North Eastern Regional Power Committee

AGENDA FOR 45TH PROTECTION COORDINATION SUB-COMMITTEE MEETING OF NERPC

Date of Meeting : 30/11/2016 (Wednesday)
Time of Meeting : 10:30 hrs
Venue : "Hotel Nandan", Guwahati.

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 44TH MEETING OF PROTECTION SUB-COMMITTEE OF NERPC.

The minutes of 44th meeting of Protection Sub-committee held on 29th September 2016 at Guwahati were circulated vide letter No. NERPC/SE/ PCC/2016/2277-2314 dated 7th October 2016.

No comments/observations were received from the constituents, the Sub-Committee may kindly confirm the minutes of 44th PCCM of NERPC

ITEMS FOR DISCUSSION

2. Protection audit of Agartala, Surjamaninagar, Udaipur sub-stations of TSECL and Palatana, OTPC.

During Sub Group Committee Meeting of PCC held on 24th Oct'16, the forum decided that the Protection audit of Agartala, Surjamaninagar, Udaipur sub-stations of TSECL and Palatana, OTPC are required to be taken up urgently.

For protection audit of Agartala, Surjamaninagar, Udaipur sub-stations of TSECL and Palatana, OTPC from 7th to 9th November 2016, following members were nominated by the respective constituents:

a. AEGCL- Ashutosh Bhattacharya, Dy. Manager (9435332928)
b. NERTS- Deva Prasad Pal, Sr. Engineer (9435382360)
c. NERPC- Abhijeet Agrawal, AEE (9871266951)
d. NEEPCO- Prosenjit Sen, Sr. Manager (9436167999)
e. OTPC- Smruti Ranjan Das, Manager (9612400784)
f. Tripura- Mrinal Paul, Manager (9436137022)

The team had visited the substations for Protection Audit. The findings of the team and detailed report of Protection Audit of these substations is given in Annexure - I.

Members may discuss.

3. Identification of short lines to install line differential protection.

During Sub Group Committee Meeting of PCC held on 24th Oct'16, NERLDC informed the forum that for purpose of installation of line differential protection on Short lines it is necessary to identify the list of lines for this purpose.

The identification exercise for installation of Differential Protection relays has to be completed for all Transmission Lines of NER Grid level on a priority basis.

As informed by BgTPP, NTPC & POWERGRID, the installation of Differential Protection on 400 kV BgTPP – Bongaigaon D/C has been completed.

As the 1st stage, differential protection is to be installed on important short lines like 132 kV Silchar – Srikona D/C, 132 kV Imphal(PG) – Imphal(MSPCL) D/C etc.

Members may discuss.

4. Preparation of Draft model maintenance procedures that are to be followed by utilities.

During Sub Group Committee Meeting of PCC held on 24th Oct'16, it was noted that NERTS and AEGCL have already submitted their maintenance manual to the forum. SE(P), NERPC suggested that PGCIL, NERLDC and AEGCL together will prepare the guidelines for draft model maintenance procedure for transmission systems for all utilities. All constituents were requested to give their suggestions and feedback to them.

Sh. H. Talukdar, PGCIL, Sh. Jerin Jacob (Eng.NERLDC)/Rahul Chakrabarti, (Sr. Engr, NERLDC) and Sh. Ashutosh Bhattacharjee, DM, AEGCL were nominated to draft the guideline within 30th November 2016. The forum also agreed that the nominated members may call on utilities whenever needed.

All constituents are requested to submit their maintenance procedure to the forum for preparation of draft model maintenance procedure at the earliest.

Members may discuss.

5. Calculation of Relay Setting as per recommendation of V. Ramakrishna task Force

The relay settings details as formulated by NERTS in line with recommendations of V. Ramakrishna Task Force on Power system contingencies, had been circulated by NERLDC to all constituents of NER for comments. During Sub Group Committee Meeting of PCC held on 24th Oct'16, it was agreed that the same can be implemented at the earliest for uniformity in protection systems.

Members may discuss.

6. Review of Zone-II relay settings:

During Sub Group Committee Meeting of PCC held on 24th Oct'16, the forum discussed the relay settings document finalised by NERTS POWERGRID for adoption in NER, for fulfilment with recommendations of V.Ramakrishna Committee Task Force recommendations. The forum had agreed for implementation of Zone-II / Zone-III settings accordingly.

Further, several disturbances and major trippings in NER Grid are occurring on account of fault due to vegetation etc, resulting in high-resistive faults that fall outside the characteristic of Zone-II of Distance Protection. This results in delayed fault clearance by Earth fault relays, and the trippings are reflected at remote ends.

In view of this it is proposed that the Resistive reach of Zone-II of Distance protection be reviewed by all utilities.

The list of lines for implementation of settings is attached as per **Annexure-II.**

Members may discuss.

7. Manual for Protection Systems:

It has been noticed that several grid events are occurring on account of different practices for protection adopted by different utilities leading to lack of co-ordination. As per Sec.7 of

CEA Technical Standards for Connectivity to the Grid Regulations, 2007, utilities shall develop their own protection manuals conforming to various standards for the reference and use of its personnel.

During Sub Group Committee Meeting of PCC held on 24th Oct'16, it was noted that standard guidelines for protection system already exists. The recommendations of V. Ramakrishna Task Force Report is to be used by the utilities for all purposes.
It was also noted that CBIP has brought out an updated manual as of 2016 that contains detail guidelines for Transmission line protection. The manual was circulated to all constituents by NERLDC for reference.
The forum decided that the constituents may refer to it as guidelines for Protection systems for transmission.

Members may discuss.

8. Review of relay settings- Substation wise (including downstream state substation).

During Sub Group Committee Meeting of PCC held on 24th Oct'16, it was informed that due to ill-coordination in relay settings between State systems and ISTS, frequent tripping of elements are happening. Most of the Grid disturbances in NER Grid are due to this.

P&E Dept., Mizoram and DoP, Nagaland were requested to co-ordinate their relay settings with ISTS systems and implement the same as suggested by NERTS.
NERPC may take up with P&E Dept., Mizoram and DoP, Nagaland in this regard for quick implementation.
NERPC, P&E Dept., Mizoram and DoP, Nagaland to inform the current status.

9. Details of PSS installed and activated in all Hydro stations.

During Sub Group Committee Meeting of PCC held on 24th Oct'16, NERLDC requested all power stations to provide details where PSS is installed. It was also requested to activate existing PSS after tuning and inform the same through mail.

NEEPCO vide mail dtd. 27th Oct'16 informed that all hydro stations of NEEPCO have PSS installed and activated. NERLDC vide email dtd. 27th Oct'16 had requested NEEPCO for further details of PSS.

NERLDC requested NEEPCO and NHPC to furnish details and settings of existing PSS (Time constant, PSS gain, PSS output limiter Max, Min etc.). The details of PSS are yet to be received at NERLDC, except for Palatana CCGT.

Members may discuss.

10. Review of Recommendations of Empowered Committee for Analysis of GD-V and GD-IV in NER.

- During Sub Group Committee Meeting of PCC held on 24th Oct'16, NERLDC indicated that SPAR (Single Phase Auto Reclosure) is not available in 132 kV AGTPP – Agartala D/C lines, which was resulting in multiple tripping of these lines on transient fault. NERTS was requested for changing of Auto-reclosure scheme to SPAR.
  It was also decided that utilities should identify those transmission lines which have no SPAR scheme for implementation of the same. Implementation of SPAR is considered necessary in view of reliability of the power system.
- It was noted that most of trippings of transmission lines in NER Grid occur either on account of lightning strikes or due to vegetation infringement problem. It was decided that all utilities will identify the lightning prone areas and conduct checking of high tower footing resistance in transmission lines in these areas.

Since tripping of line on lightning occurs due to Arcing, to prevent that it is required to either maintain low value of tower footing resistance or go for installation of lightning arrester for the particular towers having consistent high footing resistance due to prevailing ground conditions.

- For purpose of information regarding furnishing of communication outage during Grid disturbance of Category-V in NER, NERLDC had circulated a format as finalized by NLDC. However, till date information has been received only from SLDC-Mizoram, SLDC-Meghalaya, Ranganadi HEP.
  NERLDC had followed up with constituents vide reminder emails dated 26th Oct'16, 01st Nov'16, 21st Nov'16. The information is being sought to solve the matter of telemetry unavailability in real-time SLDC-Mizoram, SLDC-Meghalaya, Ranganadi HEP during Grid Disturbances, which delay the restoration time.
  Format is attached as per ***Annexure-III***.

Members may discuss.

11. Low Frequency Oscillations (LFO) in All India Grid on 21st Nov'16.

Low frequency Inter-area oscillation of around 0.38 Hz was observed in All India Grid on 21st November'16 w.e.f. 13:37 Hrs for a duration of nearly 5 minutes. No conclusive event of switching etc. has been found during or prior to that period that might have caused the LFO to trigger.

It was requested to all utilities to check for any Instances of switching during the time of 13:30 Hrs to 13:50 Hrs, and intimate the same to NERLDC.
Till now, inputs have been received from Palatana-CCGT, Loktak HEP, SLDC-Assam in respect of this event.

This sort of oscillations may be extremely harmful to stability of the interconnected grid, and real-time operators at Control centers (SLDCs / ISGS / etc.) must be aware to report any such cases of oscillation.

A Snapshot of LFO on 21st Nov'16 is attached in **Annexure-IV.**

All entities of NER are requested to be alert in respect of such LFOs in the Grid, and report the same to SLDC / NERLDC / NLDC.

Members may discuss.

11. Frequent Tripping of 220 kV New Mariani (PG) - Mokokchung (PG) D/C lines.

220kV Mariani (PG) – Mokokchung (PG) D/C lines tripped several times due to the operation of over voltage protection at Mokokchung (PG) end.

Tripping details of the 220 kV Mariani (PG)-Mokokchung (PG) line I are as follows:

Sl. No	Name of Element	Date & Time of Tripping	Name of Nodes	Relay indication	Date & Time of Restoration
1	220 kV Mariani(PG)-Mokokchung (PG) I	06-10-16 12:29	Mariani(PG)	Over Voltage	06-10-16 19:16
			Mokokchung(PG)	Direct Trip received	
2	220 kV Mariani(PG)-Mokokchung (PG) I	25-10-16 2:59	Mariani(PG)	Not Furnished	25-10-16 6:57
			Mokokchung(PG)	Over Voltage	
3	220 kV	26-10-16	Mariani(PG)	Over Voltage	26-10-16

	Mariani(PG)-Mokokchung (PG) I	0:03	Mokokchung(PG)	Not Furnished	7:00
4	220 kV Mariani(PG)-Mokokchung (PG) I	27-10-16 23:19	Mariani(PG)	Direct Trip received	28-10-16 13:25
			Mokokchung(PG)	Over Voltage	
5	220 kV Mariani(PG)-Mokokchung (PG) I	28-10-16 23:11	Mariani(PG)	No tripping	29-10-16 6:43
			Mokokchung(PG)	Over Voltage	
6	220 kV Mariani(PG)-Mokokchung (PG) I	30-10-16 0:42	Mariani(PG)	Over Voltage	30-10-16 11:51
			Mokokchung(PG)	Direct Trip received	
7	220 kV Mariani(PG)-Mokokchung (PG) I	30-10-16 23:38	Mariani(PG)	Direct Trip received	31-11-16 19:54
			Mokokchung(PG)	Over Voltage	
8	220 kV Mariani(PG)-Mokokchung (PG) I	31-10-16 22:34	Mariani(PG)	Direct Trip received	01-11-16 9:36
			Mokokchung(PG)	Over Voltage	
9	220 kV Mariani(PG)-Mokokchung (PG) I	01-11-16 23:02	Mariani(PG)	Direct Trip received	02-11-16 15:33
			Mokokchung(PG)	Over Voltage	
10	220 kV Mariani(PG)-Mokokchung (PG) I	02-11-16 22:39	Mariani(PG)	Direct Trip received	03-11-16 15:05
			Mokokchung(PG)	Over Voltage	
11	220 kV Mariani(PG)-Mokokchung (PG) I	04-11-16 4:13	Mariani(PG)	Over Voltage	04-11-16 17:35
			Mokokchung(PG)	Over Voltage	
12	220 kV Mariani(PG)-Mokokchung (PG) I	05-11-16 21:27	Mariani(PG)	Direct Trip received	07-11-16 21:48
			Mokokchung(PG)	Over Voltage	
13	220 kV Mariani(PG)-Mokokchung (PG) I	13-11-16 21:59	Mariani(PG)	Over Voltage	14-11-16 16:17
			Mokokchung(PG)	Direct Trip received	
14	220 kV Mariani(PG)-Mokokchung (PG) I	14-11-16 21:34	Mariani(PG)	Over Voltage	15-11-16 16:26
			Mokokchung(PG)	Direct Trip received	
15	220 kV Mariani(PG)-Mokokchung (PG) I	15-11-16 23:01	Mariani(PG)	Direct Trip received	16-11-16 16:34
			Mokokchung(PG)	Over Voltage	
16	220 kV Mariani(PG)-Mokokchung (PG) I	17-11-16 1:59	Mariani(PG)	Over Voltage	17-11-16 9:22
			Mokokchung(PG)	Over Voltage	
17	220 kV	19-11-16	Mariani(PG)	Over Voltage	19-11-16

	Mariani(PG)-Mokokchung (PG) I	4:01	Mokokchung(PG)	Over Voltage	5:56
18	220 kV Mariani(PG)-Mokokchung (PG) I	20-11-16 22:20	Mariani(PG)	Direct Trip received	21-11-16 18:01
			Mokokchung(PG)	Over Voltage	

It has been seen from DRs of cases furnished by NERTS that Overvoltage tripping of these lines are occurring at around 242 kV. However, the design voltage for 220 kV elements is 245 kV, and hence lines should trip only for voltages beyond 245 kV.

Members may discuss.

12. Training on Protection Systems by M/s Tractebel for remaining activities for Task-II

As informed by M/s Tractebel, a meeting and training programme will be conducted in Shillong during 12th Dec'16 to 16th Dec'16 for remaining activities for Task-II.

M/S Tractebel will impart training on Protection systems during this period.

All the utilities are requested to nominate at least 2 executives and give the names to NERPC/NERLDC at the earliest for proper arrangement of training.

The venue for the training shall be NERLDC Conference Room.

Members may discuss.

13. Analysis & Discussion on Events, Grid Incidences, Grid Disturbances which occurred in NER Grid w.e.f September- October'16.

The following numbers of Grid Disturbances (GD) & Grid Incidents (GI) occurred during the period **w.e.f 1st September, 2016 to 31st October, 2016** :-

Sl No	Control Area	Grid Incidents	Grid Disturbance	Grid Incidents	Grid Disturbance
		Sep-Oct'16	Sep-Oct'16	During 2016	During 2016
1	Palatana	5	0	15	3
2	AGBPP	8	0	24	2
3	AGTPP	6	0	30	5
4	Ranganadi	0	0	1	2
5	Kopili	3	0	4	2
6	Khandong	2	0	6	2
7	Doyang	0	1	3	6
8	Loktak	0	0	2	3
9	BgTPP	0	0	7	2
10	Arunachal Pradesh	0	11	0	45
11	Assam	0	7	0	48
12	Manipur	0	11	0	52

13	Meghalaya	0	10	0	69
14	Mizoram	0	2	0	24
15	Nagaland	0	12	0	63
16	Tripura	0	1	0	6

Sl . No.	Category of GD/GI	Grid Disturbance in nos	
		Sep-Oct'16	During 2016
1	GI-I	8	42
2	GI-II	16	37
3	GD I	51	255
4	GD II	0	4
5	GD III	0	0
6	GD IV	0	0
7	GD V	0	1
8	**Total GI**	**24**	**79**
9	**Total GD**	**51**	**260**

This is for information to the members. **Remedial Measure are to taken by the concerned power utilities of NER.**

The root cause analysis and remedial measures to prevent the Grid Events were discussed during Meeting of Sub-group of PCC. The same are reproduced below:

I. Salakati (PG) Substation Blackout:

2 Nos of disturbance occurred due to tripping of lines emanating from Salakati (PG) Substation (**Sl No. 1 to 2 of Disturbance Report of NER Grid attached in Annex-III**).

A. Due to tripping of all outgoing elements from Salakati on 16.09.16 at 18:00 Hrs, Salakati station was separated from rest of NER Grid and blacked out. Part of Eastern Bhutan was connected with Indian Grid through 132 kV Salakati - Gelephu line (some of the internal lines of Bhutan kept open for system requirement). At 18:00 Hrs on 16.09.16, 132 kV Salakati - Gelephu line tripped. Due to tripping of this element, Eastern Bhutan was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

B. Due to tripping of 220 kV BTPS - Salakati I line (220 kV BTPS - Salakati I line was not restored after tripping at 18:00 Hrs on 16.09.16 & 220 kV BTPS - Agia I & II lines handtripped at 19:10 Hrs on 16.09.16 to reduce the loading of 220 kV BTPS-salakati I line) at 2107 Hrs on 16.09.16, Dhaligaon area was separated from rest of NER Grid and collapsed due to no source in this area. Part of Eastern Bhutan was connected with Indian Grid through 132 kV Salakati - Gelephu line (some of the internal lines of Bhutan kept open for system requirement). At 21:07 Hrs on 16.09.16, 132 kV Salakati

- Gelephu line tripped. Due to tripping of this element, Eastern Bhutan was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Root Cause Analysis:

On Salakati - BTPS II jumper failure occurred on R-ph. Rectified by PG. (Line-1 tripped only at BTPS end). SPS operated at Dhaligaon. PG rectified fault current (seen as 9 kA in DR). After 9 mins, there was also jumper failure on Birpara - Salakati I line due to overload

Remedial Measure to be taken:

POWERGRID to ensure healthiness of line sections through proper maintenance activities.

II. Disturbance in Jiribam, Umrangshu & Haflong area:

1 No of disturbance occurred due to tripping of 132 kV Jiribam(PG)- Badarpur (PG) line, 132 kV Haflong(PG)- Umrangshu (AS) line, 132 kV Khandong(NO)- Umrangshu(AS) line, 132 kV Jiribam(PG)- Loktak(NH) line and132 kV Jiribam(PG)- Aizwal(PG) line. (**Sl No. 3 of Disturbance Report of NER Grid attached in Annex-III**).

Due to tripping of this element, Jiribam area, Umrangshu area & Haflong area were separated from rest of NER Grid and subsequently collapsed due to no source in this area

Root Cause Analysis:

Fault was in 132 kV Jiribam - Aizwal line. Non clearance of fault at Jiribam end even after initiation of Zone I caused tripping of lines connected to Jiribam from remote end.As intimated by POWERGRID, during the fault 132 kV Jiribam - Aizwal line was charged through transfer bus at Jiribam end and tie CB was not tripped due to defective tripping relay. DR indicates B-E fault with gradually increasing fault current up to 0.36 kA at Aizwal end & up to 1 kA at Jiribam end.Angle between Vb & Ib around 30 degree at Jiribam end & Gradually increasing nature of fault current indicate fault due to vegetation infringement.

Remedial Measure to be taken:

Vegetation clearence to be done by POWERGRID and status to be reported to NERPC & NERLDC.

III. Disturbances in Arunachal Pradesh System:

Total **8 Nos** Disturbances have occurred in Arunachal Pradesh system during the month of September- October'16. **(Sl No. 4 to 11 of Disturbance Report of NER Grid attached in Annexure-III)**

i. Capital Area:

1 No of disturbance occurred due to tripping of 132 kV Lekhi – Nirjuli line, while Bus Coupler CB of Gohpur kept open for system requirement **(Sl No. 4 of Disturbance Report of NER Grid attached in Annexure-III)**.

Due to tripping of this element, Nirjuli area of Arunachal Pradesh and Gohpur Area (Gohpur Load) of Assam were separated from rest of NER Grid and subsequently collapsed due to no source in these areas.

Root Cause Analysis:

Problem may be in Arunachal Pradesh section of 132 kV Lekhi - Nirjuli line. Manager (NERTS) said infringement problem was there in Arunachal Pradesh section.

Remedial Measure to be taken:

NERPC to take up with Arunachal Pradesh seperately for resolving this problem.

j. Ziro Area :

1 No disturbance occurred due to tripping of 132 kV Ranganadi- Ziro line, **(Sl No. 5 of Disturbance Report of NER Grid attached in Annexure-III).**

Due to tripping of this element, Ziro area of Arunachal Pradesh was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Root Cause Analysis: Fault in the line.Root cause could not be concluded due to unavailabilty of DR output from Ranganadi end.

Remedial Measure to be taken:
NEEPCO to furnish DR output of Ranganadi end to conclude the root cause.

k. Khupi Area :
6 Nos disturbances occurred due to tripping of 132 kV Balipara- Khupi line, **(Sl No. 6 to 11 of Disturbance Report of NER Grid attached in Annexure-III).**
Due to tripping of this element, Khupi area of Arunachal Pradesh was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Root Cause Analysis:
Likely due to vegetation fault in the line.Root cause could not be concluded due to unavailability of DR from Balipara End. As informed by NEEPCO,physical patrolling of critical stretches of the line revealed no fault.

Remedial Measure to be taken:
Vegetation clearance is to be done by NEEPCO and status to be reported to NERLDC & NERPC on a regular basis. NEEPCO to furnish DR data of Balipara end for concluding root cause.

IV. Disturbances in Assam System:

Total **3 Nos** Disturbances have occurred in Assam system during the month of September- October'16 **(Sl. No. 12 to 14 of Disturbance Report of NER Grid attached in Annexure-III).**

A. Boko Area:
1 No disturbance occurred due to tripping of 220 kV Agia - Boko line & 220 kV Boko - Azara line, **(Sl No. 12 of Disturbance Report of NER Grid attached in Annexure-III).**

Due to tripping of these elements, Boko area of Assam was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Root Cause Analysis:
AEGCL said fault in Agia - Boko line. Agia end DP, Z-1 operated. O/C relay should not have operated at Azara / Boko. There could be problem with time co-ordination of O/C relays. (Boko should have cleared first). AEGCL to check

Remedial Measure to be taken:
AEGCL to check and co-ordinate relay settings to prevent unwanted operation

B. Dhaligaon Area:
1 No disturbance occurred due to tripping of 132 kV Dhaligaon-BTPS I & II lines tripped **(Sl No. 13 of Disturbance Report of NER Grid attached in Annexure-III).**

Due to tripping of these elements, Dhaligaon area of Assam was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Root Cause Analysis:
Busbar protection Operated at BTPS. In Bus-bar Zone-1, 220 kV BTPS- Salakati line I is present, and on Zone-2 220 kV BTPS- Salakati line II is present. In Zone-1, it found open isolator on 220 kV BTPS- Salakati line I (incorrectly).

Remedial Measure to be taken:
Rectified by AEGCL

C. Dullavcherra and Hailakandi Area:
1 No disturbance occurred due to tripping of 132 kV Silchar- Hailakandi line while 132 kV Dullavcherra- Dharmanagar line was kept open for system requirement, **(Sl No. 14 &19 of Disturbance Report of NER Grid attached in Annexure-III).**

Due to tripping of this element, Dullavcherra and Hailakandi area of Assam was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Root Cause Analysis:

Fault in the line. Root cause could not be concluded due to unavailabilty of DR outputs from both ends.

Remedial Measure to be taken:
AEGCL&POWERGRID to furnish relay DR outputs of their end for this event.

V. Disturbances in Manipur System:

Total **8 Nos.** Disturbances have occurred in Manipur system during the month of September- October'16. **(Sl No. 15 to 22 of Disturbance Report of NER Grid attached in Annexure-III).**

A. Capital & Karong Areas:

3 No of disturbances occurred due to tripping of 132 kV Imphal (PG)- Imphal (Manipur) I & II lines, **(Sl No. 15 to 17 of Disturbance Report of NER Grid attached in Annexure-III).**

Due to tripping of these elements, Capital & Karong area of Manipur were separated from rest of NER Grid and subsequently collapsed due to no source in these areas.

Root Cause Analysis:
For Sl. No. 15
Fault in state end; No autoreclose operated at Imphal (PG) end. As per NERTS, problem in Karong feeder from Imphal.
For Sl. No. 16
Likely due to fault in the line as the E/F relay operated at both ends.Root cause could not be concluded due to unavailability of DR from both ends.
For Sl. No. 17
DR indicates R-E fault with fault current gradually increasing up to 1.2 kA.Angle between Vr and Ir around 28 degrees during fault and slowly increasing nature of fault current indicate high resistive fault. There is no vegetation problem in this D/C line as intimated by POWERGRID.So fault was likely due to downstream vegetation infringement.

Remedial Measure to be taken:
For Sl. No. 15
MSPCL to investigate the cause of tripping and intimate the forum.
For Sl. No. 16
POWERGRID shall furnish DR at Imphal(PG) end of the line.MSPCL shall confirm relay indication of Imphal(MA) end of this line and furnish downstream tripping if any.
For Sl. No. 17
Operation of Over current relay at Imphal (MA) is not desirable as these lines are radially fed. MSPCL shall check over current relay settings at Imphal end. Vegetation clearance of downstream lines (downstream of Imphal) to be done by MSPCL and status to be furnished to NERPC & NERLDC.

