is requested to rectify the following issues-

i) PLCC in 132 kV Jiribam(PG)-Tipaimukh line to be made healthy.

ii) Delayed fault clearing time by CB (more than 100 msec) at Tipaimukh for Aizwal-Tipaimukh line.

In 68th PCCM, MSPCL updated, regarding PLCC in 132kV Jiribam- Tipaimukh line, that PLCC card replacement is to be done this month.

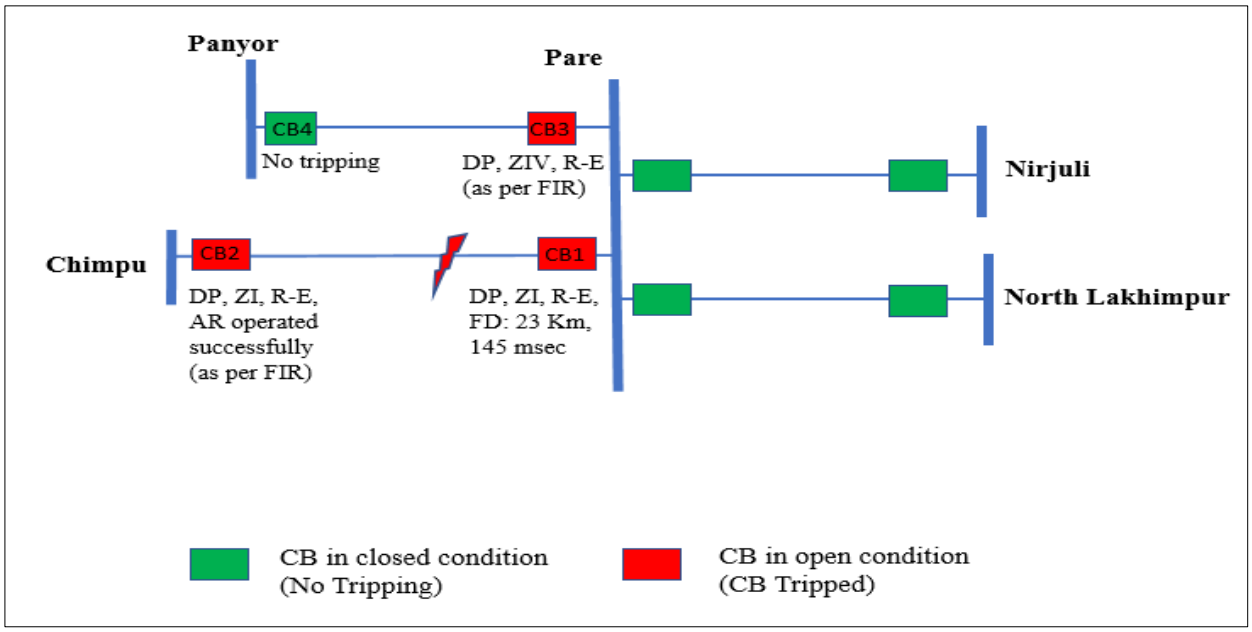
After detailed deliberation the forum requested –

1. MSPCL to test the distance relay and conduct timing test of CB at Tipaimukh end for Aizawl line and address the issue of delayed clearance on Z1.
2. NERTS to increase the Zone II time delay to 130 msec for 132 kV Jiribam-Tipaimukh line considering Max fault clearance time of 132 kV level within 160 msec as per CEA.

MSPCL and NERTS may update

C.8 Multiple tripping of 132 kV Panyor-Pare line & 132 kV Pare-Itanagar line on 09.05.2024

At 02:07 Hrs of 09.05.2024, 132 kV Pare-Itanagar & 132 kV Panyor-Pare lines tripped.



As per DR analysis of 132 kV Pare-Itanagar line, R-E fault initiated at 02:07:24.071 Hrs. After 74 msec, R-phase current increased to 2.9 kA. Fault cleared within 145 msec on operation of DP, ZI (initially ZII pickup) from Pare end.

For 132 kV Panyor-Pare line, there was no tripping from Panyor end. However, Pare CB tripped on DP, ZIV (as per FIR, no DR/EL submitted)

DoP AP & NEEPCO may update the following-

1. Reason for tripping of 132 kV Panyor-Pare on Z4 and its corrections.
2. Reason for Non operation of AR during Single phase fault at Pare end of 132 kV Pare-Itanagar line.

Deliberation of 69th PCCM-

NEEPCO updated that ZIV settings at Pare end for Panyor line will be checked and will be revised soon. Forum requested to share the protection settings of 132 kV Paynor Line with NERLDC & NERPC.

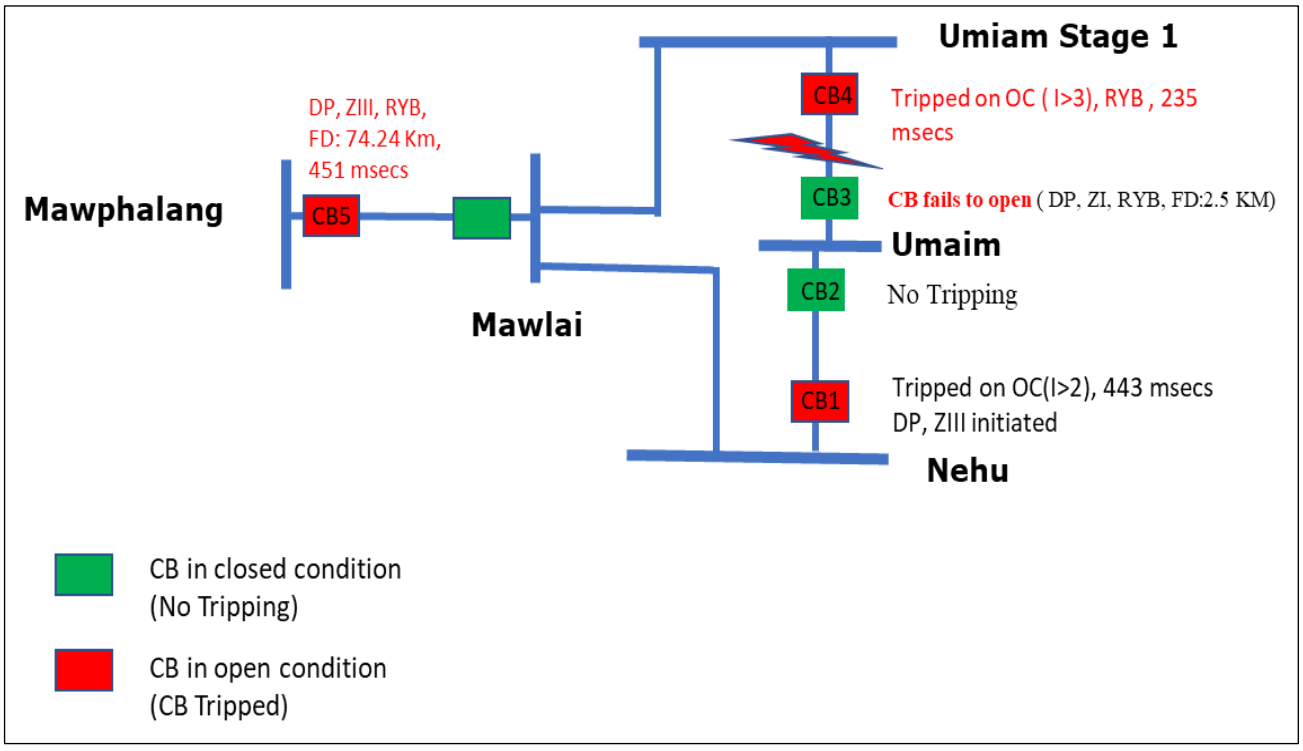
No conclusive reason shared by NEEPCO for Non operation of AR during Single phase fault at Pare HEP. Forum requested NEEPCO to enable AR function in all lines connected to Pare HEP as it's the mandate of IEGC.

NEEPCO may update

C.9 Grid disturbances in Umiam of Meghalaya Power System on 24-06-2024:

Umiam S/S of Meghalaya Power System was connected with rest of NER Grid via 132kV Umiam Stage I - Umiam and 132 kV Nehu-Umiam lines.

At **13:38** Hrs of 24-06-2024, 132kV Umiam Stage I-Umiam and 132 kV Nehu-Umiam lines tripped. Due to tripping of these lines, Umiam S/S of Meghalaya Power System was isolated from NER Grid.



As per DR analysis of Umiam end of 132 KV Umiam Stage 1- Umiam, R-Y-B (Ir-Iy-Ib-2.5 kA) phase fault initiated at 13:35.32.800 Hrs. Distance Protection detected the fault in ZI and Trip command issued. However, CB fails to open at Umaim resulted in the opening of CB at Nehu for 132 KV NEHU – Umiam.

As per DR analysis of Umiam I end of 132 KV Umiam Stage I- Umiam, R-Y-B (Ir-5.4 kA Iy-7 kA & Ib-7 kA) phase fault initiated at 13:37.01.866 Hrs. However, tripping observed due to operation of Highset OC relay in 235 msecs.

Root Cause of the tripping of **132 KV Umiam Stage 1- Umiam**: snapping of conductor.

Following action taken by MePTCL (As per Detailed Report):

1. On inspection it was found that there was mechanical blockage in the tripping mechanism at Umiam (for Umiam Stage I) which halted the CB from opening. (The problem was then rectified).
2. The Zone III-time delay of 132kV Mawphlang- Mawlai feeder has been reset to 500 ms and also the high set, DEF of 132 kV NEHU-Umiam feeder changed to 400 ms.

MePTCL is requested to update:

1. Reason for non-operation of DP (Main Protection) at Umiam Stage I for 132 KV Umiam Stage 1- Umiam line.
2. The status of review of ZIII time delay (451 msec) setting and its coordination at Mawphlang as per NER protection philosophy.
3. Rectification of DR parameter standardization at Umiam, Umiam I & Mawphlang for proper analysis purpose as per Grid code.

In 69th PCCM, MePTCL stated that the 132 kV Umiam stg I-Umiam line is a very short line and there is no differential Protection (due to non-availability of OPGW on the line) Distance protection on the line and only B/U protection is present on the line. Forum exhorted MePTCL to install OPGW on the line and commission Differential Protection on the line.

Regarding ZIII settings at Mawphlang end for Mawlai line, Forum requested MePTCL to revise the time delay to 750 msec.

MePGCL assures that rectification of DR parameter standardization at Umiam, Umiam I & Mawphlang will be done within July24.

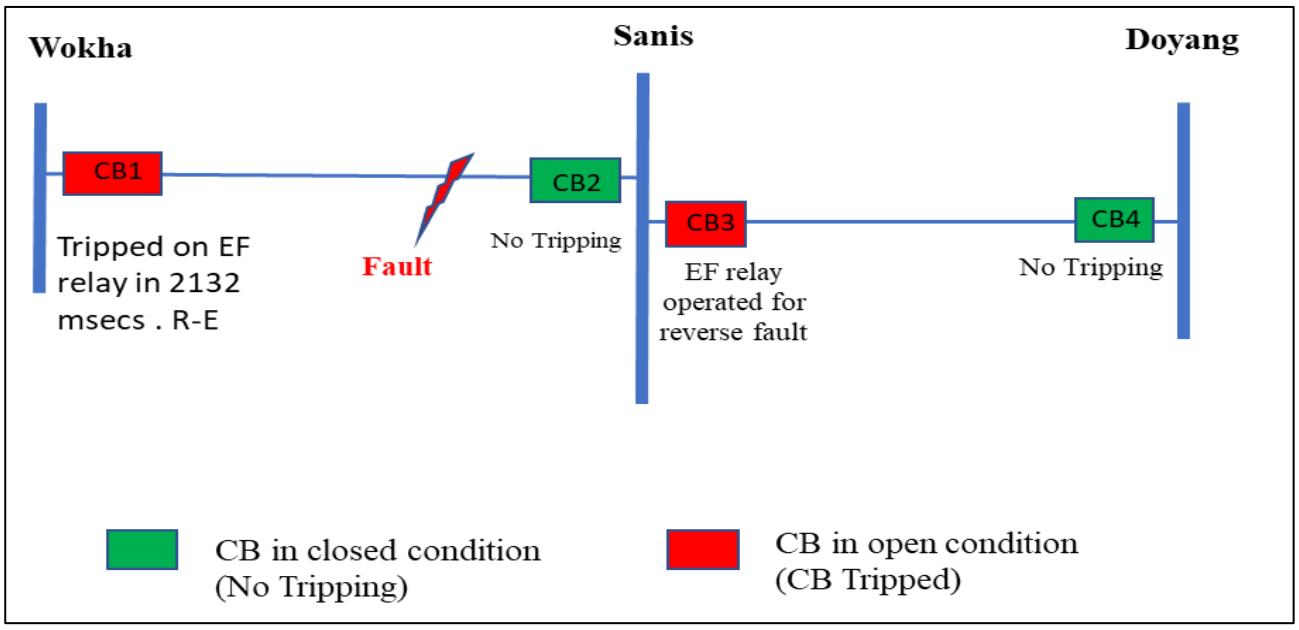
Also, the forum requested MePTCL to revise the settings of B/U OC protection at Nehu end for Umiam line so the it is coordinated with ZIII protection.

Meghalaya may update

C.10 Grid Disturbance in Sanis area of Nagaland on 27-June-24:

Sanis area of Nagaland Power System was connected with rest of NER Grid through 132 kV Sanis-Wokha line and 132 kV Doyang-Sanis line.

At **03:54 Hrs of 27.06.2024**, 132 kV Sanis-Wokha line and 132 kV Doyang-Sanis line tripped resulting in blackout of Sanis area of Nagaland.



DR of Wokha end of 132kV Sanis-Wokha Line, R-E fault of High resistive nature initiated at 03:54:13.213 Hrs and cleared by Backup EF relay in 2132 msecs at Wokha end. There was no tripping from Sanis end.

DR of Sanis end of 132kV Doyang-Sanis Line, Tripping observed on reverse fault. There was no tripping from Doyang end.

Observations:

1. Non operation of protection system at Sanis for 132 kV Wokha Line and
2. Mis-operation of B/U at Sanis for 132 kV Doyang Line.

In 69th PCCM, DoP Nagaland stated that the transmission wing will visit Sanis SS next week to look into the issues with protection system for Doyang line.

DoP Nagaland may update

C.11 Frequent tripping of Monarchak Generation during June'24:

On 16.06.2024 & 17.06.2024, Monarchak GT tripped on Rotor Earth Fault.
As per DR analysis, there were no fluctuations in voltage and current magnitudes during both tripping events. On 16th June'24, the recorded current and voltage at the time of the event were 2.3 kA (Ir=Iy=Ib) and 6.5 kV (Vre=Vye=Vbe), respectively. Similarly, on 17th June'24, the recorded values were 3.2 kA (Ir=Iy=Ib) and 6.5 kV (Vre=Vye=Vbe).

Therefore, tripping of Monarchak GT on operation of the Rotor E/F seems to be misoperation.

NEEPCO is requested to:

1. Update the root cause of such tripping and its remedial measures.
2. Review the Rotor E/F settings along with healthiness of Relay and check for any DC earth faults in the DC system.

In 69th PCCM, EF relay replaced with new one on 3rd June'24 as stated by NEEPCO. Also, NEEPCO informed that BHEL engineer will visit next week to look into the issue with the excitation system.

Neepco may update

C.12 Mock testing of System Protection Scheme (SPS) related to tripping of Bus reactors at 400 kV P K Bari (ISTS) & 400 kV S M Nagar (ISTS):

As per Clause 16.2 of IEGC 2023, mock testing of SPS for reviewing SPS parameters & functions should be conducted at least **once** in a year.

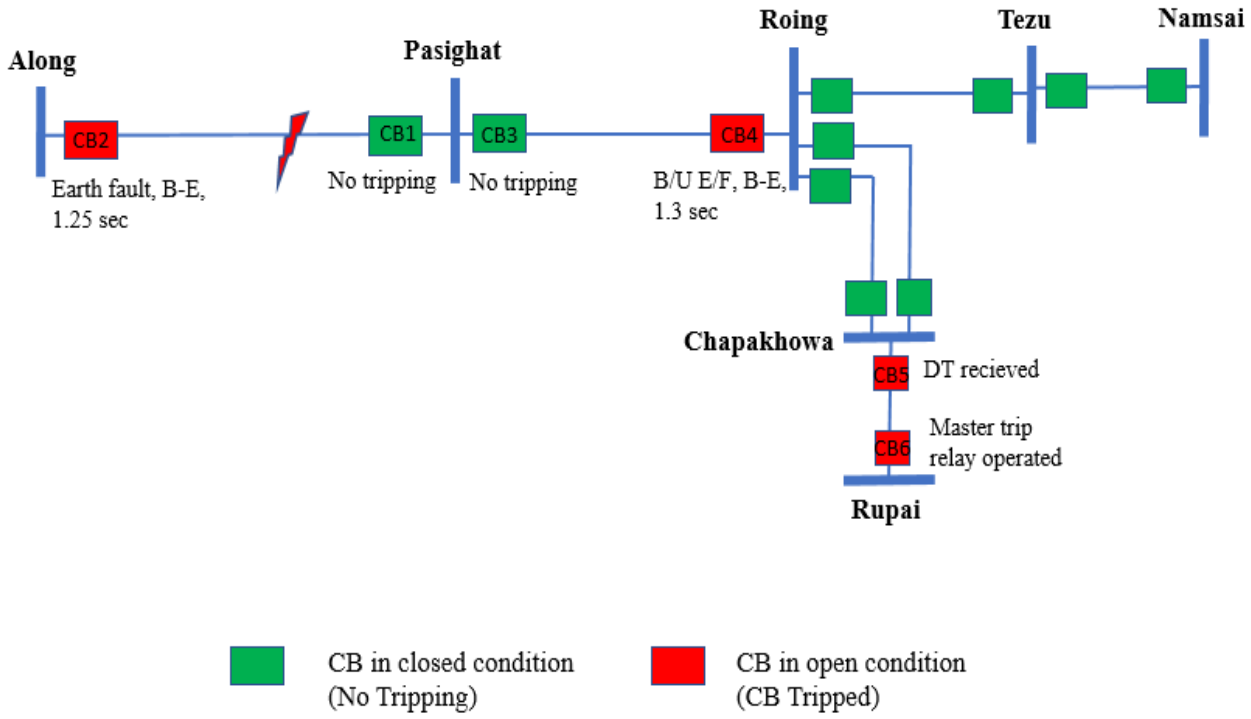
In order to compliance the above clause, IndiGrid is requested to provide the tentative dates for mock testing of SPS in July'24 related to tripping of Bus reactors at 400 kV P K Bari (ISTS) & 400 kV S M Nagar (ISTS).

In 69th PCCM, M/s Indigrid informed that the mock testing is likely to be done in last week of July'24.

Indigrid may update

C.13 Grid disturbance in Pasighat, Roing, Tezu, Namsai areas of Arunachal Pradesh and Chapakhowa area of Assam on 29.06.2024

At 09:25 Hrs of 29.06.2024, 132 kV Along-Pasighat, 132 kV Roing-Pasighat & 132 kV Rupai-Chapakhowa lines tripped leading to blackout of Pasighat, Roing, Tezu, Namsai areas of Arunachal Pradesh and Chapakhowa area of Assam. Load loss of 14 MW occurred.



As per DR analysis, resistive B-E fault (Ib-0.32 kA, In-0.26 kA) in 132 kV Along-Pasighat line initiated at 09:24:32.912 Hrs and cleared within 1.25 sec from Along end on operation of directional earth fault. There was no tripping from Pasighat end due to which fault was feeding from Roing end which was finally cleared by tripping of healthy 132 kV Roing-Pasighat line from Roing end (within 1.3 sec) on operation of backup E/F.

At the same time, 132 kV Rupai-Chapakhowa line also tripped with B/U EF operated at Rupai and DT received at Chapakhowa which seems to be unwanted.

Observations:

1. Protection system at Pasighat failed to isolate the fault in 132 kV Along-Pasighat line which is a matter of concern.
2. Unwanted tripping of 132 kV Rupai-Chapakhowa line on B/U protection.
3. FIR/DR/EL of tripping of 132 kV Rupai-Chapakhowa line not submitted by AEGCL due to which proper analysis could not be done.

DoP Arunachal Pradesh/AEGCL is requested to update –

1. Root cause of non-isolation of fault by protection system at Pasighat for 132 kV Along Line and its remedial measures.
2. Reason of B/U operation at Rupai for 132 kV Chapakhowa Line and its setting coordination.

Similar event occurred at 11:21 Hrs. of 03rd July.

Deliberation of the 69th PCCM

1.Regarding non-operation of protection at Pashighat end for Along line, DoP Ar. Pradesh stated that earlier there was issue in CT neutral wiring in B/U protection, which was rectified. However, the problem has recurred, so DoP Arunachal Pradesh will check the EF relay comprehensively along with that at Along and Roing.

2.Regarding Tripping at Rupai for Chapakhowa line, AEGCL updated that the DT EF protection was kept on. AEGCL disabled the Backup high set setting at Rupai end after the event.

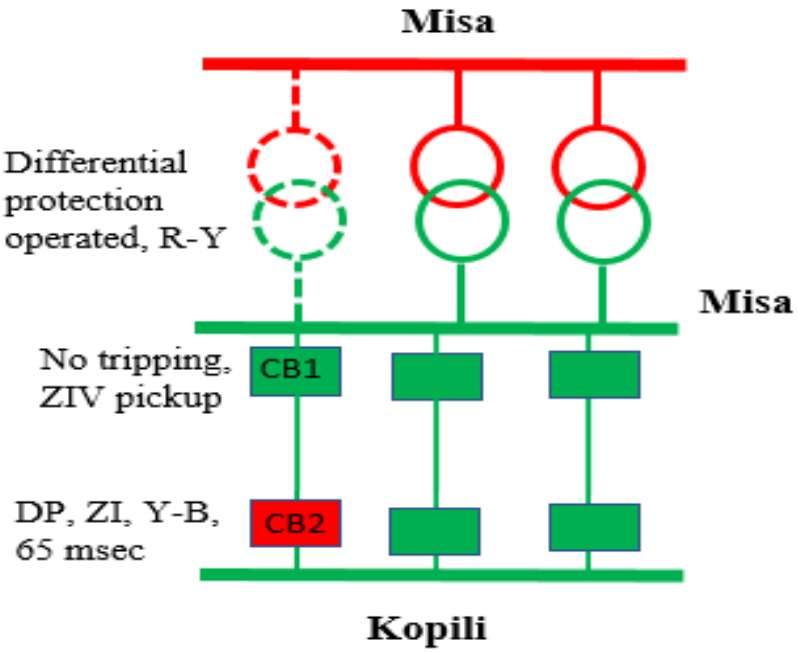
NERLDC highlighted that similar type of events occurred on 9th July'24, where fault in 132 kV Along-Basar line was not clear from Along & Pasighat and it is clear from Roing on Z-III protection.

Forum requested DoP AP, to conduct relay testing using the same fault current and submit a detailed report thereafter. Due to the frequent protection failures at Along and Pasighat, NERLDC emphasized the urgent need for inspections/protection audit at these two substations without delay.

DoP Ar. Pradesh may update

C.14 Unwanted tripping of 220 kV Misa-Kopili I line on 28.05.2024

At 06:39 Hrs of 28.05.2024, 220 kV Misa-Kopili I line and 500 MVA, 400/220 kV ICT-I at Misa tripped.



CB in closed condition (No Tripping)

CB in open condition (CB Tripped)

400/220 kV ICT-I at Misa tripped on operation of differential protection.

As report by POWERGRID, a long branch of tree had fallen over middle and bottom conductor and touched tower cross arm of 220 kV side dead-end tower due to heavy storm which caused immediate tripping of ICT-I at Misa on diff. protection.

At the same time, 220 kV Misa-Kopili I line tripped from Kopili end on operation of DP, ZI (fault cleared within 65 msec). There was no tripping from Misa end.

ZIV was pickup from Misa end which clearly indicates that fault is in reverse direction.

NEEPCO is requested to update the reason of ZI tripping at Kopili end and its corrections for 220 kV Misa-Kopili I line to avoid any further reoccurrence.

In 69th PCCM, NEEPCO deliberated that the Main I relay Mal-operation of Misa-Kopili I at NEEPCO end.

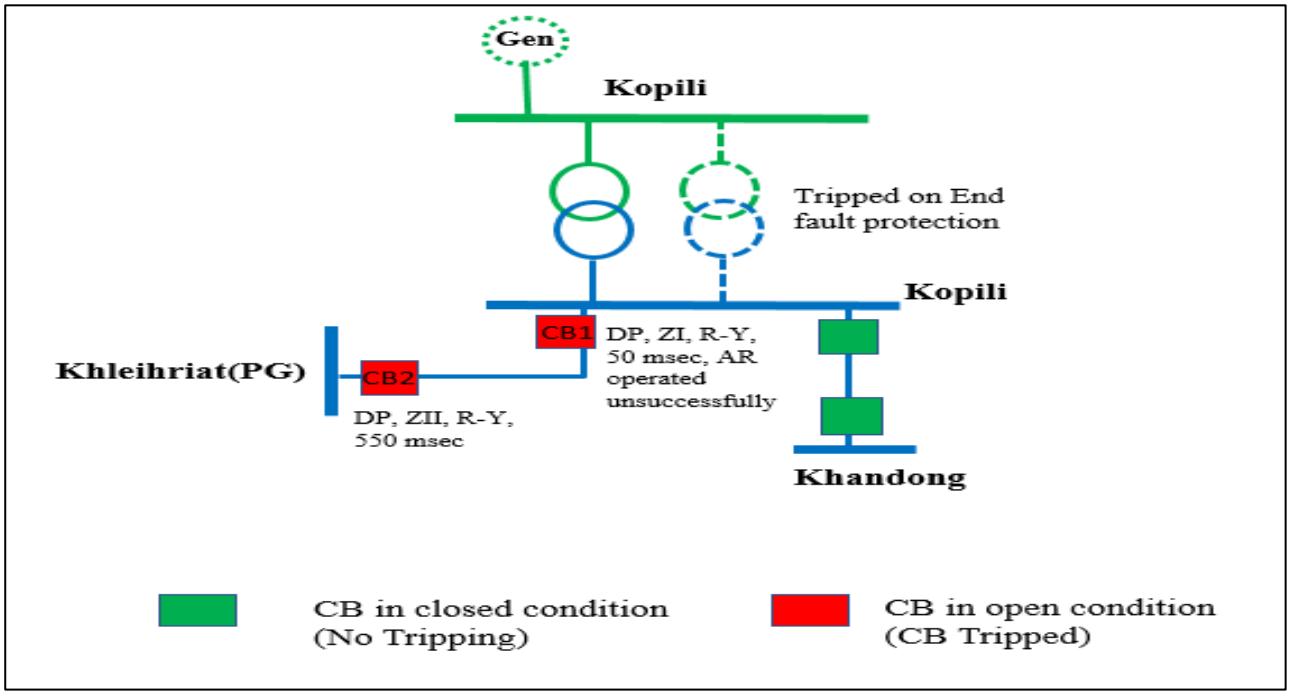
NEEPCO stated that issue of ZI operation from Kopili end will be checked and resolved shortly.

Forum requested to compare the relay settings at Kopili end with other two circuit as they have not tripped. Also, requested to furnish Main-1 setting (.set) file of all 3 lines to NERLDC and NERPC.

NEEPCO may update

C.15 Tripping of 220/132 kV Kopili ICT-II on 28.05.2024

At 01:43 Hrs of 28.05.2024, 132 kV Kopili-Khleihriat line & 220/132 kV Kopili ICT-II tripped.



As per DR analysis of 132 kV Kopili - Khleihriat line, R-Y fault (Ir-6.5 kA, Iy-6.5 kA) cleared within 50 msecs on operation of DP, ZI from Kopili end and within 550 msec from Khleihriat end on operation of DP, ZII (As reported by POWERGRID, the line tripped due to falling of tree on line at span no. 21 to 22).

At the same time, 220/132 kV ICT-II at Kopili tripped on operation of end fault protection (EFP) as per information received from NEEPCO.

NEEPCO may update the reason for operation of end fault protection of Kopili ICT-II for fault beyond line and its corrective measures.

In 69th PCCM, NEEPCO informed that 220 kV side bay of the ICT II tripped on EFP, which is embedded in the Bus Bar protection of the 220 kV bus. He further updated that DR and EL of the tripping have been sent to the OEM for analysis and the report will be shared shortly to NERPC and NERLDC.

Forum requested NEEPCO to check the protection settings as well as configurations in the Bus Bar protection relay.

NEEPCO may update

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 69th PCCM

Sl no	**State**	**Important Transmission lines where AR has to be enabled at the earliest**	**Status (68th/67th PCCM)**	**status as per 69th PCCM**
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 March'24.	3 Ph AR enabled on the lines
2.	Assam	All 220kV and 132kV lines	For 220kV Some bays at Tinsukia, NTPS and Kathalguri remaining, to be done soon For 132kV bays Testing and enabling of AR is being done	Process underway. To be completed by September'24. AEGCL requested NEEPCO to provide the PLCC wrirng

			gradually, to be completed by June'24.	scheme at Kathalguri SS.
3.	Manipur	132kV Imphal-Ningthounkong	DPR preparation underway, to be prepared by March'24	DPR under preparation. To be completed shortly.
4.	Meghalaya	**Annexure** (D.1)	August'24. Forum requested Meghalaya to provide monthly work progress report (around 25 number of 132kV line)	By August'24, will share the work progress report shortly
5.	Tripura	132kV Agartala-S M Nagar (TSECL), 132kV Agartal-Rokhia DC, 132kV, 132kV Agartala-Budhjungnagar	To be done during internal audit.	Aug'24

Utilities may further update

D.2. <u>Installation of line differential protection for short lines:</u>

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 69th PCCM -

Name of utility	**Last updated status (68th/67th PCCM)**	**status as per 69th PCCM**
AEGCL	AEGCL updated that PSDF monitoring group has suspended funding for LDP for 1 year. AEGCL requested MS, NERPC to take up with	MS, NERPC stated that funding for the LDP considering the special case

	NPC, CEA to provide funding for the same considering the special case of NER	of NER will be taken up as resolution by RPC forum
MSPCL	DPR under preparation, to be submitted within one month.	DP under preparation, to be completed shortly
MePTCL	LDP operation for 9 feeders. For Neighrims-NEHU line, waiting for dark fiber. For other lines, OPGW not available commissioned after OPGW link is established. (**Annexure D.2**) 7 Feeder operational for rest OPGW work is pending OPGW to be installed on 16 lines. LDP will be enabled after that.	Regarding OPGW installation, MePTCL updated that DPR is being prepared for inclusion in reliable communication scheme. For NEHU-NEighrims line, fiber has to be laid by PowerGrid NERPSIP.
P&ED Mizoram	Lines identified 132kV Khamzawl - Khawiva. DPR being revised. Mizoram requested for assistance in preparation of DPR. Forum requested Assam to provide assistance to Mizoram in this regard.	Mizoram stated that DPR in final stage. Price offer ahs been received and the DPR will be prepared by end of July'24
DoP Nagaland	LDP Doyang-Sanis line, LDR to be installed by NEEPCO. NEEPCO stated that LDR is available with NEEPCO, however, healthiness of the OPGW link on the line has to be checked first. Forum asked DoP Nagaland to coordinate with NEEPCO in this regard	DoP Nagaland updated that FOTE is present. NEEPCO updated that GE engineers will visit on 15th July.
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.	Approved for ADB funding. E-tendering underway. Regarding Rokhia-N.Rokhia link, he updated that the breaker has been received. MS, NERPC suggested to apply under PSDF

Utilities may further update

D.3. Status against remedial actions for important grid events:

Status as updated in the 69th PCCM:

Sl No	Details of the events(outage)	Remedial action suggested	Name of the utility & previous update	status as per 69th PCCM
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. PLCC panels received. For further work PSDF payment issue. Matter to be taken up with PSDF	DoP updated that PSDF funding will be short closed due to long pending payment issues and delays. He further stated that state is considering funding of the project through its own funding. PLCC work to be tentatively completed by end of this year.
2.	132 kV DoyangMokokchung line 132 kV Mokokchung - Mokokchung (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, by March'24	DPR is being prepared for DTPC link on the line. Offer by Hitachi by July end
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.)	DPR returned by PSDF.
4.	132 kV Loktak-Jiribam line, 132 kV Loktak-Imphalline,132 kV Loktak-Ningthoukhong line, 132 kV Loktak-Rengpang line & Loktak	> 5MVA TRAFO (Aux. Transformer) to be repaired ->5MVA Auxiliary TRAFO panel to be repaired by NHPC	NHPC Tender awarded, Order placed, manufacturing underway.	TX manufacturing underway. To be completed by Dec'24

	Units 1,2 and 3 on 3rdAug			
5.	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) Renovation would start in Nov.'24 and to be completed by Oct.'25. Forum stressed to take LBB on priority.	Same status, Forum requested to expedite it
6.	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. Visit of OEM next week. To be completed by April'24	BBR defective. Order placed in Oct'23, will arrive in around 7 months, i.e. by May or June'24
7.	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 Visit of OEM next week. To be completed by April'24	By May'24
8.	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 DPR is under preparation for PSDF. CT under procurement, to be completed by end of this year	By end of this year
9.	AR issue at Gohpur end for 132kV Nirjuli-Gohpur line	Panel replacement underway	AEGCL - By April'24	Panel commissioned in June 2024.
10.	Non-operation of AR at Doyang HEP	Pneumatic CBs to be replaced	NEEPCO- August 2024	March'25
11.	Generation evacuation issue at Leshka due to tripping of any line of 132kV Leshka-Khliehriat DC line	SPS to be implemented	MePGCL to implement the SPS by May'24	
12	Multiple trippings fn the lines connected to Leshka station in	Differential protection on the link line to be implemented.	MePGCL	

	April'24 have been observed due to delayed clearance of faults in the link line (GT to Switchyard, 550 meters)	Also, AR on the link line to be implemented	To be discussed in internal OCC meeting first	
13	Multiple tripping of 132 kV Panchgram-Lumshnonong line in April'24 has been observed due to delayed clearance of downstream fault in Lumshnong	B/U protection settings coordination for the 132kV downstream industrial feeders has to be done	MePTCL To be done shortly	
14	Issue with CB at P K Bari end for Dharmangar line (agenda item C.5 of 69th PCCM.) Powergrid has reduced timing of zone settings at Kumaraghat end for P K Bari line. The settings will be reverted as soon as the breaker issues is resolved by TSECL	Pneumatic CB at P K Bari end to be replaced with spring charging type CB	TSECL	

Utilities may further update

****

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		

MePTCL

STATUS OF LINE DIFFERENTIAL PROTECTION PROJECT UNDER PSDF

Sl. No	Feeder Name	Installation		Commissioning	Remarks
		End A	End B		
1	EPIP-I - EPIP II Line I	Completed	Completed	Completed	
2	EPIP-I - EPIP II Line II	Completed	Completed	Completed	
3	EPIP -I - Killing Line I	Completed	Completed	Not Completed	Fiber Network Not Available
4	EPIP -I - Killing Line II	Completed	Completed	Not Completed	
5	EPIP -I - M/S Maithan Alloy	Completed	Completed	Not Completed	
6	EPIP -I - Shyam Century	Completed	Completed	Not Completed	
7	EPIP-II - Umtru Line I	Completed	Completed	Completed	
8	EPIP-II - Umtru Line II	Completed	Completed	Completed	
9	EPIP II - New Umtru	Completed	Completed	Completed	
10	EPIP II - Killing Line I	Completed	Completed	Not Completed	Fiber Network Not Available
11	EPIP II - Killing Line II	Completed	Completed	Not Completed	
12	Umtru- New Umtru	Completed	Completed	Completed	
13	LUMSHNONG- M/S MCL	Completed	Completed	Not Completed	Fiber Network Not Available
14	LumSHNONG- M/S ACL	Completed	Completed	Not Completed	
15	Lumshnong - M/S MPL	Completed	Completed	Not Completed	
16	UMIAM - Stage I	Completed	Completed	Not Completed	
17	Umiam - NEHU	Completed	Completed	Completed	
18	UMIAM STAGE-I - Umiam Stage II	Completed	Completed	Not Completed	Fiber Network Not Available
19	NEHU - NEIGHRIMS	Completed	Completed	Not Completed	Awaiting for Commissioning of fiber under NERFO
20	NEHU - MAWLAI	Completed	Completed	Completed	
21	KHLIEHRIAT (MePTCL)-KHLIEHRIAT(PG) line-II	Completed	Completed	Completed	
22	Stage-III - Stage IV Line I	Completed	Completed	Not Completed	Fiber Network Not Available
23	Stage-III - Stage IV Line II	Completed	Completed	Not Completed	

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

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

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

Table of Contents

Sl. No	GD/GI/ Near miss	Area Affected	Date & Time
15	GD-I	Kohima area of Nagaland Power System and Karong area of Manipur Power System	13-07-2024 11:22
16	GD-I	Karong area of Manipur Power System	13-07-2024 12:52
17	GD-I	Kokrajhar, Bilasipara and Gauripur areas of Assam Power System	15-07-2024 18:10
18	GD-II	Upper Assam areas of Assam Power System, AGBPP Generating stations, and Pasighat, Roing, Tezu and Namsai areas of Arunachal Power System	15-07-2024 19:45
19	GD-I	Doyang Generating station of NEEPCO	16-07-2024 10:08
20	GD-I	Kokrajhar, Bilasipara and Gauripur areas of Assam Power System	16-07-2024 12:23
21	GD-I	Ganol HEP of Meghalaya	17-07-2024 10:11
22	GD-I	Rongkhon,Ampati and Ganol area of Meghalaya Power System	17-07-2024 12:29
23	GD-I	NEIGRIHMS & IIM Area of Meghalaya Power System	17-07-2024 14:50
24	GD-I	Umiam Stage 2 of Meghalaya Power System	17-07-2024 15:03
25	GD-I	Khupi, Tenga areas of Arunachal Pradesh Power System	19-07-2024 10:43
26	GD-I	Deomali Area of Arunachal Pradesh Power system	19-07-2024 11:17
27	GD-I	Dhemaji & Silapathar Areas of Assam Power system	19-07-2024 11:19
28	GD-I	Rengpang area of Manipur Power System	20-07-2024 18:05
29	GD-I	Karong area of Manipur Power System	21-07-2024 10:15
30	GD-I	Kohima area of Nagaland Power System and Karong area of Manipur Power System	21-07-2024 12:19

31	GD-I	Pasighat Substation of Arunachal Pradesh power system	26-07-2024 10:50
32	GD-I	Udaipur area of Tripura Power System	26-07-2024 11:25
33	GD-I	Rengpang area of Manipur Power System	27-07-2024 08:23
34	GD-I	Turial Generating Units of NEEPCO	27-07-2024 19:45

***** Compiled report prepared as on 30-07-2024**

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 Pasighat, Roing, Tezu, Namsai areas of Arunachal Pradesh Power System and Chapakhowa area of Assam Power System 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))

Date (दिनांक**):17-07-2024**

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

Pasighat, Roing, Tezu, Namsai areas of Arunachal Pradesh Power System and Chapakhowa area of Assam Power System were connected with rest of NER Power system via 132 kV Along - Pasighat Line, 132 kV Roing - Pasighat Line and 132 kV Rupai – Chapakhowa line. Prior to the event, 132 kV Rupai - Chapakhowa line was under outage since 11:18 Hrs of 03.07.2024.

At 11:21 Hrs of 03.07.2024, 132 kV Along - Pasighat Line, 132 kV Roing-Pasighat Line & 132 kV Rupai-Chapakhowa line tripped. Due to tripping of these elements, Pasighat, Roing, Tezu, Namsai areas of Arunachal Pradesh Power System and Chapakhowa area of Assam Power System were isolated from NER Grid and collapsed due to no source available in these areas.

Power supply was extended to Chapakhowa area of Assam Power System by charging 132 kV Rupai – Chapakhowa line at 11:48 Hrs of 03.07.2024. Subsequently, power supply was extended to Roing, Tezu and Namsai areas of Arunachal Pradesh Power System by charging 132 kV Roing-Chapakhowa D/C lines at 12:39 Hrs of 03.07.2024. Power supply is extended to Pasighat area of Arunachal Pradesh Power System by charging 132 kV Roing –Pasighat line charged at 14:51 Hrs of 03.07.2024

2. **Time and Date of the Event (**घटना का स मय और दिनांक**):** 11:21 Hrs of 03-07-2024

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

4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Pasighat, Roing, Tezu, Namsai areas of Arunachal Pradesh and Chapakhowa area of Assam Power System

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	49.98	3017	2421
Post Event (घटना के बाद)	49.94	3013	2427

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

2. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss 0.5 MW in Chapakhowa area and 10 MW in Pasighat, Roing, Tezu, Namsai areas.
3. **Duration of interruption (रुकावट की अवधि): 27 min-Chapakhowa, Roing, Tezu & Namsai- 1 Hr 18 min, Pasighat-3 Hr 30 min**
4. **Network across the affected area (प्रभावित क्षेत्र का नक्शा):**

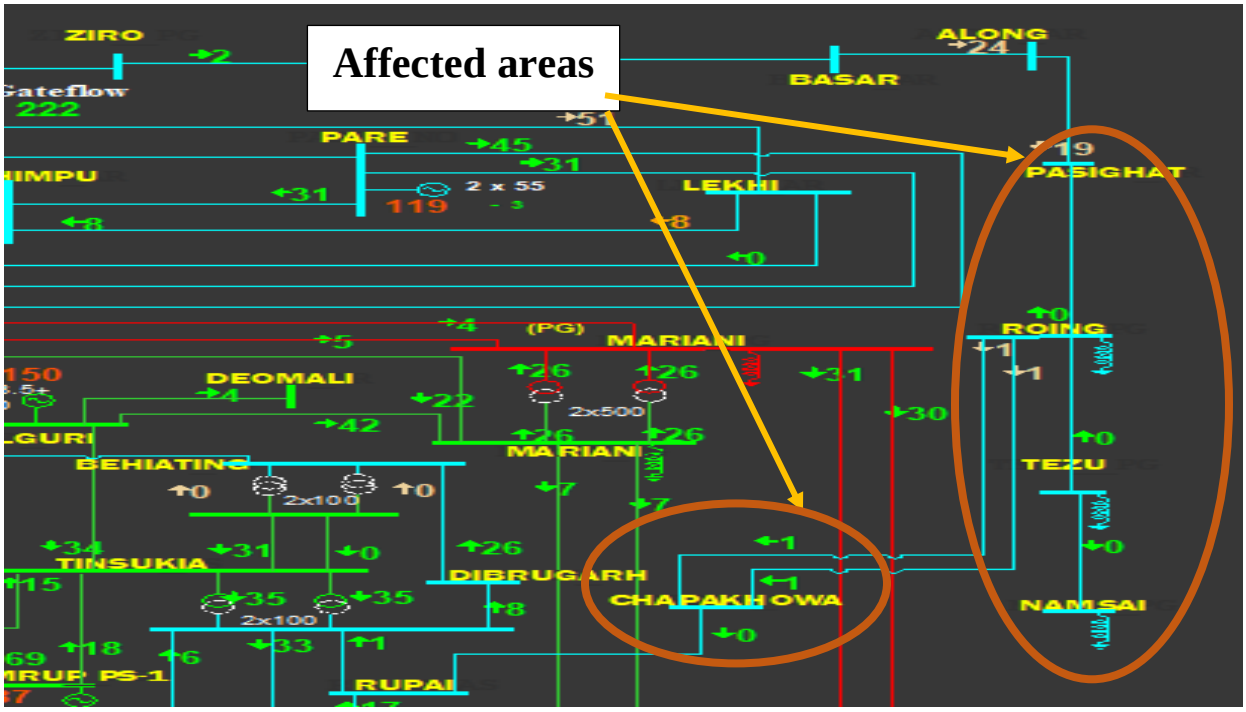


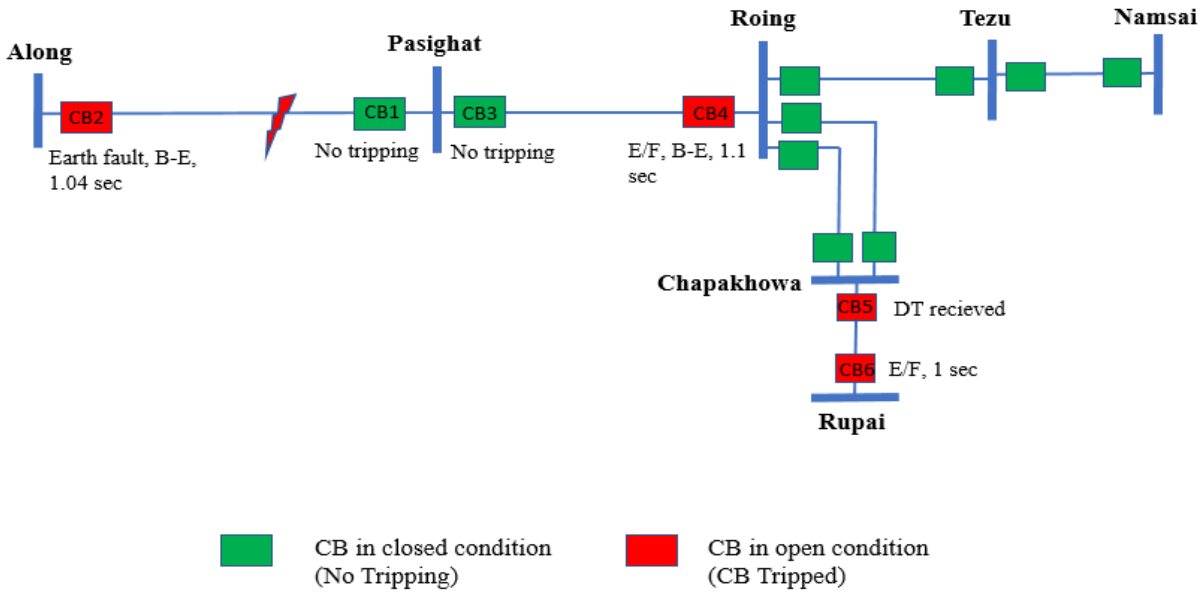
Figure 1: Network across the affected area

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

6. 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 Along-Pasighat Line	11:21	15:15	E/F operated, B-E	No tripping
2	132 kV Roing-Pasighat Line	11:21	14:51	E/F operated, B-E	No tripping
3	132 kV Rupai-Chapakhowa Line	11:21	11:48	E/F operated	DT recieved

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



As per DR analysis, resistive B-E fault (Ib-360 A, In-270 A) initiated at 11:21:01.415 Hrs and cleared within 1.04 sec from Along end on operation of Earth fault. There was no tripping from Pasighat end due to which fault was feeding from Roing end which was finally cleared by tripping of healthy 132 kV Roing-Pasighat line from Roing end within 1.1 sec on operation of earth fault.

Backup relay at Pasighat for 132 kV Along-Pasighat line detected B-E fault with Ib: 306 A, Vbe: 30 kV. However no Trip command issue was recorded.

At the same time, 132 kV Rupai-Chapakhowa line tripped on operation of E/F from Rupai end. DEF protection at Rupai end overreached for fault in 132 kV Along-Pasighat line and issued a trip on DEF after 1 second.

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

- Protection system at Pasighat failed to isolate the fault in 132 kV Along-Pasighat line leading to tripping of healthy 132 kV Roing-Pasighat line.
- Tripping of 132 kV Rupai-Chapakhowa line on DEF from Rupai end for fault in 132 kV Along-Pasighat line is inferred unwanted.

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

Action Taken by DoP, Arunachal as informed on 3rd July 2024:

- The CT neutral wiring to the backup relay at Pasighat (for Along) was corrected on 3rd July 2024 at 14:26 hrs.
- The earth fault relay settings of the backup relay have been implemented in the main relay under IN>2 settings to ensure correct isolation of fault at Pasighat in case of another failure of the backup relay. The settings shall be disabled in the main relay on confirmation of correct operation of the backup relay, if required.

Action taken by AEGCL: DEF settings at Rupai has been updated with respect to the fault.

10. 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)	**DoP AP, AEGCL & NERTS**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**NERTS**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**DoP AP & NERTS**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**No violation**
5.	**Any other non-compliance**		**-**

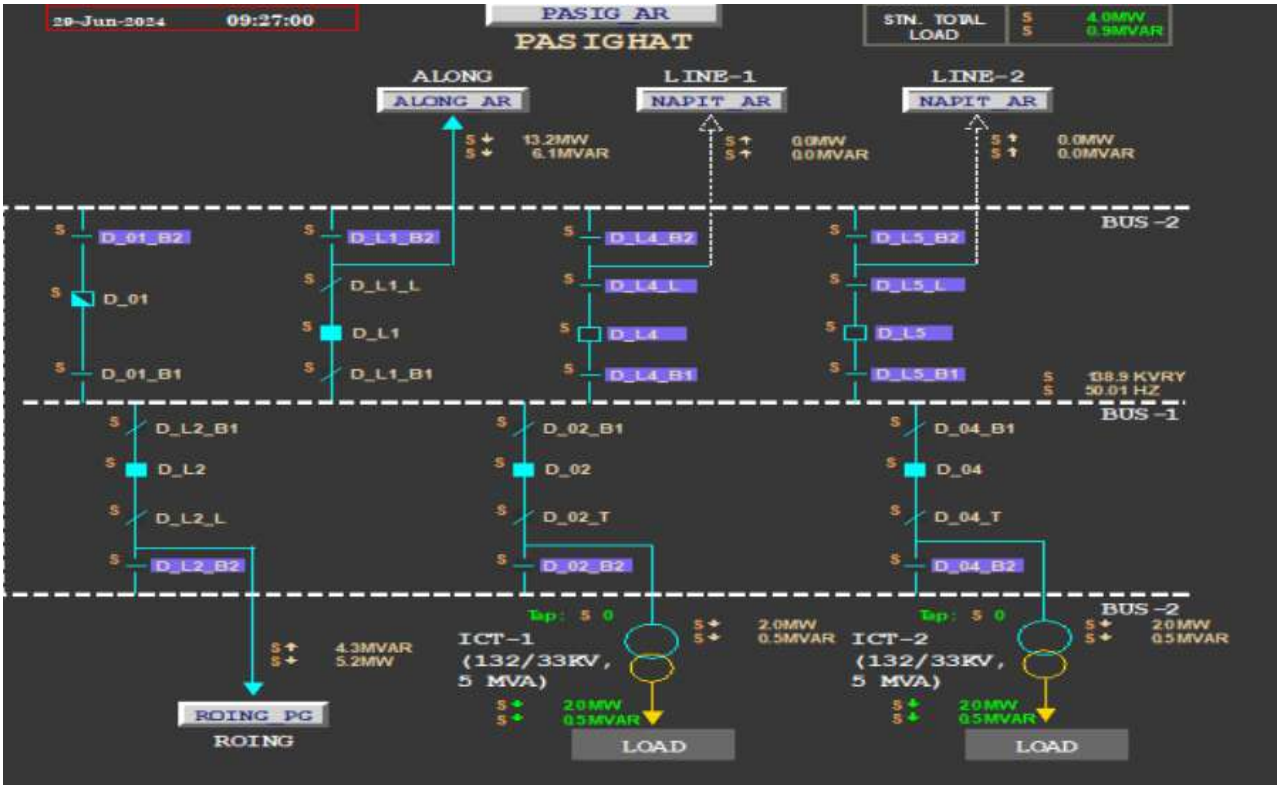
11. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- With the approaching windy monsoon season with high demand period, to reduce tripping of elements due to vegetation issues/ lightning etc, it is requested to ensure proper maintenance of the lines.
- Healthiness of protection system needs to be ensured at all times.

Annexure 1: Sequence of Events as per SCADA

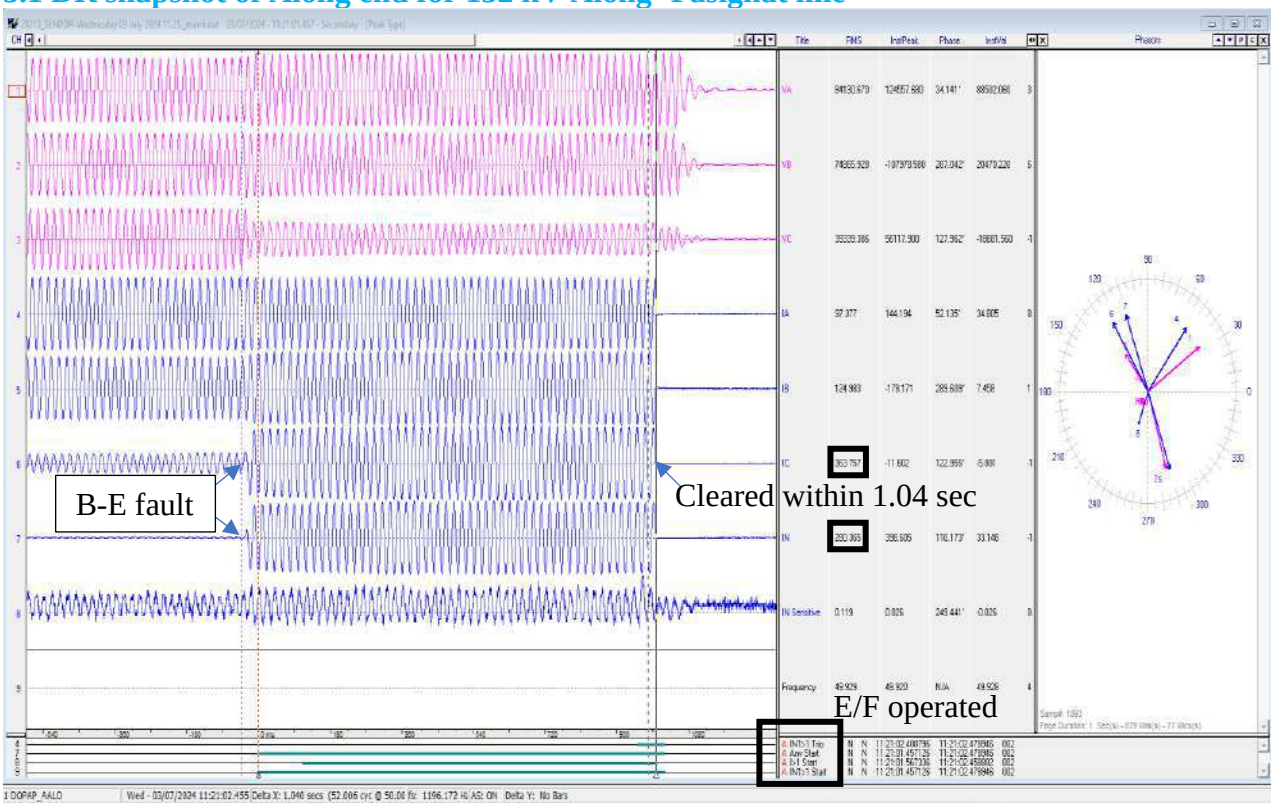
AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
ARUNCH	1C	ROING_PG	ROING CB REACTOR D_R1_BR CB OPEN	03 Jul 2024 11:13:53:000	02 Jul 2024 22:43:50:000	5.5E+08
ARUNCH	1C	ROING_PG	ROING CB REACTOR D_R1_BR CB OPEN	03 Jul 2024 11:13:53:000	02 Jul 2024 22:43:50:000	5.5E+08
ARUNCH	1C	ROING_PG	ROING CB 132Kv LINE-1 TO PASIG OPEN	03 Jul 2024 11:21:40:000	02 Jul 2024 22:51:29:000	63000000
ARUNCH	1C	ROING_PG	ROING CB 132Kv LINE-1 TO PASIG OPEN	03 Jul 2024 11:21:40:000	02 Jul 2024 22:51:29:000	63000000
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	03 Jul 2024 02:23:15:000	03 Jul 2024 02:22:52:000	6.62E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	03 Jul 2024 02:23:15:000	03 Jul 2024 02:23:05:000	6.82E+08
ARUNCH	1C	ROING_PG	ROING CB 132Kv LINE-1 TO PASIG CLOSED	03 Jul 2024 14:53:16:000	03 Jul 2024 02:23:13:000	7.43E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	03 Jul 2024 02:23:34:000	03 Jul 2024 02:23:23:000	3.47E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	03 Jul 2024 02:23:43:000	03 Jul 2024 02:23:37:000	3.22E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	03 Jul 2024 11:21:16:000	03 Jul 2024 11:21:09:000	1.97E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	03 Jul 2024 11:21:16:000	03 Jul 2024 11:21:09:000	1.97E+08
AEGCL	1C	CHAPA_AS	CHAPAKHOWA CB 132Kv LINE TO RUPAI OPEN	03 Jul 2024 11:21:41:000	03 Jul 2024 11:21:29:000	84000000
AEGCL	1C	CHAPA_AS	CHAPAKHOWA CB 132Kv LINE TO RUPAI OPEN	03 Jul 2024 11:21:41:000	03 Jul 2024 11:21:29:000	84000000
ARUNCH	1C	ALONG_AR	ALONG CB 132Kv LINE TO PASIG OPEN	03 Jul 2024 11:21:41:000	03 Jul 2024 11:21:31:000	84000000
ARUNCH	1C	ALONG_AR	ALONG CB 132Kv LINE TO PASIG OPEN	03 Jul 2024 11:21:41:000	03 Jul 2024 11:21:31:000	84000000
AEGCL	1C	KATHA_NO	KATHALGURI CB 220Kv LINE-2 TO TINSU CLOSED	03 Jul 2024 11:47:29:000	03 Jul 2024 11:46:09:000	3.58E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	03 Jul 2024 11:48:08:000	03 Jul 2024 11:47:54:000	66000000
AEGCL	1C	CHAPA_AS	CHAPAKHOWA CB 132Kv LINE TO RUPAI CLOSED	03 Jul 2024 11:48:12:000	03 Jul 2024 11:48:01:000	64000000
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	03 Jul 2024 11:48:41:000	03 Jul 2024 11:48:22:000	1.26E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	03 Jul 2024 15:16:06:000	03 Jul 2024 15:15:50:000	3.22E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	03 Jul 2024 15:16:37:000	03 Jul 2024 15:16:16:000	2.02E+08
ARUNCH	1C	ALONG_AR	ALONG CB 132Kv LINE TO PASIG CLOSED	03 Jul 2024 15:16:37:000	03 Jul 2024 15:16:23:000	9.95E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	03 Jul 2024 15:18:08:000	03 Jul 2024 15:17:51:000	8.92E+08
TSECL	1C	DHALA_TE	DHALABILL CB 132Kv LINE-1 TO MOHAN CLOSED	03 Jul 2024 15:19:44:000	03 Jul 2024 15:17:54:000	4.16E+08

Annexure 2: SLD of affected S/S

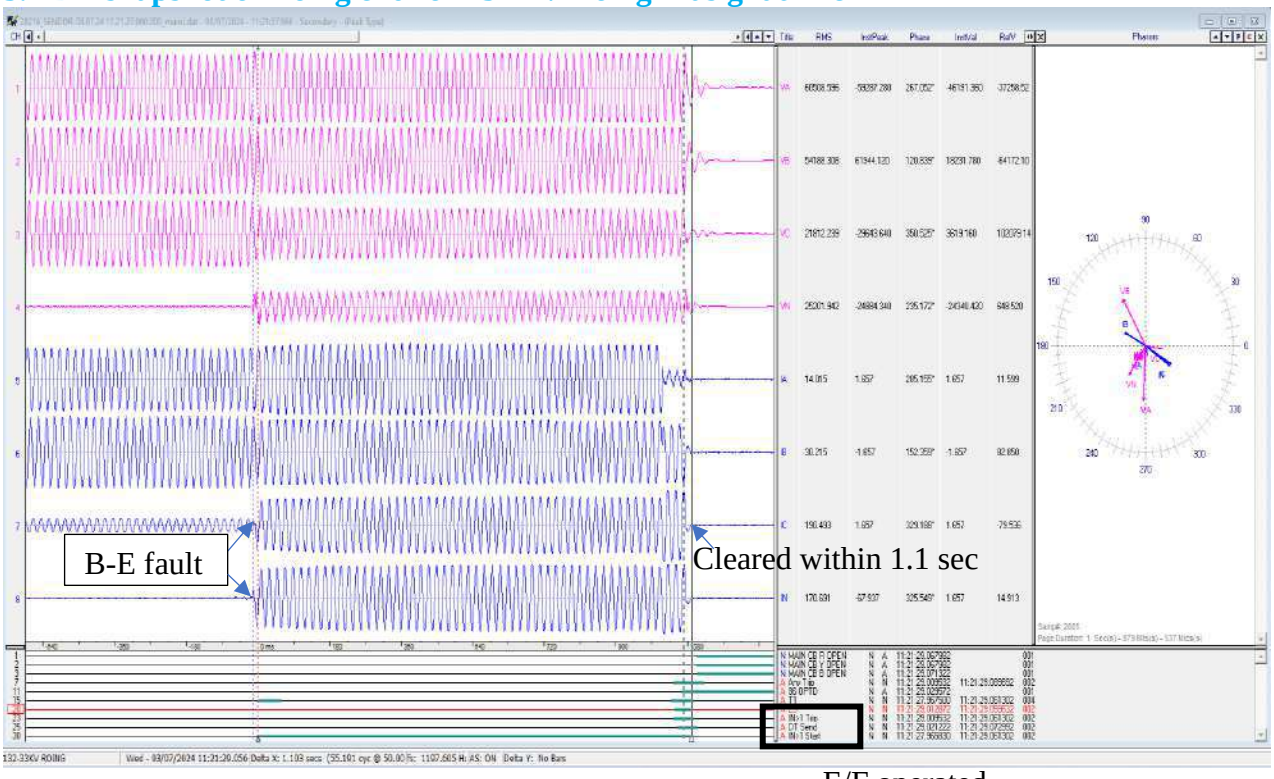


Annexure 3: DR Snapshot

3.1 DR snapshot of Along end for 132 kV Along- Pasighat line



3.2 DR snapshot of Roing end for 132 kV Roing- Pasighat line



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 Churachandpur, Thanlon, Elangkangpokpi, Kakching, Chandel, Moreh, Thoubal old, New Thoubal and Kongba areas of Manipur Power System and Tamu load of Myanmar power system

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

Date (दिनांक):19-07-2024

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

Churachandpur Thanlon, Elangkangpokpi, Kakching, Chandel, Thoubal Old, New Thoubal and Kongba area of Manipur Power System and Tamu load of Myanmar Power System were connected with rest of NER Grid via 132 kV New Thoubal - Kakching Line, 132 kV Old Thoubal - Kakching Line, 132 kV Kongba - Yaingangpokpi 1&2 Lines. 400 kV Imphal(PG)-Thoubal-1 line was under outage condition since 18.10.2021, 400 kV Imphal(PG)-Thoubal-2 line was under outage condition since 24.04.2024 and 132 kV Ningthoukhong-Churachandpur D/C lines were under outage condition since 15.06.2024.

At 16:20 Hrs of 05.07.2024, 132 kV New Thoubal - Kakching Line, 132 kV Old Thoubal - Kakching Line, 132 kV Kongba - Yaingangpokpi 1&2 Lines tripped. Due to tripping of these lines, Churachandpur Thanlon, Elangkangpokpi, Kakching, Chandel, Thoubal Old, New Thoubal and Kongba area of Manipur Power System and Tamu load of Myanmar Power System were isolated from NER Grid and collapsed due to no source available in these areas.

Power supply was extended to Churachandpur, Thanlon, Elangkangpokpi, Kakching, Chandel, Thoubal Old, New Thoubal and Kongba area of Manipur Power System and Tamu load of Myanmar Power System by first charging 132 kV Kongba - Yaingangpokpi 1 Line at 16:35 Hrs of 05.07.2024 and then subsequently charging 132 kV Kongba - Yaingangpokpi 2 Line, 132 kV New Thoubal - Kakching Line, 132kV Thoubal New – Kongba 1, 132kV Thoubal New – Kongba 2 and 132kV Thoubal Old – Thoubal New lines.

2. **Time and Date of the Event (घटना का स मय और दिनांक):** 06:11 Hrs of 15-06-2024

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

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Churachandpur Thanlon, Elangkangpokpi, Kakching, Chandel, Thoubal Old, New Thoubal and Kongba area of Manipur Power System and Tamu area of Myanmar power system

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency	Regional Generation (MW)	Regional Demand (MW)	ISGS Generation (MW)
Pre-Event (घटना पूर्व)	49.85	3121	2202	2399
Post Event (घटना के बाद)	49.85	3119	2155	2393

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(	400kV-Imphal(PG)-Thoubal-1 line was under outage condition since 18.10.2021, 400 kV Imphal(PG)-Thoubal-2 line was under outage condition since 24.04.2024 and 132 kV Ningthoukhong-Churachandpur D/C lines were under outage condition since 15.06.2024.
Weather Condition (मौसम स्थिति)	Inclement

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 28 MW occurred. There was no generation loss.

7. **Duration of interruption (रुकावट की अवधि): 15 mins**

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

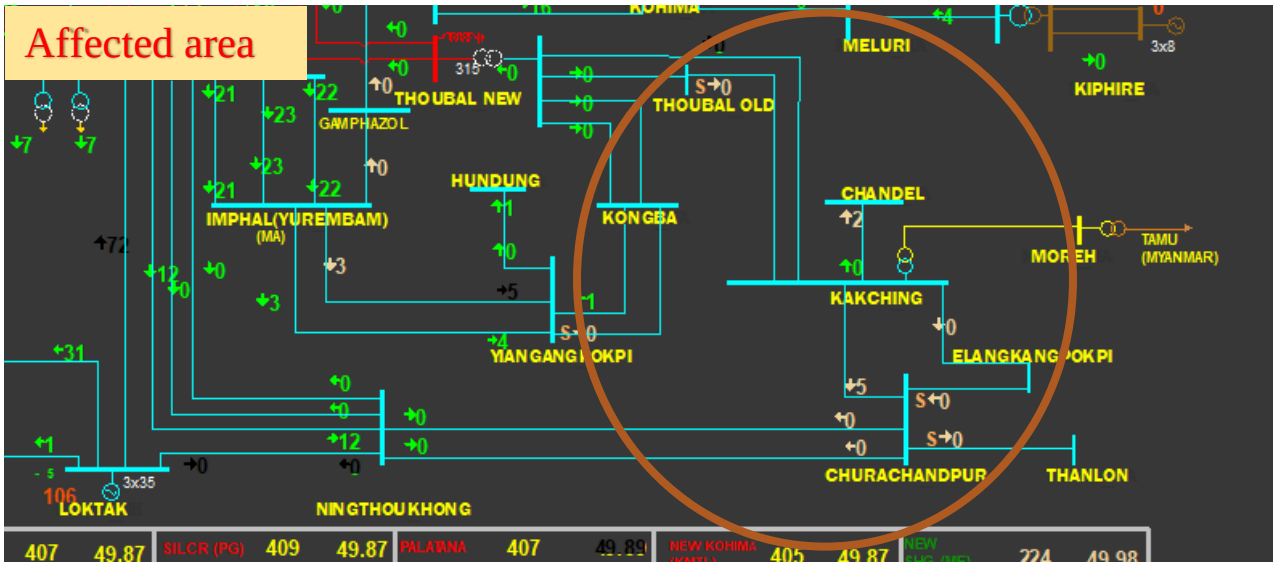


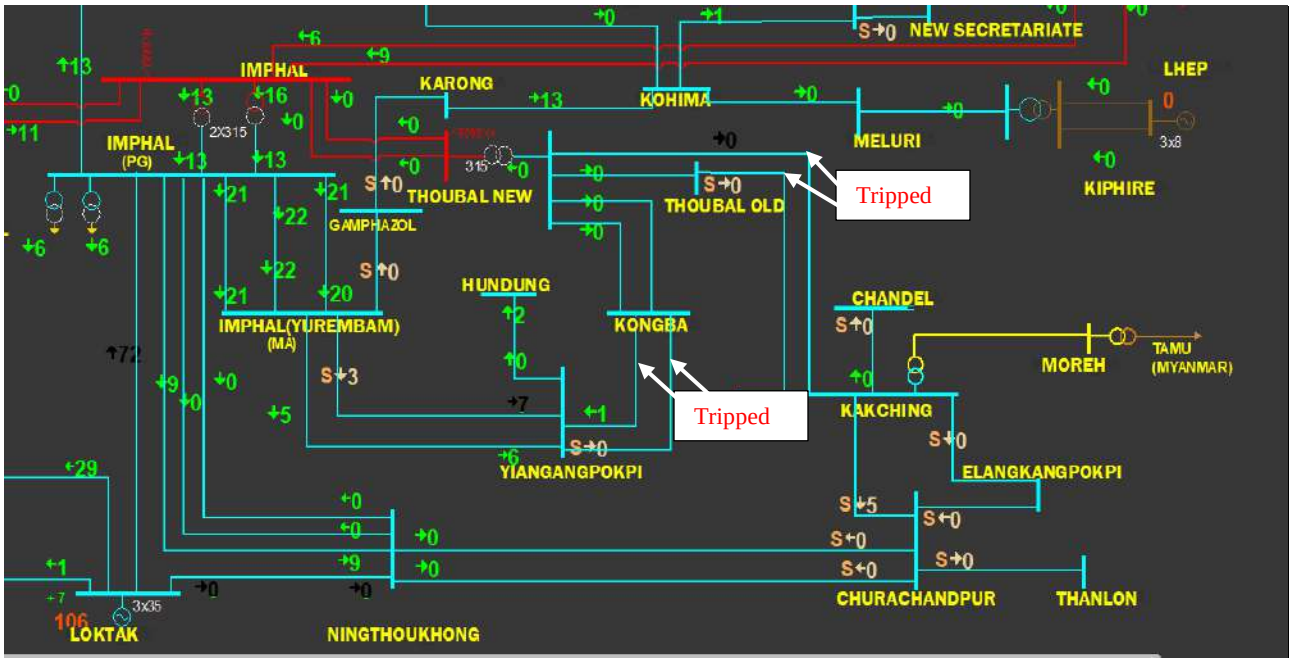
Figure 1: Network across the affected area

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

10. Major Elements Tripped (प्रमुख ट्रिपिंग):

Sl no	Name	Trip time (hh:mm)	Restoration time (hh:mm)	Relay End 1	Relay End 2
1	132 kV Old Thoubal-Kakching Line	16:20		DP, ZI, R-Y, FD: 6.8 Km	Not furnished
2	132 kV New Thoubal-Kakching Line	16:20	22:21	CB pole discrepancy	No tripping
3	132 kV Kongba-Yiangangpokpi I Line	16:20	16:35	Not furnished (DR/EL not submitted)	
4	132 kV Kongba-Yiangangpokpi II Line	16:20	18:35	Not furnished (DR/EL not submitted)	

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



Proper analysis could not be done due to non-submission of DR/EL.

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

- SOE not recorded for tripping of all the elements. The same needs attention from MSPCL/SLDC Manipur team.

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

Power supply was extended to Churachandpur, Thanlon, Elangkangpokpi, Kakching, Chandel, Thoubal Old, New Thoubal and Kongba area of Manipur Power System and Tamu load of Myanmar Power System by first charging 132 kV Kongba - Yaingangpokpi 1 Line at 16:35 Hrs of 05.07.2024 and then subsequently charging 132 kV Kongba - Yaingangpokpi 2 Line, 132 kV New Thoubal - Kakching Line, 132kV Thoubal New – Kongba 1, 132kV Thoubal New – Kongba 2 and 132kV Thoubal Old – Thoubal New lines.

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)	**MSPCL**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**MSPCL**
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. **Key Lessons Learnt (प्रमुख अधिगम बिंदु):**

- MSPCL is requested to ensure that patrolling related activities are undertaken as per CEA (Grid Standard) Regulation, 2010 on regular basis and measures may be identified and implemented at the earliest so as to minimize tripping of these lines.
- Healthiness of protection system needs to be ensured at all times.

Annexure 1: Sequence of Events as per SCADA

SOE not recorded

ग्रिड-इंडिया GRID-INDIA
ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
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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 Karong area of Manipur 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):21-07-2024

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

Karong area of Manipur Power System is connected with rest of NER Grid through 132 kV Imphal (MSPCL)-Karong and 132 kV Karong-Kohima lines. Prior to the event, 132 kV Imphal(MSPCL)-Karong line was under outage.

At **13:24 Hrs of 07.07.2024**, 132 kV Karong-Kohima line tripped. Due to tripping of this line, Karong area of Manipur Power System got isolated from NER Grid and collapsed due to no source available in this area.

Power supply was extended to Karong area of Manipur Power System by charging 132 kV Karong-Kohima Line at 13:52 Hrs of 07.07.2024.

2. **Time and Date of the Event (घटना का स मय और दिनांक):** 08:44 Hrs of 28-05-2024
3. **Event Category (ग्रिड घटना का प्रकार):** GD-I
4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Karong area of Manipur
5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)	State Generation (MW)	State Demand (MW)
Pre-Event (घटना पूर्व)	50.02	2951	2478		
Post Event (घटना के बाद)	50.02	2956	2480		

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 Imphal(MSPCL)-Karong line was under outage
Weather Condition (मौसम स्थिति)	Inclement

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 8 MW. There was no generation loss.

7. **Duration of interruption (रुकावट की अवधि): 28 min**

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

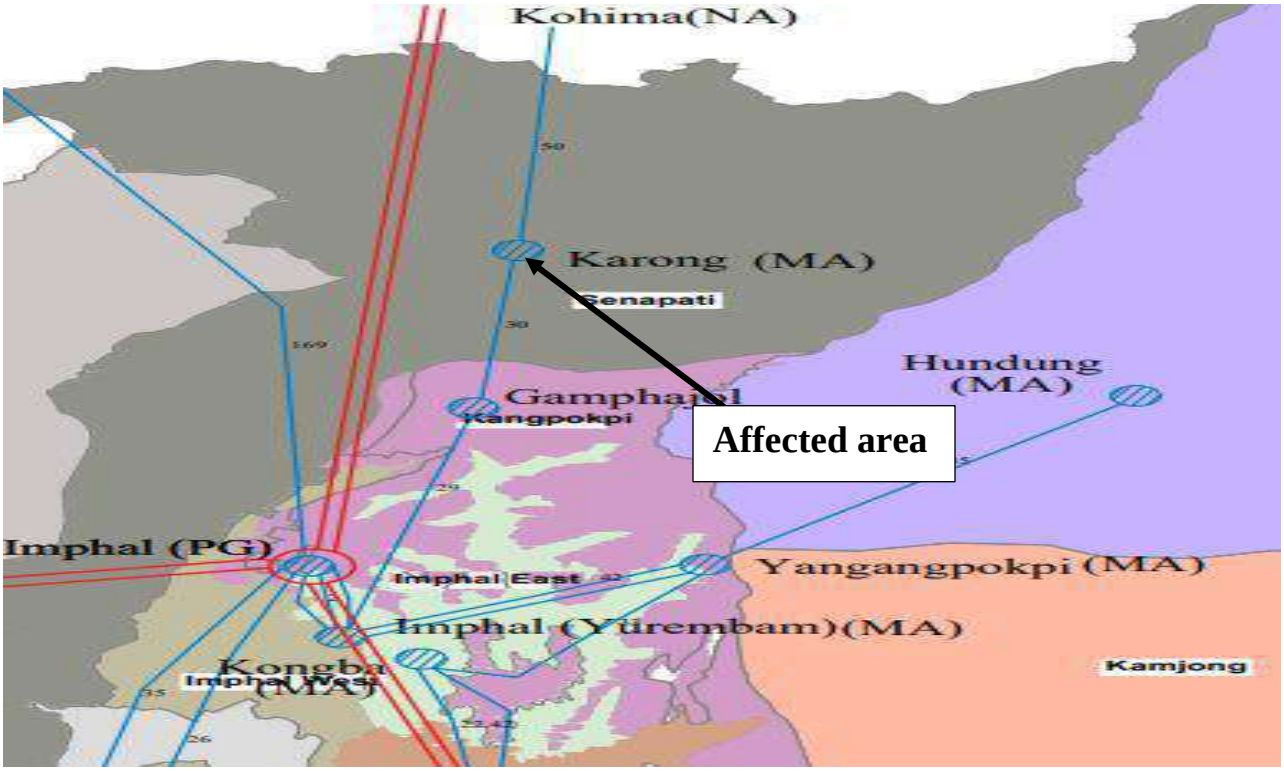


Figure 1: Network across the affected area

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 Karong-Kohima Line	13:24	13:52	No tripping	E/F, O/C

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

Proper analysis could not be done due to non-submission of DR/EL.

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

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

Power supply was extended to Karong area of Manipur Power System by charging 132 kV Karong-Kohima Line at 13:52 Hrs of 07.07.2024.

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)	MSPCL
2.	Whether DR/EL provided within 24 Hours?	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	MSPCL, DoP Nagaland
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		-

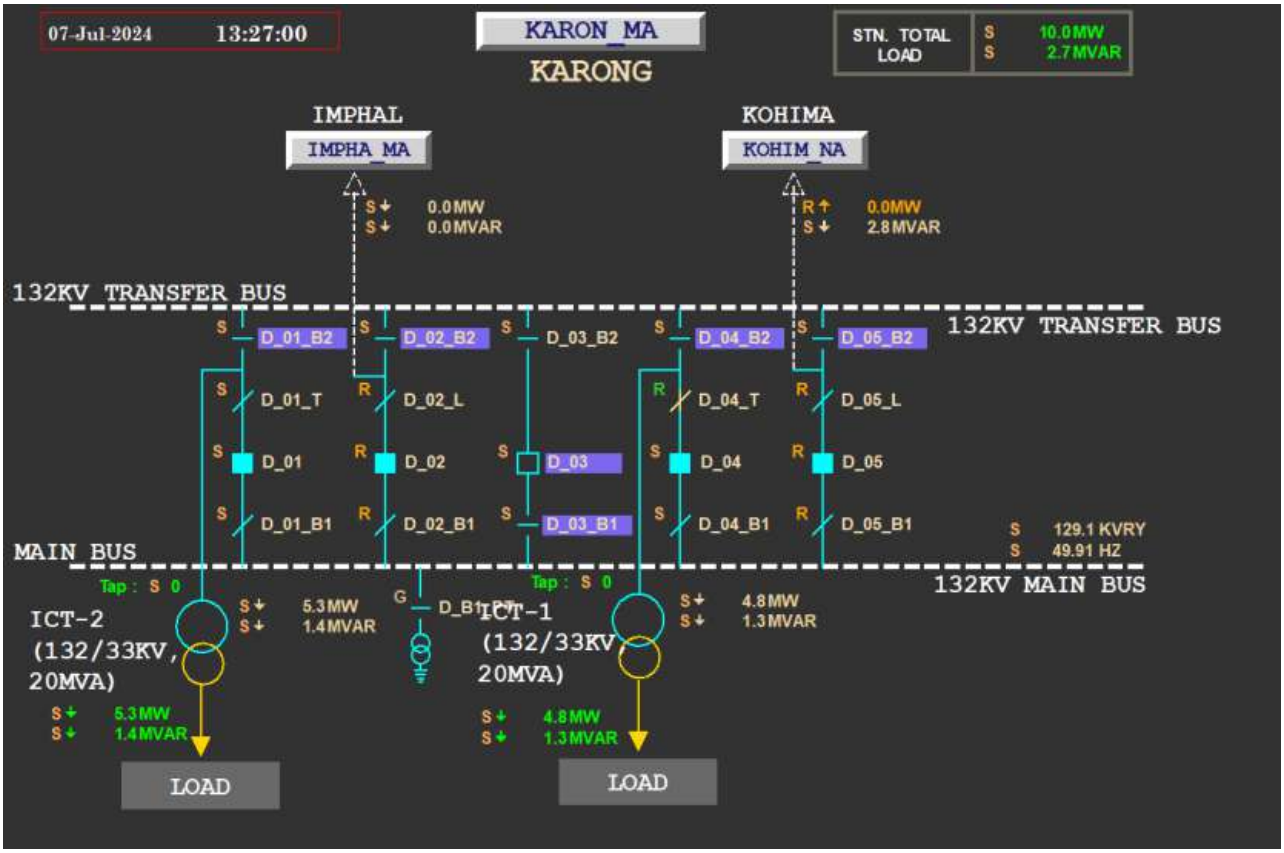
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.