B. Rengpang Area:

5 Nos. disturbances occurred due to tripping of 132 kV Loktak- Rengpang line while 132 kV Rengpang - Jiribam(MA) line is under outage, **(Sl No. 18 to 22 of Disturbance Report of NER Grid attached in Annexure-III).**

Due to tripping of this element, Rengpang area of Manipur was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Root Cause Analysis:
Likely vegetation problem (Heavy jungle). Also possible that fault in downstream getting cleared. Manipur to furnish details

Remedial Measure to be taken:
Vegetation clearance to be done in line sections. In forested areas, adequate manpower to be employed. NHPC to check Over Current relay settings at Loktak.

VI. Disturbances in Meghalaya System:

Total **6 Nos.** Disturbances have occurred in Meghalaya system during the month of September- October'16. **(Sl No. 23 to 28 of Disturbance Report of NER Grid attached in Annexure-III).**

A. Khliehriat Area:

4 Nos disturbances occurred due to tripping of 132 kV Khliehriat (PG)- Khliehriat (MePTCL) I & II lines, **(Sl No. 23 to 26 of Disturbance Report of NER Grid attached in Annexure-III).**

Due to tripping of these elements, Khliehriat area of Meghalaya was separated from rest of NER Grid and subsequently collapsed due to load generation mismatch.

Root Cause Analysis:

Trippings in Khliehriat side are not possible to analyse properly due to absence of numerical relays. PGCIL said setting of DP, Z-1 at Khliehriat(PG) is around 70 kms. NERTS to clarify why the distance shown by relay is more than setting distance.

Remedial Measure to be taken:

Meghalaya to review relay co-ordination within their own system. MePTCL to install Numerical relays on all feeders from Khliehriat (MePTCL) on urgent basis. It is to be further co-ordinate with NERTS for upstream. By December, relays will be installed (MePTCL confirmed). Numerical relays now present only on Neigrihms and Leshka feeders from Khlehriat. NERPC also mentioned poor manpower at Byrnihat / Khliehriat substations, and requested MePTCl to take up for improvement.

B. Lumshnong Area:

1 No. of disturbance occurred due to tripping of 132 kV Panchgram - Lumshnong line, while 132 kV Lumshnong - Khliehriat line kept open for system requirement. **(Sl No. 27 of Disturbance Report of NER Grid attached in Annexure-III).**

Due to tripping of this element, Lumshnong area of Meghalaya was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Root Cause Analysis:

Due to vegetation problem in the line, 132 kV Lumshnong - Panchgram line tripped.

Remedial Measure to be taken:

Vegetation clearance is to be done by MePTCL & AEGCL. Patrolling report is to be submitted and status of vegetation clearance is to be reported by MePTCL & AEGCL.

C. Byrnihat Area:

1 No. of disturbance occurred due to tripping of 132 kV EPIP II-Byrnihat I & II lines while 132 kV Kahilipara-Umtru I & II lines, 132 kV Sarusajai-Umtru I & II lines & 132 kV Umium Stage I - Umium Stage III 1&2 lines kept open for System requirement. **(Sl No. 28 of Disturbance Report of NER Grid attached in Annexure-III).**

Due to tripping of these elements, Byrnihat area of Meghalaya was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Root Cause Analysis:

Due to vegetation problem in the line, 132 kV Lumshnong - Panchgram line tripped.

Remedial Measure to be taken:

Vegetation clearance is to be done by MePTCL & AEGCL. Patrolling report is to be submitted and status of vegetation clearance is to be reported by MePTCL & AEGCL.

VII. Disturbances in Mizoram System:

Total **2 Nos.** Disturbances have occurred in Mizoram system during the month of September- October'16. **(Sl No. 29 to 30 of Disturbance Report of NER Grid attached in Annexure-III).**

A. Zuangtui Area:

2 Nos. disturbances occurred due to tripping of 132 kV Aizawl - Zuangtui line, **(Sl No. 29 to 30 of Disturbance Report of NER Grid attached in Annexure-III).**

Due to tripping of this element, Zuangtui area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Root Cause Analysis:
Relay co-ordination not yet down by Mizoram. P&E Dept., Mizoram not agreed to implement

Remedial Measure to be taken:
NERPC to take up with P&E Dept., Mizoram to ensure Mizoram does co-ordination of it's protection system with NERTS so that un-wanted tripping of EHV lines does not occur

VIII. Disturbances in Nagaland System:

Total **4 Nos.** Disturbances have occurred in Nagaland system during the month of September- October'16. **(Sl No. 31 to 34 of Disturbance Report of NER Grid attached in Annexure-III).**

A. Mokokchung Area:

1 No disturbance occurred due to tripping of 132 kV Doyang - Mokokchung (NA) line and 220 kV Mariani (PG)-Mokokchung (PG) I, **(Sl No. 31 of Disturbance Report of NER Grid attached in Annexure-III).**

Due to tripping of these element, Mokokchung area of Nagaland was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Root Cause Analysis: DoP, Nagaland to give further details. NEEPCO to confirm later after getting details from Doyang HEP

Remedial Measure to be taken:
As per NERTS, Instantaneous element at Mariani disabled so that tripping of 220 kV Mariani - Mokokchung along with 132 kV Doyang - Mokokchung does not occur. DoP, Nagaland to co-ordinate downstream relay settings with NERTS in order to prevent unwanted tripping of EHV elements

B. Capital Area:

3 Nos. disturbances occurred due to tripping of 132 kV Dimapur (PG) - Kohima line, **(Sl No. 32 to 34 of Disturbance Report of NER Grid attached in Annexure-III).**

Due to tripping of this element, Capital area of Nagaland was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Root Cause Analysis:
Downstream fault in DoP, Nagaland system that was not cleared on time.

Remedial Measure to be taken:
DoP, Nagaland to restore the condition of 132kV Dimapur-Kohima line to original and co-ordinate downstream relay settings with NERTS to prevent unwanted line trippings.

IX. Substation / Power Station Black out:

A. Doyang Power Plant:

1 No. disturbances occurred due to tripping of 132 kV Dimapur - Doyang I & II lines and 132 kV Doyang- Mokokchung line. **(Sl No. 35 of Disturbance Report of NER Grid attached in Annexure-III).**

Due to evacuation problem, Doyang Power Station was blacked out.

Root Cause Analysis:
Likely due to downstream fault in the Nagaland System. Root cause could not be concluded due to unavailability of DR & Relay indications from Doyang End.

Remedial Measure to be taken:
NEEPCO shall furnish DR & Relay indications at Doyang end of the line. Relay coordination is to be done by DoP, Nagaland with POWERGRID to avoid tripping of ISTS lines.

B. Kumarghat Substation:

1 No. disturbances occurred due to tripping of all outgoing lines from Kumarghat Subststion. **(Sl No. 36 of Disturbance Report of NER Grid attached in Annex-III).**
At 18:09 Hrs on 03.10.16, 132 kV AGTPP - Kumarghat line, 132 kV Badarpur - Kumarghat line, 132 kV Aizwal - Kumarghat line & 132 kV P K Bari - Kumarghat line tripped and Kumarghat SubStation was blacked out.

Root Cause Analysis:
Mal-operation during relay testing.

Remedial Measure to be taken:
Relay testing to be done after taking necessary precautions to avoid unwanted trippings.

14. Analysis of Element trippings of NER Grid from September - October 2016:

The tripping of transmission elements and generating units of NER Grid were discussed during the Meeting of Sub-group of PCC on 24th October'16.
The list of trippings along with Root cause analysis and Remedial measures to prevent recurrence is as per ***Annexure-V.***
The remedial measures as indicates need to be implemented by the utilities at the earliest.

During analysis of the Grid Events, lack of information like relay indications, Disturbance Recorders etc. lead to inconclusive analysis. It has been found that the Doyang HEP has repeatedly failed to furnish the necessary information inspite of reminders. Also, Dimapur(PG), Balipara(PG) for 132 kV Balipara – Khupi line do not furnish the DR outputs in case of events.
Also, DR from Assam and Imphal(PG) are not obtained in most of the disturbances.

Members may discuss.

15. Additional Agenda from NPC, CEA:

Line Differential Protection: Many transmission lines are now having OPGW or separate optic fibre laid for communication. Where ever such facilities are available, it is recommended to have the line differential protection as Main-I protection with distance protection as back-up (built-in Main relay or standalone). Main-II protection shall continue to be distance protection. For cables and composite lines, line differential protection with built-in distance back up shall be applied as Main-I protection and distance relay as Main-II protection. Auto-recloser shall be blocked for faults in the cables. This is following recommendation of the Sub-Committee on Relay/Protection under Task Force for Power System Analysis under contingencies (Para 14 in Section-6 of the report under Relay setting guidelines for Transmission lines). This is for detailed deliberation by constituents members.

Members may discuss.

16. Additional Agenda from NLDC: Violation of protection standard in case of tripping of Inter-Regional lines of voltage class 220 kV above:

NLDC, POSOCO has informed vide letter No. POSOCO/NLDC/2016/839 dated 07.11.2016 that the ER/NER Inter-Regional Lines viz. 400 kV Siliguri - Bongaigaon Lines - II & III have tripped on 03.10.2016 at 11:46 Hrs and 27.10.2016 at 11:55 Hrs. respectively. The two lines were restored on 03.10.2016 at 12:19 Hrs and 27.10.2016 at 12:07 Hrs. respectively. The fault clearing times of the two lines are 240 msec and 1120 msec respectively. However as per section 3.e of Grid Standards Regulation of CEA 2011, fault in case of 400 kV Nominal System Voltage maximum time of fault clearing is 100 msec only. It is observed that the faults had not been cleared within specified time during these incidents. The constituents are requested to clarify at the time of deliberation.

Members may discuss.

It was decided that the next meeting of the committee shall be held within 45 days of issuance of these minutes of meeting.

The meeting ended with thanks to the Chair.

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3rd Party Protection Audit of Tripura Sub-Stations & OTPC, Agartala 2016

As per the resolution of protection-related Sub Group Committee Meeting of NERPC held at NERLDC Shillong on 24.10.2016, third party protection audit of Tripura substations viz., 132kV 79 Tilla, 132 kV Surjyamaninagar, OTPC, Agartala & 132 kV Udaipur have been carried out from 07-10 November 2016 by a team comprising of representatives from NERPC, AEGCL, PGCIL, OTPC & NEEPCO. Following are the observations and recommendations of the audit team for the respective substations.

Observations and Recommendations

1. **132kV 79, Tilla Grid Sub-Station, Agartala on 07.11.2016**
   a. Detailed information of various protection tripping is not maintained properly.
   b. Condition of the room in which battery banks are kept is not up to the mark. Adequate amenities such as Air conditioners should be provided.
   c. On 04.04.2016 at 09:08 hrs, in SM Nagar 2 line, a fault was occurred. The respective relay picked up in Zone 3 but within 26 ms it got into Zone 4 which lasted for 254 mSec. Other Zone 4 pickups are also seen recorded by the relay. At present, Zone 4 reach is found to be 10% of Zone 1 impedance. The team recommends TSECL to implement the zone settings as per Ramakrishna Committee recommendations.
   d. The protection audit team helped TSECL Engineers in calculating he various zone settings as well as other protection settings as per Ramakrishna Committee Recommendations and recommends these settings to be implemented in all the feeder relays.
   e. Earth Resistance in the sub-station was found to be 0.56 Ohms which is acceptable.
   f. It is also recommended by the team to keep SOTF only for Z1 and Z2.
   g. DC Negative earth fault is observed. The observed values are following:

72.6 V	Positive to Earth
48.6 V	Negative to Earth

2. **Surjyamaninagar Grid Sub-station, Agartala on 08.11.2016**
   a. Distance protection relay settings of 132kV Palatana Feeder have been verified and found in conformity. A few numbers of disturbance records from the relay have been analyzed. A tripping on **30.08.2016** is found to be correct. The relay picked up in Zone1 and cleared the fault within its stipulated time.
   b. DPR settings of 79 Tilla 1&2 have also been verified and found in order but not as per the Ramakrishna Committee's settings.
   c. The audit team recommends the implementation of Ramakrishna Committee's settings to all the feeder relays of Surjyamaninagar, Sub-Station (primary as well as backup).
   d. It is been noted that the 132kV Palatana feeder relays are maintained by PGCIL and settings as per Ramakrishna Committee has already been implemented in them. TSECL maintains all

the other feeder relays. The concerned TSECL official was explained the calculation of the relay settings as per the Ramakrishna Committee which is to be implemented in their relays.

e. The team also verified the DC voltage of the substation and negative earth fault is observed as given below.

Sr. No.	Item	+ve to Earth voltage	-ve to Earth voltage
1.	220 V DC charger	148V	95V
2.	220 V DC Charger	148V	102.1V
3.	48 V DC Charger	51V	0

f. Earth resistance was found to be 0.6 ohms which is under the acceptable limits.

g. The team recommends installation of exhaust fans in the battery charger and battery bank rooms.

h. In view of the safety of relays and other equipment present in the control room, the team strongly recommends proper insulation of the windows and constant air conditioning of the room.

3. OTPC Grid Sub-Station, Palatana, Agartala on 09.11.2016

a. The Protection Audit team comprising of NEEPCO, NERPC, AEGCL & POWERGRID visited the above mentioned sub-station and inferred the points as under.

b. The 132kV Palatatana – Surjyamaninagar feeder has its primary protections intact and stable with Distance Protection Relays as recommended.

c. In relation to the audit report prepared for Surjyamaninagar Sub - Station, the Distance Protection Relay at Palatana found in conformity for any inevitable electrical fault.

d. More specifically the DPRs at Palatana & Surjyamaninagar acted brilliant on **30.08.2016**, clearing a single phase to ground fault efficiently.

e. The audit team found this authentic to have all the protective devices at the very best of their health at Surjyamaninagar Sub – Station. The investigation finally resulted satisfactory for all relays at Surjyamaninagar end maintained by POWERGRID.

f. Discrepancies noticed at OTPC end are summarized in the following sub – sets : -

I. The 132kV Palatana – Surjyamaninagar feeder's Distance Protection Relay is incorrectly configured for its Directional Earth Fault function. It is seen that the current configuration for directional Earth Fault is chosen to be definite one (DT) with a 1.5 Sec delay & Plug set at 300mA. This setting is in direct contrast to Ramakrishna Committee recommendations.

II. The HV side back-up O/C & E/F relay for ICT -1 at OTPC is having a peculiar setting of O/C stage (instantaneous) with a pick up = 3 X In with zero delay.

III. The E/F parameter of HV side back-up O/C & E/F relay for ICT -1 is also found vulnerable with a pickup = 10% & delay of 0.4Sec.

IV. An incident of Palatana blackout on **01.05.2016** relates to this unexpected relay settings mentioned as above.

V. On 01.05.2016 a disturbance in Y / B-phase of the 132kV Palatana – Surjyamaninagar feeder was observed and consequent tripping of the back-up E/F relay for ICT -1 was found very natural since the back-up E/F relay for the same feeder (132kV Palatana – Surjyamaninagar) could not operate on time due to the setting constraint.

VI. The Audit team recommends OTPC to adopt the actual gradation of proper functioning of all these protective relays in coherence with the **Ramakrishna Committee Recommendations**.

VII. Further help in this regard may please be extended from NERPC / NERLDC / POWERGRID / AEGCL.

g. OTPC also requested the audit team for staging their future demand in front of NERPC for incorporation of another SPS guarding any unwanted tripping of ICTs at OTPC end, when the second ICT comes into its very operation.

4. 132kV Udaipur Grid Sub-Station, Agartala on 09.11.2016

a. The protection audit team calculated the various zone settings as well as other protection settings as per Ramakrishna Committee Recommendations and recommends these settings to be implemented in all the feeder relays.

b. Condition of the room in which battery banks are kept should be improved. Adequate amenities such as Air conditioners should be provided.

Impedances of Shortest Line and Longest Lines

SN	Organisation	Name of Station	Voltage Level	Shortest Line			Longest Line		
				Name	Length	Impedance	Name	Length	Impedance
1	PGCIL	Bongaigaon	400kV	NTPC 1& 2	3.119	0.962	Balipara II&IV	309	77.549
2	PGCIL	Siliguri	400kV	Rongpoh	109	33.626	Bongaigaon III&IV	220	55.212
3	PGCIL	Balipara	400kV	BNC 3&4	57.294	17.675	Bongaigaon II&IV	309	159.475
4	PGCIL	Misa	400kV	Balipara 1&2	95.407	29.433	Balipara 1 & II	95.407	29.433
5	PGCIL	Silchar	400kV	Byrnihat	217	66.945	Azara	265	81.753
6	PGCIL	HVDC BNC	400kV	Balipara III&IV	57.294	17.675	Ranganadi 1&2	129.335	39.900
7	AEGCL	Azara	400kV	Bongaigaon	160	49.360	Silchar	256	78.976
8	MeECL	Byrnihat	400kV	Bongaigaon	201	62.000	Silchar	217	66.945
9	NTPC	BTPS	400kV	Bongaigaon	3	0.923			
10	OTPC	Pallatana	400kV	Silchar	247	76.200			
11	NEEPCO	Ranganadi	400kV	BNC	131	40.414			
12	PGCIL	Salakati	220kV	BTPS I& II	3.7	1.497	Birpara I & II	161.9	65.527
13	PGCIL	Birpara	220kV				Malbase		
14	PGCIL	Balipara	220kV	Sonabil	8.6	3.480	Sonabil	55	22.259
15	PGCIL	Misa	220kV	Samaguri I & II	34.4	13.880	Mariani New	222.682	68.690
16	PGCIL	Dimapur	220kV	Misa I & II	123.52	49.803	Misa I & II	123.52	49.803
17	PGCIL	Mariani New	220kV	Mokokchung I&II	48.8	19.676	Mokokchung I&II	48.8	19.676
18	PGCIL	Mokokchnug	220kV	Mariani New I&II	48.8	19.676	Mariani New I&II	48.8	19.676
19	AEGCL	BTPS	220kV	Salakati	3	1.214	Agia	63	25.496
20	AEGCL	Sonabil	220kV	Balipara	8.6	3.480	Samaguri	47.4	19.183
21	AEGCL	Mariani Old	220kV	Kathalguri	163	50.286	Misa	220	67.870
22	AEGCL	Samaguri	220kV	Misa I & II	35	14.164	Mariani	168	68.000
23	AEGCL	Agia	220kV	Boko (D/C)	38	15.379	Azara (D/C)	107	43.303
24	AEGCL	Boko	220kV	Azara (D/C)	38	15.379	Agia (D/C)	70	28.329
25	AEGCL	Azara	220kV	Sarusajai (D/C)	24	9.713	Agia (D/C)	107	43.303
26	AEGCL	Sarusajai	220kV	Jawahar Nagar (D/C)	11	4.452	Samaguri (D/C)	117	47.350
27	AEGCL	Jawahar Nagar	220kV	Sarusajai (D/C)	11	4.452	Samaguri (D/C)	117	47.350
28	AEGCL	Tinsukia	220kV	Kathalguri D/C	25	10.118	NTPS D/C	40	16.188
29	NEEPCO	Kopili	220kV	Misa I & II	73	29.543	Misa III	76	30.871
30	NEEPCO	Kathalguri	220kV	Deomali	19	7.689	Mariani (PG)	161	49.670
31	PGCIL	Salakati	132kV	Gelephu S/C	49.6	21.575	Gelephu	49.6	21.575
32	PGCIL	Balipara	132kV	Depota	28	12.180	Khupi	77	33.495
33	PGCIL	Dimapur	132kV	Dimapur (s) I	0.4	0.174	Imphal	169	73.515
34	PGCIL	Jiribam	132kV	Jiribam (State)	0.4	0.174	Aizawl	173	75.255
35	PGCIL	Aizawl	132kV	Zemabawk I	0.6	0.261	Jiribam	173	75.255
36	PGCIL	Badarpur	132kV	Badarpur state	1.023	0.429	Kumarghat	118	51.330
37	PGCIL	Imphal	132kV	Imphal state I	1.5	0.653	Silchar	174	53.690
38	PGCIL	Silchar	132kV	Srikona I & II	1.119	0.505	Imphal I & II	174	53.679
39	PGCIL	Khleriat	132kV	Khleriat II	5.35	2.327	Badarpur	76.646	32.168
40	PGCIL	Haflong	132kV	Haflong state	1.2	0.522	Jiribam	100.63	43.770
41	PGCIL	Kumarghat	132kV	P K Bari (state)	1.5	0.653	Badarpur	131	56.980
42	PGCIL	Nirjuli	132kV	Lekhi	41.74	9.696	Gohpur	42.5	18.487
43	PGCIL	Ziro	132kV	Ranganadi	44.292		Daporijo	86.722	37.724
44	PGCIL	BNC	132kV	Pavoi I & II	12.931	5.452	Pavoi I & II	12.931	5.452
45	PGCIL	Mokokchung	132kV	Mokokchung I&II	1.4	0.564	Mokokchung I& II	1.4	0.564
46	BPC	Gelephu	132kV						
47	AEGCL	Bhalukpungi	132kV	Khupi	33	14.355	Balipara	35	15.225
48	AEGCL	Bokajan	132kV	Dimapur	25	10.875	Golaghat	65	28.275
49	AEGCL	Srikona	132kV	Silchar I & II	1	0.452	Pailapool	35	15.855
50	AEGCL	Dullovcherra	132kV	Dharmanagar	29	12.615	Silchar	50	22.035
51	AEGCL	Gohpur	132kV	Nirjuli	43	18.487	Sonabil	88	38.280
52	AEGCL	Pavoi	132kV	BNC I & II	13	12.931	Gohpur	51	21.500
53	AEGCL	Pailapool	132kV	Jiribam (State)	15	6.525	Srikona	35	15.225
54	AEGCL	Panchgram	132kV	Badarpur	1	0.435	Silchar I & II	30	13.335
55	AEGCL	Haflong(state)	132kV	Haflong(PG)	1				
56	AEGCL	Umranshu	132kV	Khandong	11	4.785	Haflong(PG)	52	22.620
57	AEGCL	Balipara	132kV	Sonabil(220kV D/C)	14	5.666	Hkhupi	35	15.295
58	AEGCL	Depota	132kV	Sonabil	17	7.395	Rowta	72	31.464