Annexure 1: Sequence of Events as per SCADA

AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
AEGCL	1C	LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ BETWEEN	07 Jul 2024 16:41:35:000	07 Jul 2008 12:10:58:000	5.76E+08
AEGCL	1C	LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ CLOSED	07 Jul 2024 16:49:37:000	07 Jul 2008 12:19:19:000	9.83E+08
AEGCL	1C	LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ BETWEEN	07 Jul 2024 16:50:00:000	07 Jul 2008 12:19:50:000	4.62E+08
NAGALD	1C	KOHIM_NA	KOHIMA CB 132Kv LINE-1 TO KARON INVALID	07 Jul 2024 13:24:53:000	07 Jul 2008 13:24:24:000	5.42E+08
AEGCL	1C	LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ CLOSED	07 Jul 2024 18:19:52:000	07 Jul 2008 13:49:32:000	8.84E+08
NAGALD	1C	KOHIM_NA	KOHIMA CB 132Kv LINE-1 TO KARON CLOSED	07 Jul 2024 13:53:33:000	07 Jul 2008 13:53:15:000	8.6E+08
AEGCL	1C	LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ CLOSED	07 Jul 2024 18:27:27:000	07 Jul 2008 13:56:44:000	7.1E+08
AEGCL	1C	LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ BETWEEN	07 Jul 2024 18:35:12:000	07 Jul 2008 14:04:48:000	1.69E+08

Annexure 2: SLD of affected substation



ग्रिड-इंडिया GRID-INDIA
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CIN : U40105DL2009GOI188682, Website : www.nerldc.in, E-mail : nerldc@grid-india.in, Tel.: 0364-2537470/427, Fax: 03642537486

Detailed Report of Grid Disturbance in Jirania area 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):21-07-2024

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

Jirania area of Tripura Power System is connected with rest of NER Grid through 132 kV Budhjundnagar-Jirania & 132 kV Jirania-Baramura-Gamaitilla link.

At **16:51 Hrs of 07.07.2024**, 132 kV Budhjungnagar-Jirania & 132 kV Baramura-Gamitilla lines tripped. Due to tripping of these lines, Jirania area of Tripura Power System got isolated from NER Grid and collapsed due to no source available in this area.

Power supply was extended to Jirania area of Tripura Power System by charging 132 kV Buhjungnagar-Jirania line at 17:42 Hrs of 07.07.2024.

2. **Time and Date of the Event (घटना का स मय और दिनांक):** 16:51 Hrs of 07-05-2024

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

4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Jirania area of Tripura

5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)	State Generation (MW)	State Demand (MW)
Pre-Event (घटना पूर्व)	49.93	2995	2525		
Post Event (घटना के बाद)	49.93	3003	2500		

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 4 MW. There was no generation loss.

7. **Duration of interruption (रुकावट की अवधि): 51 min**

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

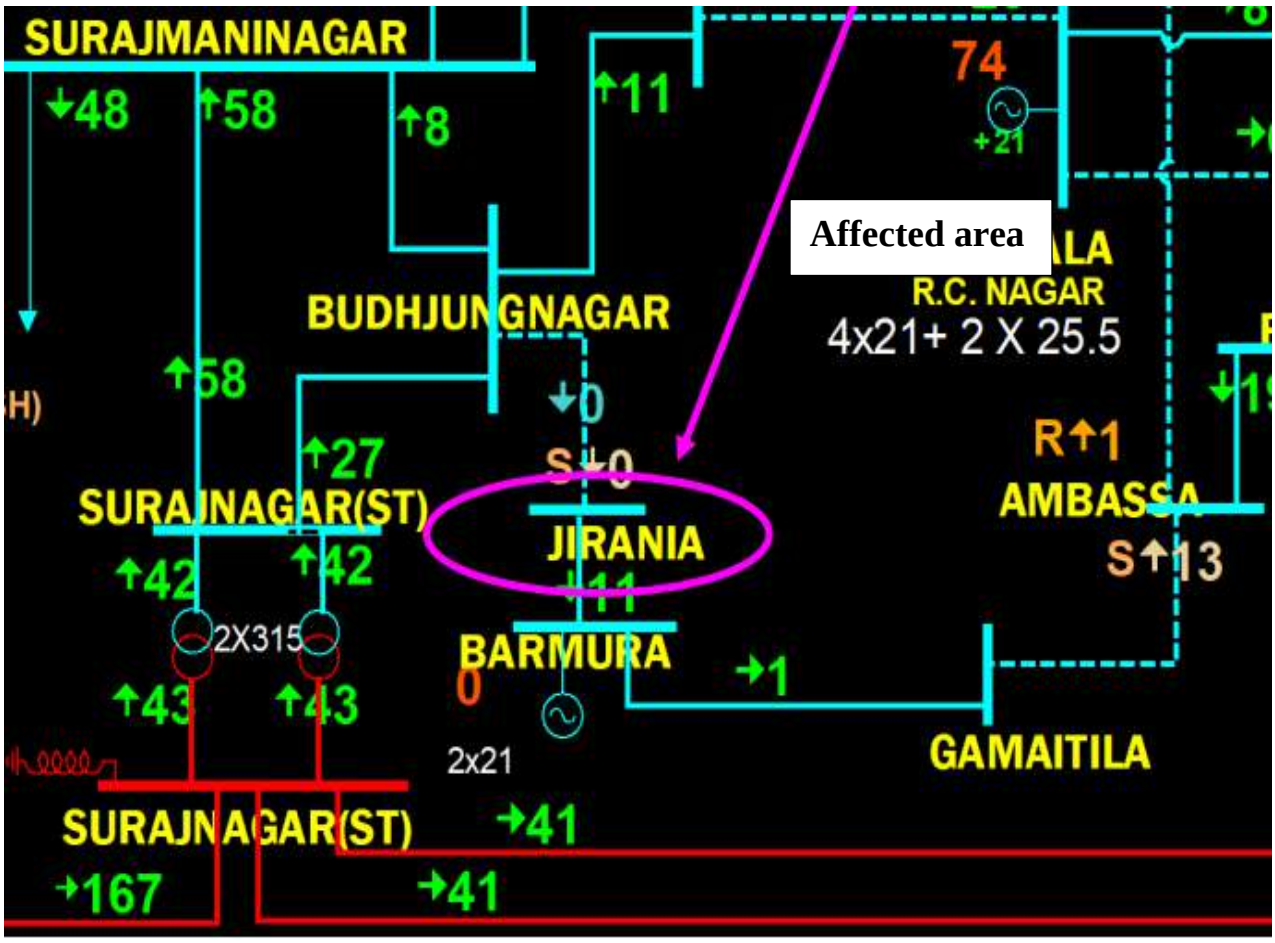


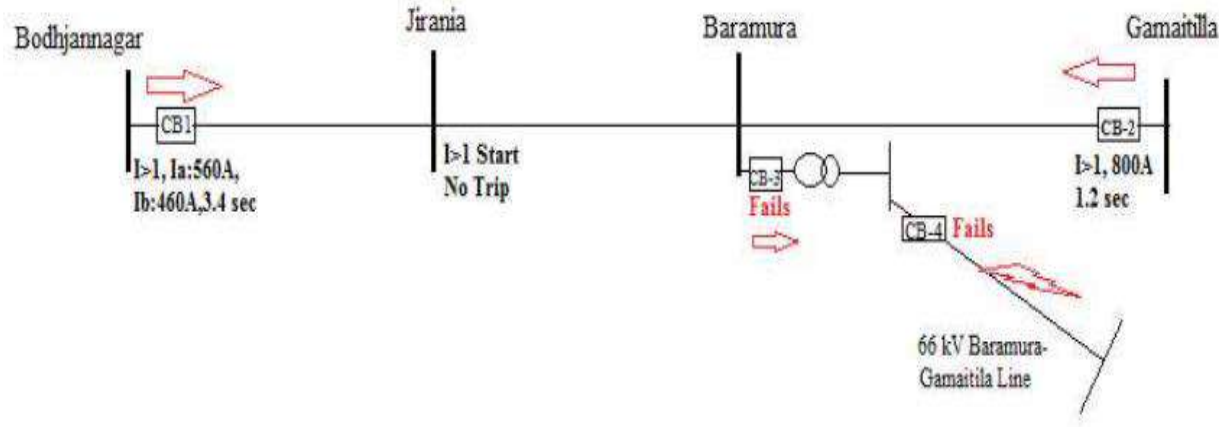
Figure 1: Network across the affected area

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 Budhjungnagar-Jirania line	16:51	17:42	O/C operated	No tripping
2	132 kV Baramura-Jirania line	16:51	17:48	No tripping	No tripping(O/C start)
3	132 kV Baramura-Gamaitilla line	16:51	18:10	No tripping	O/C operated

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



As per DR analysis of 132 kV Budhjungnagar-Jirania line, R-Y fault (Ir-560 A, Iy-460 A) cleared on operation of O/C protection from Budhjungnagar end within 3.4 sec. There was no tripping from Jirania end.

As per DR analysis of 132 kV Baramura-Gamaitilla line, fault cleared within 1.2 sec on operation of O/C protection from Gamaitilla end. There was no tripping from Baramura end.

O/C pickup at Jirania end for 132 kV Baramura - Jirania Line. However, no tripping was recorded in DR.

Suspected fault in downstream of Baramura which was not cleared resulting in clearance of fault by tripping of healthy lines 132 kV Budhjungnagar-Jirania & 132 kV Baramura-Gamaitilla from remote ends.

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

- Protection system at Baramura for downstream feeder and transformer HV side at Baramura did not operate which resulted in delayed clearance of fault from Gamaitilla and Bodhjannagar ends.
- O/C pickup at Jirania end for 132 kV Baramura - Jirania Line. However, there was no tripping. B/U setting needs to be coordinated at Jirania for 132 kV Baramura - Jirania Line as per NER protection philosophy.
- DR time drift of 3 minutes and 10 minutes observed at Bodhjannagar & Jirania.
- SOE not recorded for tripping of 132 kV Baramura-Gamaitilla line. The same needs attention from TSECL.

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

Power supply was extended to Jirania area of Tripura Power System by charging 132 kV Buhjungnagar-Jirania line at 17:42 Hrs of 07.07.2024.

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	**TSECL**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**TSECL**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**Time drift of 3 min-Budhjungnagar; 10 min-Jirania**
5.	**Any other non-compliance**		-

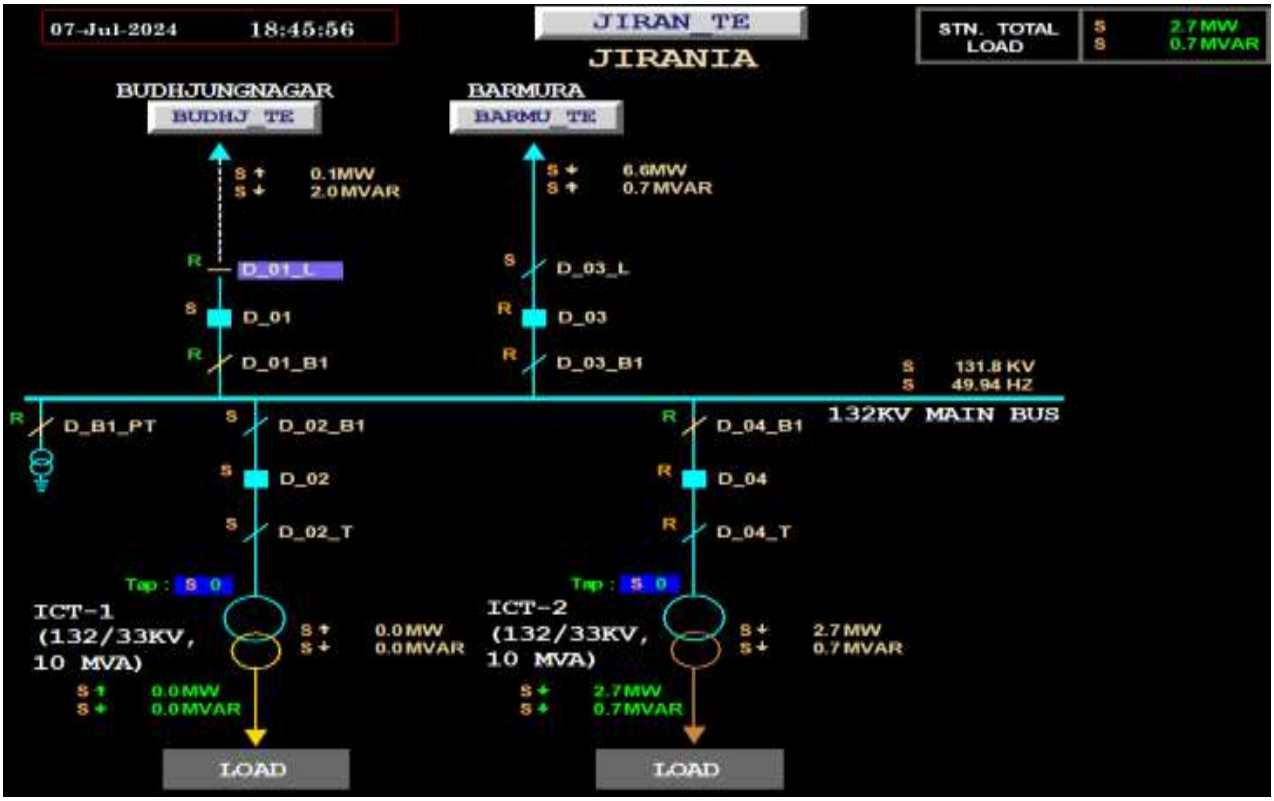
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.
- Need for preventive maintenance to ensure the healthiness of the protection system of downstream.

Annexure 1: Sequence of Events as per SCADA

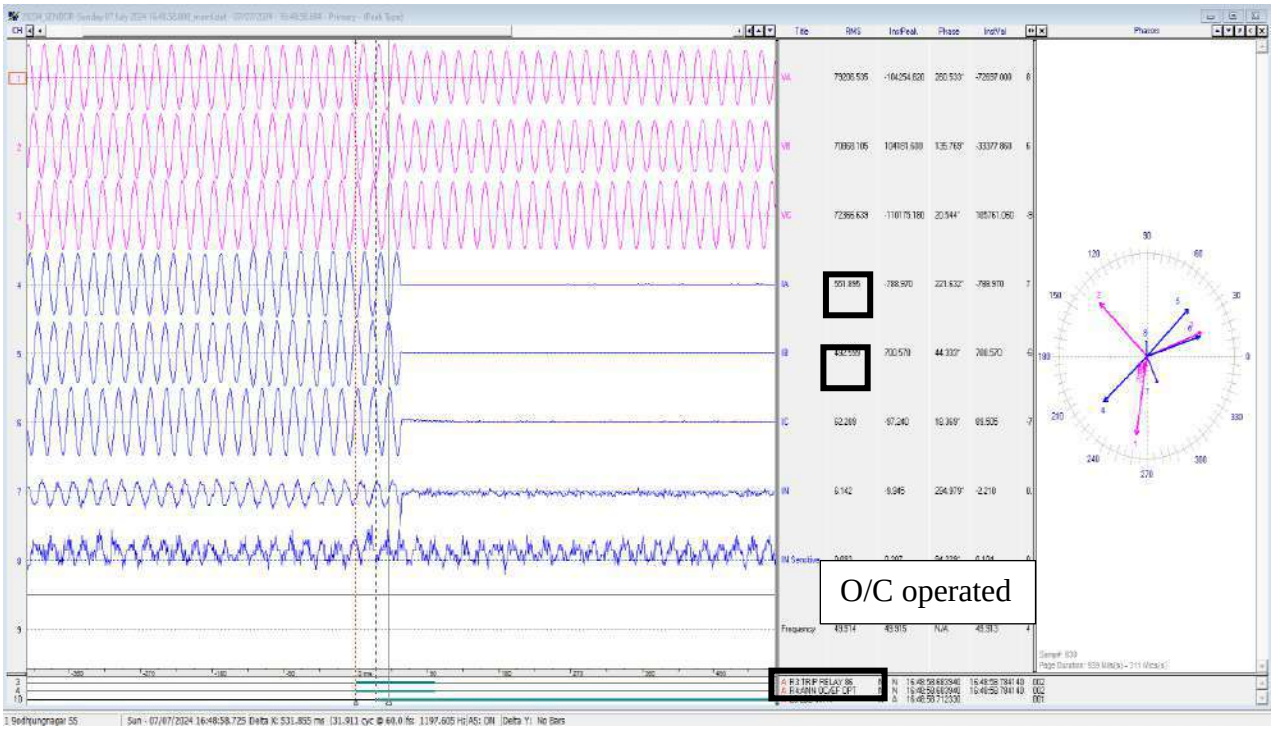
AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
---	---	---	---	---	---	---
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	07 Jul 2024 16:43:06:000	07 Jul 2024 16:42:45:000	6.98E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	07 Jul 2024 16:44:39:000	07 Jul 2024 16:44:24:000	8.53E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	07 Jul 2024 16:45:07:000	07 Jul 2024 16:44:46:000	38000000
TSECL	1C	BUDHJ_TE	BUDHJUNGNAGAR CB 132Kv LINE-1 TO JIRAN OPEN	07 Jul 2024 16:50:37:000	07 Jul 2024 16:50:00:000	6.95E+08
AEGCL	1C	BORNA_AS	BORNAGAR CB 33 KV CP 1 1 CB OPEN	07 Jul 2024 16:51:40:000	07 Jul 2024 16:51:24:000	4.2E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	07 Jul 2024 16:55:36:000	07 Jul 2024 16:54:58:000	90000000
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	07 Jul 2024 17:37:21:000	07 Jul 2024 17:36:49:000	8.11E+08
MSPCL	1C	NINGT_MA	NINGTHOUKHONG CB 132Kv LINE-1 TO CHURA CLOSED	07 Jul 2024 17:37:47:000	07 Jul 2024 17:37:12:000	2.38E+08
AEGCL	1C	BORNA_AS	BORNAGAR CB 33 KV CP 1 1 CB CLOSED	07 Jul 2024 17:37:21:000	07 Jul 2024 17:37:14:000	3.11E+08
TSECL	1C	BUDHJ_TE	BUDHJUNGNAGAR CB 132Kv LINE-1 TO JIRAN CLOSED	07 Jul 2024 17:42:21:000	07 Jul 2024 17:41:55:000	53000000
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	07 Jul 2024 17:42:56:000	07 Jul 2024 17:42:40:000	4.37E+08

Annexure 2: SLD of affected substation

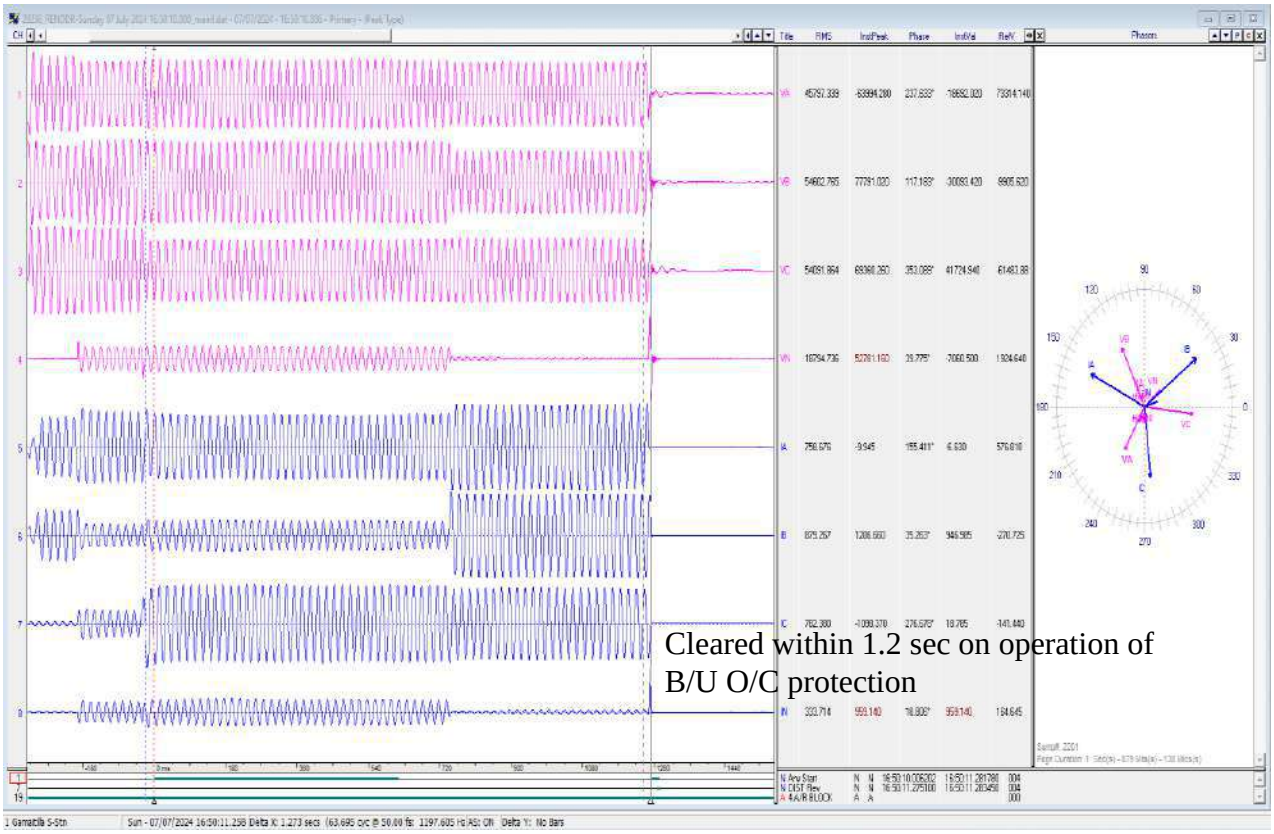


Annexure 3: Disturbance recorder snips showing faults and digital signals

3.1. DR Snapshot of Budhjungnagar for 132 kV Budhjungnagar-Jirania Line



3.2. DR Snapshot of Gamaitilla for 132 kV Gamaitilla-Baramura Line



ग्रिड-इंडिया GRID-INDIA
ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
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(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 Longnak area in Nagaland 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))

Date (दिनांक)**:22-07-2024**

1. Event Summary (घटना का सारांश):

Longnak area of Nagaland Power System was connected with rest of NER Grid through 132 kV Mokokchung-Longnak line.

At 01:37 Hrs of 08-07-2024, 132 kV Mokokchung-Longnak line tripped. Due to tripping of this element, Longnak area of Nagaland Power System was isolated from NER Grid and collapsed due to no source available this area.

Power supply was extended to Longnak area of Nagaland Power System by charging 132 kV Mokokchung-Longnak line at 05:27 Hrs on 08-07-2024.

2. Time and Date of the Event (घटना का स मय और दिनांक)**:** 01:37 Hrs of 08-07-2024

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

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Longnak area of Nagaland Power System.

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50.01	3416	2650
Post Event (घटना के बाद)	50.01	3415	2650

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)	Inclement

2. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 0.5 MW. There was no generation loss.

3. **Duration of interruption (रुकावट की अवधि): 3 Hrs 50 min**

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

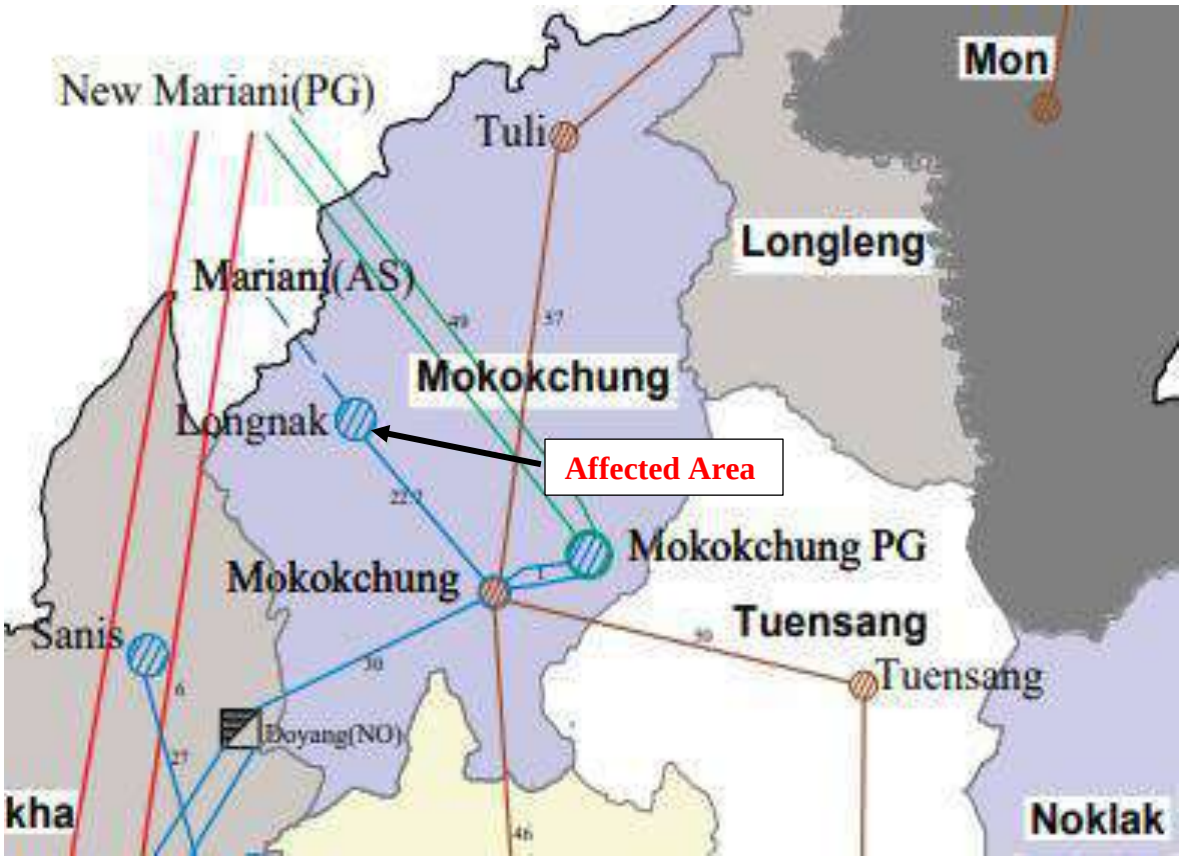


Figure: Network across the affected area

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

6. **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 Mokokchung-Longnak line	01:37	05:27	Earth fault	No tripping

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

Proper analysis could not be done due to non-submission of DR/EL.

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

9. **Action Taken/Remedial Measures (सुधारात्मक उपाय):**

- Power supply was extended to Longnak area of Nagaland Power System by charging 132 kV Mokokchung-Longnak line at 05:27 Hrs on 08-07-2024.

10. **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)	**DoP Nagaland**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**DoP Nagaland**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**DoP Nagaland**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	-
5.	**Any other non-compliance**		-

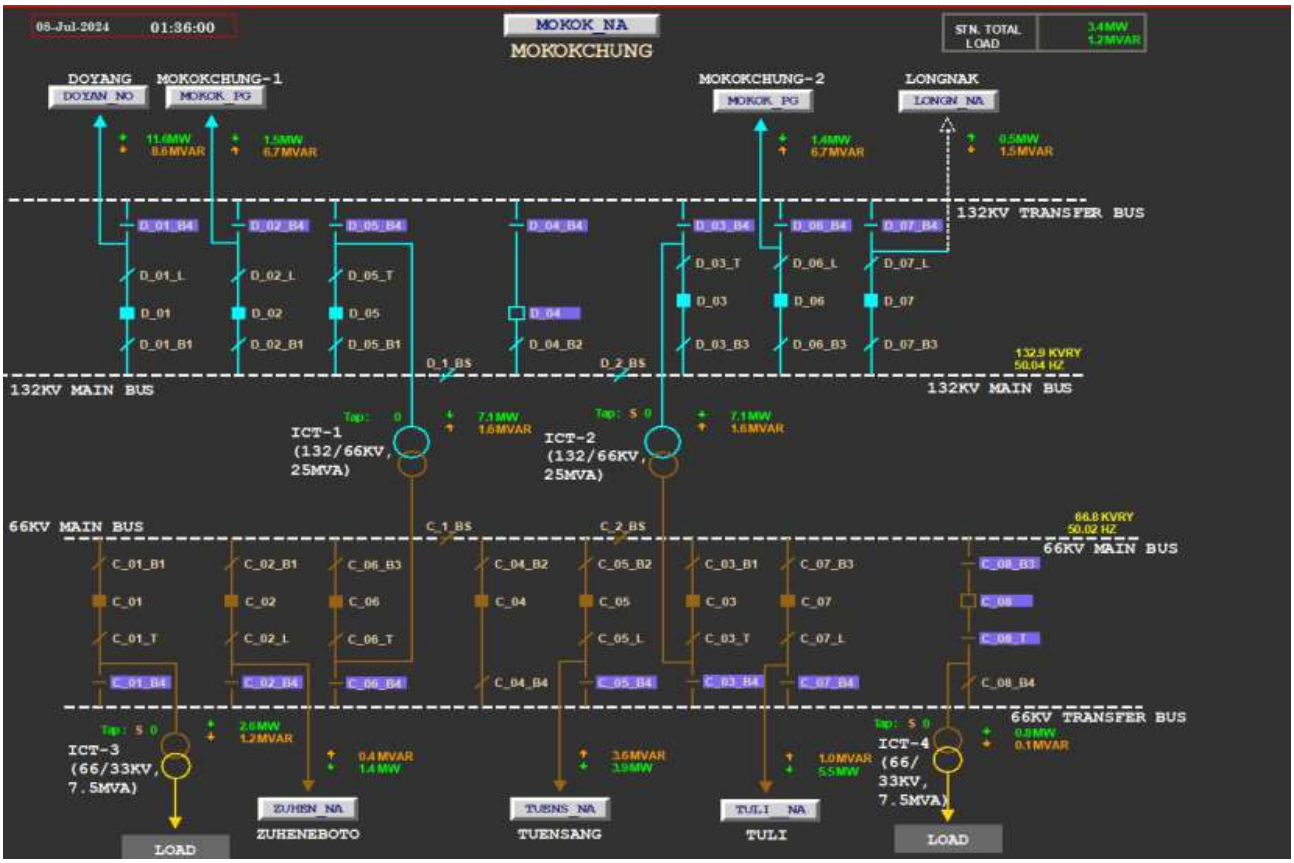
11. **Key Lessons Learnt (प्रमुख अधिगम बिंदु):**

- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.

Annexure 1: Sequence of Events

AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	08 Jul 2024 01:37:05:000	08 Jul 2024 01:36:37:000	2.93E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	08 Jul 2024 01:37:32:000	08 Jul 2024 01:36:51:000	2.73E+08
NAGALD	1C	MOKOK_NA	MOKOKCHUNG CB 132Kv LINE-1 TO LONGN OPEN	08 Jul 2024 01:38:00:000	08 Jul 2024 01:37:39:000	7.11E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	08 Jul 2024 01:42:47:000	08 Jul 2024 01:42:19:000	9.2E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	08 Jul 2024 05:22:24:000	08 Jul 2024 05:21:56:000	5.2E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	08 Jul 2024 05:22:35:000	08 Jul 2024 05:22:10:000	5E+08
NAGALD	1C	MOKOK_NA	MOKOKCHUNG CB 132Kv LINE-1 TO LONGN CLOSED	08 Jul 2024 05:22:59:000	08 Jul 2024 05:22:27:000	4.6E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	08 Jul 2024 05:24:07:000	08 Jul 2024 05:23:59:000	2.45E+08

Annexure 2: SLD of affected S/S



ग्रिड-इंडिया GRID-INDIA
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(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 Longnak area in Nagaland 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))

Date (दिनांक)**:22-07-2024**

1. Event Summary (घटना का सारांश):

Longnak area of Nagaland Power System was connected with rest of NER Grid through 132 kV Mokokchung-Longnak line.

At 06:28 Hrs of 08-07-2024, 132 kV Mokokchung-Longnak line tripped. Due to tripping of this element, Longnak area of Nagaland Power System was isolated from NER Grid and collapsed due to no source available this area.

Power supply was extended to Longnak area of Nagaland Power System by charging 132 kV Mokokchung-Longnak line at 12:04 Hrs on 08-07-2024.

2. Time and Date of the Event (घटना का स मय और दिनांक)**:** 06:28 Hrs of 08-07-2024

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

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Longnak area of Nagaland Power System.

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50.08	3404	2391
Post Event (घटना के बाद)	50.08	3404	2389

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)	Inclement

2. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 2 MW. There was no generation loss.

3. **Duration of interruption (रुकावट की अवधि): 5 Hrs 36 min**

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

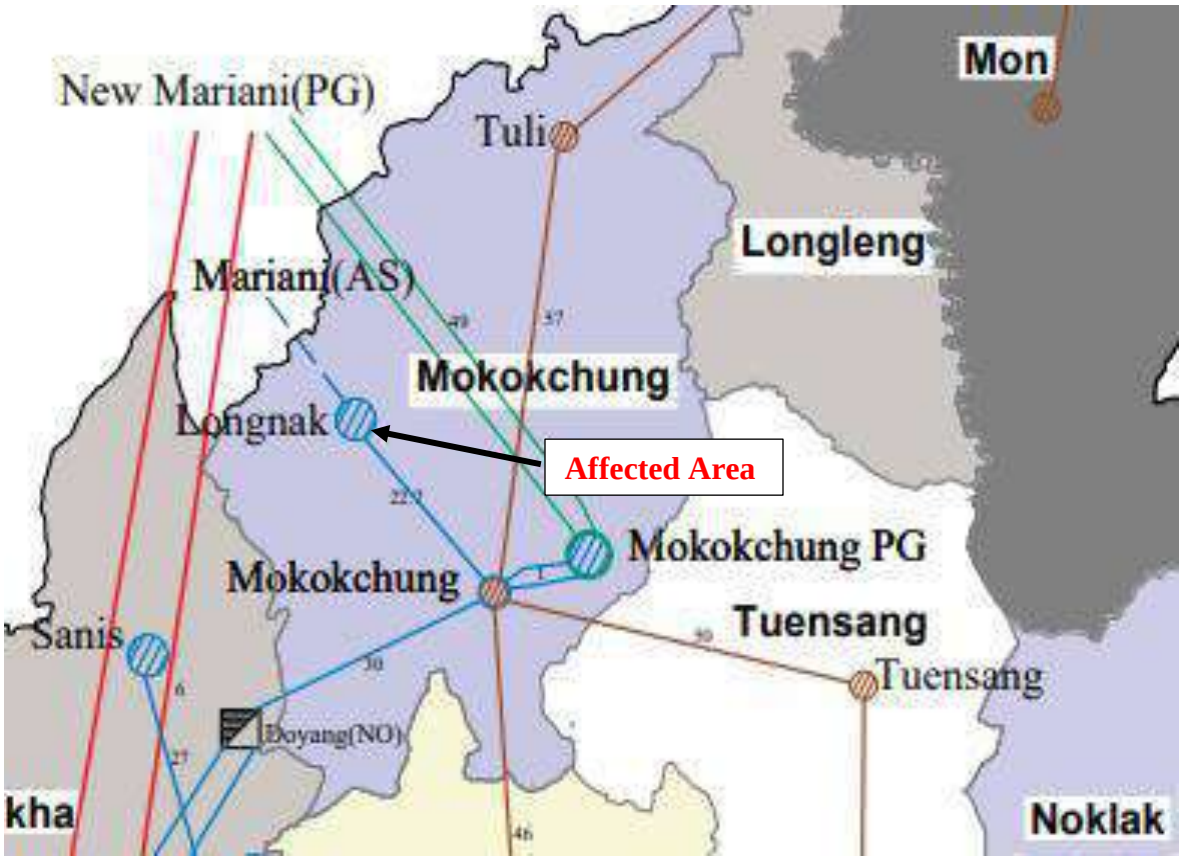


Figure: Network across the affected area

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

6. **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 Mokokchung-Longnak line	06:28	12:04	Earth fault	No tripping

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

Proper analysis could not be done due to non-submission of DR/EL.

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

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

- Power supply was extended to Longnak area of Nagaland Power System by charging 132 kV Mokokchung-Longnak line at 12:04 Hrs on 08-07-2024.

10. 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)	**DoP Nagaland**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**DoP Nagaland**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**DoP Nagaland**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	-
5.	**Any other non-compliance**		-

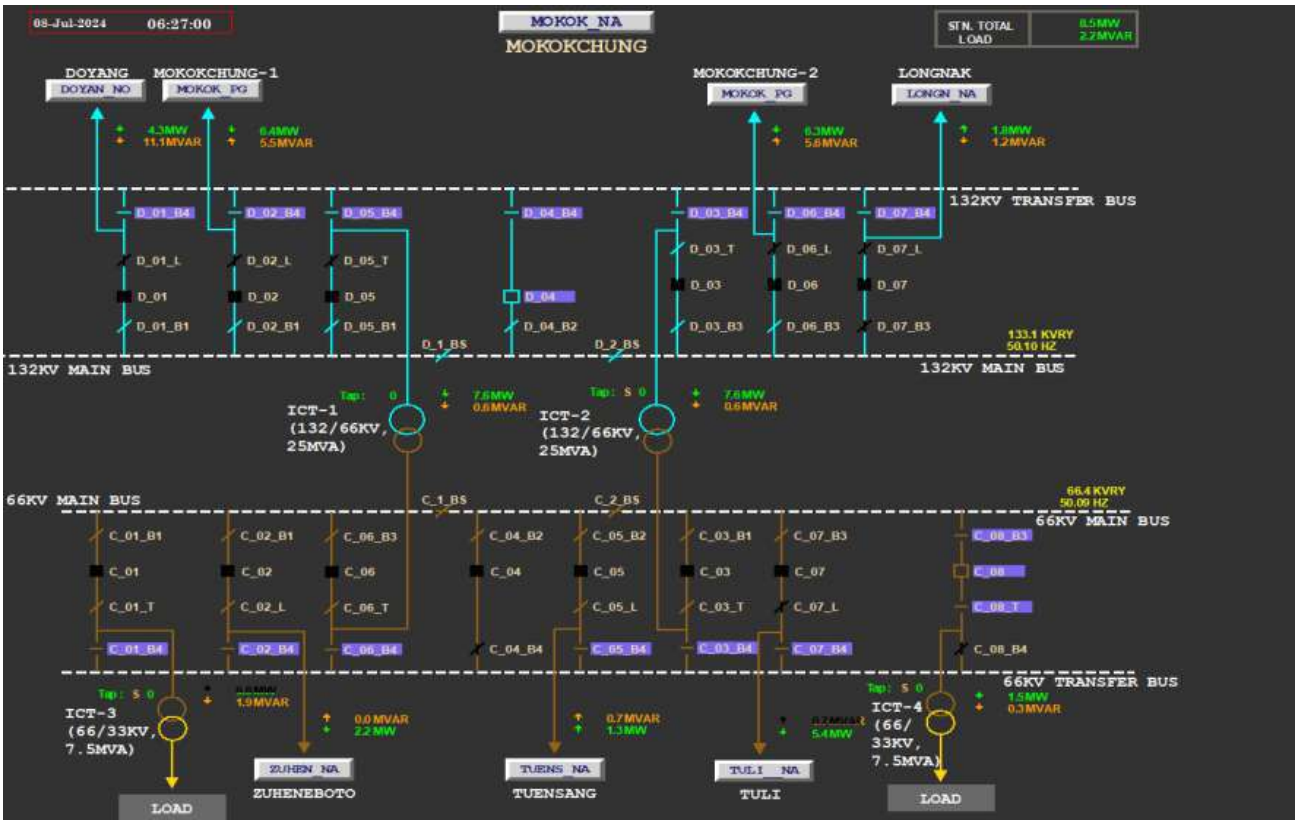
11. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.

Annexure 1: Sequence of Events

AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	08 Jul 2024 06:27:19:000	08 Jul 2024 06:27:02:000	3.02E+08
NAGALD	1C	DOYAN_NO	DOYANG CB 132/33 T1 (PRIM) OPEN	08 Jul 2024 06:28:22:000	08 Jul 2024 06:28:18:000	4.09E+08
NAGALD	1C	MOKOK_NA	MOKOKCHUNG CB 132Kv LINE-1 TO LONGN OPEN	08 Jul 2024 06:28:52:000	08 Jul 2024 06:28:35:000	1.21E+08
NAGALD	1C	DOYAN_NO	DOYANG CB 132/33 T1 (PRIM) CLOSED	08 Jul 2024 06:28:51:000	08 Jul 2024 06:28:49:000	4.18E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	08 Jul 2024 06:29:33:000	08 Jul 2024 06:29:24:000	5.97E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	08 Jul 2024 07:32:19:000	08 Jul 2024 07:32:14:000	9.62E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	08 Jul 2024 12:00:55:000	08 Jul 2024 12:00:41:000	5.46E+08
MEECL	1C	MAWPH_ME	MAWNGAP CB 33Kv LOAD MAWJR OPEN	08 Jul 2024 12:01:29:000	08 Jul 2024 12:01:08:000	1.02E+08
NAGALD	1C	MOKOK_NA	MOKOKCHUNG CB 132Kv LINE-1 TO LONGN CLOSED	08 Jul 2024 12:04:19:000	08 Jul 2024 12:04:01:000	6.63E+08
MEECL	1C	NANGA_ME	NANGALBIBRA CB 33Kv LOAD RONGJ CLOSED	08 Jul 2024 12:05:54:000	08 Jul 2024 12:05:23:000	1.12E+08

Annexure 2: SLD of affected S/S



ग्रिड-इंडिया GRID-INDIA
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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 Rengpang area in Manipur 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))

Date (दिनांक**):22-07-2024**

1. Event Summary (घटना का सारांश):

Rengpang area of Manipur Power System was connected with rest of NER Grid through 132 kV Loktak – Rengpang line. 132 kV Jiribam-Rengpang line was under outage since 18:18 Hrs of 17.11.2023.

At 10:31 Hrs of 08-07-2024, 132 kV Loktak – Rengpang line tripped. Due to tripping of this element, Rengpang area of Manipur Power System was isolated from NER Grid and collapsed due to no source available this area.

Power supply was extended to Rengpang area of Manipur Power System by charging 132 kV Loktak – Rengpang line at 12:12 Hrs on 08-07-2024.

2. Time and Date of the Event (घटना का स मय और दिनांक**):** 10:31 Hrs of 08-07-2024

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

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Rengpang area of Manipur Power System.

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50	3217	2571
Post Event (घटना के बाद)	50	3210	2579

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 Jiribam-Rengpang line was under outage since 18:18 Hrs of 17.11.2023.
Weather Condition (मौसम स्थिति)	Cloudy and drizzling

2. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 3 MW.

3. **Duration of interruption (रुकावट की अवधि): 41 min**

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

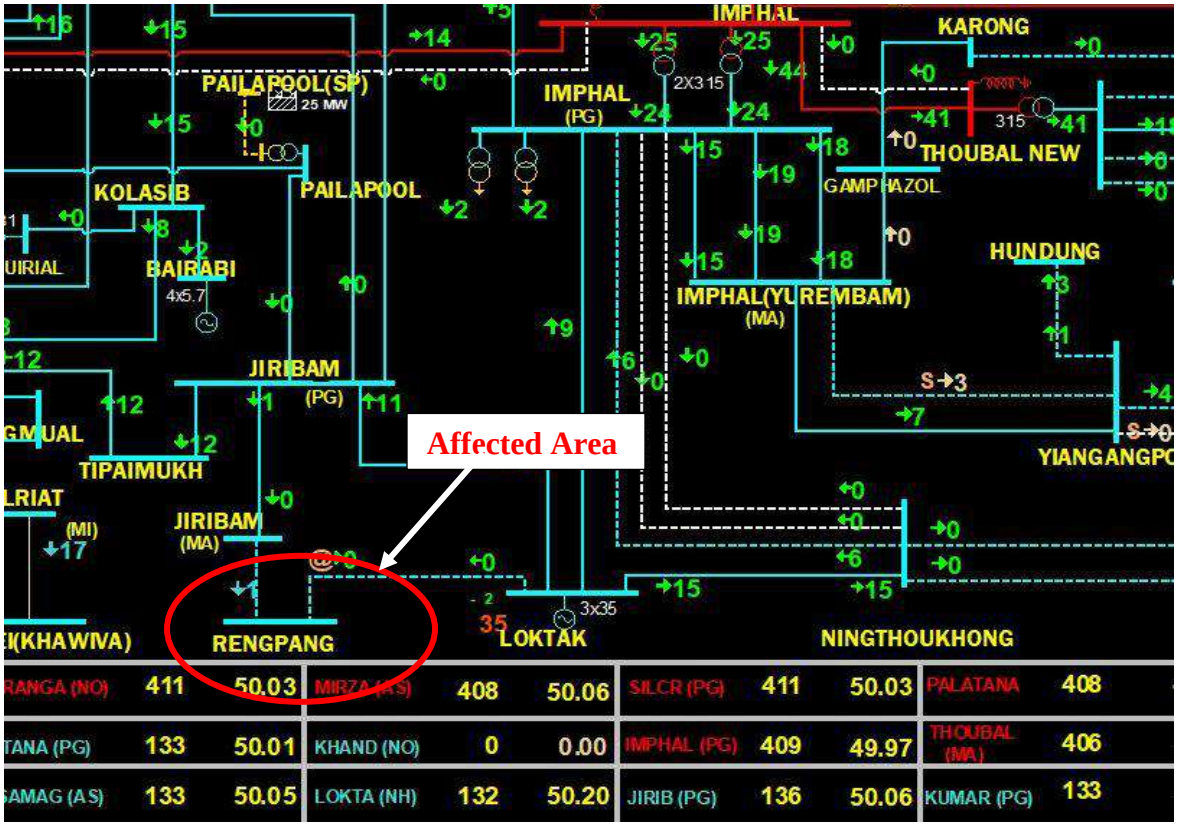


Figure: Network across the affected area

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

6. **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	132kV Loktak-Rengpang Line	10:31	12:12	DP, ZI, B-E, FD: 18.8 Km	No tripping(radial)

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

As per DR analysis, B-E fault (Ib-2.5 kA, In-2.5 kA) initiated at 10:30:58.746 Hrs and cleared within 97 msec on operation of DP, ZI from Loktak end. After 1 sec, AR was attempted and tripped due to persisting fault. There was no tripping from Rengpang end.

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

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

- Power supply was extended to Rengpang area of Manipur Power System by charging 132 kV Loktak – Rengpang line at 12:12 Hrs on 08-07-2024.

10. 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	**MSPCL, NHPC**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**MSPCL**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**No violation**
5.	**Any other non-compliance**		-

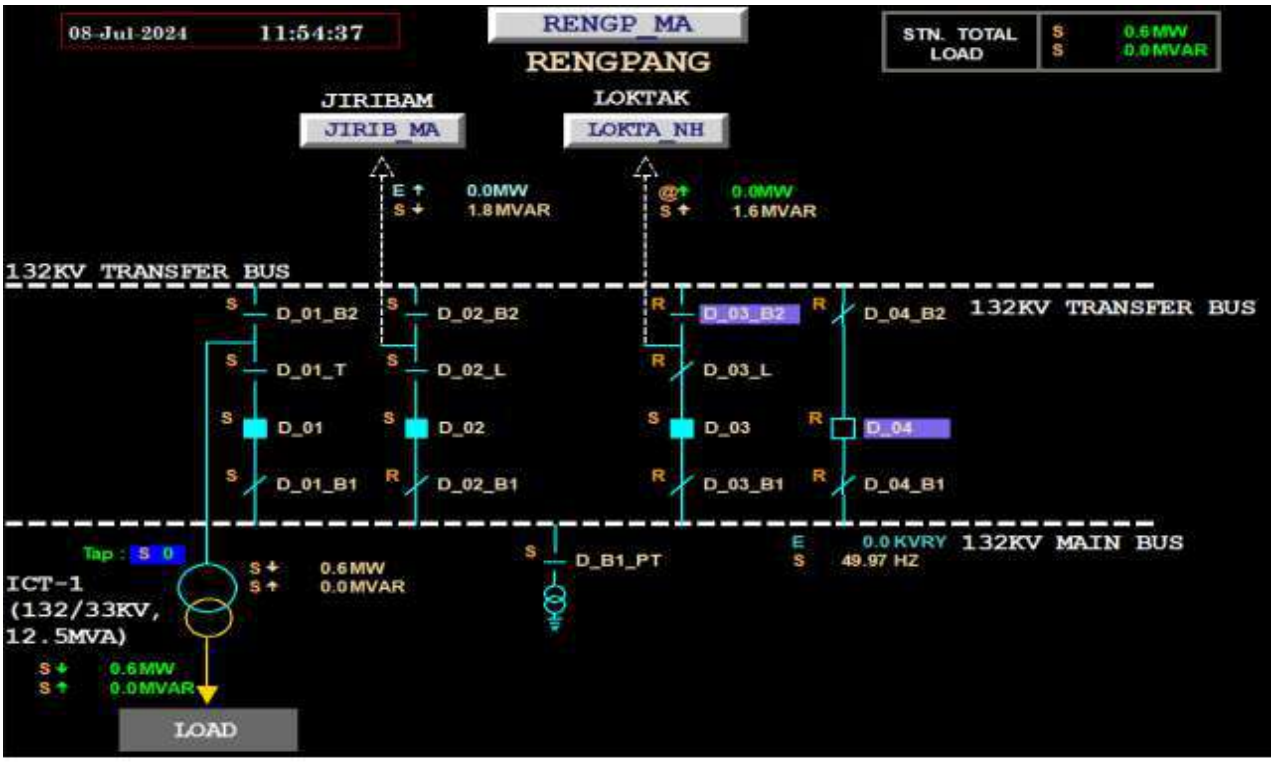
11. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.

Annexure 1: Sequence of Events

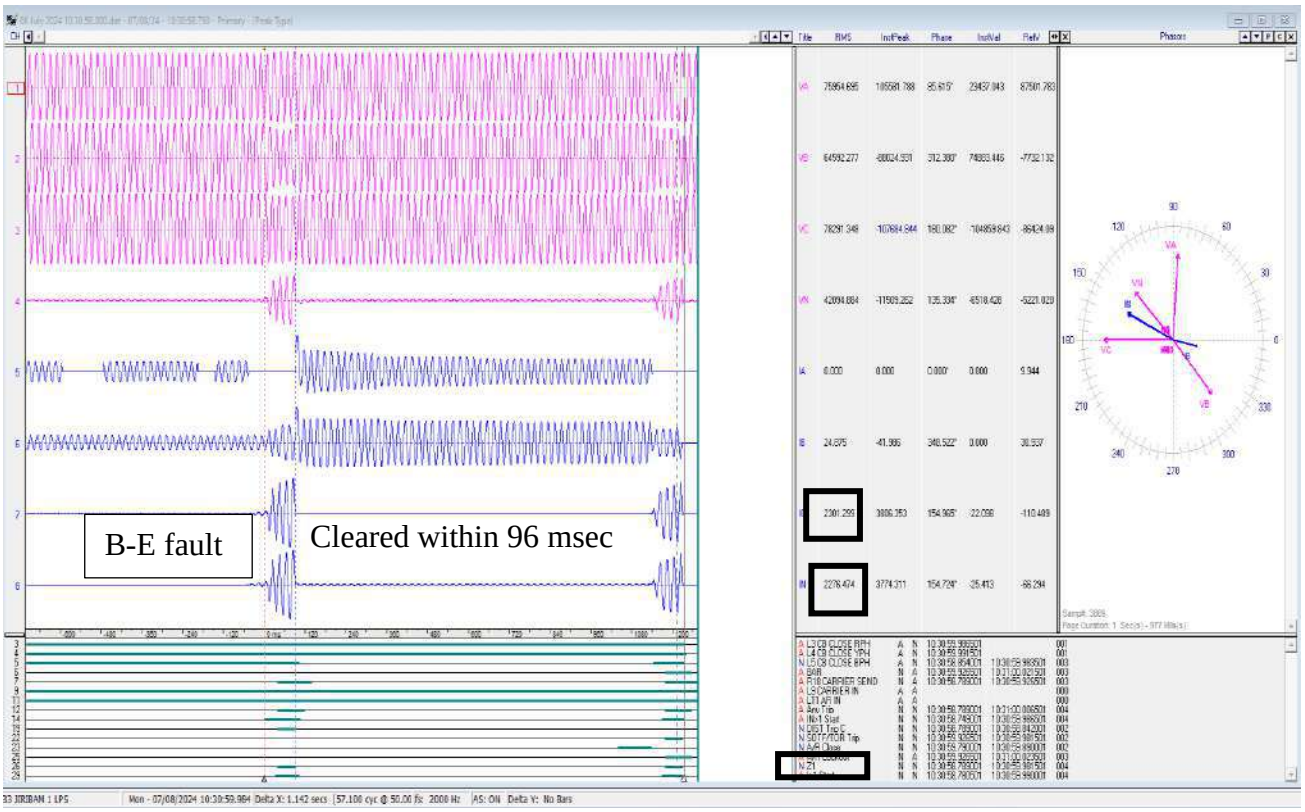
AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	08 Jul 2024 01:01:11:000	08 Jul 2024 01:00:54:000	6.95E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	08 Jul 2024 01:01:26:000	08 Jul 2024 01:01:11:000	2.95E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	08 Jul 2024 01:01:36:000	08 Jul 2024 01:01:26:000	3.65E+08
MSPCL	1C	LOKTA_NH	LOKTAK CB 132Kv LINE TO RENGP OPEN	08 Jul 2024 10:31:01:000	08 Jul 2024 01:01:40:000	1.82E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	08 Jul 2024 01:02:01:000	08 Jul 2024 01:01:43:000	8.35E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	08 Jul 2024 02:41:55:000	08 Jul 2024 02:41:40:000	4.15E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	08 Jul 2024 02:42:15:000	08 Jul 2024 02:41:53:000	4.45E+08
MSPCL	1C	LOKTA_NH	LOKTAK CB 132Kv LINE TO RENGP CLOSED	08 Jul 2024 12:12:56:000	08 Jul 2024 02:43:34:000	3.54E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	08 Jul 2024 02:50:02:000	08 Jul 2024 02:49:45:000	5.45E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	08 Jul 2024 02:50:21:000	08 Jul 2024 02:49:58:000	4E+08

Annexure 2: SLD of affected S/S



Annexure 3: Disturbance recorder snips showing faults and digital signals

3.1. DR Snapshot of Loktak for 132 kV Loktak-Rengpang Line



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 Along & Pasighat areas of Arunachal Pradesh Power System 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))

Date (दिनांक**):23-07-2024**

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

Along and Pasighat areas of Arunachal Pradesh Power System were connected with rest of NER Power system via 132 kV Along - Basar Line and 132 kV Roing - Pasighat Line.

At 12:38 Hrs of 09.07.2024, 132 kV Along - Pasighat Line, 132 kV Roing-Pasighat Line & 132 kV Along-Basar Line tripped. Due to tripping of these elements, Along and Pasighat areas of Arunachal Pradesh Power System were isolated from NER Grid and collapsed due to no source available in these areas.

Power is restored at Pasighat area by charging 132 kV Roing-Pasighat line at 14:45 Hrs of 09-07-2024 and further extended to the Along area by charging 132 kV Along-Pasighat line at 16:22 Hrs of 09-07-2024.

2. **Time and Date of the Event** (घटना का स मय और दिनांक**):** 12:38 Hrs of 09-07-2024

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

4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Along & Pasighat areas

5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50.03	2963	2655
Post Event (घटना के बाद)	50.03	2966	2656

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

2. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss 10 MW. No generation loss

3. **Duration of interruption (रुकावट की अवधि): 127 min-Pasighat, 217 min-Along**

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

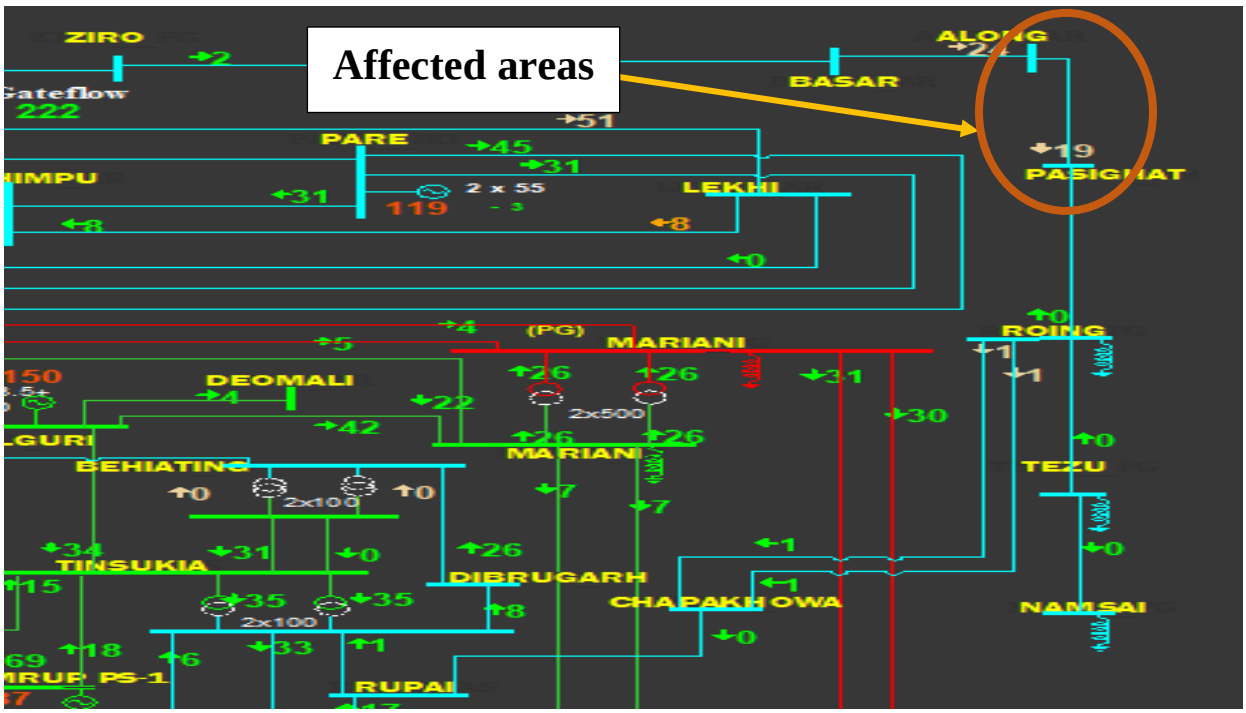


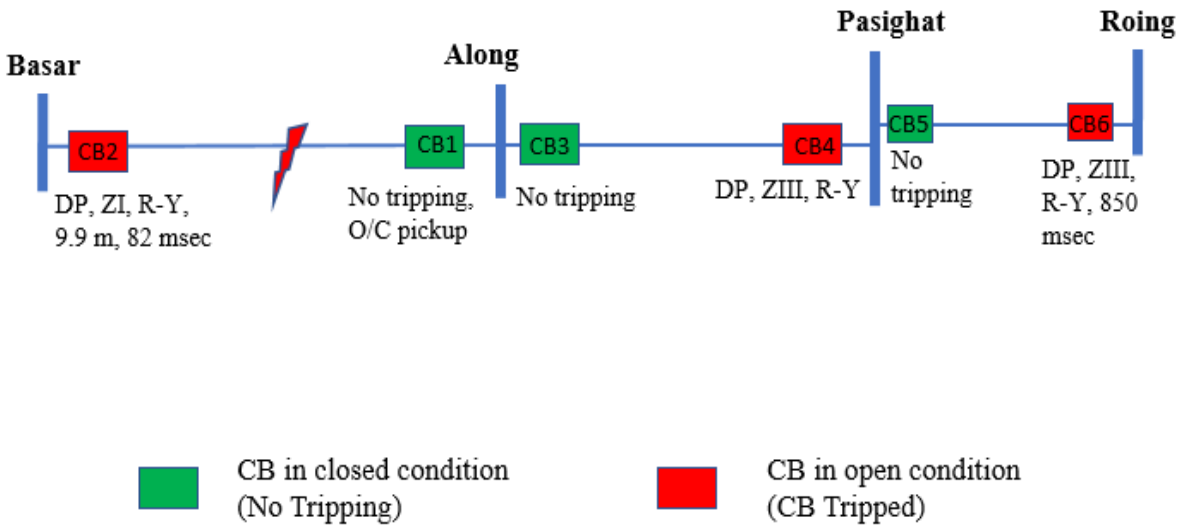
Figure 1: Network across the affected area

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

6. **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 Along-Pasighat Line	12:38	16:22	No tripping	DP, ZIII, R-Y
2	132 kV Basar-Along Line	12:38	-	DP, ZI, R-Y, FD: 9.9 km	No tripping (I>1 pickup)
3	132 kV Roing-Pasighat Line	12:38	14:45	DP, ZIII, R-Y	No tripping

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



As per DR analysis of 132 kV Along-Basar line, R-Y fault (Ir-861 A, Iy-791 A) initiated at 12:38:03.595 Hrs and cleared within 82 msec from Basar end on operation of DP, ZI. There was no tripping from Along end (I>1 pickup)

As per DR analysis of 132 kV Along-Pasighat line, R-Y fault detected in ZIII from Pasighat end and issued trip command after 818 msec and CB opened within 100 msec.

As per DR analysis of 132 kV Roing-Pasighat line, R-Y fault cleared within 850 msec on operation of DP, ZIII. There was no tripping from Pasighat end.

Fault in 132 kV Along-Basar line which was not cleared from Along end leading to clearing of fault by tripping of healthy 132 kV Roing-Pasighat line.

As informed by DoP AP, fault occurred due to falling of big tree touching two phase conductor.

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

- Protection system at Along failed to isolate the fault in 132 kV Along-Basar line leading to tripping of healthy 132 kV Roing-Pasighat line.
- Non-clearance of fault by the protection system at Pasighat for 132 kV Along-Pasighat line on B/U protection needs to be checked.
- SOE not recorded for tripping of 132 kV Along-Basar line. The same needs attention from DoP Arunachal Pradesh/ SLDC Arunachal Pradesh team.

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

- Power is restored at Pasighat area by charging 132 kV Roing-Pasighat line at 14:45 Hrs of 09-07-2024 and further extended to the Along area by charging 132 kV Along-Pasighat line at 16:22 Hrs of 09-07-2024.

10. 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)	**DoP AP**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**DoP AP**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**DoP AP**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**Time drift of 2 min at Pasighat end for 132 kV Along-Pasighat line**
5.	**Any other non-compliance**		-

11. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.

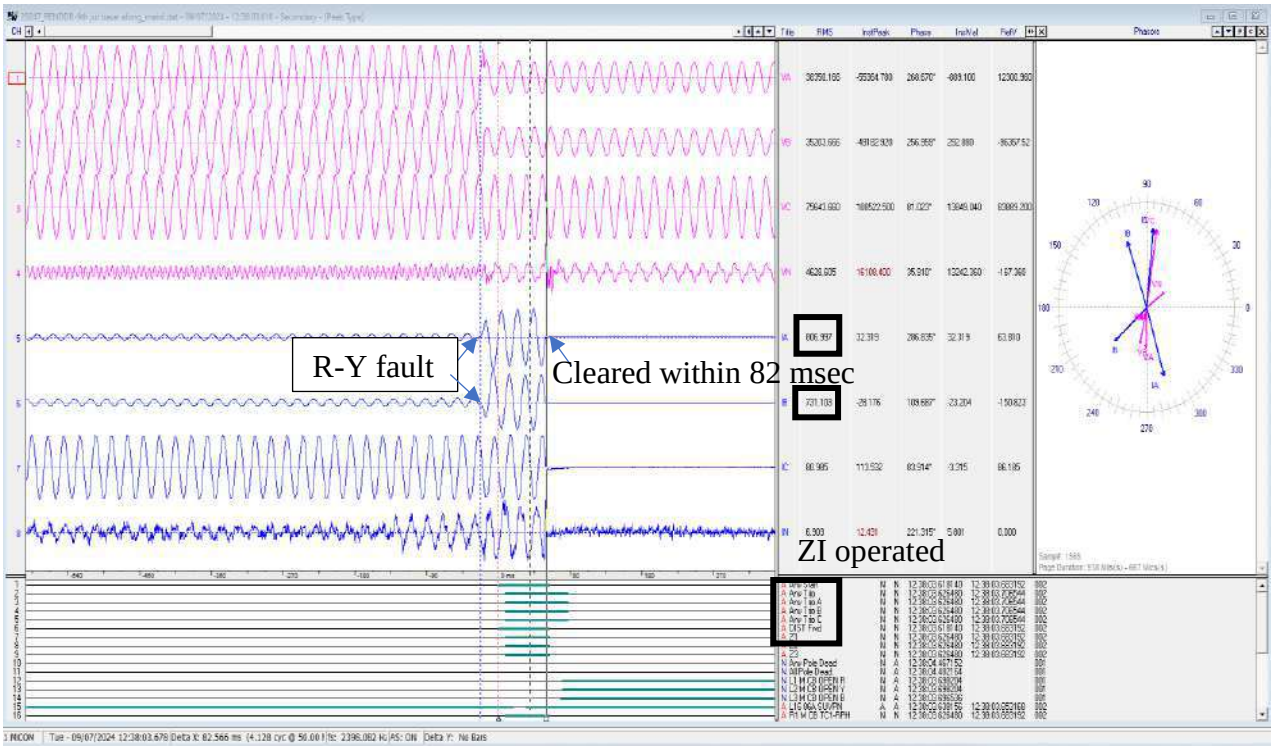
- Healthiness of protection system needs to be ensured at all times.

Annexure 1: Sequence of Events as per SCADA

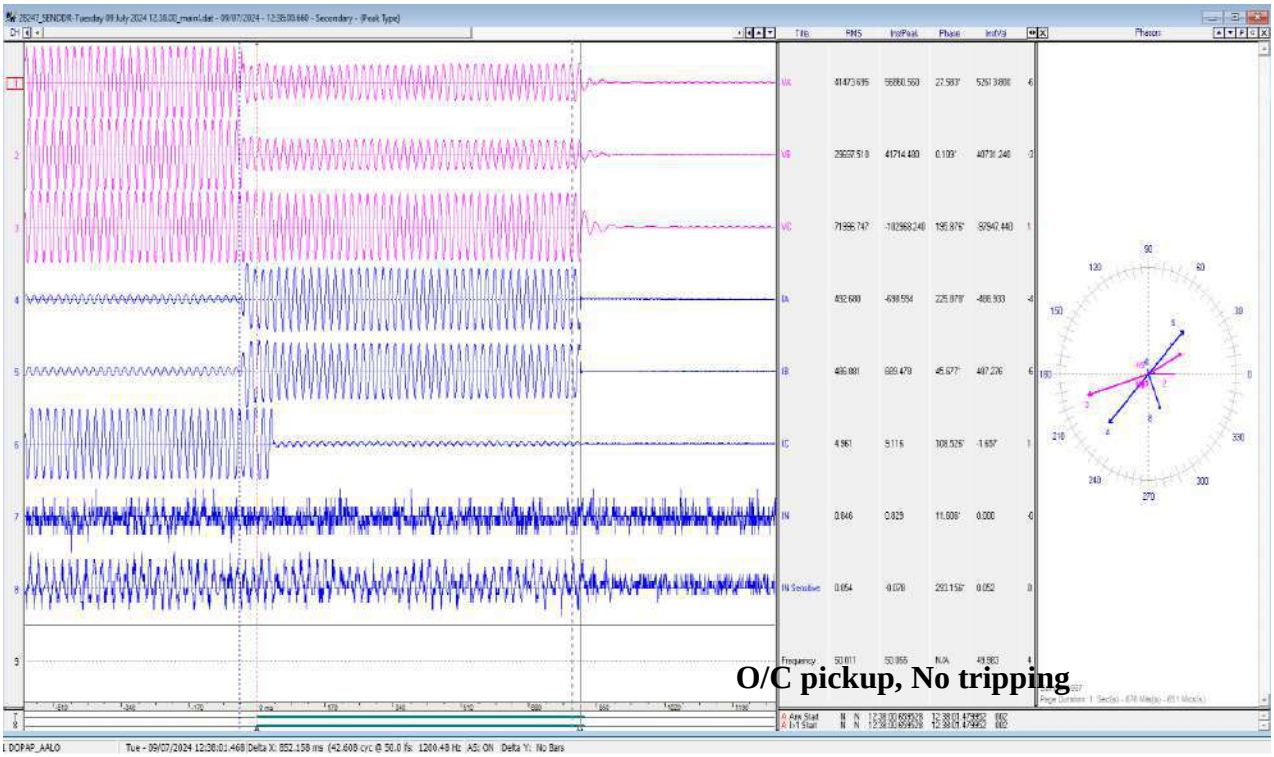
AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
MSPCL	1C	IMPHA_PG	IMPHAL CB TIE CB THOUBL2 CLOSED	09 Jul 2024 19:15:29:000	25 Apr 2024 15:00:32:000	5.31E+08
MSPCL	1C	IMPHA_PG	IMPHAL CB TIE CB THOUBL2 CLOSED	09 Jul 2024 19:20:34:000	25 Apr 2024 15:00:32:000	5.31E+08
ARUNCH	1C	ALONG_AR	ALONG CB 132Kv LINE TO PASIG OPEN	09 Jul 2024 12:39:24:000	12 May 2024 12:56:47:000	1.11E+08
ARUNCH	1C	ALONG_AR	ALONG CB 132Kv LINE TO PASIG CLOSED	09 Jul 2024 16:24:12:000	12 May 2024 16:41:45:000	5.13E+08
MSPCL	1C	IMPHA_PG	IMPHAL CB BR_2 CB CLOSED	09 Jul 2024 19:20:26:000	14 May 2024 10:22:36:000	7.66E+08
MSPCL	1C	IMPHA_PG	IMPHAL CB TIE CB CLOSED	09 Jul 2024 19:20:34:000	14 May 2024 10:23:25:000	8.59E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	09 Jul 2024 00:05:50:000	09 Jul 2024 00:05:24:000	1.77E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	09 Jul 2024 00:05:55:000	09 Jul 2024 00:05:49:000	4.07E+08
ARUNCH	1C	ROING_PG	ROING CB 132Kv LINE-1 TO PASIG OPEN	09 Jul 2024 12:38:07:000	09 Jul 2024 00:08:04:000	4.54E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	09 Jul 2024 00:11:01:000	09 Jul 2024 00:10:56:000	6.93E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	09 Jul 2024 00:11:31:000	09 Jul 2024 00:11:21:000	43000000
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	09 Jul 2024 02:15:00:000	09 Jul 2024 02:14:55:000	1.08E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	09 Jul 2024 02:15:53:000	09 Jul 2024 02:15:21:000	98000000
ARUNCH	1C	ROING_PG	ROING CB 132Kv LINE-1 TO PASIG CLOSED	09 Jul 2024 14:45:54:000	09 Jul 2024 02:15:51:000	1.67E+08
MIZORM	1C	INDOO_MI	INDOOR CB 33 Kv BS 1 BETWEEN	09 Jul 2024 02:17:35:000	09 Jul 2024 02:17:20:000	9.03E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	09 Jul 2024 02:19:00:000	09 Jul 2024 02:18:25:000	9.68E+08

Annexure 2: DR Snapshot

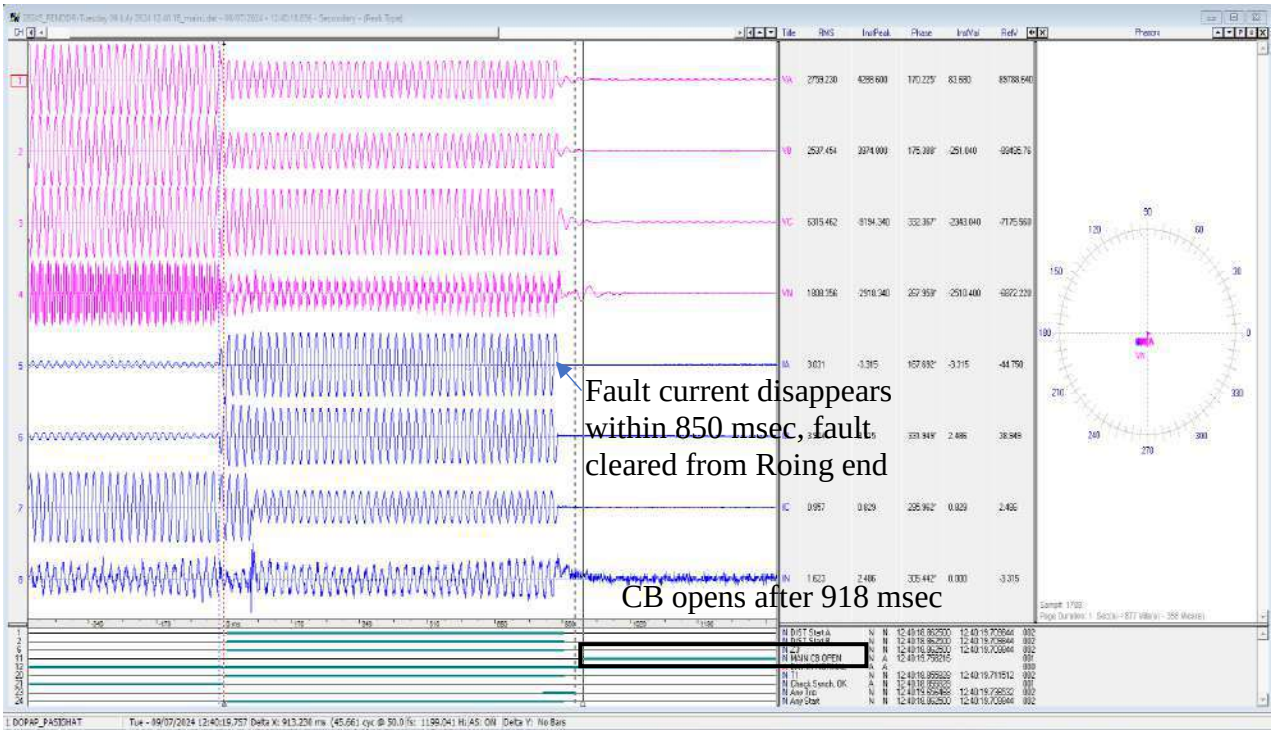
2.1 DR snapshot of Basar end for 132 kV Basar-Along line



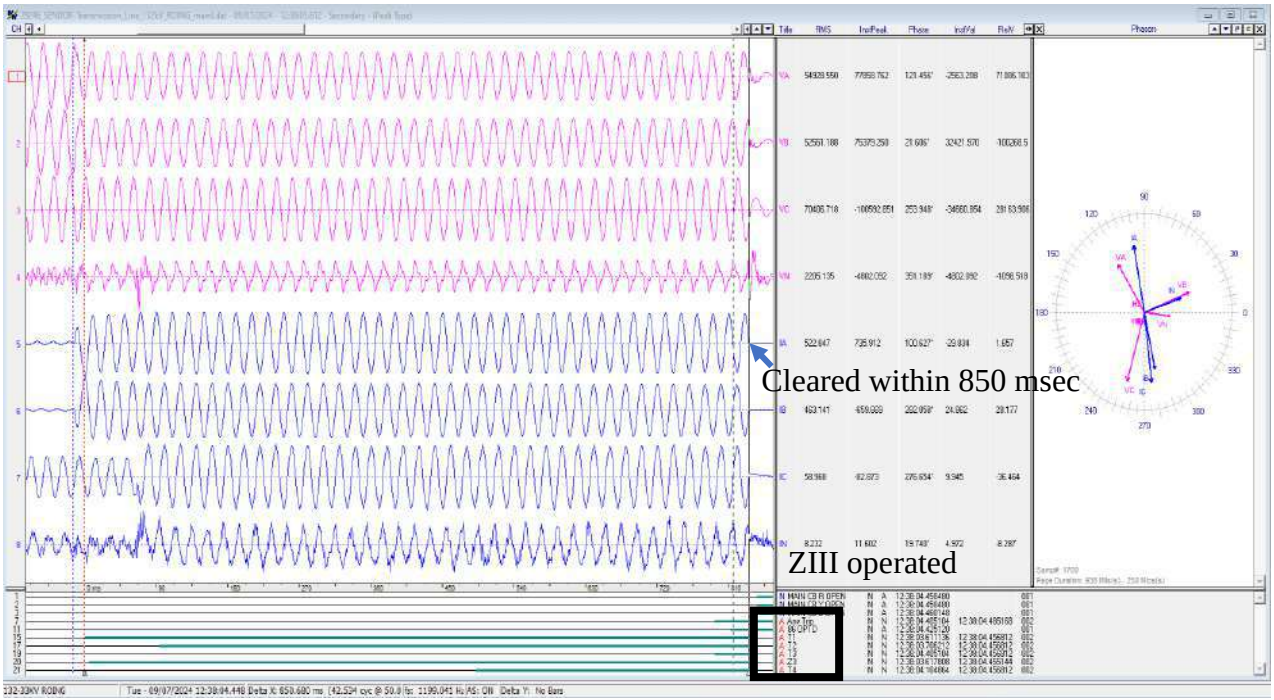
2.2 DR snapshot of Along end for 132 kV Basar-Along line



2.3 DR snapshot of Pasighat end for 132 kV Along-Pasighat line



2.4 DR snapshot of Roing end for 132 kV Roing-Pasighat line



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 Khupi, Tenga & Dikshi areas of Arunachal Pradesh Power System 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))

Date (दिनांक**):23-07-2024**

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

Khupi, Tenga & Dikshi areas of Arunachal Pradesh Power System were connected with rest of NER Power system via 132 kV Balipara- Tenga line and 400/132 kV, 3x40 MVA ICT at Kameng.

At 13:42 Hrs of 09.07.2024, 132 kV Balipara-Tenga line and 400/132 kV, 3x40 MVA ICT at Kameng tripped leading to blackout of Khupi, Tenga and Dikshi areas of Arunachal Pradesh Power system due to load generation mismatch in these areas.

Power is restored at Tenga, Khupi and Dikshi areas by charging 132 kV Balipara-Tenga line at 15:20 Hrs of 09-07-2024.

2. **Time and Date of the Event (**घटना का स मय और दिनांक**):** 13:42 Hrs of 09-07-2024

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

4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Tenga, Khupi and Dikshi areas of Arunachal Pradesh

5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	49.84	3074	2582
Post Event (घटना के बाद)	49.84	3077	2606

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

2. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss 8 MW and generation loss of 23 MW

3. **Duration of interruption (रुकावट की अवधि): 1 Hr 21 min**

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

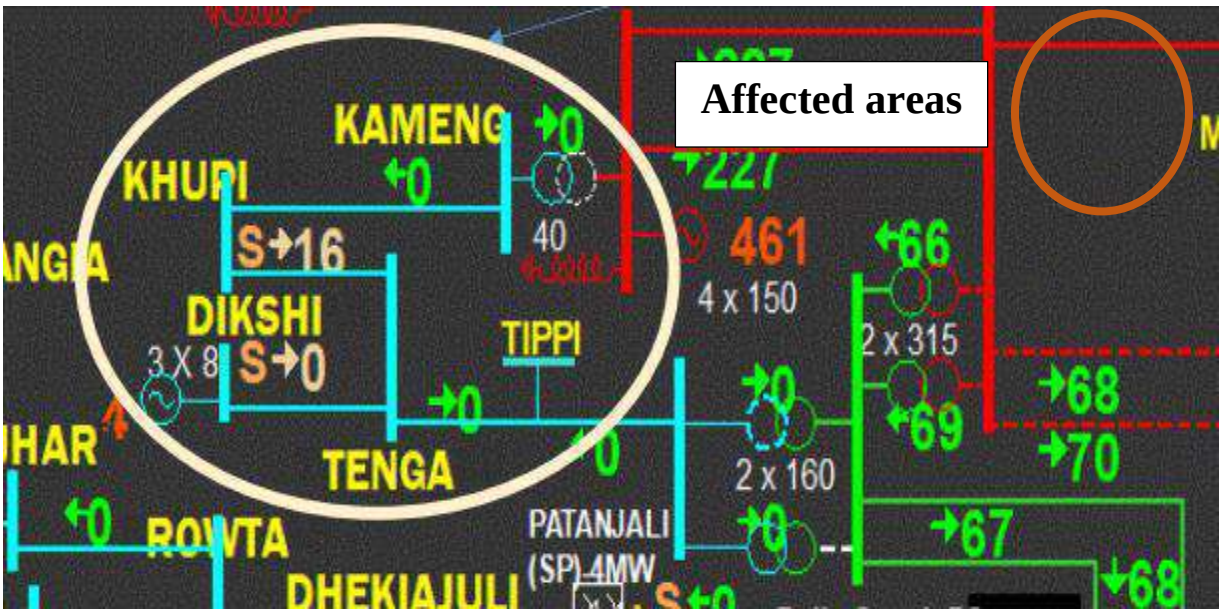


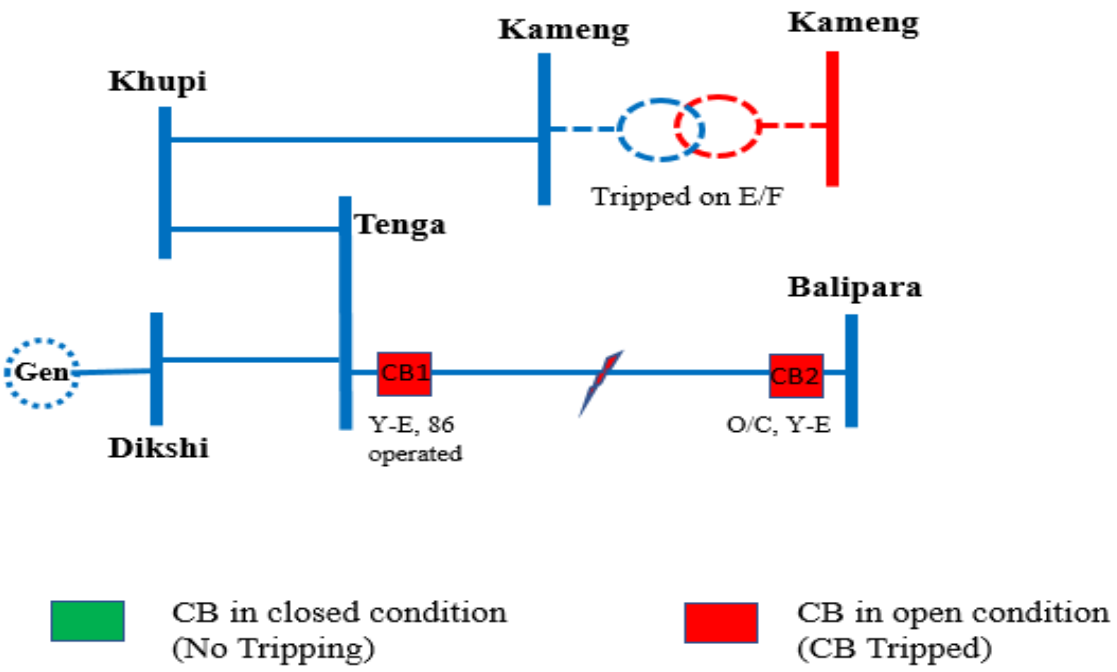
Figure 1: Network across the affected area

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

6. **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 Balipara-Tenga Line	13:42	15:20	O/C operated, Y-E	86 relay operated
2	400/132 kV, 3x40 MVA ICT at Kameng	13:42	15:03	HV earth fault Stg-I operated	

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



As per DR analysis, resistive Y-E fault occurred in 132 kV Balipara - Tenga Line with Ib: 666A, Vbe: 75 kV, In: 598 A, cleared in more than 539 msec on operation of O/C protection from Balipara end (I>1 started and tripped within 56 msec). As per DR of Tenga end, Y-E fault detected by relay and 86 relay operated at 13:41:09.367 Hrs.

Fault in 132 kV Balipara-Tenga line is likely due to vegetation.

At the same time, 3x40 MVA, 400/132 kV ICT at Kameng tripped on E/F (as per FIR) at 13:42:38.735 Hrs (Iy-193 A) which seems misoperation. Fault clearance time could not be concluded as there is no **Any start** digital channel high recorded which seems misoperation.

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

- O/C time delay setting of 132 kV Balipara-Tenga line for Balipara end needs to be reviewed and coordinated as per NER protection philosophy.
- It is not clear which protection issued tripped command to CB at Tenga end. The Same needs to be checked by DoP AP.
- B/U E/F setting of 400/132 kV ICT at Kameng needs to be reviewed and coordinated as per NER protection philosophy to prevent unnecessary tripping for fault beyond protected zone.

- DR time needs to be standardized:

  i) DR time duration is insufficient. It needs to be increased to 3 sec with pre fault time of 500 msec and post fault time of 2500 msec.

  ii) **Any start** digital channel needs to be configured in DR.

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

- Power is restored at Tenga, Khupi and Dikshi areas by charging 132 kV Balipara-Tenga line at 15:20 Hrs of 09-07-2024.

10. 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)	**DoP AP**
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)	**DoP AP**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**Time drift of 33 min at Balipara end for 132 kV Balipara-Tenga line**
5.	**Any other non-compliance**		**-**

11. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

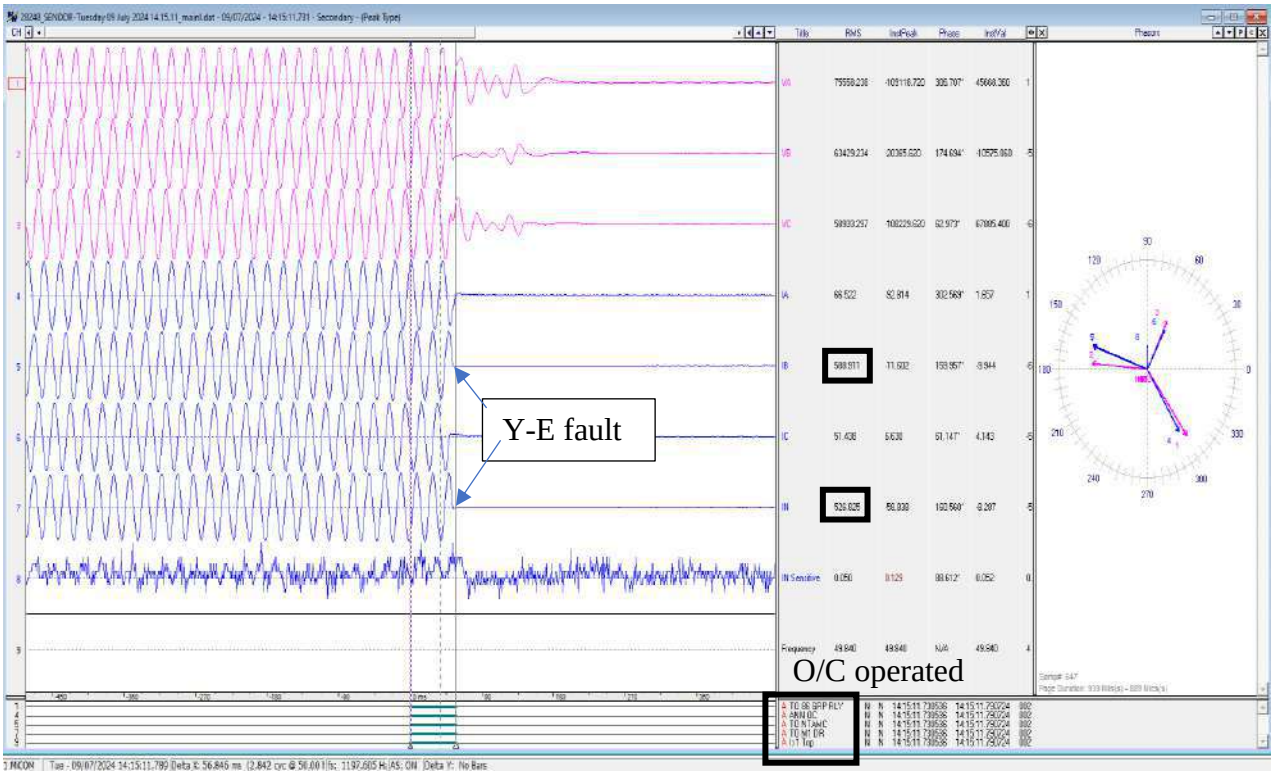
- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.
- Healthiness of protection system needs to be ensured at all times.
- Periodic review of protection settings needs to be conducted.

Annexure 1: Sequence of Events as per SCADA

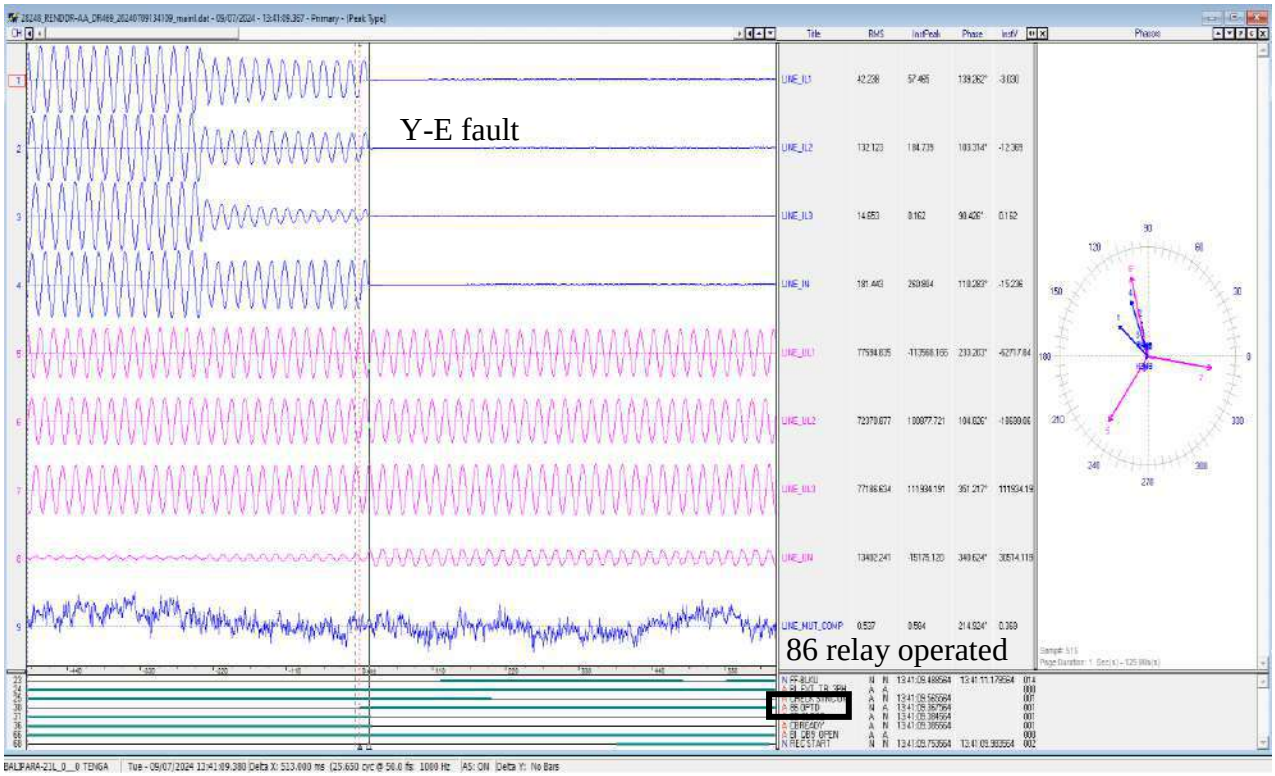
AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
AEGCL	1C	SONAP_AS	SONAPUR CB 220/132 T2 (SEC) CLOSED	09 Jul 2024 13:43:07:000	09 Jul 2024 13:42:42:000	9.12E+08
AEGCL	1C	SONAP_AS	SONAPUR CB 220/132 T2 (SEC) CLOSED	09 Jul 2024 13:43:07:000	09 Jul 2024 13:42:42:000	9.12E+08
ARUNCH	1C	KMENG_NO	KAMENG CB 400/132 T1 (SEC) OPEN	09 Jul 2024 13:42:53:000	09 Jul 2024 13:42:48:000	5.61E+08
ARUNCH	1C	KMENG_NO	KAMENG CB 400/132 T1 (SEC) OPEN	09 Jul 2024 13:42:53:000	09 Jul 2024 13:42:48:000	5.61E+08
AEGCL	1C	BALIP_PG	BALIPARA CB 132Kv LINE TO TENGA OPEN	09 Jul 2024 13:42:53:000	09 Jul 2024 13:42:49:000	33000000
AEGCL	1C	BALIP_PG	BALIPARA CB 132Kv LINE TO TENGA OPEN	09 Jul 2024 13:42:53:000	09 Jul 2024 13:42:49:000	33000000
ARUNCH	1C	KMENG_NO	KAMENG CB 400/132 T1 (PRIM) OPEN	09 Jul 2024 13:43:11:000	09 Jul 2024 13:42:51:000	9.94E+08
ARUNCH	1C	KMENG_NO	KAMENG CB 400/132 T1 (PRIM) OPEN	09 Jul 2024 13:43:11:000	09 Jul 2024 13:42:51:000	9.94E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	09 Jul 2024 14:47:30:000	09 Jul 2024 14:47:01:000	13000000
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	09 Jul 2024 14:47:56:000	09 Jul 2024 14:47:26:000	1.33E+08
AEGCL	1C	BALIP_PG	BALIPARA CB 132Kv LINE TO TENGA CLOSED	09 Jul 2024 14:49:48:000	09 Jul 2024 14:49:44:000	8.37E+08
TSECL	1C	UDAIP_TE	UDAIPUR CB 66Kv LINE-1 TO BOGAF OPEN	09 Jul 2024 14:51:46:000	09 Jul 2024 14:51:24:000	2.32E+08
AEGCL	1C	BONGA_PG	BONGAIGAON CB 220Kv LOAD-2 NANGA CLOSED	09 Jul 2024 15:01:27:000	09 Jul 2024 15:01:23:000	8.53E+08
AEGCL	1C	BONGA_PG	BONGAIGAON CB 220Kv LOAD-2 NANGA OPEN	09 Jul 2024 15:01:53:000	09 Jul 2024 15:01:51:000	7000000
ARUNCH	1C	KMENG_NO	KAMENG CB 400/132 T1 (PRIM) CLOSED	09 Jul 2024 15:03:18:000	09 Jul 2024 15:03:04:000	6.59E+08
ARUNCH	1C	KMENG_NO	KAMENG CB 400/132 T1 (SEC) CLOSED	09 Jul 2024 15:03:29:000	09 Jul 2024 15:03:23:000	3.64E+08
AEGCL	1C	BONGA_PG	BONGAIGAON CB 220Kv LOAD-2 NANGA CLOSED	09 Jul 2024 15:04:15:000	09 Jul 2024 15:04:13:000	4.37E+08

Annexure 2: DR Snapshot

2.1 DR snapshot of Balipara end for 132 kV Balipara-Tenga line



2.2 DR snapshot of Tenga end for 132 kV Balipara-Tenga line



2.3 DR snapshot of 400/132 kV 3x40 MVA Kameng ICT

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 Kokrajhar, Bilasipara and Gauripur areas of Assam Power System 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))

Date (दिनांक**):23-07-2024**

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

   Kokrajhar, Bilasipara and Gauripur areas of Assam Power System were connected to NER Power system via 132 kV BTPS – Kokrajhar D/C lines. 132 kV Gauripur – Gosaigaon line was kept opened for load segregation purpose.

   At 03:55 Hrs of 11-07-2024, 132 kV BTPS – Kokrajhar I & II lines tripped. Due to tripping of these lines, Kokrajhar, Bilasipara and Gauripur areas of Assam Power System were isolated from NER Grid and collapsed due to no source available in these areas.

   Power was extended to Kokrajhar, Bilasipara and Gauripur areas of Assam Power System by charging 132 kV BTPS-Kokrajhar II line at 04:11 Hrs of 11-07-2024.

2. **Time and Date of the Event (**घटना का स मय और दिनांक**):** 03:55 Hrs of 11-07-2024
3. **Event Category** (ग्रिड **घटना का प्रकार**)**:** GD-I
4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Kokrajhar, Bilasipara and Gauripur areas of Assam
5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)			
Post Event (घटना के बाद)			

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(	132kV Gauripur – Gossaigaon Line is kept open (conductor constraint)

Weather Condition (मौसम स्थिति)	Rainy weather

6. **Load and Generation loss (लोड और जेनरेशन हानि):** There was load loss of 25 MW. No generation loss

7. **Duration of interruption (रुकावट की अवधि): 16 min**

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

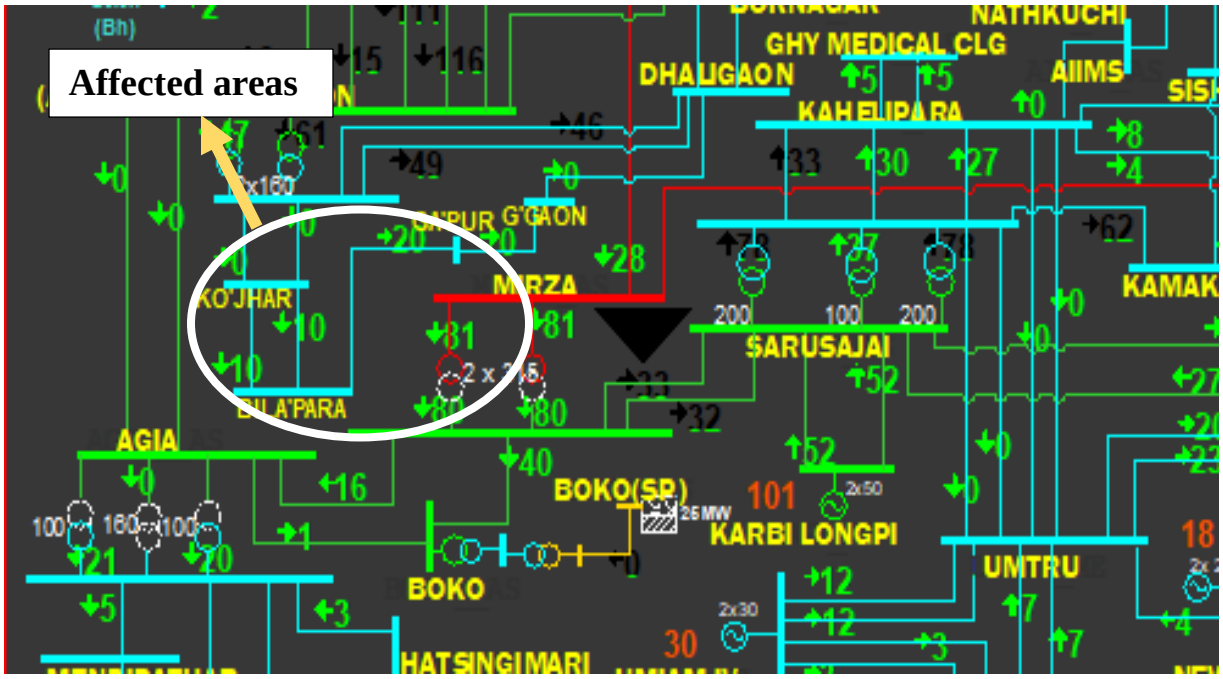


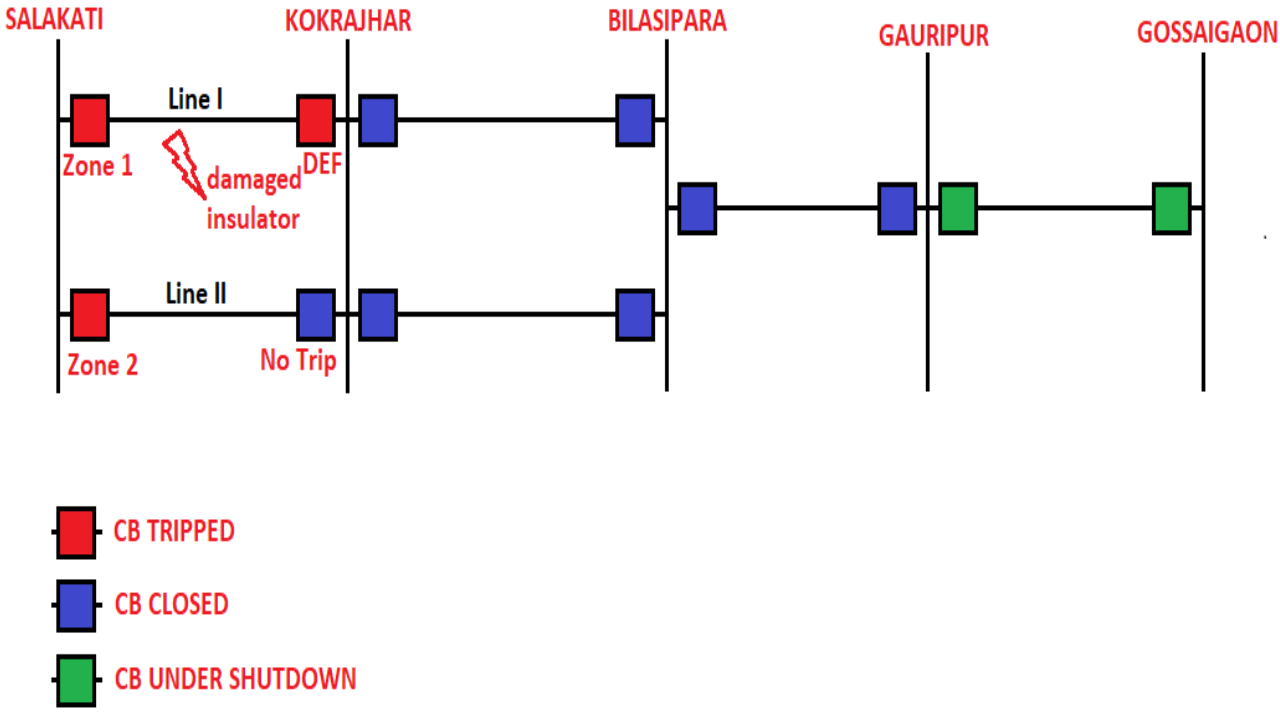
Figure 1: Network across the affected area

9. **Details of Equipment Failure (if any during the event) (**उपकरण विफलता का विवरण**):** Insulator disc fail (polymer insulator) at loc. 26

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 BTPS – Kokrajhar I Line	03:55	16:29	DP, ZI, B-E, FD: 2.2 Km	DEF operated
2	132 kV BTPS – Kokrajhar II Line	03:55	04:11	DP, ZII, Y-B-E	No tripping

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



As per DR analysis, solid B-E fault in 132 kV BTPS-Kokrajhar I line initiated at 03:55:38.044 Hrs and cleared within 60 msec on operation of DP, ZI from BTPS end. DEF operated at Kokrajhar end (no DR submitted) which seems unwanted.

DR of 132 kV BTPS-Kokrajhar II line detected Y-B-E fault and cleared within 408 msec on operation of DP, ZII from BTPS end. There was no tripping from Kokrajhar end.

As informed by AEGCL, polymer insulator disc failure occurred at Loc.26.

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

- Non-operation of distance protection at Kokrajhar end for 132 kV BTPS-Kokrajhar I Line.

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

- Power was extended to Kokrajhar, Bilasipara and Gauripur areas of Assam Power System by charging 132 kV BTPS-Kokrajhar II line at 04:11 Hrs of 11-07-2024.
- Damaged polymer insulator was detected at Location no. 26 in 132 kV BTPS-Kokrajhar I Line. Restoration work was carried out by AEGCL and the line was charged successfully at 16:29 Hrs of 11-07-2024.
- DEF setting and distance protection setting at Kokrajhar for 132 kV BTPS-Kokrajhar I line will be reviewed shortly by AEGCL.

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	**AEGCL**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**No violation**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**No violation**
5.	**Any other non-compliance**		**-**

15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Periodic Thermo-vision scanning of bay equipment /joints is utmost importance to detect hot spot/loose joints and further remedial measures to prevent such events.
- Team AEGCL is requested to carry out patrolling and maintenance related activities as per various CEA/CERC regulations.

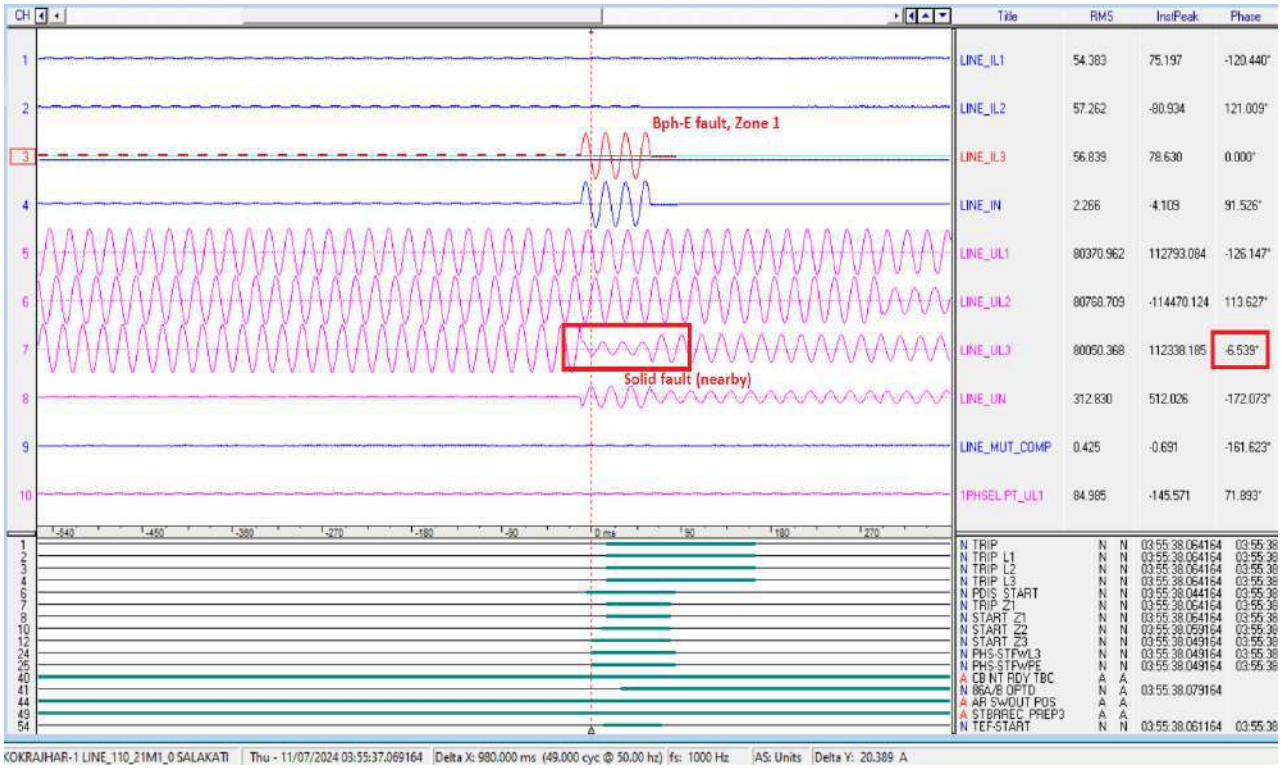
Annexure 1: Sequence of Events as per SCADA

AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
---	---	---	---	---	---	---
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	11 Jul 2024 03:54:30:000	11 Jul 2024 03:54:25:000	8.67E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	11 Jul 2024 03:55:20:000	11 Jul 2024 03:54:49:000	8.92E+08
AEGCL	1C	BONGA_AS	BONGAIGAON CB 132Kv LINE-2 TO KOKRA OPEN	11 Jul 2024 03:56:09:000	11 Jul 2024 03:55:42:000	4.37E+08
AEGCL	1C	BONGA_AS	BONGAIGAON CB 132Kv LINE-1 TO KOKRA OPEN	11 Jul 2024 03:56:09:000	11 Jul 2024 03:55:42:000	4.37E+08
AEGCL	1C	GAURI_AS	GAURIPUR CB 132/33 T1 (SEC) OPEN	11 Jul 2024 03:57:51:000	11 Jul 2024 03:57:09:000	82000000
AEGCL	1C	GAURI_AS	GAURIPUR CB 132/33 T1 (PRIM) OPEN	11 Jul 2024 03:57:51:000	11 Jul 2024 03:57:26:000	2.84E+08
AEGCL	1C	GAURI_AS	GAURIPUR CB 132/33 T2 (PRIM) OPEN	11 Jul 2024 03:57:51:000	11 Jul 2024 03:57:31:000	11000000
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	11 Jul 2024 04:10:55:000	11 Jul 2024 04:10:30:000	7.28E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	11 Jul 2024 04:11:33:000	11 Jul 2024 04:10:55:000	88000000
AEGCL	1C	BONGA_AS	BONGAIGAON CB 132Kv LINE-2 TO KOKRA CLOSED	11 Jul 2024 04:11:33:000	11 Jul 2024 04:11:15:000	2.88E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	11 Jul 2024 04:12:23:000	11 Jul 2024 04:12:00:000	1.63E+08

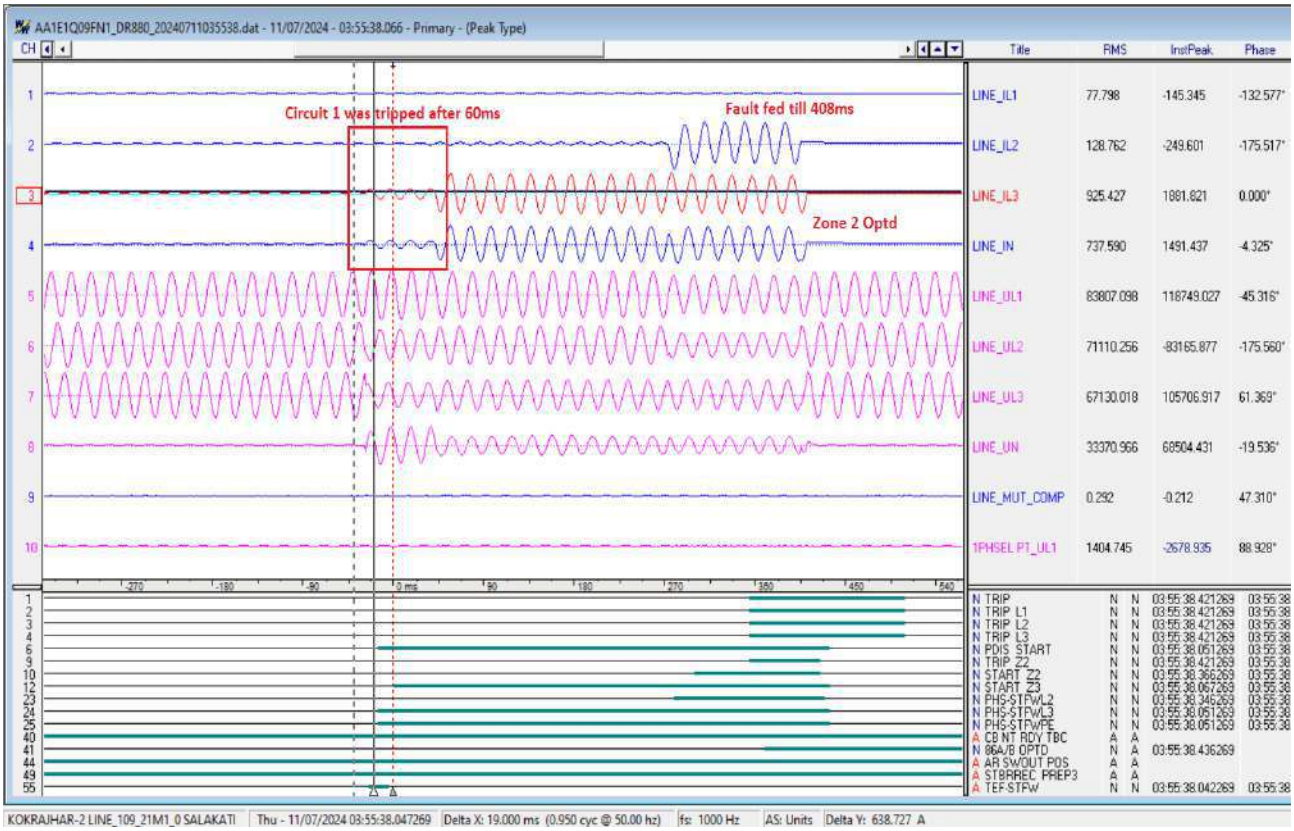
Annexure 2: SLD of affected S/S

Annexure 3: Disturbance recorder snips showing faults and digital signals

3.1. DR Snapshot of BTPS for 132 kV BTPS-Kokrajhar I Line



3.2. DR Snapshot of BTPS for 132 kV BTPS-Kokrajhar II Line



ग्रिड-इंडिया GRID-INDIA
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CIN : U40105DL2009GOI188682, Website : www.nerldc.in, E-mail : nerldc@grid-india.in, Tel.: 0364-2537470/427, Fax: 03642537486

Detailed Report of Grid Disturbance in Rongkhon, Ampati, Phulbari and Ganol S/S of Meghalaya 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):25-07-2024

1. Event Summary (घटना का सारांश):

Rongkhon, Ampati, Phulbari areas and Ganol HEP of Meghalaya Power System were connected to NER Power system via 132 kV Rongkhon - Nangalbibra line.

At 07:44 Hrs of 11-07-2024, 132 kV Rongkhon – Nangalbibra Line tripped. Due to tripping of this line, Rongkhon, Ampati, Phulbari areas and Ganol HEP of Meghalaya Power System were isolated from NER Grid and collapsed due to no source available in these areas.

Power supply was extended to Rongkhon, Ampati, Phulbari & Ganol areas of Meghalaya Power System by charging 132 kV Nangalbibra –Rongkhon line at 07:55 Hrs of 11-07-2024.

2. Time and Date of the Event (घटना का स मय और दिनांक): 07:44 Hrs of 11-07-2024

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

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Rongkhon, Ampati, Phulbari areas and Ganol HEP of Meghalaya Power System

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50.04	3159	2305
Post Event (घटना के बाद)	50.04	3154	2313

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)	Inclement

2. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 23 MW. There was no generation loss.
3. **Duration of interruption (रुकावट की अवधि): 10 min**
4. **Network across the affected area (प्रभावित क्षेत्र का नक्शा):**

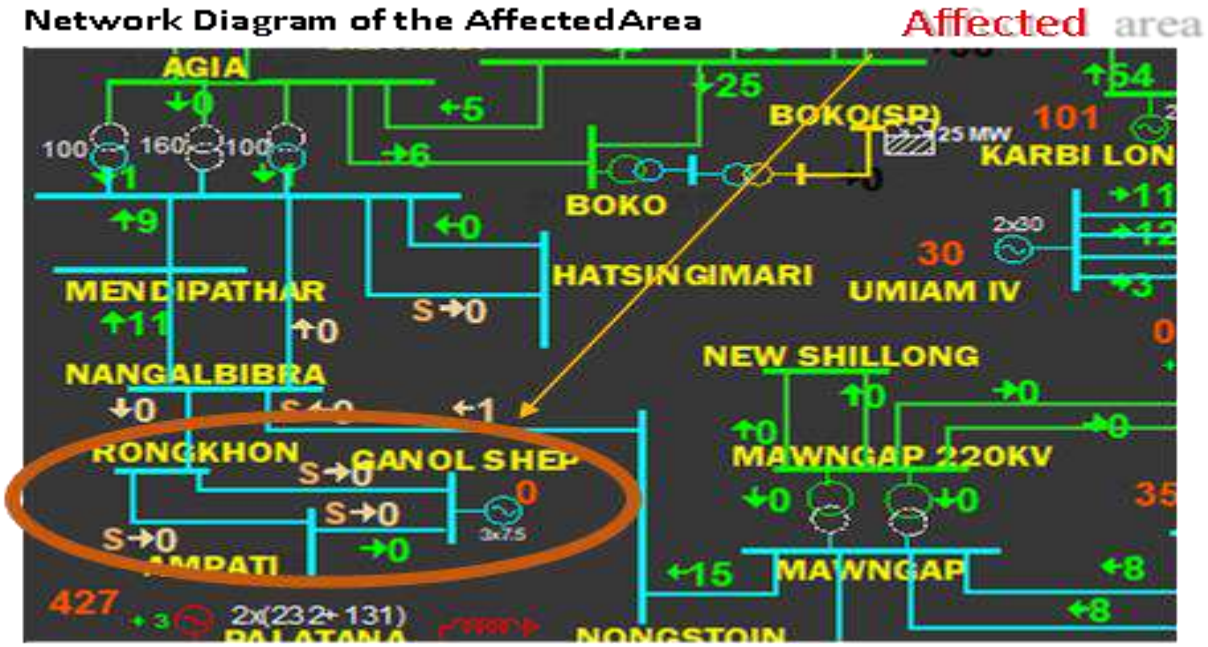


Figure 1: Network across the affected area

5. **Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NIL**
6. **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 Rongkhon-Nangalbibra Line	07:44	07:55	DP, ZI, R-Y-B-E, FD: 5.469 Km	DP, ZI, R-Y-B-E, FD: 59.18 Km

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

As per DR analysis of Nangalbibra end of 132 kV Rongkhon- Nangalbibra line, R-Y-B-E fault initiated at 07:41:28.105 Hrs in 132 kV Nangalbibra-Rongkhon line and cleared on operation of DP, ZI from Nangalbibra end. Fault is likely due to lightning.

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

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

Power supply was extended to Rongkhon, Ampati, Phulbari & Ganol areas of Meghalaya Power System by charging 132 kV Nangalbibra –Rongkhon line at 07:55 Hrs of 11-07-2024.

10. 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)	**MePTCL**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**MePTCL**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**MePTCL** (24.07.2024)
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**3 min at Nangalbibra**
5.	**Any other non-compliance**		-

11. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

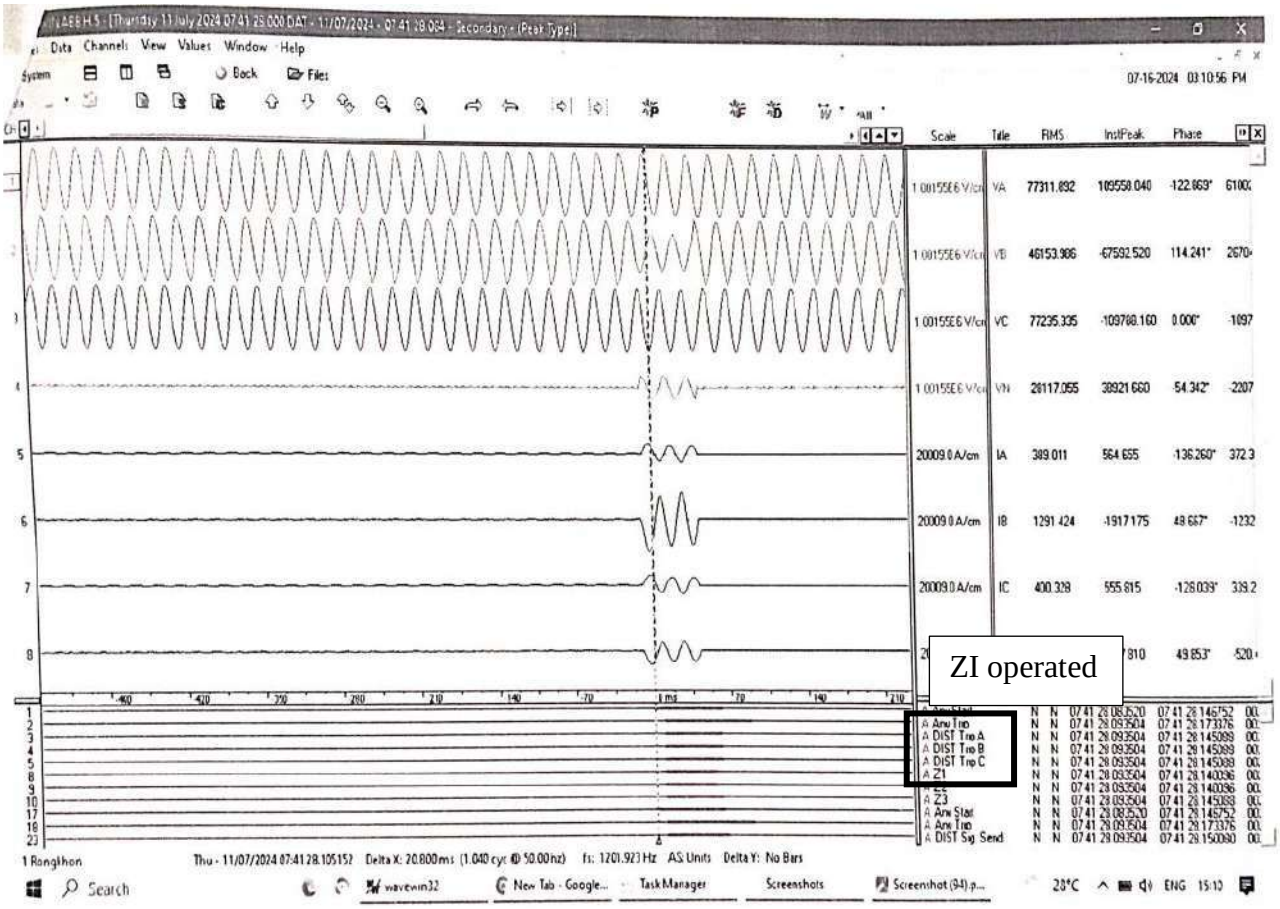
- Availability of AR scheme to avoid grid Disturbance due to transient nature of fault.

Annexure 1: Sequence of Events as per SCADA

AREA	CATEGOR	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
---	---	---	---	---	---	---
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	11 Jul 2024 07:41:37:000	11 Jul 2024 07:40:45:000	9.3E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	11 Jul 2024 07:42:41:000	11 Jul 2024 07:42:21:000	3.65E+08
MEECL	1C	RONGK_ME	RONGKHON CB 132Kv LINE TO NANGA OPEN	11 Jul 2024 07:42:41:000	11 Jul 2024 07:42:32:000	2.36E+08
MEECL	1C	GANOL_ME	GANOL SHEP CB 132Kv LINE TO RONGK OPEN	11 Jul 2024 07:42:41:000	11 Jul 2024 07:42:32:000	4.68E+08
MEECL	1C	GANOL_ME	GANOL SHEP CB 132 KV UNIT (H03) OPEN	11 Jul 2024 07:42:41:000	11 Jul 2024 07:42:33:000	1.23E+08
MEECL	1C	NANGA_ME	NANGALBIBRA CB 33Kv LOAD BAGHM CLOSED	11 Jul 2024 07:54:07:000	11 Jul 2024 07:53:54:000	6.16E+08
NAGALD	1C	DIMAP_PG	DIMAPUR CB 220/132 T3 (SEC) OPEN	11 Jul 2024 07:54:40:000	11 Jul 2024 07:54:40:000	20000000
MEECL	1C	RONGK_ME	RONGKHON CB 132Kv LINE TO NANGA CLOSED	11 Jul 2024 07:55:35:000	11 Jul 2024 07:55:20:000	8.51E+08
AEGCL	1C	CHAPA_AS	CHAPAKHOWA CB 132/33 T1 (PRIM) OPEN	11 Jul 2024 07:56:46:000	11 Jul 2024 07:56:21:000	6.01E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	11 Jul 2024 07:56:46:000	11 Jul 2024 07:56:28:000	1.16E+08
AEGCL	1C	CHAPA_AS	CHAPAKHOWA CB 132/33 T1 (SEC) OPEN	11 Jul 2024 07:56:53:000	11 Jul 2024 07:56:43:000	6.56E+08

Annexure 2: Disturbance recorder snips showing faults and digital signals

2.1. DR Snapshot of Nangalbibra for 132 kV Nangalbibra-Rongkhon Line



ग्रिड-इंडिया GRID-INDIA
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CIN : U40105DL2009GOI188682, Website : www.nerldc.in, E-mail : nerldc@grid-india.in, Tel.: 0364-2537470/427, Fax: 03642537486

Detailed Report of Grid Disturbance in Rengpang area in Manipur 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))

Date (दिनांक)**:23-07-2024**

1. Event Summary (घटना का सारांश):

Rengpang area of Manipur Power System was connected with rest of NER Grid through 132 kV Loktak – Rengpang line. 132 kV Jiribam-Rengpang line was under outage since 18:18 Hrs of 17.11.2023.

At 09:23 Hrs of 11-07-2024, 132 kV Loktak – Rengpang line tripped. Due to tripping of this element, Rengpang area of Manipur Power System was isolated from NER Grid and collapsed due to no source available this area.

Power supply was extended to Rengpang area of Manipur Power System by charging 132 kV Loktak – Rengpang line at 10:22 Hrs on 11-07-2024.

2. Time and Date of the Event (घटना का स मय और दिनांक)**:** 09:23 Hrs of 11-07-2024

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

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Rengpang area of Manipur Power System

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50.01	2849	2268
Post Event (घटना के बाद)	50.01	2854	2286

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 Jiribam-Rengpang line was under outage since 18:18 Hrs of 17.11.2023.
Weather Condition (मौसम स्थिति)	Windy

2. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 1 MW.
3. **Duration of interruption (रुकावट की अवधि): 59 min**
4. **Network across the affected area (प्रभावित क्षेत्र का नक्शा):**

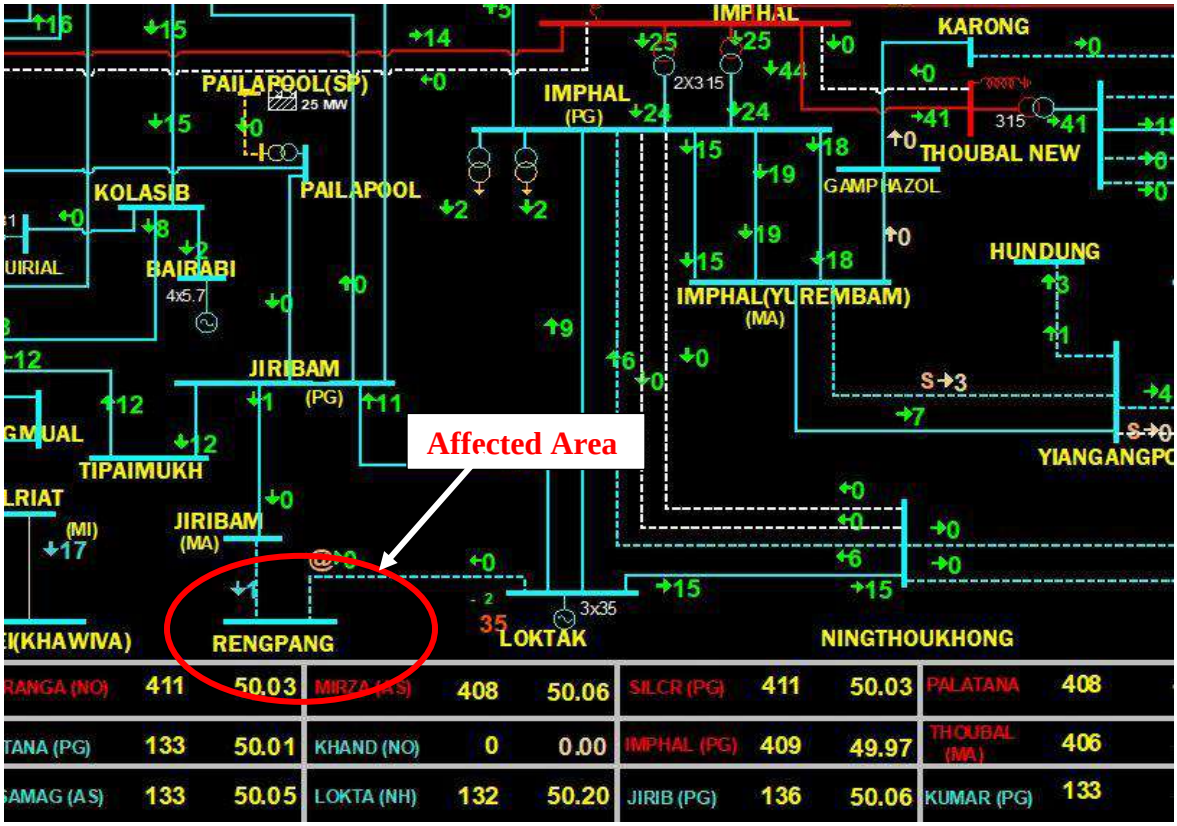


Figure: Network across the affected area

5. **Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NIL**
6. **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-Rengpang Line	09:23	10:22	O/C operated	No tripping(radial)

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

As per DR analysis, resistive Y-E fault (Iy-499 A, In-481 A) in 132 kV Loktak-Rengpang line cleared in more than 750 msec from Loktak end. IN>1 & I>1 started and I>1 trip issued at 09:23:32.052 from Loktak end. There was no tripping from Rengpang end.

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

- **Any Start** digital channel not high during the fault due to which fault clearing time could not be concluded.

9. **Action Taken/Remedial Measures (सुधारात्मक उपाय):**

- Power supply was extended to Rengpang area of Manipur Power System by charging 132 kV Loktak – Rengpang line at 10:22 Hrs on 11-07-2024.

10. **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)	**MSPCL**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**MSPCL**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**MSPCL**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**No violation**
5.	**Any other non-compliance**		**-**

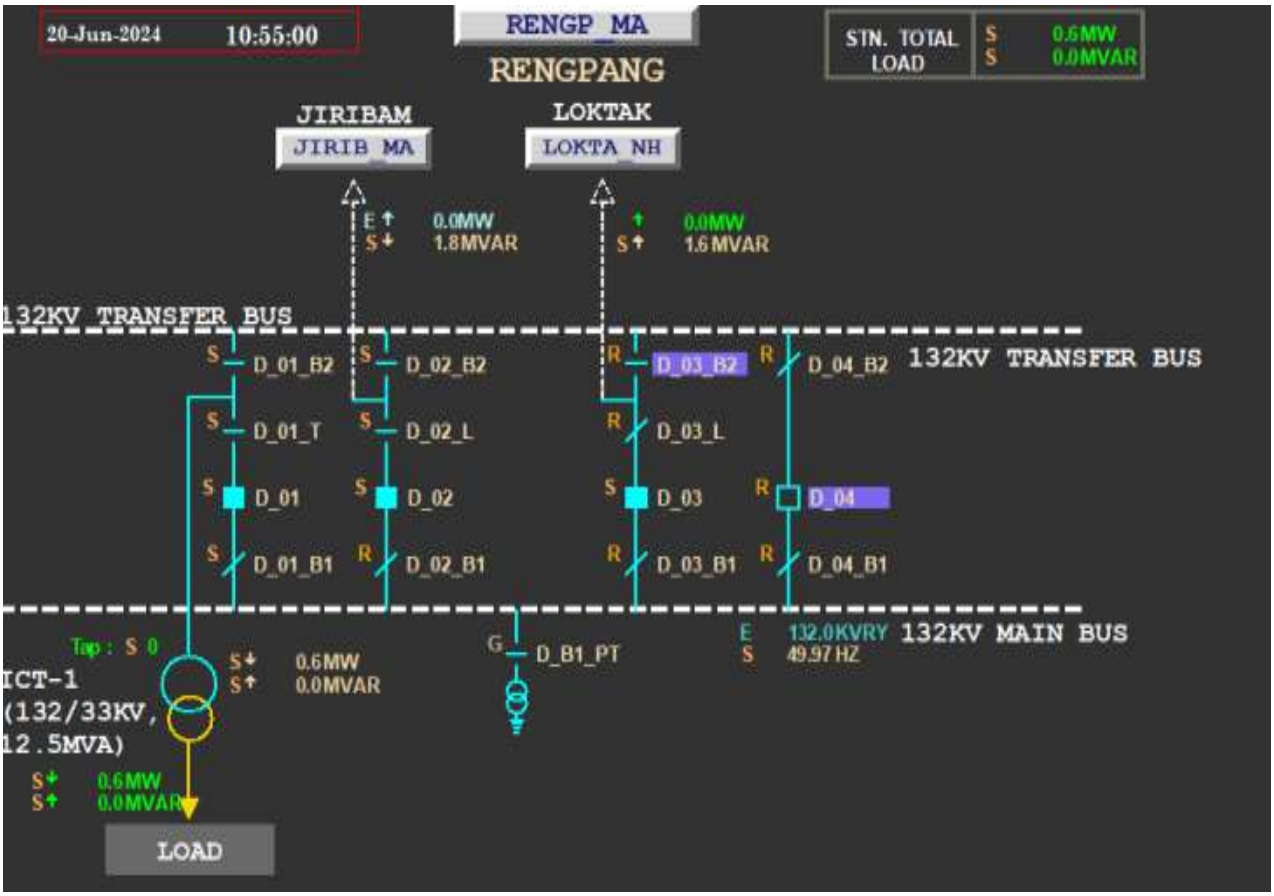
11. **Key Lessons Learnt (प्रमुख अधिगम बिंदु):**

- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.

Annexure 1: Sequence of Events

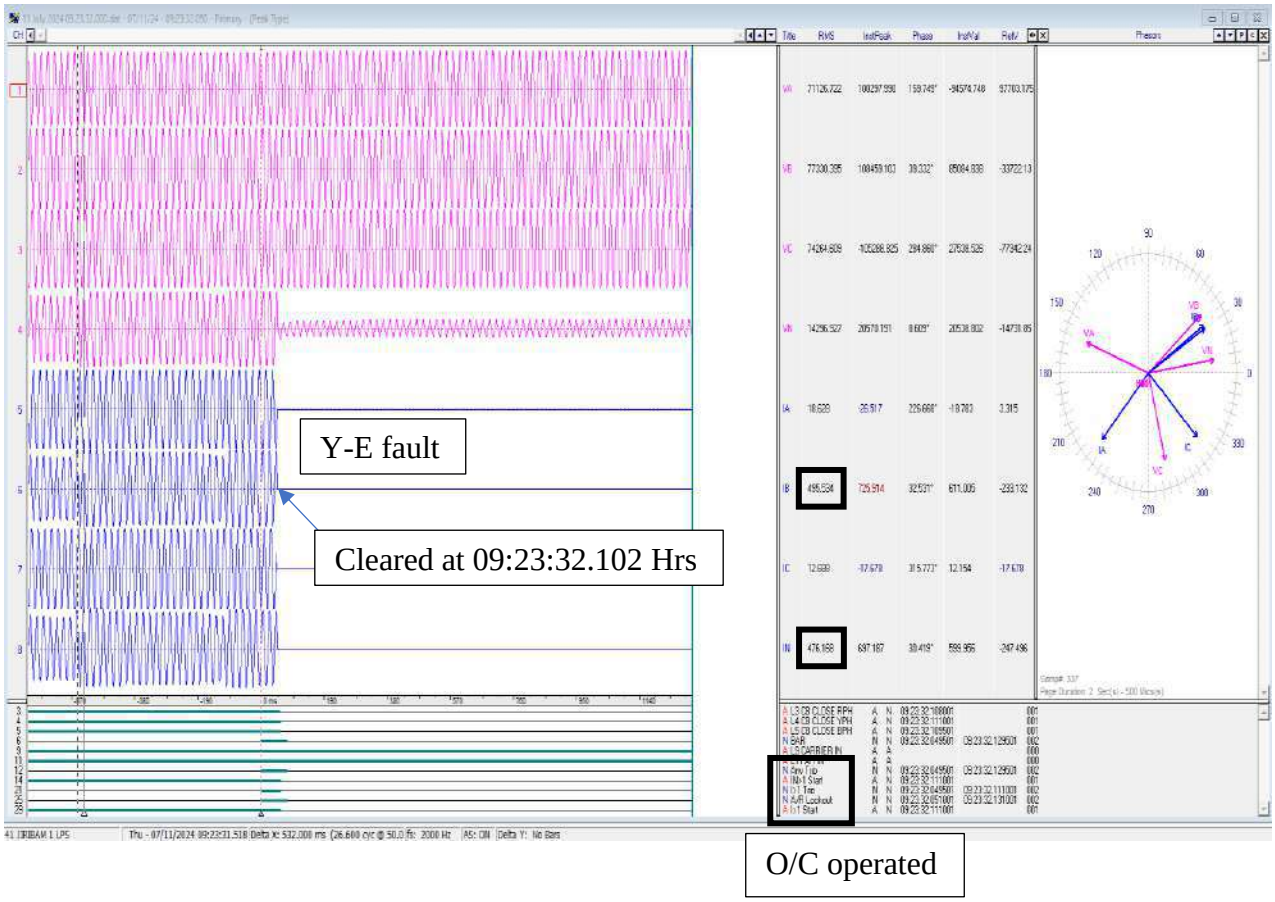
AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
---	---	---	---	---	---	---
ARUNCH	1C	ROING_PG	ROING CB 132Kv LINE-1 TO CHAPA CLOSED	11 Jul 2024 11:50:30:000	10 Jul 2024 23:20:28:000	57000000
ARUNCH	1C	ROING_PG	ROING CB 132Kv LINE-2 TO CHAPA CLOSED	11 Jul 2024 12:09:43:000	10 Jul 2024 23:39:40:000	5.57E+08
MSPCL	1C	LOKTA_NH	LOKTAK CB 132Kv LINE TO RENGP OPEN	11 Jul 2024 09:23:33:000	10 Jul 2024 23:54:12:000	1.81E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA OPEN	11 Jul 2024 00:00:50:000	11 Jul 2024 00:00:42:000	1.32E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	11 Jul 2024 00:01:23:000	11 Jul 2024 00:01:06:000	4.82E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	11 Jul 2024 10:22:54:000	11 Jul 2024 10:22:35:000	8.07E+08
MEECL	1C	MAWPH_ME	MAWNGAP CB 132Kv LINE-1 TO UMIA1 OPEN	11 Jul 2024 10:22:54:000	11 Jul 2024 10:22:46:000	1.82E+08
MSPCL	1C	LOKTA_NH	LOKTAK CB 132Kv LINE TO RENGP CLOSED	11 Jul 2024 10:22:48:000	11 Jul 2024 10:22:47:000	3.8E+08
MEECL	1C	MAWPH_ME	MAWNGAP CB 132Kv LINE-2 TO UMIA1 OPEN	11 Jul 2024 10:23:22:000	11 Jul 2024 10:23:02:000	4.57E+08
MEECL	1C	MAWLA_ME	MAWLAI CB 132Kv LINE-1 TO UMIA1 BETWEE	11 Jul 2024 10:24:00:000	11 Jul 2024 10:23:46:000	2.37E+08

Annexure 2: SLD of affected S/S



Annexure 3: Disturbance recorder snips showing faults and digital signals

3.1. DR Snapshot of Loktak for 132 kV Loktak-Rengpang Line



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 Kokrajhar, Bilasipara and Gauripur areas of Assam Power System 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))

Date (दिनांक**):23-07-2024**

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

   Kokrajhar, Bilasipara and Gauripur areas of Assam Power System were connected to NER Power system via 132 kV BTPS – Kokrajhar D/C lines. Prior to the event, 132 kV BTPS-Kokrajhar I line was under outage & 132 kV Gauripur – Gosaigaon line was kept opened for load segregation purpose.

   At 11:53 Hrs of 11-07-2024, 132 kV BTPS – Kokrajhar II line tripped. Due to tripping of this line, Kokrajhar, Bilasipara and Gauripur areas of Assam Power System were isolated from NER Grid and collapsed due to no source available in these areas.

   Power was extended to Bilasipara and Gauripur areas of Assam Power System by charging 132 kV Gauripur-Gossaigaon line at 12:09 Hrs of 11-07-2024. Subsequently, power was extended to Kokrajhar area at 12:16 Hrs of 11-07-2024.

2. **Time and Date of the Event (**घटना का स मय और दिनांक**):** 11:53 Hrs of 11-07-2024
3. **Event Category** (ग्रिड **घटना का प्रकार**)**:** GD-I
4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Kokrajhar, Bilasipara and Gauripur areas of Assam
5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	49.99	2887	2393
Post Event (घटना के बाद)	49.99	2899	2334

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(	132kV Gauripur – Gossaigaon Line is kept open (conductor constraint). Also, 132 kV BTPS-Kokrajhar 1 line was under faulty condition
Weather Condition (मौसम स्थिति)	Normal

6. **Load and Generation loss (**लोड और जेनरेशन हानि**):** There was load loss of 55 MW. No generation loss

7. **Duration of interruption (रुकावट की अवधि): 16 min**

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

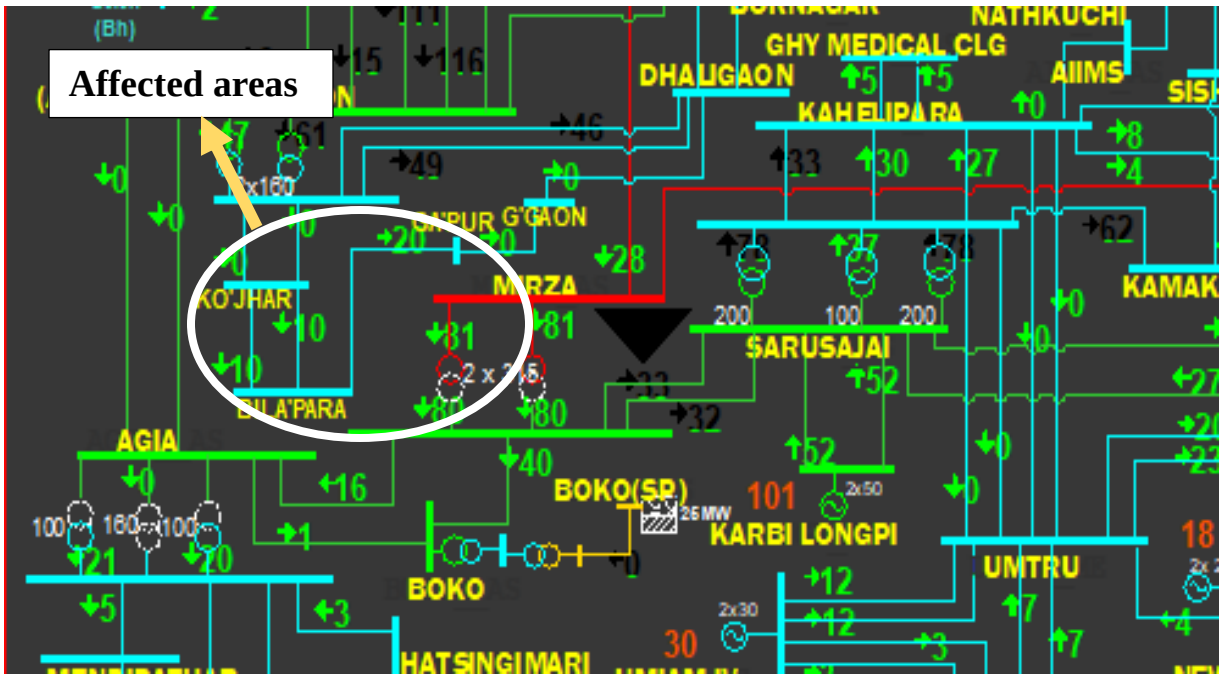


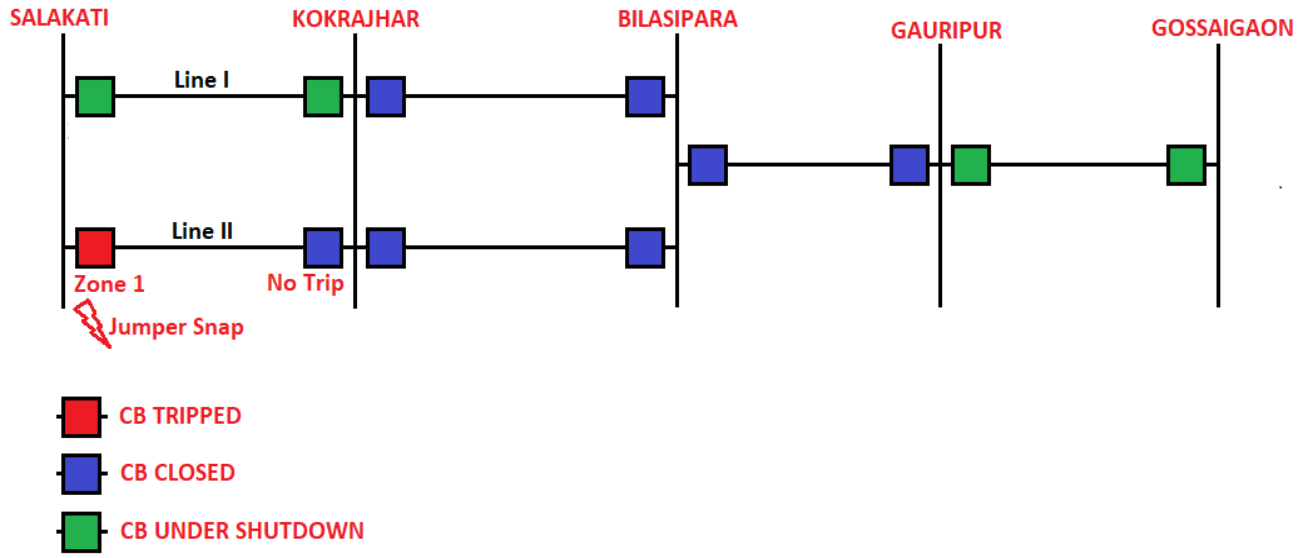
Figure 1: Network across the affected area

9. **Details of Equipment Failure (if any during the event) (**उपकरण विफलता का विवरण**):** Snapping of wave trap jumper at BTPS

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 BTPS – Kokrajhar II Line	11:53	13:10	DP, ZI, Y-E	No tripping(radial)

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



As per DR analysis, Y-E fault (Iy-12.7 kA, In-12.5 kA) initiated at 11:53:05.938 Hrs and cleared within 73 msec on operation of DP, ZI from BTPS end. There was no tripping from Kokrajhar end as it was in radial configuration.

As informed by AEGCL, fault was due to jumper snap at Wave Trap location at BTPS.

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

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

- Power was extended to Bilasipara and Gauripur areas of Assam Power System by charging 132 kV Gauripur-Gossaigaon line at 12:09 Hrs of 11-07-2024. Subsequently, power was extended to Kokrajhar area at 12:16 Hrs of 11-07-2024.
- Maintenance work was carried out by AEGCL and 132 kV BTPS-Kokrajhar II line was successfully restored at 13:10 Hrs of 11-07-2024.

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)	**No violation**

4.	**DR Time Synchronization Issues**	IEGC section 17.3	**No violation**
5.	**Any other non-compliance**		**-**

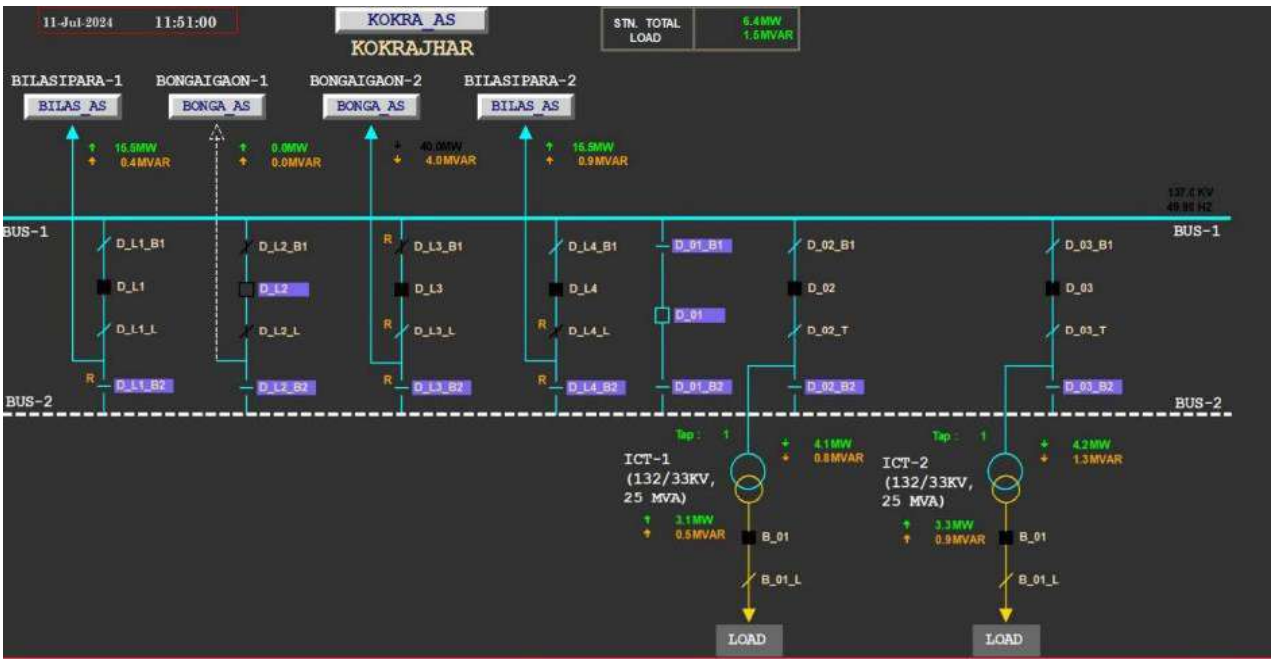
15. <u>Key Lessons Learnt (प्रमुख अधिगम बिंदु):</u>

- Periodic Thermo-vision scanning of bay equipment /joints is utmost importance to detect hot spot/loose joints and further remedial measures to prevent such events.
- Team AEGCL is requested to carry out patrolling and maintenance related activities as per various CEA/CERC regulations.

Annexure 1: Sequence of Events as per SCADA

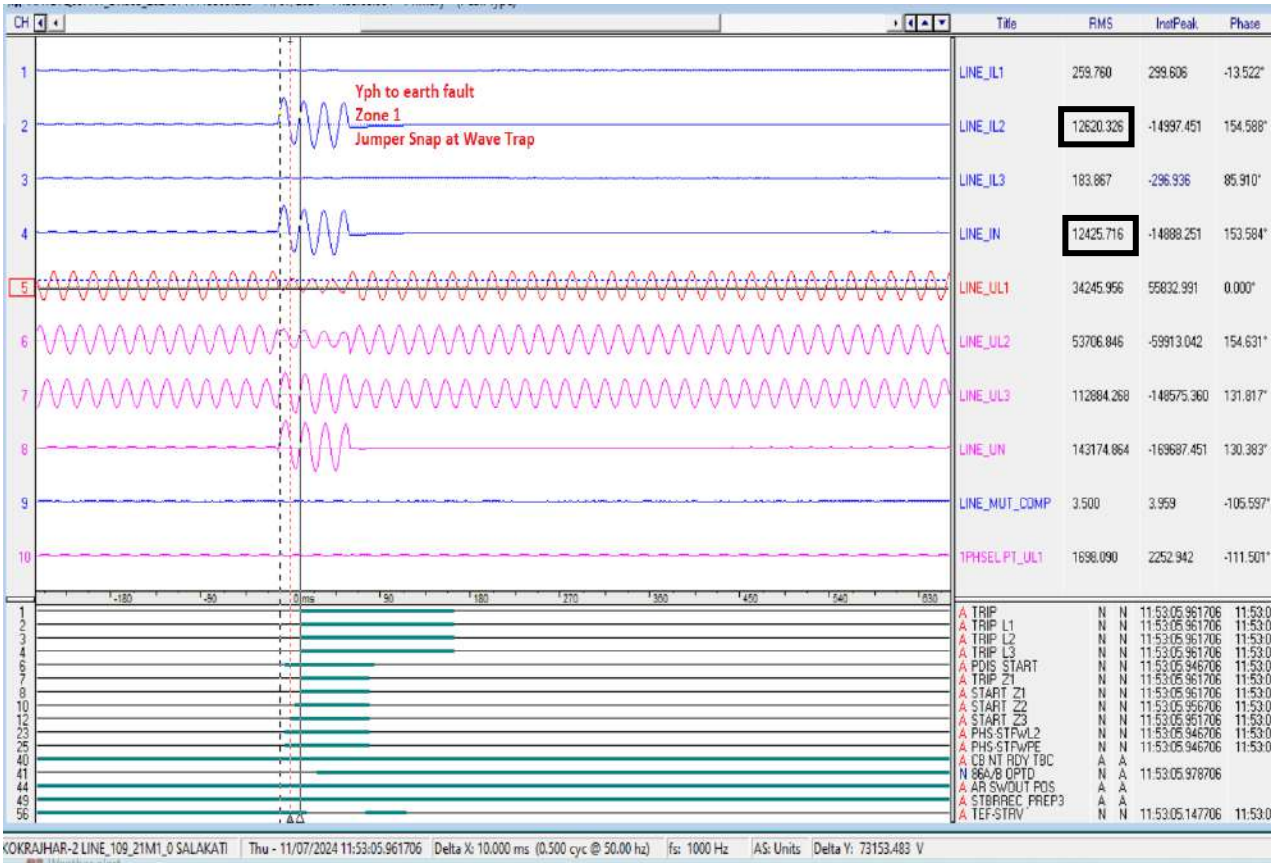
AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA BETWEEN	11 Jul 2024 11:49:38:000	11 Jul 2024 11:49:19:000	7.34E+08
AEGCL	1C	BILAS_AS	BILASIPARA CB 132Kv LINE-1 TO KOKRA CLOSED	11 Jul 2024 12:16:58:000	11 Jul 2024 11:49:51:000	3.19E+08
AEGCL	1C	BONGA_AS	BONGAIGAON CB 132Kv LINE-2 TO KOKRA OPEN	11 Jul 2024 11:53:32:000	11 Jul 2024 11:53:07:000	3.99E+08
AEGCL	1C	GAURI_AS	GAURIPUR CB 132Kv LINE TO BILAS OPEN	11 Jul 2024 11:55:35:000	11 Jul 2024 11:54:42:000	4.21E+08
AEGCL	1C	GAURI_AS	GAURIPUR CB 132Kv LINE TO GOSAI OPEN	11 Jul 2024 11:55:06:000	11 Jul 2024 11:54:51:000	1.29E+08
AEGCL	1C	GAURI_AS	GAURIPUR CB 132/33 T1 (SEC) OPEN	11 Jul 2024 11:55:50:000	11 Jul 2024 11:55:29:000	2.93E+08
AEGCL	1C	GAURI_AS	GAURIPUR CB 132Kv LINE TO GOSAI CLOSED	11 Jul 2024 13:10:27:000	11 Jul 2024 13:06:52:000	3.56E+08
AEGCL	1C	GAURI_AS	GAURIPUR CB 132/33 T1 (SEC) CLOSED	11 Jul 2024 13:10:27:000	11 Jul 2024 13:07:26:000	23000000
AEGCL	1C	BONGA_AS	BONGAIGAON CB 132Kv LINE-2 TO KOKRA CLOSED	11 Jul 2024 13:08:31:000	11 Jul 2024 13:08:06:000	3.82E+08
AEGCL	1C	GAURI_AS	GAURIPUR CB 132Kv LINE TO BILAS CLOSED	11 Jul 2024 13:10:27:000	11 Jul 2024 13:09:17:000	2.5E+08

Annexure 2: SLD of affected S/S



Annexure 3: Disturbance recorder snips showing faults and digital signals

3.1. DR Snapshot of BTPS for 132 kV BTPS-Kokrajhar II Line



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 Rokhia generating station 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**):25-07-2024**

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

Rokhia generating station of Tripura Power System is connected with rest of NER Grid through 132 kV Rokhia-Agartala I&II and 132 kV Rokhia-Monarchak lines.

At **00:27 Hrs of 13.07.2024**, 132 kV Rokhia-Agartala I&II and 132 kV Rokhia-Monarchak lines tripped. Due to tripping of these lines, Rokhia S/S of Tripura Power System got isolated from NER Grid and collapsed due to load generation mismatch in this area. Due to tripping of 132 kV Monarchak-Rokhia line, SPS at Monarchak operated which led to tripping of Monarchak STG.

Power supply was extended to Rokhia S/S of Tripura Power System by charging 132 kV Rokhia-Agartala I line at 01:14 Hrs of 13.07.2024.

2. **Time and Date of the Event (**घटना का स मय और दिनांक**):** 00:27 Hrs of 13-07-2024
3. **Event Category (**ग्रिड **घटना का प्रकार):** GD-I
4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Rokhia generating station of Tripura
5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50.01	3197	2901
Post Event (घटना के बाद)	50.01	3160	2864

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 13 MW & generation loss of 17 MW in Rokhia.