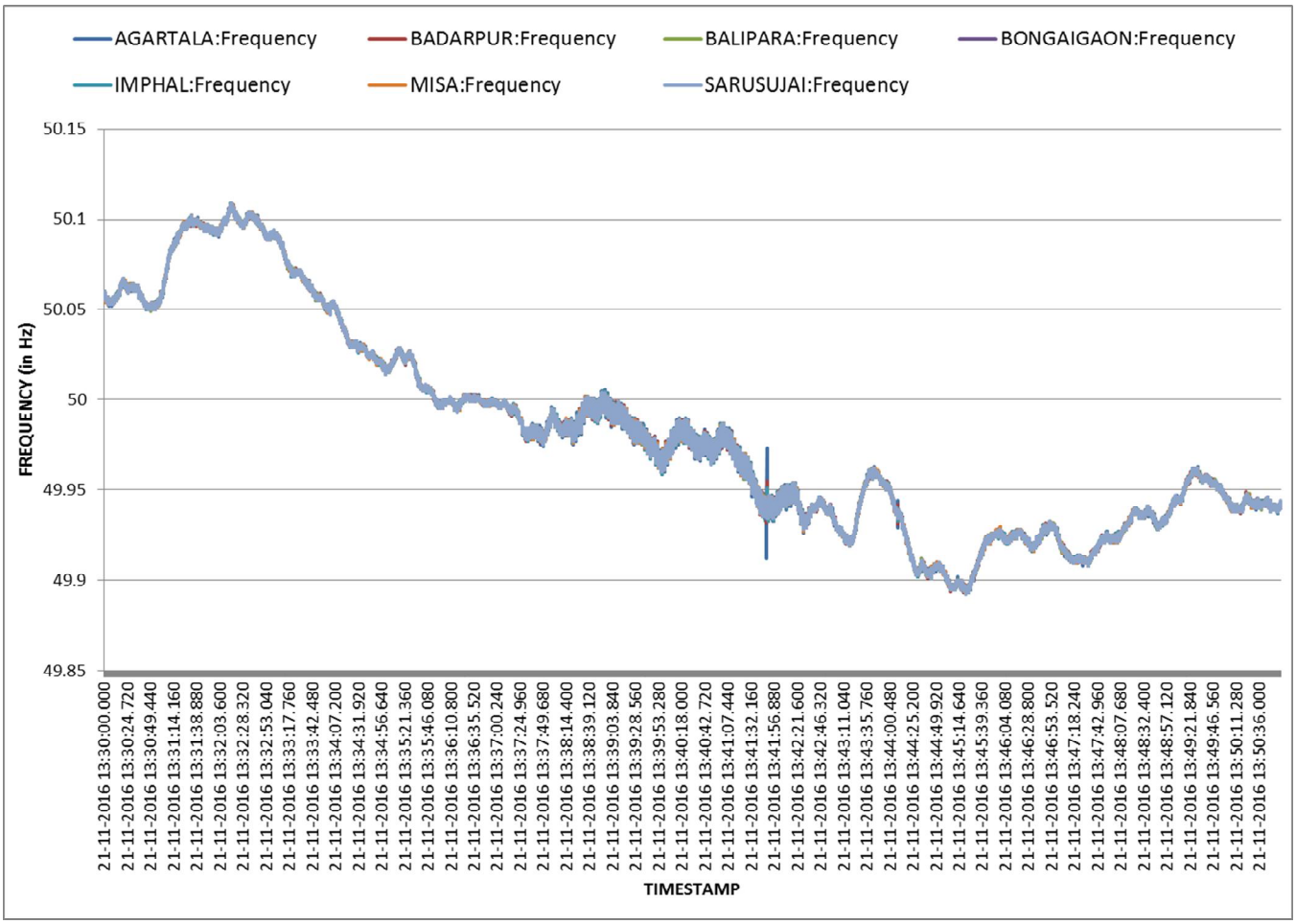
SN	Organisation	Name of Station	Voltage Level	Shortest Line			Longest Line		
				Name	Length	Impedance	Name	Length	Impedance
59	AEGCL	Mariani	132kV	Jorhat (D/C)	20	8.432	LTPS	54	23.490
60	AEGCL	Jorhat	132kV	Mariani(D/C)	20	8.432	Bokakhat	89	38.715
61	AEGCL	Nazira	132kV	Sibasagar	13	5.655	Jorhat	69	30.015
62	AEGCL	LTPS	132kV	Sonari(D/C)	17	7.168	NTPS (D/C)	60	25.297
63	AEGCL	Sonari	132kV	LTPS (D/C)	17	7.168	NTPS (D/C)	60	25.297
64	AEGCL	NTPS	132kV	Tinsukia	43	18.705	Sonari (D/C)	60	25.297
65	AEGCL	Tinsukia	132kV	Lidu	22	9.570	Dibrugarh	53	23.055
66	AEGCL	Dibrugarh	132kV	Behiating	9	3.915	Tinsukia	53	23.055
67	AEGCL	Behiating	132kV	Dibrugarh	9	3.915	Moran	47	20.445
68	AEGCL	Moran	132kV	LTPS	39	16.965	Behiating	47	20.445
69	AEGCL	Dhaligaon	132kV	BRPL	6	2.610	Nalbari	106	46.110
70	AEGCL	Nalbari	132kV	Rangia(D/C)	22	9.276	Dhaligaon (D/C)	106	44.692
71	AEGCL	Barnagar	132kV	Dhaligaon (D/C)	42	17.708	Rangia n(D/C)	86	36.259
72	AEGCL	Rangia	132kV	Nalbari D/C	22	9.276	Rowta (D/C)	108	45.535
73	AEGCL	Sipajhar	132kV	Rangia D/C	38	16.022	Rowta (D/C)	44	18.551
74	AEGCL	Rowta	132kV	Sipajhar	44	19.140	Rangia n(D/C)	108	45.535
75	AEGCL	Kahilipara	132kV	Dishpur	3	1.305	Sisugram	12	5.220
76	AEGCL	Sisugram	132kV	Kahilipara	12	5.220	Rangia n(D/C)	34	14.335
77	AEGCL	Sarusajai	132kV	Kahilipara	4	1.740	Umtru (I & II)	18	7.589
78	AEGCL	Narengi	132kV	Kahilipara	12	5.220	CTPS	20	8.700
79	AEGCL	Dishpur	132kV	Kahilipara	3	1.305	CTPS	29	12.615
80	AEGCL	CTPS	132kV	Narengi	20	8.700	Baghjap	35	15.225
81	AEGCL	BTPS	132kV	Kokrajhar	10	4.350	Dhaligaon I & II	22	9.276
82	AEGCL	Kokrajhar	132kV	BTPS I& II	10	4.216	Bilasipara	24	10.440
83	AEGCL	Bilasipara	132kV	Gouripur	10	4.350	Kokrajhar	24	10.440
84	AEGCL	Gouripur	132kV	Bilasipara	10	4.350	Gossaigaon	63	27.405
85	AEGCL	Gossaigaon	132kV	Gouripur	63	27.405	Dhaligaon	64	27.840
86	NEEPCO	Khangdong	132kV	Kopili-I & umrangso	11	4.785	Khliehriat(PG)-I	42	18.270
87	NEEPCO	Ranganadi	132kV	Lekhi	18	7.830	Ziro	45	19.575
88	NEEPCO	R C Nagar	132kV	Agartal-I&II	8	3.373	Kumarghat	104	45.240
89	NEEPCO	Doyang	132kV	Mokokchung I&II	28	11.800	Dimapur I &II	93	39.211
90	NEEPCO	Kopili	132kV	Khandong-I	11	4.785	Khandong-II	12	5.220
91	DOP(N)	Dimapur	132kV	Dimapur(PG)	1	0.422			
92	DOP(N)	Kohima	132kV	Dimapur(PG)	45	19.575	Meluri	74	32.190
93	DOP(N)	Mokokchung	132kV	Mokokchung(PG)	1	0.452	Doyang	28	12.180
94	DOP(M)	Nithongkong	132kV	Loktak	11	4.785	Imphal(PG)	26	11.310
95	DOP(M)	Yurembam	132kV	Imphal(PG)- I & II	2	0.843	Karong	60	26.100
96	DOP(M)	Jiribam(S)	132kV	Jiribam (PG)	1	0.435	Rengpang	40	17.400
97	NHPC	Loktak	132kV	Ningthoukhong	11	4.785	Jiribam (PG)	82	35.670
98	MeECL	Khleriat	132kV	Khliehriat(PG)-II	5	2.175	Khandong	42	18.270
99	MeECL	Neigrims	132kV	NEHU	7	3.045	Khliehriat	63	27.405
100	MeECL	Mustem	132kV	Khliehriat(PG)-II	16	6.960	NEHU	42	18.270
101	MeECL	NEHU	132kV	Umium	7	3.045	Mustem	42	18.270
102	MeECL	Umium	132kV	Umium_St_1	5	2.175	NEHU	7	3.045
103	MeECL	Umium_St_1	132kV	Umium_St_2	3	1.305	Mawngap	33	14.355
104	MeECL	Mawlai	132kV	Mawngap	2	0.870	Cherrapunjee	41	17.835
105	MeECL	Mawngap	132kV	Mawlai	2	0.870	Nongstoin	56	24.360
106	MeECL	Umium_St_3	132kV	Umium_St_4 I&II	8	3.373	Umtru I & II	41	17.286
107	MeECL	Umtru	132kV	EPIP_2 I & II	1	0.422	Umium_St_3 I&II	41	17.286
108	MeECL	EPIP_2	132kV	Umtru I & II	1	0.422	Byrnihat I & II	10	4.216
109	MeECL	Lumshnong	132kV	MPL	0.3	0.131	Panchgram	25	10.875
110	Tripura	P K bari	132kV	Kumarghat(PG)	1	0.435	Ambasa	45	19.575
111	Tripuar	SurajmaniNagar	132kV	Agartal/Budhjang	18	7.830	Comilla	67	20.670
112	Tripura	Agartala	132kV	AGTPP-I&II/Budh	8	3.373	Dhalabil	45	19.575
113	Tripura	Udaipur	132kV	Pallatana	34	14.790	Monarchak	41	17.835
114	Tripura	Rokhia	132kV	Monarchak	29	12.615	Agartala-I&II	35	15.225
115	Tripura	Dhalabil	132kV	Kamalpur	32	13.920	Agartala	45	19.575
116	Tripura	Kamalpur	132kV	Ambassa	30	13.050	Dhalabil	32	13.920
117	Tripura	Ambasa	132kV	Teliamura	25	10.875	PK Bari	45	19.575
118	Tripura	Teliamura	132kV	Baramura	14	5.903	Ambassa	25	10.875

SN	Organisation	Name of Station	Voltage Level	Shortest Line			Longest Line		
				Name	Length	Impedance	Name	Length	Impedance
119	Tripura	Baramura	132kV	Teliamura	14	5.903	Jirania	15	6.525
120	Tripura	Jirania	132kV	Budhjungnagar	7	2.951	Baramura	15	6.525
121	Tripura	Budhjungnagar	132kV	Jirania	7	2.951	Srjamaninaga-I&II	18	7.830
122	Mizoram	Zemabawk	132kV	Aizawl(PG)	7	3.045	Serchip	54	23.490
123	Mizoram	Luangmual	132kV	Aizawl(PG)	1	0.435			
124	Mizoram	Kolasib	132kV	Bairabi	30	13.050	Badarpur(PG)	107	46.545
125	DOP(AP)	Lekhi	132kV	Nirjuli	4	1.740	Ranganadi	18	7.830
126	DOP(AP)	Daporijo	132kV	Along	83	36.100	Ziro	87	37.845
127	OTPC	Pallatana	132kV	Udaipur	12	5.220	Surjamanin-I&II	45	13.882

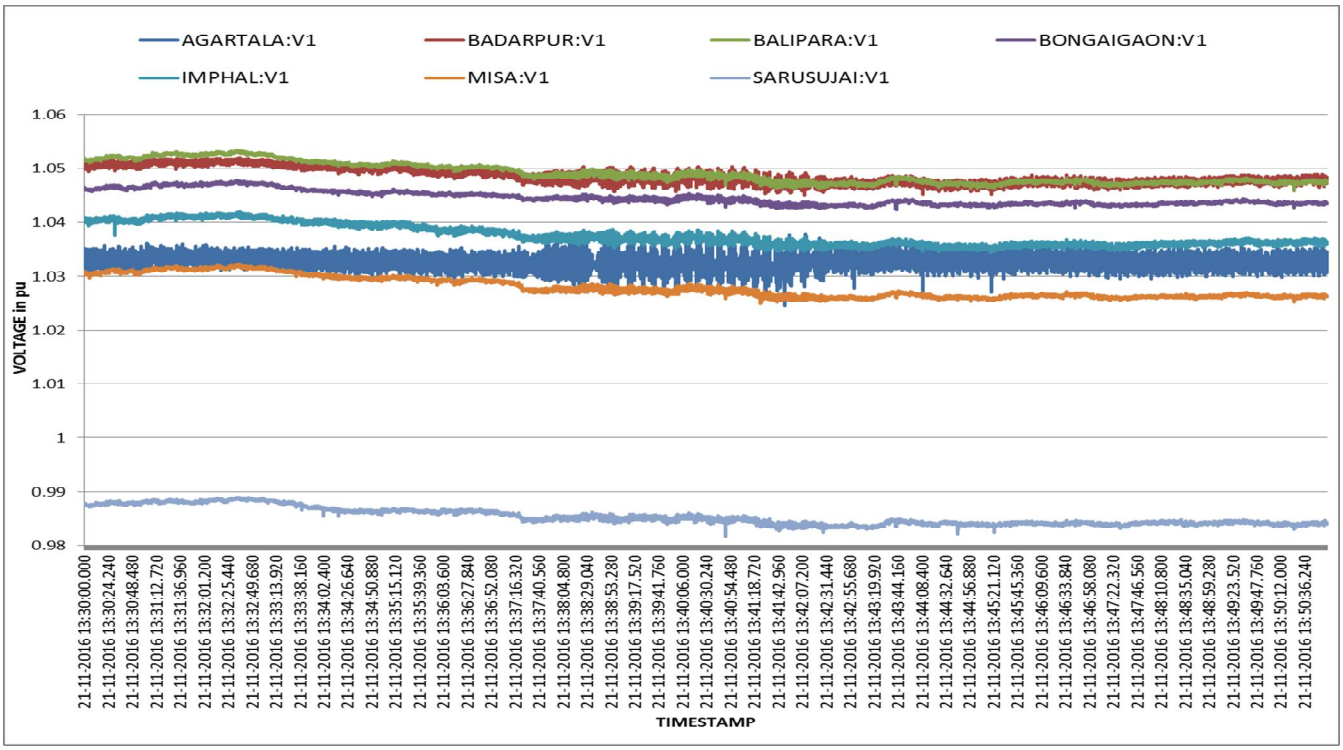
Status of telemetry data in NER during the GD-V of 16th April 2016

S.no	Name of Station	Owner Entity	Telemetry Available(Yes/No)		Link-I (Description)	Link-II (Description)	Link-I (Status) as per NMS record		Link-II (Status) as per NMS records		Remark
			Prior to event(12:00 Hrs)	During the event(12:15 Hrs)			Pre-Event	During Event	Pre Event	During Event	
1	Aizwal	PGCIL	No	No	PLCC + FO	N/A					
2	Kopex	PGCIL	No	No	FO	N/A					
3	Mokokchung	PGCIL	No	No	PLCC + FO	N/A					
4	Bongaigaon	PGCIL	Yes	No	FO	N/A					
5	Salakati	PGCIL	Yes	No	PLCC + FO	N/A					
6	Itanagar	PGCIL	Yes	No	FO	N/A					
7	Kolasib	PGCIL	Yes	No	PLCC + FO	N/A					
8	Silchar	PGCIL	Yes	No	FO	N/A					
9	Badarpur	PGCIL	Yes	Yes	FO	N/A					
10	Biswanath Charialli(HVDC)	PGCIL	Yes	Yes	FO	N/A					
11	DIMAPUR	PGCIL	Yes	Yes	FO	N/A					
12	Imphal	PGCIL	Yes	Yes	FO	N/A					
13	Kumarghat	PGCIL	Yes	Yes	FO	N/A					
14	Jiribam	PGCIL	Yes	Yes	PLCC + FO	N/A					
15	Moriani	PGCIL	Yes	Yes	PLCC + FO	N/A					
16	Misa	PGCIL	Yes	Yes	FO	N/A					
17	Ziro S/S	PGCIL	Yes	Yes	PLCC + FO	N/A					
18	Balipara	PGCIL	Yes	Yes	FO	FO					
19	Khliehirat	PGCIL	Yes	Yes	FO	N/A					
20	Haflong	PGCIL	Yes	Yes	PLCC + FO	N/A					
21	Doyang	NEEPCO	No	No	PLCC + FO	N/A					
22	R.C Nagar	NEEPCO	No	No	FO	N/A					
23	Ranganadi	NEEPCO	No	No	PLCC + FO	N/A					
24	Kopili	NEEPCO	No	No	FO	N/A					
25	Khandong	NEEPCO	Yes	Yes	FO	N/A					
26	Kathalguri	NEEPCO	Yes	Yes	PLCC + FO	N/A					
27	BTPS	NTPC	Yes	No	PLCC + FO	N/A					
28	Loktak	NHPC	Yes	Yes	PLCC + FO	N/A					
29	Palatana	OTPC	Yes	Yes	PLCC + FO	N/A					

N.B. Link-I and Link-II refer to the connection link between the station and the RLDC, the type of connection (FO/RF/GPRS) and link status may be asked from SCADA Dept and updated. It is believed that the Link status is logges with the AMC provider for the telecom link.



[In figure above, Oscillations in frequency observed with similar magnitude across all buses of NER]



[In figure above, Oscillations in Bus Voltage magnitude seen most prominently at Agartala and Badarpur PMUs. Both are close to generators of NER (Agartala = near Palatana, AGTPP, Tripura generators ; and Badarpur = close to Kopili, Khandong, Leshka generators)

Disturbance in Arunachal Pradesh System

Ziro area of Arunachal Pradesh was connected with rest of NER Grid through 132 kV Ranganadi-Ziro line. At Hr on , 132 kV Ranganadi-Ziro line tripped. Due to tripping of this element, Ziro area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Capital area of Arunachal Pradesh and Gohpur Area of Assam were connected with rest of NER Grid through 132 kV Lekhi-Nirjuli line (132 kV Balipara-Gohpur line & Bus Coupler CB of Gohpur kept open for system requirement). At Hr on , 132 kV Lekhi-Nirjuli line tripped. Due to tripping of this element, Capital area & Gohpur area were separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Khupi area of Arunachal Pradesh was connected with rest of NER Grid through 132 kV Balipara- Khupi line. At Hr on , 132 kV Balipara- Khupi line tripped. Due to tripping of this element, Khupi area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Deomali area of Arunachal Pradesh was connected with rest of NER Grid through 220 kV AGBPP-Deomali line. At Hr on , 220 kV AGBPP-Deomali line tripped. Due to tripping of this element, Deomali area was separated from rest of NER Grid and subsequently collapsed due to no source in this area

Lekhi area & Capital area of Arunachal Pradesh and Gohpur Area of Assam were connected with rest of NER Grid through 132 kV Ranganadi-Lekhi line (132 kV Balipara-Gohpur line & Bus Coupler CB of Gohpur kept open for system requirement). At Hr on ,132 kV Ranganadi-Lekhi line tripped. Due to tripping of this element, Lekhi area & Capital area & Gohpur area were separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Lekhi area & Capital area of Arunachal Pradesh were connected with rest of NER Grid through 132 kV Ranganadi-Lekhi line (132 kV Gohpur-Nirjuli line was under outage). At Hr on ,132 kV Ranganadi-Lekhi line tripped. Due to tripping of this element, Lekhi area & Capital area were separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Disturbance in Assam System

Depota area of Assam was connected with rest of NER Grid through 132 kV Balipara -Depota line (132 kV Rangia-Sipajhar line, 132 kV Rangia-Rowta line & 132 kV Samaguri-Depota line kept open for system requirement). At Hr on , 132 kV Balipara -Depota line tripped. Due to tripping of this element, Depota area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Capital area of Assam was connected with rest of NER Grid through 220 kV Samaguri-Azara I & II lines, 220 kV Sarusajai-Samaguri line, 220 kV Samaguri-Jawhar Nagar line & 132 kV Rangia-Motonga line. (132 kV Kahilipara-Umtru I & II lines, 132 kV Sarusajai-Umtru I & II lines, 132 kV Rangia-Bornagar line, 132 kV Rangia-Nalbari line, 132kV Rangia -Sipajhar & 132 kV Rangia- Rowta lines kept open for system requirement). At Hr on ,220 kV Samaguri-Azara I & II lines, 220 kV Sarusajai-Samaguri line, 220 kV Samaguri-Jawhar Nagar line & 132 kV Rangia-Motonga line tripped. Due to tripping of these elements, Capital area of Assam was separated from rest of NER Grid and subsequently collapsed due to no source/load generation mismatch in this area.

Upper Assam area was connected with rest of NER Grid through 220 kV Mariani(AS)-Misa, 220 kV Mariani(AS)-Samaguri I line & 132 kV Bokajan -Dimapur line. (220 kV Mariani(AS)-Samaguri II line & 132 Mariani(AS)-Mokokchung line kept open for system requirement). At Hr on ,220 kV Mariani(AS)-Misa, 220 kV Mariani(AS)-Samaguri I line & 132 kV Bokajan -Dimapur line tripped. Due to tripping of these elements, Upper Assam area was separated from rest of NER Grid and subsequently collapsed due to load generation mismatch in this area.

South Assam area was connected with rest of NER Grid through 132 kV Panchgram-Badarpur line, 132 kV Silchar-Srikona I & II lines & 132 kV Silchar-Panchgram line (132 kV Panchgram-Lumshnong line & 132 kV Pailapool-Jiribam line kept open for system requirement). At Hr on ,132 kV Panchgram-Badarpur line, 132 kV Silchar-Srikona I & II lines & 132 kV Silchar-Panchgram line tripped. Due to tripping of these elements, South Assam area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Samaguri area of Assam was connected with rest of NER Grid through 220/132 kV, 3x50 MVA ICTs (CB at Depota of 132 kV Samaguri-Depota line, 66 kV Bokajan-Diphu & Bus Coupler CB at Gohpur kept open due to system requirement).At Hr on , 220/132 kV, 3x50 MVA ICTs tripped. Due to tripping of these elements, Samaguri area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Umrangso area of Assam was connected with rest of NER Grid through 132 kV Khandong-Umrangsho line & 132 kV Haflong-Umrangsho line .At Hr on , 132 kV Khandong-Umrangsho line & 132 kV Haflong-Umrangsho line tripped. Due to tripping of these elements, Umrangsho area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Haflong area of Assam was connected with rest of NER Grid through 132kV Haflong (AS)-Haflong(PG) line. At Hr on ,132kV Haflong (AS)-Haflong(PG) line tripped. Due to tripping of this element, Haflong area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Dullavcherra area of Assam was connected with rest of NER Grid through 132 kV Dullavcherra-Dharmanagar line & 132 kV Silchar-Dullavcherra line. At Hr on , 132 kV Dullavcherra-Dharmanagar line & 132 kV Silchar- Dullavcherra line tripped. Due to tripping of these elements, Dullavcherra area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Agia-Boko area of Assam & Nangalbibra area of Meghalaya was connected with rest of NER Grid through 220 kV Boko-Azara line, 220 kV Agia-Azara line & 220 kV BTPS-Agia I & II lines (132 kV Nangalbibra-Nongstoin line kept open for system requirement). At Hr on ,220 kV Boko-Azara line, 220 kV Agia-Azara line & 220 kV BTPS-Agia I & II lines tripped. Due to tripping of these elements, Agia-Boko area of Assam & Nangalbibra area of Meghalaya were separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Dhaligaon area of Assam was connected with rest of NER Grid through 132 kV Dhaligaon-BTPS I & II lines (132 kV Rangia-Bornagar line & 132 kV Rangia-Nalbari line kept open for system requirement). At Hr on ,132 kV Dhaligaon-BTPS I & II lines tripped. Due to tripping of these elements, Dhaligaon area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Pavoi area of Assam was connected with rest of NER Grid through 132 kV Biswanath Charali-Pavoi I&II lines (132 kV Pavoi-Depota line and 132 kV Pavoi-Samaguri line kept open for system requirement). At Hrs on , 132 kV Biswanath Charali-Pavoi I&II lines tripped. Due to tripping of these elements, Pavoi area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Khupi area of Arunachal Pradesh and Depota area of Assam were connected with rest of NER Grid through 220/132 kV,50 MVA ICT I&II at Balipara (132 kV Rangia-Sipajhar line, 132 kV Rangia-Rowta line & 132 kV Samaguri-Depota line kept open for system requirement). At 18:45 Hrs on 25.01.2015 ,220/132 kV,50 MVA ICT I&II at Balipara tripped. Due to tripping of these elements, Khupi area and Depota area were separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Disturbance in Manipur System

Capital area & Karong area of Manipur were connected with rest of NER Grid through 132 kV Imphal-Imphal I & II lines (132 kV Kakching-Kongba line & 132 kV Karong-Kohima line kept open for system requirement). At Hr on ,132 kV Imphal-Imphal I & II lines tripped. Due to tripping of these elements, Capital area & Karong area were separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Capital area & Karong Area of Manipur was connected with rest of NER Grid through 132 kV Imphal-Imphal I & II lines & 132 kV Karong - Kohima line (132 kV Kakching-Kongba line kept open for system requirement). At Hr on ,132 kV Imphal-Imphal I & II lines & 132 kV Karong - Kohima line tripped. Due to tripping of this element, Capital area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Jiribam area of Manipur was connected with rest of NER Grid through 132 kV Jiribam(PG)-Jiribam (MA) line (132 kV Jiribam(MA)-Rengpang line is under long outage). At Hr on ,132 kV Jiribam(PG)-Jiribma (MA) line tripped. Due to tripping of this element, Jiribam area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Karong area of Manipur was connected with rest of NER Grid through 132 kV Karong-Kohima line & 132 kV Karong-Imphal(MA) line. At Hr on , 132 kV Karong-Kohima line & 132 kV Karong-Imphal (MA) line tripped. Due to tripping of these elements, Karong area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Rengpang area of Manipur was connected with rest of NER Grid through 132 kV Loktak-Rengpang line (132 kV Rengpang-Jiribam(MA) line is under long outage). At Hr on ,132 kV Loktak-Rengpang line tripped. Due to tripping of this element,Rengpang area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Ningthoukhong area of Manipur was connected with rest of NER Grid through 132 kV Loktak-Ningthoukhong line & 132 kV Imphal(PG)-Ningthoukhong line (132 kV kakching-Kongba line kept open for system constraint). At Hr on , 132 kV Loktak-Ningthoukhong line & 132 kV Imphal(PG)-Ningthoukhong line tripped. Due to tripping of these elements, Ningthoukhong area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Imphal area of Manipur was connected with rest of NER Grid through 132/33 kV, 2x50 MVA ICTs. At Hr on , 132/33 kV, 2x50 MVA ICTs tripped. Due to tripping of these elements, Imphal area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Disturbance in Meghalaya System

Khliehriat area of Meghalaya was connected with rest of NER Grid through 132 kV Khliehriat (PG)-Khliehriat (MePTCL) I & II lines. (132 kV Panchgram-Lumnsnong line,132 kV NEHU-Umiam line & 132 kV NEHU-Mawlai line were kept open for system requirement). At Hrs on ,132 kV Khliehriat (PG)-Khliehriat (MePTCL) I & II lines tripped. Due to tripping of these elements, Khleihriat area was separated from rest of NER Grid and subsequently collapsed due to load generation mismatch/no source in this area.