7. **Duration of interruption (रुकावट की अवधि): 40 min**

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

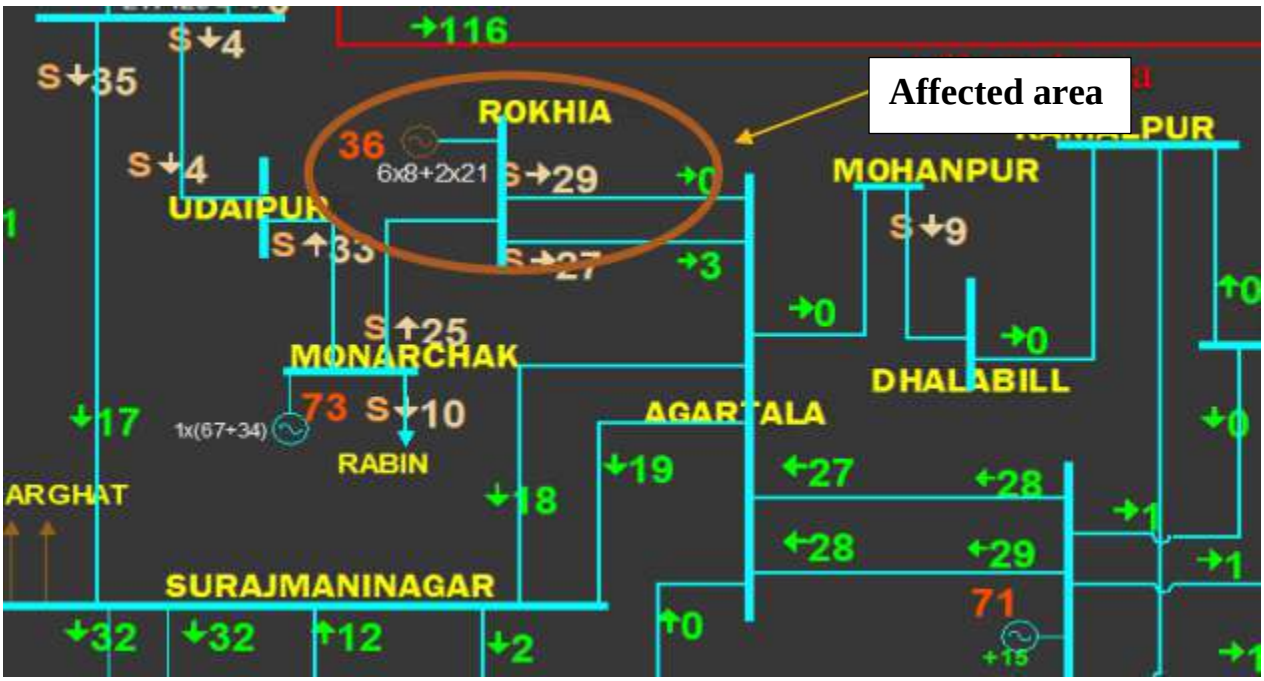


Figure 1: Network across the affected area

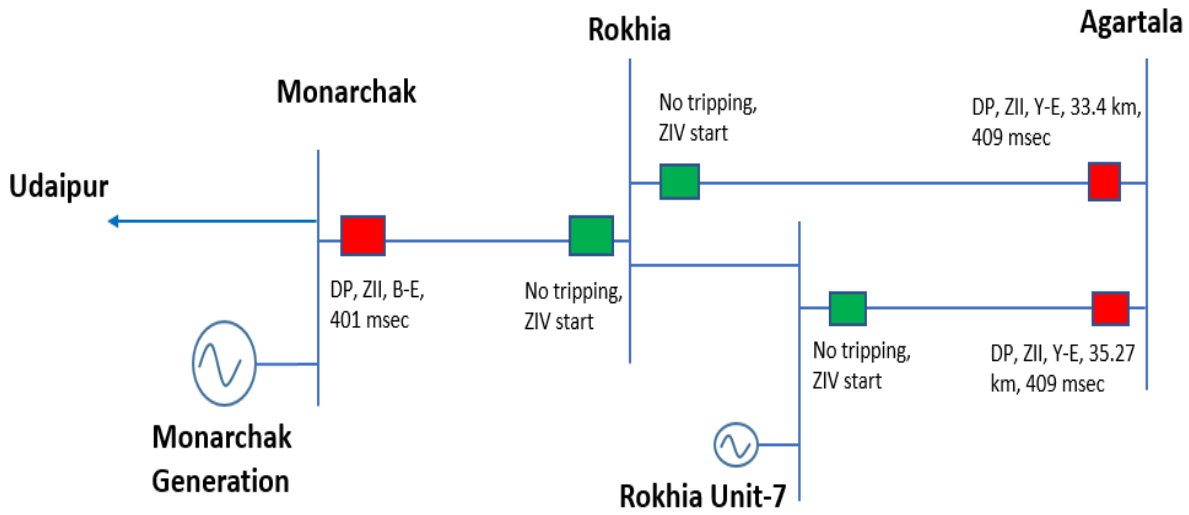
9. **Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NIL**

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 Rokhia-Agartala I Line	00:27	01:14	No tripping(ZIV start)	DP, ZII, Y-E, 33.4 Km
2	132 kV Rokhia-Agartala II Line	00:27	01:23	No tripping(ZIV start)	DP, ZII, Y-E, 35.27 Km
3	132 kV Rokhia-Monarchak Line	00:27	01:37	No tripping(ZIV start)	DP, ZII, B-E

4	Rokhia Unit-7	00:27	02:13	Loss of evacuation path
5	Monarchak STG	00:27	01:57	SPS related to Monarchak operated successfully

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



As per DR analysis of 132 kV Agartala-Rokhia D/C Lines, solid Y-E fault (Iy-2.1 kA, In-1.1 kA) initiated at 00:25:58.992 Hrs and cleared within 409 msec on operation of DP, ZII from Agartala end. There was no tripping from Rokhia end (ZIV pickup).

At the same time, 132 kV Rokhia-Monarchak line tripped on operation of DP, ZII from Monarchak end within 401 msec. ZIV pickup at Rokhia end (no tripping)

ZIV pickup at Rokhia end for all the lines clearly indicates that fault is in switchyard of Rokhia.

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

- Absence of proper protection system in 132 kV Rokhia-Rokhia link feeder. TSECL needs to expedite installation of LDP protection in the link feeder.

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

Power supply was extended to Rokhia S/S of Tripura Power System by charging 132 kV Rokhia-Agartala I line at 01:14 Hrs of 13.07.2024.

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

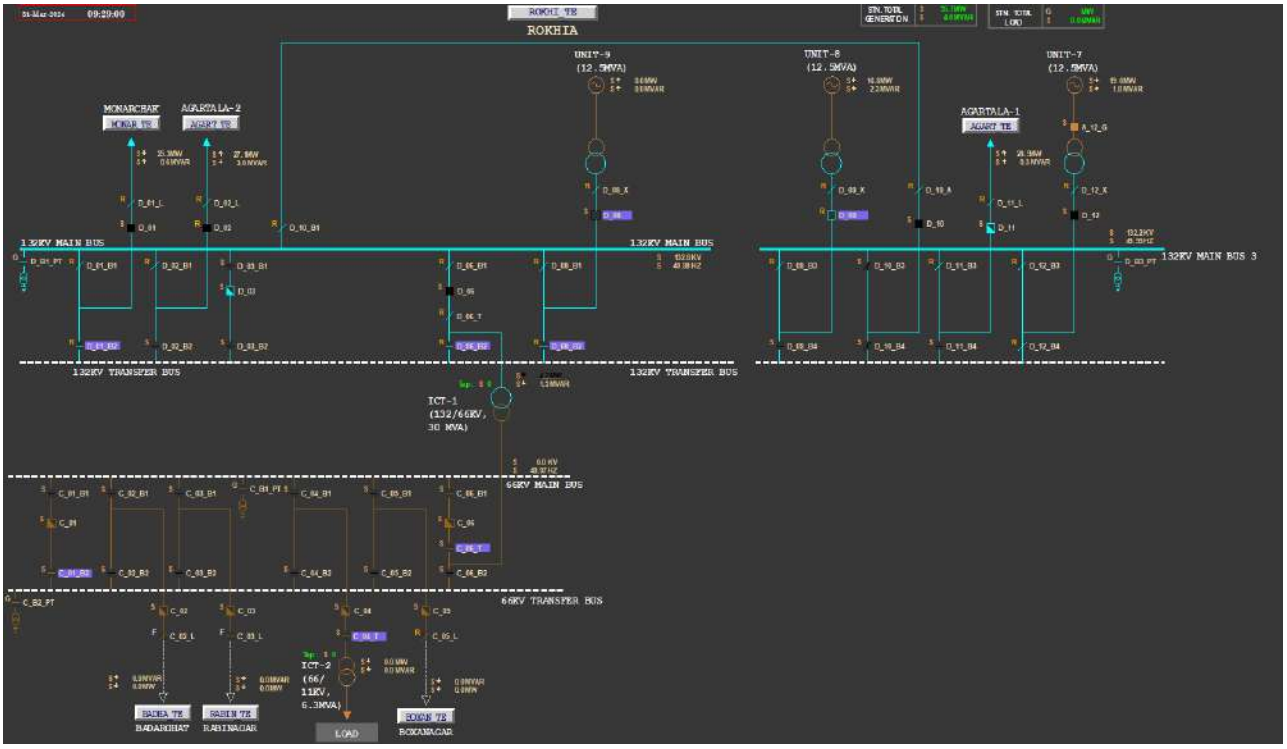
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.
- Healthiness of protection system needs to be checked regularly.

Annexure 1: Sequence of Events as per SCADA

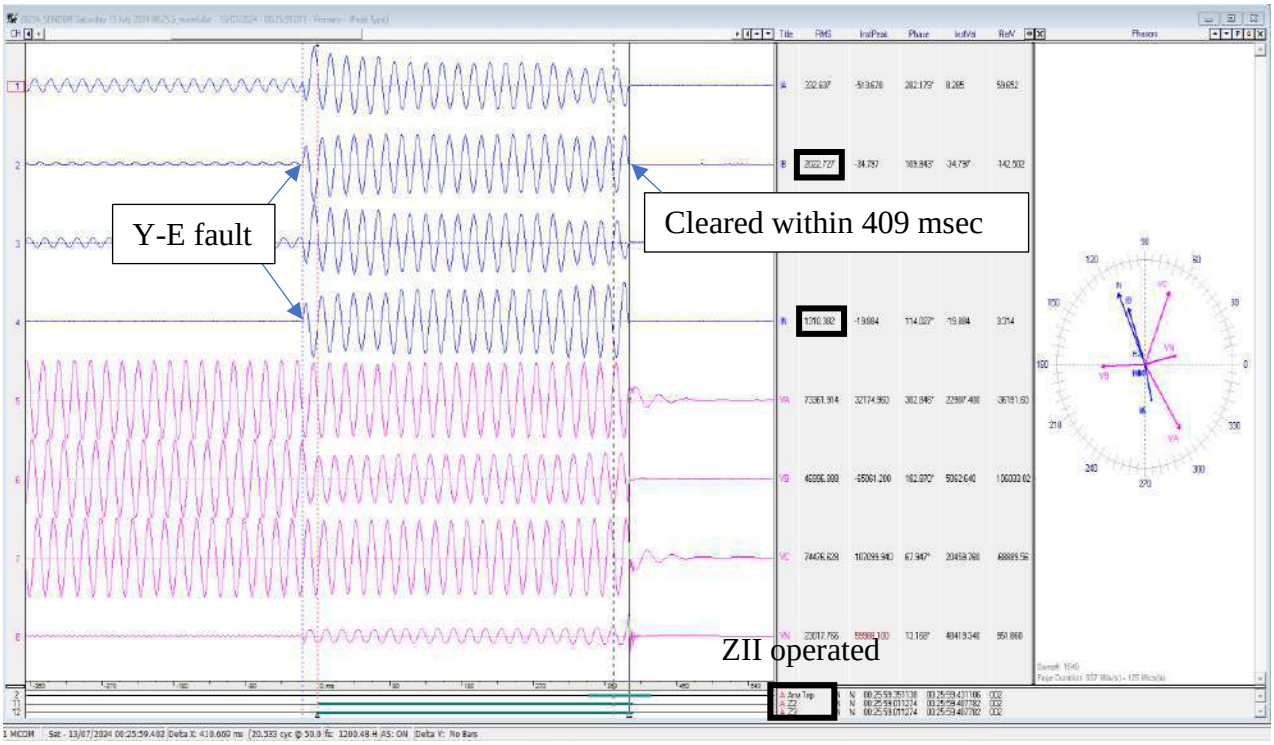
AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
AEGCL	1C	LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ CLOSED	13 Jul 2024 20:50:38:000	13 Jul 2008 16:20:18:000	6.7E+08
AEGCL	1C	LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ BETWEEN	13 Jul 2024 20:50:43:000	13 Jul 2008 16:20:21:000	6.78E+08
TSECL	1C	ROKHI_TE	ROKHIA CB 11 KV UNIT G7 OPEN	13 Jul 2024 00:27:10:000	17 May 2017 14:51:59:000	2.63E+08
TSECL	1C	ROKHI_TE	ROKHIA CB 11 KV UNIT G7 CLOSED	13 Jul 2024 02:13:41:000	17 May 2017 14:51:59:000	2.63E+08
MIZORM	1C	LUNGM_MI	LUNGMUAL CB 132/33 T2 (PRIM) CLOSED	13 Jul 2024 18:35:28:000	12 Jul 2023 14:26:15:000	6.69E+08
TSECL	1C	ROKHI_TE	ROKHIA CB 11 KV UNIT (G9) OPEN	13 Jul 2024 00:26:47:000	12 Jul 2024 23:26:47:000	54000000
TSECL	1C	ROKHI_TE	ROKHIA CB 132Kv LINE-1 TO MONAR OPEN	13 Jul 2024 00:47:07:000	12 Jul 2024 23:46:58:000	8.1E+08
TSECL	1C	ROKHI_TE	ROKHIA CB 132Kv LINE-2 TO AGART INVALID	13 Jul 2024 00:47:07:000	12 Jul 2024 23:47:01:000	2E+08
TSECL	1C	MONAR_TE	MONARCHAK CB 132/11 T1 (PRIM) OPEN	13 Jul 2024 00:27:10:000	13 Jul 2024 00:26:40:000	4.89E+08
TSECL	1C	MONAR_TE	MONARCHAK CB 132Kv LINE-1 TO ROKHI OPEN	13 Jul 2024 00:27:10:000	13 Jul 2024 00:26:40:000	4.89E+08
TSECL	1C	ROKHI_TE	ROKHIA CB 132Kv LINE-1 TO MONAR CLOSED	13 Jul 2024 01:32:48:000	13 Jul 2024 00:32:41:000	87000000
TSECL	1C	ROKHI_TE	ROKHIA CB 132Kv LINE-2 TO AGART OPEN	13 Jul 2024 01:24:26:000	13 Jul 2024 01:23:55:000	2.44E+08
TSECL	1C	MONAR_TE	MONARCHAK CB 132Kv LINE-1 TO ROKHI CLOSED	13 Jul 2024 01:36:47:000	13 Jul 2024 01:36:10:000	48000000
TSECL	1C	MONAR_TE	MONARCHAK CB 132/11 T1 (PRIM) CLOSED	13 Jul 2024 01:56:49:000	13 Jul 2024 01:56:49:000	9.62E+08
AEGCL	1C	SAMAG_AS	SAMAGURI CB 220Kv LINE TO MARIA CLOSED	13 Jul 2024 02:07:44:000	13 Jul 2024 02:07:37:000	4.44E+08
AEGCL	1C	SAMAG_AS	SAMAGURI CB 220Kv LINE TO MARIA BETWEEN	13 Jul 2024 02:11:44:000	13 Jul 2024 02:11:41:000	9.89E+08

Annexure 2: SLD of affected substation

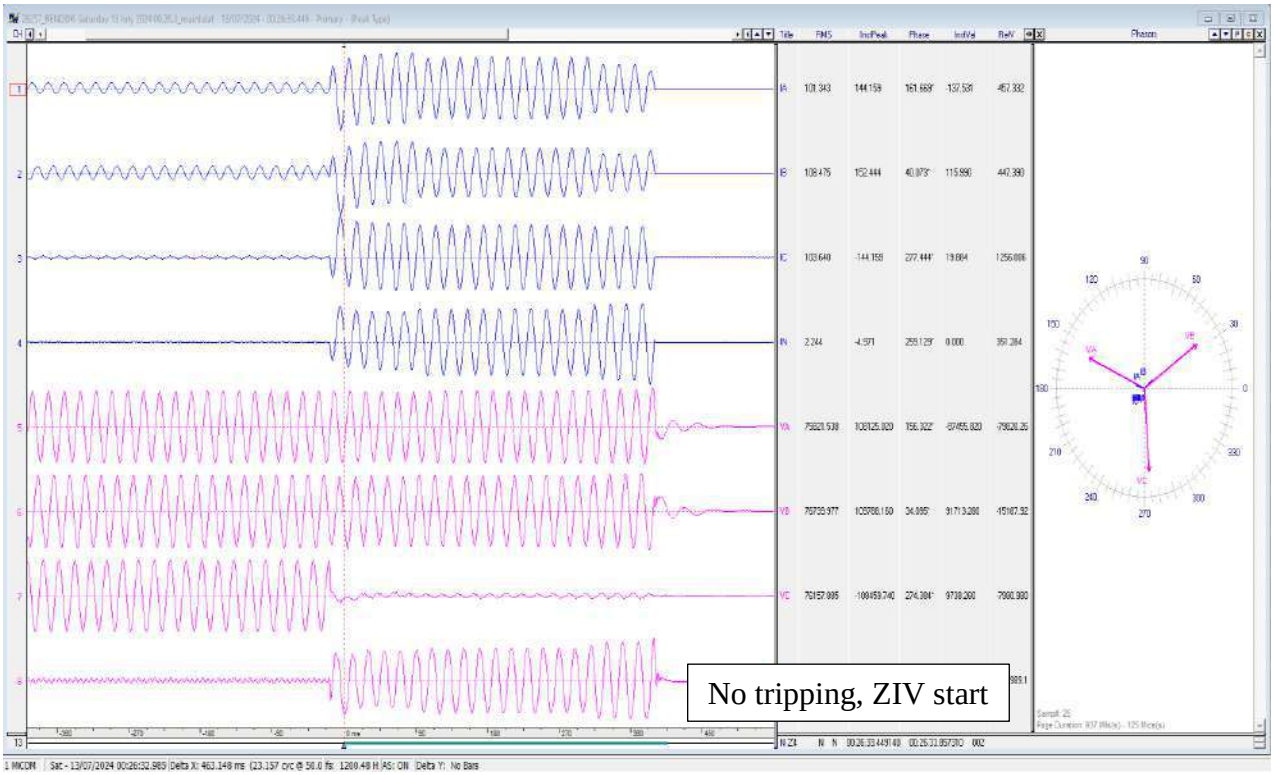


Annexure 3: Disturbance recorder snips showing faults and digital signals

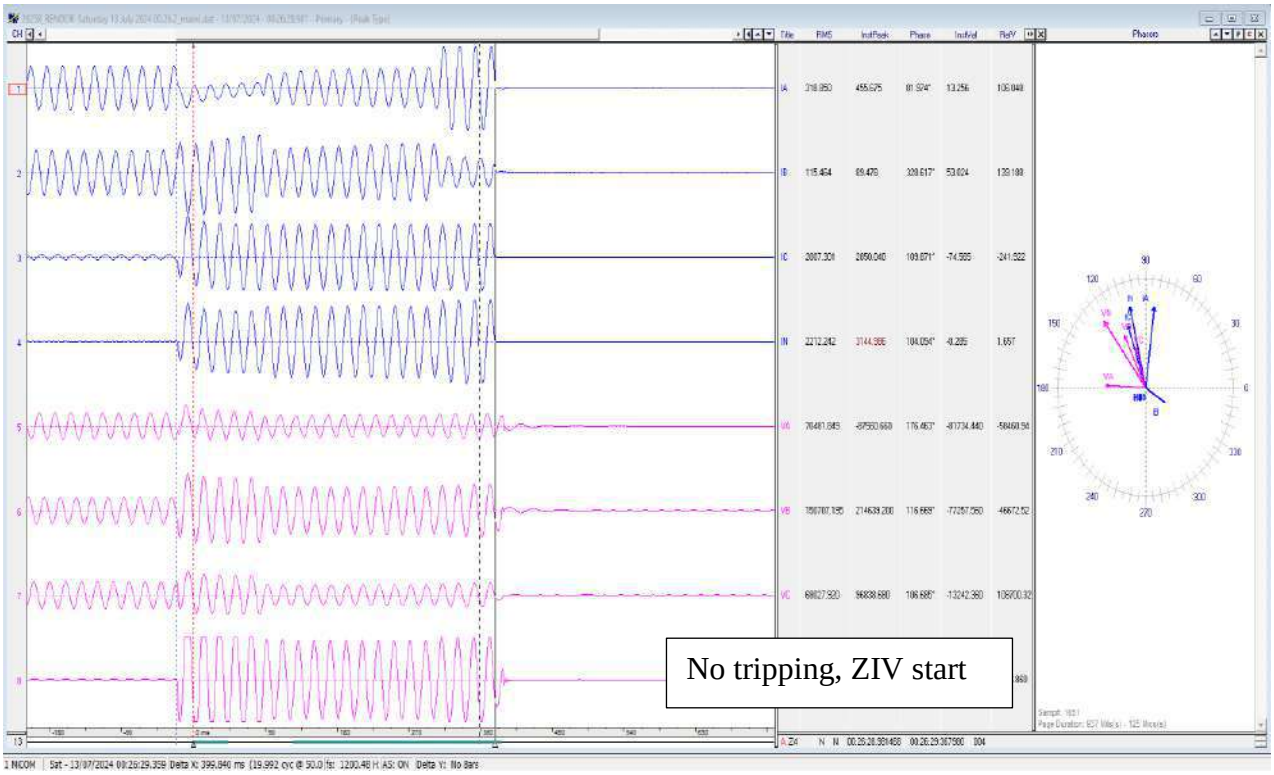
3.1. DR Snapshot of Agartala for 132 kV Agartala-Rokhia I Line



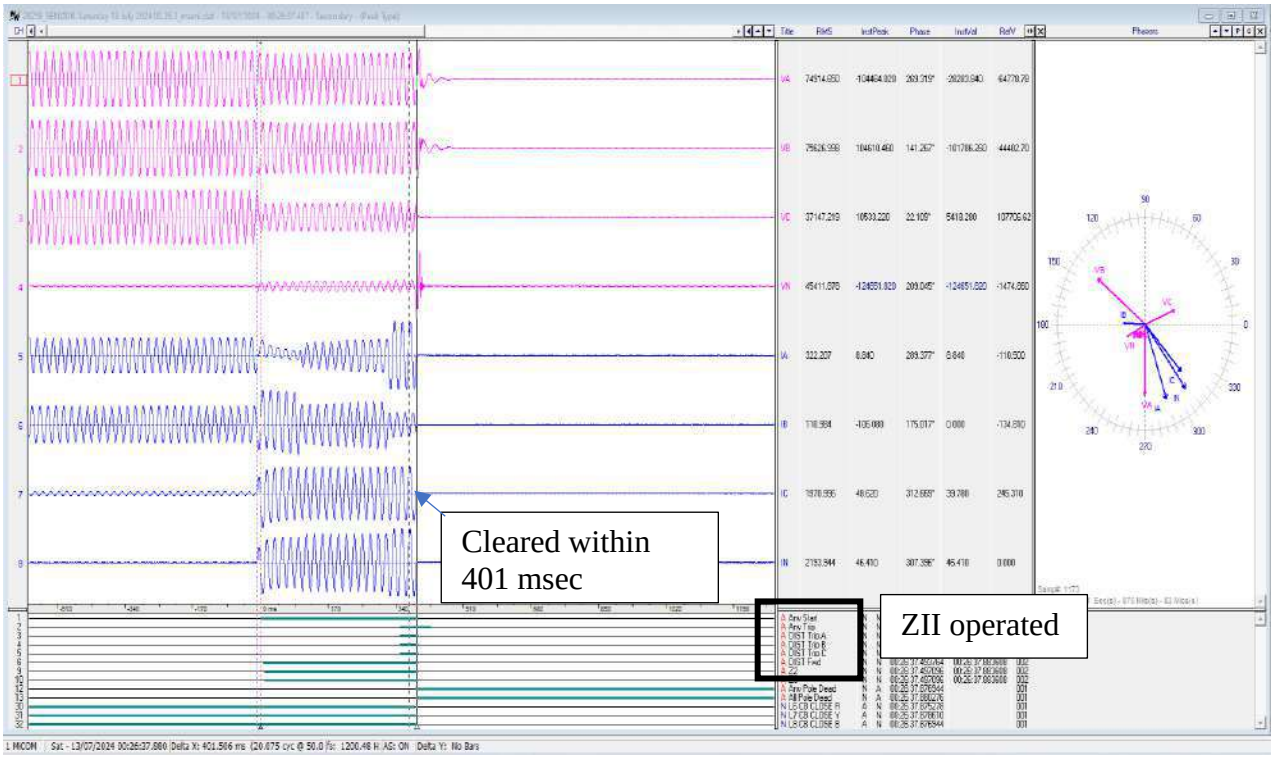
3.2. DR Snapshot of Rokhia for 132 kV Agartala-Rokhia I Line



3.3. DR Snapshot of Rokhia for 132 kV Rokhia-Monarchak Line



3.4. DR Snapshot of Monarchak for 132 kV Rokhia-Monarchak Line



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 Kohima area of Nagaland & Karong area of Manipur power system 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**):24-07-2024**

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

Kohima area of Nagaland and Karong area of Manipur Power System are connected with rest of NER Grid through 132 kV Imphal (MSPCL)-Karong, 132 kV Dimapur-Kohima & 132 kV Kohima-Zadima lines. Prior to the event, 132 kV Imphal (MSPCL)-Karong line tripped at 09:38 Hrs of 12-07-2024.

At **11:22 Hrs of 13.07.2024**, 132 kV Dimapur-Kohima & 132 kV Kohima-Zadima lines tripped. Due to tripping of these lines, Kohima and Karong areas got isolated from NER Grid and collapsed due to no source available in these areas.

Power supply was extended to Kohima area of Nagaland & Karong area of Manipur Power System by charging 132 kV Dimapur-Kohima Line at 12:01 Hrs of 13.07.2024.

2. **Time and Date of the Event (**घटना का स मय और दिनांक**):** 11:22 Hrs of 13-07-2024

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

4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Kohima and Karong area

5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50.10	2784	2491
Post Event (घटना के बाद)	50.10	2776	2470

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 Yurembam- Karong line tripped at 09:38 hrs of 12-07-2024 and is under patrolling
Weather Condition (मौसम स्थिति)	Rainy

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 18 MW in Kohima and 7 MW in Karong area. There was no generation loss.

7. **Duration of interruption (रुकावट की अवधि): 39 min**

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

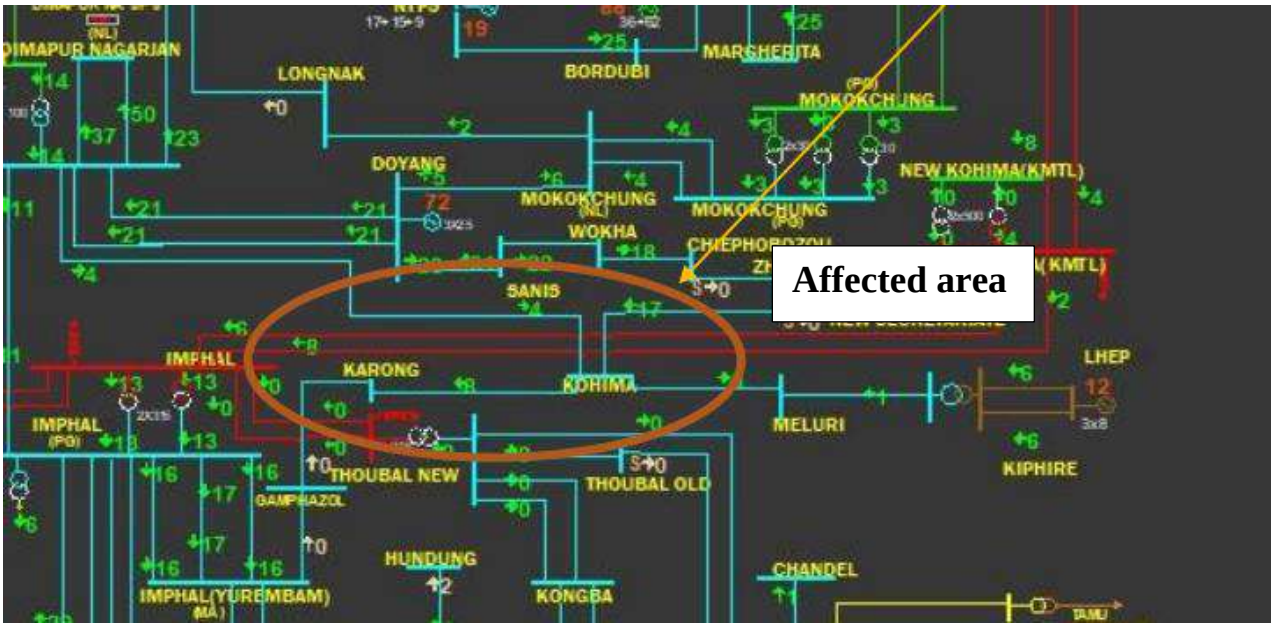


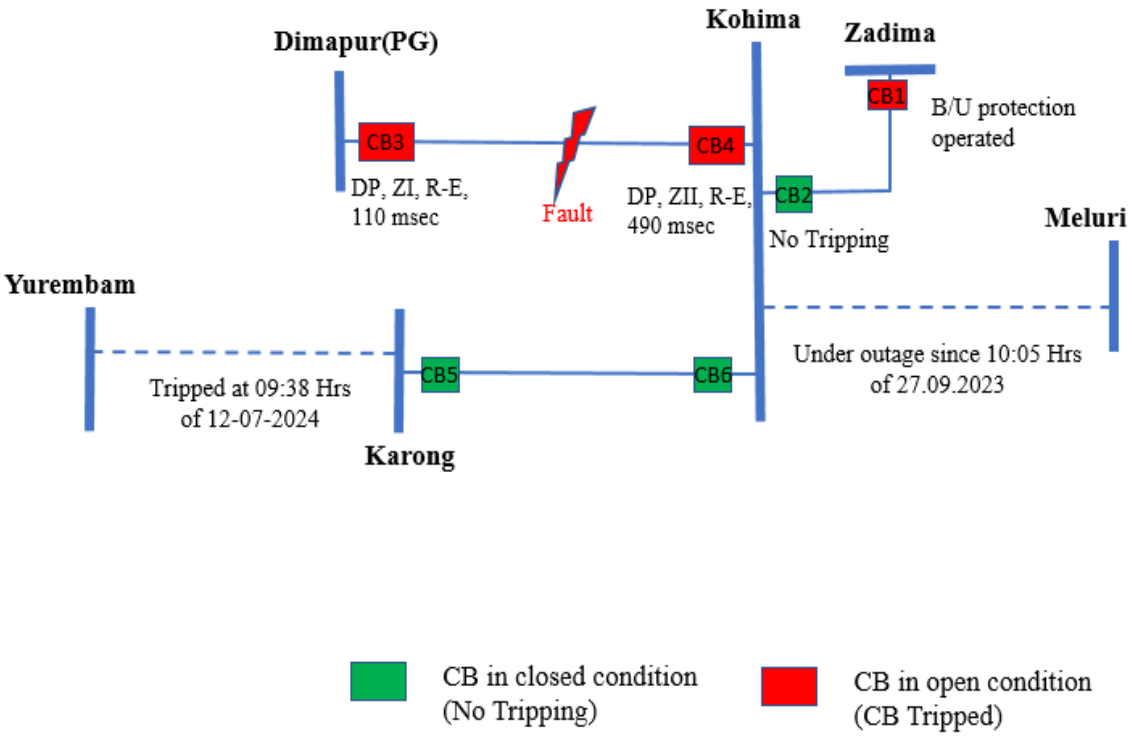
Figure 1: Network across the affected area

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 Dimapur-Kohima Line	11:22	12:01	DP, ZI, R-E, 20.14 Km	DP, ZII, R-E, 46 Km
2	132 kV Kohima-Zhadima Line	11:22	12:01	No tripping	B/U E/F operated

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



As per DR analysis, high resistive R-E fault (Ir-2 kA, In-1.9 kA) in 132 kV Dimapur-Kohima line initiated at 11:22:42.532 Hrs and cleared within 110 msec on operation of DP, ZI from Dimapur end and within 500 msec from Kohima end on operation of DP, ZII.

At the same time, 132 kV Kohima-Zadhima line tripped on B/U protection from Zadhima end which resulted in blackout of Kohima & Karong S/S.

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

- B/U setting at Zadhima for 132 kV Kohima-Zadhima line needs to be reviewed by DoP Nagaland.
- SOE not recorded for tripping of 132 kV Kohima-Zadhima line.

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

- Power supply was extended to Kohima area of Nagaland & Karong area of Manipur Power System by charging 132 kV Dimapur-Kohima Line at 12:01 Hrs of 13.07.2024.

- BU EF setting at Zhadima for 132 kV Kohima-Zhadima line was revised in co-ordination with Z3 time on 17.07.2024

  Old setting (PS/TMS): 11% / 0.29

  New setting (PS/TMS): 10% / 0.38

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)	**MSPCL**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**MSPCL, DoP Nagaland**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**MSPCL, DoP Nagaland**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**Time drift of 2 min at Kohima for 132 kV Dimapur-Kohima line**
5.	**Any other non-compliance**		-

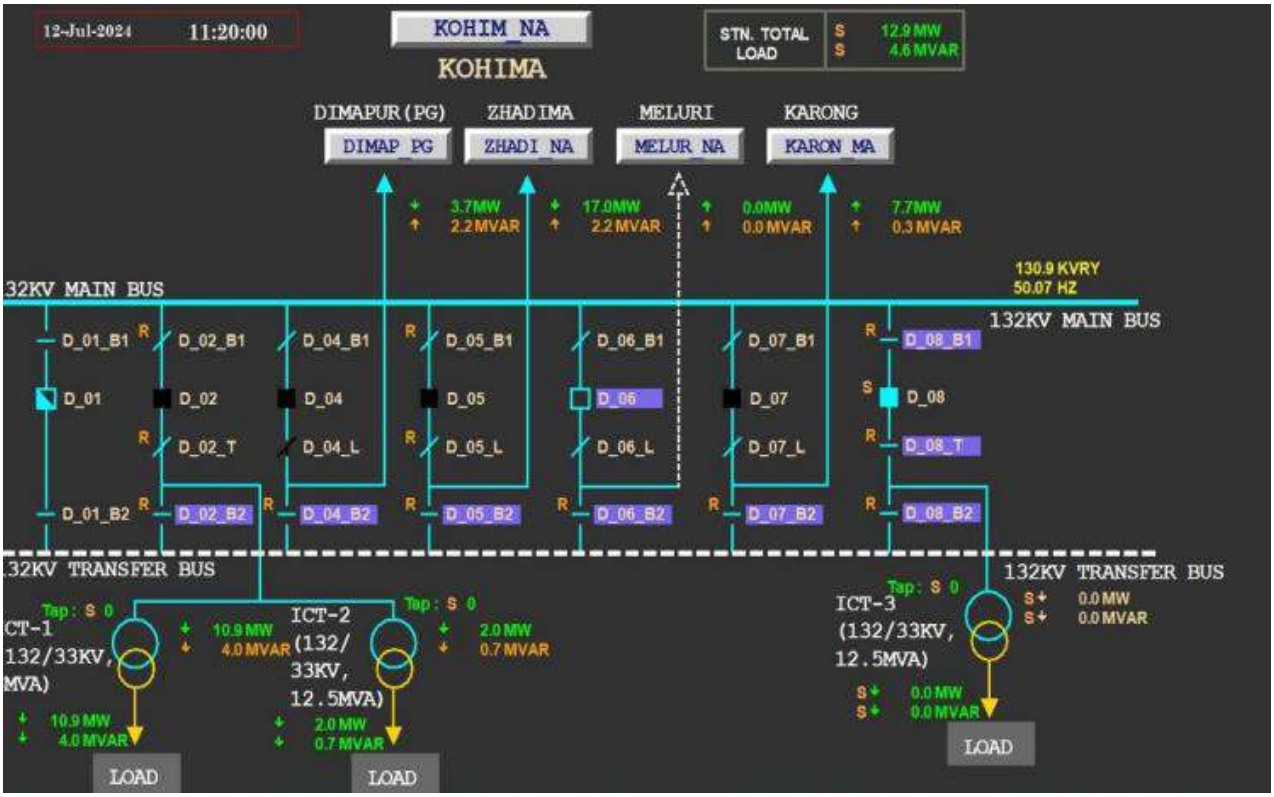
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.
- Need for preventive maintenance to ensure the healthiness of the protection system.

Annexure 1: Sequence of Events as per SCADA

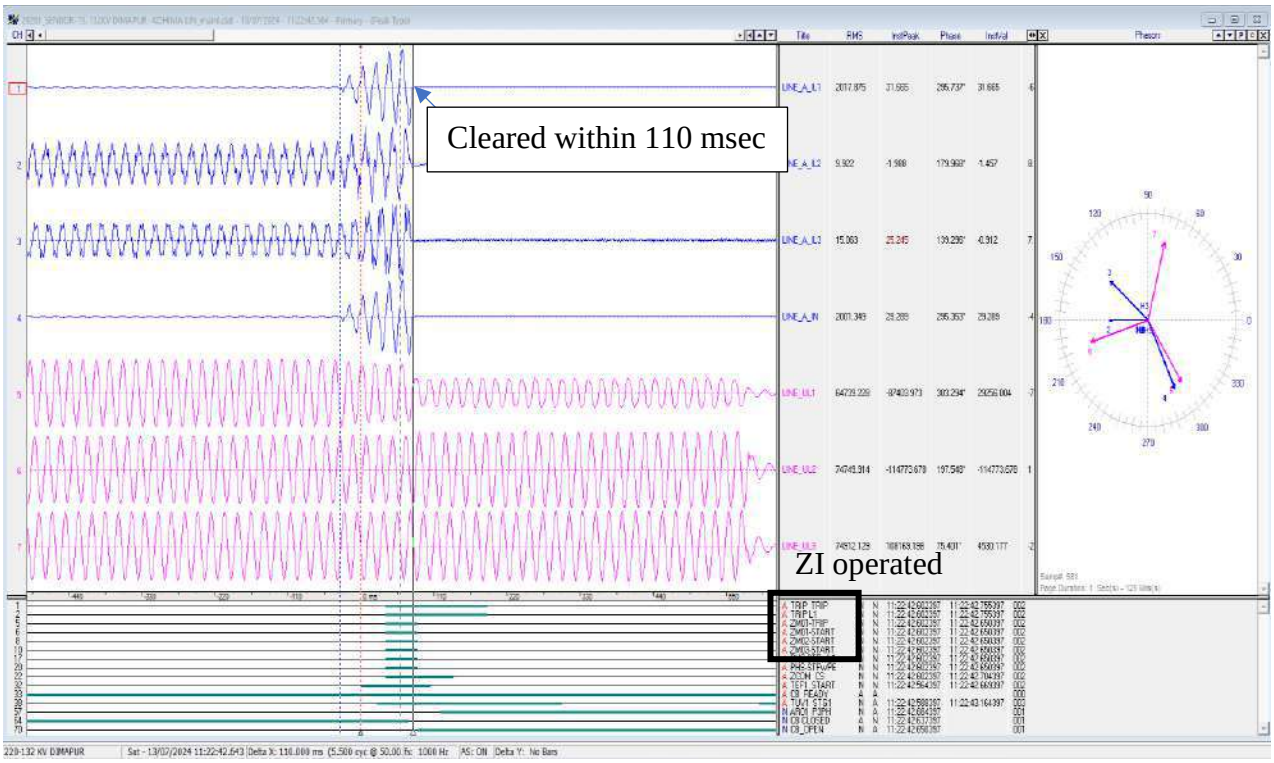
AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
---	---	---	---	---	---	---
AEGCL	1C	AZRRT_AS	ROWTA(SP) CB 11 KV UNIT (U2) OPEN	13 Jul 2024 11:22:37:000	13 Jul 2024 11:22:25:000	6.85E+08
AEGCL	1C	AZRRT_AS	ROWTA(SP) CB 33Kv LINE TO ROWTA OPEN	13 Jul 2024 11:22:37:000	13 Jul 2024 11:22:25:000	6.85E+08
NAGALD	1C	DIMAP_PG	DIMAPUR CB 132Kv LINE-1 TO KOHIM OPEN	13 Jul 2024 11:22:39:000	13 Jul 2024 11:22:42:000	6.63E+08
AEGCL	1C	AZRRT_AS	ROWTA(SP) CB 33Kv LINE TO ROWTA CLOSED	13 Jul 2024 11:28:41:000	13 Jul 2024 11:28:24:000	3.37E+08
AEGCL	1C	AZRRT_AS	ROWTA(SP) CB 11 KV UNIT (U2) CLOSED	13 Jul 2024 11:29:17:000	13 Jul 2024 11:29:11:000	1.48E+08
AEGCL	1C	DEPOT_AS	DEPOTA (TEZPUR) CB 132Kv LINE TO DHEKI CLOSED	13 Jul 2024 11:30:43:000	13 Jul 2024 11:30:29:000	8.13E+08
NAGALD	1C	DIMAP_PG	DIMAPUR CB 132Kv LINE-1 TO KOHIM CLOSED	13 Jul 2024 11:48:57:000	13 Jul 2024 11:49:01:000	4.27E+08
MEECL	1C	NANGA_ME	NANGALBIBRA CB 33Kv LOAD NANGL OPEN	13 Jul 2024 11:54:22:000	13 Jul 2024 11:53:59:000	5.08E+08
MEECL	1C	NANGA_ME	NANGALBIBRA CB 33Kv LOAD NANGL CLOSED	13 Jul 2024 11:56:44:000	13 Jul 2024 11:56:20:000	4.13E+08

Annexure 2: SLD of affected substation

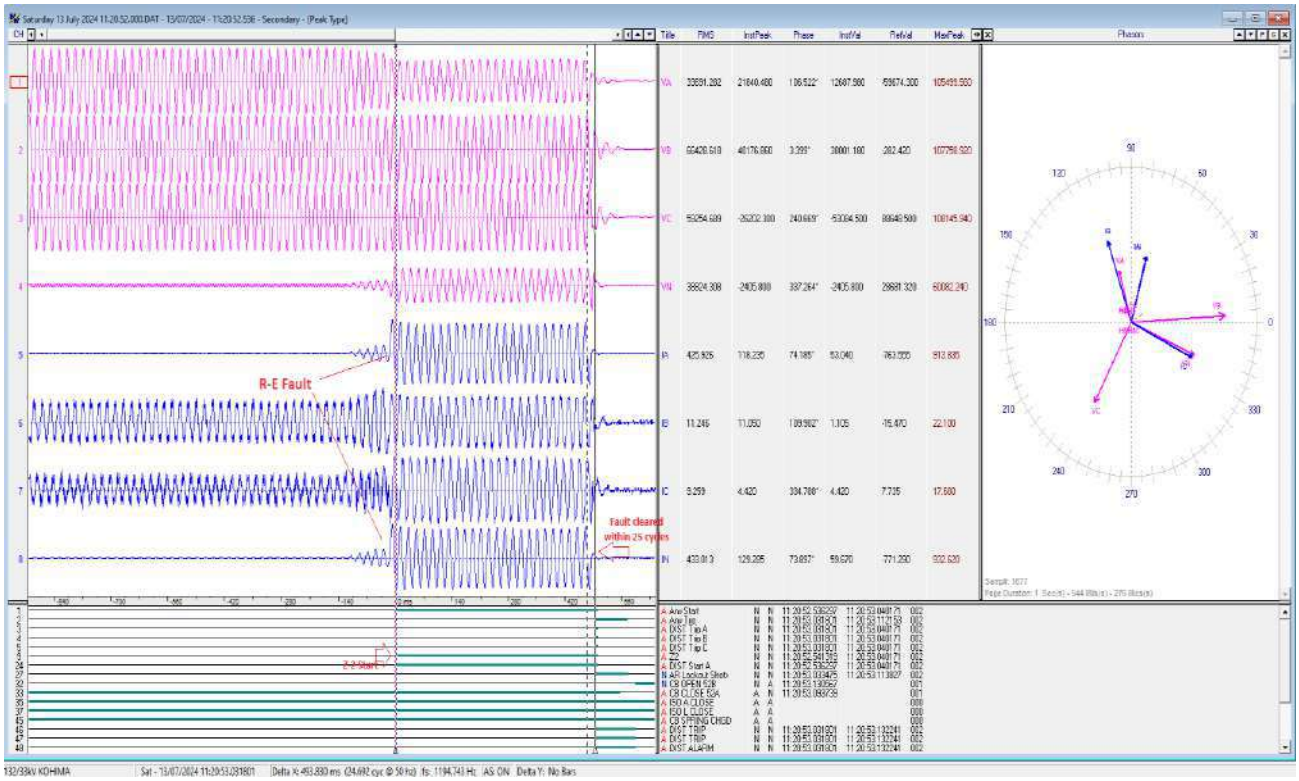


Annexure 3: DR snapshot

3.1 DR of Dimapur end for 132 kV Dimapur-Kohima line



3.2 DR of Kohima end for 132 kV Dimapur-Kohima line



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 Karong area of Manipur 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 सी37.2 (एफ) के अनुपालन में)

Date (दिनांक**):24-07-2024**

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

Karong area of Manipur Power System is connected with rest of NER Grid through 132 kV Imphal (MSPCL)-Karong and 132 kV Karong-Kohima lines. Prior to the event, 132 kV Imphal(MSPCL)-Karong line tripped at 09:38 Hrs of 12-07-2024.

At **12:52 Hrs of 13.07.2024**, 132 kV Karong-Kohima line tripped. Due to tripping of this line, Karong area of Manipur Power System got isolated from NER Grid and collapsed due to no source available in this area.

Power supply was extended to Karong area of Manipur Power System by charging 132 kV Karong-Kohima Line at 13:08 Hrs of 13.07.2024.

2. **Time and Date of the Event (**घटना का स मय और दिनांक**):** 12:52 Hrs of 13-07-2024

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

4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Karong area of Manipur

5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50.1	2784	2491
Post Event (घटना के बाद)	50.1	2776	2470

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 Yurembam- Karong line tripped at 09:38 hrs of 12-07-2024 and is under patrolling
Weather Condition (मौसम स्थिति)	Normal

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 4 MW. There was no generation loss.

7. **Duration of interruption (रुकावट की अवधि): 16 min**

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

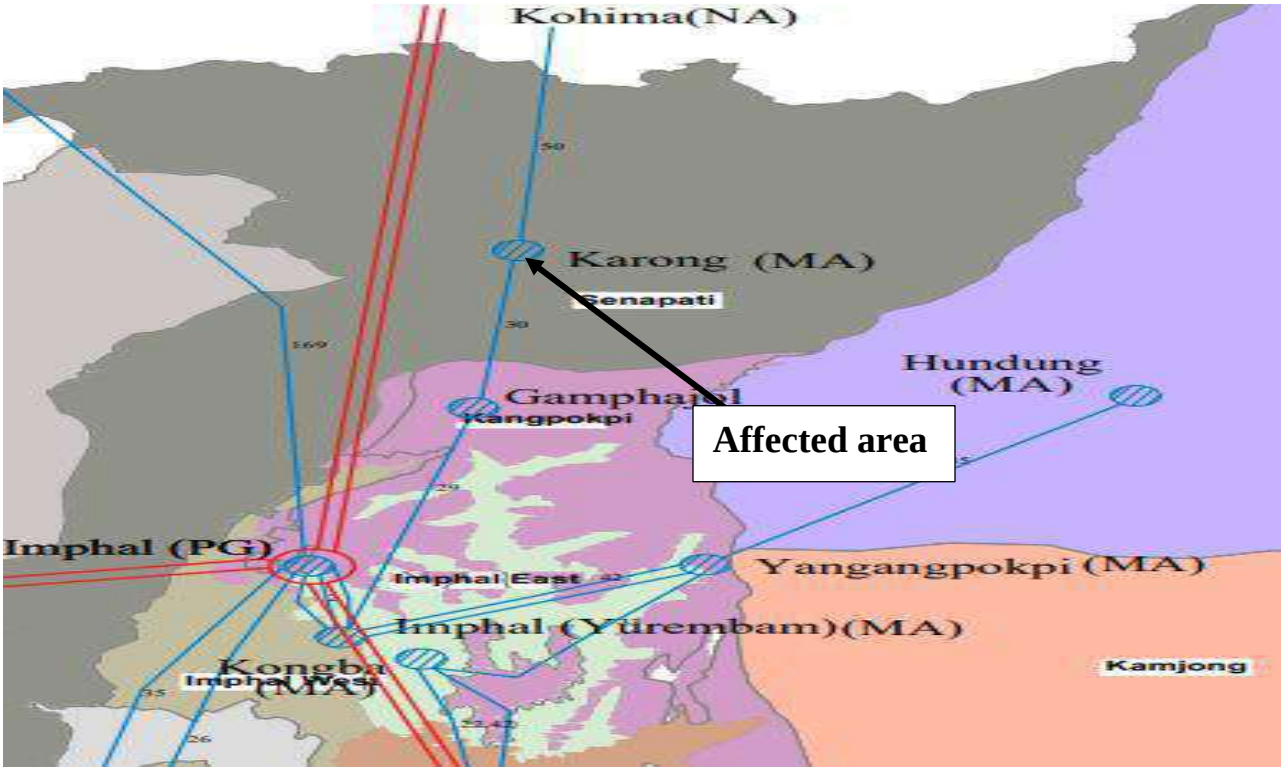


Figure 1: Network across the affected area

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 Karong-Kohima Line	12:52	13:08	No tripping	DP, ZII, R-E, FD: 44.45 Km

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

As per EL file of Kohima for 132 kV Karong-Kohima line, R phase Ir-1.36 kA fault initiated at 12:51:30.906 Hrs and cleared within 427 msec on operation of DP, ZII from Kohima end. There was no tripping from Karong end.

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

- SOE not recorded for tripping of 132 kV Karong-Kohima line. The same needs attention from DoP Nagaland/SLDC Nagaland team.

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

Power supply was extended to Karong area of Manipur Power System by charging 132 kV Karong-Kohima Line at 13:08 Hrs of 13.07.2024.

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	**MSPCL, DoP Nagaland**
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**		-

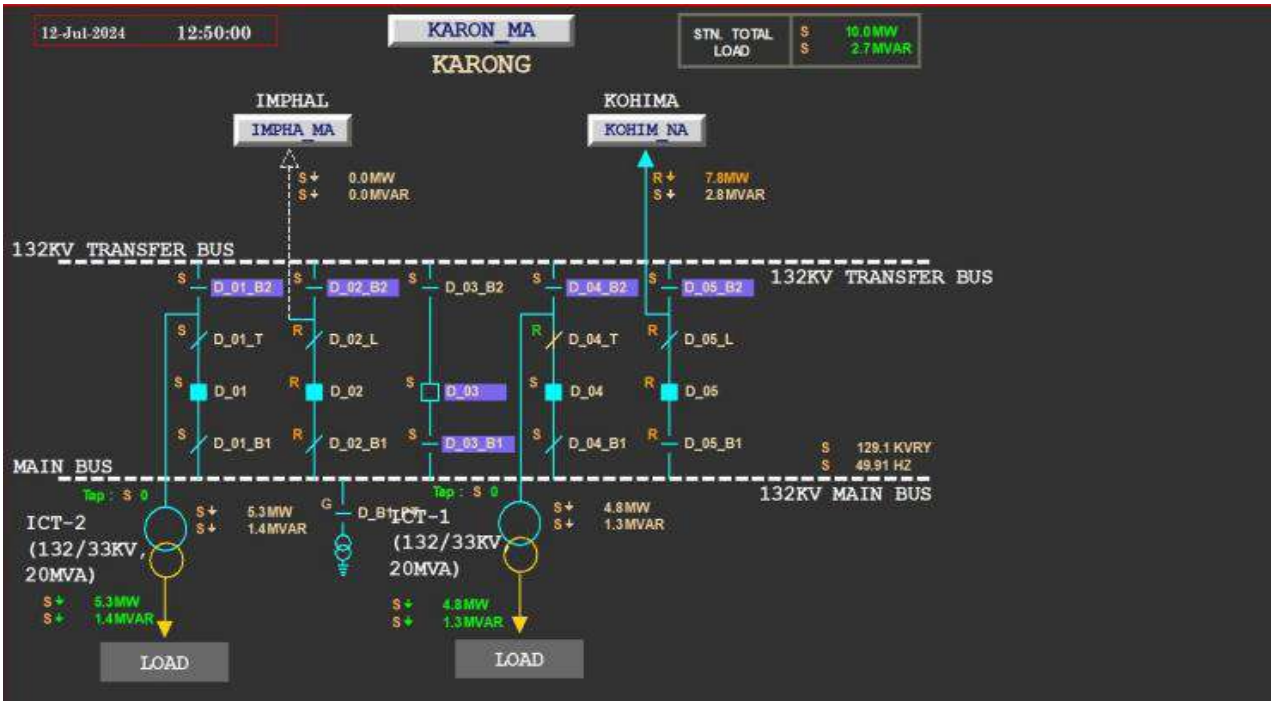
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.

Annexure 1: Sequence of Events as per SCADA

SOE not recorded

Annexure 2: SLD of affected substation



Annexure 3: EL snapshot of Kohima end for 132 kV Karong-Kohima line

Saturday 13 July 2024 12:51:31.915		Fault Recorded
Description		132KV KARONG
Plant reference		132KV KOHIMA
Model number		P44291AB6M0710M
Address		001 Column:01 Row:00
Event type		Fault record
Event Value		0
Active Group		1
Faulted Phase		1111001
Start Elements		00000000010000000000010000011
Tripped Elts		00000000000000010000000000000C
Time Stamp	Saturday 13 July 2024	12:51:30.906
Fault Alarms		00000000001000
System Frequency		50.00 Hz
Fault Duration		426.6ms **Fault clearing time**
Relay Trip Time		79.99ms
Fault Location		44.45km
IA		1367 A **R-phase fault**
IB		100.3 A
IC		116.5 A
VAN		39.89kV
VBN		75.36kV
VCN		73.24kV
Fault Resistance	2.366	Ohm
Fault in Zone	Zone	2
Tripped Elts 2		0000000000000000
Start Elements 2		000000000000
Evt Unique Id		475800

ग्रिड-इंडिया GRID-INDIA
ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
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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 Kokrajhar, Bilasipara and Gauripur areas of Assam Power System 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))

Date (दिनांक**):25-07-2024**

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

   Kokrajhar, Bilasipara and Gauripur areas of Assam Power System were connected to NER Power system via 132 kV BTPS – Kokrajhar D/C lines. 132 kV Gauripur – Gosaigaon line was kept opened for load segregation purpose.

   At 18:10 Hrs of 15-07-2024, 132 kV BTPS – Kokrajhar I & II lines tripped. Due to tripping of these lines, Kokrajhar, Bilasipara and Gauripur areas of Assam Power System were isolated from NER Grid and collapsed due to no source available in these areas.

   Power was extended to Kokrajhar, Bilasipara and Gauripur areas of Assam Power System by charging 132 kV BTPS-Kokrajhar II line at 21:00 Hrs of 15-07-2024.

2. **Time and Date of the Event (**घटना का स मय और दिनांक**):** 18:10 Hrs of 15-07-2024
3. **Event Category** (ग्रिड **घटना का प्रकार**)**:** GD-I
4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Kokrajhar, Bilasipara and Gauripur areas of Assam
5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	49.98	3224	2878
Post Event (घटना के बाद)	49.98	3226	2811

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(	132kV Gauripur – Gossaigaon Line is kept open (conductor constraint)

Weather Condition (मौसम स्थिति)	Rainy weather

6. **Load and Generation loss (लोड और जेनरेशन हानि):** There was load loss of 45 MW. No generation loss

7. **Duration of interruption (रुकावट की अवधि): 2 Hr 50 min**

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

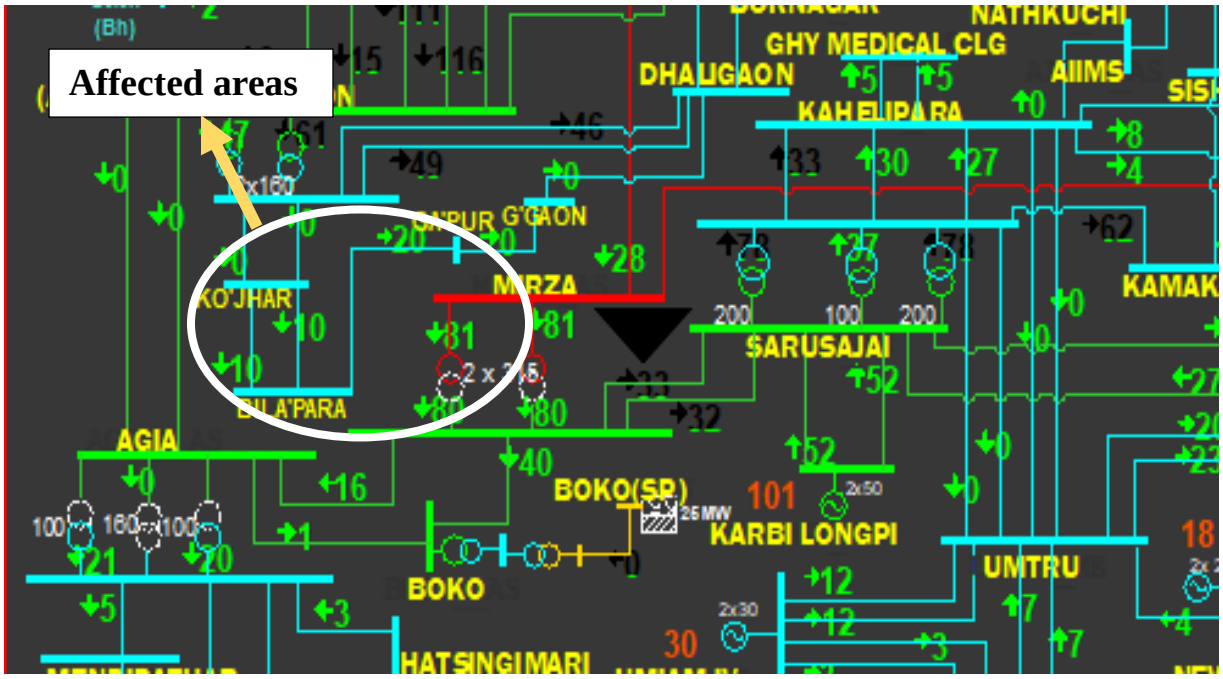


Figure 1: Network across the affected area

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 BTPS – Kokrajhar I Line	18:10	-	DP, ZI, R-Y-B-E, 9.1 Km	No tripping
2	132 kV BTPS – Kokrajhar II Line	18:10	21:00	DP, ZI, R-Y-B-E	No tripping

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

Proper analysis could not be done due to non-submission of FIR/DR/EL.

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

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

- Power was extended to Kokrajhar, Bilasipara and Gauripur areas of Assam Power System by charging 132 kV BTPS-Kokrajhar II line at 21:00 Hrs of 15-07-2024.

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)	**AEGCL**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**AEGCL**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**AEGCL**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	-
5.	**Any other non-compliance**		-

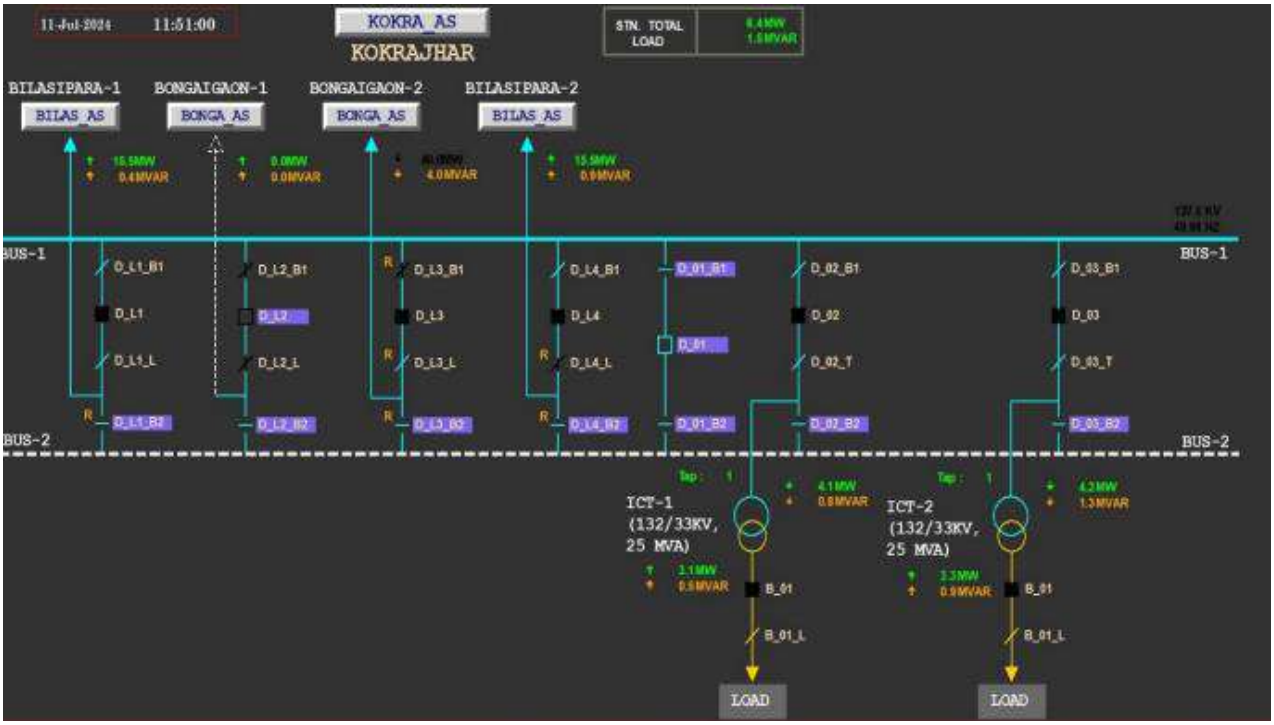
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Team AEGCL is requested to carry out patrolling and maintenance related activities as per various CEA/CERC regulations.

Annexure 1: Sequence of Events as per SCADA

AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
-------	----------	--------	----------	----------	----------	----------
AEGCL	1C	BONGA_AS	BONGAIGAON CB 220/132 T1 (PRIM) OPEN	15 Jul 2024 18:10:31:000	15 Jul 2024 18:10:21:000	9.72E+08
AEGCL	1C	BONGA_AS	BONGAIGAON CB 220/132 T1 (SEC) OPEN	15 Jul 2024 18:10:31:000	15 Jul 2024 18:10:21:000	9.9E+08
AEGCL	1C	BONGA_AS	BONGAIGAON CB 132Kv LINE-2 TO KOKRA OPEN	15 Jul 2024 18:10:31:000	15 Jul 2024 18:10:21:000	7.41E+08
AEGCL	1C	BONGA_AS	BONGAIGAON CB 132Kv LINE-1 TO KOKRA OPEN	15 Jul 2024 18:10:31:000	15 Jul 2024 18:10:21:000	7.49E+08
AEGCL	1C	GAURI_AS	GAURIPUR CB 132/33 T1 (SEC) OPEN	15 Jul 2024 18:11:38:000	15 Jul 2024 18:11:30:000	45000000
AEGCL	1C	GAURI_AS	GAURIPUR CB 132/33 T1 (PRIM) OPEN	15 Jul 2024 18:12:23:000	15 Jul 2024 18:11:49:000	60000000
AEGCL	1C	JAKSN_AS	JACKSON_SP CB 220/33 T2 (PRIM) BETWEEN	15 Jul 2024 20:59:52:000	15 Jul 2024 20:59:55:000	6.58E+08
AEGCL	1C	TINSU_AS	TINSUKIA CB 220/132 T1 (PRIM) CLOSED	15 Jul 2024 21:00:39:000	15 Jul 2024 21:00:18:000	5.58E+08
AEGCL	1C	KATHA_NO	KATHALGURI CB 220Kv LINE-1 TO TINSU CLOSED	15 Jul 2024 21:01:24:000	15 Jul 2024 21:00:19:000	3.02E+08
AEGCL	1C	BONGA_AS	BONGAIGAON CB 132Kv LINE-2 TO KOKRA CLOSED	15 Jul 2024 21:00:58:000	15 Jul 2024 21:00:56:000	2.88E+08
AEGCL	1C	BORNA_AS	BORNAGAR CB 33 KV CP 1 1 CB OPEN	15 Jul 2024 21:02:01:000	15 Jul 2024 21:02:04:000	2.08E+08
AEGCL	1C	TINSU_AS	TINSUKIA CB 220/132 T1 (SEC) CLOSED	15 Jul 2024 21:02:36:000	15 Jul 2024 21:02:26:000	8.38E+08

Annexure 2: SLD of affected S/S



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 complete Upper Assam area & Pasighat, Roing, Tezu and Namsai areas of Arunachal 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))

Date (दिनांक):22-07-2024

1. Event Summary (घटना का सारांश):

Upper Assam Power System consisting of Mariani(AS), Jorhat(Garmur), Jorhat(west), Bokakhat, Teok Nazira, Lakwa(LTPS), Moran, Sonari, NTPS, Bordubi, Namrup PS-1, Tinsukia, Amguri JACKSON SP, Dibrugarh, Margherita, Rupai, Margherita Chapakowa areas, and Deomali, Pasighat, Roing, Tezu and Namsai areas of Arunachal Power System of NER and AGBPP Generating Stations were connected with rest of NER Grid through 220 kV Mariani(AS)-Samaguri line, 220 kV Mariani(AS)- Mariani(PG) line, 220 kV AGBPP-Mariani(PG) line,132 kV Golaghat- Mariani(AS) line, and 132 kV Along-Pasighat line.

At 19:45 Hrs of 15.07.2024, 220 kV Mariani(AS)-Samaguri line, 220 kV Mariani(AS)-Mariani(PG) line, 220 kV AGBPP- Mariani(PG) line,132 kV Golaghat- Mariani(AS) line, and 132 kV Along-Pasighat line tripped. Due to tripping of these elements, Upper Assam power system consisting of Mariani(AS), Jorhat(Garmur), Jorhat(west), Bokakhat, Teok Nazira, Lakwa(LTPS), Moran, Sonari, NTPS, Bordubi, Namrup PS-1, Tinsukia, Amguri JACKSON SP, Dibrugarh, Margherita, Rupai, Margherita Chapakowa areas, and Deomali, Pasighat, Roing, Tezu and Namsai areas of Arunachal Power System of NER and AGBPP Generating Stations were isolated from NER Grid and collapsed due to load generation mismatch in these areas

Power was extended to Upper Assam power system consisting of Mariani(AS), Jorhat(Garmur), Jorhat(west), Bokakhat, Teok Nazira, Lakwa(LTPS), Moran, Sonari, NTPS, Bordubi, Namrup PS-1, Tinsukia, Amguri JACKSON SP, Dibrugarh, Margherita, Rupai, Margherita Chapakhowa areas by charging 220 kV Mariani(AS)-Samaguri line at 20:37 Hrs and to Pasighat, Roing, Tezu and Namsai areas of Arunachal Power System by charging 132

kV Along-Pasighat line at 20:56 Hrs and to Deomali area of Arunachal Power System by charging 220 kV AGBPP- Deomali line.

All load was restored by 22:30 hrs (as informed by AEGCL).

2. **Time and Date of the Event (**घटना का स मय और दिनांक**):** 19:45 Hrs of 15-07-2024

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

4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Upper Assam areas of Assam Power System and Deomali (radial from AGBPP), Pasighat, Roing, Tezu and Namsai areas of Arunachal Power System of NER.

5. **Antecedent Conditions (पूर्ववर्ती स्थिति)**:

	Frequency	Regional Generation (MW)	Regional Demand (MW)	**State Generation (MW)	**State Demand (MW)
Pre-Event (घटना पूर्व)	50.01	3434	3140	286.22	1985.4
Post Event (घटना के बाद)	50.01	2999	2822	186.61	1680

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

***** State Generation/load for Assam***

As per Flash report (AEGCL), Instant generation loss of around 100 MW and load loss of around 300 MW. Later other generating units tripped at 19:53hrs leading to final generation loss of around 230MW.

Important Transmission Line/Unit if under outage (before the even))महत्वपूर्ण संचरण लाइने/ विधुत उत्पादन इकाइयां जो बंद है(	220 KV Main Bus-II at Mariani (AS) was under ESD (10:38 Hrs -19:35 Hrs on 15-07-2024) for rectification of hotspot at R-phase isolator connected to 220KV Main Bus-II of Bus coupler Bay.
Weather Condition (मौसम स्थिति)	Normal

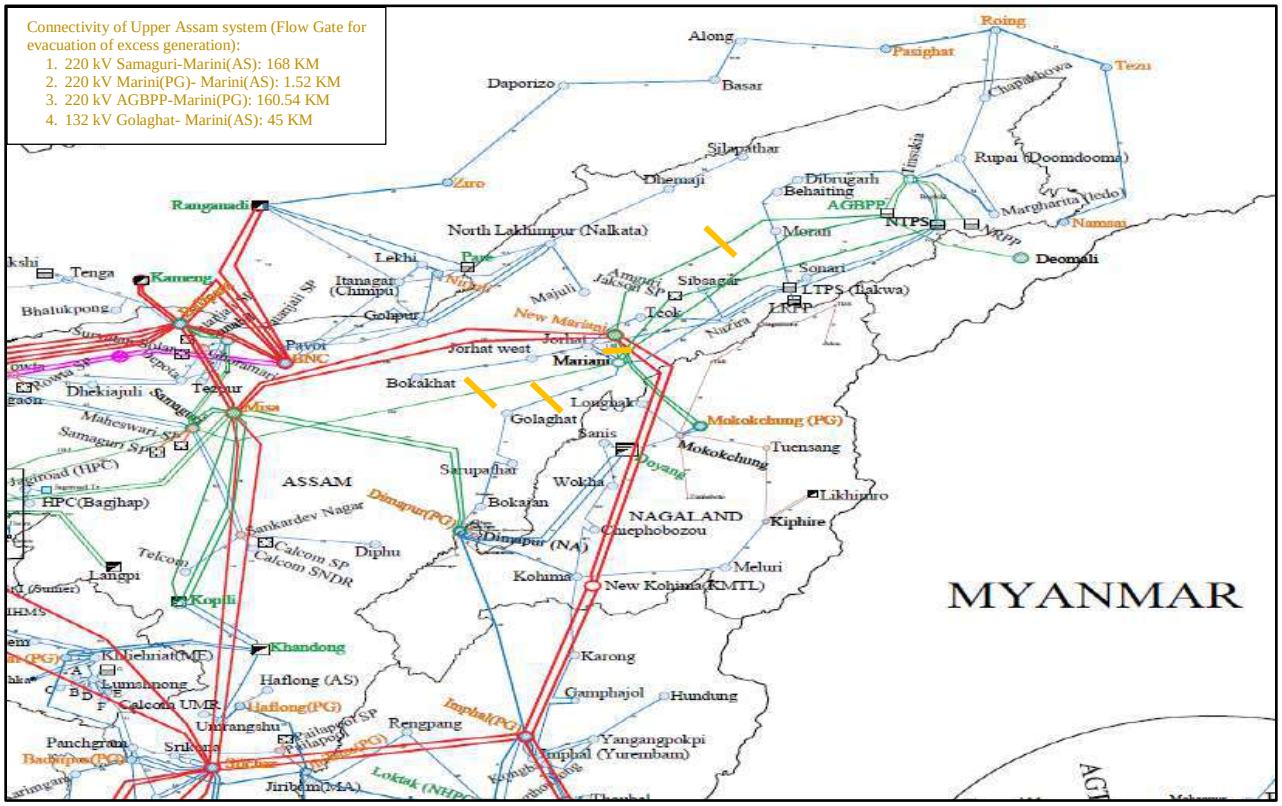
6. **Load and Generation loss (**लोड और जेनरेशन हानि**):**

Generation Loss: 423.7 MW (AGBPP: 197 MW, LTPS: 55.7 MW, LRPP: 63 MW, NTPS: 17 MW, NRPP: 91 MW)

Load Loss: 324 MW (Assam: 300 MW & Arunachal-24 MW)

7. **Duration of interruption (रुकावट की अवधि): 39 minutes**

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



Snapshot of 19:45 Hrs (Pre-fault Condition)

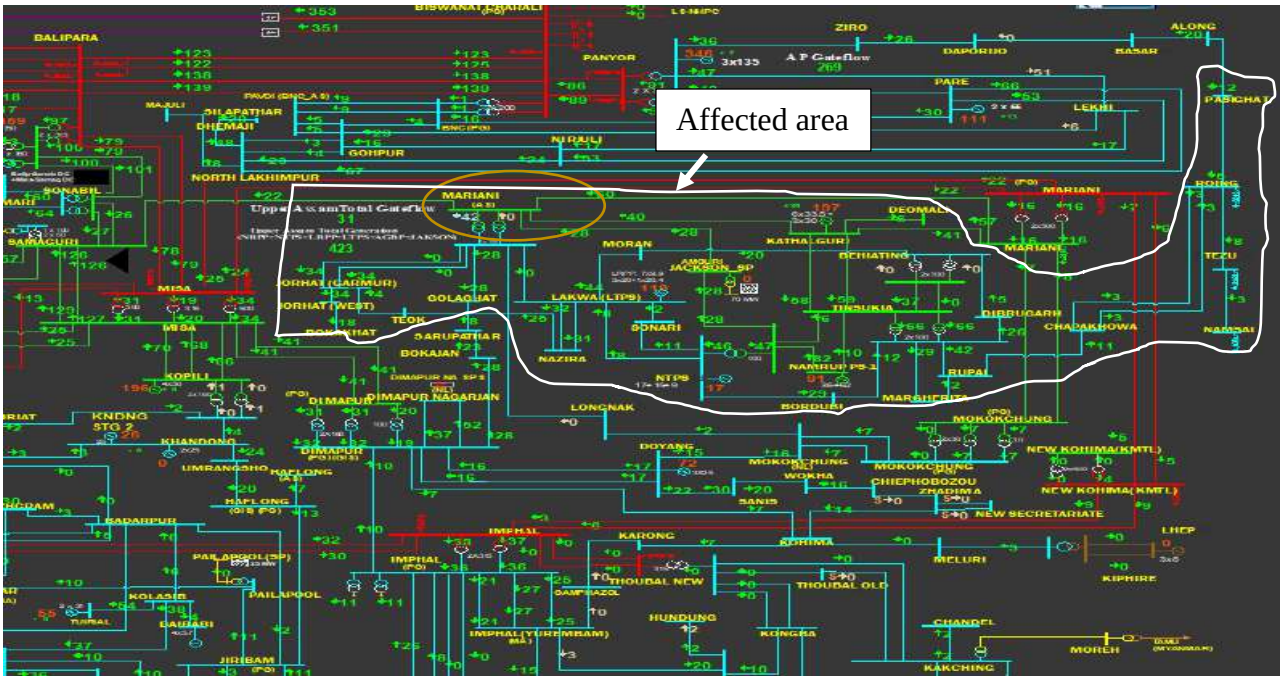


Figure 1: Network across the affected area

9. **Details of Equipment Failure (if any during the event) (**उपकरण विफलता का विवरण**):** Flashover at 220 kV Bus-I Isolator at Mariani(AS) for 220 kV AGBPP- Mariani(AS) line

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

Sl no	Name	Trip time (hh:mm)	Restoration time (hh:mm)	Relay End 1	Relay End 2
1	220 kV Mariani(AS)-Samaguri line	19:45 Hrs	20:25 Hrs	No Tripping	Tripped on ZII, R-B in 400 msecs
2	220 kV AGBPP-Mariani(PG) line (Length: 160.54 KM)	19:45 Hrs	20:11 Hrs	Tripped on DP, ZII, R-B, FD:166.9 KM (Ir: 0.76 A, Ib: 1.1 KA)	No Tripping
3	220 kV Mariani(AS)-Mariani(PG) line **(Length: 1.5 KM)**	19:45 Hrs	20:48 Hrs	Tripped on DP, Z IV in 560 msecs	No Tripping, ZIII initiated for 560 msecs
4	220 kV AGBPP-Mariani(AS) line (Length: 162.9 KM)	19:45 Hrs	01:40 Hrs **16-07-2024**	Tripped on DP, Z II, R-B, FD: 154.7 KM (Ir: 0.8 A , Ib: 1.13 kA)	Tripped on DP, Z-IV
5	132 kV Golaghat-Mariani(AS) line	19:45 Hrs	21:12	Tripped on Dir OC operated	No Tripping
6	220 kV Bus Coupler at Mariani (AS)	19:45 Hrs	-	Non. Dir E/F Operated	
7	400/220 kV ICT-1 at Mariani (PG)	19:45 Hrs	23:04 Hrs	Tripped on Over Current	
8	132 kV Along-Pasighat line	19:45 Hrs	20:56 Hrs	No Tripping	Tripped on Backup OC , Ir: 658A, Iy:682A, Ib:655A
9	AGBPP U1- U9 (Unit 3 under PSD)	19:45 Hrs	**15th July:** U5: 23:41 **16th July:** U1- 01:44, U2- 00:31, U4- 01:50, U9-13:25 Hrs **17th July**:	Loss of evacuation path. V<1 Trip command observed at ABPP for U5,U8 & U9 (CB not opened)	

			U7-09:34, U8-13:28, **18th July:** U6: 16:24		
10	220 kV Amguri Jackson SP-Mariani(AS) line	19:45 Hrs	20:37 Hrs	No Tripping	DT Received
11	132 kV Jorhat- Garmur(AS) line	19:45 Hrs	21:11 Hrs	No Trip	Z-III
12	NTPS U2 & U6	19:45 Hrs	-	Loss of Evacuation	
13	NRPP GTG	19:45 Hrs	22:37 Hrs	Loss of Evacuation	
14	NRPP STG	19:45 Hrs	-	Loss of Evacuation	
15	LRPP U1 to U7	19:45 Hrs	-	Loss of Evacuation	
16	LTPS U5 to U8	19:45 Hrs	-	Loss of Evacuation	

#As per AEGCL **(Flash Report),** LTPS units tripped at 19:45 hrs, LRPP, NTPS units tripped at 19:53 hrs. NRPP STG & GTG tripped at 19:49 hrs & 19:53hrs

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

The 220kV Mariani Bus-II was under shutdown (*for hotspot rectification works*). All the feeders were shifted to 220kV Bus-I. The segregation of feeders during the Main Bus II shutdown are as below:

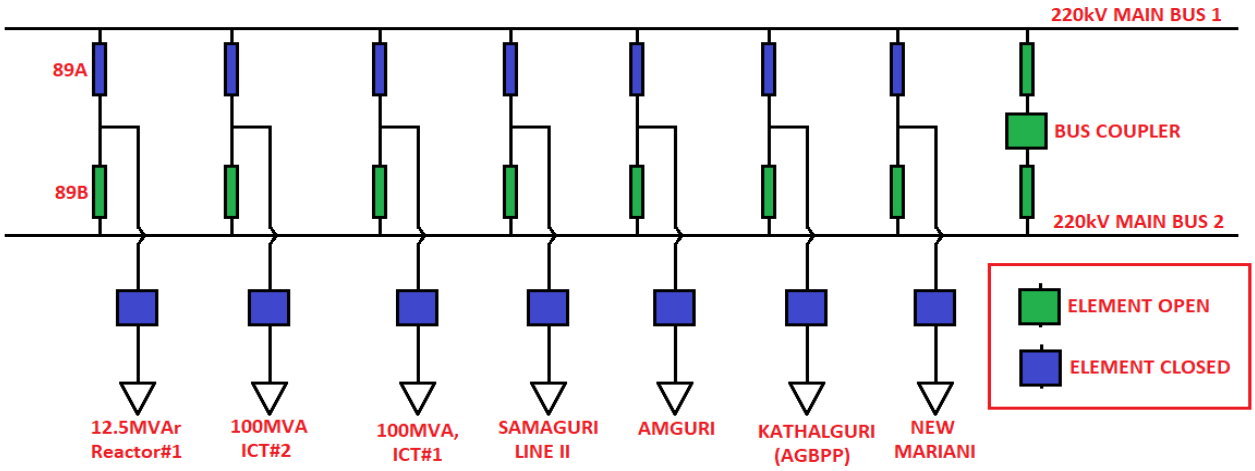


Figure 2: SLD of 220kV Mariani Substation (Main Bus-II SD)

SEQEUNCE OF EVENTS:

i) At 10:38Hrs on 15th of July, 2024, 220kV Main Bus-II at Mariani Substation was taken under Emergency shutdown for hotspot rectification works.

ii) At 18:43Hrs, the shutdown of 220kV Main Bus-II was returned

iii) At 19:25 Hrs, 220 kV Main Bus-II energised by closing of 220 kV Bus Coupler Circuit breaker.

iv) At 19:35 Hrs, the 220kV New Mariani(PG) feeder was shifted from Main Bus-I to Main Bus-II "On Load transfer" by Closing Bus-II Isolator (89B) and opening the Bus-I Isolator (89A) (Refer figure 3)

v) 220kV Kathalguri feeder was transferred from Main Bus-I to Main Bus-II by closing 89B Bus Isolator (89A already in closed position). The next step was to open the 89A bus isolator to complete the on-load transfer operation.

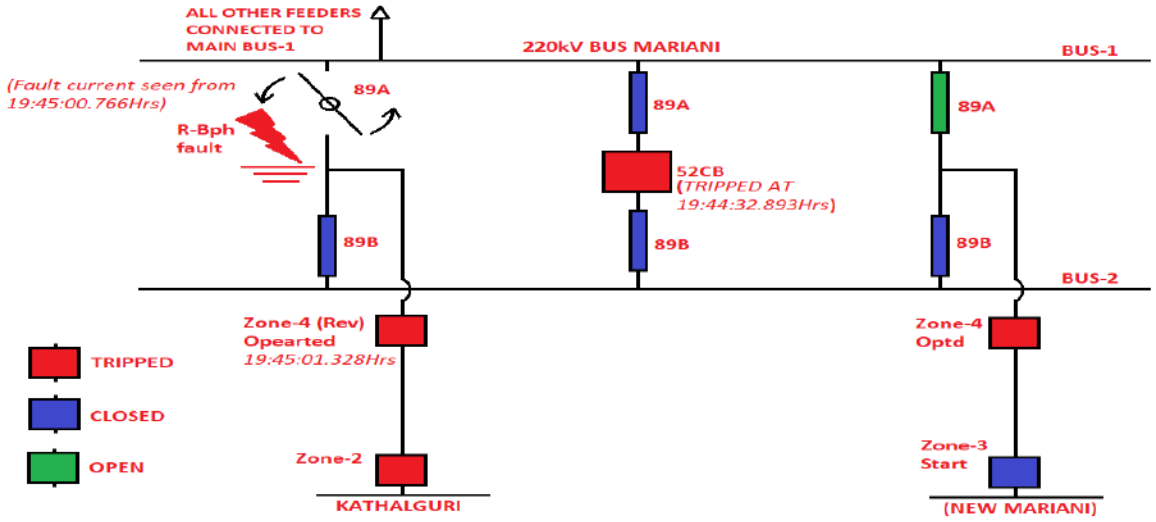


Figure 3: Initiation of Fault at Mariani – Kathalguri 89A Bus-I Isolator

vi) The Bus Coupler Feeder Tripped on Non-Directional IDMT Earth fault (51N) at 19:44:32.893Hrs (Refer Figure 3) due to absence of B Phase current (in the pre-fault state) as per the DR output recorded by the Bus Coupler relay. As per the SCADA SOE, the 89A Bus Isolator for Kathalguri Feeder was shown in "Interim State i.e. neither open nor close" at 19:44:33.416Hrs which infers that, the Bus Coupler CB tripped during the instant the opening of 89A isolator was under operation.

vii) The time of tripping of 220kV Bus Coupler Circuit Breaker and the Opening of 89A Bus Isolators of 220kV Kathalguri feeder from 220 kV Main Bus-I were overlapped and heavy

flashover were observed at 19:44:59.156 Hrs (Refer Figure 4 SAS SOE) due to on load current breaking operation by 89A Isolator.

Form No. :
Region :

AEGCL
220/132/33KV MARIANI GRID SUBSTATION
\\HMI-1\WinCC_Project_MARIANI_3\MARIANI.mcp

DOC NO.
Substation : MARIANI

Date	Month	Year

	Date	Time	Message Group	WinCC Message Text	Value	Cause	Additional cause
12	15/07/2024	19:44:32.184	MARIANI_B209_220KV_BUS COUPLER_67_67N	NON-DIR IDMT E/F PICKUP	RESET	spontaneous	no error
12	15/07/2024	19:44:32.184	MARIANI_B209_220KV_BUS COUPLER_67_67N	NON-DIR DMT GENERAL PICKUP	RESET	spontaneous	no error
12	15/07/2024	19:44:32.525	MARIANI_B209_220KV_BUS COUPLER_67_67N	NON-DIR IDMT E/F PICKUP	OPERATED	spontaneous	no error
12	15/07/2024	19:44:32.525	MARIANI_B209_220KV_BUS COUPLER_67_67N	NON-DIR DMT GENERAL PICKUP	OPERATED	spontaneous	no error
13	15/07/2024	19:44:32.846	MARIANI_B209_220KV_BUS COUPLER_67_67N	NON-DIR IDMT E/F OPTD	OPERATED	spontaneous	no error
13	15/07/2024	19:44:32.846	MARIANI_B209_220KV_BUS COUPLER_67_67N	NON-DIR DMT GENERAL TRIP	OPERATED	spontaneous	no error
13	15/07/2024	19:44:32.852	MARIANI_B209_220KV_BUS COUPLER_BCU	DIR, O/C & E/F PROT OPTD	OPERATED	spontaneous	no error
13	15/07/2024	19:44:32.871	MARIANI_B209_220KV_BUS COUPLER_BCU	86A/86B OPERATED	OPERATED	spontaneous	no error
13	15/07/2024	19:44:32.883	MARIANI_B209_220KV_BUSBAR_87BB	TBC 3-PH INITIATION	OPERATED	spontaneous	no error
13	15/07/2024	19:44:32.893	MARIANI_B209_220KV_BUS COUPLER_BCU	CB STATUS	interm. state	spontaneous	no error
13	15/07/2024	19:44:32.901	MARIANI_B209_220KV_BUS COUPLER_BCU	CB STATUS	OFF	spontaneous	no error
13	15/07/2024	19:44:32.916	MARIANI_B209_220KV_BUS COUPLER_67_67N	NON-DIR IDMT E/F PICKUP	RESET	spontaneous	no error
13	15/07/2024	19:44:32.916	MARIANI_B209_220KV_BUS COUPLER_67_67N	NON-DIR DMT GENERAL PICKUP	RESET	spontaneous	no error
13	15/07/2024	19:44:32.959	MARIANI_B209_220KV_BUS COUPLER_67_67N	EF OPTD (BUS COUPLER EF OPERATED	OPERATED	spontaneous	no error
14	15/07/2024	19:44:32.993	MARIANI_B209_220KV_BUS COUPLER_67_67N	NON-DIR IDMT E/F OPTD	RESET	spontaneous	no error
14	15/07/2024	19:44:32.993	MARIANI_B209_220KV_BUS COUPLER_67_67N	NON-DIR DMT GENERAL TRIP	RESET	spontaneous	no error
14	15/07/2024	19:44:32.996	MARIANI_B209_220KV_BUS COUPLER_BCU	DIR, O/C & E/F PROT OPTD	RESET	spontaneous	no error
14	15/07/2024	19:44:33.416	MARIANI_B205_220KV_KATHALGURI_BCU	89A STATUS (89A OPENING OPERATION)	interm. state	spontaneous	no error
14	15/07/2024	19:44:33.419	MARIANI_B205_220KV_KATHALGURI_BCU	89A STATUS	ON	spontaneous	no error
14	15/07/2024	19:44:33.422	MARIANI_B205_220KV_KATHALGURI_BCU	89A STATUS	interm. state	spontaneous	no error
14	15/07/2024	19:44:33.559	MARIANI_B209_220KV_BUS COUPLER_67_67N	EF OPTD (Differ by 0.5 sec)	RESET	spontaneous	no error
14	15/07/2024	19:44:33.579	MARIANI_B209_220KV_BUSBAR_87BB	KOTHALGURI 89A STATUS	OFF	spontaneous	no error
14	15/07/2024	19:44:59.005	MARIANI_B205_220KV_KATHALGURI_BCU	89A STATUS	OFF	spontaneous	no error
14	15/07/2024	19:44:59.016	MARIANI_B205_220KV_KATHALGURI_BCU	89A STATUS	interm. state	spontaneous	no error
15	15/07/2024	19:44:59.022	MARIANI_B205_220KV_KATHALGURI_BCU	89A STATUS	OFF	spontaneous	no error
	Date	Time	Message Group	WinCC Message Text	Value	Cause	Additional cause
15	15/07/2024	19:44:59.110	MARIANI_B205_220KV_KATHALGURI_BCU	89A STATUS	interm. state	spontaneous	no error
15	15/07/2024	19:44:59.112	MARIANI_B205_220KV_KATHALGURI_BCU	89A STATUS	OFF	spontaneous	no error
15	15/07/2024	19:44:59.154	MARIANI_B205_220KV_KATHALGURI_BCU	89A STATUS	interm. state	spontaneous	no error
15	15/07/2024	19:44:59.156	MARIANI_B205_220KV_KATHALGURI_BCU	89A STATUS (89A COMPLETELY OPENED)	OFF	spontaneous	no error

Figure 4: Sequence of Events recorded at Substation SCADA

viii) The 89A flashover across the Isolator arms can be considered as a bus fault. The 220 kV Bus-II was separated from the fault by tripping of 220kV Kathalguri (NEEPCO) on Z-II within 520 msec and 220kV New Mariani (PG) CBs at Mariani end on Zone 4 protection within 546 msec.

ix) The fault feeding from 220 kV Bus-I was isolated by tripping of the following remote end feeders of 220kV and 132kV Line (Refer figure 5)

- 220 kV Samaguri line on Z-II within 380 msec from Samaguri
- 220 kV Amguri line at Mariani on DT received. At Amguri Z-II pickup and carrier send.
- 132 kV LTPS and Garmur on Z-III
- 132 kV Teok-Garmur from Teok on Z-III and 132 kV Golghat on OC operation.

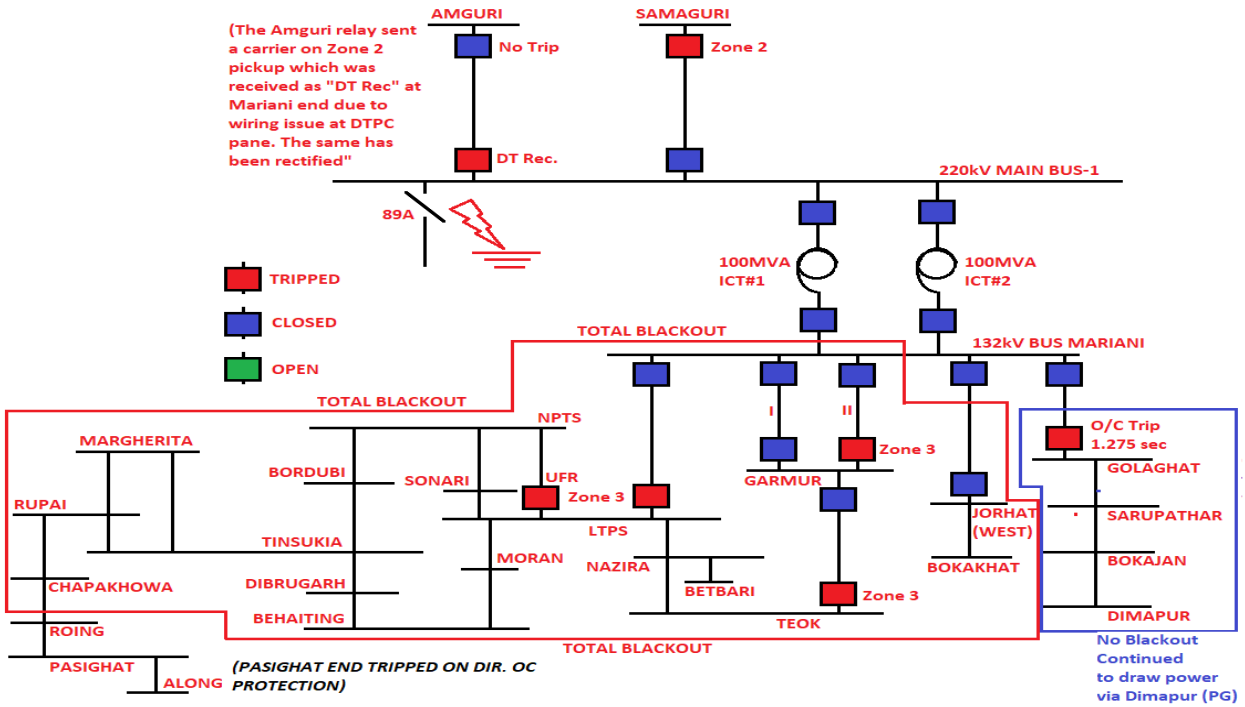


Figure 5: Tripping of Upstream and Downstream elements

x) As per DR signal by Arunachal Pradesh, 132kV Pasighat – Along line tripped on Dir. OC (Ir: 658A, Iy: 682A, Ib: 655A) protection during the fault event.

xi) Due to the above events initiated from the Bus fault at Mariani Assam, the above areas mentioned in *figure 5* suffered a **total blackout**.

xii) During the above event, all the four units of Kopili HEP tripped, which seems to be mis-operation. As per DR analysis, at 19:45:00.805 Hrs, V<1 with Vae: 6.4 kV, Vbe: 6.2 kV, Vce: 5.8 kV pickup. At 19:45:00.992 Hrs, V dep OC start was recorded with Vae: 6.2 kV. Vbe: 6.1 kV, Vce: 5.6 kV, Ia: 2 kA, Ib: 3.8 kA, Ic: 3.3 kA and current magnitude drops to Ia: 54A, Ib: 55A, Ic: 7A.At 19:45:01.340 Hrs, F>1 with 51.475 Hz pickup and Finally at 19:45:02.424 Hrs, F>2 Trip observed.

xiii) Also, 400/220 kV, 500 MVA ICT-I at Mariani (PG) tripped on Over current. As per DR analysis, I>1 start with Ia: 1655A, Ic: 1598 A and I>1 tripped issued within 516 msec.

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

- Non isolation of R-B bus fault at 220 kV Mariani (AS) Bus-I due to unavailability of Bus Bar protection, which is the non-compliance of SCHEDULE-V, Clause 4 of the CEA Technical Standards for Construction of Electrical Plants & Electrical Lines Regulation-2022. *<u>The Bus Bar protection needs to be checked and commissioned at the earliest possible time.</u>*
- Backup Earth fault trip for Bus Coupler at Mariani due to absence of B-Phase current. This absence may be attributed to issues in the primary B-phase path of the Bus Coupler Bay (such

as hardware clamps, CB B-phase resistance etc.). *To determine the exact cause, the conductor clamps need to be inspected, and the CB static contact resistance/DCRM test should be conducted immediately.*

- Zone-III picked up at Mariani (PG) end for the bus fault at Mariani (Assam). If Zone-II at Mariani (PG) had cleared the fault within 350msec, the upstream 220 kV Kathalguri-New Mariani Line would have remained operational and the large-scale blackout may have been restricted. *The Zone-II reach setting at Mariani (PG) for 220 kV Mariani (Assam) line needs to be reviewed. The reason for any discrepancies should be identified and corrected immediately*.
- 132 kV Pasighat-Along Line tripped from Pasighat on directional OC, resulted into blackout at Chapakhowa, Roing, Tezu, Namsai & Pasighat area of Arunachal Pradesh. *OC setting at Pasighat need to be reviewed and it is to be coordinated as per NER protection philosophy.*
  There is an urgent need for Backup setting coordination for the 132 kV Rupai-Chapakhowa-Roing-Pasighat-Along-Basar-Daporizo-Zero-Paynor link due to the network changes following the commissioning of 132 kV Roing-Chapakhowa D/C.
- *The tripping of 4X50 MW Kopili generation occurred with an F>2 that needs to be reviewed. Following the V dep OC pickup, the current instantly dropped to approx. zero (Ia: 54A, Ib: 55A, Ic: 7A). The cause of this drop needs to be identified*. According to NERLDC records, the maximum frequency during the event was 50.12 Hz. *The reasons for the relay sensing F>1 and F>2 trip should be checked and necessary correction should be made immediately.*
- One 500 MVA, ICT-I at Mariani (PG) tripped on overcurrent, with a tripping time that appears to be 516 milliseconds. *The overcurrent setting needs to be reviewed immediately, and corrective action should be taken.*
- SOE for Tripping of 132 kV Mariani (AS) - Golaghat & 132 kV Along-Pasighat not recorded in the SCADA. *The healthiness of CB auxiliary status with RTU needs to be checked and corrective action should be taken.*

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

As per Detailed report submitted by AEGCL,

i) The 220kV New Mariani Bay at Mariani (AEGCL) is owned by PGCIL (Bay equipment and Control and Relay Panel). After the fault event, the isolator contacts were found to be damaged (R-B phases). The Bus jumper connecting the isolator was also found partially damaged. As per discussion, PGCIL has agreed to repair the damaged parts of the isolator.

AEGCL would repair the damaged R phase conductor. AEGCL has requested PGCIL to replace the old 89A bus isolator (which is mechanically not smooth to operate).

ii) The 220kV Bus Coupler tripped on Earth fault due to absence of B phase current (which was not a fault condition). The tripping was due to the fact that OC and EF settings for bus coupler relays are set non-directional in nature (As per protection philosophy). There is no polarization element to detect overcurrent or earth faults.

iii) Until the next shutdown is availed to replace the damaged conductors (Jumper from 89A isolators), testing of the Bus coupler CB and conductor clamps, AEGCL propose to activate voltage polarization feature to detect actual earth fault in the Bus Coupler relay.

In that case, any sudden absence of current in the B phase (which is not a fault scenario and may be compared to Broken Conductor scenario as in line protection), will not trigger unwanted tripping of the Bus Coupler Breaker on Earth fault protection.

The proposed settings for earth fault may be considered as:

STAGE-I

Curve: IDMT Normal Inverse

Direction: Non-Directional

Polarization: With Zero-Sequence voltage and zero-sequence current

Pickup: 160A

TMS: Will be re-verified in co-ordination with fault data from site

The star point for the Bus Coupler Bay is towards Main Bus-I. Any fault in the Bus Coupler Bay is a bus fault and should be cleared by the Bus differential relay. The above settings would act as a backup for downstream ICTs and 220kV Transmission lines.

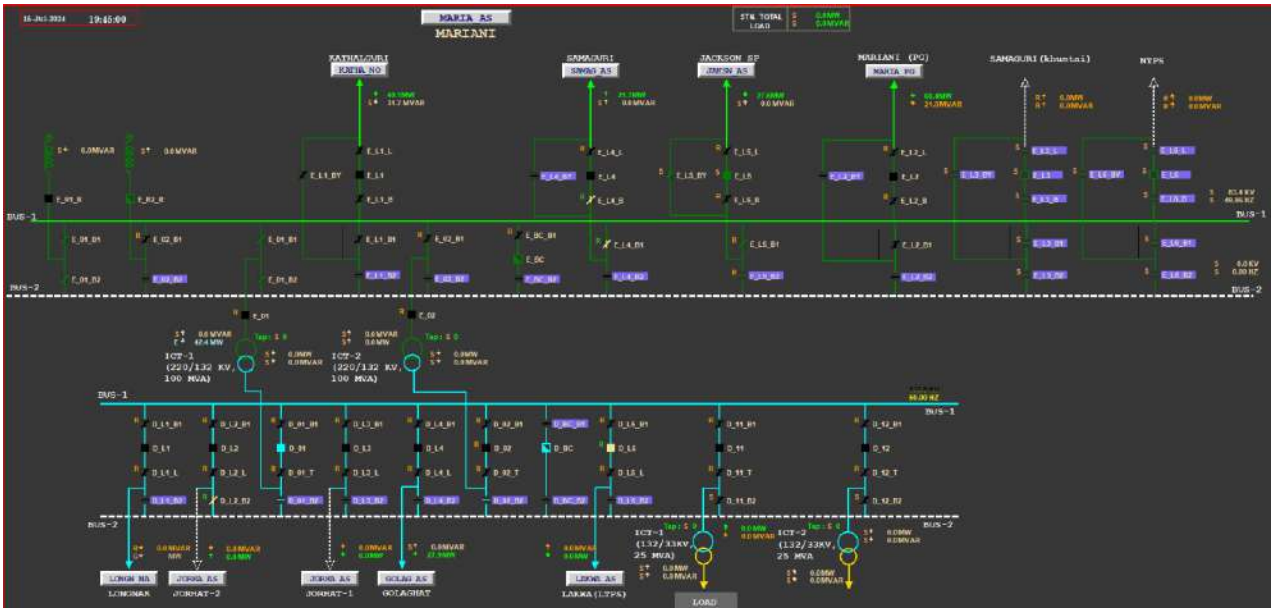
14. Non-compliance observed (विनियमन का गैर-अनुपालन):

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

15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Conduct periodic thermovision scanning of switchyard equipment and various joints to identify any hotspot for early detection of loose joints.
- Perform Periodic maintenance of isolator alignments and measurement of contact resistance (CRM) of isolators and DCRM of Circuit Breaker.
- Regular checking of health of all protection systems, and periodically review and test protection settings.
- Ensure strict adherence to shut down period. Extension of S/D from the approved schedule should be avoided. For example: The ESD of 220 kV Bus II at Mariani(AS) was approved from 9 Hrs to 15 Hrs, but S/D extended till peak hours.
- Switching of important elements during peak hour should be avoided.

Annexure 1: SLD of Mariani (AS) as per SCADA



Annexure 2: Sequence of Events as per SCADA

LOCATION	TEXT	SYSTEM_TIME
MARIA_AS	MARIANI CB 220 KV COUPLER (BC) BETWEEN	15 Jul 2024 10:38:34:000
--------	----------	----------
KATHA_NO	KATHALGURI CB 220Kv LINE-1 TO MARIA OPEN	15 Jul 2024 19:44:56:000
KATHA_NO	KATHALGURI CB 220Kv LINE TO MARIA OPEN	15 Jul 2024 19:44:56:000
MARIA_AS	MARIANI CB 220Kv LINE TO MARIA OPEN	15 Jul 2024 19:45:32:000
SAMAG_AS	SAMAGURI CB 220Kv LINE TO MARIA INVALID	15 Jul 2024 19:45:32:000

JAKSN_AS	JACKSON_SP CB 220/33 T1 (SEC) OPEN	15 Jul 2024 19:45:32:000
JAKSN_AS	JACKSON_SP CB 220/33 T2 (SEC) OPEN	15 Jul 2024 19:45:32:000
TEOK__AS	TEOK CB 132Kv LINE TO JORHA OPEN	15 Jul 2024 19:46:25:000
LAKWA_AS	LAKWA (LTPS) CB 11 KV UNIT G5 OPEN	15 Jul 2024 19:46:36:000
JAKSN_AS	JACKSON_SP CB 220/33 T2 (SEC) CLOSED	15 Jul 2024 19:48:18:000
JAKSN_AS	JACKSON_SP CB 220/33 T1 (SEC) CLOSED	15 Jul 2024 19:48:34:000
RUPAI_AS	RUPAI CB 132/33 T1 (PRIM) OPEN	15 Jul 2024 19:49:34:000
RUPAI_AS	RUPAI CB 132/33 T2 (PRIM) OPEN	15 Jul 2024 19:49:34:000
RUPAI_AS	RUPAI CB 132/33 T1 (SEC) OPEN	15 Jul 2024 19:49:34:000
RUPAI_AS	RUPAI CB 132/33 T2 (SEC) OPEN	15 Jul 2024 19:49:34:000
NRPP__AS	NAMRUP PS-1 CB 11 KV UNIT (GT1) OPEN	15 Jul 2024 19:49:34:000
MARGH_AS	MARGHERITA CB 132/33 T1 (PRIM) OPEN	15 Jul 2024 19:49:34:000
MARGH_AS	MARGHERITA CB 132/33 T2 (PRIM) OPEN	15 Jul 2024 19:49:34:000
MARGH_AS	MARGHERITA CB 132/33 T1 (SEC) OPEN	15 Jul 2024 19:49:34:000
MARGH_AS	MARGHERITA CB 132/33 T2 (SEC) OPEN	15 Jul 2024 19:49:34:000
BOKAK_AS	BOKAKHAT CB 132Kv LINE TO JRTWT OPEN	15 Jul 2024 19:52:11:000
BOKAK_AS	BOKAKHAT CB 132/33 T1 (SEC) OPEN	15 Jul 2024 19:52:11:000
BOKAK_AS	BOKAKHAT CB 132/33 T2 (SEC) OPEN	15 Jul 2024 19:52:11:000
KATHA_NO	KATHALGURI CB 11 KV UNIT (GT5) OPEN	15 Jul 2024 19:52:12:000
KATHA_NO	KATHALGURI CB 11 KV UNIT (GT2) OPEN	15 Jul 2024 19:53:10:000
KATHA_NO	KATHALGURI CB 11 KV UNIT (GT4) OPEN	15 Jul 2024 19:53:10:000
KATHA_NO	KATHALGURI CB 11 KV UNIT (GT1) OPEN	15 Jul 2024 19:53:10:000
NMRUP_AS	NTPS CB 132/66 T2 (PRIM) OPEN	15 Jul 2024 19:53:27:000
NMRUP_AS	NTPS CB 132Kv LINE TO LAKWA OPEN	15 Jul 2024 19:53:27:000
NAZIR_AS	NAZIRA CB 132Kv LOAD RLWAY OPEN	15 Jul 2024 19:53:27:000
JAKSN_AS	JACKSON_SP CB 220/33 T2 (PRIM) INVALID	15 Jul 2024 19:53:27:000
NMRUP_AS	NTPS CB 132/66 T2 (SEC) OPEN	15 Jul 2024 19:53:27:000
JAKSN_AS	JACKSON_SP CB 220/33 T1 (SEC) OPEN	15 Jul 2024 19:53:27:000
JAKSN_AS	JACKSON_SP CB 220/33 T2 (SEC) OPEN	15 Jul 2024 19:53:27:000
KOKRA_AS	KOKRAJHAR CB 132Kv LINE-1 TO BILAS CLOSED	15 Jul 2024 19:53:39:000
BILAS_AS	BILASIPARA CB 132Kv LINE-1 TO KOKRA CLOSED	15 Jul 2024 19:54:09:000
LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ CLOSED	15 Jul 2024 19:54:41:000
BILAS_AS	BILASIPARA CB 132Kv LINE TO GAURI OPEN	15 Jul 2024 19:54:41:000
LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ BETWEEN	15 Jul 2024 19:55:40:000
SIBSA_AS	SIBSAGAR CB 132/33 T1 (SEC) OPEN	15 Jul 2024 19:55:40:000
SIBSA_AS	SIBSAGAR CB 132/33 T2 (SEC) OPEN	15 Jul 2024 19:55:40:000
BILAS_AS	BILASIPARA CB 132Kv LINE-2 TO KOKRA CLOSED	15 Jul 2024 19:56:26:000
DIBRU_AS	DIBRUGARH CB 132/33 T1 (PRIM) OPEN	15 Jul 2024 19:56:39:000
DIBRU_AS	DIBRUGARH CB 132/33 T2 (PRIM) OPEN	15 Jul 2024 19:56:39:000
JORHA_AS	JORHAT (GARMUR) CB 132/33 T1 (SEC) OPEN	15 Jul 2024 19:56:43:000
JORHA_AS	JORHAT (GARMUR) CB 132/33 T3 (SEC) OPEN	15 Jul 2024 19:56:57:000
JORHA_AS	JORHAT (GARMUR) CB 132/33 T2 (SEC) OPEN	15 Jul 2024 19:56:57:000

JORHA_AS	JORHAT (GARMUR) CB 132/33 T1 (PRIM) OPEN	15 Jul 2024 19:57:06:000
JORHA_AS	JORHAT (GARMUR) CB 132/33 T2 (PRIM) OPEN	15 Jul 2024 19:57:24:000
JORHA_AS	JORHAT (GARMUR) CB 132/33 T3 (PRIM) OPEN	15 Jul 2024 19:57:24:000
JORHA_AS	JORHAT (GARMUR) CB 132Kv LINE-1 TO MARIA OPEN	15 Jul 2024 19:57:34:000
LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ CLOSED	15 Jul 2024 19:57:36:000
LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ BETWEEN	15 Jul 2024 19:57:39:000
MORAN_AS	MORAN CB 132/33 T1 (SEC) OPEN	15 Jul 2024 19:57:57:000
JORHA_AS	JORHAT (GARMUR) CB 132Kv LINE TO TEOK_ OPEN	15 Jul 2024 19:58:42:000
SONAR_AS	SONARI CB 132/33 T1 (SEC) OPEN	15 Jul 2024 19:58:54:000
JORHA_AS	JORHAT (GARMUR) CB 132Kv LINE TO JRTWT OPEN	15 Jul 2024 19:59:02:000
RUPAI_AS	RUPAI CB 132Kv LINE TO CHAPA OPEN	15 Jul 2024 19:59:58:000
ROING_PG	ROING CB 132Kv LINE-2 TO CHAPA OPEN	15 Jul 2024 20:00:28:000
MORAN_AS	MORAN CB 132/33 T2 (SEC) OPEN	15 Jul 2024 20:00:37:000
TINSU_AS	TINSUKIA CB 220 KV COUPLER (BC) CLOSED	15 Jul 2024 20:00:37:000
ROING_PG	ROING CB 132Kv LINE-1 TO CHAPA OPEN	15 Jul 2024 20:00:42:000
MOKOK_PG	MOKOKCHUNG CB 220/132 T1 (SEC) CLOSED	15 Jul 2024 20:01:21:000
MARGH_AS	MARGHERITA CB 132Kv LINE TO TINSU OPEN	15 Jul 2024 20:04:08:000
MARGH_AS	MARGHERITA CB 132Kv LINE TO RUPAI OPEN	15 Jul 2024 20:04:08:000
LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ CLOSED	15 Jul 2024 20:05:45:000
LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ BETWEEN	15 Jul 2024 20:06:02:000
TEZU__PG	TEZU CB 132Kv LINE-1 TO NAMSA OPEN	15 Jul 2024 20:07:25:000
ROING_PG	ROING CB 132Kv LINE-1 TO PASIG OPEN	15 Jul 2024 20:08:31:000
ROING_PG	ROING CB 132/33 T1 (PRIM) OPEN	15 Jul 2024 20:08:58:000
ROING_PG	ROING CB 132/33 T2 (PRIM) OPEN	15 Jul 2024 20:09:21:000
ROING_PG	ROING CB 132Kv LINE-1 TO TEZU_ OPEN	15 Jul 2024 20:11:11:000
TEZU__PG	TEZU CB 132Kv LINE-1 TO ROING OPEN	15 Jul 2024 20:11:11:000
MARIA_PG	MARIANI CB Tie CB Misa2-F_T1 OPEN	15 Jul 2024 20:11:28:000
MARIA_PG	MARIANI CB TIE 06 - CB F_06 OPEN	15 Jul 2024 20:11:28:000
MARIA_PG	MARIANI CB 400/220 T1 (SEC) OPEN	15 Jul 2024 20:11:28:000
TEOK__AS	TEOK CB 132/33 T1 (SEC) OPEN	15 Jul 2024 20:11:37:000
TEOK__AS	TEOK CB 132/33 T2 (SEC) OPEN	15 Jul 2024 20:12:04:000
BONGA_AS	BONGAIGAON CB 220Kv LINE-2 TO RNG22 OPEN	15 Jul 2024 20:17:38:000
KATHA_NO	KATHALGURI CB 220Kv LINE-1 TO TINSU INVALID	15 Jul 2024 20:17:54:000
KATHA_NO	KATHALGURI CB 220Kv LINE-1 TO TINSU OPEN	15 Jul 2024 20:17:56:000
TINSU_AS	TINSUKIA CB 220 KV COUPLER (BC) INVALID	15 Jul 2024 20:18:15:000
BONGA_AS	BONGAIGAON CB 220 KV COUPLER (03) OPEN	15 Jul 2024 20:18:26:000
BONGA_AS	BONGAIGAON CB 220Kv LINE-2 TO AGIA_ OPEN	15 Jul 2024 20:18:26:000
BONGA_AS	BONGAIGAON CB 220Kv LINE-2 TO BTPS_ OPEN	15 Jul 2024 20:19:14:000
KATHA_NO	KATHALGURI CB 220Kv LINE TO MARIA CLOSED	15 Jul 2024 20:20:08:000
LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD COLONY OPEN	15 Jul 2024 20:20:17:000
DIBRU_AS	DIBRUGARH CB 132/33 T1 (SEC) OPEN	15 Jul 2024 20:20:17:000
KOKRA_AS	KOKRAJHAR CB 132Kv LINE-2 TO BONGA OPEN	15 Jul 2024 20:21:39:000

BONGA_AS	BONGAIGAON CB 132Kv LINE-2 TO KOKRA OPEN	15 Jul 2024 20:21:39:000
BONGA_AS	BONGAIGAON CB 220Kv LINE-4 TO SALAK OPEN	15 Jul 2024 20:22:06:000
DIMAP_NA	DIMAPUR NAGARJAN CB 66Kv LINE TO POWRH OPEN	15 Jul 2024 20:22:06:000
BONGA_AS	BONGAIGAON CB 220 KV COUPLER (03) INVALID	15 Jul 2024 20:22:27:000
BILAS_AS	BILASIPARA CB 132/33 T2 (PRIM) OPEN	15 Jul 2024 20:23:12:000
BILAS_AS	BILASIPARA CB 132/33 T1 (PRIM) OPEN	15 Jul 2024 20:23:12:000
BILAS_AS	BILASIPARA CB 132Kv LINE-1 TO KOKRA OPEN	15 Jul 2024 20:23:37:000
BONGA_AS	BONGAIGAON CB 220 KV COUPLER (03) CLOSED	15 Jul 2024 20:23:37:000
KOKRA_AS	KOKRAJHAR CB 132/33 T1 (PRIM) OPEN	15 Jul 2024 20:24:21:000
KOKRA_AS	KOKRAJHAR CB 132/33 T1 (SEC) OPEN	15 Jul 2024 20:24:21:000
KOKRA_AS	KOKRAJHAR CB 132/33 T2 (SEC) OPEN	15 Jul 2024 20:24:21:000
KOKRA_AS	KOKRAJHAR CB 132/33 T2 (PRIM) INVALID	15 Jul 2024 20:24:29:000
KOKRA_AS	KOKRAJHAR CB 132Kv LINE-1 TO BILAS OPEN	15 Jul 2024 20:24:29:000
LANGP_AS	KARBI LONGPI CB 11 KV UNIT (G2) CLOSED	15 Jul 2024 20:24:29:000
SAMAG_AS	SAMAGURI CB 220Kv LINE TO MARIA CLOSED	15 Jul 2024 20:25:15:000
SIBSA_AS	SIBSAGAR CB 132Kv LINE TO NAZIR OPEN	15 Jul 2024 20:25:15:000
KATHA_NO	KATHALGURI CB 220Kv LINE-2 TO TINSU OPEN	15 Jul 2024 20:25:21:000
KATHA_NO	KATHALGURI CB 220Kv LINE-1 TO DEOMA OPEN	15 Jul 2024 20:25:21:000
KATHA_NO	KATHALGURI CB 11 KV UNIT (ST1) OPEN	15 Jul 2024 20:25:36:000
KATHA_NO	KATHALGURI CB 11 KV UNIT (ST2) OPEN	15 Jul 2024 20:25:36:000
KATHA_NO	KATHALGURI CB 11 KV UNIT (ST3) OPEN	15 Jul 2024 20:25:36:000
KATHA_NO	KATHALGURI CB 11 KV UNIT (GT6) OPEN	15 Jul 2024 20:25:36:000
BILAS_AS	BILASIPARA CB 132Kv LINE-2 TO KOKRA OPEN	15 Jul 2024 20:25:46:000
NAZIR_AS	NAZIRA CB 132/33 T1 (SEC) OPEN	15 Jul 2024 20:25:46:000
NAZIR_AS	NAZIRA CB 132/33 T2 (SEC) OPEN	15 Jul 2024 20:25:46:000
MORAN_AS	MORAN CB 132/33 T1 (PRIM) OPEN	15 Jul 2024 20:26:30:000
LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ INVALID	15 Jul 2024 20:27:09:000
MORAN_AS	MORAN CB 132 KV COUPLER (01) OPEN	15 Jul 2024 20:29:38:000
NAZIR_AS	NAZIRA CB 132/33 T1 (PRIM) OPEN	15 Jul 2024 20:39:28:000
NRPP__AS	NAMRUP PS-1 CB 11 KV UNIT (GT2) OPEN	15 Jul 2024 20:39:28:000
NRPP__AS	NAMRUP PS-1 CB 220Kv LINE TO TINSU OPEN	15 Jul 2024 20:39:28:000
NRPP__AS	NAMRUP PS-1 CB 220Kv LINE TO NMRUP OPEN	15 Jul 2024 20:39:28:000
NAZIR_AS	NAZIRA CB 132/33 T2 (PRIM) OPEN	15 Jul 2024 20:39:37:000
LAKWA_AS	LAKWA (LTPS) CB 132/33 T2 (PRIM) OPEN	15 Jul 2024 20:40:20:000
LAKWA_AS	LAKWA (LTPS) CB 132/33 T2 (SEC) OPEN	15 Jul 2024 20:40:20:000
LAKWA_AS	LAKWA (LTPS) CB 132/33 T1 (PRIM) OPEN	15 Jul 2024 20:40:20:000
LAKWA_AS	LAKWA (LTPS) CB 132/33 T1 (SEC) OPEN	15 Jul 2024 20:40:20:000
SISHU_AS	SISHUGRAM CB 33 KV CP 1 1 CB OPEN	15 Jul 2024 20:40:37:000
BIHIA_AS	BEHIATING CB 132/33 T1 (PRIM) OPEN	15 Jul 2024 20:40:38:000
BIHIA_AS	BEHIATING CB 132/33 T1 (SEC) OPEN	15 Jul 2024 20:40:38:000
BIHIA_AS	BEHIATING CB 132/33 T2 (SEC) OPEN	15 Jul 2024 20:40:38:000
BIHIA_AS	BEHIATING CB 132/33 T2 (PRIM) OPEN	15 Jul 2024 20:40:38:000

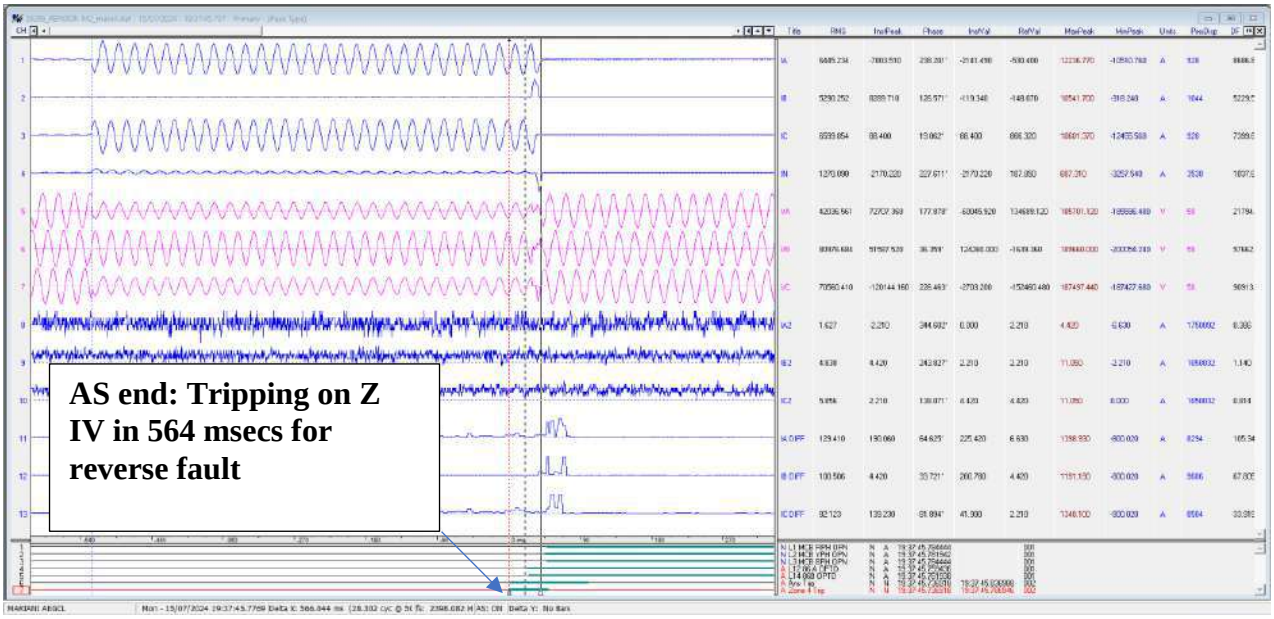
BILAS_AS	BILASIPARA CB 132Kv LINE TO GAURI CLOSED	15 Jul 2024 20:41:15:000
BILAS_AS	BILASIPARA CB 132/33 T1 (PRIM) CLOSED	15 Jul 2024 20:41:36:000
BILAS_AS	BILASIPARA CB 132/33 T2 (PRIM) CLOSED	15 Jul 2024 20:42:06:000
BTPS__NT	BGTPP CB 400/220/33 T2 (PRIM) CLOSED	15 Jul 2024 20:42:10:000
TEOK__AS	TEOK CB 132/33 T1 (PRIM) OPEN	15 Jul 2024 20:42:44:000
TEOK__AS	TEOK CB 132/33 T2 (PRIM) OPEN	15 Jul 2024 20:43:14:000
BTPS__NT	BGTPP CB 400/220/33 T2 (SEC) CLOSED	15 Jul 2024 20:43:59:000
BONGA_AS	BONGAIGAON CB 220Kv LINE-2 TO BTPS_ CLOSED	15 Jul 2024 20:45:39:000
MARIA_AS	MARIANI CB 220Kv LINE TO MARIA CLOSED	15 Jul 2024 20:48:36:000
SONAR_AS	SONARI CB 132/33 T1 (SEC) CLOSED	15 Jul 2024 20:49:32:000
SALAK_PG	SALAKATI CB 220Kv LINE-4 TO BONGA CLOSED	15 Jul 2024 20:53:49:000
BONGA_AS	BONGAIGAON CB 220Kv LINE-4 TO SALAK CLOSED	15 Jul 2024 20:54:29:000
BONGA_AS	BONGAIGAON CB 220Kv LINE-2 TO RNG22 CLOSED	15 Jul 2024 20:55:40:000
KATHA_NO	KATHALGURI CB 220Kv LINE-1 TO DEOMA CLOSED	15 Jul 2024 20:57:48:000
TINSU_AS	TINSUKIA CB 220/132 T1 (PRIM) OPEN	15 Jul 2024 20:59:02:000
TINSU_AS	TINSUKIA CB 220/132 T1 (SEC) OPEN	15 Jul 2024 20:59:02:000
TINSU_AS	TINSUKIA CB 220/132 T2 (SEC) OPEN	15 Jul 2024 20:59:02:000
JAKSN_AS	JACKSON_SP CB 220/33 T1 (SEC) CLOSED	15 Jul 2024 20:59:52:000
JAKSN_AS	JACKSON_SP CB 220/33 T2 (PRIM) BETWEEN	15 Jul 2024 20:59:52:000
TINSU_AS	TINSUKIA CB 220/132 T1 (PRIM) CLOSED	15 Jul 2024 21:00:39:000
KATHA_NO	KATHALGURI CB 220Kv LINE-2 TO TINSU CLOSED	15 Jul 2024 21:00:51:000
BONGA_AS	BONGAIGAON CB 132Kv LINE-2 TO KOKRA CLOSED	15 Jul 2024 21:00:58:000

***** Tripping of 132 kV Mariani(AS)- Golaghat & 132 kV Along-Pasighat not recorded in the SoE.**

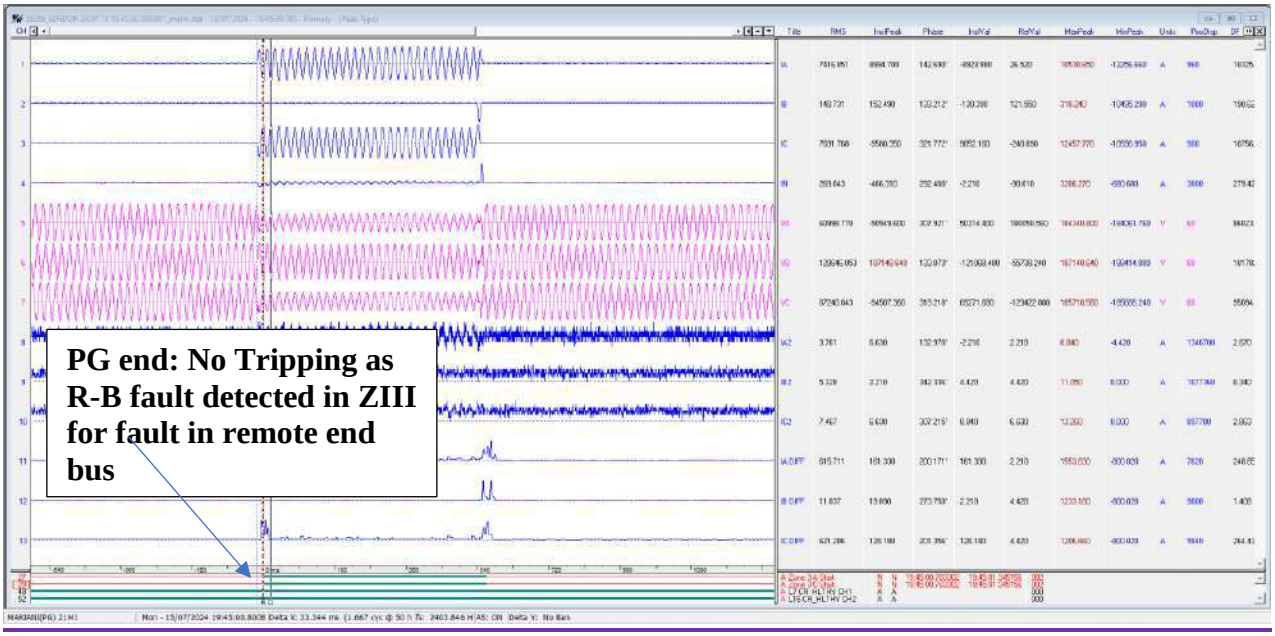
Annexure 3: Disturbance recorder snips showing faults and digital signals

3.1. DR Snapshot of 220 kV Mariani(AS)-Mariani(PG) Line.

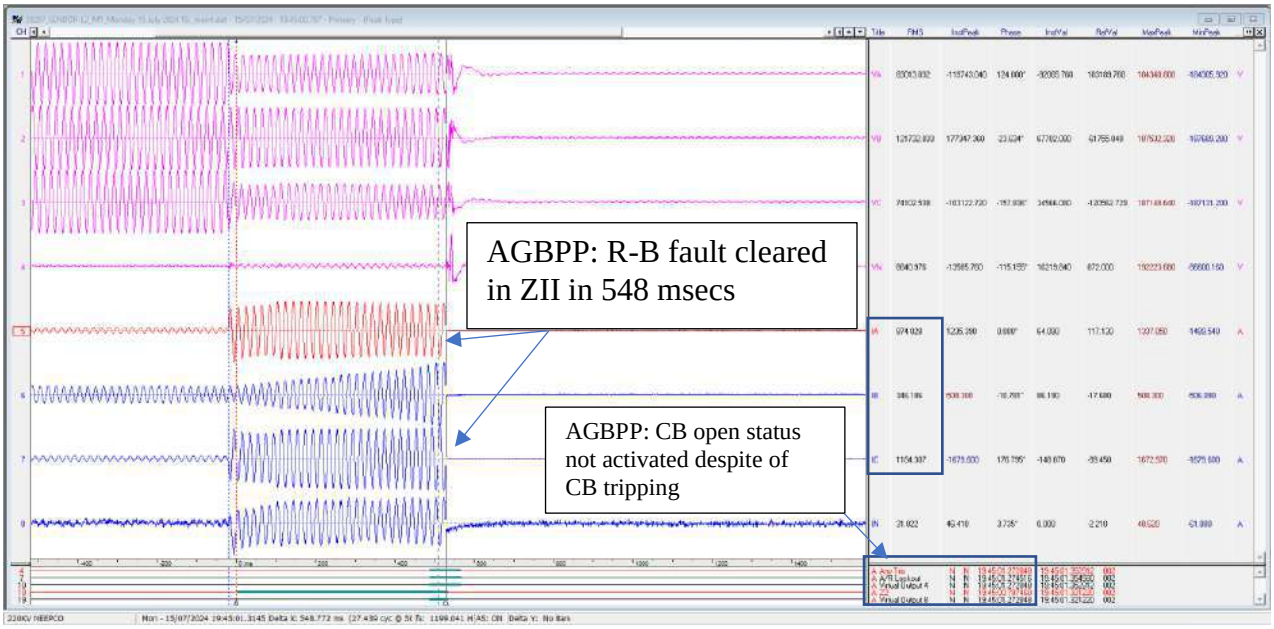
Mariani(AS) end



Mariani(PG) end

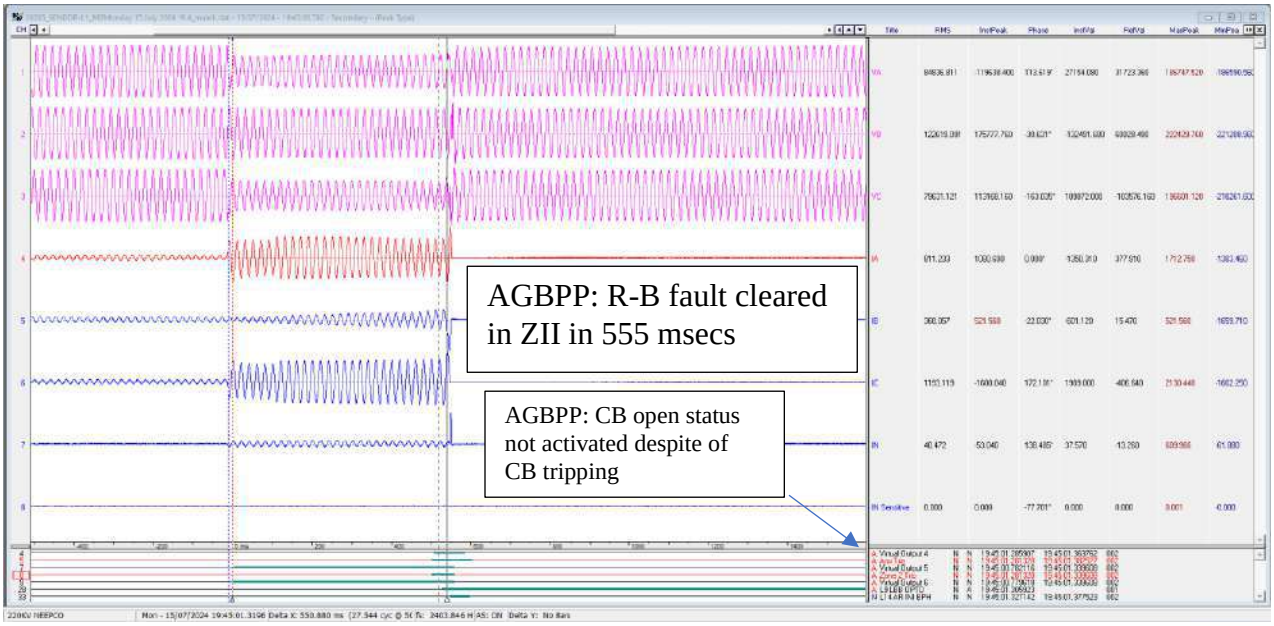


3.2. DR Snapshot of AGBPP end of 220 kV AGBPP- Mariani(AS)



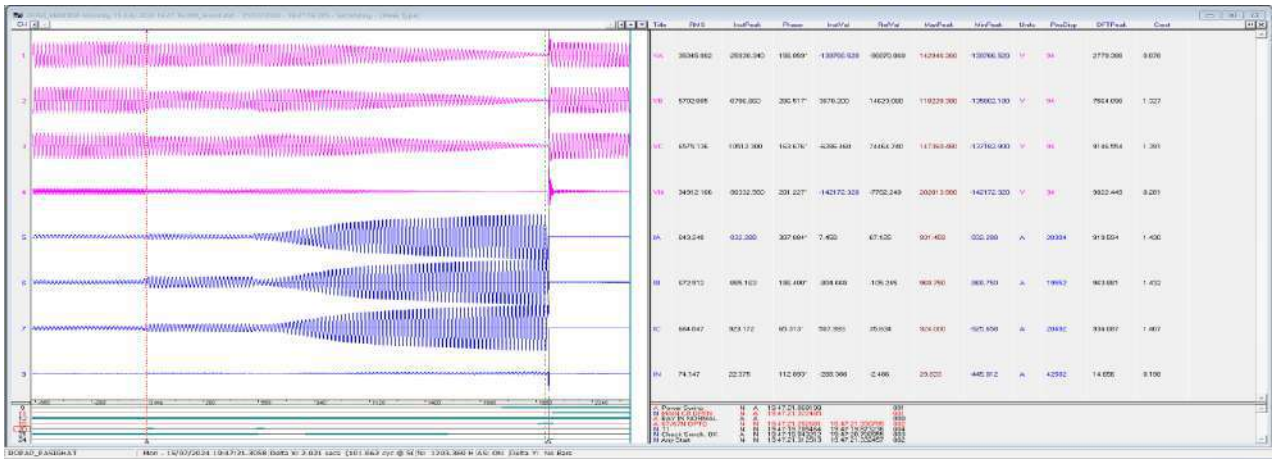
Monday 15 July 2024 19:45:01.960	Fault Recorded
Description	MARIANI LINE
Plant reference	220KV NEEPCO
Model number	P44231AB6M0550K
Address	001 Column:01 Row:00
Event type	Fault record
Event Value	0
Active Group	1
Faulted Phase	1110101
Start Elements	00000000001000000000000000001
Tripped Elts	00000000000000100000000000000
Time Stamp Monday 15 July 2024	19:45:01.272
Fault Alarms	0000010000100
System Frequency	49.95 Hz
Fault Duration	533.9ms
Relay Trip Time	80.08ms
Fault Locatio XY	154.7km
IA	875.2 A
IB	338.6 A
IC	1178 A
VAN	82.94kV
VBN	121.4kV
VCN	74.14kV
Fault Resista XY 3.998	Ohm
Fault in Zone Zone	2

3.3. DR Snapshot of AGBPP end of 220 kV AGBPP- Mariani(PG)

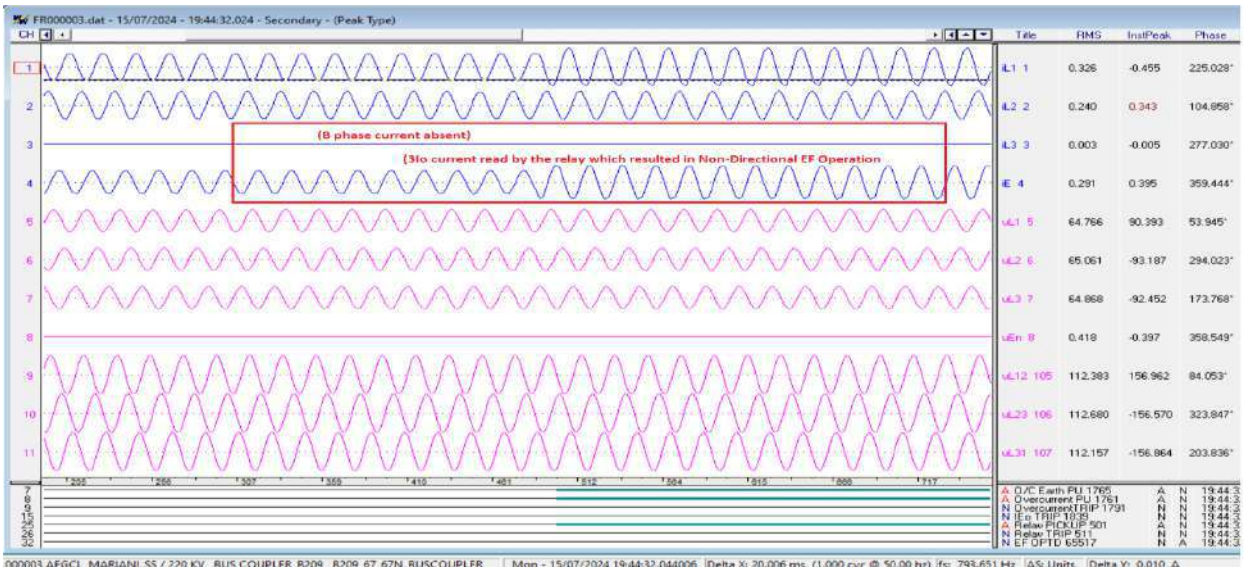


Monday 15 July 2024 19:45:01.903	Fault Recorded
Description	MICA LINE
Plant reference	220KV NEEPCO
Model number	P44231AB6M0550K
Address	001 Column:01 Row:00
Event type	Fault record
Event Value	0
Active Group	1
Faulted Phase	1110101
Start Elements	0100000001000000000001000001
Tripped Elts	0000000000000001000000000000C
Time Stamp Monday 15 July 2024	19:45:01.274
Fault Alarms	00000100001000
System Frequency	49.95 Hz
Fault Duration	567.2ms
Relay Trip Time	80.08ms
Fault Locatio XY	166.9km
IA	762.0 A
IB	345.0 A
IC	1125 A
VAN	82.61kV
VBN	121.7kV
VCN	74.31kV
Fault Resista XY 6.786	Ohm
Fault in Zone Zone	2

3.4. DR Snapshot of Pasighat end for 132 kV Along-Pasighat Line



3.5. DR Snapshot of Bus coupler at Mariani (Assam)



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
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Detailed Report of Grid Disturbance in Doyang generating station of NEEPCO Power System 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))

Date (दिनांक):25-07-2024

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

   Doyang generating station of NEEPCO power system is connected with the rest of NER Power system via 132 kV Dimapur-Doyang D/C lines, 132 kV Doyang-Mokokchung line and 132 kV Doyang-Sanis line. Prior to the event, 132 kV Dimapur-Doyang I line was under planned shutdown since 09:22 Hrs of 16-07-2024.

   At 10:08 Hrs of 16-07-2024, 132 kV Dimapur-Doyang II, 132 kV Doyang-Mokokchung and 132 kV Doyang-Sanis lines tripped. Sunsequently, all three units of Doyang tripped leading to blackout in Doyang generating station of NEEPCO power system.

   Power was extended to Doyang generating station by charging 132 kV Doyang-Mokokchung line at 11:21 Hrs of 16-07-2024.

2. **Time and Date of the Event (घटना का स मय और दिनांक):** 10:08 Hrs of 16-07-2024
3. **Event Category (ग्रिड घटना का प्रकार):** GD-I
4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Doyang generating station of NEEPCO
5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50	2408	2546
Post Event (घटना के बाद)	50	2335	2527

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 Doyang-Dimapur 1 line went under planned shutdown at 09:22 Hrs of 16.07.2024
Weather Condition (मौसम स्थिति)	Normal

6. **Load and Generation loss (लोड और जेनरेशन हानि):** There was generation loss of 73 MW. No load loss

7. **Duration of interruption (रुकावट की अवधि): 1 Hr 13 min**

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

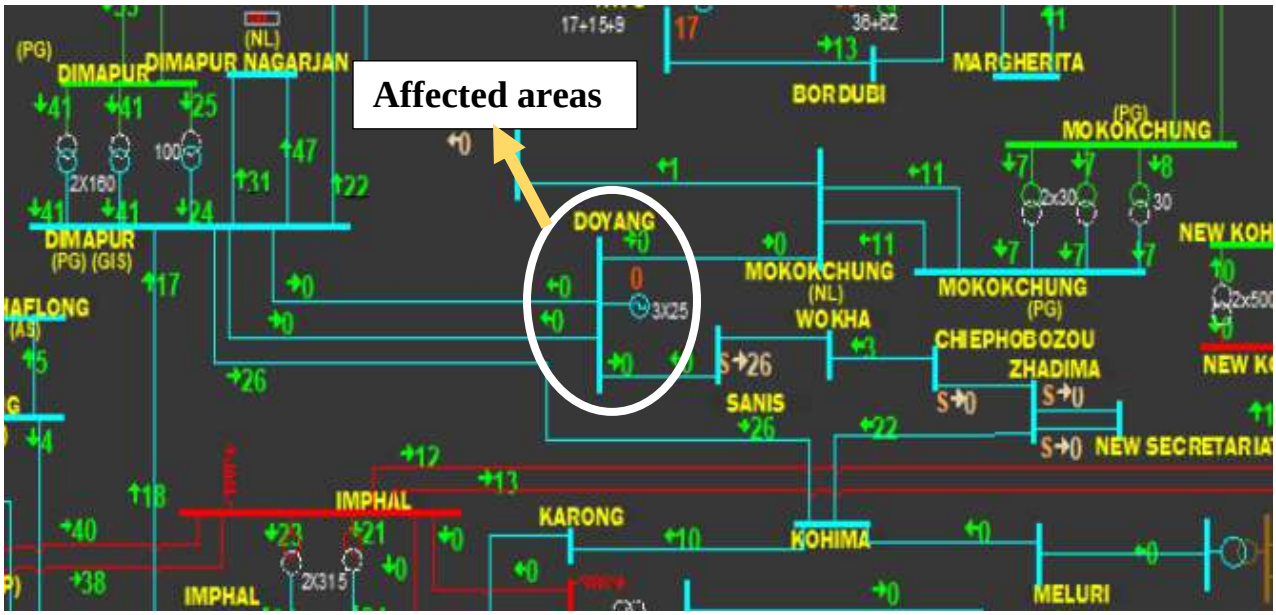


Figure 1: Network across the affected area

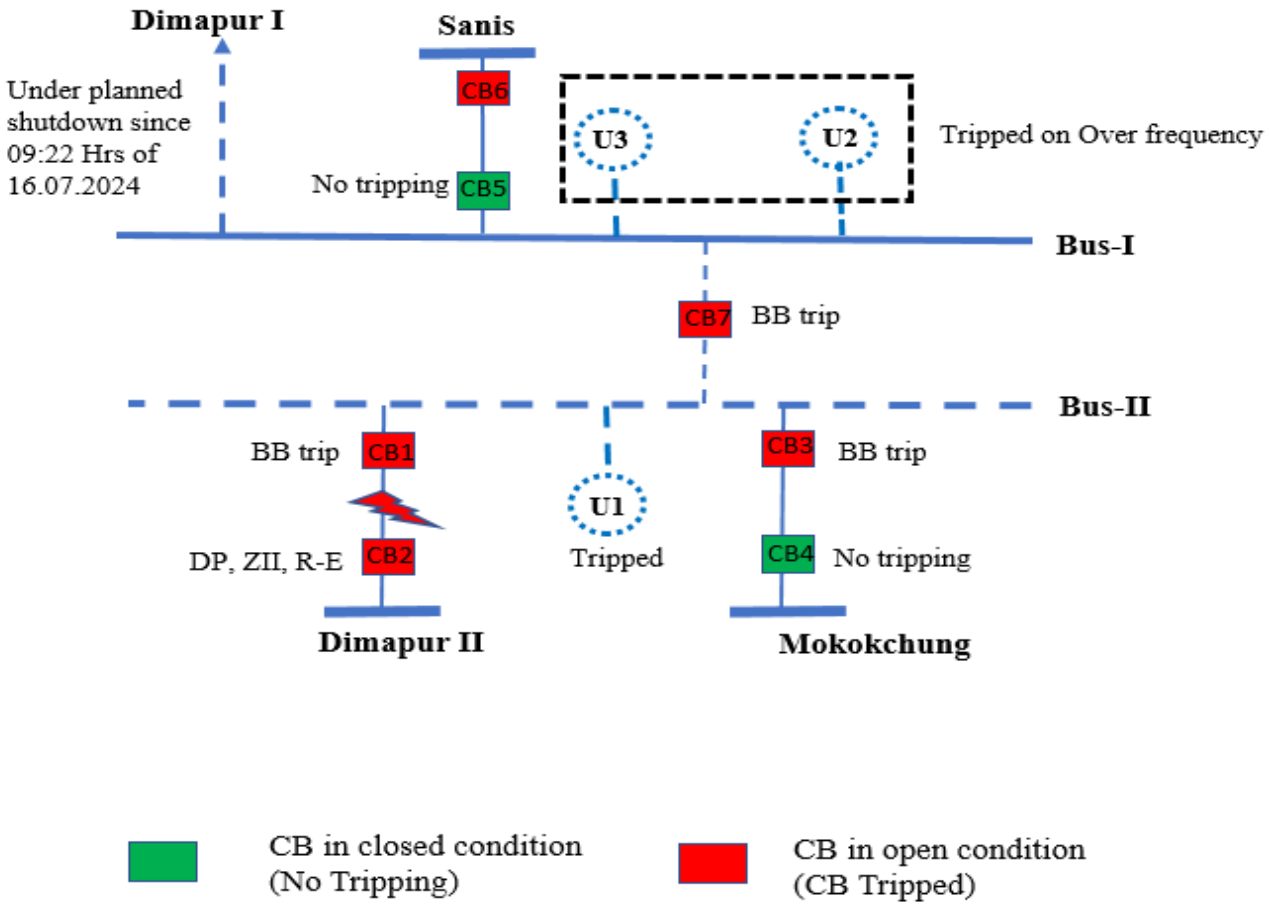
9. **Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NIL**

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 Dimapur-Doyang II line	10:08	11:34	DP, ZII, R-E	BB trip
2	132 kV Doyang-Mokokcung Line	10:08	11:21	BB trip	No tripping
3	132 kV Doyang-Sanis Line	10:08	11:21	No tripping (ZIV start)	Not furnished(no DR/EL)
4	Doyang Unit-1	10:08	11:49	Loss of evacuation path	

5	Doyang Unt-2	10:08	11:33	Tripped on over frequency
6	Doyang Unit-3	10:08	11:39	Tripped on over frequency
7	132 kV Bus Coupler at Doyang	10:08	10:38	BB trip at Doyang

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



As per DR analysis, R-E fault (Ir-1.1 kA, In-1 kA) in 132 kV Dimapur-Doyang II line initiated at 10:08:36.655 Hrs and cleared within 233 msec on operation of DP, ZII (Carrier aided trip) from Dimapur end. At Doyang end, R-E fault detected and Bus bar trip signal issued instantly. Y & B-phase pole of CB tripped within 52 msec. However, fault current was persisting in R-phase pole and disappeared at 10:08:36.820 Hrs on operation of ZI.

As per DR of 132 kV Doyang-Mokokchung line, 132 kV Doyang-Mokokchung line tripped on operation of bus bar protection from Doyang end. There was no tripping from Mokokchung end.

Bus coupler at Doyang tripped on Bus bar trip leading to blackout of 132 kV Doyang Bus-II.

At the same time, 132 kV Doyang-Sanis line also tripped. There was no tripping from Doyang end (ZIV pickup). Fault current disappears within 78 msec due to tripping from Sanis end (no DR submitted)

Doyang Unit-1 tripped at 10:08:36.744 Hrs and Unit-2 & 3 tripped on Over frequency.

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

- Operation of Bus bar protection at Doyang for fault in 132 kV Dimapur-Doyang II line is unwanted.
- Non-opening of R-ph CB pole at Doyang for 132 kV Dimapur-Doyang II line after issuing of BB trip.
- Delayed ZI start after 169 msec of fault initiation at Doyang end for 132 kV Dimapur-Doyang II Line. Distance protection setting needs to be reviewed.
- Delayed Carrier aided tripping of 132 kV Dimapur-Doyang II line due to late receipt of carrier signal at Dimapur end.
- Non tripping of Doyang Unit-1 on BB trip needs to be checked by NEEPCO. From DR data, it is not clear which protection operated.
- DR time duration is insufficient at Doyang for 132 kV Doyang-Sanis line. It has to be increased to 3 sec with pre fault of 500 msec and post fault of 2.5 sec.
- SOE not recorded for tripping of 132 kV Doyang-Sanis line. The same needs attention from DoP Nagaland/SLDC Nagaland team.

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

- Power was extended to Doyang generating station by charging 132 kV Doyang-Mokokchung line at 11:21 Hrs of 16-07-2024.

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)	**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**		-

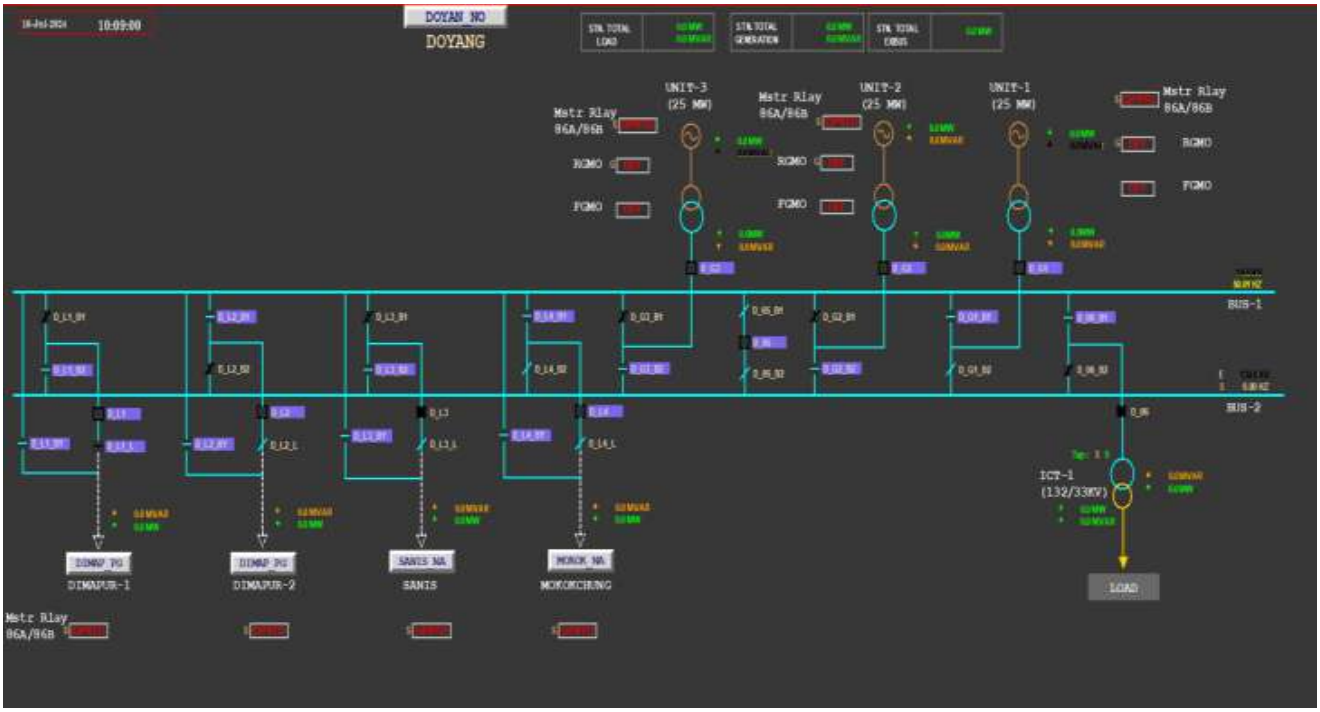
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Healthiness of protection system needs to be ensured at all times.