Khliehriat area of Meghalaya was connected with rest of NER Grid through 132 kV Khliehriat (PG)-Khliehriat (MePTCL) I & II lines and 2 x 160 MVA, 220/132 kV ICT I&II at Byrnihat (132 kV Khliehriat-Lumnsnong line,132 kV Sarusajai-Umtru I&II lines and 132 kV Kahilipara-Umtru I&II lines kept open for system requirement). At Hrs on ,132 kV Khliehriat (PG)-Khliehriat (MePTCL) I & II lines132 kV Mustem-Khliehriat & 132 kV NEIGRIHMS - Khliehriat (ME) line tripped. Due to tripping of these elements, Khleihriat area was separated from rest of NER Grid and subsequently collapsed due to load generation mismatch/no source in this area.

Agia-Boko area of Assam & Nangalbibra area of Meghalaya was connected with rest of NER Grid through 220 kV Boko-Azara line, 220 kV Agia-Azara line & 220 kV BTPS-Agia I & II lines (132 kV Nangalbibra-Nongstoin line kept open for system requirement). At Hr on ,220 kV Boko-Azara line, 220 kV Agia-Azara line & 220 kV BTPS-Agia I & II lines tripped. Due to tripping of these elements, Agia-Boko area of Assam & Nangalbibra area of Meghalaya were separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Byrnihat area of Meghalaya was connected with rest of NER Grid throug 132 kV EPIP II-Byrnihat I & II lines (132 kV Kahilipara-Umtru I & II lines, 132 kV Sarusajai-Umtru I & II lines, 132 kV Nangalbibra-Nongstoin line, 132 kV NEHU-Umiam line & 132 kV NEHU-Mawlai line kept open for System requirement). At Hr on ,132 kV EPIP II-Byrnihat I & II lines tripped. Due to tripping of these elements, Byrnihat area was separated from rest of NER Grid and subsequently collapsed due to no source in this area/due to load generation mismatch.

h 132 kV Agia - Medipathar line. At Hrs on ,132 kV Agia - Medipathar line tripped. Due to tripping of this element, Nangalbibra area w

Disturbance in Mizoram System

Zuangtui area of Mizoram was connected with rest of NER Grid through 132 kV Aizawl- Zuangtui line. At Hrs on , 132 kV Aizawl-Zuangtui line tripped. Due to tripping of this element, Zuangtui area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Luangmual area of Mizoram was connected with rest of NER Grid through 132 kV Aizawl-Luangmual line. At Hrs on , 132 kV Aizawl- Luangmual line tripped. Due to tripping of this element, Luangmual area was separated from rest of NER Grid and subsequent collapsed due to no source in this area.

Kolasib area of Mizoram was connected with rest of NER Grid through 132 kV Kolasib-Badarpur line & 132 kV Kolasib-Aizwal line. At Hr on , 132 kV Kolasib-Badarpur line & 132 kV Kolasib-Aizwal line tripped. Due to tripping of these elements, Kolasib area was separated from rest of NER Grid and subsequently collapsed due to no source in this area/due to load generation mismatch.

Disturbance in Nagaland System

Dimapur area of Nagaland was connected with rest of NER Grid through 132 kV Dimapur (PG)-Dimapur (NA) I & II lines. At Hr on ,132 kV Dimapur (PG)-Dimapur (NA) I & II lines tripped. Due to tripping of these elements, Dimapur area was separated from rest of NER Grid and subsequently collapsed due to no source in this area

Mokokchung area of Nagaland was connected with rest of NER Grid through 132 kV Doyang-Mokokchung (NA), 132 kV Mokokchung (NA)-Mokokchung (PG) I & II lines. (132 kV Mokokchung(NA)-Marianai(AS) is under long outage & 66 kV Tuengsang-Likimro line kept open for system requirement). At Hr on ,132 kV Doyang-Mokokchung (NA), 132 kV Mokokchung (NA)-Mokokchung (PG) I & II lines tripped. Due to tripping of these elements, Mokokchung area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Capital area of Nagaland was connected with rest of NER Grid through 132 kV Dimapur(PG)-Kohima line (132 kV Kohima-Karong line & 66 kV Tuensang-Likimro line kept open for system requirement). At Hr on ,132 kV Dimapur(PG)-Kohima line tripped. Due to tripping of this element, Capital area was separated from rest of NER Grid and subsequently collapsed due to no source in this area/due to load generation mismatch.

Disturbance in Tripura System

Tripura System was connected with rest of NER Grid through 132 kV AGTPP-Agartala I & II lines, 132 kV P K Bari-Kumarghat line, 132 kV Dharmanagar-Dullavcherra line, 132 kV Palatana-Udaipur line & 132 kV Palatana-Surjamaninagar line. At Hr on ,132 kV AGTPP-Agartala I & II lines, 132 kV P K Bari-Kumarghat line, 132 kV Dharmanagar-Dullavcherra line, 132 kV Palatana-Udaipur line & 132 kV Palatana-Surjamaninagar line tripped. Due to tripping of these elements, Tripura System was separated from rest of NER Grid and subsequently collapsed due to load generation mismatch.

Udaipur area of Tripura was connected with rest of NER Grid through 132 kV Udaipur-Palatana line & 132 kV Monarchak-Udaipur line (66 kV Gakulnagar-Udaipur line & 66 kV Belonia-Bagafa line kept open for system requirement). At Hr on ,132 kV Udaipur-Palatana line & 132 kV Monarchak-Udaipur line tripped. Due to tripping of these elements, Udaipur area was separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Disturbance in AGBPP Power Station

AGBPP Power Station was connected with rest of NER Grid through 220 kV AGBPP-Mariani(AS) line, 220 kV AGBPP-Mariani(PG) line & 220 kV AGBPP- Tinsukia I & II lines. At Hr on , 220 kV AGBPP-Mariani (AS) line, 220 kV AGBPP-Mariani(PG) & 220 kV AGBPP- Tinsukia I & II lines tripped. Due to evacuation problem, AGBPP was blacked out.

Disturbance in AGTPP Power Station

AGTPP Power Station was connected with rest of NER Grid through 132 kV AGTPP-Agartala I & II lines & 132 kV AGTPP-Kumarghat line.At Hr on , 132 kV AGTPP-Agartala I & II lines & 132 kV AGTPP-Kumarghat line tripped. Due to evacuation problem, AGTPP was blacked out.

Disturbance in Ranganadi Power Station

Ranganadi Power Station was connected with rest of NER Grid through 400 kV Ranganadi-Balipara I & II lines (132 kV Balipara-Gohpur line & Bus Coupler CB of Gohpur kept open for system requirement).At Hr on , 400 kV Ranganadi-Balipara I & II lines tripped. Due to evacuation problem, Ranganadi Power Station was blacked out.

Disturbance in Kopili Power Station

Kopili Power Station was connected with rest of NER Grid through 220 kV Kopili-Misa I, II & III lines & 132 kV Kopili-Khandong I & II lines. At Hr on , 220 kV Kopili-Misa I, II & III lines, 132 kV Kopili-Khandong I & II lines tripped. Due to evacuation problem, Kopili Power Station was blacked out.

Disturbance in Khandong Power Station

Khandong Power Station was connected with rest of NER Grid through 132 kV Kopili-Khandong I & II lines, 132 kV Khandong-Umrangso line & 132 kV Khandong-Khliehriat(PG) I & II lines.At Hr on , 132 kV Kopili-Khandong I & II lines & 132 kV Khandong-Umrangso line & 132 kV Khandong-Khliehriat(PG) I & II lines tripped. Due to evacuation problem, Khandong Power Station was blacked out.

Disturbance in Doyang Power Station

Doyang Power Station was connected with rest of NER Grid through 132 kV Doyang- Dimapur I & II lines & 132 kV Doyang-Mokokchung(NA) line. At Hr on , 132 kV Doyang- Dimapur I & II lines & 132 kV Doyang-Mokokchung(NA) line tripped. Due to evacuation problem, Doyang Power Station was blacked out.

Disturbance in Loktak Power Station

Loktak Power Station was connected with rest of NER Grid through 132 kV Loktak-Imphal(PG) line, 132 kV Loktak-Jiribam line & 132 Loktak-Ningthoukhong line(132 kV Rengpang - Jiribam(MA) is under long outage). At Hr on , 132 kV Loktak-Imphal(PG) line, 132 kV Loktak-Jiribam line & 132 Loktak-Ningthoukhong line tripped. Due to evacuation problem, Loktak Power

Disturbance in Palatana Power Station

Palatana Power Station was connected with rest of NER Grid through 400 kV Palatana-Silchar I & II lines, 132 kV Palatana-Surjamaninagar line & 132 kV Palatana-Udaipur line. At Hr on , 400 kV Palatana-Silchar I & II lines, 132 kV Palatana-Surjamaninagar line & 132 kV Palatana-Udaipur line tripped. Due to evacuation problem, Palatana Power Station was blacked out.

Disturbance in Bongaigaon Thermal Power Station

Bongaigaon Thermal Power Station was connected with rest of NER Grid through 400 kV Bongaigaon-BgTPP(NTPC) I & II lines. At Hr on , 400 kV Bongaigaon-BgTPP(NTPC) I & II lines tripped. Due to evacuation problem, BgTPP was blacked out.

Sl. No.	Name of tripping element/ Description	Owner	Data to be furnished by	Name of Node	Name of Node
	400 kV Balipara - Bongaigaon I	POWERGRID	POWERGRID	Balipara	Bongaigaon
	400 kV Balipara - Bongaigaon II	POWERGRID	POWERGRID	Balipara	Bongaigaon
	400 kV Balipara - Bongaigaon III	POWERGRID	POWERGRID	Balipara	Bongaigaon
	400 kV Balipara - Bongaigaon IV	POWERGRID	POWERGRID	Balipara	Bongaigaon
	400 kV Balipara - Ranganadi I	POWERGRID	POWERGRID & NEEPCO	Balipara	Ranganadi
	400 kV Balipara - Ranganadi II	POWERGRID	POWERGRID & NEEPCO	Balipara	Ranganadi
	400 kV Bongaigaon - New Siliguri I	POWERGRID	POWERGRID	Bongaigaon	New Siliguri
	400 kV Bongaigaon - New Siliguri II	POWERGRID	POWERGRID	Bongaigaon	New Siliguri
	400 kV Bongaigaon - New Siliguri III	ENICL	POWERGRID	Bongaigaon	New Siliguri
	400 kV Bongaigaon - New Siliguri IV	ENICL	POWERGRID	Bongaigaon	New Siliguri
	400 kV BgTPP - Bongaigaon I	POWERGRID	NTPC & POWERGRID	BgTPP	Bongaigaon
	400 kV BgTPP - Bongaigaon II	POWERGRID	NTPC & POWERGRID	BgTPP	Bongaigaon
	400 kV Misa - Balipara I	POWERGRID	POWERGRID	Misa	Balipara
	400 kV Misa -Balipara II	POWERGRID	POWERGRID	Misa	Balipara
	400 kV Palatana - Silchar I	NETC	OTPC & POWERGRID	Palatana	Silchar
	400 kV Palatana - Silchar II	NETC	OTPC & POWERGRID	Palatana	Silchar
	400 kV Silchar - Azara	NETC & AEGCL	POWERGRID & AEGCL	Silchar	Azara
	400 kV Silchar - Byrnihat	NETC & MePTCL	POWERGRID & MePTCL	Silchar	Byrnihat
	400 kV Balipara-Biswanath Charali I	POWERGRID	POWERGRID	Balipara	Biswanath Charali
	400 kV Balipara-Biswanath Charali II	POWERGRID	POWERGRID	Balipara	Biswanath Charali
	400 kV Balipara-Biswanath Charali III	POWERGRID	POWERGRID	Balipara	Biswanath Charali
	400 kV Balipara-Biswanath Charali 1V	POWERGRID	POWERGRID	Balipara	Biswanath Charali
	400 kV Ranganadi-Biswanath Charali 1	POWERGRID	NEEPCO & POWERGRID	Ranganadi	Biswanath Charali
	400 kV Ranganadi-Biswanath Charali 1I	POWERGRID	NEEPCO & POWERGRID	Ranganadi	Biswanath Charali
	400 kV Bongaigaon - Byrnihat	NETC & MePTCL	POWERGRID & MePTCL	Bongaigaon	Byrnihat
	400 kV Bongaigaon - Azara	NETC & AEGCL	POWERGRID & AEGCL	Bongaigaon	Azara
	220 kV AGBPP - Mariani(PG)	POWERGRID	NEEPCO & POWERGRID	AGBPP	Mariani (PG)
	220 kV AGBPP - Tinsukia I	AEGCL	NEEPCO & AEGCL	AGBPP	Tinsukia
	220 kV AGBPP - Tinsukia II	AEGCL	NEEPCO & AEGCL	AGBPP	Tinsukia
	220 kV AGBPP - Deomali	DoP, AP	NEEPCO & DoP, AP	AGBPP	Deomali
	220 kV Agia - Boko	AEGCL	AEGCL	Agia	Boko
	220 kV Agia -Azara	AEGCL	AEGCL	Agia	Azara
	220 kV Azara - Sarusajai I	AEGCL	AEGCL	Azara	Sarusajai
	220 kV Azara - Sarusajai II	AEGCL	AEGCL	Azara	Sarusajai
	220 kV Balipara - Samaguri	AEGCL & POWERGRID	POWERGRID & AEGCL	Balipara	Samaguri
	220 kV Birpara - Salakati I	POWERGRID	POWERGRID	Birpara	Salakati
	220 kV Birpara - Salakati II	POWERGRID	POWERGRID	Birpara	Salakati
	220 kV Boko -Azara	AEGCL	AEGCL	Boko	Azara
	220 kV BTPS - Agia I	AEGCL	AEGCL	BTPS	Agia
	220 kV BTPS - Agia II	AEGCL	AEGCL	BTPS	Agia
	220 kV BTPS - Salakati I	POWERGRID	AEGCL & POWERGRID	BTPS	Salakati
	220 kV BTPS - Salakati II	POWERGRID	AEGCL & POWERGRID	BTPS	Salakati
	220 kV Kopili - Misa I	POWERGRID	NEEPCO & POWERGRID	Kopili	Misa
	220 kV Kopili - Misa II	POWERGRID	NEEPCO & POWERGRID	Kopili	Misa
	220 kV Kopili - Misa III	POWERGRID	NEEPCO & POWERGRID	Kopili	Misa
	220 kV Mariani(AS) - AGBPP	POWERGRID	AEGCL &NEEPCO	Mariani(AS)	AGBPP
	220 kV Misa - Dimapur I	POWERGRID	POWERGRID	Misa	Dimapur
	220 kV Misa - Dimapur II	POWERGRID	POWERGRID	Misa	Dimapur
	220 kV Misa - Byrnihat I	MePTCL	POWERGRID & MePTCL	Misa	Byrnihat
	220 kV Misa - Byrnihat II	MePTCL	POWERGRID & MePTCL	Misa	Byrnihat
	220 kV Misa - Mariani(AS)	POWERGRID	POWERGRID & AEGCL	Misa	Mariani (AS)
	220 kV Misa - Mariani(PG)	POWERGRID	POWERGRID	Misa	Mariani (PG)
	220 kV Misa - Samaguri I	POWERGRID	POWERGRID & AEGCL	Misa	Samaguri
	220 kV Misa - Samaguri II	POWERGRID	POWERGRID & AEGCL	Misa	Samaguri
	220 kV NTPS - Tinsukia I	AEGCL	AEGCL	NTPS	Tinsukia
	220 kV NTPS - Tinsukia II	AEGCL	AEGCL	NTPS	Tinsukia
	220 kV Samaguri - Jawaharnagar	AEGCL	AEGCL	Samaguri	Jawaharnagar
	220 kV Samaguri - Mariani I	AEGCL	AEGCL	Samaguri	Mariani
	220 kV Samaguri - Mariani II	AEGCL	AEGCL	Samaguri	Mariani
	220 kV Samaguri - Sarusajai	AEGCL	AEGCL	Samaguri	Sarusajai
	220 kV Sarusajai - Jawaharnagar	AEGCL	AEGCL	Sarusajai	Jawaharnagar
	220 kV Sarusajai - Langpi I	AEGCL	AEGCL	Sarusajai	Langpi
	220 kV Sarusajai - Langpi II	AEGCL	AEGCL	Sarusajai	Langpi
	220 kV Mokokchung-Mokokchung I	POWERGRID	POWERGRID	Mokokchung(PG)	Mokokchung(NA)
	220 kV Mokokchung-Mokokchung II	POWERGRID	POWERGRID	Mokokchung(PG)	Mokokchung(NA)
	132 kV Agartala - Bodhjungnagar	TSECL	TSECL	Agartala	Bodhjungnagar
	132 kV Agartala - Dhalabil (Khowai)	TSECL	TSECL	Agartala	Dhalabil
	132 kV Agartala - Rokhia I	TSECL	TSECL	Agartala	Rokhia
	132 kV Agartala - Rokhia II	TSECL	TSECL	Agartala	Rokhia
	132 kV Agia - Medipathar	MePTCL	AEGCL & MePTCL	Agia	Medipathar
	132 kV AGTPP - Agartala I	POWERGRID	NEEPCO & TSECL	AGTPP	Agartala
	132 kV AGTPP - Agartala II	POWERGRID	NEEPCO & TSECL	AGTPP	Agartala
	132 kV AGTPP - Kumarghat	POWERGRID	NEEPCO & POWERGRID	AGTPP	Kumarghat
	132 kV Aizwal - Kolasib	POWERGRID	POWERGRID & P&ED, Mizoram	Aizawl	Kolasib
	132 kV Aizwal - Kumarghat	POWERGRID	POWERGRID	Aizawl	Kumarghat
	132 kV Aizwal - Longmual	P & ED Mizoram	POWERGRID & P&ED, Mizoram	Aizawl	Longmual
	132 kV Aizwal - Zuangtui	POWERGRID	POWERGRID & P&ED, Mizoram	Aizawl	Zuangtui
	132 kV Ambasa - Kamalpur	TSECL	TSECL	Ambassa	Kamalpur
	132 kV Ambasa - P K Bari	TSECL	TSECL	Ambassa	PK Bari
	132 kV Badarpur - Jiribam	POWERGRID	POWERGRID	Badarpur	Jiribam
	132 kV Badarpur - Kolasib	POWERGRID	POWERGRID & P&ED, Mizoram	Badarpur	Kolasib
	132 kV Badarpur - Kumarghat	POWERGRID	POWERGRID	Badarpur	Kumarghat
	132 kV Badarpur - Panchgram	POWERGRID	POWERGRID & AEGCL	Badarpur	Panchgram
	132 kV Balipara - Depota	AEGCL	POWERGRID & AEGCL	Balipara	Depota
	132 kV Balipara - Gohpur	AEGCL	POWERGRID & AEGCL	Balipara	Gohpur
	132 kV Balipara - Khupi	NEEPCO	POWERGRID & NEEPCO	Balipara	Khupi
	132 kV Baramura - Gamaitilla	TSECL	TSECL	Baramura	Gamaitilla
	132 kV Bodhjungnagar - Jirania	TSECL	TSECL	Bodhjungnagar	Jirania
	132 kV Bokajan - Golaghat	AEGCL	AEGCL	Bokajan	Golaghat
	132 kV BTPS - Dhaligaon I	AEGCL	AEGCL	BTPS	Dhaligaon
	132 kV BTPS - Dhaligaon II	AEGCL	AEGCL	BTPS	Dhaligaon
	132 kV CTPS - Dispur	AEGCL	AEGCL	CTPS	Dispur
	132 kV Dhalabil - Kamalpur	TSECL	TSECL	Dhalabil	Kamalpur
	132 kV Dhaligaon – Barnagar	AEGCL	AEGCL	Dhaligaon	Barnagar
	132 kV Dhaligaon - Nalbari	AEGCL	AEGCL	Dhaligaon	Nalbari
	132 kV Dibrugarh – Behiating	AEGCL	AEGCL	Dibrugarh	Behiating
	132 kV Moran – Behiating	AEGCL	AEGCL	Moran	Behiating
	132 kV Dimapur - Bokajan	AEGCL	POWERGRID & AEGCL	Dimapur	Bokajan
	132 kV Dimapur - Doyang I	POWERGRID	POWERGRID & NEEPCO	Dimapur	Doyang
	132 kV Dimapur - Doyang II	POWERGRID	POWERGRID & NEEPCO	Dimapur	Doyang
	132 kV Dimapur - Imphal	POWERGRID	POWERGRID	Dimapur	Imphal
	132 kV Dimapur (PG) - Dimapur (Nagaland) I	DoP Nagaland	POWERGRID & DoP,Nagaland	Dimapur (PG)	Dimapur
	132 kV Dimapur (PG) - Dimapur (Nagaland) II	POWERGRID & DoP Nagaland	POWERGRID & DoP,Nagaland	Dimapur (PG)	Dimapur
	132 kV Dimapur (PG) - Kohima	POWERGRID & DoP Nagaland	POWERGRID & DoP,Nagaland	Dimapur (PG)	Kohima
	132 kV Doyang - Mokokchung(NA)	DoP Nagaland	NEEPCO & DoP,Nagaland	Doyang	Mokokchung(NA)
	132 kV Dullavcherra - Dharmanagar	AEGCL & TSECL	AEGCL & TSECL	Dullavcherra	Dharmanagar
	132 kV EPIP II - Byrnihat I	MePTCL	MePTCL	EPIP II	Byrnihat
	132 kV EPIP II - Byrnihat II	MePTCL	MePTCL	EPIP II	Byrnihat
	132 kV EPIP II - Umtru I	MePTCL	MePTCL	EPIP II	Umtru
	132 kV EPIP II - Umtru II	MePTCL	MePTCL	EPIP II	Umtru
	132 kV Gamaitila - Ambasa	TSECL	TSECL	Gamaitilla	Ambassa
	132 kV Gohpur - Nirjuli	POWERGRID	AEGCL & POWERGRID	Gohpur	Nirjuli
	132 kV Haflong(PG) - Jiribam	POWERGRID	POWERGRID	Haflong(PG)	Jiribam
	132 kV Imphal (MA)- Karong	MSPCL	MSPCL	Imphal(MA)	Karong
	132 kV Imphal (PG) - Imphal (MA) I	POWERGRID	POWERGRID & MSPCL	Imphal (PG)	Imphal
	132 kV Imphal (PG) - Imphal (MA) II	POWERGRID/MSPCL	POWERGRID & MSPCL	Imphal (PG)	Imphal
	132 kV Jirania - Baramura	TSECL	TSECL	Jirania	Baramura
	132 kV Jiribam - Aizwal	POWERGRID	POWERGRID	Jiribam	Aizawl
	132 kV Jiribam - Pailapool	AEGCL	POWERGRID & AEGCL	Jiribam	Pailapool
	132 kV Kahilipara - Umtru I	AEGCL & MePTCL	AEGCL & MePTCL	Kahilipara	Umtru
	132 kV Kahilipara - Umtru II	AEGCL & MePTCL	AEGCL & MePTCL	Kahilipara	Umtru
	132 kV Kamalpur - P K Bari	TSECL	TSECL	Kamalpur	PK Bari
	132 kV Khandong - Umrangso	POWERGRID & AEGCL	NEEPCO & AEGCL	Khandong	Umrangso
	132 kV Haflong- Umrangso	POWERGRID & AEGCL	POWERGRID & AEGCL	Haflong	Umrangso
	132 kV Khandong - Khliehriat(PG) I	POWERGRID	NEEPCO & POWERGRID	Khandong	Khliehriat(PG)
	132 kV Khandong - Khliehriat(PG) II	POWERGRID	NEEPCO & POWERGRID	Khandong	Khliehriat(PG)
	132 kV Khliehriat (PG)-Badarpur	POWERGRID	POWERGRID	Khliehriat(PG)	Badarpur
	132 kV Khliehriat (PG) - Khliehriat (ME) I	POWERGRID	POWERGRID & MePTCL	Khliehriat (PG)	Khliehriat(ME)
	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	POWERGRID & MePTCL	Khliehriat (PG)	Khliehriat(ME)
	132 kV Kohima - Karong	MSPCL & DoP Nagaland	DoP Nagaland & MSPCL	Kohima	Karong
	132 kV Kopili - Khandong I	POWEGRID	NEEPCO	Kopili	Khandong
	132 kV Kopili - Khandong II	POWEGRID	NEEPCO	Kopili	Khandong
	132 kV Lanka - Diphu	AEGCL	AEGCL	Lanka	Diphu
	132 kV Lekhi - Nirjuli	DoP AP & POWERGRID	DoP AP & POWERGRID	Lekhi	Nirjuli
	132 kV Loktak - Imphal (PG)	POWERGRID	NHPC & POWERGRID	Loktak	Imphal (PG)
	132 kV Loktak - Jiribam(PG)	POWERGRID	NHPC & POWERGRID	Loktak	Jiribam(PG)
	132 kV Loktak - Ningthoukhong	MSPCL	NHPC & MSPCL	Loktak	Ningthoukhong
	132 kV Loktak - Rengpang	MSPCL	NHPC & MSPCL	Loktak	Rengpang
	132 kV LTPS – Mariani(AS)	AEGCL	AEGCL	LTPS	Mariani.(AS)
	132 kV LTPS – Moran	AEGCL	AEGCL	LTPS	Moran
	132 kV LTPS – Sonari	AEGCL	AEGCL	LTPS	Sonari
	132 kV NTPS – Sonari	AEGCL	AEGCL	NTPS	Sonari
	132 kV LTPS – NTPS	AEGCL	AEGCL	LTPS	NTPS
	132 kV Lumshnong - Khliehriat(ME)	MePTCL	MePTCL	Lumshnong	Khliehriat
	132 kV Lumshnong - Panchgram	MePTCL & AEGCL	MePTCL & AEGCL	Lumshnong	Panchgram
	132 kV Mariani(AS) - Golaghat	AEGCL	AEGCL	Mariani(AS)	Golaghat
	132 kV Mariani(AS) - Mokokchang(NA)	AEGCL & DoP Nagaland	AEGCL & DoP Nagaland	Mariani(AS)	Mokokchung(NA)
	132 kV Mawlai - NEHU	MePTCL	MePTCL	Mawlai	NEHU
	132 kV Leshka - Khleihriat (ME) I	MePTCL	MePTCL	Leshka	Khliehriat (ME)
	132 kV Leshka - Khleihriat (ME) II	MePTCL	MePTCL	Leshka	Khliehriat (ME)
	132 kV NEHU - Khliehriat (ME)	MePTCL	MePTCL	NEHU	Khliehriat (ME)
	132 kV NEHU - NEIGRIHMS	MePTCL	MePTCL	NEHU	NEIGRIHMS
	132 kV NEIGRIHMS - Khliehriat (ME)	MePTCL	MePTCL	NEIGRIHMS	Khliehriat
	132 kV Ningthoukong - Imphal(PG)	MSPCL & POWERGRID	MSPCL & POWERGRID	Ningthoukhong	Imphal (PG)
	132 kV P K Bari - Dharmanagar	TSECL	TSECL	PK Bari	Dharmanagar
	132 kV P K Bari - Kumarghat	TSECL	TSECL & POWERGRID	PK Bari	Kumarghat
	132 kV Palatana-Udaipur	TSECL	OTPC & TSECL	Palatana	Udaipur
	132 kV Panchgram - Dullavcherra	AEGCL	AEGCL	Panchgram	Dullavcherre
	132 kV Ranganadi - Lekhi	POWERGRID & DoP AP	NEEPCO & DoP AP	Ranganadi	Lekhi
	132 kV Ranganadi - Ziro	POWERGRID	NEEPCO & POWERGRID	Ranganadi	Ziro
	132 kV Rangia - Barnagar	AEGCL	AEGCL	Rangia	Barnagar
	132 kV Rangia - Kahilipara	AEGCL	AEGCL	Rangia	Kahilipara
	132 kV Rangia - Motonga	BPC	AEGCL & BPC	Rangia	Motonga
	132 kV Rangia - Nalbari	AEGCL	AEGCL	Rangia	Nalbari
	132 kV Rangia - Sipajhar	AEGCL	AEGCL	Rangia	sipajhar
	132 kV Rangia – Sishugram	AEGCL	AEGCL	Rangia	Sishugram
	132 kV Rengpang - Jiribam (MA)	MSPCL	MSPCL	Rengpang	Jiribam(MA)
	132 kV Rokhia-Udaipur	TSECL	TSECL	Rokhia	Udaipur
	132 kV Salakati- Gelephu	POWERGRID	POWERGRID & BPC	Salakati	Gelephu
	132 kV Sarusajai – Kahilipara I	AEGCL	AEGCL	Sarusajai	Kahilipara
	132 kV Sarusajai – Kahilipara II	AEGCL	AEGCL	Sarusajai	Kahilipara
	132 kV Sarusajai – Kahilipara III	AEGCL	AEGCL	Sarusajai	Kahilipara
	132 kV Sarusajai – Kahilipara IV	AEGCL	AEGCL	Sarusajai	Kahilipara
	132 kV Sarusajai - Umtru I	MePTCL	AEGCL & MePTCL	Sarusajai	Umtru
	132 kV Sarusajai - Umtru II	MePTCL	AEGCL & MePTCL	Sarusajai	Umtru
	132 kV Silchar - Badarpur I	POWERGRID	POWERGRID	Silchar	Badarpur
	132 kV Silchar - Badarpur II	POWERGRID	POWERGRID	Silchar	Badarpur
	132 kV Silchar - Dullavcherra	POWERGRID & AEGCL	POWERGRID & AEGCL	Silchar	Dullavcherra