Annexure 1: Sequence of Events as per SCADA

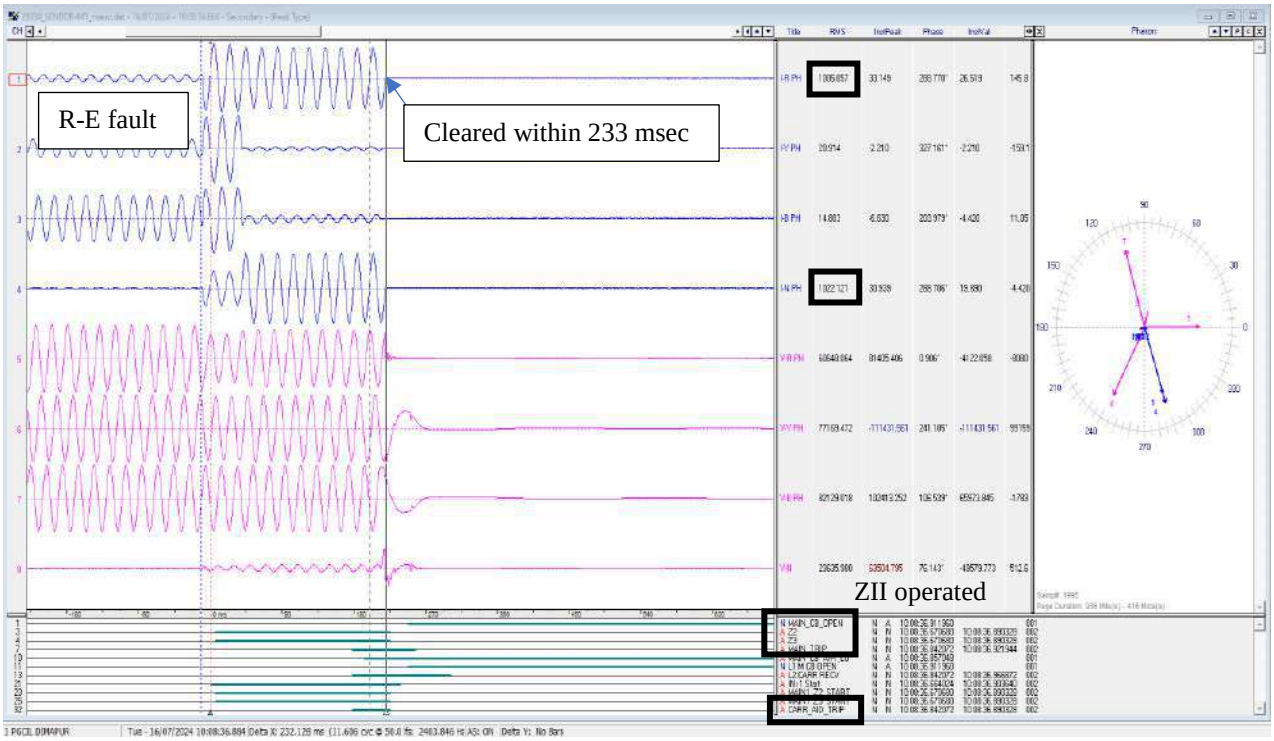
AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
AEGCL	1C	MORAN_AS	MORAN CB 132/33 T2 (SEC) OPEN	16 Jul 2024 10:01:36:000	16 Jul 2024 10:01:25:000	7.41E+08
AEGCL	1C	LAKWA_AS	LAKWA (LTPS) CB 11 KV UNIT G5 CLOSED	16 Jul 2024 10:04:23:000	16 Jul 2024 10:04:12:000	32000000
NAGALD	1C	DOYAN_NO	DOYANG CB 132 KV COUPLER (05) OPEN	16 Jul 2024 10:08:36:000	16 Jul 2024 10:08:35:000	8.66E+08
NAGALD	1C	DOYAN_NO	DOYANG CB 11 KV UNIT (H01) OPEN	16 Jul 2024 10:08:36:000	16 Jul 2024 10:08:35:000	9.02E+08
NAGALD	1C	DOYAN_NO	DOYANG CB 132Kv LINE-2 TO DIMAP OPEN	16 Jul 2024 10:08:36:000	16 Jul 2024 10:08:35:000	8.64E+08
NAGALD	1C	DOYAN_NO	DOYANG CB 132Kv LINE-1 TO MOKOK OPEN	16 Jul 2024 10:08:36:000	16 Jul 2024 10:08:35:000	8.65E+08
NAGALD	1C	DIMAP_PG	DIMAPUR CB 132Kv LINE-2 TO DOYAN OPEN	16 Jul 2024 10:08:32:000	16 Jul 2024 10:08:36:000	9.06E+08
NAGALD	1C	KIPHI_NA	KIPHIRE CB 66Kv LINE TO TUENS OPEN	16 Jul 2024 10:08:36:000	16 Jul 2024 10:08:36:000	5.69E+08
NAGALD	1C	DOYAN_NO	DOYANG CB 11 KV UNIT (H03) OPEN	16 Jul 2024 10:08:36:000	16 Jul 2024 10:08:37:000	4.95E+08
NAGALD	1C	DOYAN_NO	DOYANG CB 11 KV UNIT (H02) OPEN	16 Jul 2024 10:08:43:000	16 Jul 2024 10:08:38:000	73000000
AEGCL	1C	GOSAI_AS	GOSSAIGAON CB 132/33 T1 (PRIM) CLOSED	16 Jul 2024 10:13:33:000	16 Jul 2024 10:13:03:000	6.52E+08
MEECL	1C	UMIA4_ME	UMIAM IV CB 132Kv LINE-2 TO UMTRU OPEN	16 Jul 2024 10:37:11:000	16 Jul 2024 10:36:20:000	8.98E+08
MEECL	1C	UMTRU_ME	UMTRU CB 132Kv LINE-2 TO UMIA4 OPEN	16 Jul 2024 10:36:38:000	16 Jul 2024 10:36:30:000	1.2E+08
NAGALD	1C	DOYAN_NO	DOYANG CB 132 KV COUPLER (05) CLOSED	16 Jul 2024 10:38:49:000	16 Jul 2024 10:38:43:000	9.54E+08
AEGCL	1C	SONAB_AS	SONABIL CB 132Kv LINE-2 TO TEZPR CLOSED	16 Jul 2024 11:00:21:000	16 Jul 2024 10:39:59:000	8.36E+08
MEECL	1C	NANGA_ME	NANGALBIBRA CB 33Kv LOAD RONGJ CLOSED	16 Jul 2024 11:26:16:000	16 Jul 2024 11:19:30:000	4.19E+08
NAGALD	1C	DOYAN_NO	DOYANG CB 132Kv LINE-1 TO MOKOK CLOSED	16 Jul 2024 11:21:49:000	16 Jul 2024 11:21:46:000	4.96E+08
NAGALD	1C	DIMAP_NA	DIMAPUR NAGARJAN CB 66Kv LINE-1 TO SINJN OPEN	16 Jul 2024 11:23:11:000	16 Jul 2024 11:23:01:000	3.1E+08
AEGCL	1C	NAZIR_AS	NAZIRA CB 132/33 T1 (SEC) CLOSED	16 Jul 2024 11:28:40:000	16 Jul 2024 11:28:25:000	2.69E+08
MEECL	1C	UMTRU_ME	UMTRU CB 132Kv LINE-1 TO EPIP2 OPEN	16 Jul 2024 11:33:17:000	16 Jul 2024 11:33:08:000	6.77E+08
NAGALD	1C	DOYAN_NO	DOYANG CB 11 KV UNIT (H02) CLOSED	16 Jul 2024 11:33:18:000	16 Jul 2024 11:33:10:000	8.05E+08
NAGALD	1C	DIMAP_PG	DIMAPUR CB 132Kv LINE-2 TO DOYAN CLOSED	16 Jul 2024 11:33:54:000	16 Jul 2024 11:33:52:000	1.96E+08
NAGALD	1C	DOYAN_NO	DOYANG CB 132Kv LINE-2 TO DIMAP CLOSED	16 Jul 2024 11:34:08:000	16 Jul 2024 11:34:02:000	2.71E+08
AEGCL	1C	MORAN_AS	MORAN CB 132 KV COUPLER (01) CLOSED	16 Jul 2024 11:36:48:000	16 Jul 2024 11:36:33:000	3.3E+08
AEGCL	1C	MORAN_AS	MORAN CB 132/33 T2 (SEC) CLOSED	16 Jul 2024 11:38:01:000	16 Jul 2024 11:37:50:000	8E+08
NAGALD	1C	DOYAN_NO	DOYANG CB 11 KV UNIT (H03) CLOSED	16 Jul 2024 11:39:07:000	16 Jul 2024 11:39:02:000	8.27E+08
MSPCL	1C	IMPHA_MA	IMPHAL(YUREMBAM) CB 132Kv LINE-1 TO KARON OP	16 Jul 2024 11:40:30:000	16 Jul 2024 11:40:21:000	8.5E+08
MEECL	1C	EPIP2_ME	EPIP-2 (NORBONG) CB 132Kv LINE-2 TO EPIP1 BETWE	16 Jul 2024 11:49:15:000	16 Jul 2024 11:48:54:000	1E+08
NAGALD	1C	DOYAN_NO	DOYANG CB 11 KV UNIT (H01) CLOSED	16 Jul 2024 11:49:36:000	16 Jul 2024 11:49:29:000	8.4E+08
MEECL	1C	EPIP2_ME	EPIP-2 (NORBONG) CB 132Kv LINE-2 TO EPIP1 CLOSE	16 Jul 2024 11:49:49:000	16 Jul 2024 11:49:38:000	5.54E+08
AEGCL	1C	BILAS_AS	BILASIPARA CB 132Kv LINE-1 TO KOKRA OPEN	16 Jul 2024 12:24:45:000	16 Jul 2024 11:57:38:000	8.37E+08

Annexure 2: SLD of affected S/S

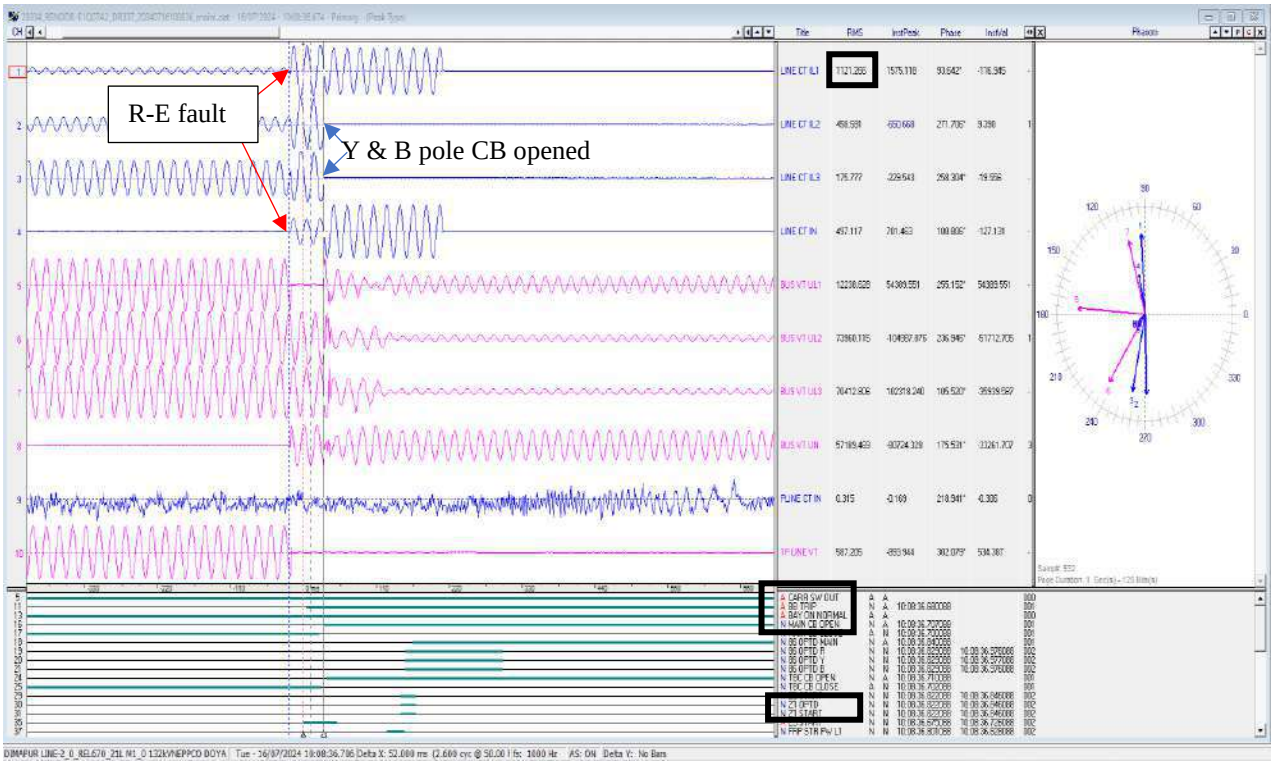


Annexure 3: DR snapshot

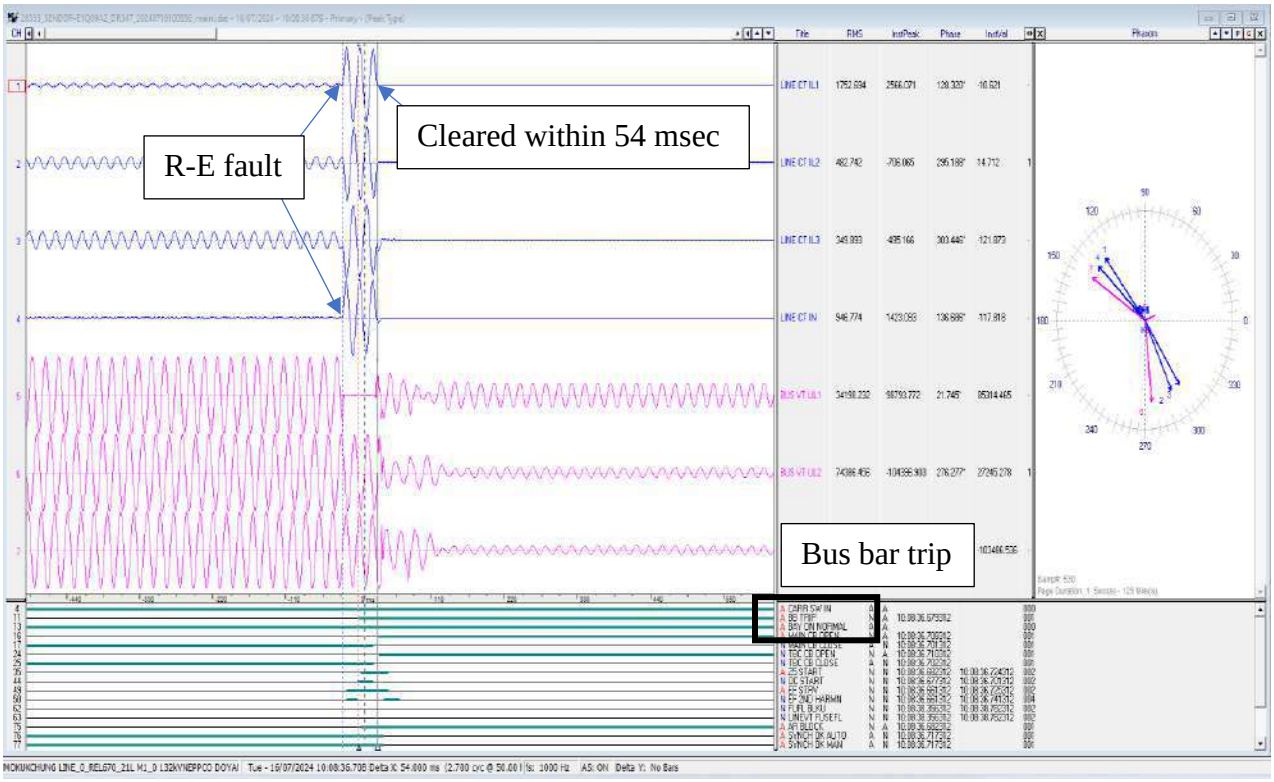
3.1 DR snapshot of Dimapur end for 132 kV Dimapur-Doyang II Line



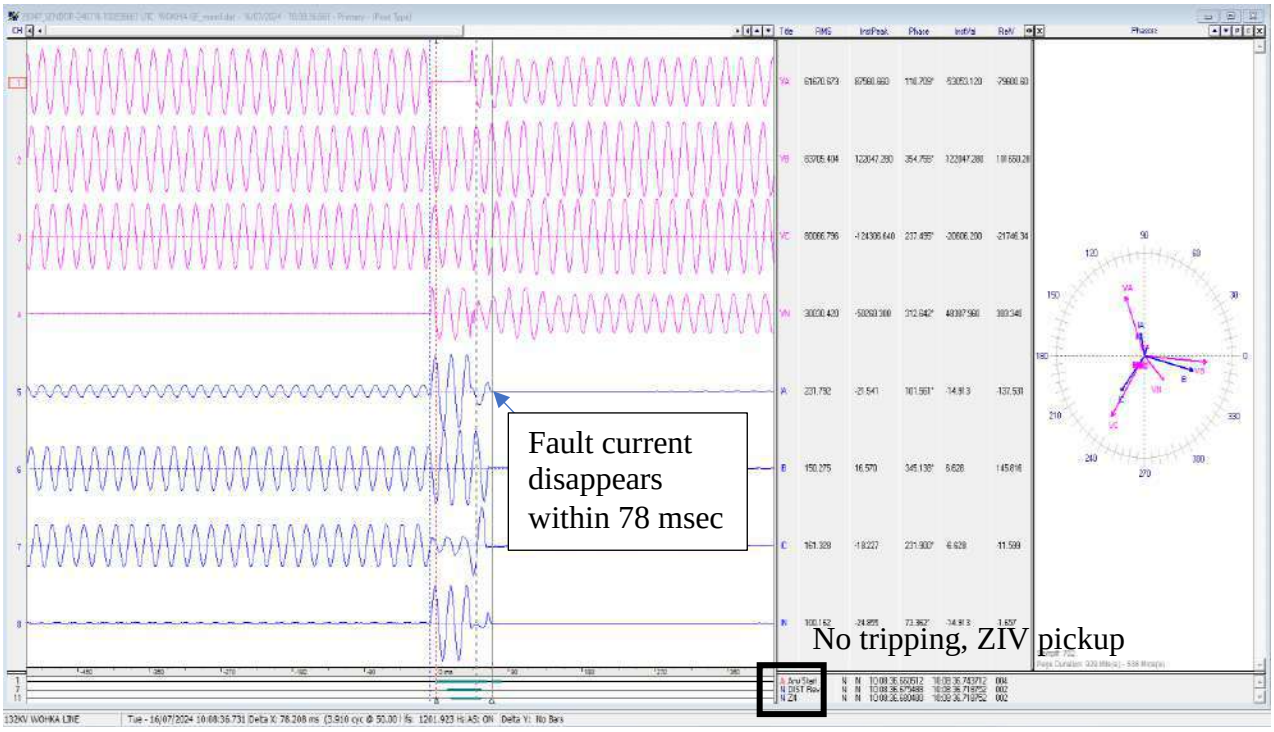
3.2 DR snapshot of Doyang end for 132 kV Dimapur-Doyang II Line



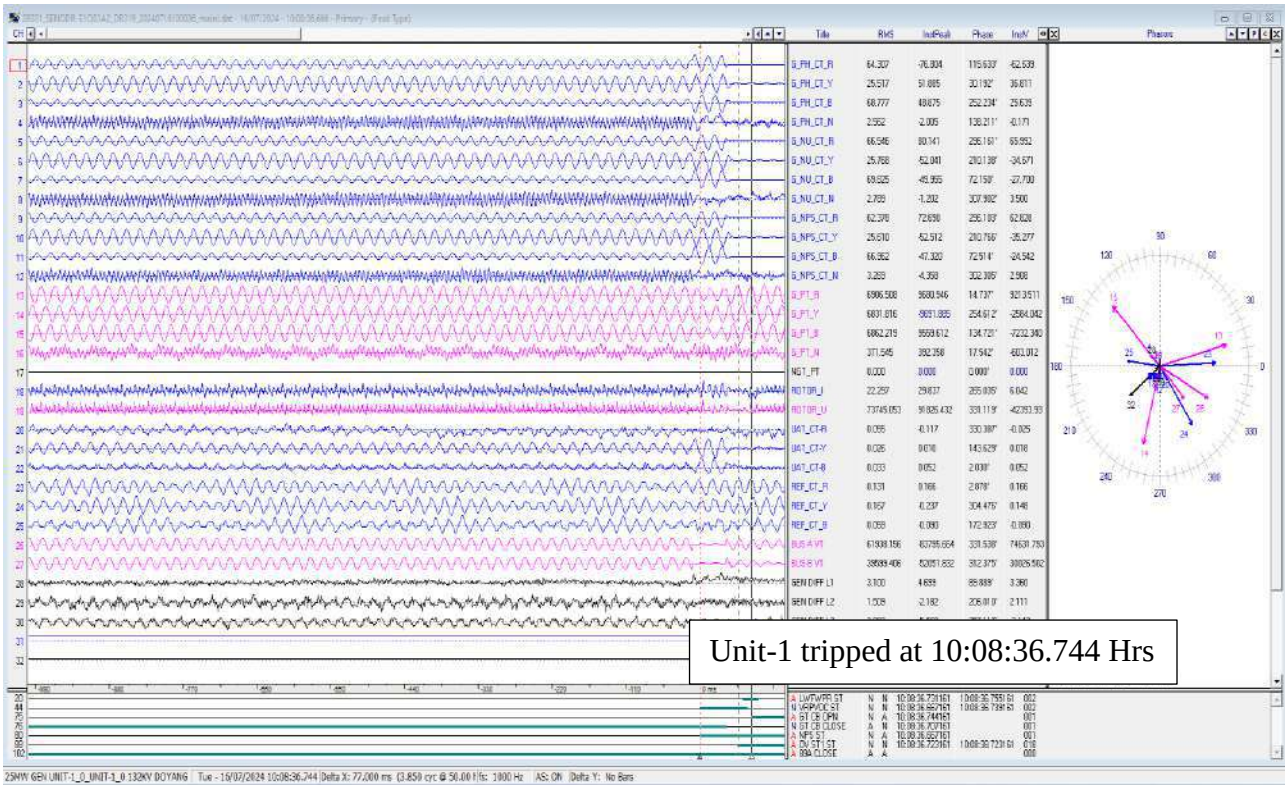
3.3 DR snapshot of Doyang end for 132 kV Doyang-Mokokchung Line



3.4 DR snapshot of Doyang end for 132 kV Doyang-Sanis Line



3.5 DR snapshot of Doyang Unit-1



ग्रिड-इंडिया GRID-INDIA
ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
GRID CONTROLLER OF INDIA LIMITED
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कार्यालय : लोवर, लापालांग, शिलांग -793006
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CIN : U40105DL2009GOI188682, Website : www.nerldc.in, E-mail : nerldc@grid-india.in, Tel.: 0364-2537470/427, Fax: 03642537486

Detailed Report of Grid Disturbance in Kokrajhar, Bilasipara and Gauripur areas of Assam Power System 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))

Date (दिनांक):25-07-2024

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

   Kokrajhar, Bilasipara and Gauripur areas of Assam Power System were connected to NER Power system via 132 kV BTPS – Kokrajhar D/C lines. Prior to the event, 132 kV Gauripur – Gosaigaon line was kept opened for load segregation purpose. Also, 132 kV BTPS-Kokrajhar I Line was under outage since 18:10 hrs of 15.07.2024.

   At 12:23 Hrs of 16-07-2024, while taking charging attempt of 132 kV 132 kV BTPS – Kokrajhar I line, 132 kV BTPS-Kokrajhar D/C lines tripped. Due to tripping of this line, Kokrajhar, Bilasipara and Gauripur areas of Assam Power System were isolated from NER Grid and collapsed due to no source available in these areas.

   Power was extended to Kokrajhar, Bilasipara and Gauripur areas of Assam Power System by charging 132 kV BTPS-Kokrajhar II line at 12:28 Hrs of 16-07-2024.

2. **Time and Date of the Event (घटना का स मय और दिनांक):** 12:23 Hrs of 16-07-2024
3. **Event Category (ग्रिड घटना का प्रकार):** GD-I
4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Kokrajhar, Bilasipara and Gauripur areas of Assam
5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	49.92	2300	2664
Post Event (घटना के बाद)	49.92	2305	2573

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 Gauripur – Gossaigaon Line is kept open (conductor constraint). Also, 132 kV BTPS-Kokrajhar I line is under outage since 18:10 Hrs of 15.07.2024
Weather Condition (मौसम स्थिति)	Light rain

6. **Load and Generation loss (**लोड और जेनरेशन हानि**):** There was load loss of 64 MW. No generation loss

7. **Duration of interruption (रुकावट की अवधि): 5 min**

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

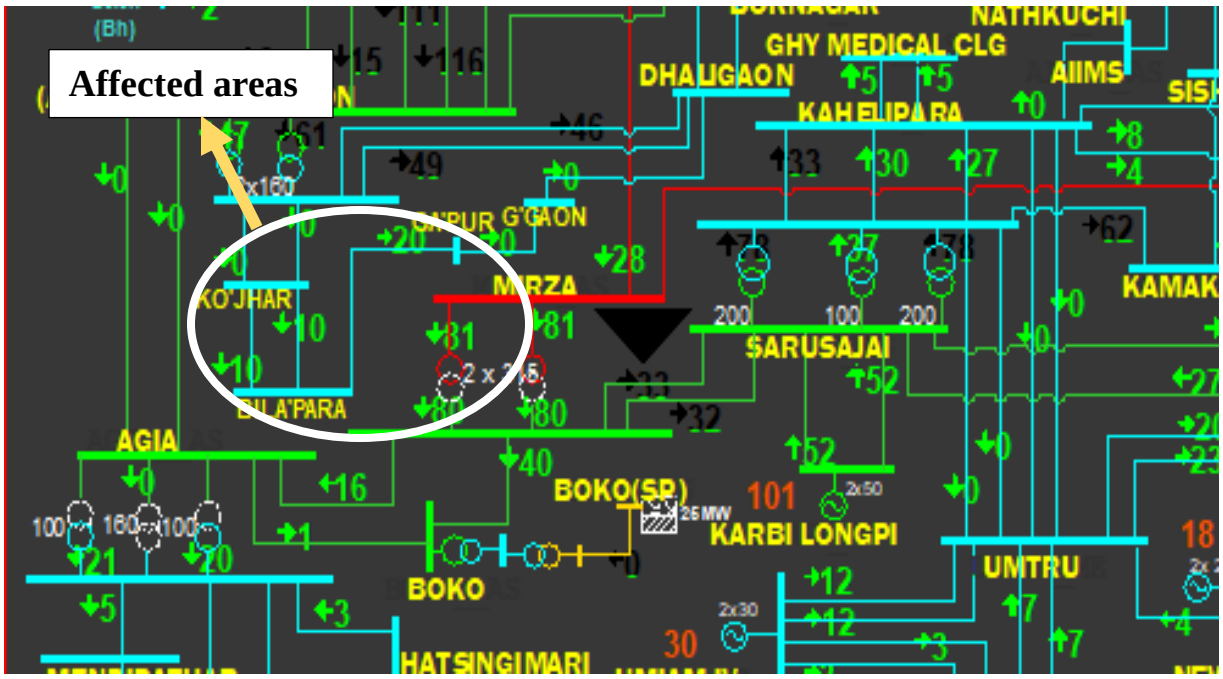


Figure 1: Network across the affected area

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 BTPS – Kokrajhar I Line	12:23	15:59	DP, ZI, B-E, 1.9 Km	E/F
2	132 kV BTPS – Kokrajhar II Line	12:23	12:28	DP, ZII, Y-B	No tripping

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

Proper analysis could not be done due to non-submission of FIR/DR/EL.

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

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

- Power was extended to Kokrajhar, Bilasipara and Gauripur areas of Assam Power System by charging 132 kV BTPS-Kokrajhar II line at 12:28 Hrs of 16-07-2024.

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

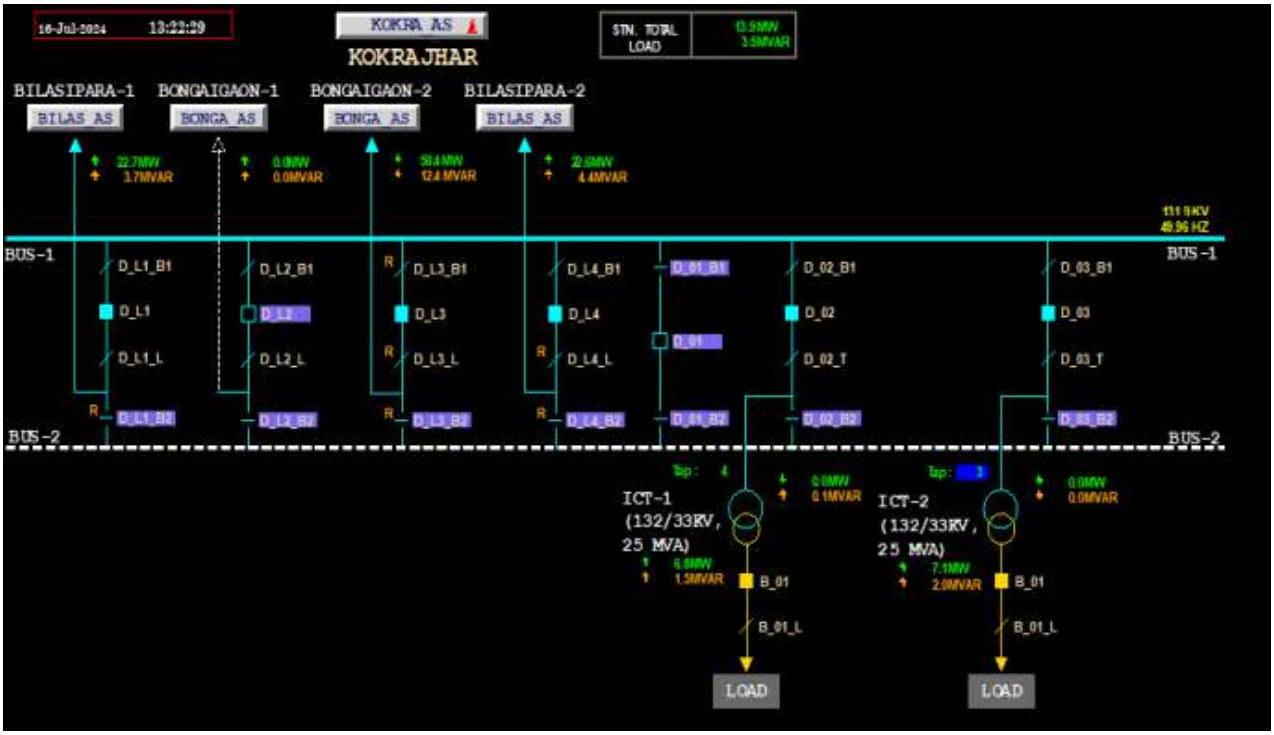
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Team AEGCL is requested to carry out patrolling and maintenance related activities as per various CEA/CERC regulations.

Annexure 1: Sequence of Events as per SCADA

AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
AEGCL	1C	SONAB_AS	SONABIL CB 220Kv LINE-2 TO SAMAG CLOSED	16 Jul 2024 12:16:30:000	16 Jul 2024 12:16:14:000	8.65E+08
MEECL	1C	GANOL_ME	GANOL SHEP CB 132 KV UNIT (H02) OPEN	16 Jul 2024 12:18:48:000	16 Jul 2024 12:18:37:000	8.62E+08
AEGCL	1C	BONGA_AS	BONGAIGAON CB 132Kv LINE-2 TO KOKRA OPEN	16 Jul 2024 12:23:11:000	16 Jul 2024 12:22:56:000	8.01E+08
AEGCL	1C	BONGA_AS	BONGAIGAON CB 132Kv LINE-1 TO KOKRA OPEN	16 Jul 2024 12:23:11:000	16 Jul 2024 12:22:56:000	4.26E+08
AEGCL	1C	GAURI_AS	GAURIPUR CB 132/33 T1 (SEC) OPEN	16 Jul 2024 12:24:15:000	16 Jul 2024 12:23:59:000	8.31E+08
AEGCL	1C	GAURI_AS	GAURIPUR CB 132Kv LINE TO BILAS OPEN	16 Jul 2024 12:24:45:000	16 Jul 2024 12:24:03:000	9.97E+08
NAGALD	1C	DIMAP_NA	DIMAPUR NAGARJAN CB 66Kv LINE-1 TO SINJN BETW	16 Jul 2024 12:25:13:000	16 Jul 2024 12:25:03:000	4.34E+08
AEGCL	1C	LANKA_AS	LANKA (S.NAGAR) CB 132Kv LINE-1 TO SAMAG OPEN	16 Jul 2024 12:28:14:000	16 Jul 2024 12:28:06:000	34000000
AEGCL	1C	BONGA_AS	BONGAIGAON CB 132Kv LINE-2 TO KOKRA CLOSED	16 Jul 2024 12:28:43:000	16 Jul 2024 12:28:33:000	8.99E+08
TSECL	1C	UDAIP_TE	UDAIPUR CB 66Kv LINE-1 TO BOGAF BETWEEN	16 Jul 2024 12:32:50:000	16 Jul 2024 12:32:24:000	5.68E+08
AEGCL	1C	BORDU_AS	BORDUBI CB 132Kv LINE TO TINSU CLOSED	16 Jul 2024 16:27:51:000	16 Jul 2024 15:57:22:000	4.12E+08
AEGCL	1C	BONGA_AS	BONGAIGAON CB 132Kv LINE-1 TO KOKRA CLOSED	16 Jul 2024 15:59:12:000	16 Jul 2024 15:58:51:000	37000000
ARUNCH	1C	PASIG_AR	PASIGHAT CB 132Kv LINE TO ALONG CLOSED	16 Jul 2024 16:12:07:000	16 Jul 2024 16:11:35:000	2.19E+08
MEECL	1C	UMIA1_ME	UMIAM I CB 11 KV UNIT (H01) CLOSED	16 Jul 2024 16:13:23:000	16 Jul 2024 16:13:04:000	2.37E+08

Annexure 2: SLD of affected S/S



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 Ganol HEP of Meghalaya 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):26-07-2024

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

   Ganol HEP of Meghalaya Power System were connected to NER Power system via 132 kV Ganol-Rongkhon Line.

   At 10:11 Hrs of 17-07-2024, 132 kV Ganol-Rongkhon Line tripped. Due to tripping of this line, Ganol HEP of Meghalaya power system got isolated from NER grid due to loss of evacuation path.

   Power supply was extended to Ganol HEP of Meghalaya Power System by charging 132 kV Ganol-Rongkhon line at 10:16 hrs of 17-07-2024.

2. **Time and Date of the Event (घटना का स मय और दिनांक):** 10:11 Hrs of 17-07-2024.

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

4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Ganol generating station of Meghalaya Power System

5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	49.98	2702	2805
Post Event (घटना के बाद)	49.98	2697	2810

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

2. **Load and Generation loss (लोड और जेनरेशन हानि):** Generation loss of 15 MW and load loss of 9 MW

3. **Duration of interruption (रुकावट की अवधि): 5 min**

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

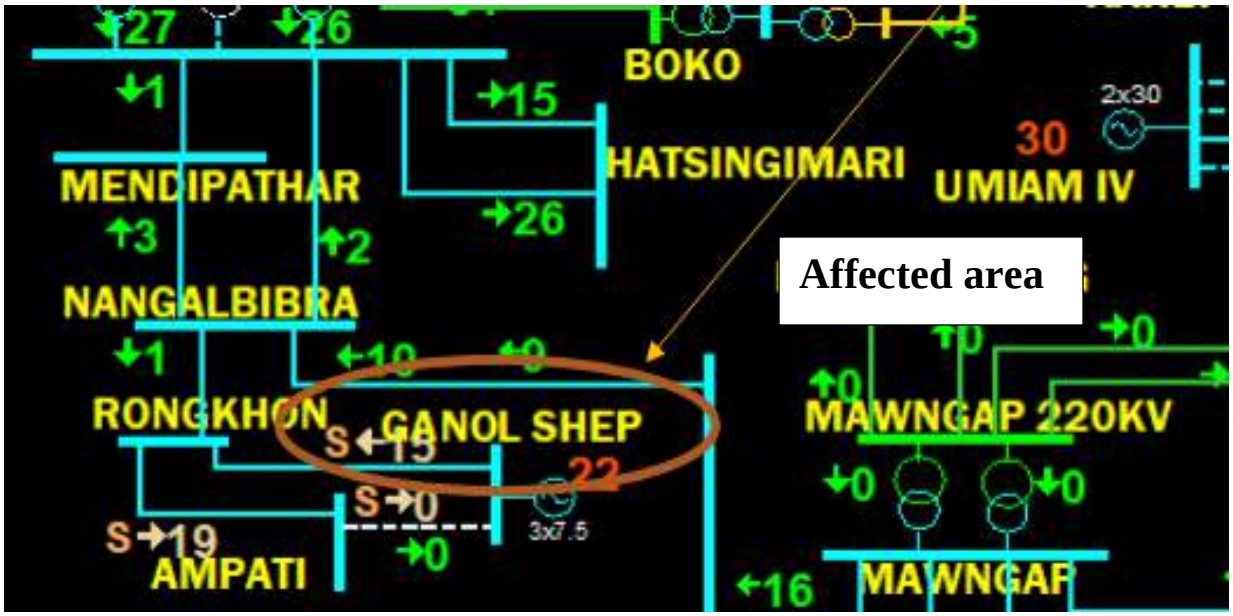


Figure 1: Network across the affected area

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

6. **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 Ganol-Rongkhon Line	10:11	10:16	E/F	No tripping
2	Ganol Unit-1	10:11	10:36	Loss of evacuation path	
3	Ganol Unit-2	10:11	10:25		
4	Gnaol Unit-3	10:11	10:29		

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

Proper analysis could not be done due to non-submission of FIR/R/EL.

8. **Protection/Operational issues observed (सुरक्षा/परिचालन संबंधी समस्या): NA**

9. **Action Taken/Remedial Measures (सुधारात्मक उपाय):**

Power supply was extended to Ganol HEP of Meghalaya Power System by charging 132 kV Ganol-Rongkhon line at 10:16 hrs of 17-07-2024.

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

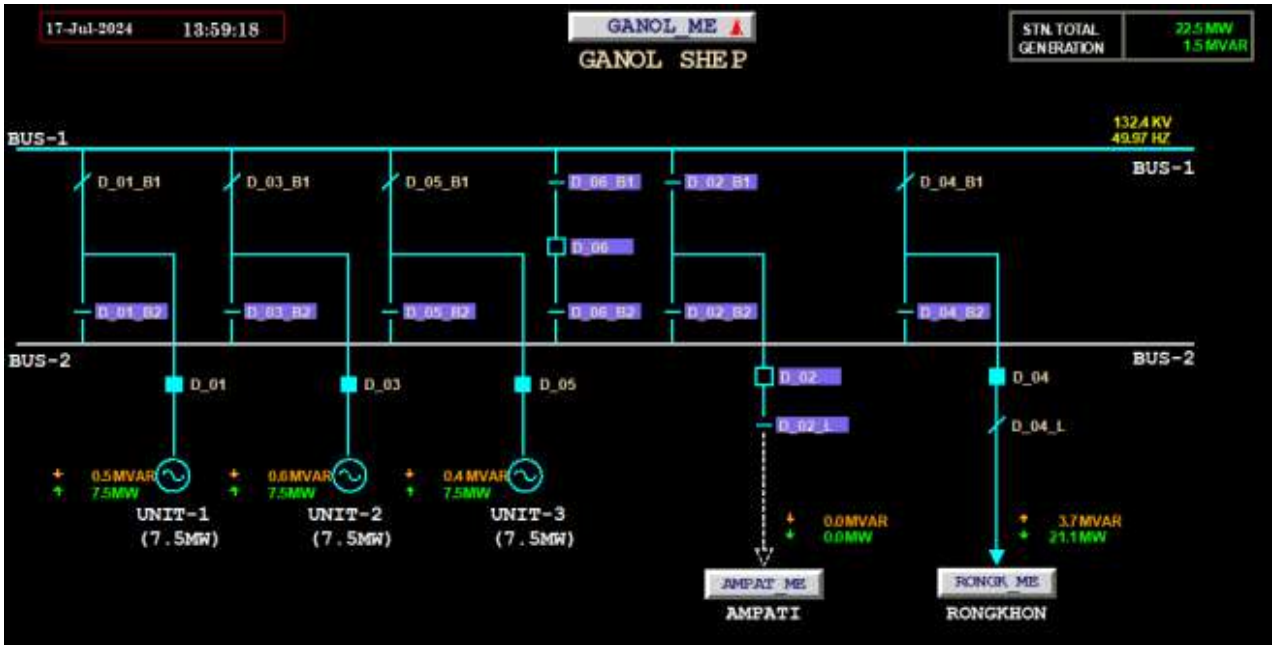
11. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Availability of AR scheme to avoid grid Disturbance due to transient nature of fault.

Annexure 1: Sequence of Events as per SCADA

AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
TSECL	1C	PKBAR_ST	PKBAR(ST) CB 402 MN CB OPEN	17 Jul 2024 01:21:44:000	17 Jul 2024 01:21:42:000	7.63E+08
TSECL	1C	PKBAR_ST	PKBAR(ST) CB MN CB BR-1 OPEN	17 Jul 2024 01:22:07:000	17 Jul 2024 01:22:05:000	6.55E+08
MEECL	1C	GANOL_ME	GANOL SHEP CB 132 KV UNIT (H02) OPEN	17 Jul 2024 01:27:36:000	17 Jul 2024 01:27:24:000	4.77E+08
TSECL	1C	PKBAR_ST	PKBAR(ST) CB MN CB BR-1 CLOSED	17 Jul 2024 01:27:39:000	17 Jul 2024 01:27:38:000	2.75E+08
NAGALD	1C	MOKOK_NA	MOKOKCHUNG CB 66Kv LINE-1 TO ZUHEN CLOSED	17 Jul 2024 10:02:16:000	17 Jul 2024 10:02:05:000	8.88E+08
NAGALD	1C	DIMAP_NA	DIMAPUR NAGARJAN CB 33Kv LOAD-1 OPEN	17 Jul 2024 10:06:07:000	17 Jul 2024 10:05:20:000	2.02E+08
MEECL	1C	GANOL_ME	GANOL SHEP CB 132Kv LINE TO RONGK OPEN	17 Jul 2024 10:10:45:000	17 Jul 2024 10:10:06:000	2.65E+08
MEECL	1C	GANOL_ME	GANOL SHEP CB 132 KV UNIT (H03) OPEN	17 Jul 2024 10:10:45:000	17 Jul 2024 10:10:07:000	4.65E+08
MEECL	1C	GANOL_ME	GANOL SHEP CB 132 KV UNIT (H01) OPEN	17 Jul 2024 10:10:45:000	17 Jul 2024 10:10:07:000	4.65E+08
AEGCL	1C	BNCHV_PG	BISWANAT CHARALI CB MN CB 400/132 KV ICT 1 CL	17 Jul 2024 10:12:43:000	17 Jul 2024 10:12:41:000	7.94E+08
MEECL	1C	GANOL_ME	GANOL SHEP CB 132Kv LINE TO RONGK CLOSED	17 Jul 2024 10:15:43:000	17 Jul 2024 10:15:33:000	4.25E+08
NAGALD	1C	DIMAP_NA	DIMAPUR NAGARJAN CB 66Kv LINE-1 TO SINJN OPE	17 Jul 2024 10:16:58:000	17 Jul 2024 10:16:16:000	88000000
AEGCL	1C	KMGNJ_AS	KARIMGANJ CB 132/33 T2 (SEC) OPEN	17 Jul 2024 11:26:58:000	17 Jul 2024 10:21:27:000	7.1E+08
MEECL	1C	GANOL_ME	GANOL SHEP CB 132 KV UNIT (H02) CLOSED	17 Jul 2024 10:25:31:000	17 Jul 2024 10:24:08:000	8.23E+08
ARUNCH	1C	LEKHI_AR	LEKHI CB 132Kv LINE TO ITANA BETWEEN	17 Jul 2024 11:05:59:000	17 Jul 2024 10:24:49:000	9.44E+08
NAGALD	1C	MOKOK_PG	MOKOKCHUNG CB 220/132 T2 (SEC) OPEN	17 Jul 2024 10:27:55:000	17 Jul 2024 10:27:48:000	9.65E+08
MEECL	1C	GANOL_ME	GANOL SHEP CB 132 KV UNIT (H03) CLOSED	17 Jul 2024 10:29:10:000	17 Jul 2024 10:28:34:000	37000000
AEGCL	1C	BNCHV_PG	BISWANAT CHARALI CB CB BW BALIP 3 & BR 1 OPEN	17 Jul 2024 10:30:26:000	17 Jul 2024 10:30:24:000	5.74E+08
AEGCL	1C	BNCHV_PG	BISWANAT CHARALI CB MN CB 80 MVAR BR 1 OPEN	17 Jul 2024 10:30:26:000	17 Jul 2024 10:30:24:000	5.74E+08
AEGCL	1C	DHEMA_AS	DHEMAJI CB 132 KV COUPLER (04) OPEN	17 Jul 2024 11:26:58:000	17 Jul 2024 10:34:10:000	3.11E+08
MEECL	1C	GANOL_ME	GANOL SHEP CB 132 KV UNIT (H01) CLOSED	17 Jul 2024 10:36:39:000	17 Jul 2024 10:35:51:000	8.22E+08
AEGCL	1C	GOHPU_AS	GOHPUR CB 132/33 T1 (PRIM) OPEN	17 Jul 2024 10:36:39:000	17 Jul 2024 10:36:39:000	0
AEGCL	1C	DISPU_AS	DISPUR CB 132/11 T1 (SEC) OPEN	17 Jul 2024 10:36:39:000	17 Jul 2024 10:36:39:000	0

Annexure 2: SLD of affected S/S



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 Rongkhon, Ampati, Phulbari and Ganol S/S of Meghalaya 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):26-07-2024

1. Event Summary (घटना का सारांश):

Rongkhon, Ampati, Phulbari areas and Ganol HEP of Meghalaya Power System were connected to NER Power system via 132 kV Rongkhon - Nangalbibra line.

At 12:29 Hrs of 17-07-2024, 132 kV Rongkhon – Nangalbibra Line tripped. Due to tripping of this line, Rongkhon, Ampati, Phulbari areas and Ganol HEP of Meghalaya Power System were isolated from NER Grid and collapsed due to no source available in these areas.

Power supply was extended to Rongkhon, Ampati, Phulbari & Ganol areas of Meghalaya Power System by charging 132 kV Nangalbibra –Rongkhon line at 12:37 Hrs of 17-07-2024.

2. Time and Date of the Event (घटना का स मय और दिनांक): 12:29 Hrs of 17-07-2024.

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

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Rongkhon, Ampati, Phulbari areas and Ganol HEP of Meghalaya Power System

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50.03	2521	2401
Post Event (घटना के बाद)	50.03	2381	2387

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

2. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 24 MW. Generation loss of 22.5 MW at Ganol.
3. **Duration of interruption (रुकावट की अवधि): 8 min**
4. **Network across the affected area (प्रभावित क्षेत्र का नक्शा):**

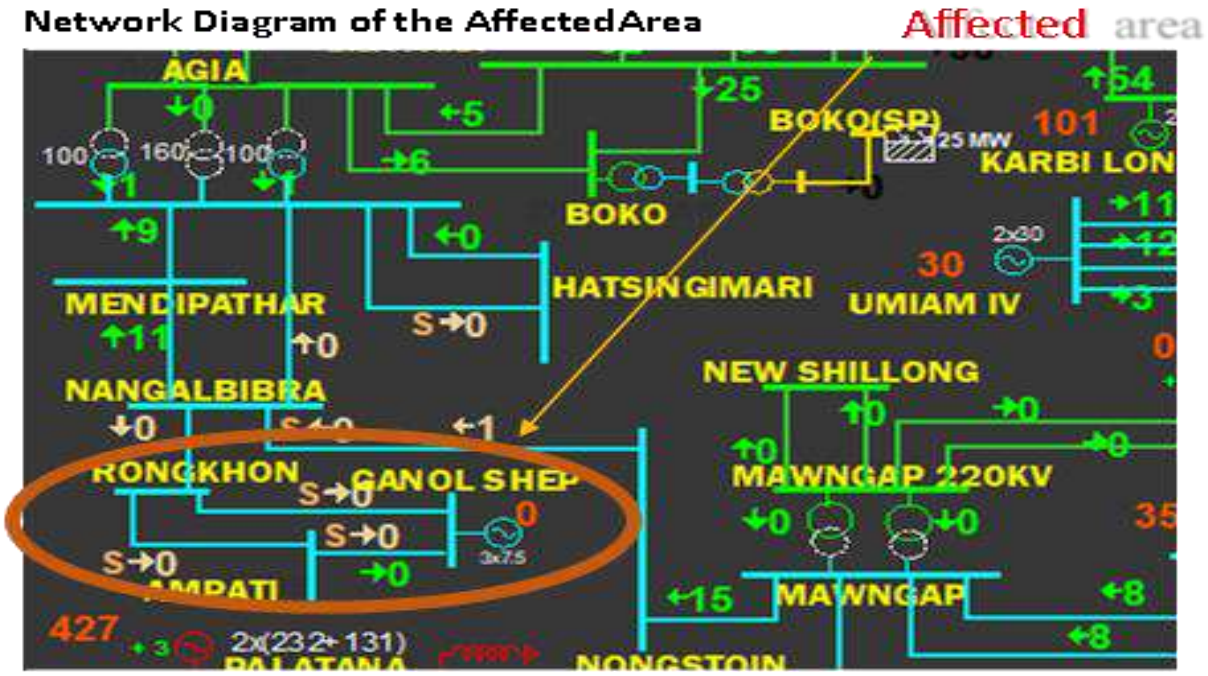


Figure 1: Network across the affected area

5. **Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NIL**
6. **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 Rongkhon-Nangalbibra Line	12:29	12:37	No tripping	DP, ZI, R-E, 22.72 Km

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

As per DR analysis, resistive R-E fault (Ir-954 A, In-703 A) initiated at 12:28:12.190 Hrs in 132 kV Nangalbibra-Rongkhon line. ZI started at 12:28:12.988 Hrs and cleared the fault within 35 msec from Nangalbibra end. There was no tripping from Rongkhon end(radial). Total fault duration: 833 msec

Fault in 132 kV Nangalbibra-Rongkhon line is likely due to vegetation.

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

9. **Action Taken/Remedial Measures (सुधारात्मक उपाय):**

- Power supply was extended to Rongkhon, Ampati, Phulbari & Ganol areas of Meghalaya Power System by charging 132 kV Nangalbibra –Rongkhon line at 12:37 Hrs of 17-07-2024.
- Line maintenance team was informed by MePTCL for patrolling of line.

10. **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)	**No violation**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**No violation**
5.	**Any other non-compliance**		-

11. **Key Lessons Learnt (प्रमुख अधिगम बिंदु):**

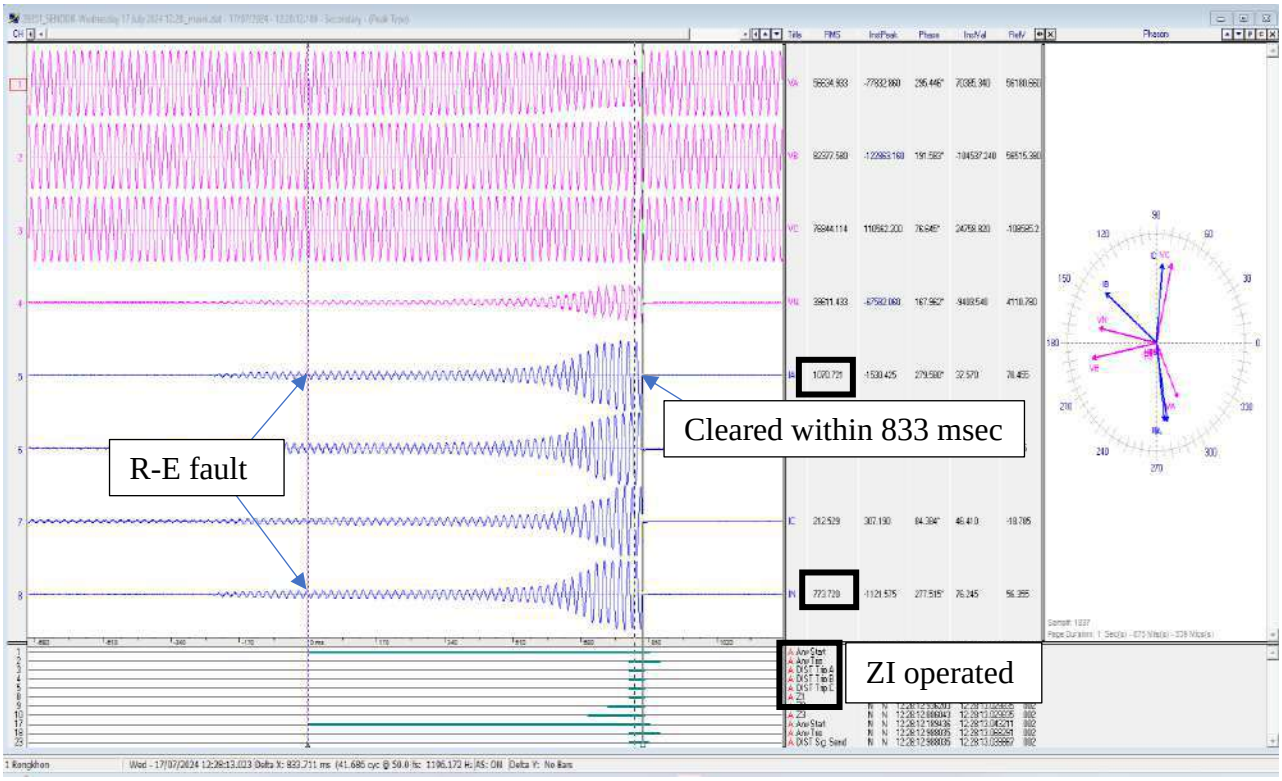
- Proper patrolling and maintenance related activities as per CEA regulations needs to be carried out.
- Availability of AR scheme to avoid grid Disturbance due to transient nature of fault.

Annexure 1: Sequence of Events as per SCADA

SOE not recorded

Annexure 2: Disturbance recorder snips showing faults and digital signals

2.1. DR Snapshot of Nangalbibra for 132 kV Nangalbibra-Rongkhon Line



Wednesday 17 July 2024 12:28:13.405	Fault Recorded
Description	Nangal
Plant reference	Rongkhon
Model number	P44291AB7M0720M
Address	001 Column:01 Row:00
Event type	Fault record
Event Value	0
Active Group	1
Faulted Phase	1111001
Start Elements	00000000010000000000010000011
Tripped Elts	00000000000000010000000000000
Time Stamp Wednesday 17 July ...	12:28:12.190
Fault Alarms	00000000000000
System Frequency	50.51 Hz
Fault Duration	853.8ms
Relay Trip Time	80.22ms
Fault Locatio XY	22.72km
IA	110.7 A
IB	16.78 A
IC	16.74 A
VAN	75.53kV
VBN	77.68kV
VCN	77.06kV
Fault Resista XY 42.57	Ohm
Fault in Zone Zone	1
Tripped Elts 2	0000000000000000
Start Elements 2	000000000000
Evt Unique Id	70986

ग्रिड-इंडिया GRID-INDIA
ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
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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 NEIGRIHMS & IIM areas of Meghalaya 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):26-07-2024

1. Event Summary (घटना का सारांश):

NEIGRIHMS & IIM areas of Meghalaya power system is connected to the rest of NER grid via 132 kV NEIGRIHMS-NEHU line & 132 kV Khleihriat-NEIGRIHMS line. IIM area is radially fed from NEIGRIHMS end.

At 14:50 Hrs of 17-07-2024, 132 kV NEIGRIHMS-IIM line tripped resulting in blackout of IIM area.

At 14:56 Hrs of 17-07-2024, 132 kV NEHU-NEIGRIHMS line & 132 kV Khleihriat-NEIGRIHMS line tripped. Due to tripping of these elements, NEIGRIHMS area of Meghalaya got isolated due to no source available in this area.

Power supply was extended to NEIGRIHMS area of Meghalaya Power System by charging 132 kV NEHU - NEIGRIHMS line at 15:15 Hrs of 17-07-2024. Power supply was extended to IIM area of Meghalaya Power System by charging 132 kV IIM - NEIGRIHMS line at 15:34 Hrs of 17-07-2024.

2. Time and Date of the Event (घटना का स मय और दिनांक): 14:50 Hrs of 17-07-2024

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

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): NEIGRIHMS & IIM area of Meghalaya

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50.03	2643	2965
Post Event (घटना के बाद)	50.03	2643	3030

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)	Rain and thunderstorm

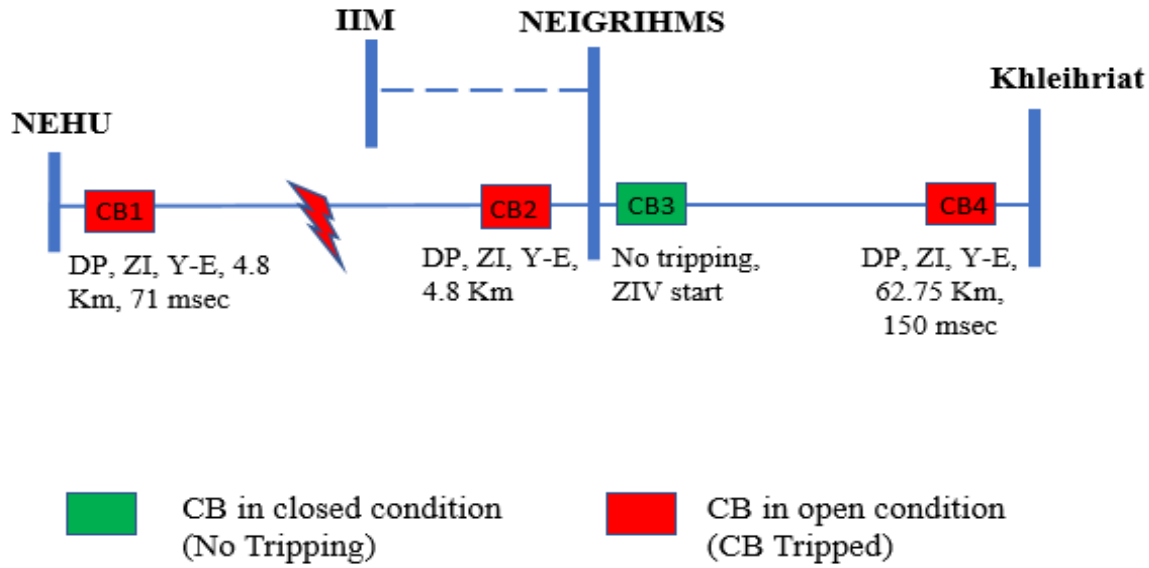
2. **Load and Generation loss (लोड और जेनरेशन हानि):** 2 MW in NEIGRIHMS & IIM
3. **Duration of interruption (रुकावट की अवधि): 19 min (NEIGRIHMS) & 44 min (IIM)**
4. **Network across the affected area (प्रभावित क्षेत्र का नक्शा):**

Figure 1: Network across the affected area

5. **Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NIL**
6. **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 NEIGRIHMS-IIM Line	14:50	15:34	Not furnished	
2	132 kV NEHU-NEIGRIHMS Line	14:56	15:15	DP, ZI, Y-E, 4.844 Km	DP, ZI, Y-E, 4.8 Km
3	132 kV Khleihriat-NEIGRIHMS Line	14:56	15:18	DP, ZI, Y-E, 62.75 Km	No tripping (ZIV pickup)

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



As per DR Analysis, Y-E fault (Ib: 5.3 kA, Vbe: 21 kV) occurred at 14:55:33.570 Hrs in 132 kV NEHU - NEIGRIHMS line at a distance of 4.844 Km from NEHU and fault cleared within 71 msec on DP, Z-1 from NEHU end. At NEIGRIHMS end, ZI operated (as per FIR). However, fault was feeding from Khleihriat end till 150 msec.

Distance protection relay at Khleihriat for 132 kV Khleihriat-NEIGRIHMS line detected Y-E fault (Ib: 1.3 kA, Vbe: 54 kV) in ZI and cleared within 150 msec.

ZIV pickup at NEIGRIHMS end and there was no tripping from NEIGRIHMS end which clearly indicated that fault is beyond the line.

As informed by MePTCL, fault in 132 kV NEHU-NEIGRIHMS line is likely due to lightning.

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

- Tripping of 132 kV Khleihriat-NEIGRIHMS line from Khleihriat end on ZI is inferred unwanted as fault is in 132 kV NEHU-NEIGRIHMS line. The distance protection setting needs to be reviewed by MePTCL.
- Delayed operation of distance protection at NEIGRIHMS for 132 kV NEHU-NEIGRIHMS line.
- Delay in CB opening within 100 msec after issuance of Z-I trip at Khleihriat end for 132 kV Khleihriat-NEIGRIHMS line.

- SOE not recorded for tripping of 132 kV NEIGRIHMS-IIM line, 132 kV NEHU-NEIGRIHMS line & 132 kV Khleihriat-NEIGRIHMS line. The same needs attention from MePTCL/SLDC Meghalaya team.

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

- Power supply was extended to NEIGRIHMS area of Meghalaya Power System by charging 132 kV NEHU - NEIGRIHMS line at 15:15 Hrs of 17-07-2024. Power supply was extended to IIM area of Meghalaya Power System by charging 132 kV IIM - NEIGRIHMS line at 15:34 Hrs of 17-07-2024.
- Checking and reviewing of Zone-I impedance setting of 132 kV Khleihriat-NEIGRIHMS line at Khleihriat will be carried out by MePTCL.
- Line maintenance team has been informed by MePTCL for patrolling and checking of line.

10. 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	**MePTCL**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**No violation**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**No violation**
5.	**Any other non-compliance**		**-**

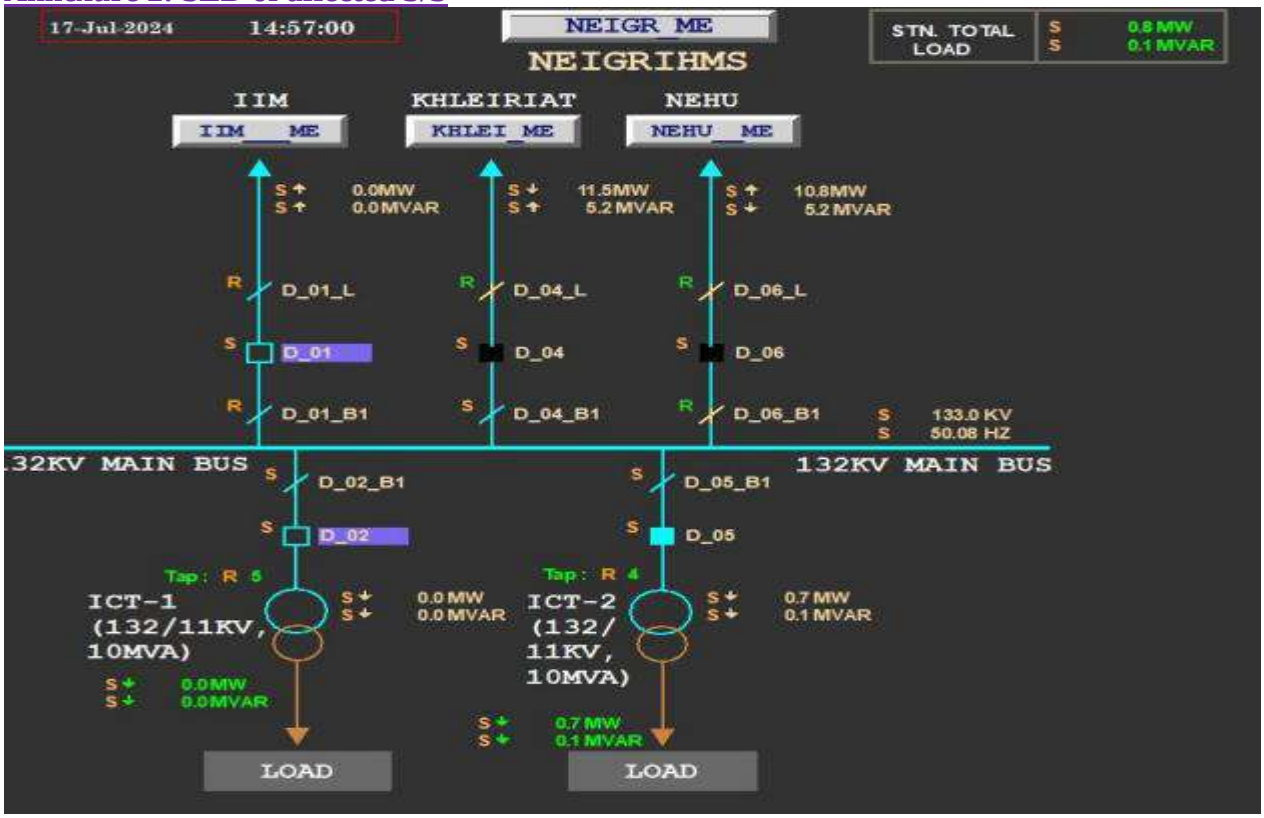
11. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Periodic review of relay settings needs to be conducted by MePTCL**.**
- Periodic testing of CB (Operation timing, DCRM, etc) should be conducted to ensure healthiness of CB mechanism.

Annexure 1: Sequence of Events as per SCADA

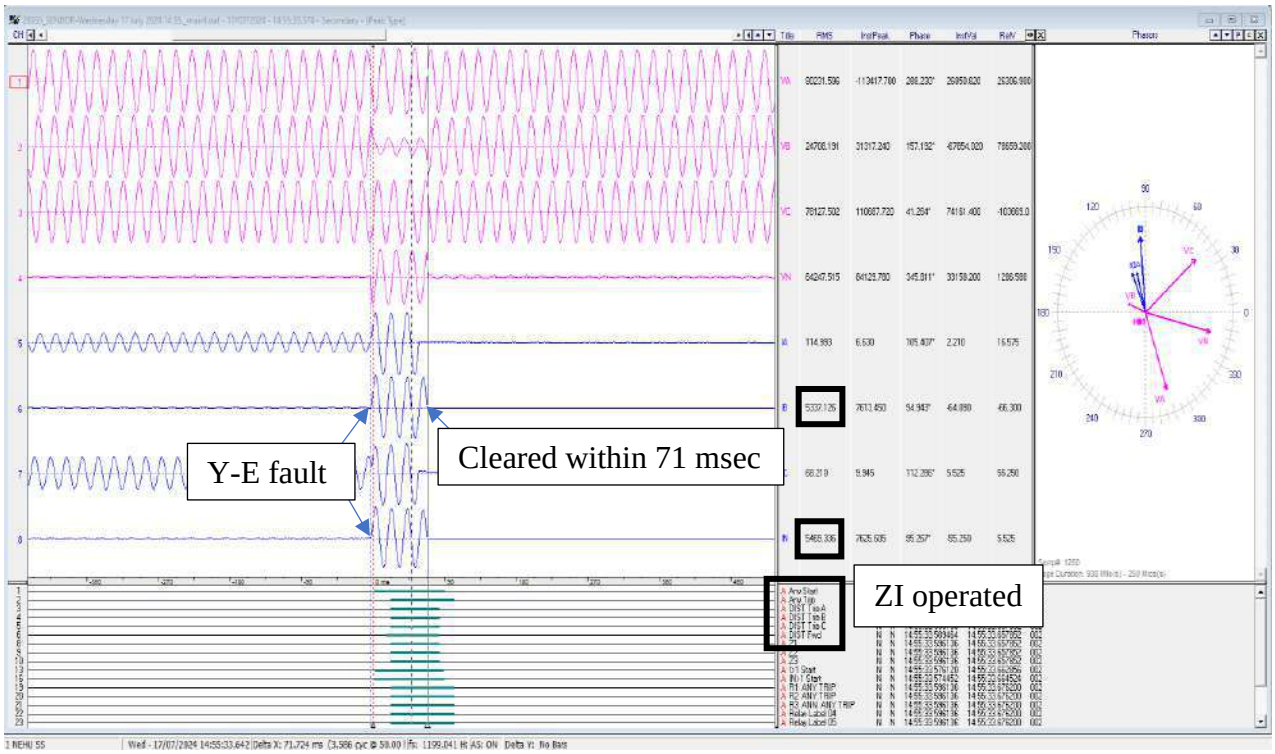
SOE not recorded

Annexure 2: SLD of affected S/S

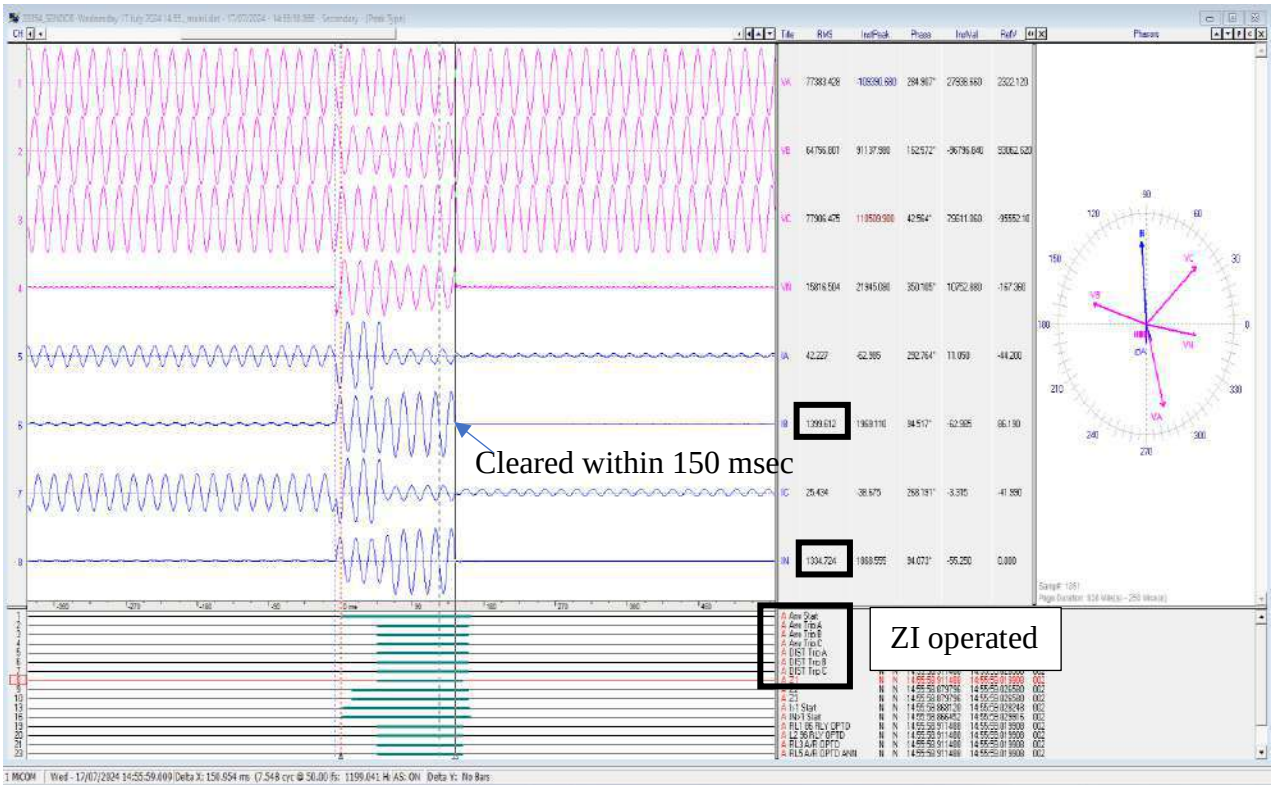


Annexure 3: Disturbance recorder snips showing faults and digital signals

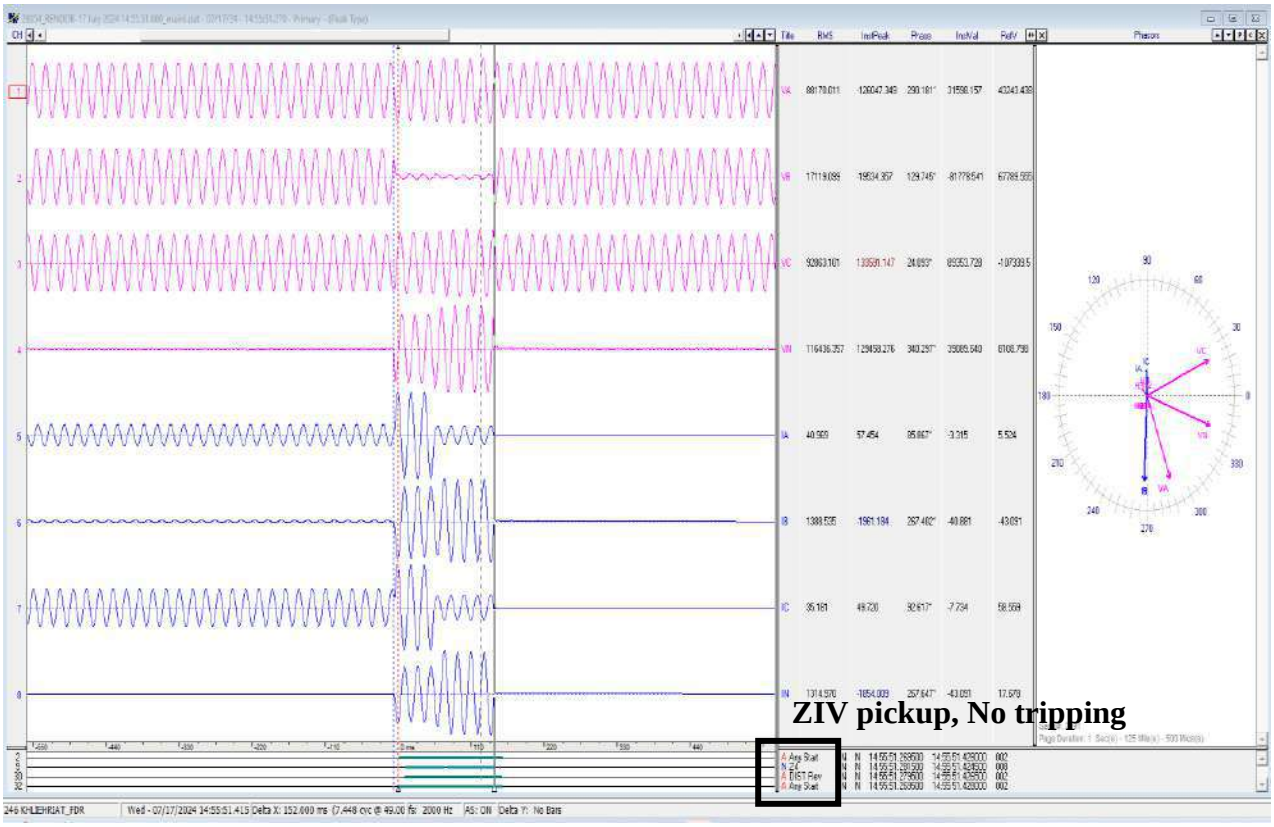
3.1. DR Snapshot of NEHU for 132 kV NEHU-NEIGRIHMS Line



3.2. DR Snapshot of Khleihriat for 132 kV Khleihriat-NEIGRIHMS Line



3.3. DR Snapshot of NEIGRIHMS for 132 kV Khleihriat-NEIGRIHMS Line



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 Umiam Stg-II generating station of Meghalaya 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):26-07-2024

1. Event Summary (घटना का सारांश):

Umiam Stg-II generating station of Meghalaya Power System were connected to NER Power system via 132 kV Umiam Stg II-Umiam Stg I Line.

At 15:03 Hrs of 17-07-2024, 132 kV Umiam Stg II-Umiam Stg I Line tripped. Due to tripping of this line, Umiam Stg-II generating station of Meghalaya power system got isolated from NER grid due to loss of evacuation path.

Power supply was extended to Umiam Stage-II of Meghalaya Power System by charging 132kV Umiam Stg II-Umiam Stg I line at 15:48 hrs of 17-07-2024.

2. Time and Date of the Event (घटना का स मय और दिनांक): 15:03 Hrs of 17-07-2024.

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

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Umiam Stg-II generating station of Meghalaya Power System

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	49.99	2720	2715
Post Event (घटना के बाद)	49.99	2706	2587

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)	Inclement

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

3. **Duration of interruption (रुकावट की अवधि): 45 min**

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

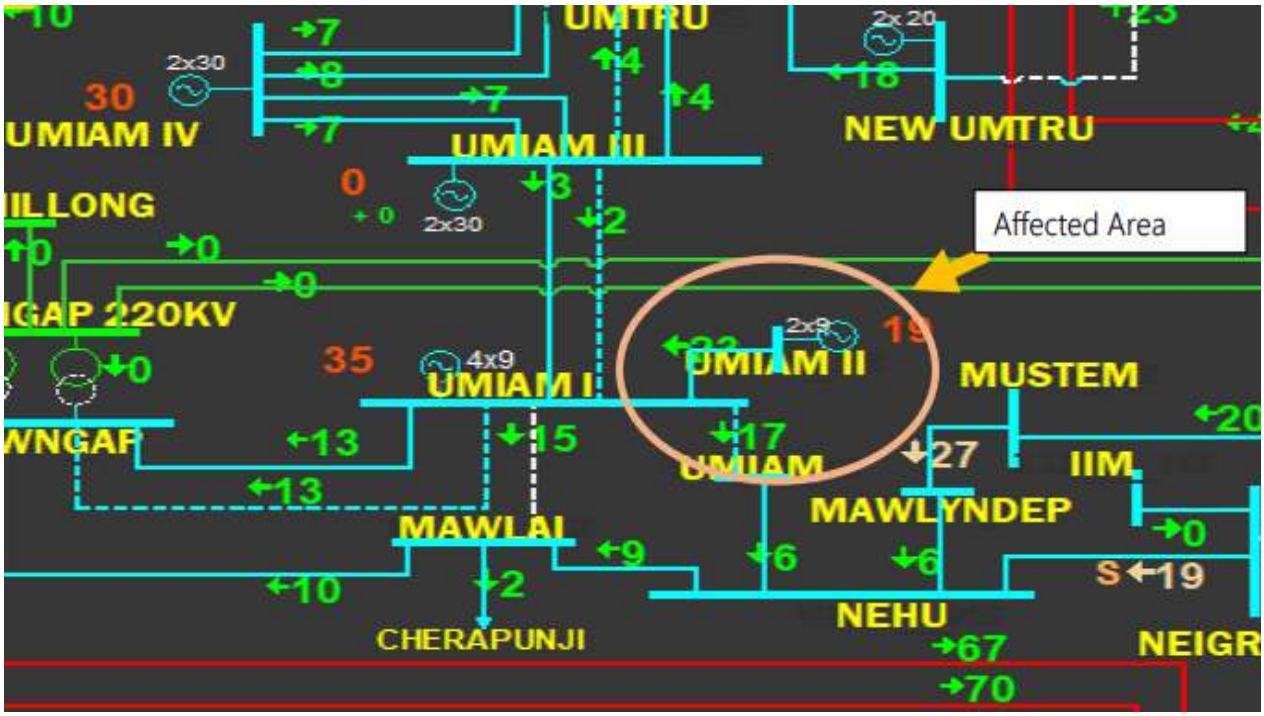


Figure 1: Network across the affected area

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

6. **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 Umiam Stg II-Umiam Stg I line	15:03	15:48	No tripping	O/C operated, R-Y-B
2	Umiam Stg-II Unit-1	15:03	16:08	Loss of evacuation path	
3	Umiam Stg-II Unit-2	15:03	16:16		

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

As per DR analysis, R-Y-B fault (Ir-7 kA, Iy-7.1 kA, Ib-7.1 kA) initiated at 15:02:21.069 Hrs and cleared within 487 msec on operation of O/C protection from Umiam Stg II end.

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

- DR needs to be standardized:

  i) DR time duration is insufficient. It needs to be increased to 3 sec with prefault of 500 msec and post fault of 2.5 sec.

  ii) DR digital channel needs to be configured.

- SOE not recorded for tripping of 132 kV Umiam Stg II-Umiam Stg I line. The same needs attention from MePGCL.

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

Power supply was extended to Umiam Stage-II of Meghalaya Power System by charging 132kV Umiam Stg II-Umiam Stg I line at 15:48 hrs of 17-07-2024.

10. 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)	**MePGCL**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**MePGCL**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**MePGCL**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	-
5.	**Any other non-compliance**		-

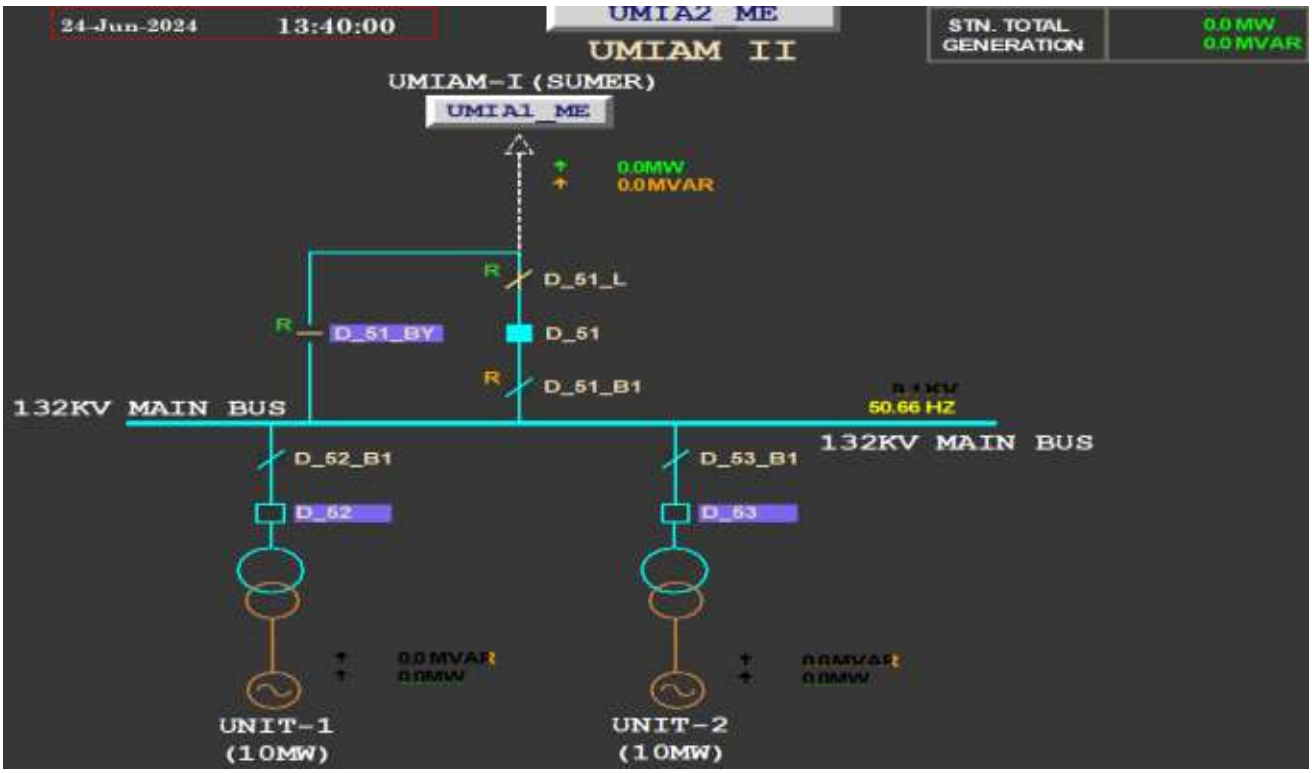
11. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Availability of AR scheme to avoid grid Disturbance due to transient nature of fault.

Annexure 1: Sequence of Events as per SCADA

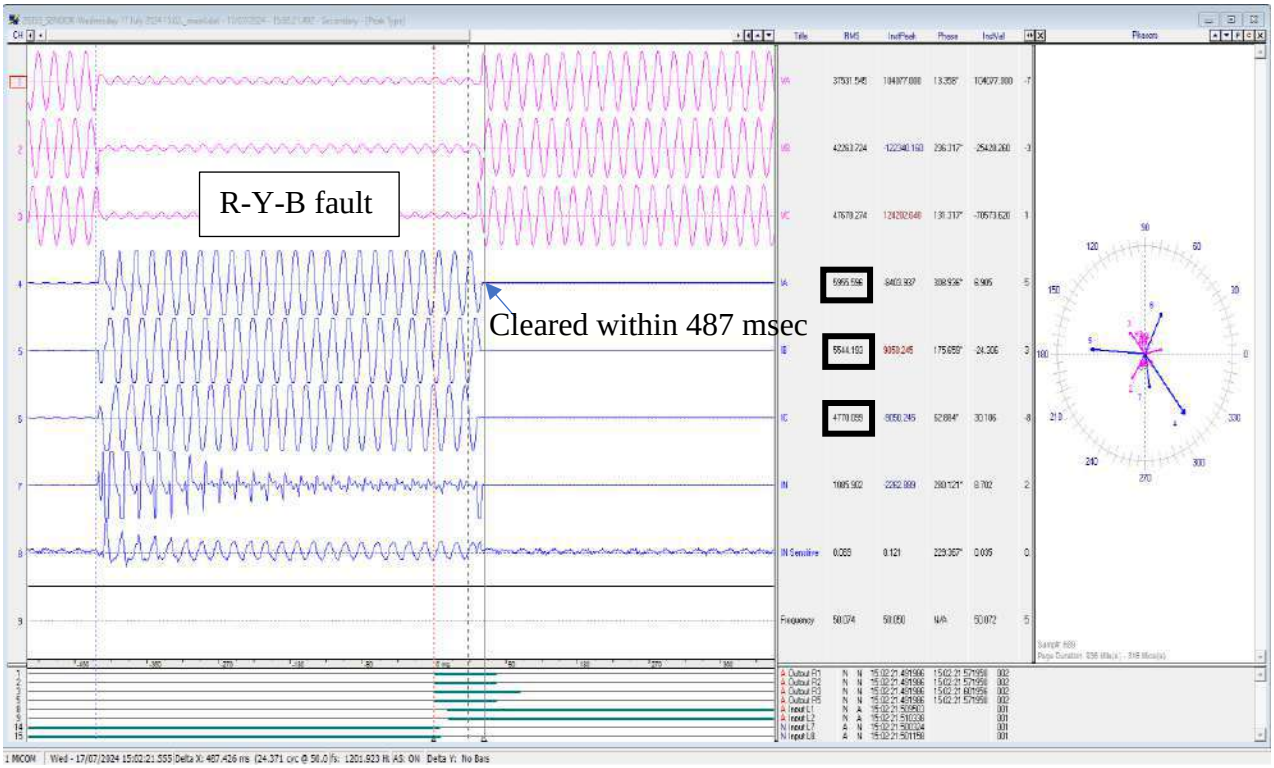
AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
AEGCL	1C	BALIP_PG	BALIPARA CB 400/33/220 T1 (TER) CLOSED	17 Jul 2024 15:46:15:000	17 Jul 2024 15:46:11:000	6.35E+08
AEGCL	1C	BALIP_PG	BALIPARA CB 400/33/220 T1 (TER) OPEN	17 Jul 2024 15:46:20:000	17 Jul 2024 15:46:15:000	68000000
MEECL	1C	UMIA1_ME	UMIAM I CB 132Kv LINE-1 TO UMIA2 CLOSED	17 Jul 2024 15:48:27:000	17 Jul 2024 15:47:58:000	1.96E+08
MEECL	1C	UMIAM_ME	UMIAM CB 132Kv LINE-1 TO UMIA1 CLOSED	17 Jul 2024 16:01:22:000	17 Jul 2024 16:01:13:000	9.96E+08
MEECL	1C	NWUMT_ME	NEW UMTRU CB 132 KV UNIT (H02) OPEN	17 Jul 2024 16:15:36:000	17 Jul 2024 16:06:36:000	4.9E+08
MEECL	1C	UMIA2_ME	UMIAM II CB 11 KV UNIT (H01) CLOSED	17 Jul 2024 16:08:25:000	17 Jul 2024 16:07:56:000	5.52E+08
NAGALD	1C	DIMAP_NA	DIMAPUR NAGARJAN CB 33Kv LOAD-1 OPEN	17 Jul 2024 16:13:58:000	17 Jul 2024 16:13:48:000	4.6E+08
NAGALD	1C	DIMAP_NA	DIMAPUR NAGARJAN CB 66Kv LINE-1 TO SINJN OPE	17 Jul 2024 16:14:13:000	17 Jul 2024 16:14:06:000	8.01E+08
MEECL	1C	UMIA1_ME	UMIAM I CB 11 KV UNIT (H04) BETWEEN	17 Jul 2024 16:16:25:000	17 Jul 2024 16:16:18:000	2.05E+08
MEECL	1C	UMIA2_ME	UMIAM II CB 11 KV UNIT (H02) CLOSED	17 Jul 2024 16:16:34:000	17 Jul 2024 16:16:26:000	87000000
MEECL	1C	MAWPH_ME	MAWNGAP CB 33Kv LOAD MAWSY CLOSED	17 Jul 2024 16:16:51:000	17 Jul 2024 16:16:45:000	7.45E+08
AEGCL	1C	LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ BETWEEN	17 Jul 2024 16:20:58:000	17 Jul 2024 16:20:54:000	6000000

Annexure 2: SLD of affected S/S



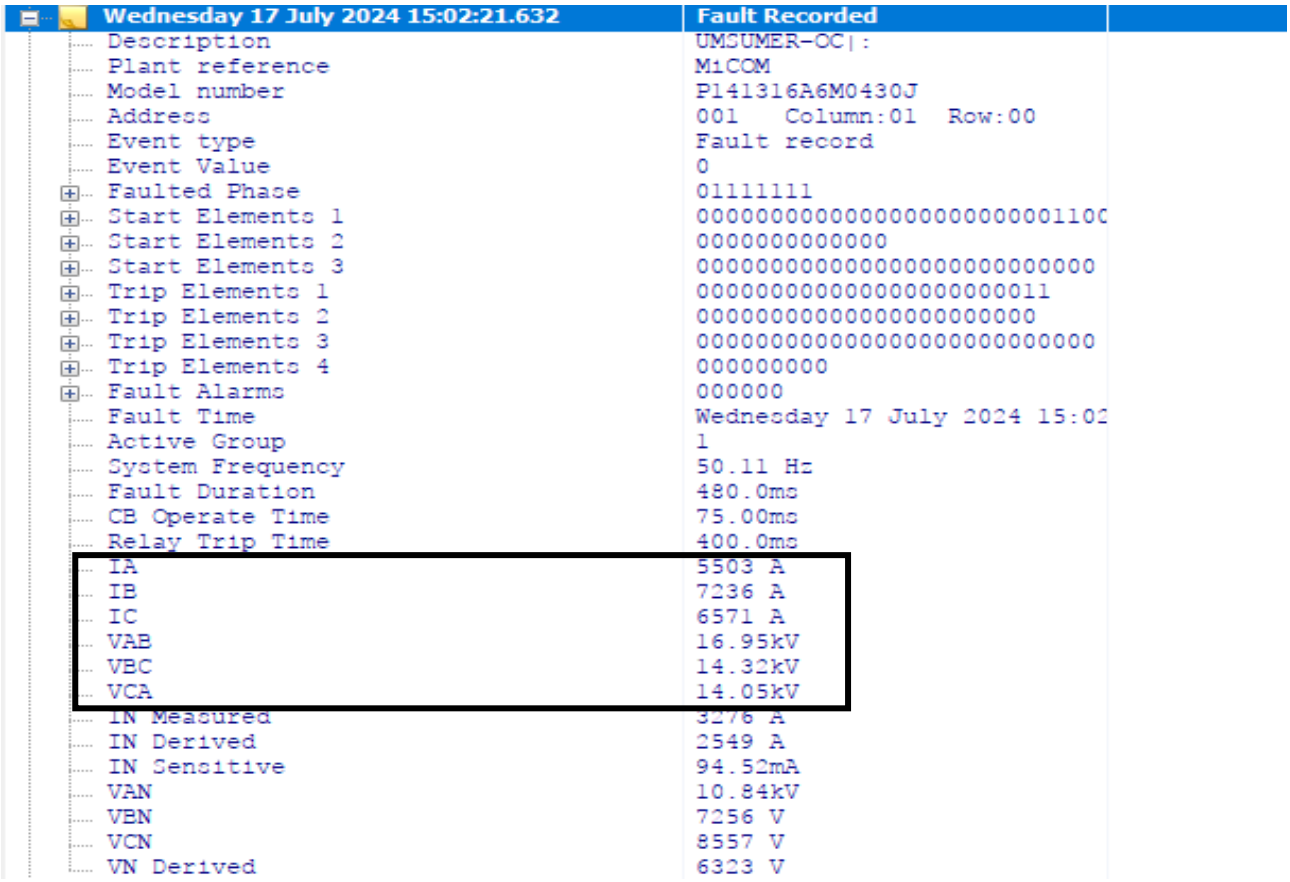
Annexure 3: DR/EL snapshot

3.1 DR snapshot of Umiam Stg II end for 132 kV Umiam Stg II-Umiam Stg I line



3.2 EL snapshot of Umiam Stg II end for 132 kV Umiam Stg II-Umiam Stg I line

Wednesday 17 July 2024 15:02:21.574	I>2 Start A OFF
Wednesday 17 July 2024 15:02:21.574	I>2 Start B OFF
Wednesday 17 July 2024 15:02:21.510	Logic Inputs 1
Wednesday 17 July 2024 15:02:21.509	Logic Inputs 1
Wednesday 17 July 2024 15:02:21.501	Logic Inputs 1
Wednesday 17 July 2024 15:02:21.500	Logic Inputs 1
Wednesday 17 July 2024 15:02:21.495	Output Contacts1
Wednesday 17 July 2024 15:02:21.494	I>1 Trip B ON
Wednesday 17 July 2024 15:02:21.494	I>1 Trip A ON
Wednesday 17 July 2024 15:02:21.494	I>1 Trip C ON
Wednesday 17 July 2024 15:02:21.494	Trip Command In ON
Wednesday 17 July 2024 15:02:21.494	I>1 Trip ON
Wednesday 17 July 2024 15:02:21.135	IN1>2 Start OFF
Wednesday 17 July 2024 15:02:21.135	IN1>1 Start OFF
Wednesday 17 July 2024 15:02:21.135	IN/SEF>Blk Start OFF
Wednesday 17 July 2024 15:02:21.135	Start N OFF
Wednesday 17 July 2024 15:02:21.115	Start N ON
Wednesday 17 July 2024 15:02:21.115	IN1>1 Start ON
Wednesday 17 July 2024 15:02:21.115	IN/SEF>Blk Start ON
Wednesday 17 July 2024 15:02:21.115	IN1>2 Start ON
Wednesday 17 July 2024 15:02:21.095	I>1 Start ON
Wednesday 17 July 2024 15:02:21.095	Any Start ON
Wednesday 17 July 2024 15:02:21.095	I>1 Start C ON
Wednesday 17 July 2024 15:02:21.095	I>1 Start A ON
Wednesday 17 July 2024 15:02:21.095	I>1 Start B ON
Wednesday 17 July 2024 15:02:21.095	I>2 Start ON
Wednesday 17 July 2024 15:02:21.095	I> BlockStart ON
Wednesday 17 July 2024 15:02:21.095	I>2 Start C ON
Wednesday 17 July 2024 15:02:21.095	I>2 Start A ON
Wednesday 17 July 2024 15:02:21.095	I>2 Start B ON



Wednesday 17 July 2024 15:02:21.632	Fault Recorded
Description	UMSUMER-OC|:
Plant reference	MiCOM
Model number	P141316A6M0430J
Address	001 Column:01 Row:00
Event type	Fault record
Event Value	0
Faulted Phase	01111111
Start Elements 1	00000000000000000000000001100
Start Elements 2	0000000000000
Start Elements 3	00000000000000000000000000000
Trip Elements 1	00000000000000000000011
Trip Elements 2	0000000000000000000000
Trip Elements 3	00000000000000000000000000000
Trip Elements 4	000000000
Fault Alarms	000000
Fault Time	Wednesday 17 July 2024 15:02
Active Group	1
System Frequency	50.11 Hz
Fault Duration	480.0ms
CB Operate Time	75.00ms
Relay Trip Time	400.0ms
IA	5503 A
IB	7236 A
IC	6571 A
VAB	16.95kV
VBC	14.32kV
VCA	14.05kV
IN Measured	3276 A
IN Derived	2549 A
IN Sensitive	94.52mA
VAN	10.84kV
VBN	7256 V
VCN	8557 V
VN Derived	6323 V

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 Khupi, Tenga & Dikshi areas of Arunachal Pradesh Power System 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))

Date (दिनांक**):26-07-2024**

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

Khupi, Tenga & Dikshi areas of Arunachal Pradesh Power System were connected with rest of NER Power system via 132 kV Balipara- Tenga line and 400/132 kV, 3x40 MVA ICT at Kameng.

At 10:43 Hrs of 19.07.2024, 132 kV Balipara-Tenga line tripped. Also, 132 kV Bus Coupler at Kameng tripped which resulted in blackout of Khupi, Tenga & Dikshi areas of Arunachal Pradesh Power system.

Power is restored at Tenga, Khupi and Dikshi areas by charging 132 kV Kameng-Khupi line at 13:42 Hrs of 19-07-2024.

2. **Time and Date of the Event (**घटना का स मय और दिनांक**):** 10:43 Hrs of 19-07-2024

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

4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Tenga, Khupi and Dikshi areas of Arunachal Pradesh

5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	49.95	2432	2801
Post Event (घटना के बाद)	49.95	2437	2830

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

2. **Load and Generation loss (लोड और जेनरेशन हानि):** Generation loss of 20 MW & Load loss 1 MW

3. **Duration of interruption (रुकावट की अवधि): 1 Hr 21 min**

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

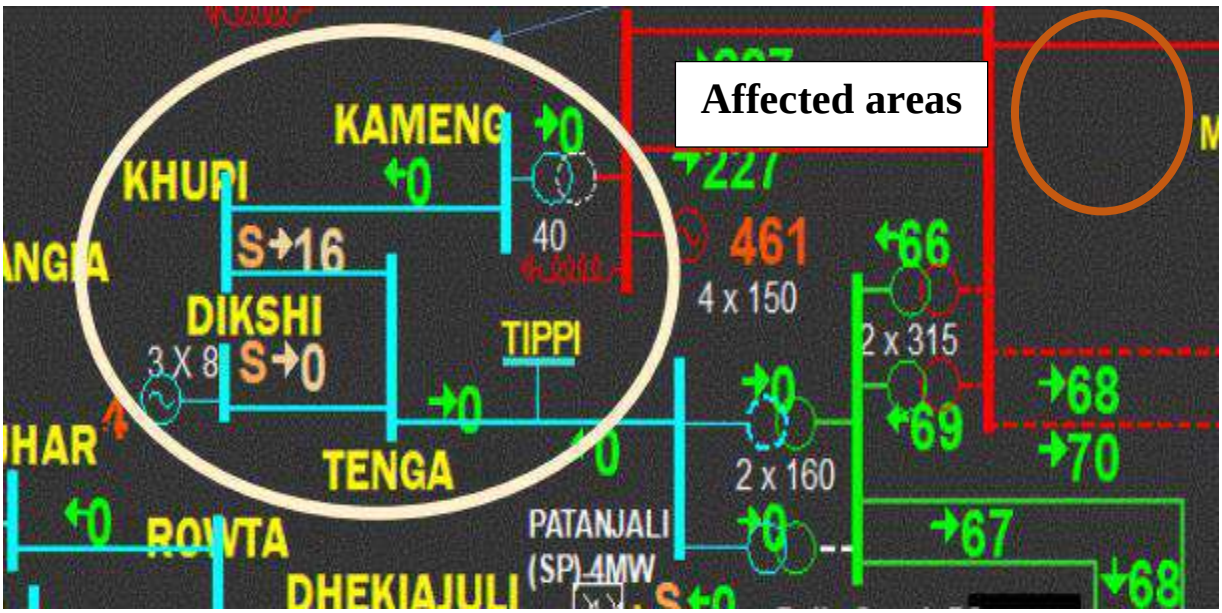


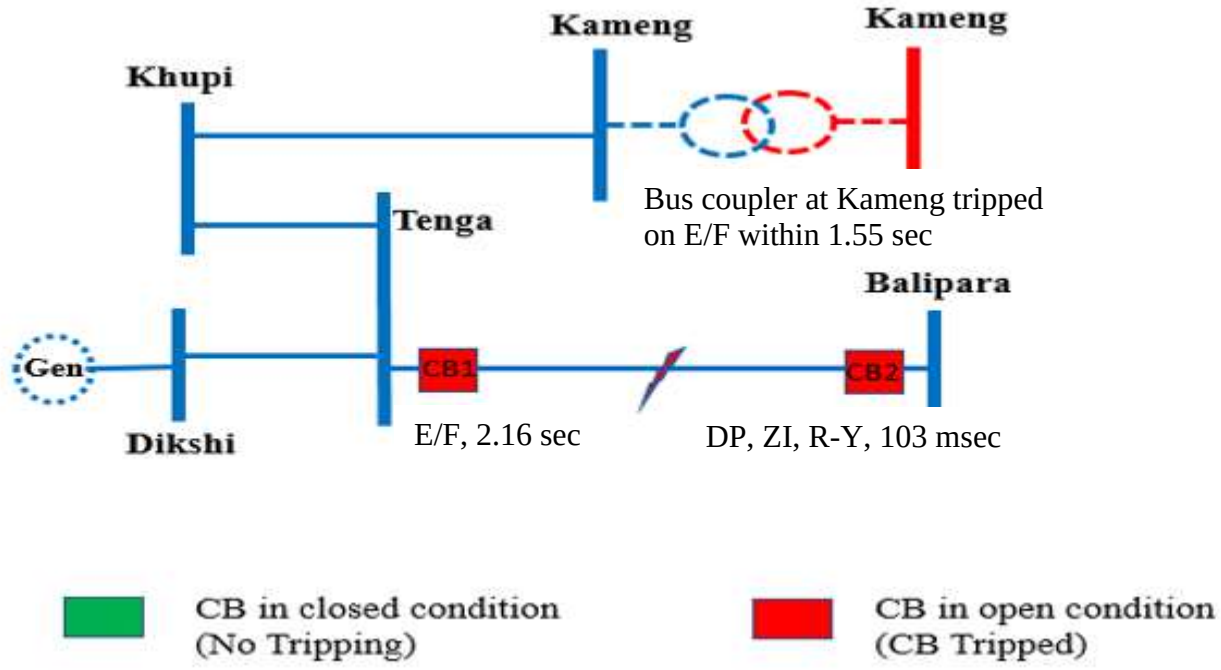
Figure 1: Network across the affected area

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

6. **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 Balipara-Tenga Line	10:43	-	DP, ZI, R-Y	E/F
2	132 kV Bus Coupler at Kameng	10:43	10:51	HV E/F operated	

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



As per DR analysis, R-Y fault (Ir-2.3 kA, Iy-2.1 kA) initiated at 10:42:00.106 Hrs in 132 kV Balipara-Tenga line and fault was cleared from Balipara end on operation of Z-1 within 103 msec. At Tenga end, In>1 start and In>1 tripped issued at 11:33:52.902 Hrs within 2.16 sec.

The same fault was also sensed by B/U relay of Kameng HEP bus coupler at 10:43:02.563 Hrs and tripped on Ie>1 within 1.55 sec which seems to be mis-operation. This resulted in blackout of Tenga, Khupi and Dikshi generation of Arunachal Pradesh power system.

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

- Tripping of Bus coupler at Kameng on operation of B/U E/F seems to be misoperation. The bus coupler setting needs to be reviewed and coordinated with B/U relay operating time of Line/ICT.
- Neutral current of 0.249A recorded in the DR of Kameng Bus coupler which seems to be very low. The neutral current circuit needs to be checked.
- Huge time drift of 51 minutes observed in DR of Tenga end for 132 kV Balipara-Tenga line.
- DR needs to be standardized at Tenga.

1. Analog neutral current needs to be configured.
2. Only two digital channels configured.

- Protection setting from Khupi to Tenga to Balipara needs to be reviewed and coordinated as per NER protection philosophy.

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

Power is restored at Tenga, Khupi and Dikshi areas by charging 132 kV Kameng-Khupi line at 13:42 Hrs of 19-07-2024.

10. 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)	**DoP AP**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**DoP AP**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**DoP AP**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**Time drift of 51 min at Tenga end for 132 kV Balipara-Tenga line**
5.	**Any other non-compliance**		**-**

11. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

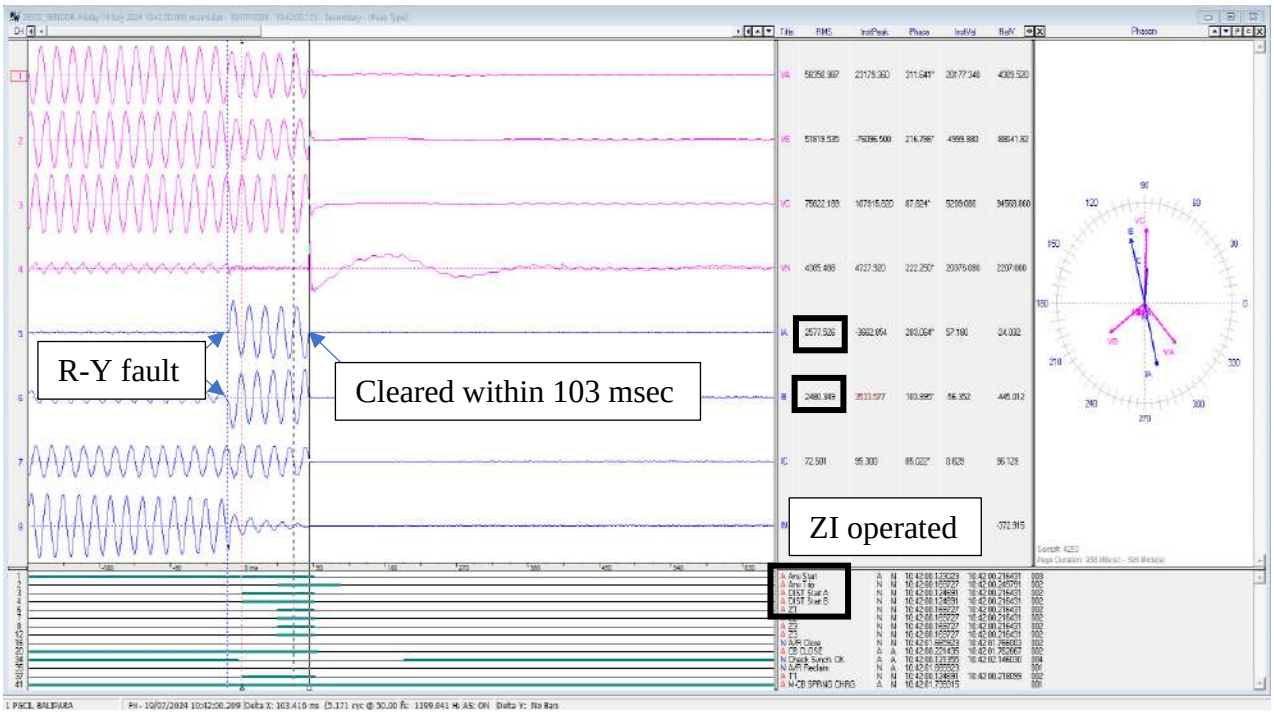
- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.
- Healthiness of protection system needs to be ensured at all times.
- Periodic review of protection settings needs to be conducted.

Annexure 1: Sequence of Events as per SCADA

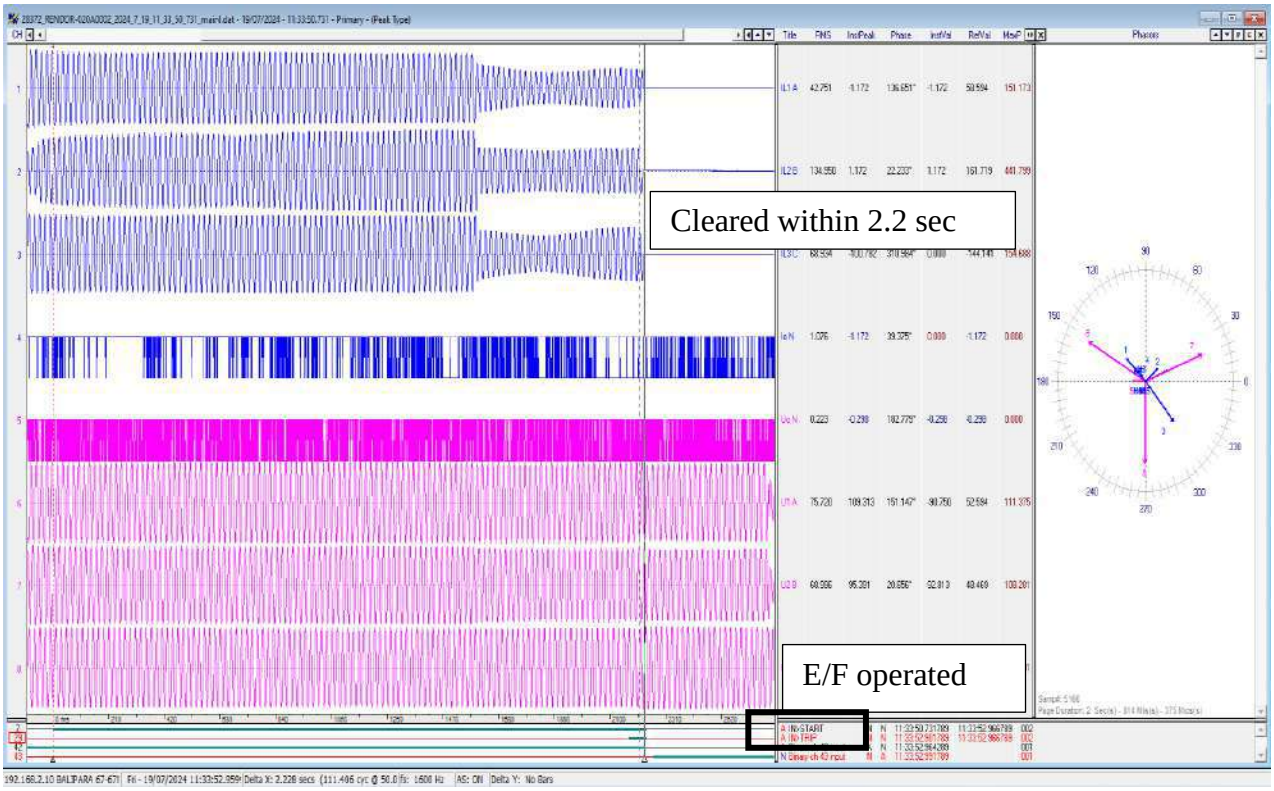
AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
ARUNCH	1C	TENGA_AR	TENGA CB 132Kv LINE TO BALIP OPEN	19 Jul 2024 10:43:25:000	19 Jul 2024 10:43:19:000	5.87E+08
ARUNCH	1C	TENGA_AR	TENGA CB 132Kv LINE TO DIKSH OPEN	19 Jul 2024 10:43:25:000	19 Jul 2024 10:43:20:000	4.81E+08
AEGCL	1C	BALIP_PG	BALIPARA CB 132Kv LINE TO TENGA OPEN	19 Jul 2024 10:43:25:000	19 Jul 2024 10:43:20:000	1.66E+08
AEGCL	1C	BALIP_PG	BALIPARA CB 132Kv LINE TO TENGA CLOSED	19 Jul 2024 10:43:28:000	19 Jul 2024 10:43:21:000	7.05E+08
ARUNCH	1C	KMENG_NO	KAMENG CB 132 KV COUPLER (07) OPEN	19 Jul 2024 10:43:34:000	19 Jul 2024 10:43:23:000	1.88E+08
AEGCL	1C	TINSU_AS	TINSUKIA CB 220/132 T1 (PRIM) BETWEEN	19 Jul 2024 10:44:40:000	19 Jul 2024 10:44:19:000	7.9E+08
NAGALD	1C	DIMAP_NA	DIMAPUR NAGARJAN CB 33Kv LOAD-1 CLOSED	19 Jul 2024 10:48:20:000	19 Jul 2024 10:47:58:000	8.2E+08
ARUNCH	1C	KMENG_NO	KAMENG CB 132Kv LINE-1 TO KHUPI OPEN	19 Jul 2024 10:48:25:000	19 Jul 2024 10:48:19:000	7.41E+08
MEECL	1C	NANGA_ME	NANGALBIBRA CB 33Kv LOAD RONGJ OPEN	19 Jul 2024 10:55:28:000	19 Jul 2024 10:48:47:000	64000000
MEECL	1C	NANGA_ME	NANGALBIBRA CB 33Kv LOAD RONGJ CLOSED	19 Jul 2024 10:57:32:000	19 Jul 2024 10:50:48:000	1.22E+08
ARUNCH	1C	KMENG_NO	KAMENG CB 132 KV COUPLER (07) CLOSED	19 Jul 2024 10:51:53:000	19 Jul 2024 10:51:44:000	3.89E+08
AEGCL	1C	CHAPA_AS	CHAPAKHOWA CB 132/33 T2 (PRIM) OPEN	19 Jul 2024 10:53:58:000	19 Jul 2024 10:53:48:000	5.8E+08
AEGCL	1C	TINSU_AS	TINSUKIA CB 220/132 T1 (SEC) CLOSED	19 Jul 2024 11:02:30:000	19 Jul 2024 11:02:22:000	8.9E+08

Annexure 2: DR Snapshot

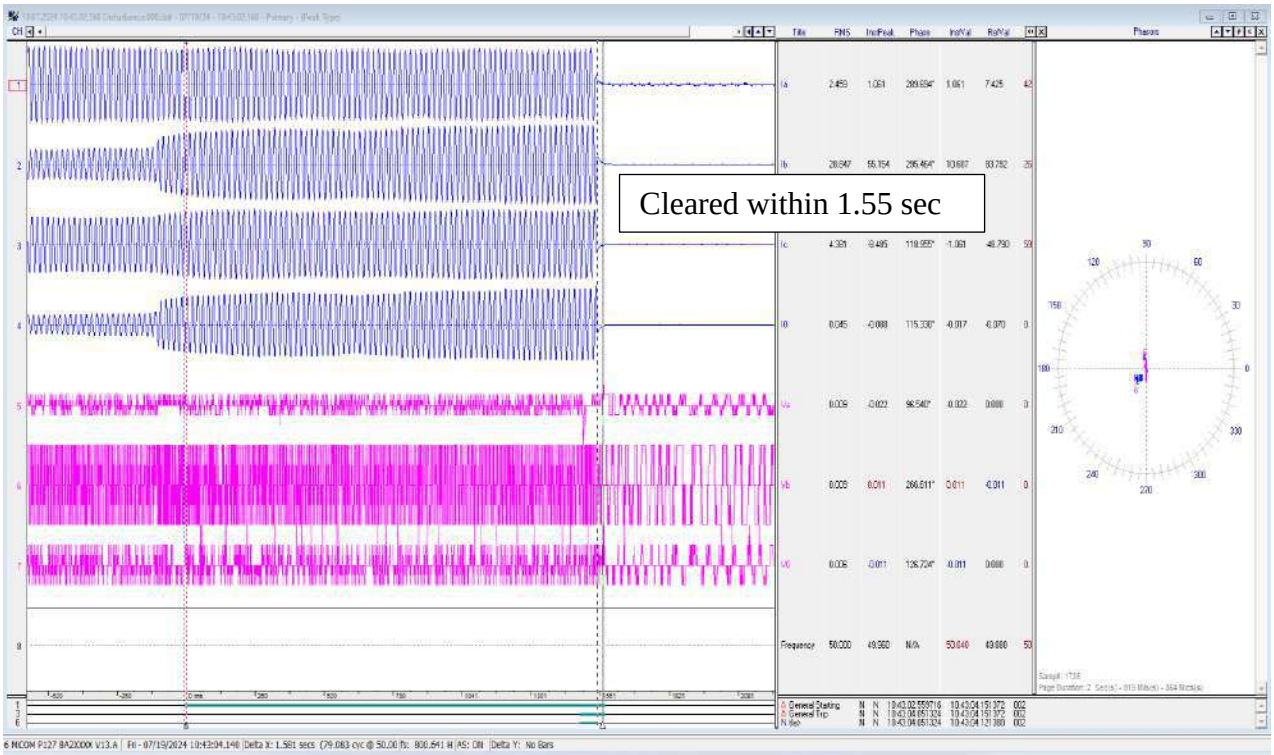
2.1 DR snapshot of Balipara end for 132 kV Balipara-Tenga line



2.2 DR snapshot of Tenga end for 132 kV Balipara-Tenga line



2.3.DR snapshot of 132 kV Kameng Bus coupler



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 Deomali area of Arunachal Pradesh 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))

Date (दिनांक**):25-07-2024**

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

   Deomali area of Arunachal Pradesh Power System was connected with rest of NER Grid via 220 kV AGBPP-Deomali line.

   At 11:17 Hrs of 19-07-2024, 220 kV AGBPP-Deomali line tripped. Due to tripping of this element, Deomali area of Arunachal Pradesh power System was isolated from NER Grid and collapsed due to no source available in this area.

   Power supply was extended to Deomali area of Arunachal Pradesh Power System by charging 220 kV AGBPP-Deomali line at Hrs of 19.07.2024.

2. **Time and Date of the Event (**घटना का स मय और दिनांक**):** 11:17 Hrs of 19-07-2024
3. **Event Category (**ग्रिड **घटना का प्रकार):** GD-I
4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Deomali area of Arunachal Pradesh
5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	49.93	2483	2882
Post Event (घटना के बाद)	49.93	2508	2861

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 1 MW occurred. There was no generation loss.
7. **Duration of interruption (रुकावट की अवधि): min**
8. **Network across the affected area (प्रभावित क्षेत्र का नक्शा):**

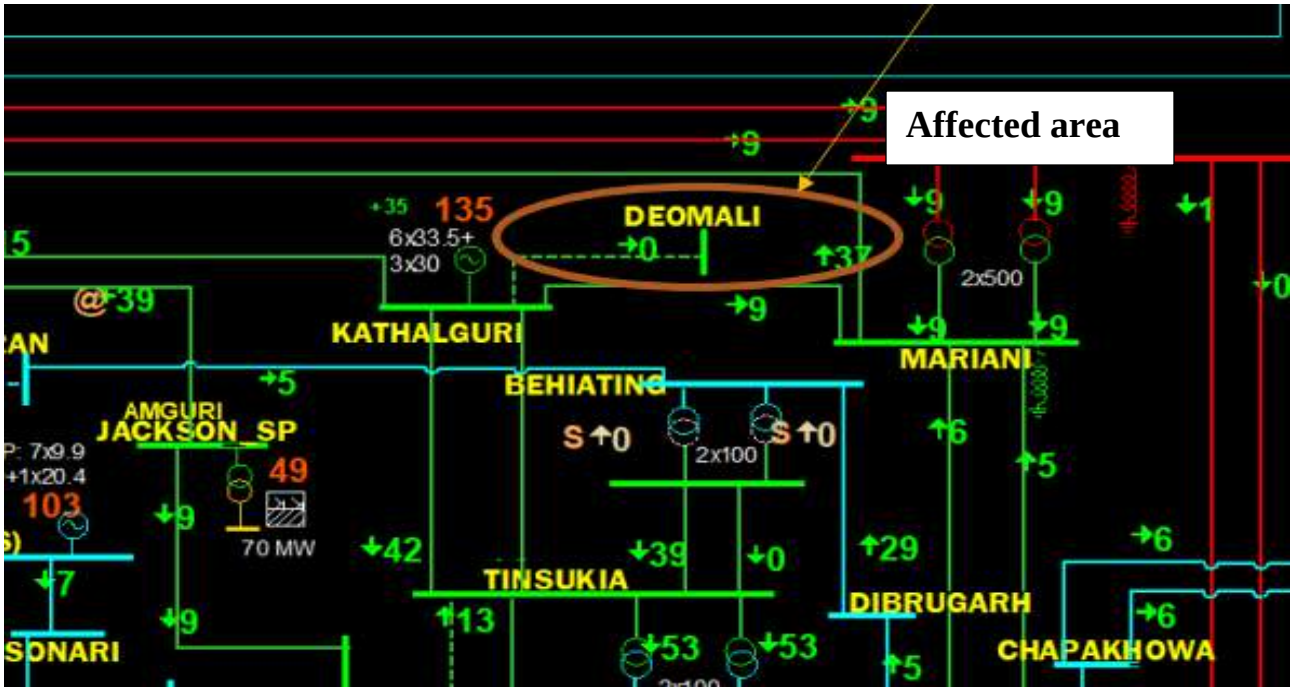


Figure: Network across the affected area

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	220 kV AGBPP-Deomali Line	11:17	-	DP, ZII, Y-B	No tripping (radial)

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

As per EL data, Y-B fault (Iy-4.72 kA, Ib-4.75 kA) in 220 kV AGBPP-Deomali line initiated at 11:17:08.014 Hrs and cleared within 387 msec on operation of DP, ZII from AGBPP end. There was no tripping from Deomali end (radial).

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

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

- Power supply was extended to Dhemaji and Silapathar areas of Assam Power System by charging 132 kV North Lakhimpur-Dhemaji Line at 13:57 Hrs of 14.05.2024.

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)	**DoP AP**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**DoP AP**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**DoP AP**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	-
5.	**Any other non-compliance**		-

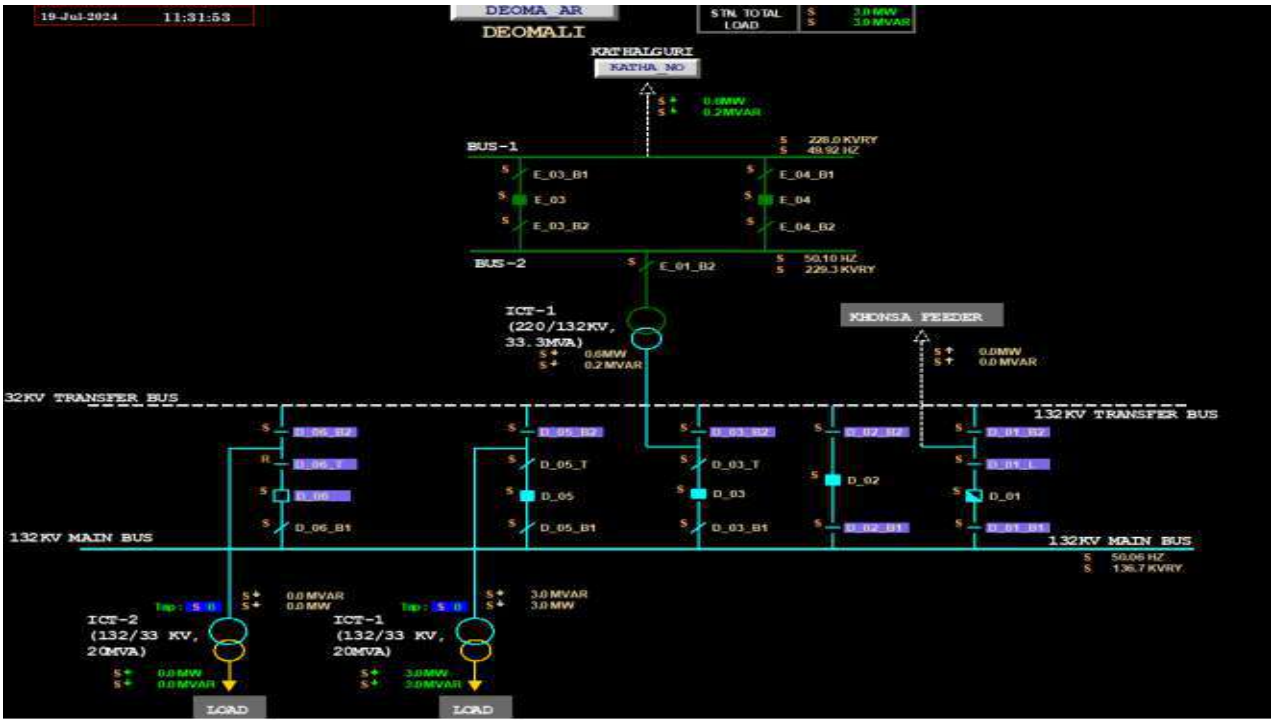
15. **Key Lessons Learnt (प्रमुख अधिगम बिंदु):**

- Proper patrolling and maintenance related activities as per CEA regulations needs to be carried out by DoP AP.

Annexure 1: Sequence of Events as per SCADA

AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
ARUNCH	1C	TENGA_AR	TENGA CB 132Kv LINE TO KHUPI OPEN	19 Jul 2024 11:05:21:000	19 Jul 2024 11:05:10:000	1.8E+08
TSECL	1C	BARMU_TE	BARMURA CB 132Kv LINE-1 TO JIRAN OPEN	19 Jul 2024 12:12:25:000	19 Jul 2024 11:12:15:000	1.45E+08
NAGALD	1C	MOKOK_NA	MOKOKCHUNG CB 66/33 T3 (PRIM) CLOSED	19 Jul 2024 11:13:24:000	19 Jul 2024 11:13:18:000	5.82E+08
AEGCL	1C	KATHA_NO	KATHALGURI CB 220Kv LINE-1 TO DEOMA OPEN	19 Jul 2024 11:17:09:000	19 Jul 2024 11:15:42:000	6.62E+08
AEGCL	1C	LAKHI_AS	NORTH LAKHIMPUR CB 132Kv LINE TO DHEMA OPEI	19 Jul 2024 11:19:42:000	19 Jul 2024 11:19:37:000	5.38E+08
AEGCL	1C	GOHPU_AS	GOHPUR CB 132Kv LINE-2 TO LAKHI CLOSED	19 Jul 2024 12:23:27:000	19 Jul 2024 11:23:23:000	2.47E+08
AEGCL	1C	GOHPU_AS	GOHPUR CB 132Kv LINE-2 TO LAKHI OPEN	19 Jul 2024 12:27:45:000	19 Jul 2024 11:27:45:000	89000000
MEECL	1C	NANGA_ME	NANGALBIBRA CB 33Kv LOAD RONGJ CLOSED	19 Jul 2024 11:38:24:000	19 Jul 2024 11:31:41:000	7.45E+08

Annexure 2: SLD of the effected SS



Annexure 3: EL Snapshot of AGBPP end for 220 kV AGBPP-Deomali Line

Friday 19 July 2024 11:17:08.653	Fault Recorded	
Description	DEOMALI LINE	
Plant reference	220KV KATHALGURI	
Model number	P442916B6S0720M	
Address	001 Column:01 Row:00	
Event type	Fault record	
Event Value	0	
Active Group	1	
Faulted Phase	1110110	
Start Elements	00000000010000000000000001	
Tripped Elts	00000000000000100000000000C	
Time Stamp	Friday 19 July 2024 11:17:08.014	Fault initiation time
Fault Alarms	00000100000000	
System Frequency	49.98 Hz	
Fault Duration	386.8ms	Fault clearing time
Relay Trip Time	80.03ms	
Fault Location	16.97km	
IA	7.440 A	
IB	4719 A	Y-B phase fault
IC	4756 A	
VAN	125.7kV	
VBN	69.67kV	
VCN	67.34kV	
Fault Resistance	906.5mOhm	
Fault in Zone	Zone 2	DP, ZII operated
Tripped Elts 2	0000000000000000	
Start Elements 2	000000000000	
Evt Unique Id	8358	

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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 Dhemaji and Silapathar areas of Assam 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))

Date (दिनांक**):25-07-2024**

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

   Dhemaji and Silapathar areas of Assam Power System was connected with rest of NER Grid via 132 kV North Lakhimpur-Dhemaji line.

   At 11:19 Hrs of 19-07-2024, 132 kV North Lakhimpur-Dhemaji line tripped. Due to tripping of this element, Dhemaji and Silapathar areas of Assam Power System were isolated from NER Grid and collapsed due to no source available in these areas.

   Power supply was extended to Dhemaji and Silapathar areas of Assam Power System by charging 132 kV North Lakhimpur-Dhemaji Line at 11:33 Hrs of 19.07.2024.

2. **Time and Date of the Event (**घटना का स मय और दिनांक**):** 11:19 Hrs of 19-07-2024
3. **Event Category (**ग्रिड **घटना का प्रकार):** GD-I
4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Dhemaji and Silapathar area of Assam Power System
5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	49.93	2500	2886
Post Event (घटना के बाद)	49.93	2512	2832

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 36 MW occurred. There was no generation loss.
7. **Duration of interruption (रुकावट की अवधि): 14 min**
8. **Network across the affected area (प्रभावित क्षेत्र का नक्शा):**

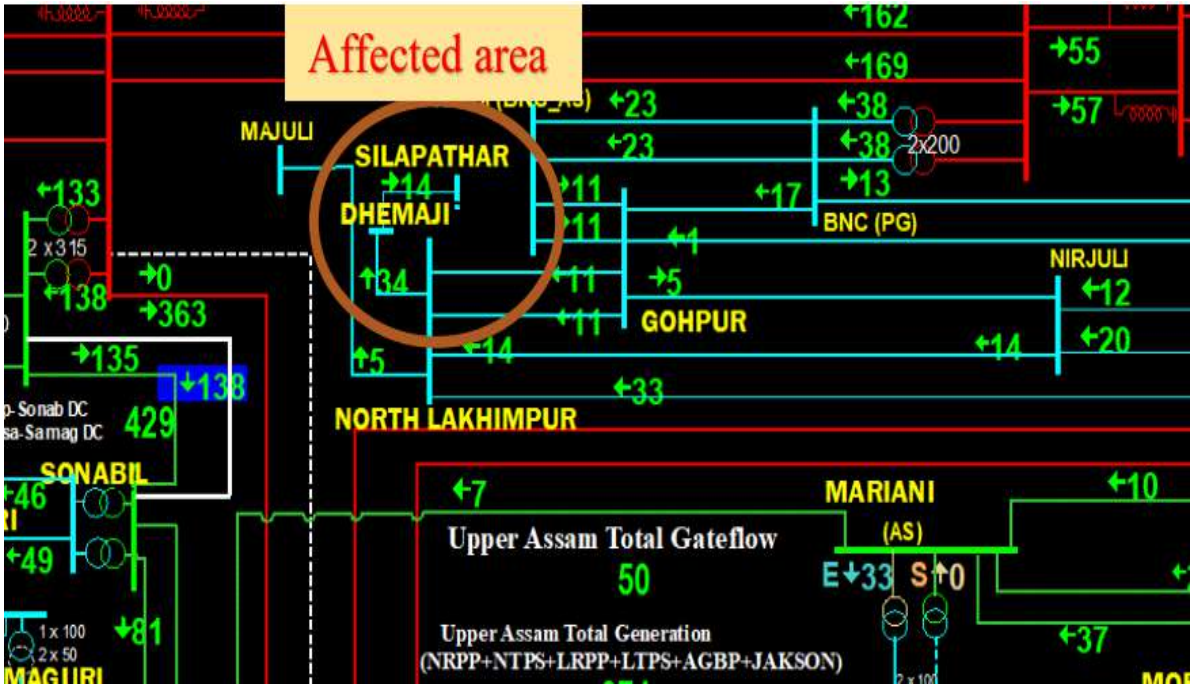


Figure: Network across the affected area

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 North Lakhimpur-Dhemaji Line	11:19	11:33	DP, ZI, Y-E, FD: 49.6 Km	No tripping (radial)

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

Proper analysis could not be done due to non-submission of FIR/DR/EL.

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

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

- Power supply was extended to Dhemaji and Silapathar areas of Assam Power System by charging 132 kV North Lakhimpur-Dhemaji Line at 13:57 Hrs of 14.05.2024.

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

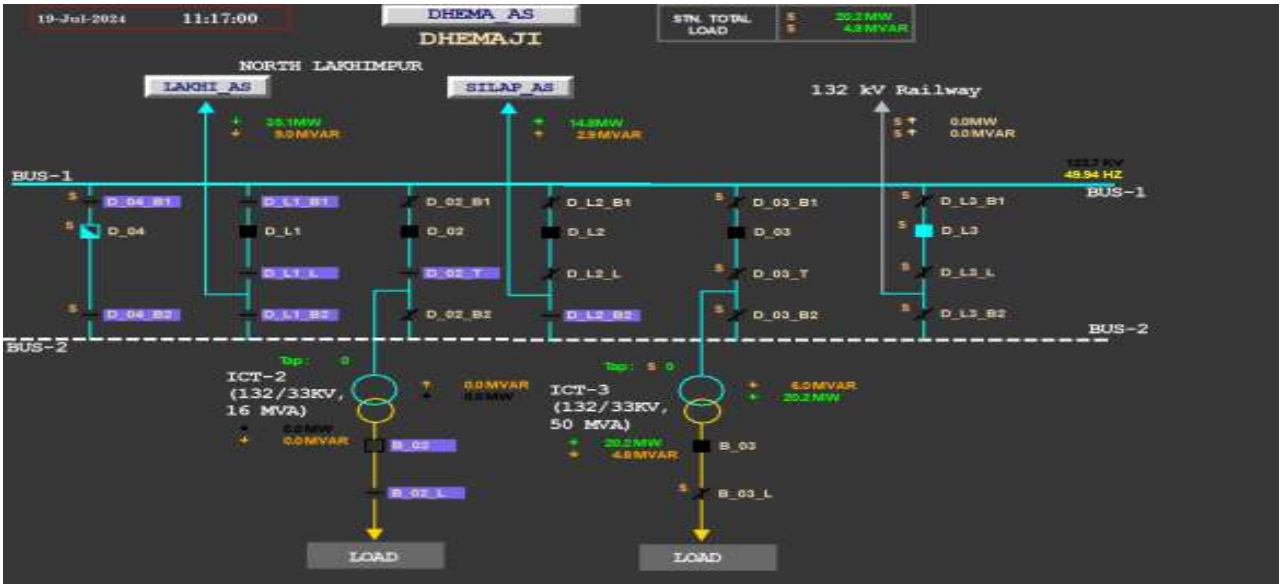
Sl.No.	Issues	Regulation Non-Compliance	Utilities
1.	**Flash Report received within 8hrs?**	IEGC section 37.2 (b)	**AEGCL**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**AEGCL**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)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

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

- Proper patrolling and maintenance related activities as per CEA regulations needs to be carried out by AEGCL.

- Availability of AR scheme to avoid grid Disturbance due to transient nature of fault.

Annexure 1: Sequence of Events as per SCADA-SOE not recorded
Annexure 2: SLD of the effected SS



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CIN : U40105DL2009GOI188682, Website : www.nerldc.in, E-mail : nerldc@grid-india.in, Tel.: 0364-2537470/427, Fax: 03642537486

Detailed Report of Grid Disturbance in Rengpang area in Manipur 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))

Date (दिनांक**):26-07-2024**

1. Event Summary (घटना का सारांश):

Rengpang area of Manipur Power System was connected with rest of NER Grid through 132 kV Loktak – Rengpang line. 132 kV Jiribam-Rengpang line was under outage since 18:18 Hrs of 17.11.2023.

At 18:05 Hrs of 20-07-2024, 132 kV Loktak – Rengpang line tripped. Due to tripping of this element, Rengpang area of Manipur Power System was isolated from NER Grid and collapsed due to no source available this area.

Power supply was extended to Rengpang area of Manipur Power System by charging 132 kV Loktak – Rengpang line at 19:18 Hrs on 22-07-2024.

2. Time and Date of the Event (घटना का स मय और दिनांक**):** 18:05 Hrs of 20-07-2024

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

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Rengpang area of Manipur Power System.

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50.03	3408	3004
Post Event (घटना के बाद)	50.03	3405	3034

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 Jiribam-Rengpang line was under outage since 18:18 Hrs of 17.11.2023.
Weather Condition (मौसम स्थिति)	Normal

2. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 3 MW.

3. **Duration of interruption (रुकावट की अवधि): 2 Days 13 min**

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

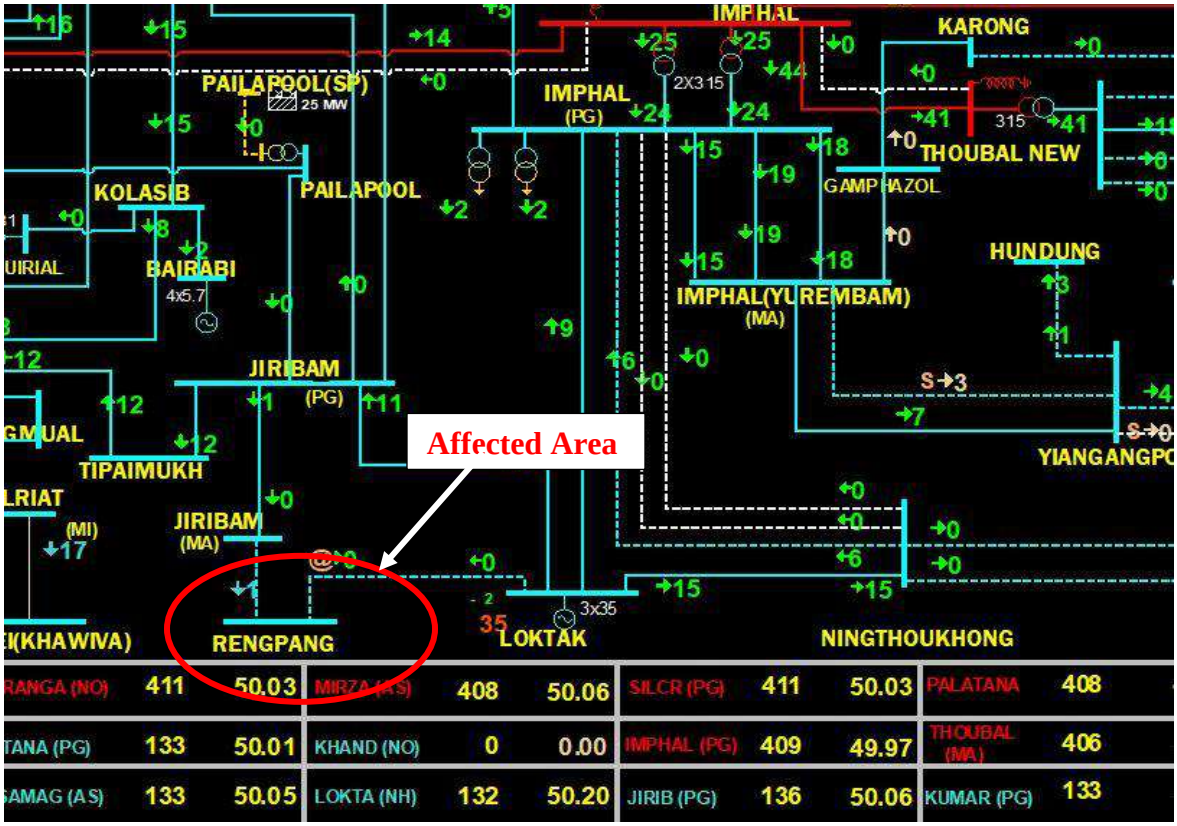


Figure: Network across the affected area

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

6. **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	132kV Loktak-Rengpang Line	18:05	19:18 Hrs of 22-07-2024	O/C operated (ZII pickup)	No tripping (radial)

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

As per DR analysis, R-E fault (Ib-2.28 kA, In-2.28 kA) initiated at 18:05:42.474 Hrs and cleared within 64 msec on operation of O/C protection from Loktak end. DP, ZII pickup at 18:05:42.499 Hrs. There was no tripping from Rengpang end.

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

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

- Power supply was extended to Rengpang area of Manipur Power System by charging 132 kV Loktak – Rengpang line at 19:18 Hrs on 22-07-2024.

10. 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)	**MSPCL**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**MSPCL, NHPC**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**MSPCL**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**No violation**
5.	**Any other non-compliance**		-

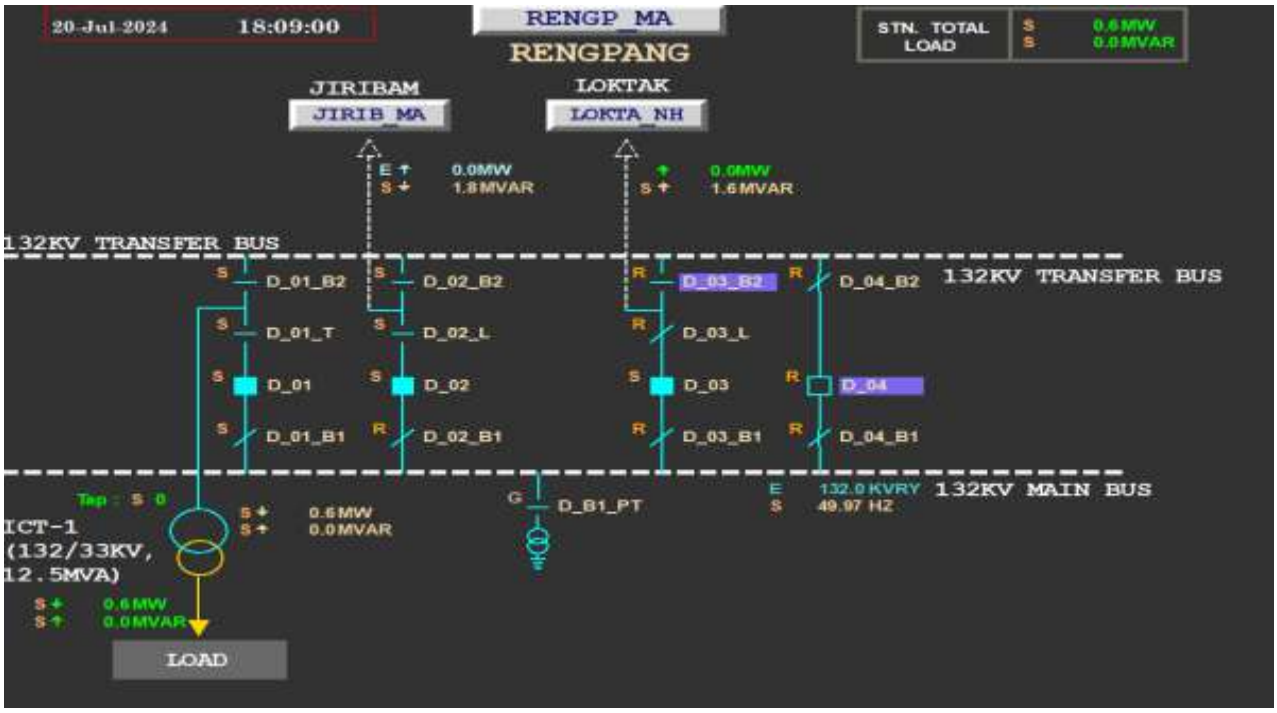
11. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.

Annexure 1: Sequence of Events

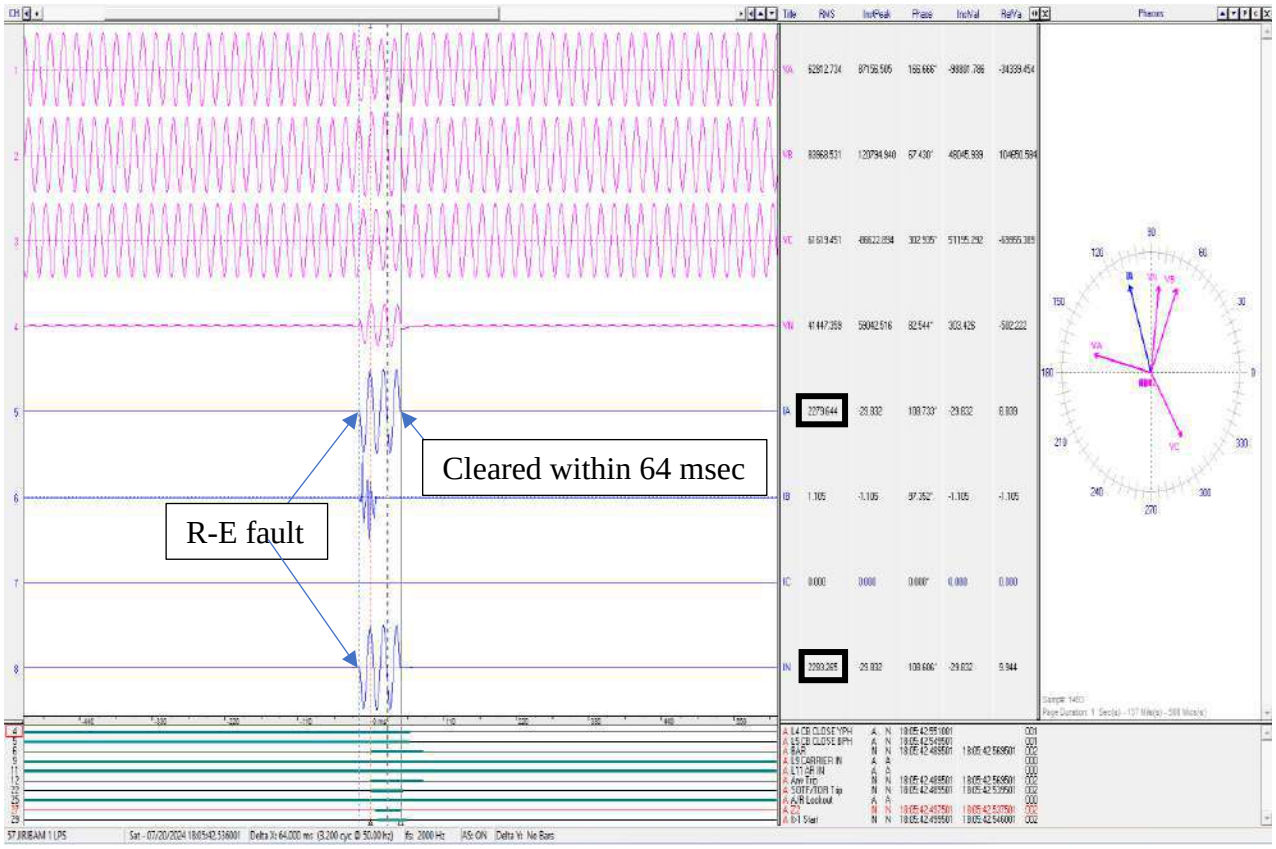
AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
AEGCL	1C	SARUP_AS	SARUPATHAR CB 132Kv LINE TO GOLAG OPEN	20 Jul 2024 08:30:27:000	20 Jul 2024 08:30:14:000	9.3E+08
AEGCL	1C	GHORA_AS	GHORAMARI CB 132Kv LINE TO DEPOT CLOSED	20 Jul 2024 08:30:37:000	20 Jul 2024 08:30:30:000	8.76E+08
AEGCL	1C	GHORA_AS	GHORAMARI CB 132Kv LINE TO DEPOT BETWEEI	20 Jul 2024 08:32:13:000	20 Jul 2024 08:32:07:000	1.85E+08
MSPCL	1C	LOKTA_NH	LOKTAK CB 132Kv LINE TO RENGP OPEN	20 Jul 2024 18:05:46:000	20 Jul 2024 08:36:22:000	6.21E+08
AEGCL	1C	MISA__PG	MISA CB 220Kv LINE-1 TO SAMAG OPEN	20 Jul 2024 08:45:26:000	20 Jul 2024 08:45:24:000	13000000
ARUNCH	1C	RANGA_NO	PANYOR CB 11 KV UNIT (H03) OPEN	20 Jul 2024 08:47:34:000	20 Jul 2024 08:47:32:000	6E+08
MEECL	1C	KHLEI_ME	KHLEIHRIAT CB 132Kv LINE TO NEIGR OPEN	20 Jul 2024 09:57:44:000	20 Jul 2024 08:59:59:000	4.05E+08

Annexure 2: SLD of affected S/S



Annexure 3: Disturbance recorder snips showing faults and digital signals

3.1. DR Snapshot of Loktak for 132 kV Loktak-Rengpang Line



3.2 EL Snapshot of Loktak for 132 kV Loktak-Rengpang Line

Saturday 20 July 2024 18:05:42.539	Z2 OFF
Saturday 20 July 2024 18:05:42.539	DIST Start A OFF
Saturday 20 July 2024 18:05:42.501	I>1 Start ON
Saturday 20 July 2024 18:05:42.499	Z2 ON
Saturday 20 July 2024 18:05:42.491	DIST Start A ON
Saturday 20 July 2024 18:05:42.491	Any Trip ON
Saturday 20 July 2024 18:05:42.491	DIST Fwd ON
Saturday 20 July 2024 18:05:42.491	AR Lockout Shot> ON
Saturday 20 July 2024 18:05:42.491	Any Start ON
Saturday 20 July 2024 18:05:42.491	Any Trip A ON
Saturday 20 July 2024 18:05:42.491	SOTF/TOR Trip ON
Saturday 20 July 2024 18:05:42.491	Output Contacts1
Saturday 20 July 2024 18:05:42.491	3P Trip ON
Saturday 20 July 2024 18:05:42.491	Any Trip B ON
Saturday 20 July 2024 18:05:42.491	Any Trip C ON
Saturday 20 July 2024 18:05:42.477	I> Start Any A ON

Saturday 20 July 2024 18:05:42.709	**Fault Recorded**
Description	NPS JIRIBAM 1
Plant reference	JIRIBAM 1 LPS
Model number	P442312B1A0070B
Address	003 Column:01 Row:00
Event type	Fault record
Event Value	0
Active Group	1
Faulted Phase	111001
Start Elements	0100000000000011
Tripped Elts	00001000000000000000000001
Time Stamp	Saturday 20 July 2024 18:05:42.491
Fault Alarms	100001000
System Frequency	51.01 Hz
Fault Duration	56.66ms
Relay Trip Time	79.91ms
Fault Location	31.94km
IA	2289 A
IB	2.695 A
IC	7.393 A
VAN	61.32kV
VBN	85.07kV
VCN	61.49kV
Fault Resistance 8.196	Ohm
Fault in Zone Zone	2

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 Karong area of Manipur 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):29-07-2024

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

Karong area of Manipur Power System is connected with rest of NER Grid through 132 kV Imphal (MSPCL)-Karong and 132 kV Karong-Kohima lines. Prior to the event, 132 kV Imphal(MSPCL)-Karong line was under idle charged condition since 17:05 Hrs of 20.07.2024.

At **10:15 Hrs of 21.07.2024**, while closing the breaker at Karong end for 132 kV Imphal(MSPCL)-Karong line, 132 kV Karong-Kohima Line tripped due to tree branches which came in touch with the Bus isolator as informed by MSPCL. Due to tripping of this line, Karong area of Manipur Power System got isolated from NER Grid and collapsed due to no source available in this area.

Power supply was extended to Karong area of Manipur Power System by charging 132 kV Karong-Kohima Line at 11:36 Hrs of 21.07.2024.

2. **Time and Date of the Event (घटना का स मय और दिनांक):** 10:15 Hrs of 21-07-2024
3. **Event Category (ग्रिड घटना का प्रकार):** GD-I
4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Karong area of Manipur
5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	49.93	2496	2564
Post Event (घटना के बाद)	49.93	2503	2555

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 Yurembam-Karong line was idle charged condition since 17:05 hrs of 20.07.2024
Weather Condition (मौसम स्थिति)	Normal

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 9 MW. There was no generation loss.

7. **Duration of interruption (रुकावट की अवधि): 1 Hr 21 min**

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

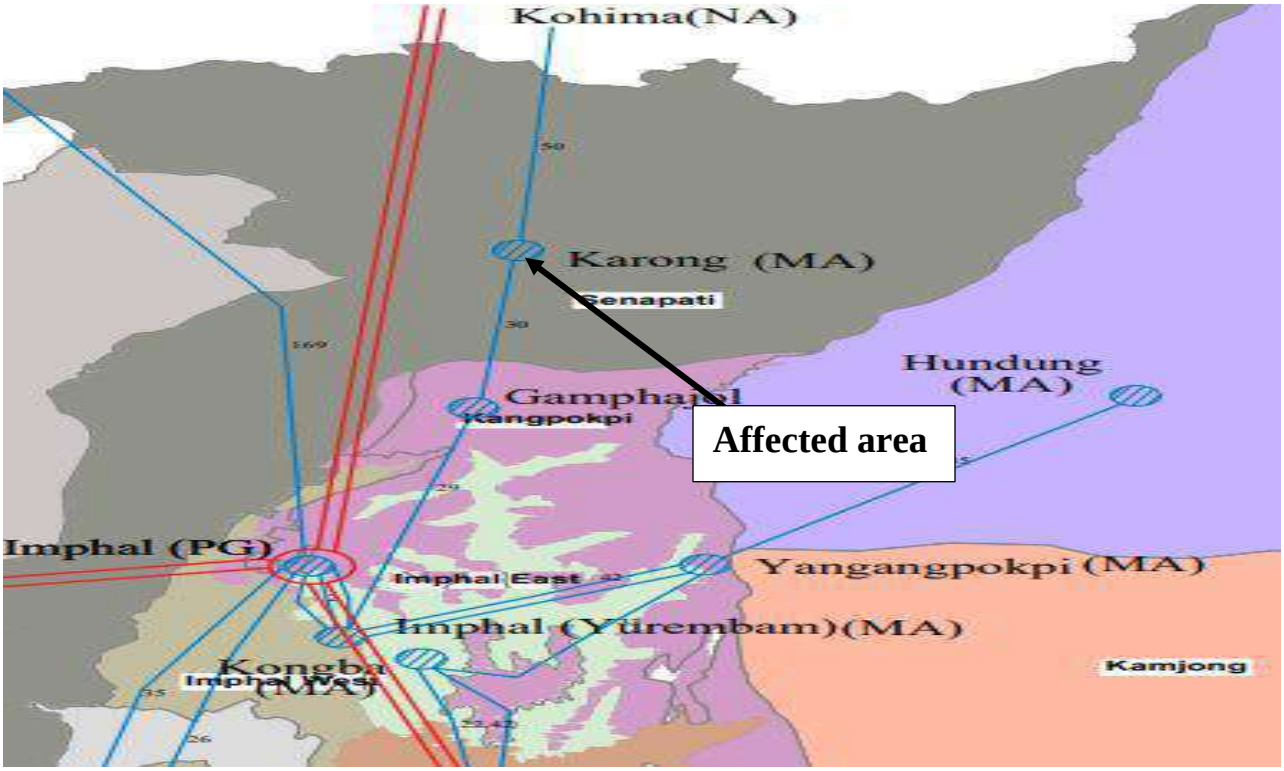


Figure 1: Network across the affected area

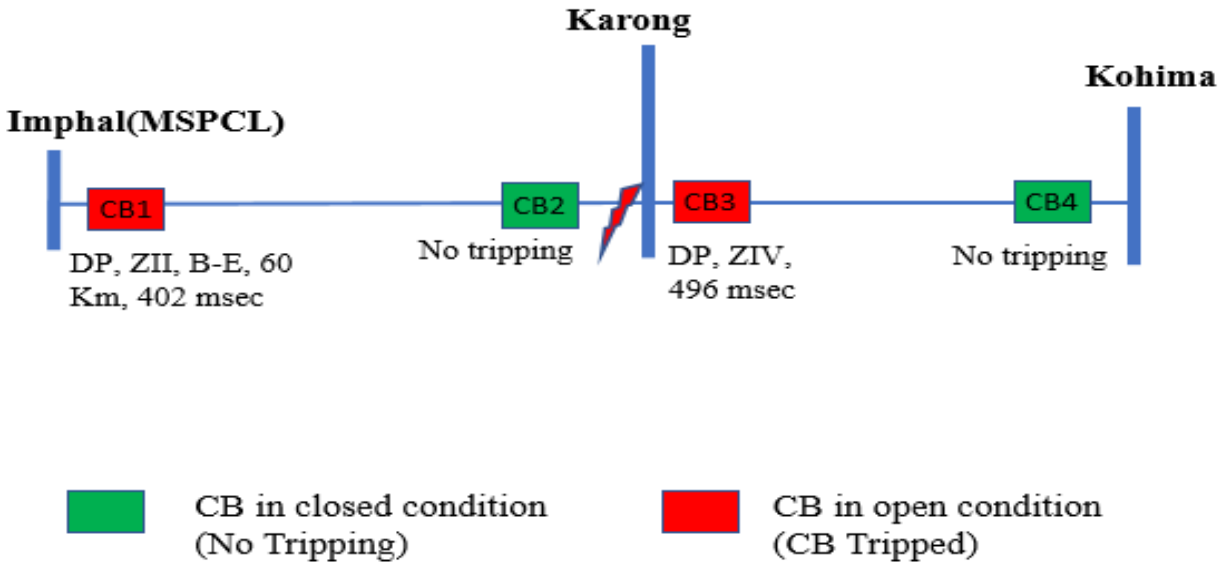
9. **Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NIL**

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 Karong-Kohima Line	10:15	11:36	DP, ZIV, B-E	No tripping

2	132 kV Imphal(MSPCL)-Karong Line	10:15	11:42 (Idle charged from Yurembam end)	DP, ZI, B-E, 60 Km	No tripping

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



As per EL file of Imphal(MSPCL) for 132 kV Imphal(MSPCL)-Karong line, B-phase (Ib- 1.55 kA) fault initiated at 10:15:03.285 Hrs and cleared within 402 msec on operation of DP, ZII.

As per EL of Karong end for 132 kV Karong-Kohima line, B-E fault cleared on operation of DP, ZIV within 496 msec from Karong end. There was no tripping from Kohima end. This clearly indicates that fault is in reverse direction.

As per information from MSPCL, while closing of Karong CB for 132 kV Imphal(MSPCL)-Karong line, tripping occurred due to tree branches coming in contact with the Bus isolator of Karong for 132 kV Imphal(MSPCL)-Karong line leading to blackout of Karong area of Manipur.

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

- Delayed fault clearance from Karong end for 132 kV Imphal(MSPCL)-Karong line led to tripping of 132 kV Karong-Kohima line.
- SOE not recorded for tripping of 132 kV Karong-Kohima line. The same needs attention from DoP Nagaland/SLDC Nagaland team.

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

Power supply was extended to Karong area of Manipur Power System by charging 132 kV Karong-Kohima Line at 11:36 Hrs of 21.07.2024.

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)	**MSPCL**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**MSPCL**
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**		-

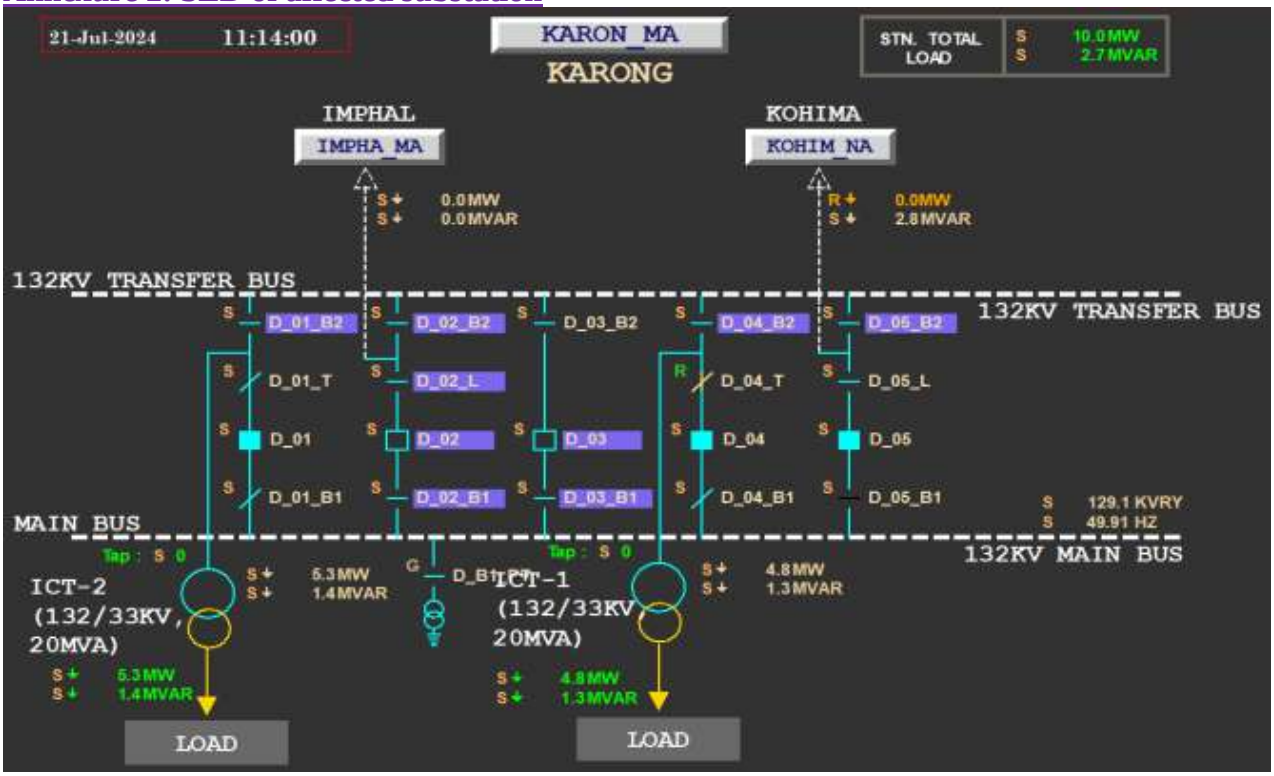
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.
- Healthiness of protection system needs to be ensured at all times.

Annexure 1: Sequence of Events as per SCADA

AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
-------	----------	--------	----------	----------	----------	----------
AEGCL	1C	LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ CLOSED	21 Jul 2024 10:02:03:000	21 Jul 2024 10:01:57:000	9.51E+08
AEGCL	1C	LAKWA_AS	LAKWA (LTPS) CB 11 KV UNIT G5 CLOSED	21 Jul 2024 10:14:22:000	21 Jul 2024 10:14:07:000	2.03E+08
MSPCL	1C	IMPHA_MA	IMPHAL(YUREMBAM) CB 132Kv LINE-1 TO KARON OPEN	21 Jul 2024 10:15:33:000	21 Jul 2024 10:15:28:000	3.83E+08
MEECL	1C	RONGK_ME	RONGKHON CB 33Kv LOAD-1 TURA_ OPEN	21 Jul 2024 10:40:35:000	21 Jul 2024 10:40:28:000	1.6E+08
AEGCL	1C	LANGP_AS	KARBI LONGPI CB 11 KV UNIT (G1) CLOSED	21 Jul 2024 11:37:20:000	21 Jul 2024 11:36:55:000	6.04E+08
MSPCL	1C	IMPHA_MA	IMPHAL(YUREMBAM) CB 132Kv LINE-1 TO KARON CLOSED	21 Jul 2024 11:42:32:000	21 Jul 2024 11:42:27:000	3.11E+08
AEGCL	1C	MARIA_PG	MARIANI CB 220Kv LOAD-1 MARIA OPEN	21 Jul 2024 12:05:54:000	21 Jul 2024 12:05:53:000	7.48E+08
AEGCL	1C	MARIA_PG	MARIANI CB 220Kv LOAD-2 MARIA OPEN	21 Jul 2024 12:06:44:000	21 Jul 2024 12:06:42:000	2.94E+08
NAGALD	1C	NWKOH_KT	NEW KOHIMA(KMTL) CB 402 TIE CB OPEN	21 Jul 2024 12:09:11:000	21 Jul 2024 12:09:08:000	9.46E+08

Annexure 2: SLD of affected substation

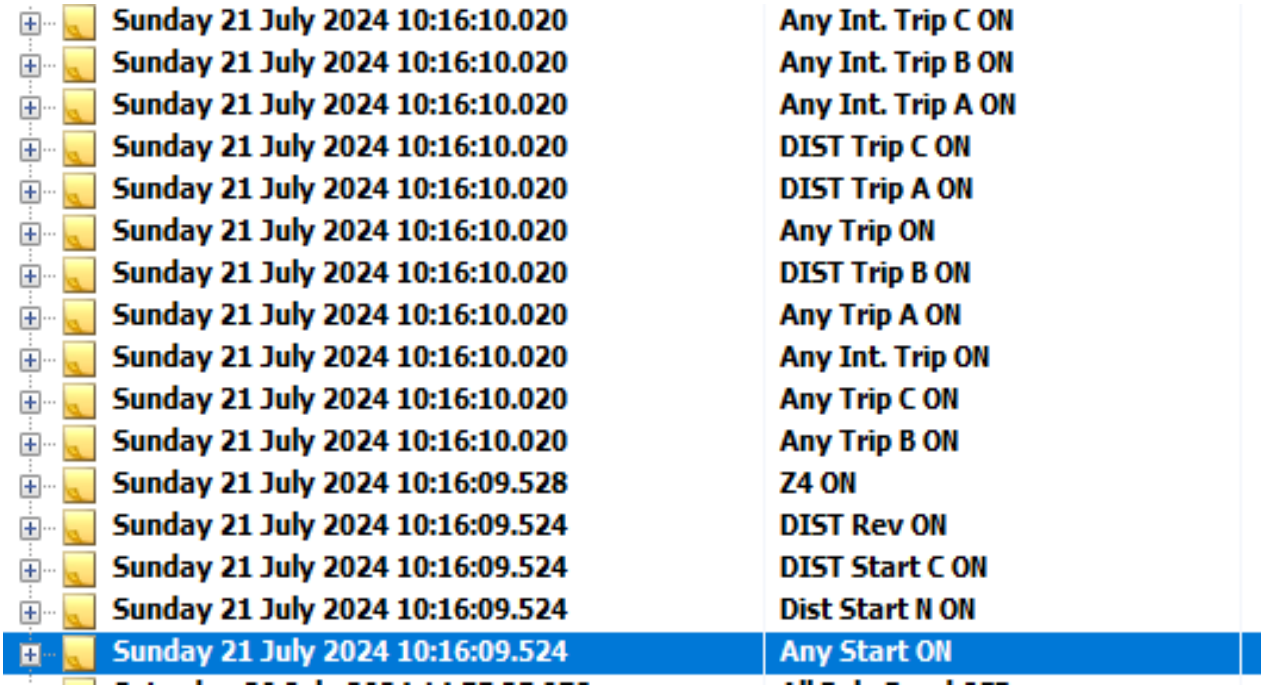


Annexure 3: DR/EL snapshot

3.1 EL snapshot of Imphal end for 132 kV Imphal-Karong line

Sunday 21 July 2024 10:15:03.959	Fault Recorded	
Description	P442 - 21M	
Plant reference	132 KV BAY -03	
Model number	P44231EB3M0500K	
Address	001 Column:01 Row:00	
Event type	Fault record	
Event Value	0	
Active Group	1	
Faulted Phase	1111100	
Start Elements	00000000010000000000000001	
Tripped Elts	00000000000000100000000000(	
Time Stamp Sunday 21 July 2024	10:15:03.285	
Fault Alarms	00000000000000	
System Frequency	49.93 Hz	
Fault Duration	402.2ms	**Fault clearing time**
Relay Trip Time	80.11ms	
Fault Location	60.03km	
IA	56.86 A	
IB	162.4 A	
IC	1553 A	**B-phase fault**
VAN	74.72kV	
VBN	75.43kV	
VCN	67.20kV	
Fault Resistance 1.737	Ohm	
Fault in Zone Zone	2	**ZII operated**
Tripped Elts 2	0000000000000000	
Start Elements 2	000000000000	

3.2 EL snapshot of Karong end for 132 kV Karong-Kohima line



Sunday 21 July 2024 10:16:10.020	Any Int. Trip C ON
Sunday 21 July 2024 10:16:10.020	Any Int. Trip B ON
Sunday 21 July 2024 10:16:10.020	Any Int. Trip A ON
Sunday 21 July 2024 10:16:10.020	DIST Trip C ON
Sunday 21 July 2024 10:16:10.020	DIST Trip A ON
Sunday 21 July 2024 10:16:10.020	Any Trip ON
Sunday 21 July 2024 10:16:10.020	DIST Trip B ON
Sunday 21 July 2024 10:16:10.020	Any Trip A ON
Sunday 21 July 2024 10:16:10.020	Any Int. Trip ON
Sunday 21 July 2024 10:16:10.020	Any Trip C ON
Sunday 21 July 2024 10:16:10.020	Any Trip B ON
Sunday 21 July 2024 10:16:09.528	Z4 ON
Sunday 21 July 2024 10:16:09.524	DIST Rev ON
Sunday 21 July 2024 10:16:09.524	DIST Start C ON
Sunday 21 July 2024 10:16:09.524	Dist Start N ON
Sunday 21 July 2024 10:16:09.524	Any Start ON

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 Kohima area of Nagaland & Karong area of Manipur power system 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**):29-07-2024**

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

Kohima area of Nagaland and Karong area of Manipur Power System are connected with rest of NER Grid through 132 kV Imphal (MSPCL)-Karong, 132 kV Dimapur-Kohima & 132 kV Kohima-Zhadima lines. Prior to the event, 132 kV Yurembam-Karong line was under idle charged condition since 11:42 Hrs of 21.07.2024; 132 kV Kohima – Meluri line was under outage since 10:05 Hrs of 27-09-2023 as S/D was taken by Kohima trans. Div. for dismantling of Tower no. AP 130.