Name of Generating Units	Owner	Node
AGBPP U 1	NEEPCO	AGBPP
AGBPP U 2	NEEPCO	AGBPP
AGBPP U 3	NEEPCO	AGBPP
AGBPP U 4	NEEPCO	AGBPP
AGBPP U 5	NEEPCO	AGBPP
AGBPP U 6	NEEPCO	AGBPP
AGBPP U 7	NEEPCO	AGBPP
AGBPP U 8	NEEPCO	AGBPP
AGBPP U 9	NEEPCO	AGBPP
AGTPP U 1	NEEPCO	AGTPP
AGTPP U 2	NEEPCO	AGTPP
AGTPP U 3	NEEPCO	AGTPP
AGTPP U 4	NEEPCO	AGTPP
AGTPP STG I	NEEPCO	AGTPP
AGTPP STG II	NEEPCO	AGTPP
Doyang U 1	NEEPCO	Doyang
Doyang U 2	NEEPCO	Doyang
Doyang U 3	NEEPCO	Doyang
Khandong U 1	NEEPCO	Khandong
Khandong U 2	NEEPCO	Khandong
Kopili Stg II	NEEPCO	Khandong
Kopili U 1	NEEPCO	Kopili
Kopili U 2	NEEPCO	Kopili
Kopili U 3	NEEPCO	Kopili
Kopili U 4	NEEPCO	Kopili
Loktak U 1	NHPC	Loktak
Loktak U 2	NHPC	Loktak
Loktak U 3	NHPC	Loktak
Palatana GTG I	OTPC	Palatana
Palatana GTG II	OTPC	Palatana
Palatana STG I	OTPC	Palatana
Palatana STG II	OTPC	Palatana
Palatana STG I	OTPC	Palatana
Ranganadi U 1	NEEPCO	Ranganadi
Ranganadi U 2	NEEPCO	Ranganadi
Ranganadi U 3	NEEPCO	Ranganadi
Bairabi U 1	P & ED Mizoram	Bairabi
Bairabi U 2	P & ED Mizoram	Bairabi
Bairabi U 3	P & ED Mizoram	Bairabi
Bairabi U 4	P & ED Mizoram	Bairabi
Baramura U 1	TSECL	Baramura
Baramura U 2	TSECL	Baramura
Baramura U 3	TSECL	Baramura
Baramura U 4	TSECL	Baramura
Baramura U 5	TSECL	Baramura
Gumti U 1	TSECL	Gumti
Gumti U 2	TSECL	Gumti
Gumti U 3	TSECL	Gumti
Langpi U 1	APGCL	Langpi
Langpi U 2	APGCL	Langpi
Likimro U 1	DoP Nagaland	Likimro
Likimro U 2	DoP Nagaland	Likimro
Likimro U 3	DoP Nagaland	Likimro
LTPS GTG U 1	APGCL	LTPS
LTPS GTG U 2	APGCL	LTPS
LTPS GTG U 3	APGCL	LTPS
LTPS GTG U 4	APGCL	LTPS
LTPS GTG U 5	APGCL	LTPS
LTPS GTG U 6	APGCL	LTPS
LTPS GTG U 7	APGCL	LTPS
LTPS STG U 8	APGCL	LTPS
Leshka U 1	MePGCL	Leshka
Leshka U 2	MePGCL	Leshka
Leshka U 3	MePGCL	Leshka
NTPS GTG U 1	APGCL	NTPS
NTPS GTG U 2	APGCL	NTPS
NTPS GTG U 3	APGCL	NTPS
NTPS GTG U 4	APGCL	NTPS
NTPS GTG U 5	APGCL	NTPS
NTPS GTG U 6	APGCL	NTPS
Rokhia U 1	TSECL	Rokhia
Rokhia U 2	TSECL	Rokhia
Rokhia U 3	TSECL	Rokhia
Rokhia U 4	TSECL	Rokhia
Rokhia U 5	TSECL	Rokhia
Rokhia U 6	TSECL	Rokhia
Rokhia U 7	TSECL	Rokhia
Rokhia U 8	TSECL	Rokhia
Rokhia U 9	TSECL	Rokhia
Serlui B U 1	P & ED Mizoram	Serlui B
Serlui B U 2	P & ED Mizoram	Serlui B
Serlui B U 3	P & ED Mizoram	Serlui B
Umiam Stg I U 1	MePGCL	Umiam Stg I
Umiam Stg I U 2	MePGCL	Umiam Stg I
Umiam Stg I U 3	MePGCL	Umiam Stg I
Umiam Stg I U 4	MePGCL	Umiam Stg I
Umiam Stg II U 1	MePGCL	Umiam Stg II
Umiam Stg II U 2	MePGCL	Umiam Stg II
Umiam Stg III U 1	MePGCL	Umiam Stg III
Umiam Stg III U 2	MePGCL	Umiam Stg III
Umiam Stg IV U 1	MePGCL	Umiam Stg IV
Umiam Stg IV U 2	MePGCL	Umiam Stg IV
Umtru U 1	MePGCL	Umtru
Umtru U 2	MePGCL	Umtru
	MePGCL	Umtru
Umtru U 3	MePGCL	Umtru
Umtru U 4	MePGCL	Umtru
Monarchak GTG	NEEPCO	Monarchak
Monarchak STG	NEEPCO	Monarchak
BgTPP U 1	NTPC	BgTPP

Operation of Auto Reclose	Relay indications provided by CR operator
Not Furnished	No tripping
Lockout	Not Furnished
Successful operation	Hand Tripped
Not operated	Tripped
Not applicable	DP, ZI, R-E
	DP, ZI, Y-E
	DP, ZI, B-E
	DP, ZII, R-E
	DP, ZII, Y-E
	DP, ZII, B-E
	DP, ZIII, R-E
	DP, ZIII, Y-E
	DP, ZIII, B-E
	DP, ZI, R-Y-E
	DP, ZI, R-B-E
	DP, ZI, Y-B-E
	DP, ZII, R-Y-E
	DP, ZII, R-B-E
	DP, ZII, Y-B-E
	DP, ZIII, R-Y-E
	DP, ZIII, R-B-E
	DP, ZIII, Y-B-E
	DP, ZI, R-Y-B
	DP, ZII, R-Y-B
	DP, ZIII, R-Y-B
	Over current
	Directional Earth Fault
	Back Up Earth Fault
	Earth Fault
	Earth Fault, R-ph
	Earth Fault, Y-ph
	Earth Fault, Y-ph
	Earth Fault, B-ph
	Over Voltage
	Over Voltage Stg I
	Over Voltage Stg II
	Direct Trip received
	Loss of Voltage
	Earth Fault, R,Y,B-Ph
	General Trip
	Busbar Protection

Effect (Loss of Load & Generation in MW)	Category as per CEA Grid Standards	Date and time or restoration provided by CR operator	Details of SPS Operation	Quantum of TTC of NER-ER corridor reduced in MW	DR output furnished within 24 hours (Y/N)	EL output furnished within 24 hours (Y/N)	Violation of Regulation/ Standard	Date & Time of Event from SOE of SCADA	Date & Time of Event from DR	Details of operation of Main I / Main Relay	Details of operation of Main II / Back up Relay	Whether the element tripped due to UFR/ ROCOF	Details of Fault locator	Date and time or restoration from SOE of SCADA	Date and time or restoration from DR	Output of Data Acquisition System (Y/N)	Fault Clearance time (from DR & nearest PMU)	Issues with the Sub-station confirguration as per CEA standard	Protection Mal-operation	Non availability of LBB/ Bus Bar Protection	Non Availability of DR	Non availability of Event logger	Non-availability of SCADA /SOE at RLDC	System is not safe after N-1 Contingency
	GD-I		SPS 1 operated		Yes	Yes						UFR				Yes								
	GD-II		SPS 2 operated		No	No						ROCOF				No								
	GD-III		SPS 3 operated																					
	GD-IV		SPS 4 operated																					
	GD-V		No SPS																					
	GI-I		SPS not operated																					
	GI-II																							
	-																							

132 kV Silchar - Panchgram	POWERGRID & AEGCL	POWERGRID & AEGCL	Silchar	Panchgram
132 kV Silchar - Srikona I	POWERGRID	POWERGRID & AEGCL	Silchar	Srikona
132 kV Silchar - Srikona II	POWERGRID	POWERGRID & AEGCL	Silchar	Srikona
132 kV Sishugram – Kahilipara	AEGCL	AEGCL	Sishugram	Kahilipara
132 kV Srikona - Pailapool	AEGCL	AEGCL	Srikona	Pailapool
132 kV Srikona - Panchgram	AEGCL	AEGCL	Srikona	Panchgram
132 kV Surjamaninagar-Budhjangnagar I	TSECL	TSECL	Surjamaninagar	Bodhjungnagar
132 kV Surjamaninagar-Budhjangnagar II	TSECL	TSECL	Surjamaninagar	Bodhjungnagar
132 kV Surjamaninagar-Palatana I	POWERGRID	TSECL & OTPC	Surjamaninagar	Palatana
132 kV Surjamaninagar-Palatana II	POWERGRID	TSECL & OTPC	Surjamaninagar	Palatana
132 kV Tinsukia - NTPS	AEGCL	AEGCL	Tinsukia	NTPS
132 kV Tinsukia – Dibrugarh	AEGCL	AEGCL	Tinsukia	Dibrugarh
132 kV Udaipur - Palatana	TSECL	TSECL & OTPC	Udaipur	Palatana
132 kV Umiam - NEHU	MePTCL	MePTCL	Umiam	NEHU
132 kV Umiam St I - Mawlai	MePTCL	MePTCL	Umiam	Mawlai
132 kV Umiam St I - Umiam	MePTCL	MePTCL	Umiam	Umiam
132 kV Umiam St I - Umiam St III I	MePTCL	MePTCL	Umiam St I	Umiam St III
132 kV Umiam St I - Umiam St III II	MePTCL	MePTCL	Umiam St I	Umiam St III
132 kV Umiam St III – Umiam St IV I	MePTCL	MePTCL	Umiam	Umiam
132 kV Umiam St III – Umiam St IV II	MePTCL	MePTCL	Umiam	Umiam
132 kV Umiam St III - Umtru I	MePTCL	MePTCL	Umiam	Umtru
132 kV Umiam St III - Umtru II	MePTCL	MePTCL	Umiam	Umtru
132 kV Umtru - Umiam St IV I	MePTCL	MePTCL	Umtru	Umiam
132 kV Umtru - Umiam St IV II	MePTCL	MePTCL	Umtru	Umiam
132 kV Silchar - Imphal (PG) I	POWERGRID	POWERGRID	Silchar	Imphal (PG)
132 kV Silchar - Imphal (PG) II	POWERGRID	POWERGRID	Silchar	Imphal (PG)
132 kV Silchar-P K Bari I	POWERGRID	POWERGRID & TSECL	Silchar	PK Bari
132 kV Silchar-P K Bari II	POWERGRID	POWERGRID & TSECL	Silchar	PK Bari
132 kV Mokokchung(NA)-Mokokchung (PG) I	POWERGRID	DoP Nagaland & POWERGRID	Mokokchung	Mokokchung
132 kV Mokokchung(NA)-Mokokchung (PG) II	POWERGRID	DoP Nagaland & POWERGRID	Mokokchung	Mokokchung
132 kV Silchar- Melriat I	POWERGRID	POWERGRID	Silchar	Melriat
132 kV Silchar- Melriat II	POWERGRID	POWERGRID	Silchar	Melriat
132 kV Udaipur-Monarchak	TSECL	TSECL	Udaipur	Monarchak
132 kV Rokhia-Monarchak	TSECL	TSECL	Rokhia	Monarchak
132 kV Biswanath Charali-Pavoi I	POWERGRID	POWERGRID & AEGCL	Biswanath Charali	Pavoi
132 kV Biswanath Charali-Pavoi II	POWERGRID	POWERGRID & AEGCL	Biswanath Charali	Pavoi
132 kV Mustem-Khliehriat	MePTCL	MePTCL	Mustem	Khliehriat
132 kV Mustem-NEHU	MePTCL	MePTCL	Mustem	NEHU
132 kV Azara-Azara I	AEGCL	AEGCL	Azara	Azara
132 kV Azara-Azara II	AEGCL	AEGCL	Azara	Azara
+/- 800 kV Biswanath Charali-Agra I	POWERGRID	POWERGRID	Biswanath Charali	Agra
+/- 800 kV Biswanath Charali-Agra II	POWERGRID	POWERGRID	Biswanath Charali	Agra
220 kV Mariani(PG)-Mokokchung (PG) I	POWERGRID	POWERGRID	Mariani(PG)	Mokokchung(PG)
220 kV Mariani(PG)-Mokokchung (PG) II	POWERGRID	POWERGRID	Mariani(PG)	Mokokchung(PG)
132 kV Haflong(PG) - Haflong	AEGCL	POWERGRID & AEGCL	Haflong(PG)	Haflong
132 kV Nangalbibra - Mendipathar	MePTCL	MePTCL	Nangalbibra	Mendipathar
132 kV Surjamaninagar-Comilla I	POWERGRID & PGCB	POWERGRID & PGCB	Surjamaninagar	Comilla
132 kV Surjamaninagar-Comilla II	POWERGRID & PGCB	POWERGRID & PGCB	Surjamaninagar	Comilla
220 kV Balipara - Sonabil	POWERGRID & AEGCL	POWERGRID & AEGCL	Balipara	Sonabil
132 kV Depota - Sonabil	AEGCL	AEGCL	Depota	Sonabil

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
1	220 kV Birpara - Salakati I	POWERGRID	**POWERGRID**	**8/29/2016 4:27**	Birpara	DP, ZI, R-E	Successful operation	No	No	-	-	8/29/2016 4:53	No SPS	-	
					Salakati	DP, ZI, R-E, 121 Kms.	Not Furnished	No	No						
	Root Cause	NERTS to inform later after gathering details from ERTS													
	Remedial Measures														
2	400 kV Ranganadi-Biswanath Charali 1I	POWERGRID	**NEEPCO & POWERGRID**	**8/29/2016 21:04**	Ranganadi	DP, ZI, B-E, 7.61 Kms.	Not Furnished	No	No	-	-	8/29/2016 21:16	No SPS	-	due to lightning as mentioned in flash report
					Biswanath Charali	DP, ZII, B-E, 131 Kms.	Successful operation	Yes	No						
	Root Cause	NERTS to inform later													
	Remedial Measures														
3	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**8/29/2016 14:29**	Khliehriat (PG)	DP, ZI, R-Y-B-E, 80.69 Kms.	Not Furnished	No	No	-	-	8/29/2016 14:48	No SPS	-	
					Khliehriat(ME)	No tripping	Not Furnished	No	No						
	Root Cause	NERTS to inform later													
	Remedial Measures														
4	220 kV Misa - Mariani(AS)	POWERGRID	**POWERGRID & AEGCL**	**8/30/2016 1:30**	Misa	DP, ZI, R-E, 142.6 Kms.	Not Furnished	No	No	-	-	8/30/2016 3:04	No SPS	-	due to lightning as mentioned in flash report
					Mariani (AS)	DP, ZI, R-E, 15.71 Kms.	Not Furnished	No	No						
	Root Cause	NERTS to inform later													
	Remedial Measures														
5	220 kV Mariani(PG)-Mokokchung (PG) I	POWERGRID	**POWERGRID**	**8/30/2016 3:03**	Mariani(PG)	Direct Trip received	Not applicable	No	No	-	-	8/30/2016 13:47	No SPS	-	
					Mokokchung(PG)	Over Voltage	Not applicable	No	No						
	Root Cause	NERTS to inform later													
	Remedial Measures														

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
6	132 kV Silchar - Srikona I	POWERGRID	**POWERGRID & AEGCL**	**8/30/2016 14:39**	Silchar	SPS I operated	Not applicable	Yes	No	-	-	8/30/2016 14:49	SPS 1 operated	-	Sil Dul line didn't trip,to be discussed in OCC,10 Min delay from 59 MW to 0,30 MW few
					Srikona		Not applicable	No	No						
7	132 kV Silchar - Srikona II	POWERGRID	**POWERGRID & AEGCL**	**8/30/2016 14:39**	Silchar		Not applicable	Yes	No	-	-	8/30/2016 15:36	SPS 1 operated	-	
					Srikona		Not applicable	No	No						
8	132 kV Silchar - Panchgram	POWERGRID & AEGCL	**POWERGRID & AEGCL**	**8/30/2016 14:39**	Silchar		Not applicable	No	No	-	-	8/30/2016 15:02	SPS 1 operated	-	
					Panchgram		Not applicable	No	No						
9	132 kV Badarpur - Panchgram	POWERGRID	**POWERGRID & AEGCL**	**8/30/2016 14:39**	Badarpur		Not applicable	No	No	-	-	8/30/2016 15:07	SPS 1 operated	-	
					Panchgram		Not applicable	No	No						
	Root Cause	Operation of SPS													
	Remedial Measures														
10	132 kV Surjamaninagar-Palatana II	POWERGRID	**TSECL & OTPC**	**8/30/2016 17:00**	Surjamaninagar	DP, ZI, R-E,15.52 Kms.	Not Furnished	No	No	-	-	8/30/2016 17:41	No SPS	-	
					Palatana	DP, ZI, R-E,19.84 Kms.	Not Furnished	No	No						
	Root Cause	NERTS to inform later													
	Remedial Measures														
11	132 kV Biswanath Charali-Pavoi I	POWERGRID	**POWERGRID & AEGCL**	**8/30/2016 18:21**	Biswanath Charali	DP, ZI, R-E, 2.8 Kms.	Not Furnished	Yes	No	-	-	8/30/2016 18:48	No SPS	-	
					Pavoi	DP, ZI, R-E, 7.719 Kms.	Not Furnished	No	No						
	Root Cause	NERTS to inform later													
	Remedial Measures														
12	220 kV BTPS - Salakati I	POWERGRID	**AEGCL & POWERGRID**	**8/31/2016 17:45**	BTPS	Tripped	Not Furnished	No	No	-	-	8/31/2016 18:48	No SPS	-	Due to Bus I tripped at Sallakati Station
					Salakati	No tripping	Not Furnished	No	No						
13	220 kV BTPS - Salakati II	POWERGRID	**AEGCL & POWERGRID**	**8/31/2016 17:45**	BTPS	Not Furnished	Not Furnished	No	No	-	-	8/31/2016 19:01	No SPS	-	Due to Tripping of Bus Coupler
					Salakati	Due to tripping of Bus Coupler	Not Furnished	No	No						
14	220/132 kV, 50 MVA ICT I at Salakati	POWERGRID	POWERGRID	**8/31/2016 17:45**	Salakati	Earth Fault	Not applicable	No	No	-	-	8/31/2016 19:22	No SPS	-	
	Root Cause	AEGCL / NERTS to inform later													

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
	Remedial Measures														
15	132 kV AGTPP - Agartala II	POWERGRID	**NEEPCO & TSECL**	**8/31/2016 8:01**	AGTPP	No tripping	Not Furnished	No	No	-	-	8/31/2016 14:46	No SPS	-	Not in NER flash report
					Agartala	Not Furnished	Not Furnished	No	No						
	Root Cause	NEEPCO to check further. How fault cleared is not apparent from available details													
	Remedial Measures														
16	132 kV AGTPP - Agartala II	POWERGRID	**NEEPCO & TSECL**	**8/31/2016 23:44**	AGTPP	DP, ZI, Y-B-E, 2.124 Kms.	Not Furnished	No	No	-	-	9/1/2016 11:50	No SPS	-	
					Agartala	Not Furnished	Not Furnished	No	No						
	Root Cause	Y-ph jumper opened at location no.15. Agartala end also tripped													
	Remedial Measures														
17	220 kV Birpara - Salakati I	POWERGRID	**POWERGRID**	**8/31/2016 17:45**	Birpara	Directional Earth Fault	Not applicable	No	No	-	-	8/31/2016 19:15	No SPS	-	
					Salakati	No tripping	Not applicable	No	No						
	Root Cause	NERTS to inform later after gathering details from ERTS													
	Remedial Measures														
18	132 kV Jiribam - Aizwal	POWERGRID	**POWERGRID**	**8/31/2016 0:01**	Jiribam	DP, ZI, R-Y-B-E, 34.78 Kms.	Not Furnished	Yes	No	-	-	8/31/2016 0:19	No SPS	-	
					Aizawl	DP, ZI, R-Y-B-E, 132.9 Kms.	Not Furnished	No	No						
	Root Cause	NERTS to inform later													
	Remedial Measures														