At **12:19 Hrs of 21.07.2024**, 132 kV Dimapur-Kohima & 132 kV Kohima-Zadima lines tripped. Due to tripping of these lines, Kohima and Karong areas got isolated from NER Grid and collapsed due to no source available in these areas.

Power supply was extended to Kohima area of Nagaland & Karong area of Manipur Power System by charging 132 kV Dimapur-Kohima Line at 12:59 Hrs of 21.07.2024.

2. **Time and Date of the Event (**घटना का स मय और दिनांक**):** 12:19 Hrs of 21-07-2024
3. **Event Category** (ग्रिड **घटना का प्रकार**)**:** GD-I
4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Kohima and Karong area
5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50.05	2562	2618
Post Event (घटना के बाद)	50.05	2558	2573

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 Yurembam-Karong line was under idle charged condition since 11:42 Hrs of 21.07.2024; 132 kV Kohima – Meluri line was under outage since 10:05 Hrs of 27-09-2023 as S/D was taken by Kohima trans. Div. for dismantling of Tower no. AP 130.
Weather Condition (मौसम स्थिति)	Rainy

6. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 14 MW in Kohima and 10 MW in Karong area. There was no generation loss.

7. **Duration of interruption (रुकावट की अवधि): 40 min**

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

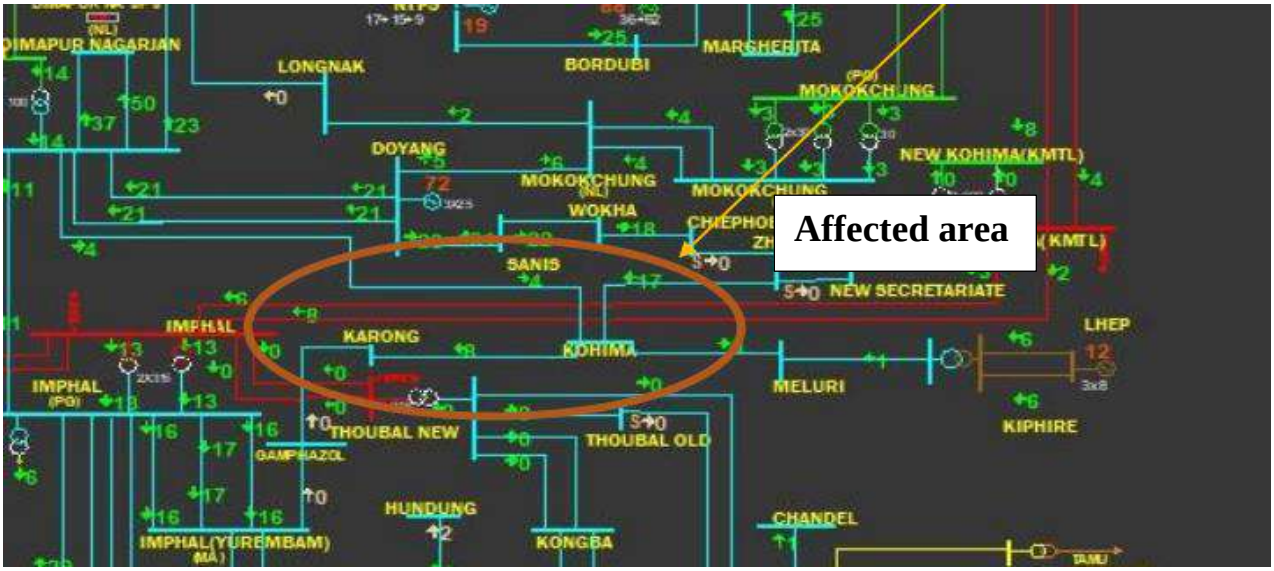


Figure 1: Network across the affected area

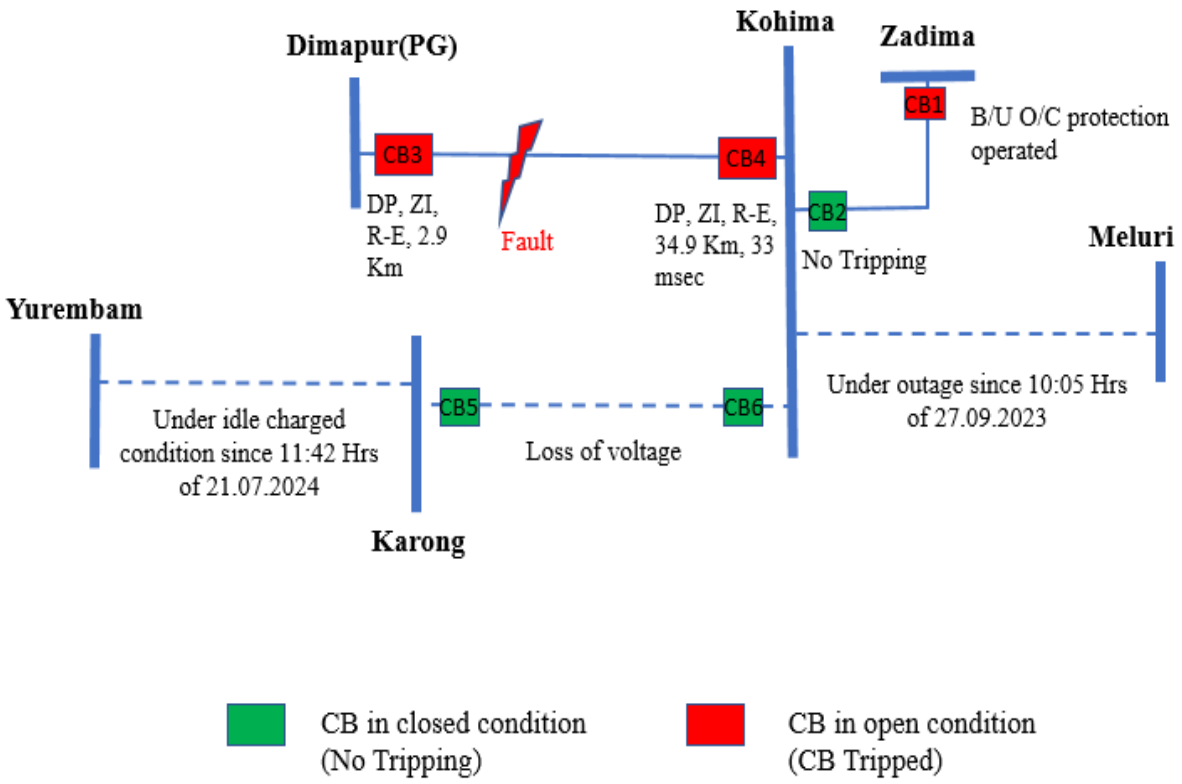
9. **Details of Equipment Failure (if any during the event) (उपकरण विफलता का विवरण): NIL**

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 Dimapur-Kohima Line	12:19	12:59	DP, ZI, R-E, 2.9 Km (no DR submitted)	DP, ZI, R-E, 34.94 Km

2	132 kV Kohima-Zhadima Line	12:19	13:28	No tripping	B/U O/C operated (no DR submitted)

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



As per DR analysis, fault in 132 kV Dimapur-Kohima line initiated at 12:18:33.408 Hrs and cleared within 33 msec on operation of DP, ZI from Kohima end. Also, ZI operated from Dimapur end (as per FIR, no DR submitted).

At the same time, 132 kV Kohima-Zadhima line tripped on B/U O/C protection from Zadhima end (no DR submitted) leading to blackout of Kohima area of Nagaland and radially connected Karong area of Manipur power system.

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

- B/U setting at Zadhima for 132 kV Kohima-Zadhima line needs to be reviewed by DoP Nagaland.
- SOE not recorded for tripping of 132 kV Kohima-Zadhima line.

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

- Power supply was extended to Kohima area of Nagaland & Karong area of Manipur Power System by charging 132 kV Dimapur-Kohima Line at 12:59 Hrs of 21.07.2024.

- Revised BU OC/EF for 132kV Kohima and Chiephobozou at Zhadima Sub-station were implemented on 24.07.2024.

  For 132 kV Kohima Line
  Old setting:
  OC/TMS = 85 % / 0.06
  EF/TMS = 11 % / 0.29
  New setting
  OC/TMS = 75 % / 0.08 [RoT = About 460ms]
  EF/TMS = 10% / 0.38 [RoT = About 920ms]

  For 132 kV Chiephobozou Line
  Old setting:
  OC/TMS = 85 % / 0.07
  EF/TMS = 11 % / 0.3
  New setting
  OC/TMS = 75 % / 0.08 [RoT = About 460ms]
  EF/TMS = 10% / 0.38 [RoT = About 920ms]

- Regarding non recording of DR/EL output at Zhadima sub-station, DoP Nagaland has taken up the issue with concerning contractor/relay engineer for rectification.

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	**POWERGRID, MSPCL, DoP Nagaland**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**MSPCL, DoP Nagaland**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**No violation**
5.	**Any other non-compliance**		**-**

15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

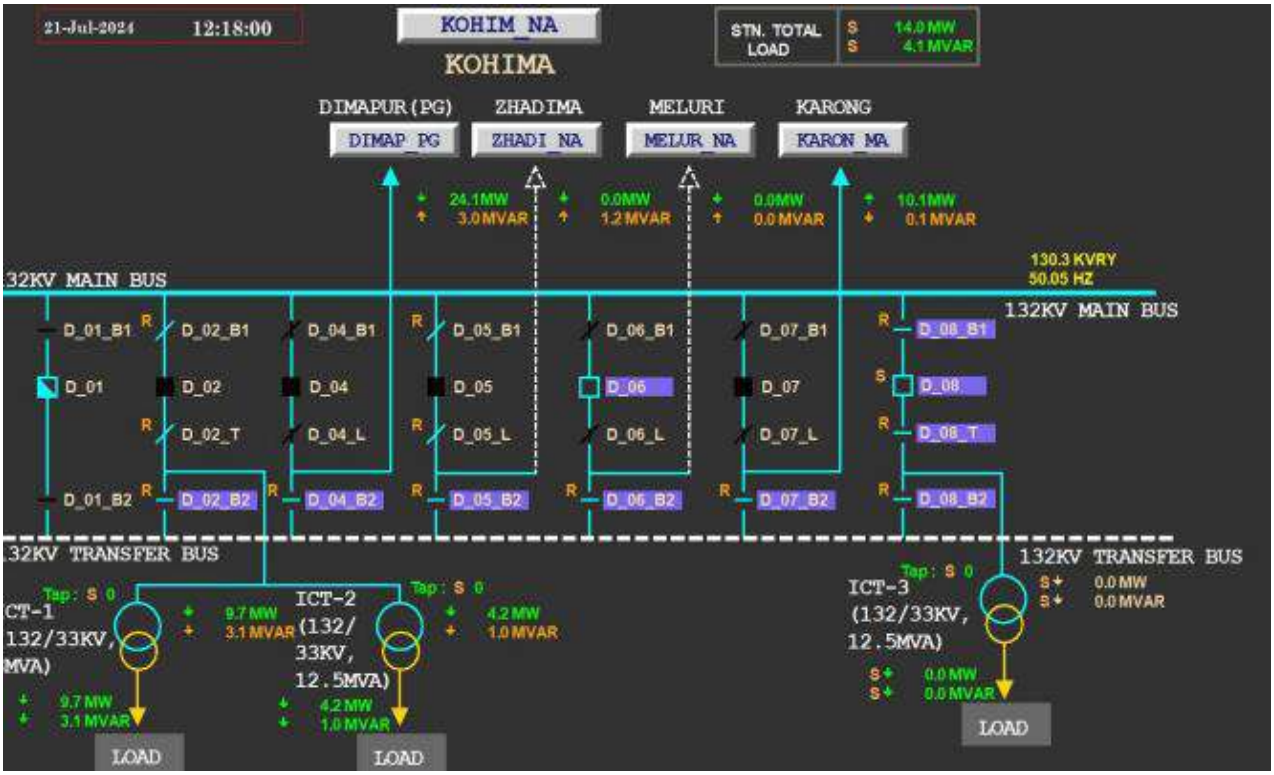
- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.

- Need for preventive maintenance to ensure the healthiness of the protection system.

Annexure 1: Sequence of Events as per SCADA

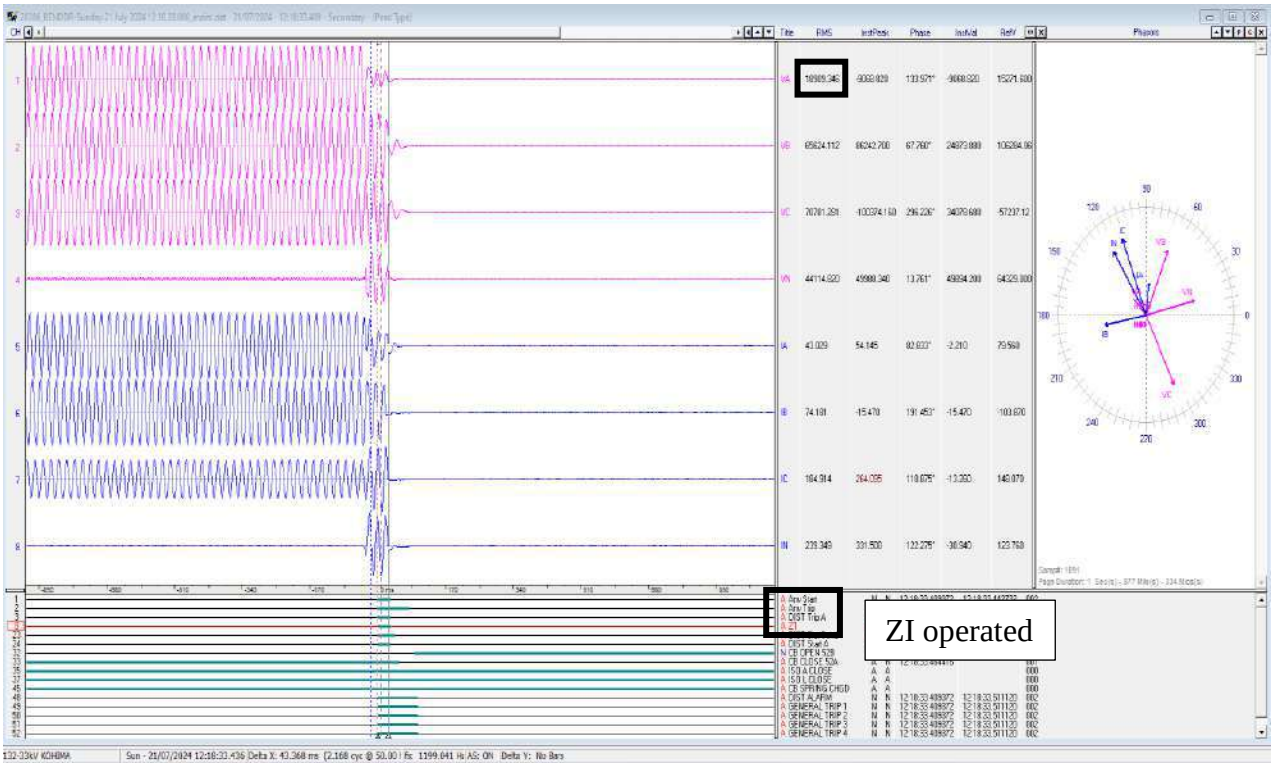
AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
---	---	---	---	---	---	---
AEGCL	1C	BALIP_PG	BALIPARA CB MN CB BNC 1 BETWEEN	21 Jul 2024 12:19:30:000	21 Jul 2024 12:19:25:000	8.02E+08
AEGCL	1C	BALIP_PG	BALIPARA CB REACTOR F_L1_LR_BNCHV CB BETWEEN	21 Jul 2024 12:19:32:000	21 Jul 2024 12:19:25:000	8.03E+08
NAGALD	1C	DIMAP_PG	DIMAPUR CB 132Kv LINE-1 TO KOHIM OPEN	21 Jul 2024 12:19:40:000	21 Jul 2024 12:19:37:000	8.46E+08
AEGCL	1C	BALIP_PG	BALIPARA CB REACTOR F_L1_LR_BNCHV CB CLOSED	21 Jul 2024 12:20:11:000	21 Jul 2024 12:20:08:000	2.33E+08
AEGCL	1C	BALIP_PG	BALIPARA CB MN CB BNC 1 CLOSED	21 Jul 2024 12:20:13:000	21 Jul 2024 12:20:08:000	2.34E+08
AEGCL	1C	BALIP_PG	BALIPARA CB 220/132 T2 (PRIM) CLOSED	21 Jul 2024 12:22:26:000	21 Jul 2024 12:22:21:000	9.73E+08
AEGCL	1C	LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ CLOSED	21 Jul 2024 12:58:24:000	21 Jul 2024 12:58:19:000	8.78E+08
NAGALD	1C	DIMAP_PG	DIMAPUR CB 132Kv LINE-1 TO KOHIM CLOSED	21 Jul 2024 12:59:16:000	21 Jul 2024 12:59:14:000	7E+08
AEGCL	1C	LAKWA_AS	LAKWA (LTPS) CB 33Kv LOAD ONGC_ CLOSED	21 Jul 2024 13:04:49:000	21 Jul 2024 13:04:45:000	3.16E+08
AEGCL	1C	MARIA_PG	MARIANI CB 220Kv LOAD-2 MARIA CLOSED	21 Jul 2024 13:05:06:000	21 Jul 2024 13:05:05:000	4.69E+08
AEGCL	1C	MARIA_PG	MARIANI CB 220Kv LOAD-1 MARIA CLOSED	21 Jul 2024 13:05:10:000	21 Jul 2024 13:05:09:000	6.59E+08

Annexure 2: SLD of affected substation



Annexure 3: DR snapshot

3.1 DR of Kohima end for 132 kV Dimapur-Kohima line



3.2 EL Snapshot of Kohima for 132 kV Dimapur-Kohima line

Sunday 21 July 2024 12:18:33.745	Fault Recorded
Description	132KV DIMAPUR
Plant reference	132/33kV KOHIMA
Model number	P44291AB6M0710M
Address	001 Column:01 Row:00
Event type	Fault record
Event Value	0
Active Group	1
Faulted Phase	0011001
Start Elements	00000000010000000000000001
Tripped Elts	00000000000000010000000000C
Time Stamp Sunday 21 July 2024	12:18:33.408
Fault Alarms	00000000000000
System Frequency	49.95 Hz
Fault Duration	33.36ms
Relay Trip Time	80.07ms
Fault Locatio XY	34.94km
IA	43.18 A
IB	72.19 A
IC	186.1 A
VAN	19.51kV
VBN	65.40kV
VCN	70.93kV
Fault Resista XY 84.13	Ohm
Fault in Zone Zone	1
Tripped Elts 2	00000000000000000
Start Elements 2	000000000000
Evt Unique Id	107683

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 Pasighat areas of Arunachal Pradesh Power System 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))

Date (दिनांक**):30-07-2024**

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

Pasighat area of Arunachal Pradesh Power System was connected with rest of NER Power system via 132 kV Along – Pasighat & 132 kV Roing-Pasight lines. Prior to the event, 132 kV Roing-Pasighat line tripped at 10:42 Hrs of 26.07.2024.

At 10:50 Hrs of 26.07.2024, 132 kV Along - Pasighat Line tripped. Due to tripping of these elements, Pasighat area of Arunachal Pradesh Power System got isolated from NER Grid and collapsed due to no source available in this area.

Power is restored at Pasighat area by charging 132 kV Along-Pasighat line at 11:17 Hrs of 26-07-2024.

2. **Time and Date of the Event (**घटना का स मय और दिनांक**):** 10:50 Hrs of 26-07-2024

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

4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Pasighat area of Arunachal Pradesh

5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50	2444	2894
Post Event (घटना के बाद)	50	2444	2893

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 Roing – Pasighat tripped at 10:42 Hrs of 26.07.2024

Weather Condition (मौसम स्थिति)	Normal

2. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss 2 MW. No generation loss

3. **Duration of interruption (रुकावट की अवधि): 27 min**

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

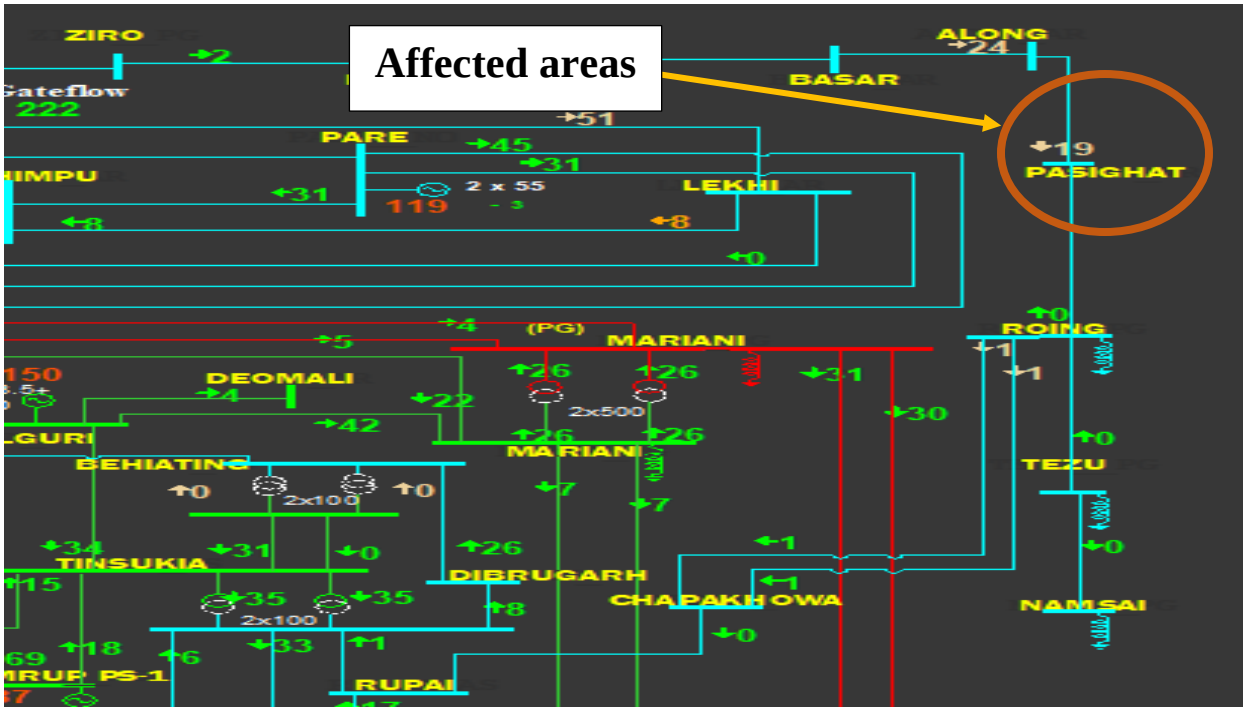


Figure 1: Network across the affected area

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

6. **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 Along-Pasighat Line	10:50	11:17	E/F	No tripping (radial)

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

As per DR analysis, resistive B-E fault (Ib-235 A, In-185 A) initiated at 10:49:01.498 Hrs and cleared within 1.87 sec on operation of Earth fault from Along end. There was no tripping from Pasighat end (radial).

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

9. **Action Taken/Remedial Measures (सुधारात्मक उपाय):**

Power is restored at Pasighat area by charging 132 kV Along-Pasighat line at 11:17 Hrs of 26-07-2024.

10. **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)	**DoP AP**
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)	**DoP AP**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**No violation**
5.	**Any other non-compliance**		-

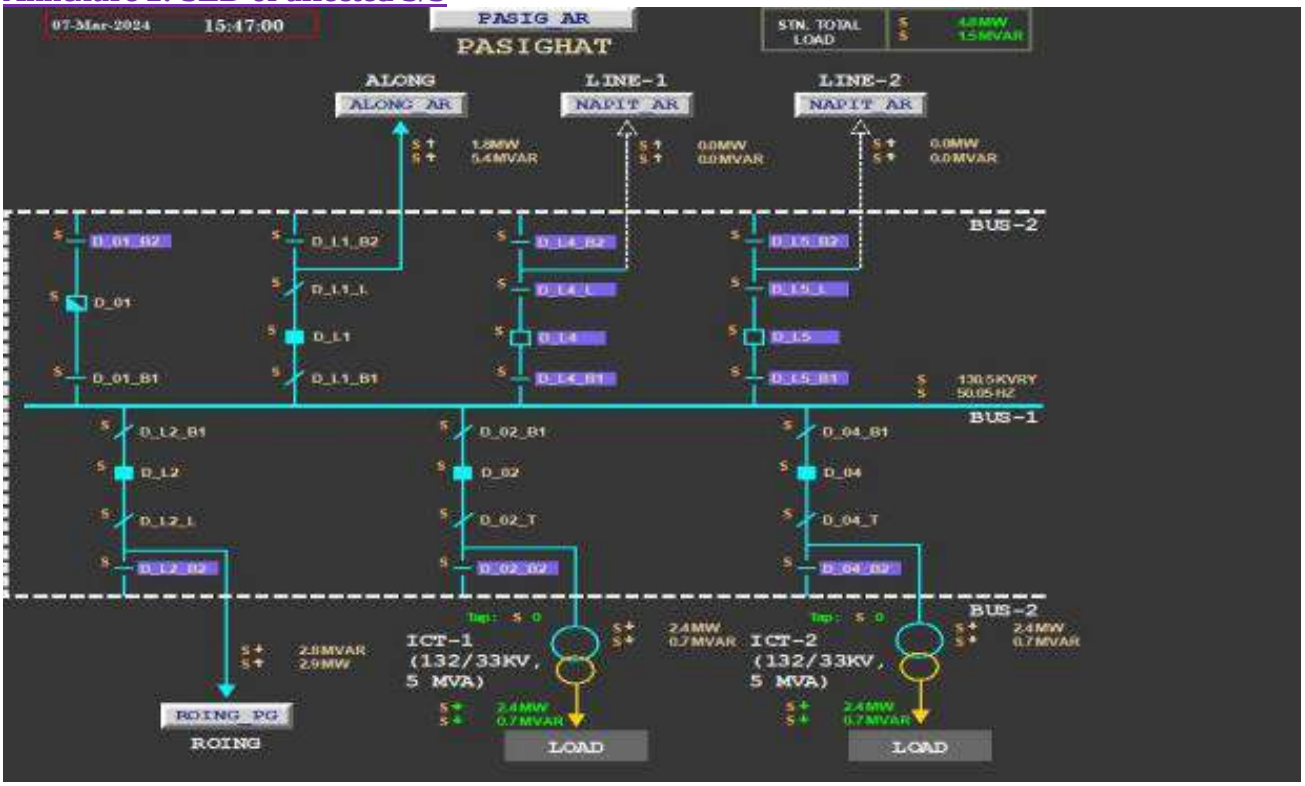
11. **Key Lessons Learnt (प्रमुख अधिगम बिंदु):**

- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.

Annexure 1: Sequence of Events as per SCADA

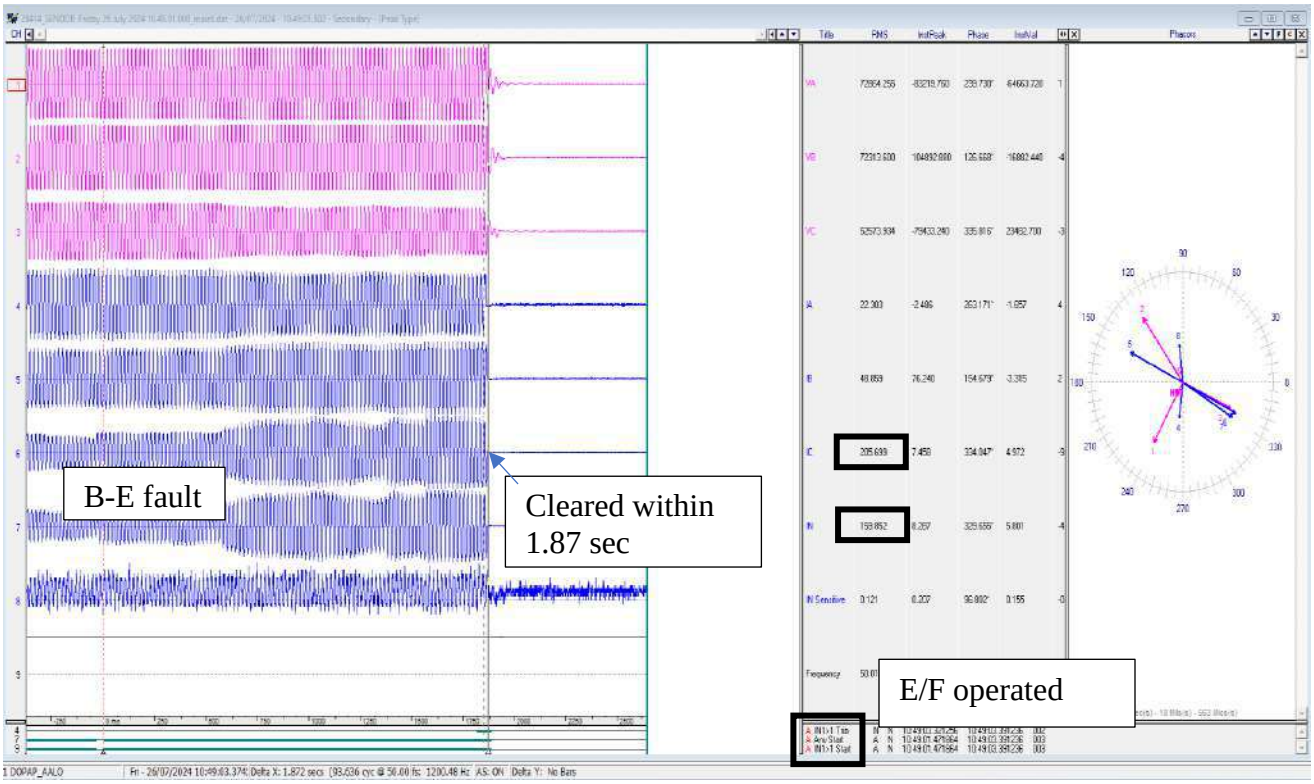
AREA	CATEGOR	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
AEGCL	1C	BONGA_P	BONGAIGAON CB CB BW ALIPU 1 & BALIP 1	26 Jul 2024 15:41:31:000	20 May 2024 17:07:25:000	8.73E+08
AEGCL	1C	BONGA_P	BONGAIGAON CB MAIN CB 125 MVAR BR C	26 Jul 2024 15:42:29:000	25 May 2024 23:08:24:000	9.72E+08
AEGCL	1C	BONGA_P	BONGAIGAON CB MN CB 400 KV ALIPU 2 CI	26 Jul 2024 15:41:21:000	28 May 2024 03:51:50:000	8.29E+08
ARUNCH	1C	ALONG_A	ALONG CB 132Kv LINE TO PASIG OPEN	26 Jul 2024 10:49:43:000	29 May 2024 11:06:34:000	8.05E+08
ARUNCH	1C	ALONG_A	ALONG CB 132Kv LINE TO PASIG CLOSED	26 Jul 2024 11:17:56:000	29 May 2024 11:34:49:000	2.55E+08
ARUNCH	1C	ALONG_A	ALONG CB 132Kv LINE TO PASIG OPEN	26 Jul 2024 12:13:35:000	29 May 2024 12:30:27:000	5.9E+08
AEGCL	1C	BONGA_P	BONGAIGAON CB CB BW ICT 1 & NWSLG 1 (	26 Jul 2024 15:29:58:000	04 Jun 2024 00:42:08:000	7.27E+08
TSECL	1C	SURAJ_ST	SURAJNAGAR(ST) CB MN CB PBAR-1 CLOSE	26 Jul 2024 10:28:25:000	07 Jun 2024 03:23:34:000	8.12E+08

Annexure 2: SLD of affected S/S



Annexure 3: DR Snapshot

3.1 DR snapshot of Along end for 132 kV Along-Pasighat line



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 Udaipur area 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**):29-07-2024**

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

Udaipur area of Tripura Power System is connected with rest of NER Grid through 132 kV Palatana-Udaipur & 132 kV Monarchak-Udaipur lines.

At **11:25 Hrs of 26.07.2024**, 132 kV Palatana-Udaipur & 132 kV Monarchak-Udaipur lines tripped. Due to tripping of these lines, Udaipur area of Tripura Power System got isolated from NER Grid and collapsed due to no source available in this area.

Power supply was extended to Udaipur area of Tripura Power System by charging 132 kV Palatana-Udaipur line at 12:10 Hrs of 26.07.2024.

2. **Time and Date of the Event (**घटना का स मय और दिनांक**):** 11:25 Hrs of 26-05-2024

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

4. **Location/Control Area** (स्थान/नियंत्रण क्षेत्र): Udaipur area of Tripura

5. **Antecedent Conditions (पूर्ववर्ती स्थिति):**

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50	2471	2873
Post Event (घटना के बाद)	50	2375	2871

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 25 MW. There was no generation loss.

7. **Duration of interruption (रुकावट की अवधि): 45 min**

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

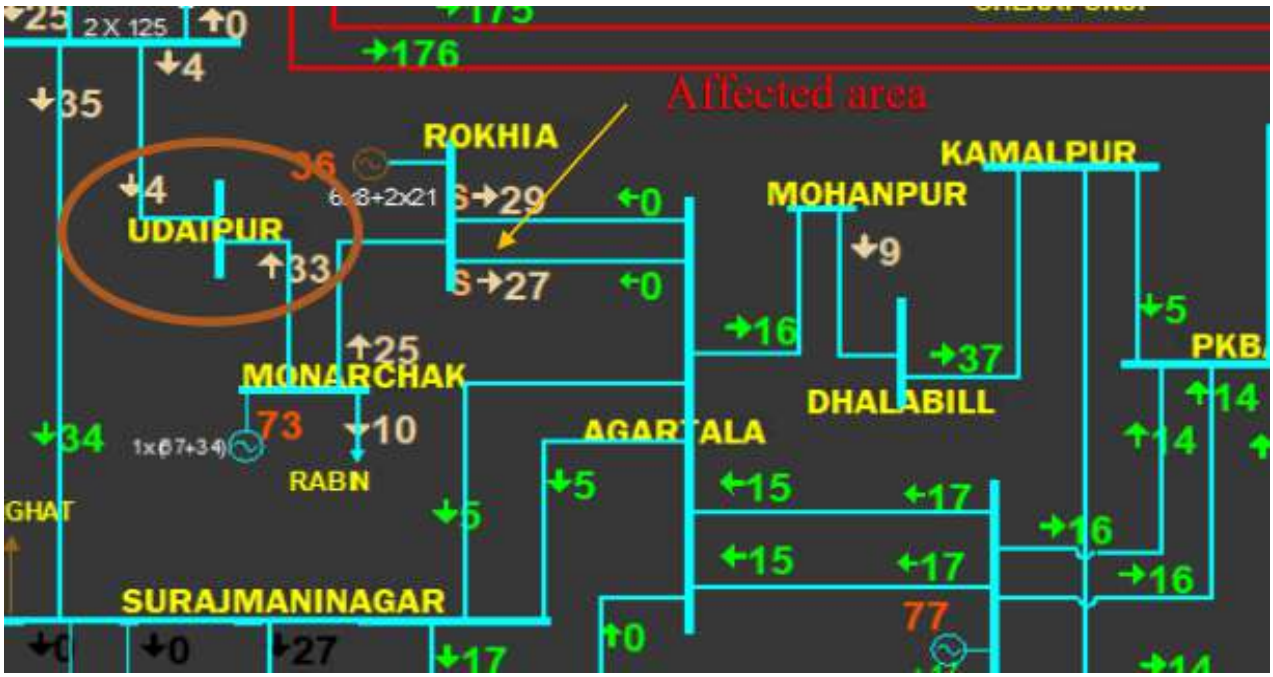


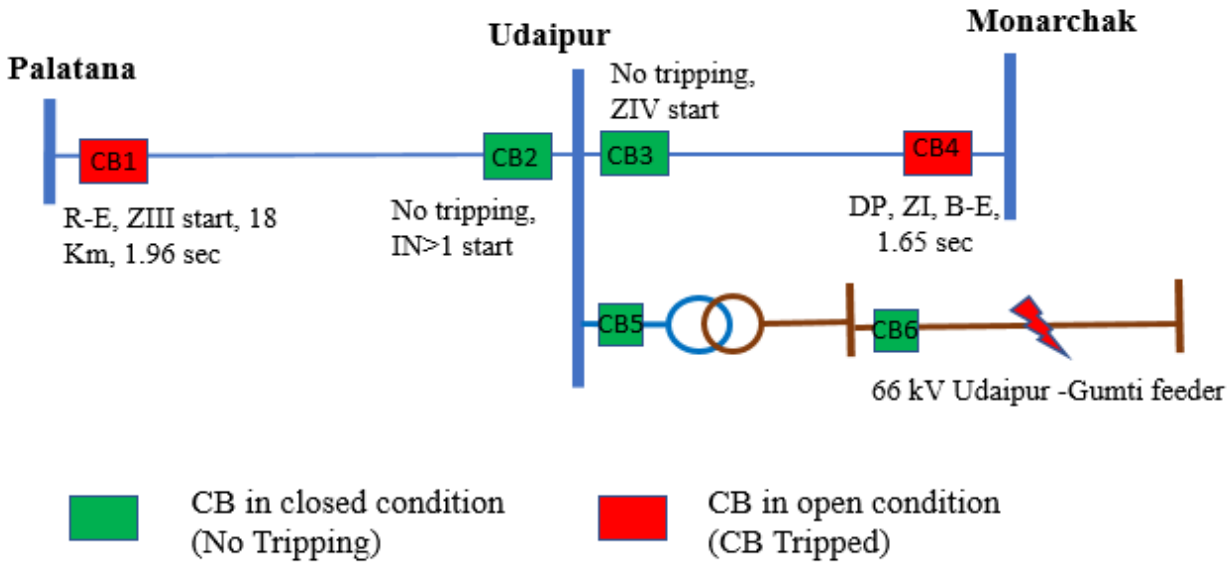
Figure 1: Network across the affected area

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 Palatana-Udaipur Line	11:25	12:10	DP, ZIII, R-E, 18 km	No tripping (IN>1 start)
2	132 kV Monarchak-Udaipur Line	11:25	-	DP, ZI, B-E, 21.39 Km	No tripping (ZIV start)

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



As per DR analysis of 132 kV Palatana-Udaipur line, high resistive R-E fault initiated at 11:12:59.566 Hrs with Ir: 145 A, In-99 A. After 1.897 sec, ZIII pickup and all poles dead within 63 msec. At Udaipur end, IN>1 started (Ib-298 A) and no tripping from Udaipur end.

As per DR analysis of 132 kV Monarchak-Rokhia line, B-E fault initiated at 11:25:01.992 Hrs with Ib:405 A, In:318A. After 1.59 sec, ZI started and tripped within 50 msec from Monarchak end. At Udaipur end, Z-II & ZIII pickup at 11:24:41.955 Hrs for 89 msec. Again at 11:24:42.142 Hrs, ZIV pickup at Udaipur end. However, there was no tripping from Udaipur end.

Suspected fault in downstream of Udaipur which was not cleared resulting in clearance of fault by tripping of healthy 132 kV Palatana-Udaipur & 132 kV Monarchak-Udaipur lines from remote ends.

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

- Protection system at Udaipur for downstream feeder and transformer HV side did not operate which resulted in delayed clearance of fault from Palatana and Monarchak ends.
- It is not clear which protection system operated at Palatana end for 132 kV Palatana-Udaipur line.
- DR time drift of 14 minutes at Palatana.

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

Power supply was extended to Udaipur area of Tripura Power System by charging 132 kV Palatana-Udaipur line at 12:10 Hrs of 26.07.2024.

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)	**TSECL**
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	**Time drift of 14 min at Palatana end for 132 kV Palatana-Udaipur line**
5.	**Any other non-compliance**		-

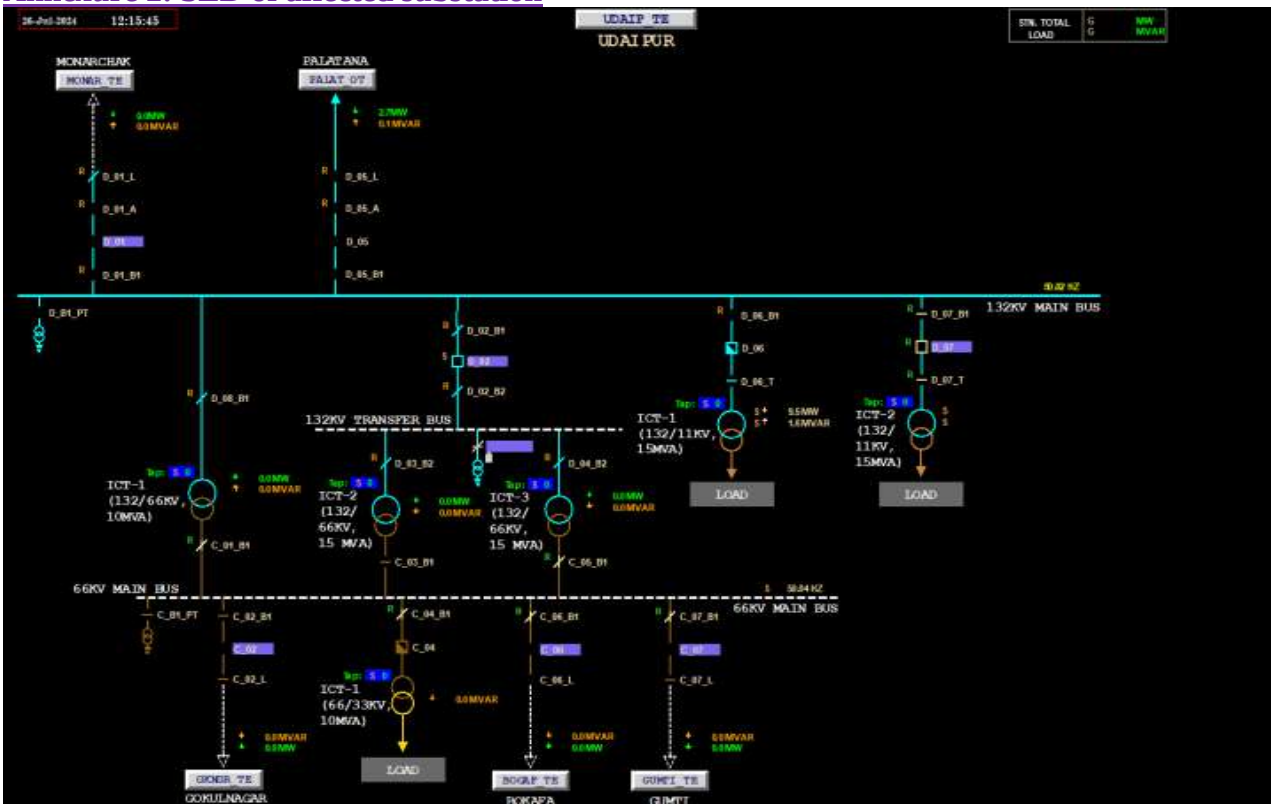
15. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.
- Need for preventive maintenance to ensure the healthiness of the protection system of downstream.

Annexure 1: Sequence of Events as per SCADA

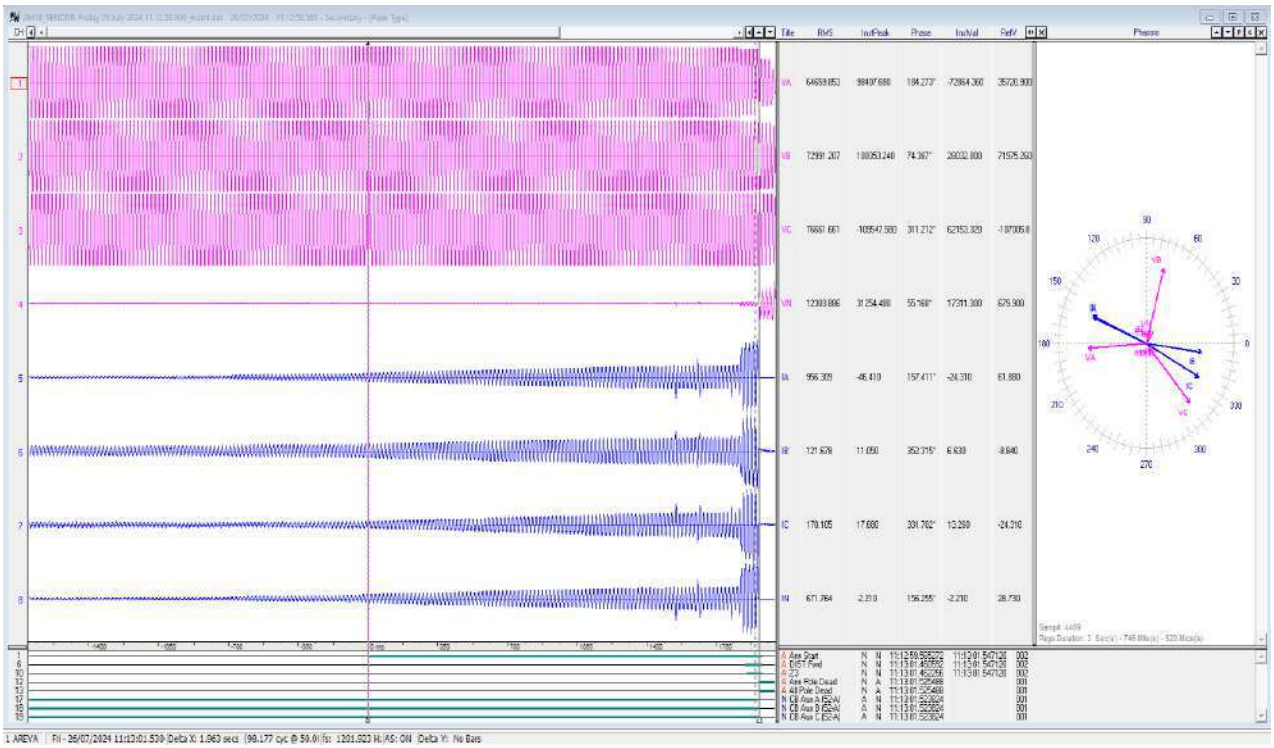
AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
TSECL	1C	UDAIP_TE	UDAIPUR CB 66Kv LINE-1 TO GUMTI OPEN	26 Jul 2024 11:25:13:000	26 Jul 2024 11:24:46:000	5.46E+08
TSECL	1C	MONAR_TE	MONARCHAK CB 132 KV COUPLER (01) OPEN	26 Jul 2024 11:25:16:000	26 Jul 2024 11:24:52:000	7.19E+08
TSECL	1C	MONAR_TE	MONARCHAK CB 132Kv LINE-1 TO UDAIP INVALID	26 Jul 2024 11:25:16:000	26 Jul 2024 11:24:52:000	7.19E+08
TSECL	1C	MONAR_TE	MONARCHAK CB 132/11 T1 (PRIM) OPEN	26 Jul 2024 11:25:26:000	26 Jul 2024 11:25:02:000	6.55E+08
TSECL	1C	PALAT_OT	PALATANA CB 132Kv LINE TO UDAIP OPEN	26 Jul 2024 11:25:16:000	26 Jul 2024 11:25:03:000	5.76E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA INVALID	26 Jul 2024 11:25:08:000	26 Jul 2024 11:25:04:000	6.69E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA INVALID	26 Jul 2024 12:01:16:000	26 Jul 2024 12:01:10:000	1.29E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA CLOSED	26 Jul 2024 12:01:30:000	26 Jul 2024 12:01:24:000	1.04E+08
TSECL	1C	MONAR_TE	MONARCHAK CB 132Kv LINE-1 TO UDAIP CLOSED	26 Jul 2024 12:01:48:000	26 Jul 2024 12:01:24:000	5.48E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA INVALID	26 Jul 2024 12:01:48:000	26 Jul 2024 12:01:43:000	6.04E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA INVALID	26 Jul 2024 12:09:45:000	26 Jul 2024 12:09:40:000	9.52E+08
TSECL	1C	PALAT_OT	PALATANA CB 132Kv LINE TO UDAIP CLOSED	26 Jul 2024 12:09:50:000	26 Jul 2024 12:09:45:000	7.45E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA CLOSED	26 Jul 2024 12:10:00:000	26 Jul 2024 12:09:55:000	9.17E+08
MEECL	1C	KILLI_ME	KILLING CB 132Kv LINE-1 TO EPIP1 CLOSED	26 Jul 2024 12:10:00:000	26 Jul 2024 12:09:55:000	7.61E+08

Annexure 2: SLD of affected substation



Annexure 3: Disturbance recorder snips showing faults and digital signals

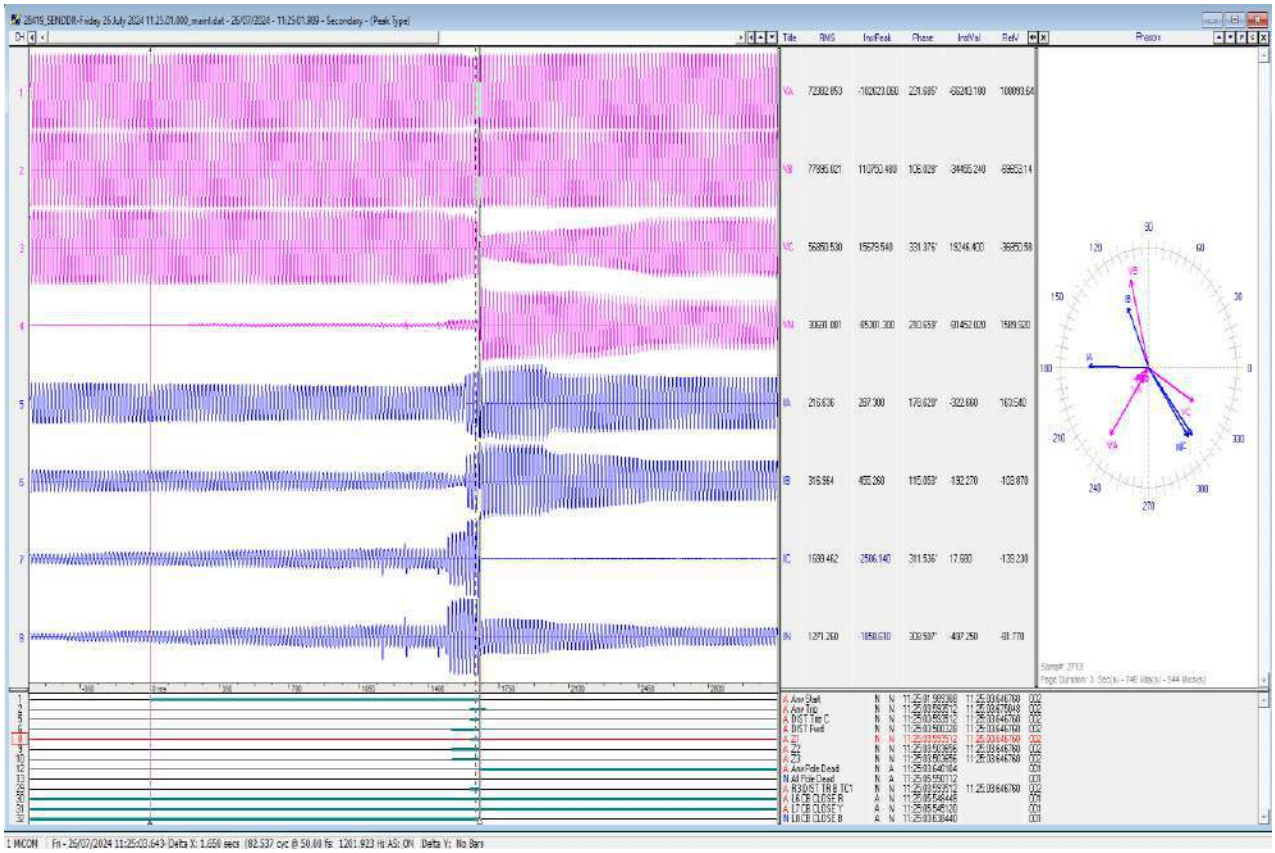
3.1. DR Snapshot of Palatana for 132 kV Palatana-Udaipur Line



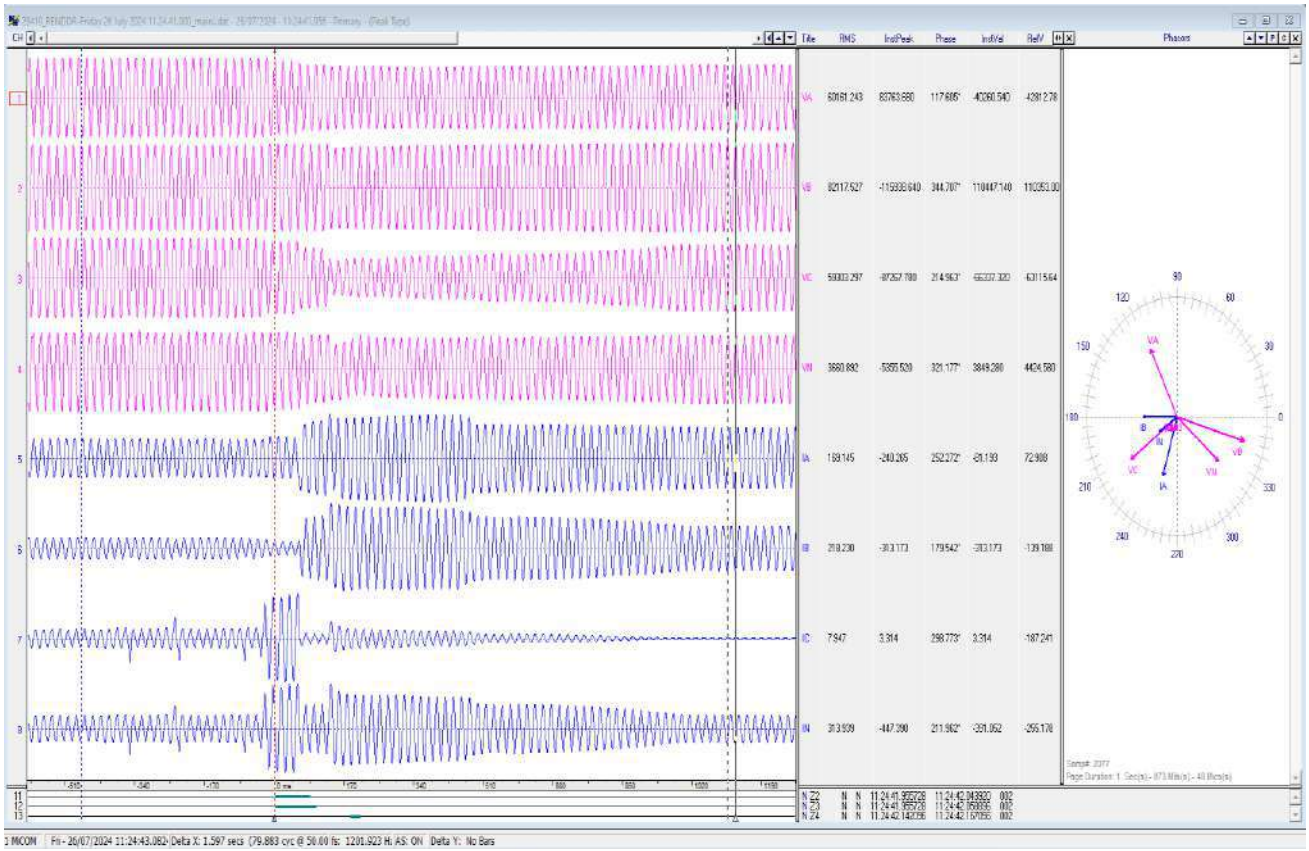
3.2. DR Snapshot of Udaipur for 132 kV Palatana-Udaipur Line

Friday 26 July 2024 11:24:44.183	Fault Recorded
Description	132 KV PALATANA
Plant reference	MiCOM
Model number	P44291NB7M0710M
Address	001 Column:01 Row:00
Event type	Fault record
Event Value	0
Active Group	1
Faulted Phase	0000000
Start Elements	00000000000000000001000001
Tripped Elts	00000000000000000000000000C
Time Stamp Friday 26 July 2024	11:24:43.275
Fault Alarms	00000000000000
System Frequency	50.06 Hz
Fault Duration	828.8ms
Relay Trip Time	0 s
IA	53.03 A
IB	49.52 A
IC	298.5 A
VAN	75.55kV
VBN	76.21kV
VCN	74.27kV
Fault in Zone	None
Tripped Elts 2	000000000000000000
Start Elements 2	000000000000
Evt Unique Id	225712

3.2. DR Snapshot of Monarchak for 132 kV Monarchak-Udaipur Line



3.3. DR Snapshot of Udaipur for 132 kV Monarchak-Udaipur Line



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 Rengpang area in Manipur 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))

Date (दिनांक)**:30-07-2024**

1. Event Summary (घटना का सारांश):

Rengpang area of Manipur Power System was connected with rest of NER Grid through 132 kV Loktak – Rengpang line. 132 kV Jiribam-Rengpang line was under outage since 18:18 Hrs of 17.11.2023.

At 08:23 Hrs of 27-07-2024, 132 kV Loktak – Rengpang line tripped. Due to tripping of this element, Rengpang area of Manipur Power System was isolated from NER Grid and collapsed due to no source available this area.

Power supply was extended to Rengpang area of Manipur Power System by charging 132 kV Loktak – Rengpang line at 15:07 Hrs on 28-07-2024.

2. Time and Date of the Event (घटना का स मय और दिनांक)**:** 08:23 Hrs of 27-07-2024

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

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Rengpang area of Manipur Power System.

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	50.02	2592	2758
Post Event (घटना के बाद)	50.02	2582	2760

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 Jiribam-Rengpang line was under outage since 18:18 Hrs of 17.11.2023.
Weather Condition (मौसम स्थिति)	Normal

2. **Load and Generation loss (लोड और जेनरेशन हानि):** Load loss of 1 MW.

3. **Duration of interruption (रुकावट की अवधि): 1 Day 6 Hrs 44 min**

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

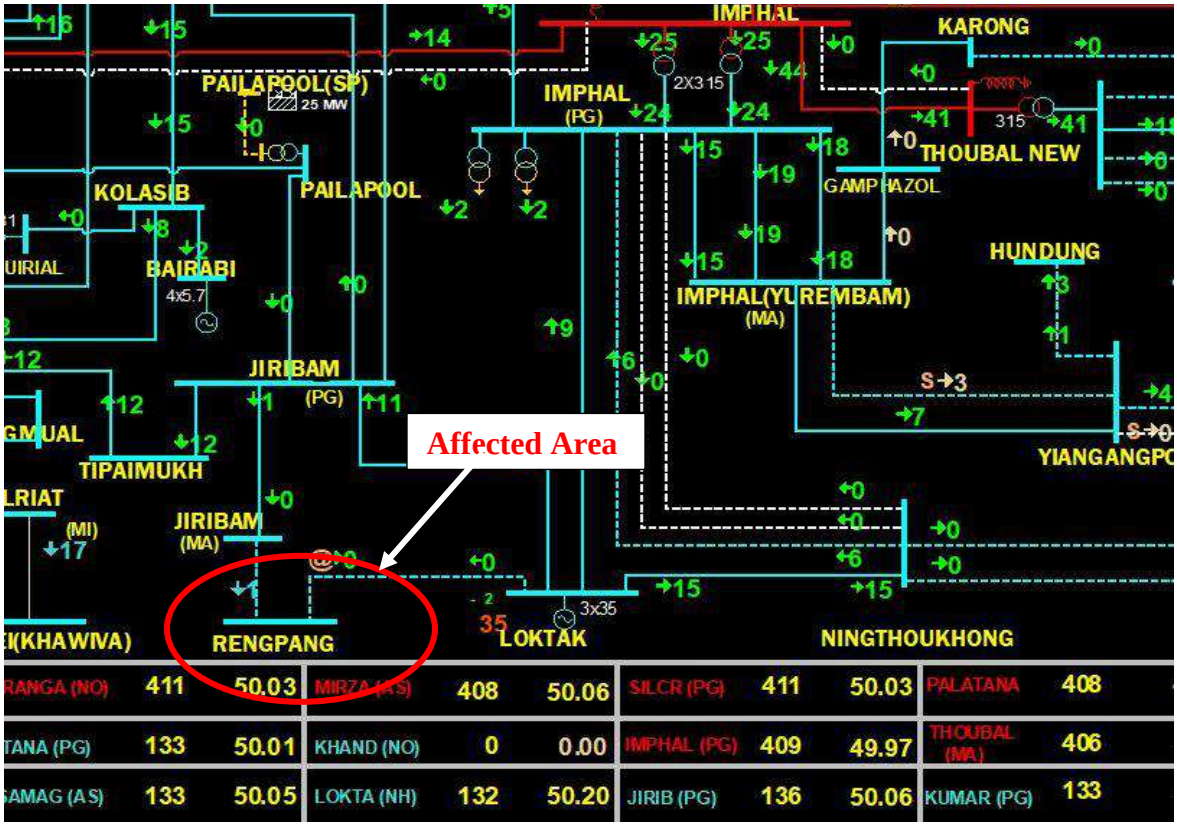


Figure: Network across the affected area

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

6. **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	132kV Loktak-Rengpang Line	08:23	15:07 Hrs of 28.07.2024	O/C operated	No tripping (radial)

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

As per EL analysis of Loktak end, IN>1 started at 08:22:59.256 Hrs. At 08:23:01.985 Hrs, I>1 trip issued and tripped within 79 msec. Fault duration: 2.78 sec. There was no tripping from Rengpang end.

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

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

- Power supply was extended to Rengpang area of Manipur Power System by charging 132 kV Loktak – Rengpang line at 15:07 Hrs on 28-07-2024.

10. 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)	**MSPCL**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**MSPCL**
3.	**Detailed Report received within 7 days?**	IEGC section 37.2 (e)	**MSPCL**
4.	**DR Time Synchronization Issues**	IEGC section 17.3	**No violation**
5.	**Any other non-compliance**		-

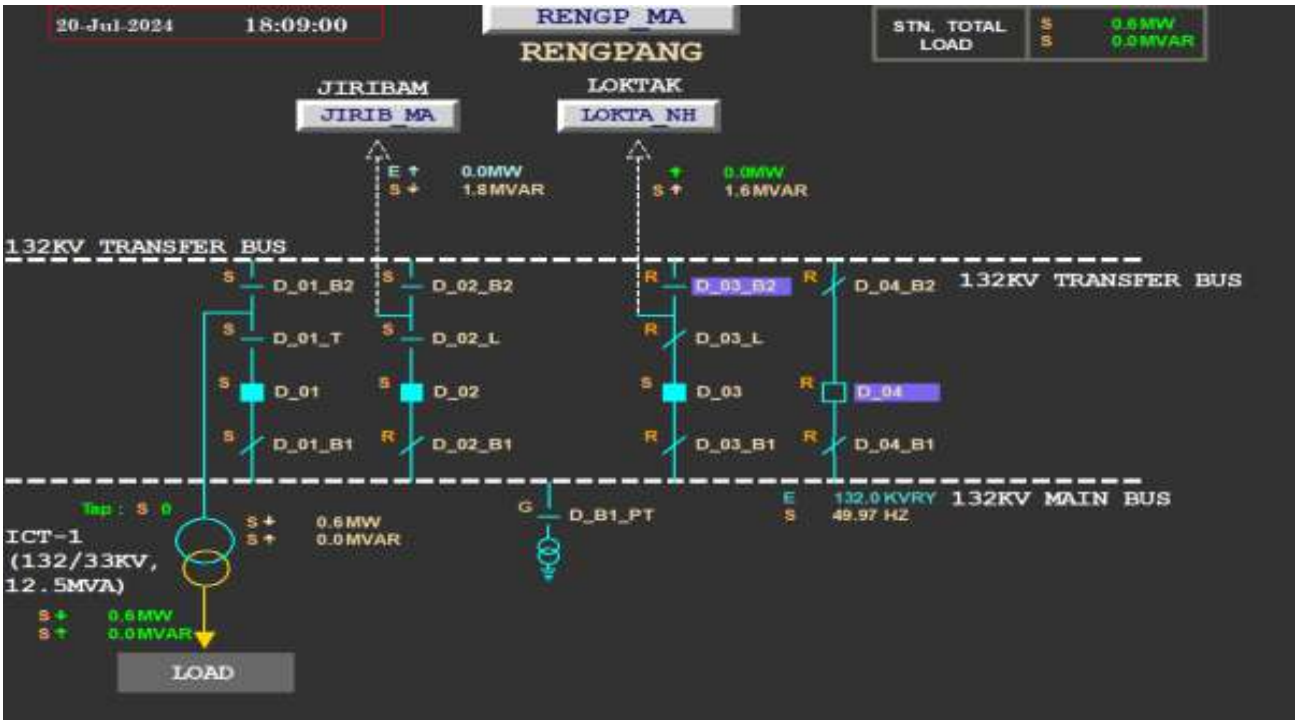
11. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.

Annexure 1: Sequence of Events

AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA CLOSED	27 Jul 2024 08:21:37:000	27 Jul 2024 08:21:33:000	7.32E+08
MEECL	1C	NANGA_ME	NANGALBIBRA CB 33Kv LOAD RONGJ CLOSED	27 Jul 2024 08:28:44:000	27 Jul 2024 08:21:52:000	6.35E+08
MEECL	1C	NANGA_ME	NANGALBIBRA CB 33Kv LOAD RONGJ OPEN	27 Jul 2024 08:22:36:000	27 Jul 2024 08:22:32:000	9.68E+08
MSPCL	1C	LOKTA_NH	LOKTAK CB 132Kv LINE TO RENGP OPEN	27 Jul 2024 08:23:04:000	27 Jul 2024 08:23:03:000	2.27E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA INVALID	27 Jul 2024 08:23:23:000	27 Jul 2024 08:23:19:000	4.32E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA CLOSED	27 Jul 2024 08:23:41:000	27 Jul 2024 08:23:34:000	5.02E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA INVALID	27 Jul 2024 08:24:52:000	27 Jul 2024 08:24:48:000	7.67E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA CLOSED	27 Jul 2024 08:25:08:000	27 Jul 2024 08:25:02:000	7.42E+08

Annexure 2: SLD of affected S/S



Annexure 3: Disturbance recorder snips showing faults and digital signals

3.1 EL Snapshot of Loktak for 132 kV Loktak-Rengpang Line

Saturday 27 July 2024 08:23:02.065	Any Trip B OFF
Saturday 27 July 2024 08:23:02.065	Any Trip A OFF
Saturday 27 July 2024 08:23:02.065	Any Trip OFF
Saturday 27 July 2024 08:23:02.065	Output Contacts1
Saturday 27 July 2024 08:23:02.065	3P Trip OFF
Saturday 27 July 2024 08:23:02.065	Any Trip C OFF
Saturday 27 July 2024 08:23:02.050	All Pole Dead ON
Saturday 27 July 2024 08:23:02.048	Any Pole Dead ON
Saturday 27 July 2024 08:23:02.047	Logic Inputs 1
Saturday 27 July 2024 08:23:02.047	CB Aux B ON
Saturday 27 July 2024 08:23:02.045	Any Start OFF
Saturday 27 July 2024 08:23:02.045	Logic Inputs 1
Saturday 27 July 2024 08:23:02.045	IN>1 Start OFF
Saturday 27 July 2024 08:23:02.045	CB Aux C ON
Saturday 27 July 2024 08:23:02.045	CB Aux A ON
Saturday 27 July 2024 08:23:02.044	I> Start Any C OFF
Saturday 27 July 2024 08:23:02.044	I>1 Start OFF
Saturday 27 July 2024 08:23:02.044	I>1 Trip OFF
Saturday 27 July 2024 08:23:01.987	AR Lockout Shot> ON
Saturday 27 July 2024 08:23:01.987	A/R Trip 3P ON
Saturday 27 July 2024 08:23:01.987	A/R Lockout ON
Saturday 27 July 2024 08:23:01.985	Any Trip A ON
Saturday 27 July 2024 08:23:01.985	Any Trip ON
Saturday 27 July 2024 08:23:01.985	I>1 Trip ON
Saturday 27 July 2024 08:23:01.985	Any Trip B ON
Saturday 27 July 2024 08:23:01.985	Output Contacts1
Saturday 27 July 2024 08:23:01.985	3P Trip ON
Saturday 27 July 2024 08:23:01.985	Any Trip C ON
Saturday 27 July 2024 08:22:59.475	I>1 Start ON
Saturday 27 July 2024 08:22:59.451	I> Start Any C ON
Saturday 27 July 2024 08:22:59.256	Any Start ON
Saturday 27 July 2024 08:22:59.256	IN>1 Start ON

Saturday 27 July 2024 08:23:02.642		Fault Recorded
Description		NPS JIRIBAM 1
Plant reference		JIRIBAM 1 LPS
Model number		P442312B1A0070B
Address		003 Column:01 Row:00
Event type		Fault record
Event Value		0
Active Group		1
Faulted Phase		111100
Start Elements		0000000000000011
Tripped Elts		00000000000000000000000011
Time Stamp	Saturday 27 July 2024	08:22:59.256
Fault Alarms		100001000
System Frequency		50.03 Hz
Fault Duration		2.789 s
Relay Trip Time		79.97ms
Fault in Zone		None

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 Tuirial generating station of NEEPCO power system 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))

Date (दिनांक**):30-07-2024**

1. Event Summary (घटना का सारांश):

Tuirial generating station of NEEPCO Power System was connected with rest of NER Grid through 132 kV Tuirial-Kolasib Line.

At 19:45 Hrs of 27-07-2024, 132 kV Tuirial-Kolasib line tripped. Due to tripping of this element, Tuirial generating station of NEEPCO got isolated from NER Grid and collapsed due to loss of evacuation path.

Power supply was extended to Tuirial S/S by charging 132 kV Tuirial-Kolasib line at 19:51 Hrs on 27-07-2024.

2. Time and Date of the Event (घटना का स मय और दिनांक**):** 19:45 Hrs of 27-07-2024

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

4. Location/Control Area (स्थान/नियंत्रण क्षेत्र): Tuirial generation of NEEPCO

5. Antecedent Conditions (पूर्ववर्ती स्थिति):

	Frequency in Hz	Regional Generation (MW)	Regional Demand (MW)
Pre-Event (घटना पूर्व)	49.98	3514	3757
Post Event (घटना के बाद)	49.98	3461	3751

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

2. **Load and Generation loss (लोड और जेनरेशन हानि):** Generation loss of 55 MW.

3. **Duration of interruption (रुकावट की अवधि): 7 minutes**

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

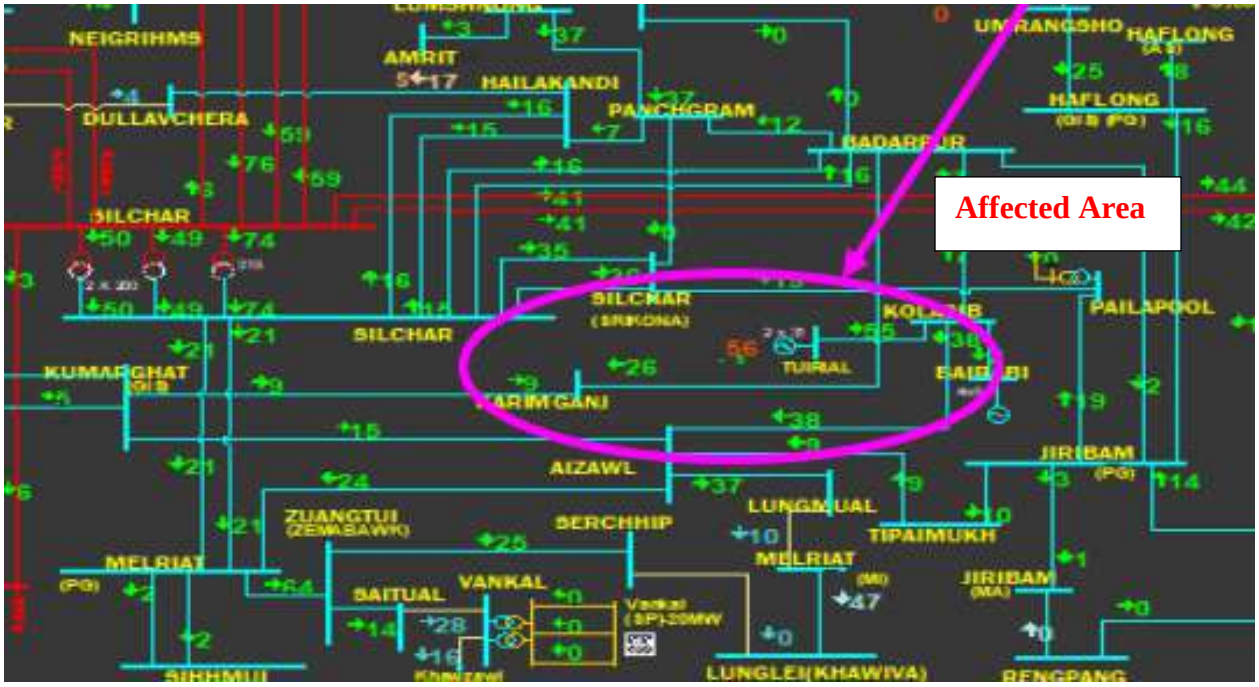


Figure: Network across the affected area

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

6. **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 Tuirial-Kolasib Line	19:45	19:51	E/F	No tripping
2	Tuirial Unit-1	19:45	19:59	Loss of evacuation path	
3	Tuirial Unit-2	19:45	20:12		

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

Proper analysis could not be done due to non-submission of FIR/DR/EL.

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

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

- Power supply was extended to Tuirial S/S by charging 132 kV Tuirial-Kolasib line at 19:51 Hrs on 27-07-2024.

10. 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)	**NEEPCO**
2.	**Whether DR/EL provided within 24 Hours?**	1. IEGC section 37.2 (c) 2. CEA grid Standard 15.3	**NEEPCO, P&ED Mizoram**
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**		-

11. Key Lessons Learnt (प्रमुख अधिगम बिंदु):

- Regular patrolling and maintenance related activities needs to be carried out as per various CEA/CERC regulations.

Annexure 1: Sequence of Events

AREA	CATEGORY	LOCATION	TEXT	SYSTEM_TIME	FIELD_TIME	MS
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA CLOSED	27 Jul 2024 19:39:07:000	27 Jul 2024 19:39:01:000	8.21E+08
MEECL	1C	KILLI_ME	KILLING CB 132Kv LINE-1 TO EPIP1 OPEN	27 Jul 2024 19:39:40:000	27 Jul 2024 19:39:36:000	2.11E+08
MIZORM	1C	TURIL_NO	TURIAL CB 132Kv LINE-1 TO KOLAS OPEN	27 Jul 2024 19:45:10:000	27 Jul 2024 19:42:48:000	6.47E+08
MIZORM	1C	KOLAS_MI	KOLASIB CB 132Kv LINE-1 TO BAIRA OPEN	27 Jul 2024 19:45:13:000	27 Jul 2024 19:45:07:000	9.17E+08
MIZORM	1C	KOLAS_MI	KOLASIB CB 132Kv LINE-1 TO BAIRA CLOSED	27 Jul 2024 19:45:22:000	27 Jul 2024 19:45:15:000	1.53E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA CLOSED	27 Jul 2024 19:47:33:000	27 Jul 2024 19:47:30:000	4.81E+08
MIZORM	1C	TURIL_NO	TURIAL CB 132Kv LINE-1 TO KOLAS BETWEEN	27 Jul 2024 19:51:42:000	27 Jul 2024 19:49:20:000	7.19E+08
MIZORM	1C	TURIL_NO	TURIAL CB 132Kv LINE-1 TO KOLAS CLOSED	27 Jul 2024 19:51:44:000	27 Jul 2024 19:49:22:000	4.51E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA INVALID	27 Jul 2024 19:50:43:000	27 Jul 2024 19:50:39:000	5.06E+08
MIZORM	1C	KOLAS_MI	KOLASIB CB 132Kv LINE-1 TO BAIRA OPEN	27 Jul 2024 19:55:06:000	27 Jul 2024 19:55:02:000	7.39E+08
MIZORM	1C	KOLAS_MI	KOLASIB CB 132Kv LINE-1 TO BAIRA CLOSED	27 Jul 2024 19:55:12:000	27 Jul 2024 19:55:09:000	5.75E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA INVALID	27 Jul 2024 19:55:44:000	27 Jul 2024 19:55:39:000	5.86E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA CLOSED	27 Jul 2024 20:30:55:000	27 Jul 2024 20:30:52:000	4.34E+08
MIZORM	1C	TURIL_NO	TURIAL CB 132 KV UNIT (H01) OPEN	27 Jul 2024 19:45:12:000	27 Jul 2024 20:36:31:000	34000000
MIZORM	1C	TURIL_NO	TURIAL CB 132 KV UNIT (H02) OPEN	27 Jul 2024 19:45:12:000	27 Jul 2024 20:36:31:000	51000000
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA INVALID	27 Jul 2024 20:39:09:000	27 Jul 2024 20:39:02:000	6.39E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA CLOSED	27 Jul 2024 20:48:35:000	27 Jul 2024 20:48:30:000	3.54E+08
MIZORM	1C	TURIL_NO	TURIAL CB 132 KV UNIT (H01) CLOSED	27 Jul 2024 19:59:08:000	27 Jul 2024 20:50:27:000	8.13E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA INVALID	27 Jul 2024 20:53:10:000	27 Jul 2024 20:53:05:000	93000000
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA CLOSED	27 Jul 2024 21:02:40:000	27 Jul 2024 21:02:34:000	2.48E+08
MIZORM	1C	TURIL_NO	TURIAL CB 132 KV UNIT (H02) CLOSED	27 Jul 2024 20:12:07:000	27 Jul 2024 21:03:28:000	7.03E+08
AEGCL	1C	SONAR_AS	SONARI CB 132Kv LINE TO LAKWA INVALID	27 Jul 2024 21:04:15:000	27 Jul 2024 21:04:11:000	3.23E+08

Annexure 2: SLD of affected S/S