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
19	220 kV Birpara - Salakati I	POWERGRID	**POWERGRID**	**9/1/2016 23:22**	Birpara	Not Furnished	Not Furnished	No	No	-	-	9/2/2016 0:17	No SPS	-	
					Salakati	DP, ZI, R-E, 83.66 Kms.	Not Furnished	Yes	No						
20	220 kV Birpara - Salakati II	POWERGRID	**POWERGRID**	**9/1/2016 23:22**	Birpara	Not Furnished	Not Furnished	No	No	-	-	9/2/2016 1:03	No SPS	-	Phase to Phase fault ,High current
					Salakati	DP, ZI, R-Y-E, 49.59 Kms.	Not Furnished	Yes	No						
	Root Cause	Fault due to lightning. Simulataneous lightning strike at 2 different locations.													
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
21	132 kV Aizwal - Kumarghat	POWERGRID	**POWERGRID**	**9/3/2016 12:40**	Aizawl	DP, ZI, Y-E, 21 Kms.	Successful operation	Yes	No	-	-	9/3/2016 12:45	No SPS	-	
					Kumarghat	DP, ZII, Y-E, 105 Kms.	Not Furnished	Yes	No						
	Root Cause	Iy lags Vy by 15 degree. Banana tree touched line. Banana trees slided from uphill side and touched circuit between loc 53-54													
	Remedial Measures	Vegetation clearance in vulnerable areas to be done by POWERGRID													
22	132 kV Haflong(PG) - Jiribam	POWERGRID	**POWERGRID**	**9/3/2016 22:28**	Haflong(PG)	DP, ZI, R-Y-B-E, 70.03 Kms.	Not Furnished	Yes	No	-	-	Not Yet Restored	No SPS	-	Y-phase ins. Decapped at loc 241 and conductor grounded,area
					Jiribam	DP, ZI, R-Y-B-E, 21.75 Kms.	Not Furnished	Yes	No						
	Root Cause	Ir lags Vy lags by 70 deg. At Loc No. 241 Y-ph insulator damaged and decapped, location flooded. Likely strike of lightning on insulator.													
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
23	132 kV Rangia - Motonga	BPC	**AEGCL & BPC**	**9/4/2016 22:58**	Rangia	No tripping	Not Furnished	No	No	-	-	9/4/2016 23:33	No SPS	-	
					Motonga	Distance Protection	Not Furnished	No	No						
	Root Cause	AEGCL confirmed that Rangia was being fed from Motonga, and that fault was within their system. Exact location of fault could not be gathered due to absence of proper relay indications.													
	Remedial Measures	AEGCL to do proper maintenance of their line section and also take up with BPC, Bhutan for the same in respective line section.													
24	220 kV Misa - Mariani(PG)	POWERGRID	**POWERGRID**	**9/5/2016 22:06**	Misa	DP, ZI, Y-E,88.5 Kms.	Successful operation	Yes	No	-	-	9/5/2016 23:15	No SPS	-	
					Mariani (PG)	DP, ZI, Y-E,99.5 Kms.	Not Furnished	No	No						

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
	Root Cause	Iy lags Vy by 72 deg Lightning fault. Flahover marks found at Loc 800-801 due to lightning.													
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
25	132 kV Silchar-P K Bari II	POWERGRID	**POWERGRID & TSECL**	**9/5/2016 20:33**	Silchar	DP, ZI, R-E,71.07 Kms.	Not Furnished	Yes	No	-	-	9/5/2016 21:00	No SPS	-	
					PK Bari	DP, ZI, R-E,91.74 Kms.	Not Furnished	No	No						
	Root Cause	Fault current in faulty phase around 1.57 kA ; Angle b/w V & I in faulty phase around 70 degree ; Likely tripping due to lightning strike													
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
26	220 kV Misa - Mariani(PG)	POWERGRID	**POWERGRID**	**9/6/2016 15:31**	Misa	Over Voltage	Not applicable	Yes	No	-	-	9/6/2016 15:46	No SPS	-	
					Mariani (PG)	Direct Trip received	Not applicable	No	No						
	Root Cause	DR indicates maximum Ph. Voltage of around 137 kV (viz. 237 kV). No overvoltage is present. Likely maloperation of protection.													
	Remedial Measures	NERTS to check and intimate to PCC forum													
27	132 kV Salakati-Gelephu	POWERGRID	**POWERGRID & BPC**	**9/6/2016 4:28**	Salakati	DP, ZIII, R-Y-B-E,63 Kms.	Not applicable	Yes	No	-	-	9/6/2016 4:52	No SPS	-	
					Gelephu	No tripping	Not applicable	No	No						
	Root Cause	Fault in Bhutan system as found from Relay indications													
	Remedial Measures	NERTS to co-ordinate with BPC, Bhutan to maintain healthiness of line													
28	132 kV Rangia - Motonga	BPC	**AEGCL & BPC**	**9/6/2016 13:30**	Rangia	No tripping	Not Furnished	No	No	-	-	9/6/2016 22:32	No SPS	-	
					Motonga	Not Furnished	Not Furnished	No	No						
	Root Cause	AEGCL confirmed that Rangia was being fed from Motonga, and that fault was within their system. Exact location of fault could not be gathered due to absence of proper relay indications.													
	Remedial Measures	AEGCL to do proper maintenance of their line section and also take up with BPC, Bhutan for the same in respective line section.													
29	132 kV Doyang - Mokokchung(NA)	DoP Nagaland	**NEEPCO & DoP,Nagaland**	**9/7/2016 9:52**	Doyang	Over Current,B-Phase	Not applicable	No	No	-	-	9/7/2016 10:40	No SPS	-	Logsheet date is wrong
					Mokokchung(NA)	No tripping	Not applicable	No	No						
	Root Cause	NEEPCO to check and confirm. As intimated by Sh.Joypal Roy, Sr.Manager (NEEPCO), details from Doyang HEP could not be gathered.													
	Remedial Measures	Matter may be raised in PCC forum and take up individually with Doyang HEP regarding non-furnishing of informtion													
30	400 kV Palatana -	NETC	**OTPC &**	**9/8/2016 11:17**	Palatana	DP, ZI, R-E,196.1 Kms.	Not Furnished	No	No	-	-	9/8/2016 11:34	No SPS	-	Subsequent over

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
	Silchar I	NETC	POWERGRID	9/8/2016 11:17	Silchar	DP, ZI, R-E,39.11 Kms.	Lockout	No	No			9/8/2016 11:34	No SPS	-	voltage at Palatana
	Root Cause	NETC has indicated that tripping was on account of vegetation infringement. It is also mentioned that Routine maintenance of this is suspended due to objection of line owner, and that 3 cases are pending in this regard before District Judge, Hailakandi.													
	Remedial Measures	Matter is serious considering this 400 kV D/C Palatana - Silchar lines serve as the evacuation path of Palatana. NERPC may take up with relevant authorities for resolution													
31	132 kV Khliehriat (PG) - Khliehriat (ME) I	POWERGRID	**POWERGRID & MePTCL**	**9/9/2016 1:43**	Khliehriat (PG)	DP, ZI, R-Y-B-E,67.78 Kms.	Not operated	No	No	Loss of Generation: 126	-	9/9/2016 2:09	No SPS	-	
					Khliehriat(ME)	No tripping	Not operated	No	No						
	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**		Khliehriat (PG)	DP, ZI, R-Y-B-E,41.41 Kms.	Not Furnished	No	No			9/9/2016 2:12	No SPS		
					Khliehriat(ME)	No tripping	Not Furnished	No	No						
	Root Cause	Khl-Khl I: Ir lags Vr by 75 deg. Likely tripping on account of lightning strike. MePTCL to further investigate as to the location of the lightning strike and identify lightning prone areas for remedial measures like reduction of Tower footing resistance or Installation of Line LAs.													
	Remedial Measures	MePTCL to further investigate as to the location of the lightning strike and identify lightning prone areas for remedial measures like reduction of Tower footing resistance or Installation of Line LAs. MePTCL to install Numerical relays on all outgoing feeders from Khliehriat(MePTCL) s/s and co-ordinate with NERTS for review of the protection system after relay installation													
32	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**9/10/2016 15:10**	Khliehriat (PG)	Earth Fault	Not applicable	No	No	-	-	9/10/2016 15:38	No SPS	-	
					Khliehriat(ME)	No tripping	Not applicable	No	No						
	Root Cause	Problem in Meghalaya state system that was not cleared by relays at Khliehriat (MePTCL)													
	Remedial Measures	MePTCL to further investigate as to the location of the lightning strike and identify lightning prone areas for remedial measures like reduction of Tower footing resistance or Installation of Line LAs. MePTCL to install Numerical relays on all outgoing feeders from Khliehriat(MePTCL) s/s and co-ordinate with NERTS for review of the protection system after relay installation													
33	132 kV Doyang - Mokokchung(NA)	DoP Nagaland	**NEEPCO & DoP,Nagaland**	**9/11/2016 9:55**	Doyang	Over current	Not applicable	No	No	-	-	9/11/2016 10:55	No SPS	-	
					Mokokchung(NA)	No tripping	Not applicable	No	No						
	Root Cause	NEEPCO to check and confirm. As intimated by Sh.Joypal Roy, Sr.Manager (NEEPCO), details from Doyang HEP could not be gathered.													
	Remedial Measures	Matter may be raised in PCC forum and take up individually with Doyang HEP regarding non-furnishing of informtion													
34	132 kV Doyang - Mokokchung(NA)	DoP Nagaland	**NEEPCO & DoP,Nagaland**	**9/12/2016 10:05**	Doyang	Over current	Not applicable	NA	NA	-	-	9/12/2016 12:49	No SPS	-	
					Mokokchung(NA)	Not Furnished	Not applicable	NA	NA						
	Root Cause	NEEPCO to check and confirm. As intimated by Sh.Joypal Roy, Sr.Manager (NEEPCO), details from Doyang HEP could not be gathered.													
	Remedial Measures	Matter may be raised in PCC forum and take up individually with Doyang HEP regarding non-furnishing of informtion													
35	132 kV Haflong(PG) - Jiribam	POWERGRID	**POWERGRID**	**9/13/2016 20:04**	Haflong(PG)	DP, ZI, R-Y-E,58.73 Kms.	Not operated	No	No	-	-	9/13/2016 20:25	No SPS	-	
					Jiribam	DP, ZI, R-Y-E,33.85 Kms.	Not operated	Yes	No						
	Root Cause	Iy lags Vy by 80 Deg in faulty phase. Tripping on account of lightning.													

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
36	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**9/14/2016 14:44**	Khliehriat (PG)	DP, ZI, R-Y-B	Not applicable	No	No	-	-	9/14/2016 15:02	No SPS	-	
					Khliehriat(ME)	No tripping	Not applicable	No	No						
	Root Cause	Iy lags Vy by 80 deg Lightening fault. FAULT BEYOND LINE LENGTH.													
	Remedial Measures	MePTCL to further investigate as to the location of the lightning strike and identify lightning prone areas for remedial measures like reduction of Tower footing resistance or Installation of Line LAs. MePTCL to install Numerical relays on all outgoing feeders from Khliehriat(MePTCL) s/s and co-ordinate with NERTS for review of the protection system after relay installation													
37	132 kV Salakati-Gelephu	POWERGRID	**POWERGRID & BPC**	**9/15/2016 22:49**	Salakati	DP, ZII, R-Y-B,59.54 Kms.	Not applicable	No	No	-	-	9/15/2016 23:07	No SPS	-	
					Gelephu	No Trip Bus Dead	Not applicable	No	No						
	Root Cause	Fault in Bhutan system as found from Relay indications													
	Remedial Measures	NERTS to co-ordinate with BPC, Bhutan to maintain healthiness of line													
38	132 kV Rangia - Motonga	BPC	**AEGCL & BPC**	**9/15/2016 22:31**	Rangia	Not Furnished	Not Furnished	No	No	-	-	9/15/2016 23:51	No SPS	-	
					Motonga	Not Furnished	Not Furnished	No	No						
	Root Cause	AEGCL confirmed that Rangia was being fed from Motonga, and that fault was within their system. Exact location of fault could not be gathered due to absence of proper relay indications.													
	Remedial Measures	AEGCL to do proper maintenance of their line section and also take up with BPC, Bhutan for the same in respective line section.													

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
39	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**9/16/2016 14:54**	Khliehriat (PG)	No tripping	Not applicable	No	No	-	-	9/16/2016 15:21	No SPS	-	
					Khliehriat(ME)	Earth Fault	Not applicable	No	No						
40	132 kV Khandong - Khliehriat(PG) I	POWERGRID	**NEEPCO & POWERGRID**	**9/16/2016 14:54**	Khandong	O/C	Successful operation	No	No	-	-	9/16/2016 15:08	No SPS	-	
					Khliehriat(PG)	DP, ZI, R-Y-B, 32.78 Kms.	Successful operation	No	No						
41	132 kV Khandong - Khliehriat(PG) II	POWERGRID	**NEEPCO & POWERGRID**	**9/16/2016 14:54**	Khandong	Earth Fault	Not operated	No	No	-	-	9/16/2016 15:25	No SPS	-	
					Khliehriat(PG)	DP, ZII, R-Y-B,36 Kms.	Not operated	No	No						
	Root Cause	Kha-Khl I: Ib lags Vb by 65 deg Lightening fault. Khan-Khl II: Iy lags Vy by 75 deg Lightening fault.													
	Remedial Measures	NEEPCO to co-ordinate relay settings with NERTS so that 132 kV Khandong - Khliehriat D/C line does not trip on unwanted relay operation. MePTCL to install Numerical relays on all outgoing feeders from Khliehriat(MePTCL) s/s and co-ordinate with NERTS for review of the protection system after relay installation													
42	132 kV Rangia - Motonga	BPC	**AEGCL & BPC**	**9/16/2016 0:11**	Rangia	Not Furnished	Not Furnished	No	No	-	-	9/16/2016 2:05	No SPS	-	
					Motonga	Not Furnished	Not Furnished	No	No						
	Root Cause	AEGCL confirmed that Rangia was being fed from Motonga, and that fault was within their system. Exact location of fault could not be gathered due to absence of proper relay indications.													
	Remedial Measures	AEGCL to do proper maintenance of their line section and also take up with BPC, Bhutan for the same in respective line section.													
43	132 kV Rangia - Motonga	BPC	**AEGCL & BPC**	**9/16/2016 11:02**	Rangia	No tripping	Not Furnished	No	No	-	-	9/16/2016 11:17	No SPS	-	
					Motonga	Not Furnished	Not Furnished	No	No						
	Root Cause	AEGCL confirmed that Rangia was being fed from Motonga, and that fault was within their system. Exact location of fault could not be gathered due to absence of proper relay indications.													
	Remedial Measures	AEGCL to do proper maintenance of their line section and also take up with BPC, Bhutan for the same in respective line section.													
44	132 kV Rangia - Motonga	BPC	**AEGCL & BPC**	**9/16/2016 17:46**	Rangia	No tripping	Not Furnished	No	No	-	-	9/16/2016 19:15	No SPS	-	
					Motonga	Not Furnished	Not Furnished	No	No						
	Root Cause	AEGCL confirmed that Rangia was being fed from Motonga, and that fault was within their system. Exact location of fault could not be gathered due to absence of proper relay indications.													
	Remedial Measures	AEGCL to do proper maintenance of their line section and also take up with BPC, Bhutan for the same in respective line section.													
45	132 kV Loktak - Imphal (PG)	POWERGRID	**NHPC & POWERGRID**	**9/16/2016 11:19**	Loktak	DP, ZI, R-B-E,9.32 Kms.	Not Furnished	Yes	No	-	-	9/16/2016 11:28	No SPS	-	
					Imphal (PG)	DP, ZII, B-E,34.26 Kms.	Successful operation	Yes	No						
	Root Cause	Ib lags Vb by 26 deg . Brioken tree from uphill side was found very near to B-ph conductor at Loc 23-24													
	Remedial Measures	Vegetation clearance in vulnerable areas in line sections to be done by POWERGRID													
46	132 kV Jiribam -	POWERGRID	**POWERGRID**	**9/17/2016 1:08**	Jiribam	DP, ZI, R-E,136.3 Kms.	Not Furnished	No	No			9/17/2016 1:22	No SPS		

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
46	Aizwal	POWERGRID	**POWERGRID**	**9/17/2016 1:08**	Aizawl	DP, ZI, R-E,8.376 Kms.	Successful operation	Yes	No	-	-	9/17/2016 1:22	No SPS	-	
	Root Cause	Ir lags Vr by 65 Deg. Suspected vegetation fault.													
	Remedial Measures	Vegetation clearance in vulnerable areas in line sections to be done by POWERGRID													
47	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**9/17/2016 13:38**	Khliehriat (PG)	DP, ZI, R-Y-B,119.9 Kms.	Successful operation	No	No	-	-	9/17/2016 14:00	No SPS	-	
					Khliehriat(ME)	No tripping	Successful operation	No	No						
	Root Cause	Problem in Meghalaya state system that was not cleared by relays at Khliehriat (MePTCL)													
	Remedial Measures	MePTCL to further investigate as to the location of the lightning strike and identify lightning prone areas for remedial measures like reduction of Tower footing resistance or Installation of Line LAs. MePTCL to install Numerical relays on all outgoing feeders from Khliehriat(MePTCL) s/s and co-ordinate with NERTS for review of the protection system after relay installation													
48	132 kV Khandong - Khliehriat(PG) II	POWERGRID	**NEEPCO & POWERGRID**	**9/17/2016 14:22**	Khandong	DP, ZI, R-E	Not Furnished	No	No	-	-	9/17/2016 14:37	No SPS	-	
					Khliehriat(PG)	DP, ZI, R-E,27.01 Kms.	Successful operation	No	No						
	Root Cause	Ir lags Vr by 75 deg in faulty phase. Likely tripping on account of Lightening strike. For 1-phase fault, A/R should have operated succesfully, but did not at Khandong end													
	Remedial Measures	Cause of Non-operation of Auto-reclose at Khandong end to be investigated by NEEPCO. Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
49	400 kV Silchar - Byrnihat	NETC & MePTCL	**POWERGRID & MePTCL**	**9/17/2016 14:34**	Silchar	DP, ZI, R-E,148 Kms.	Not Furnished	Yes	No	-	-	9/17/2016 15:13	No SPS	-	400 kV Silchar - Azara AR from DR
					Byrnihat	DP, ZI, R-E	Not Furnished	No	No						
	Root Cause	Ir lags Vr by 52 deg Suspected fault due to vegetation infringement.													
	Remedial Measures	Vegetation clearance in vulnerable areas in line sections to be done by NETC													
50	400 kV Balipara-Biswanath Charali II	POWERGRID	**POWERGRID**	**9/18/2016 7:00**	Balipara	Over Voltage	Successful operation	Yes	Yes	-	-	9/19/2016 12:04	No SPS	-	
					Biswanath Charali	Direct Trip received	Successful operation	No	No						
	Root Cause	Overvoltage could not be seen from DR (238 kV Phase volt viz. 412 kV L-L). From PMU, maximum voltage seen at Balipara and Bongaigaon respectively were 416 kV andd 409 kV. Relay mal-operation suspected.													
	Remedial Measures	NERTS to check Overvoltage relay settings on this line													

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
51	132 kV Khandong - Khliehriat(PG) I	POWERGRID	**NEEPCO & POWERGRID**	**9/18/2016 10:56**	Khandong	DP, ZI, R-Y-B,22.72 Kms.	Not Furnished	No	No	-	-	9/18/2016 11:05	No SPS	-	
					Khliehriat(PG)	DP, ZI, R-Y-B,22.16 Kms.	Successful operation	No	No						
	Root Cause	Tripped due to lightning. 3.6 kA in all 3 phases, Iy lags Vy by 67 deg. Likely tripping on account off lightning strike													
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
52	220/132 kV 50 MVA ICT II at Balipara	AEGCL	POWERGRID	**9/18/2016 6:57**	Balipara	Buchholz relay operated	Not applicable	No	No	-	-	Not Yet Restored	No SPS	-	
	Root Cause	Transformer damaged due to internal fault.													
	Remedial Measures	Already replaced by NEEPCO. Maintenance of transformers to be done properly by NEEPCO.													
53	400 kV Bongaigaon - Azara	NETC & AEGCL	**POWERGRID & AEGCL**	**9/19/2016 1:21**	Bongaigaon	DP, ZI, R-E,160.79 Kms.	Successful operation	Yes	No	-	-	9/19/2016 1:51	No SPS	-	Byn line AR sucessful from Both Ends
					Azara	DP, ZI, R-E,145.4 Kms.	Not Furnished	No	No						
54	400 kV Balipara - Bongaigaon II	POWERGRID	**POWERGRID**	**9/19/2016 1:21**	Balipara	No tripping	Not applicable	No	No	-	-	9/19/2016 1:39	No SPS	-	
					Bongaigaon	Power Swing	Not applicable	Yes	No						
	Root Cause	Bon-Azara: Ir Lags Vr by 65 Deg, Lightening fault. Bali-Bong II: Tripped due to powerswing at Bongaigaon end													
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
55	132 kV Doyang - Mokokchung(NA)	DoP Nagaland	**NEEPCO & DoP,Nagaland**	**9/19/2016 17:17**	Doyang	Over current	Not applicable	No	No	-	-	9/19/2016 17:50	No SPS	-	
					Mokokchung(NA)	Not Furnished	Not applicable	No	No						
	Root Cause	NEEPCO to check and confirm. As intimated by Sh.Joypal Roy, Sr.Manager (NEEPCO), details from Doyang HEP could not be gathered.													
	Remedial Measures	Matter may be raised in PCC forum and take up individually with Doyang HEP regarding non-furnishing of informtion													
56	220 kV Misa - Byrnihat II	MePTCL	**POWERGRID & MePTCL**	**9/20/2016 13:43**	Misa	No tripping	Not Furnished	No	No	-	-	9/21/2016 16:44	No SPS	-	Taken ES/D from 13:00 Hrs on 20th Sep'16
					Byrnihat	DP, ZI, B-E,32.69 Kms.	Not Furnished	No	No						
	Root Cause	MePTCL and NERTS to give further details in respect of this tripping													
	Remedial Measures														
57	132 kV AGTPP - Kumarghat	POWERGRID	**NEEPCO & POWERGRID**	**9/20/2016 4:04**	AGTPP	DP, ZI, B-E,61.35 Kms.	Not operated	No	No	Loss of Generation: 20	-	9/20/2016 4:32	SPS 6 operated	-	
					Kumarghat	DP, ZI, R-Y-E,37.5 Kms.	Not operated	Yes	No						
	Root Cause	Ir lags Vr by 75 deg.Flashover marks found on insulator, Flashover marks at loc 213. Likely tripping on account of lightning													

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
58	132 kV Doyang - Mokokchung(NA)	DoP Nagaland	**NEEPCO & DoP,Nagaland**	**9/20/2016 5:50**	Doyang	Over current	Not applicable	No	No	-	-	9/20/2016 6:50	No SPS	-	
					Mokokchung(NA)	No tripping	Not applicable	No	No						
	Root Cause	NEEPCO to check and confirm. As intimated by Sh.Joypal Roy, Sr.Manager (NEEPCO), details from Doyang HEP could not be gathered.													
	Remedial Measures	Matter may be raised in PCC forum and take up individually with Doyang HEP regarding non-furnishing of informtion													
59	132 kV Badarpur - Jiribam	POWERGRID	**POWERGRID**	**9/20/2016 8:25**	Badarpur	DP, ZI, R-E,17.97 Kms.	Lockout	No	No	-	-	9/20/2016 8:40	No SPS	-	
					Jiribam	DP, ZI, R-E	Lockout	No	No						
	Root Cause	Ir Lags Vr by 70 deg. Flash over marks observed in R-ph of Loc 66. Likely tripping on account of lightning													
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
60	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**9/20/2016 12:45**	Khliehriat (PG)	DP, ZI, R-Y-B-E,85.7 Kms. IR-1.28KA,IB-1.18KA,IC-	Successful operation	No	No	-	-	9/20/2016 13:02	No SPS	-	
					Khliehriat(ME)	No tripping	Not applicable	NA	NA						
	Root Cause	Fault within Meghalaya system that was cleared by remote end relays at Khliehriat(PG) substation, due to absence of relays at Khliehriat(MePTCL) end													
	Remedial Measures	MePTCL to install Numerical relays on all outgoing feeders from Khliehriat(MePTCL) s/s and co-ordinate with NERTS for review of the protection system after relay installation													
61	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**9/21/2016 10:36**	Khliehriat (PG)	DP, ZI, R-Y-B,103.2 Kms.	Not applicable	No	No	-	-	9/21/2016 10:50	No SPS	-	
					Khliehriat(ME)	No tripping	Not applicable	NA	NA						
	Root Cause	Ib lags Vb by 60 deg. Low fault current. Suspected vegetation fault.													
	Remedial Measures	MePTCL to ensure vegetation clearance in line sections. MePTCL to install Numerical relays on all outgoing feeders from Khliehriat(MePTCL) s/s and co-ordinate with NERTS for review of the protection system after relay installation													
62	132 kV Badarpur - Kolasib	POWERGRID	**POWERGRID & P&ED, Mizoram**	**9/21/2016 18:30**	Badarpur	DP, ZI, R-Y-B,35.4 Kms.	Not operated	Yes	No	-	-	9/21/2016 19:26	No SPS	-	
					Kolasib	DP, ZIII, R-Y-B,68.2 Kms.	Not operated	No	No						
	Root Cause	Ib lags Vb by 74 deg. Jumper strand demaged at LOC 124 due to lightening. Likely fault on account of lightning strike													
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
63	220 kV Misa - Byrnihat I	MePTCL	**POWERGRID & MePTCL**	**9/21/2016 9:55**	Misa	DP, ZI, B-E,85.9 Kms.	Not Furnished	No	No	-	-	9/21/2016 10:17	No SPS	-	
					Byrnihat	Not Furnished	Not Furnished	No	No						
	Root Cause	MePTCL and NERTS to give further details in respect of this tripping.													
	Remedial Measures														
64	132 kV Haflong-Umrangso	POWERGRID & AEGCL	**POWERGRID & AEGCL**	**9/22/2016 13:07**	Haflong	E/F, B-Ph O/C	Not operated	No	No	-	-	9/22/2016 13:55	No SPS	-	Not in log sheet - soft copy
					Umrangso	DP, ZIII, R-Y-B,10.5 Kms.	Not operated	No	No						
	Root Cause	Ib lags Vb by 65 deg. Flash over marks found in B-ph insulator of Loc 63. Likely tripping on account of lightning.													

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
65	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**9/23/2016 11:13**	Khliehriat (PG)	DP, ZI, R-Y-B, 86.42 Kms.	Not applicable	No	No	-	-	9/23/2016 12:42	No SPS	-	
					Khliehriat(ME)	No tripping	Not applicable	No	No						
	Root Cause	Fault within Meghalaya system that was cleared by remote end relays at Khliehriat(PG) substation, due to absence of relays at Khliehriat(MePTCL) end													
	Remedial Measures	MePTCL to install Numerical relays on all outgoing feeders from Khliehriat(MePTCL) s/s and co-ordinate with NERTS for review of the protection system after relay installation.													
66	132 kV Aizwal - Kumarghat	POWERGRID	**POWERGRID**	**9/23/2016 12:31**	Aizawl	Earth Fault	Not applicable	Yes	No	-	-	9/23/2016 12:42	No SPS	-	
					Kumarghat	DP, ZI, Y-E,102.4 Kms.	Not applicable	Yes	No						
	Root Cause	Iy lags Vy by 30 deg, Suspected vegetation fault. Insulator flash over mark at Y-ph in LOC 33.													
	Remedial Measures	Vegetation clearance in line sections in forested areas / bamboo grass areas to be done on regular basis by NERTS													
67	132 kV Aizwal - Kumarghat	POWERGRID	**POWERGRID**	**9/23/2016 17:14**	Aizawl	DP, ZI, Y-E,109.2 Kms.	Successful operation	Yes	No	-	-	9/23/2016 17:29	No SPS	-	
					Kumarghat	DP, ZI, Y-E,11.56 Kms.	Successful operation	Yes	No						
	Root Cause	Fault current growing gradually. Angle b/w V & I in faulty phase max. 19 deg. Tripping likely due to vegetation infringment.													
	Remedial Measures	Vegetation clearance in line sections in forested areas / bamboo grass areas to be done on regular basis by NERTS													
68	132 kV Biswanath Charali-Pavoi I	POWERGRID	**POWERGRID & AEGCL**	**9/23/2016 0:15**	Biswanath Charali	DP, ZI, R-Y-E,3.61 Kms.	Not operated	Yes	No	-	-	9/23/2016 1:10	No SPS	-	
					Pavoi	Not Furnished	Not operated	No	No						
69	132 kV Biswanath Charali-Pavoi II	POWERGRID	**POWERGRID & AEGCL**	**9/23/2016 0:15**	Biswanath Charali	DP, ZI, R-Y-E,4.43 Kms.	Not operated	Yes	No	-	-	9/23/2016 1:10	No SPS	-	
					Pavoi	Not Furnished	Not operated	No	No						
	Root Cause	BNC-Pavoi: Ir lags Vr by 76 deg Lightening fault. BNC-Pavoi II: Iy lags Vy by 72 deg Lightening fault.													
	Remedial Measures	AEGCL to furnish relay details in respect of every tripping. Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
70	400 kV Ranganadi-Biswanath Charali 1	POWERGRID	**NEEPCO & POWERGRID**	**9/23/2016 16:10**	Ranganadi	Over Voltage	Not Furnished	No	No	-	-	9/23/2016 16:25	No SPS	-	
					Biswanath Charali	DP, ZI, B-E,45.82 Kms.	Successful operation	No	No						
	Root Cause	Heavy lightening has been reported. DR from either end is not available. Snaps of Accuweather do not prove fault on account on lightning. NERTS to provide further details in respect of this tripping													
	Remedial Measures														
71	400 kV Bongaigaon -	POWERGRID	**POWERGRID**	**9/24/2016 23:29**	Bongaigaon	DP, ZI, R-B-E,50.32 Kms.	Not Furnished	Yes	No	-	-	9/25/2016 0:03	No SPS	-	

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
	Bongaigaon - New Siliguri I	POWERGRID	POWERGRID		New Siliguri	DP, ZI, R-B-E,190.52 Kms.	Not Furnished	No	No						
72	400 kV Bongaigaon - New Siliguri II	POWERGRID	**POWERGRID**	**9/24/2016 23:29**	Bongaigaon	DP, ZI, R-B-E,56.11 Kms.	Not Furnished	Yes	No	-	-	9/24/2016 23:58	No SPS	-	
					New Siliguri	DP, ZI, R-B-E,190.52 Kms.	Not Furnished	No	No						
	Root Cause	NERTS to confirm the details after collecting relevant information.													
	Remedial Measures														
73	220 kV Kopili - Misa I	POWERGRID	**NEEPCO & POWERGRID**	**9/24/2016 10:07**	Kopili	DP, ZI, B-E, 5.365 kms	Successful operation	No	No	-	-	9/24/2016 10:50	No SPS	-	
					Misa	DP, ZI, B-E,67 Kms.	Not Furnished	Yes	No						
	Root Cause	Bamboo came down from uphill location and touched line ; due to heavy rain. Ib = 2.26 KA. Fault on account of vegetation infringement													
	Remedial Measures	Vegetation clearance in line sections in forested areas / bamboo grass areas to be done on regular basis by NERTS													
74	132 kV Loktak - Jiribam(PG)	POWERGRID	**NHPC & POWERGRID**	**9/25/2016 1:26**	Loktak	DP, ZII, R-Y-B,82.58 Kms.	Not applicable	No	No	-	-	9/25/2016 1:54	No SPS	-	
					Jiribam(PG)	DP, ZI, B-E,11.2 Kms.	Successful operation	Yes	No						
	Root Cause	Ib lags Vb by 65 Deg. Ib = 2.719 KA. Likely tripping on account of lightning strike													
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
75	132 kV Badarpur - Jiribam	POWERGRID	**POWERGRID**	**9/25/2016 1:59**	Badarpur	DP, ZII, R-E,64.24 Kms.	Not operated	Yes	No	-	-	9/25/2016 2:20	No SPS	-	
					Jiribam	DP, ZI, R-E,12.7 Kms.	Not operated	No	No						
	Root Cause	Ir Lags Vr by 68 Deg. Flash over marks observed in R-ph of Loc 189. Likely tripping on account of lightning strike													
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
76	132 kV Khandong - Khliehriat(PG) I	POWERGRID	**NEEPCO & POWERGRID**	**9/26/2016 13:13**	Khandong	DP, ZI, R-Y-B, 17.1 Kms.	Not Furnished	Yes	No	-	-	9/26/2016 13:21	No SPS	-	
					Khliehriat(PG)	DP, ZI, R-Y-E, 30.22 Kms.	Successful operation	No	No						
	Root Cause	Khlt A/R successfully. Ir by Vr by 86 deg. High fault current. Likely tripping on account of lightning strike													
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
77	132 kV Khandong - Khliehriat(PG) I	POWERGRID	**NEEPCO & POWERGRID**	**9/26/2016 13:47**	Khandong	DP, ZI, R-Y-B, 17.06 Kms.	Not Furnished	No	No	-	-	9/26/2016 13:53	No SPS	-	
					Khliehriat(PG)	DP, ZI, R-Y-E, 36.71 Kms.	Successful operation	No	No						
	Root Cause	All phase currents around 2.3 kA. Iy lags Vy by 74 deg. Likely tripping on account of lightning strike													
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
78	220 kV BTPS - Agia II	AEGCL	**AEGCL**	**9/26/2016 13:57**	BTPS	Not Furnished	Not applicable	No	No	-	-	9/26/2016 15:18	No SPS	-	Bus coupler cb opened due to low air pressure
					Agia	Not Furnished	Not applicable	No	No						
	Root Cause	Details to be furnished by AEGCL in respect of this tripping													
	Remedial Measures														
79	**220/132 kV 80 MVA ICT at BTPS**	AEGCL	AEGCL	**9/26/2016 13:57**	BTPS	Not Furnished	Not applicable	No	No	-		9/26/2016 15:11	No SPS	-	
	Root Cause	3 phase trip, DP as recorded by relays at both ends of 220 kV BTPS - Agia II line. ICT E/F on HV side. Protection interfacing exists in ICT and hence LV side E/F would also have operated. Jumper snapped on BTPS-Agia line as mentioned by AEGCL to be reason of fault													
	Remedial Measures	Maintenance of line sections to be done appropriately to maintain healthiness of line.													
80	132 kV Doyang - Mokokchung(NA)	DoP Nagaland	**NEEPCO & DoP,Nagaland**	**9/26/2016 10:54**	Doyang	Not Furnished	Not Furnished	No	No	-	-	9/26/2016 11:05	No SPS	-	
					Mokokchung(NA)	No tripping	Not Furnished	No	No						
	Root Cause	NEEPCO to check and confirm. As intimated by Sh.Joypal Roy, Sr.Manager (NEEPCO), details from Doyang HEP could not be gathered.													
	Remedial Measures	Matter may be raised in PCC forum and take up individually with Doyang HEP regarding non-furnishing of informtion													
81	132 kV Silchar-P K Bari II	POWERGRID	**POWERGRID & TSECL**	**9/26/2016 17:46**	Silchar	Mal-operated during SAS testing	Not applicable	No	No	-	-	9/26/2016 17:58	No SPS	-	
					PK Bari	No tripping	Not applicable	No	No						
	Root Cause	Maloperation at Silchar(PG) end during SAS testing.													
	Remedial Measures	Rectified by NERTS													
82	132 kV Khandong - Khliehriat(PG) I	POWERGRID	**NEEPCO & POWERGRID**	**9/27/2016 14:17**	Khandong	DP, ZII, R-Y-B, 35.7 Kms.	Not Furnished	Yes	No	-	-	9/27/2016 23:43	No SPS	-	conductor snapping
					Khliehriat(PG)	DP, ZI, Y-E, 12.9 Kms.	Successful operation	No	No						
	Root Cause	Iy lags Vy by 46 deg. AT Loc 39 Y ph insulator Decapped and conductor grounded due to lightening. Tripping on account of lightning strike													
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**9/27/2016 14:17**	Khliehriat (PG)	No tripping	Not applicable	NA	NA	-	-	9/27/2016 14:42	No SPS	-	
					Khliehriat(ME)	Earth Fault	Not applicable	No	No						
	Root Cause	Iy lags Vy by 46 deg. Y-phase insulator decapped at loc. 39. Tripping on account of lightning													
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
83	132 kV Khliehriat (PG) - Khliehriat (ME) I	POWERGRID	**POWERGRID & MePTCL**	**9/28/2016 11:07**	Khliehriat (PG)	DP, ZI, Y-E, 16.88 Kms.	Not operated	No	No	-	-	9/28/2016 11:31	No SPS	-	
					Khliehriat(ME)	No tripping	Not operated	NA	NA						
84	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**		Khliehriat (PG)	DP, ZI, Y-E, 2.279 Kms.	Not Furnished	No	No			9/28/2016 11:37	No SPS		
					Khliehriat(ME)	No tripping	Not Furnished	NA	NA						
	Root Cause	For Khl-Khl I: Internal fault of Mehgalya, Iy lags Vy by 62 deg. Meghalaya to intimate the root cause. Likely tripping on account of lightning													
	Remedial Measures	MePTCL to install numerical relays on all outgoing feeders from Khliehriat(MePTCL) substation and further co-ordinate with NERTS for protection relay settings.													
85	132 kV Badarpur - Panchgram	POWERGRID	**POWERGRID & AEGCL**	**9/28/2016 23:52**	Badarpur	DP, ZIII, R-E, 25.6 Kms.	Not applicable	Yes	No	-	-	9/29/2016 0:19	No SPS	-	
					Panchgram	Earth Fault	Not applicable	No	No						
	Root Cause	Fault within AEGCL system that was not cleared on time													
	Remedial Measures	AEGCL to co-ordinate relay settings with that of NERTS to ensure unwanted tripping does not occur													
86	132 kV Silchar - Panchgram	POWERGRID & AEGCL	**POWERGRID & AEGCL**	**9/28/2016 23:48**	Silchar	Earth Fault	Not applicable	Yes	No	-	-	9/29/2016 0:17	No SPS	-	relay indi from DR
					Panchgram	No tripping	Not applicable	No	No						
	Root Cause	Likely fault in downstream of AEGCL system. AEGCL to confirm.													
	Remedial Measures	AEGCL to co-ordinate relay settings with that of NERTS to ensure unwanted tripping does not occur													
87	400 kV Bongaigaon - New Siliguri III	ENICL	**POWERGRID**	**9/28/2016 17:27**	Bongaigaon	DP, ZI, B-Y-E, 54.4 Kms.	Not Furnished	Yes	No	-	-	9/29/2016 15:25	No SPS	-	tripped on SOTF at 17:56 Hrs on 28.09.16
					New Siliguri	DP, ZI, Y-B-E	Not Furnished	No	No						
	Root Cause	NERTS to confirm the details after collecting relevant information.													
	Remedial Measures														
88	220 kV Mariani(PG)-Mokokchung (PG) I	POWERGRID	**POWERGRID**	**9/28/2016 3:50**	Mariani(PG)	DP, ZI, Y-E,	Not operated	No	No	-	-	9/28/2016 4:16	No SPS	-	
					Mokokchung(PG)	Over Voltage	Not operated	No	No						
	Root Cause	Tripped due to over voltage. From DR, Maximum voltage of 141 kV (L-G) viz. 244 kV L-L was observed. Maximum band of O/V permitted by IEGC is 245 kV for 220 kV level. This relay should not have operated to cause tripping even before the IEGC band was breached.													
	Remedial Measures	NERTS to rectify relay settings so that unwanted tripping does not occur													

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89	132 kV Dimapur - Imphal	POWERGRID	**POWERGRID**	**9/28/2016 10:36**	Dimapur	DP, ZII, R-E, 91.85 Kms.	Successful operation	Yes	No	-	-	9/28/2016 10:57	No SPS	-	
					Imphal	DP, ZI, R-E, 59.43 Kms.	Successful operation	Yes	No						
	Root Cause	Ir lags Vr by 31 deg. Fault due to vegetation infringment. AR attempted at both end.													
	Remedial Measures	Vegetation clearance in line sections in forested areas / bamboo grass areas to be done on regular basis by NERTS													
90	132 kV Jiribam - Aizwal	POWERGRID	**POWERGRID**	**9/28/2016 23:36**	Jiribam	DP, ZI, R-Y-E, 54 Kms.	Not Furnished	Yes	No	-	-	9/29/2016 0:04	No SPS	-	
					Aizawl	DP, ZI, R-Y-B, 33.94 Kms.	Successful operation	Yes	No						
	Root Cause	Patrolling report indicates broken insulator. Cause of tripping is not on account of any natural calamity or reasons beyond control of Transmission Licensee. Also, it is not clear how broken insulator disk was repaired in 30 minutes and line restored. NERTS to clarify the cause of this tripping													
	Remedial Measures	Proper maintenance activites are to be done by NERTS using trained manpower in forested areas													
91	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**9/28/2016 23:53**	Khliehriat (PG)	No tripping	Not applicable	NA	NA	-	-	9/29/2016 0:03	No SPS	-	
					Khliehriat(ME)	Earth Fault	Not applicable	No	No						
	Root Cause	Ir lags Vr by 20 deg. Vegetation fault, Disc insulator found broken in R-ph Loc 185.													
	Remedial Measures	Vegetation clearance in line sections in forested areas / bamboo grass areas to be done on regular basis by MePTCL.													
92	220 kV Azara - Sarusajai I	AEGCL	**AEGCL**	**9/29/2016 8:45**	Azara	Not Furnished	Not Furnished	No	No	-	-	9/29/2016 12:59	No SPS	-	
					Sarusajai	General Trip	Not Furnished	No	No						
	Root Cause	Fault on line section as confirmed by AEGCL. Transient fault. Not much vegetation exists in line section. Exact reason of fault could not be determined due to absence of complete information													
	Remedial Measures	AEGCL to maintain healthiness of line, and do patrolling after trippings to get reason for fault. Transient faults are usually due to vegetation infringment or lightning strikes. AEGCL to check the line section is clear of vegetation, and in case indication about line tripping on account of lightning strike is obtained, corrective measures are to be taken													
93	132 kV Silchar-P K Bari II	POWERGRID	**POWERGRID & TSECL**	**9/29/2016 1:33**	Silchar	DP, ZI, B-E, 84 Kms.	Not Furnished	Yes	No	-	-	9/29/2016 1:54	No SPS	-	
					PK Bari	Not Furnished	Not Furnished	No	No						
	Root Cause	NERTS / TSECL to provide further details. Root cause in Not clear													
	Remedial Measures														
94	132 kV Silchar - Panchgram	POWERGRID & AEGCL	**POWERGRID & AEGCL**	**9/29/2016 17:30**	Silchar	DP, ZIII, Y-E, 53.67 Kms.	Not applicable	No	No	-	-	9/29/2016 18:22	No SPS	-	
					Panchgram	Not Furnished	Not applicable	No	No						
	Root Cause	Likely fault in downstream of AEGCL system. AEGCL to confirm.													
	Remedial Measures	AEGCL to co-ordinate relay settings with that of NERTS to ensure unwanted tripping does not occur													

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
95	132 kV Haflong(PG) - Jiribam	POWERGRID	**POWERGRID**	**9/30/2016 12:32**	Haflong(PG)	DP, ZII, Y-E, 87.63 Kms.	Not Furnished	Yes	No	-	-	9/30/2016 12:47	No SPS	-	
					Jiribam	DP, ZI, Y-E, 12.57 Kms.	Not Furnished	No	No						
	Root Cause	Iy lags Vy by 9 deg High resistive fault, Bamboo cut by miscrients at Loc 275-276 fell on Y-ph.													
	Remedial Measures	Vegetation clearance in line sections in forested areas / bamboo grass areas to be done on regular basis by NERTS													
96	132 kV Aizwal - Kolasib	POWERGRID	**POWERGRID & P&ED, Mizoram**	**9/30/2016 12:51**	Aizawl	DP, ZI, R-E, 19.39 Kms.	Not Furnished	No	No	-	-	9/30/2016 13:11	No SPS	-	
					Kolasib	DP, ZI, R-E, 28.6 Kms.	Not Furnished	No	No						
	Root Cause	T&P Slipped and fell on conductor													
	Remedial Measures	Rectified by NERTS													
97	132 kV Khandong - Khliehriat(PG) I	POWERGRID	**NEEPCO & POWERGRID**	**9/30/2016 13:54**	Khandong	DP, ZI, R-Y-B, 25.9 Kms.	Not Furnished	No	No	-	-	9/30/2016 14:05	No SPS	-	
					Khliehriat(PG)	DP, ZI, R-Y-B, 17.7 Kms.	Successful operation	Yes	No						
	Root Cause	Ib lags Vb by 62 deg, Ib = 4.24 KA. Likely fault on account of Lightning strike													
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
98	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**9/30/2016 15:25**	Khliehriat (PG)	DP, ZI, R-Y-B, 88.08 Kms.	Not Furnished	No	No	-	-	9/30/2016 15:46	No SPS	-	
					Khliehriat(ME)	No tripping	Not Furnished	No	No						
	Root Cause	Fault within Meghalaya system that was cleared by remote end relays at Khliehriat(PG) substation, due to absence of relays at Khliehriat(MePTCL) end													
	Remedial Measures	MePTCL to install numerical relays on all outgoing feeders from Khliehriat at the earliest and co-ordinate with NERTS.													
99	132 kV AGTPP - Kumarghat	POWERGRID	**NEEPCO & POWERGRID**	**9/30/2016 23:59**	AGTPP	DP, ZI, R-B-E, 7.356 Kms.	Not Furnished	No	No	-	-	10/1/2016 0:21	SPS-6 operated	-	
					Kumarghat	DP, ZII, R-B-E, 100.6 Kms.	Not Furnished	Yes	No						
	Root Cause	As seen from DR, Ir lags Vr by 75 deg. Attached photographs show flashover marks on insulator. Tripped due to lightning strike													
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LA are to be installed													
100	+/- 800 kV Biswanath Charali-Agra I	POWERGRID	**POWERGRID**	**9/30/2016 11:01**	Biswanath Charali	Mal-operation of emulsifier system	Not applicable	No	No	-	-	9/30/2016 14:06	No SPS	-	
					Agra		Not applicable	No	No						
101	+/- 800 kV Biswanath Charali-Agra II	POWERGRID	**POWERGRID**	**9/30/2016 11:01**	Biswanath Charali	Mal-operation of emulsifier system	Not applicable	No	No	-	-	9/30/2016 14:06	No SPS	-	
					Agra		Not applicable	No	No						
	Root Cause	Mal-operation of emulsifier system													

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टोरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU	Remarks
	Remedial Measures	Rectified by POWERGRID													
102	220 kV Misa - Dimapur I	POWERGRID	**POWERGRID**	**10/1/2016 4:38**	Misa	Earth Fault	Not applicable	Yes	No	-	-	10/1/2016 5:25	No SPS	-	from DR of main 2 relay
					Dimapur	DP, ZI, R-E, 43.32 Kms.	Not applicable	No	No						
	Root Cause	Details to be furnished by NERTS in respect of this tripping													
	Remedial Measures														
103	132 kV Aizwal - Kolasib	POWERGRID	**POWERGRID & P&ED, Mizoram**	**10/2/2016 9:38**	Aizawl	DP, ZI, B-E, 17.8 Kms.	Not Furnished	No	No	-	-	10/2/2016 10:28	No SPS	-	
					Kolasib	DP, ZI, B-E	Not Furnished	No	No						
	Root Cause	Details to be furnished by NERTS in respect of this tripping													
	Remedial Measures														
103.0															

Root cause not concluded

Draft Root cause & Remedial measures

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
1	400 kV Bongaigaon - New Siliguri II	POWERGRID	**POWERGRID**	**10/3/2016 11:46**	Bongaigaon	DP, ZI, B-E, 83.55 Kms	Not Furnished	Yes	No	-	-	10/3/2016 12:19	No SPS	-
					New Siliguri	Not Furnished	Not Furnished	No	No					
	Root Cause	DR indicates B-E fault likely due to vegetation with fault current 2.7 kA & angle between Vb&Ib around 38 degrees at Bongaigaon end.												
	Remedial Measures	Patrolling report to be submitted & Vegetation clearance to be done by POWERGRID.												
2	400 kV Bongaigaon - New Siliguri III	ENICL	**POWERGRID**	**10/4/2016 11:24**	Bongaigaon	DP, ZI, R-Y Ph, 66.38 Kms	Not applicable	Yes	No	-	-	10/5/2016 15:25	No SPS	-
					New Siliguri	Not Furnished	Not applicable	No	No					
	Root Cause	DR indicates R-Y fault without involving ground.Fault current up to 4 kA.												
	Remedial Measures	Patrolling report to be submitted by POWERGRID.												
3	400 kV Bongaigaon - New Siliguri IV	ENICL	**POWERGRID**	**10/4/2016 17:36**	Bongaigaon	DP, ZI, R-E, 68 Kms	Not Furnished	Yes	No	-	-	10/6/2016 18:08	No SPS	-
					New Siliguri	DP, ZI, R-E, 112.2 Kms	Not Furnished	No	No					
	Root Cause	DR indicates R-E fault with fault current around 3kA.AR attempted but fault persisted & converted to R-Y-E. Likely due vegetation fault.												
	Remedial Measures	Patrolling report to be submitted by POWERGRID.												
4	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**10/4/2016 12:36**	Khliehriat (PG)	DP, ZI, R-Y-B, 77.49 Kms	Not applicable	No	No	-	-	10/4/2016 12:50	No SPS	-
					Khliehriat(ME)	No tripping	Not applicable	No	No					
5	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**10/4/2016 13:29**	Khliehriat (PG)	DP, ZI, R-B Ph, 86.5 Kms	Not applicable	No	No	-	-	10/4/2016 13:41	No SPS	-
					Khliehriat(ME)	Not Furnished	Not applicable	No	No					

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
6	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**10/4/2016 13:54**	Khliehriat (PG)	DP, ZI, R-Y-B, 11.03 Kms	Not applicable	No	No	-	-	10/4/2016 14:47	No SPS	-
					Khliehriat(ME)	No tripping	Not applicable	No	No					
	Root Cause	Due to fault in the Meghalaya system.												
	Remedial Measures	MePTCL is to install Numerical relays at their end to avoid tripping of ISTS lines.MePTCL to furnish Substation earthing status to NERLDC & NERPC.												
7	132 kV Rangia - Motonga	BPC	**AEGCL & BPC**	**10/3/2016 9:43**	Rangia	Not Furnished	Not applicable	No	No	-	-	10/3/2016 10:55	No SPS	
					Motonga	Earth Fault	Not applicable	No	No					
8	132 kV Rangia - Motonga	BPC	**AEGCL & BPC**	**10/3/2016 18:33**	Rangia	Over current	Not applicable	No	No	-	-	10/3/2016 19:00	No SPS	
					Motonga	Not Furnished	Not applicable	No	No					
9	132 kV Rangia - Motonga	BPC	**AEGCL & BPC**	**10/4/2016 9:45**	Rangia	No tripping	Not applicable	No	No	-	-	10/4/2016 11:00	No SPS	
					Motonga	DP, ZIII, B-E	Not applicable	No	No					
10	132 kV Rangia - Motonga	BPC	**AEGCL & BPC**	**10/4/2016 13:34**	Rangia	Not Furnished	Not applicable	No	No	-	-	10/4/2016 15:58	No SPS	
					Motonga	Not Furnished	Not applicable	No	No					
	Root Cause	-												
	Remedial Measures	-												
11	132 kV Khliehriat (PG) - Khliehriat (ME) I	POWERGRID	**POWERGRID & MePTCL**	**10/4/2016 12:36**	Khliehriat (PG)	DP, ZI, R-Y-B, 66.38 Kms.	Not applicable	Yes	No	-	-	10/4/2016 12:50	No SPS	-
					Khliehriat(ME)	No tripping	Not applicable	No	No					

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
	Root Cause	Due to fault in the Meghalaya system.												
	Remedial Measures	MePTCL is to install Numerical relays at their end to avoid tripping of ISTS lines.MePTCL to furnish Substation earthing status to NERLDC & NERPC.												
12	132 kV Jiribam - Aizwal	POWERGRID	**POWERGRID**	**10/4/2016 14:31**	Jiribam	DP, ZII, R-E, 139.6 Kms	Not Furnished	Yes	No	-	-	10/4/2016 14:45	No SPS	-
					Aizawl	DP, ZI, R-Y Ph, 25.7 Kms	Not Furnished	Yes	No					
	Root Cause	DR indicates R-Y-E fault with 1.3 kA fault current in both faulty phases at Aizwal end around .8 kA at Jiribam end, fault occurred just after Vb peak, likely fault **due to lightning**												
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LAs are to be installed												
13	400 kV Balipara-Biswanath Charali 1V	POWERGRID	**POWERGRID**	**10/5/2016 13:51**	Balipara	DP, ZI, B-E, 37.4 Kms	Not Furnished	Yes	No	-	-	10/5/2016 14:09	No SPS	-
					Biswanath Charali	DP, ZII, B-E, 51.02 Kms	Successful operation	No	No					
	Root Cause	DR indicates B-E fault likely due to vegetation with fault current 3 kA & angle between Vb&Ib around 20 degrees at Balipara end. As informed by POWERGRID, tree from outside corridor fell on to the line caused the tripping.												
	Remedial Measures	Vegetation clearance to be done by POWERGRID and status to be reported to NERPC & NERLDC.												
14	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**10/5/2016 14:02**	Khliehriat (PG)	DP, ZI, B-E, 85.18 Kms	Not applicable	No	No	-	-	10/5/2016 14:18	No SPS	-
					Khliehriat(ME)	No tripping	Not applicable	No	No					
	Root Cause	Due to fault in the Meghalaya system.												
	Remedial Measures	MePTCL is to install Numerical relays at their end to avoid tripping of ISTS lines.MePTCL to furnish Substation earthing status to NERLDC & NERPC.At one of the sub-committee meetings, NERTS had conveyed that the Zone-1 setting was 70 kms. In this case the recorded value is 85 kms. NERTS may clarify												

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
15	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**10/6/2016 13:12**	Khliehriat (PG)	DP, ZI, R-Y-B, 114.7 Kms.	Not applicable	No	No	-	-	10/6/2016 13:20	No SPS	-
					Khliehriat(ME)	No tripping	Not applicable	No	No					
	Root Cause	Due to fault in the Meghalaya system.												
	Remedial Measures	MePTCL is to install Numerical relays at their end to avoid tripping of ISTS lines.MePTCL to furnish Substation earthing status to NERLDC & NERPC.At one of the sub-committee meetings, NERTS had conveyed that the Zone-1 setting was 70 kms. In this case the recorded value is 115 kms. NERTS may clarify												
16	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**10/6/2016 12:31**	Khliehriat (PG)	DP, ZI, R-B-E, 123.4 Kms	Not applicable	No	No	-	-	10/6/2016 12:36	No SPS	-
					Khliehriat(ME)	No tripping	Not applicable	No	No					
	Root Cause	Due to fault in the Meghalaya system.												
	Remedial Measures	MePTCL is to install Numerical relays at their end to avoid tripping of ISTS lines.MePTCL to furnish Substation earthing status to NERLDC & NERPC.At one of the sub-committee meetings, NERTS had conveyed that the Zone-1 setting was 70 kms. In this case the recorded value is 123 kms. NERTS may clarify												
17	132 kV Khliehriat (PG) - Khliehriat (ME) I	POWERGRID	**POWERGRID & MePTCL**	**10/6/2016 12:52**	Khliehriat (PG)	DP, ZI, R-Y-B, 70.01 Kms.	Not applicable	No	No	-	-	10/6/2016 13:01	No SPS	-
					Khliehriat(ME)	No tripping	Not applicable	No	No					
18	132 kV Khliehriat (PG) - Khliehriat (ME) II	MePTCL	**POWERGRID & MePTCL**	**10/6/2016 12:45**	Khliehriat (PG)	DP, ZI, R-Y-B, 111.6 Kms.	Not applicable	No	No	-	-	10/6/2016 12:57	No SPS	-
					Khliehriat(ME)	No tripping	Not applicable	No	No					
	Root Cause	Due to fault in the Meghalaya system.												
	Remedial Measures	MePTCL is to install Numerical relays at their end to avoid tripping of ISTS lines.MePTCL to furnish Substation earthing status to NERLDC & NERPC.At one of the sub-committee meetings, NERTS had conveyed that the Zone-1 setting was 70 kms. In this case the recorded value is 112 kms. NERTS may clarify												
19	220 kV Mariani(PG)-Mokokchung (PG) I	POWERGRID	**POWERGRID**	**10/6/2016 12:29**	Mariani(PG)	Over Voltage	Not applicable	No	No	-	-	10/6/2016 19:16	No SPS	-
					Mokokchung(PG)	Direct Trip received	Not applicable	No	No					

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
	Root Cause	Over Voltage relay mal-operated.												
	Remedial Measures	Settings of Over Voltage relay to be changed as the IEGC band allows max. steady state Vrms up to 245 kV.												
20	400 kV Balipara-Biswanath Charali II	POWERGRID	**POWERGRID**	**10/6/2016 16:08**	Balipara	Over Voltage	Not applicable	No	No	-	-	10/6/2016 17:45	No SPS	-
					Biswanath Charali	Direct Trip received	Not applicable	No	No					
	Root Cause	From DR,Vr touched around 590 kV for around 60 msec,but in Balipara PMU,this voltage spike not reflected.May be considered as real case of Over Voltage.												
	Remedial Measures	POWERGRID to furnish SOE from BNC for checking suspected filter operations.												
21	132 kV Salakati-Gelephu	POWERGRID	**POWERGRID & BPC**	**10/8/2016 1:25**	Salakati	DP, ZI, B-E, 10.8 Kms	Not Furnished	No	No	Loss of Load: 30	-	10/8/2016 1:32	No SPS	0.0004
					Gelephu	Not Furnished	Not Furnished	No	No					
	Root Cause	Fault in the line as Zone I initiated at Salakati end.												
	Remedial Measures	POWERGRID to furnish DR output of Salakati end of this line to conclude root cause & remedial measures.												

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
22	400 kV Palatana - Silchar II	NETC	**OTPC & POWERGRID**	**10/8/2016 10:28**	Palatana	DP, ZI, B-E, 176 Kms	Not Furnished	No	No	-	-	10/8/2016 11:39	No SPS	-
					Silchar	DP, ZI, B-E, 55.79 Kms	Successful operation	No	No					
	Root Cause	Fault in the line.Root cause could not be concluded due to unavailabilty of DR outputs from Both ends.												
	Remedial Measures	OTPC&POWERGRID to submit DR outputs of their end to conclude root cause.												
23	220 kV BTPS - Salakati I	POWERGRID	**AEGCL & POWERGRID**	**10/8/2016 19:57**	BTPS	Not Furnished	Not Furnished	No	No	-	-	10/8/2016 20:05	No SPS	-
					Salakati	Not Furnished	Not Furnished	No	No					
	Root Cause	Root cause could not be concluded due to unavailabilty of DR outputs&Relay indications from Both ends.												
	Remedial Measures	AEGCL&POWERGRID to submit DR outputs&Relay indications of their end to conclude root cause.												
24	220 kV Birpara - Salakati I	POWERGRID	**POWERGRID**	**10/9/2016 7:36**	Birpara	DP, ZI, R-Y Ph, 32.1 Kms	Not Furnished	No	No	-	-	10/9/2016 8:36	No SPS	-
					Salakati	DP, ZI, R-Y Ph, 120.8 Kms	Not Furnished	No	No					
	Root Cause	Fault in the line.												
	Remedial Measures	DR output of Salakati end of this line to be submitted by POWERGRID												
25	132 kV Haflong(PG) - Jiribam	POWERGRID	**POWERGRID**	**10/9/2016 1:53**	Haflong(PG)	DP, ZI, R-B-E, 78.8 Kms	Not Furnished	Yes	No	-	-	10/9/2016 2:18	No SPS	-
					Jiribam	DP, ZI, R-B-E, 27.96 Kms	Not Furnished	No	No					
	Root Cause	DR indicates R-B-E fault with fault current upto 1 kA in faulty phases at Haflong end, fault started in B-phase when Vb approched peak and later turned to be R-B-E fault when Vr just crossed peak.Likely due to lightning.NERTS may resubmit DR from Jiribam end as DR output provided doesn't belong to this particular event.												
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LAs are to be installed												

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
26	132 kV Jiribam - Pailapool	AEGCL	**POWERGRID & AEGCL**	**10/9/2016 2:41**	Jiribam	DP, ZI, R-B -E	Not Furnished	No	No	-	-	10/9/2016 6:23	No SPS	-
					Pailapool	Not Furnished	Not Furnished	No	No					
	Root Cause	Fault in the line.Root cause could not be concluded due to unavailabilty of DR outputs from Both ends.												
	Remedial Measures	AEGCL&POWERGRID to submit DR outputs of their end to conclude root cause.												

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
27	132 kV Badarpur - Jiribam	POWERGRID	**POWERGRID**	**10/9/2016 2:44**	Badarpur	Earth Fault	Not applicable	No	No	-	-	10/9/2016 3:06	No SPS	-
					Jiribam	DP, ZI, R-E	Not applicable	No	No					
	Root Cause	DR indicates R-E fault with fault current upto 1.7 kA at Jiribam end and around 1.6 kA at Badapur end.Also angle between Vr & Ir around 71 deg shows the **likelihood of lightning fault.** NERTS may check the relay indication as from DR outputs provided, Z-2 initiated at Jiribam end and fault cleared in 450 msec (Does not tally with Zone-1 as claimed) where at Badarpur,fault cleared in 80 msec (Is E/F relay instantaneous? DR has non-standard channels and digital values non-readable).												
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LAs are to be installed												
28	132 kV Haflong(PG) - Jiribam	POWERGRID	**POWERGRID**	**10/9/2016 2:51**	Haflong(PG)	DP, ZII, R-E, 83.11 Kms	Not Furnished	Yes	Yes	-	-	10/9/2016 3:10	No SPS	-
					Jiribam	DP, ZI, R-E, 12.75 Kms	Not Furnished	Yes	Yes					
	Root Cause	DR indicates R-E fault with fault current upto 1.8 kA at Jiribam end and around .8 kA at Haflong end.Also angle between Vr & Ir around 72 deg at Haflong and 52 deg at Jiribam indicates the likelihood of **lightning fault**.												
	Remedial Measures	Vulnerable areas to lightning to be identified, Checking of Tower footing resistances to be done, and if necessary, then Line LAs are to be installed												
29	+/- 800 kV Biswanath Charali-Agra I	POWERGRID	**POWERGRID**	**10/13/2016 1:54**	Biswanath Charali	Problem in valve cooling system at Biswanath Charali end	Not Furnished	No	No	-	-	10/13/2016 2:47	No SPS	-
					Agra		Not Furnished	No	No					
	+/- 800 kV Biswanath Charali-Agra II	POWERGRID	**POWERGRID**		Biswanath Charali		Not Furnished	No	No			10/13/2016 2:49	No SPS	
					Agra		Not Furnished	No	No					
	Root Cause	Due to problem in valve cooling system at Biswanath Charali end												
	Remedial Measures	Referred to NLDC.												
30	400 kV Silchar - Byrnihat	NETC & MePTCL	**POWERGRID & MePTCL**	**10/13/2016 15:00**	Silchar	DP, ZI, R-E, 72.5 kms	Not Furnished	Yes	No	-	-	10/13/2016 15:30	No SPS	-
					Byrnihat	DP, ZI, R-E, 231.8 kms	Not Furnished	No	No					

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
	Root Cause	R-E fault with fault current 2.6 kA with angle between Vr & Ir around 29 degrees indicate **vegetation fault. Reason for DT received at Silchar could not be concluded due to unavailabilty of DR from Byrnihat.Likely due to over voltage at Byrnihat.**												
	Remedial Measures	MePTCL to provide DR from Byrnihat and check the relay indication as fault location provided with the relay indication is beyond line length(203 Kms).Vegetation clearance to be done by POWERGRID and status to be reported.Patrolling report of the event to be submitted.												
31	132 kV Dimapur - Imphal	POWERGRID	**POWERGRID**	**10/14/2016 12:15**	Dimapur	No tripping	Not applicable	Yes	No	-	-	10/14/2016 12:30	No SPS	-
					Imphal	DP, ZI, R-E, 22.72 kms	Not applicable	Yes	No					
	Root Cause	DR indicates R-E fault with fault current gradually increases up to 1 kA at Imphal end & 0.615 kA at Dimapur end.Also angle between Vr & Ir around 30 deg at Dimapur end and 14 degree indicates high resistive fault likely due to touching of bamboos.AR operated at both ends.												
	Remedial Measures	Vegetation clearance to be done by POWERGRID and status to be reported.												
32	+/- 800 kV Biswanath Charali-Agra II	POWERGRID	**POWERGRID**	**10/15/2016 11:08**	Biswanath Charali	Problem in valve cooling system at Agra end	Not Furnished	No	No	-	-	10/15/2016 12:30	No SPS	-
					Agra		Not Furnished	No	No					
	Root Cause	Due to problem in valve cooling system at Agra end												
	Remedial Measures	Referred to NLDC.												
33	132 kV AGTPP - Kumarghat	POWERGRID	**NEEPCO & POWERGRID**	**10/15/2016 12:43**	AGTPP	DP, ZI, R-E, 149.5 kms	Not applicable	No	No	-	-	10/15/2016 13:00	SPS # 6 operated	-
					Kumarghat	DP, ZI, R-E, 11.2 kms	Not applicable	Yes	No					
	Root Cause	DR from Kumarghat indicates R-E fault with fault current gradually increases up to 1.4 kA.Also angle between Vr & Ir around 15 degrees indicates **high resistive fault likely due to vegetation infringment**.As intimated by POWERGRID, line tripped as a result of tree touching at Loc 320-321 due to miscreant activity.												
	Remedial Measures	NERTS may resubmit DR output of subsequent times to get AR details (A/R not capture in).												
34	400 kV Silchar - Byrnihat	NETC & MePTCL	**POWERGRID & MePTCL**	**10/17/2016 11:43**	Silchar	DP, ZI, R-E, 69.21 kms	Not Furnished	Yes	Yes	-	-	10/17/2016 12:08	No SPS	-
					Byrnihat	DP, ZI, R-E, 55.3 kms	Not Furnished	No	No					

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
	Root Cause	R-E fault with fault current up to 2.21 kA.Fault cleared after 350 msec.Zone I picked up later.POWERGRID may check the relay indication from Silchar end.Like the event on 14th Oct'16,after R-ph trip DT received at Sichar end likely due to Over Voltage at Byrnihat end.Angle between Vr&Ir around 25 degrees indicates **vegetation fault**.												
	Remedial Measures	MePTCL to provide DR from Byrnihat.Vegetation clearance to be done by POWERGRID and status to be reported.Patrolling report of the event to be submitted.												
35	132 kV Dimapur (PG) - Kohima	POWERGRID & DoP Nagaland	**POWERGRID & DoP,Nagaland**	**10/17/2016 13:11**	Dimapur (PG)	DP, ZI,B-ph	Not applicable	No	No	-	-	10/17/2016 13:19	No SPS	-
					Kohima	No tripping	Not applicable	No	No					
	Root Cause	Likely due to fault in the line as Zone I initiated at Dimapur end.Root cause could not be concluded due to unavailabilty of DR outputs from Dimapur End.												
	Remedial Measures	POWERGRID to submit DR outputs from Dimapur End.												
36	132 kV Jiribam - Aizwal	POWERGRID	**POWERGRID**	**10/18/2016 12:05**	Jiribam	DP, R-Y-E, ZI, 131 kms	Not applicable	Yes	Yes	-	-	10/18/2016 17:53	No SPS	-
					Aizawl	DP, Y-E, ZII	Not applicable	Yes	Yes					
	Root Cause	DR indicates Y-E fault which turned in to R-Y fault not involving ground.Fault current gradually increases up to 0.9 kA at Aizwal end and 0.6 kA at Jiribam.Also,angle between Vy & Iy around 23 degrees at Aizwal & 30 degrees at Jiribam confirms **touching of tree. As informed by POWERGRID,fault occured due to touching of tree as a result of miscrient activity at Loc No 373-374.**												
	Remedial Measures	-												
37	132 kV Aizwal - Kumarghat	POWERGRID	**POWERGRID**	**10/20/2016 12:10**	Aizawl	DP, ZI, R-E	Not applicable	Yes	Yes	-	-	10/20/2016 12:32	No SPS	-
					Kumarghat	DP, ZIII, R-E, 86.4 kms	Not applicable	Yes	Yes					
38	132 kV P K Bari - Kumarghat	TSECL	**TSECL & POWERGRID**	**10/20/2016 12:10**	PK Bari	Earth Fault	Not applicable	No	No	-	-	10/20/2016 15:10	No SPS	-
					Kumarghat	No tripping	Not applicable	No	No					
	Root Cause	R-E fault in 132 kV Aizwal - Kumarghat line with fault current gradually increasing 0.564 kA at Kumarghat & 0.419 kA at Aizwal.Angle between Vr&Ir around 19 degrees indicates High resistive fault due to vegetation infringment.Delayed tripping at Kumarghat led to tripping of 132 kV P K Bari - Kumarghat line.												
	Remedial Measures	Patrolling report of the event to be submitted.Vegetation clearance to be done by POWERGRID and status to be reported. Resistive reach setting of DPR to be according to Ramakrishna Task force recommendations.												
39	132 kV Ranganadi	POWERGRID	**NEEPCO &**	**10/21/2016 2:02**	Ranganadi	DP, ZI, R-Y-B, 2.19 kms	Not applicable	No	No	-	-	10/21/2016 2:36	No SPS	-

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
33	- Lekhi	& DoP AP	**DoP AP**	10/21/2018 2:02	Lekhi	Not Furnished	Not applicable	No	No	-	-	10/21/2018 2:30	No SPS	-
	Root Cause	DR indicates Y-B fault not involving ground with fault current up to 5.5 kA.And after AR the same fault persisted.As intimated by POWERGRID, tree fell on to line.												
	Remedial Measures	Vegetation clearance to be done by POWERGRID and status to be reported.												

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
40	132 kV Khliehriat (PG)- Badarpur	POWERGRID	**POWERGRID**	**10/21/2016 12:21**	Khliehriat(PG)	DP, ZI, B-E	Not applicable	No	No	-	-	10/21/2016 12:38	No SPS	-
					Badarpur	DP, ZII, B-E	Not applicable	No	No					
	Root Cause	DR from Both end not received.As intimated by POWERGRID, DR indiactes B-E fault with fault current of 1.005 kA at Badarpur end & 0.795 kA at Khl end.Angle between Vb&Ib around 28 degrees indicate vegetation fault.Flash over occurred at Loc 94 as intimated by POWERGRID.												
	Remedial Measures	Vegetation clearance to be done by POWERGRID and status to be reported.DR from both ends to be submitted.												
41	220 kV Misa - Mariani(AS)	POWERGRID	**POWERGRID & AEGCL**	**10/23/2016 12:15**	Misa	DP, ZI, B-E, 124.3 kms	Not Furnished	Yes	No	-	-	10/23/2016 12:58	No SPS	-
					Mariani (AS)	DP, ZI, R-Y-B, 36.6 kms	Not Furnished	No	No					
	Root Cause	DR indicates B-E fault with gradually increasing fault current up to 1.2 kA at both ends.Angle between Vb & Ib around 25 degrees at Mariani end indicates chances of high resistive vegetation fault.												
	Remedial Measures	NERTS may resubmit the DR outputs from both ends since the information recorded is not complete(DR from Mariani: recorded likely after AR,DR from Misa:No info. about AR). Patrolling report of the event to be submitted.												
42	+/- 800 kV Biswanath Charali-Agra II	POWERGRID	**POWERGRID**	**10/24/2016 9:58**	Biswanath Charali	Tripped due to problem in OLTC mechanism of Y-ph star converter	Not Furnished	No	No	-	-	10/24/2016 13:40	No SPS	-
					Agra		Not Furnished	No	No					
	Root Cause	-												
	Remedial Measures	-												
43	+/- 800 kV Biswanath Charali-Agra II	POWERGRID	**POWERGRID**	**10/24/2016 13:41**	Biswanath Charali	**Tripped due to Ground Overcurrent**	Not Furnished	No	No	-	-	10/24/2016 14:02	No SPS	-
					Agra		Not Furnished	No	No					
	Root Cause	-												

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
	Remedial Measures	-												
44	220 kV Mokokchung-Mokokchung I	POWERGRID	**POWERGRID & DOP, Nagaland**	**10/25/2016 2:59**	Mokokchung(PG)	Not Furnished	Not Furnished	No	No	-	-	10/25/2016 6:57	No SPS	-
					Mokokchung(NA)	Over Voltage	Not Furnished	No	No					
	Root Cause	In submitted DR,analog inputs are missing so the cause of tripping is inconclusive. Also, it has been noticed that 220kV Mariani - Mokokchung lines trip on overvoltage before the IEGC band limit of 245 kV is reached, which is a maloperation. NERTS has not responded inspite of several reminders												
	Remedial Measures	NERTS may resubmit DR and clarify overvoltage tripping.												
45	220 kV Kopili - Misa II	POWERGRID	**NEEPCO & POWERGRID**	**10/25/2016 11:14**	Kopili	DP, ZI, B-E, 56.04 kms	Not Furnished	No	No	-	-	10/25/2016 11:31	No SPS	-
					Misa	DP, ZI, B-E	Not Furnished	No	No					
	Root Cause	Patrolling report indicates touching of Banana leaves caused tripping. Not conclusive. In faulty phase (B-phase), angle between V & I is around 54 degree and fault current suddenly increasing to a very high value (~1.2 kA) and max. up to 5.3 kA. This is not characteristic of fault due to vegetation.DR indicates AR sucessful from Misa end.												
	Remedial Measures	NEEPCO to submit DR of Kopili end of this line.Vegetation clearance to be done by POWERGRID and status to be reported.												
46	220 kV Mariani(PG)-Mokokchung (PG) I	**POWERGRID**	**POWERGRID**	**10/26/2016 0:03**	Mariani(PG)	Over Voltage	Not Furnished	No	No	-	-	10/26/2016 7:00	No SPS	-
					Mokokchung(PG)	Not Furnished	Not Furnished	No	No					
47	220 kV Mariani(PG)-Mokokchung (PG) I	POWERGRID	**POWERGRID**	**10/27/2016 23:19**	Mariani(PG)	Direct Trip received	Not Furnished	No	No	-	-	10/28/2016 13:25	No SPS	-
					Mokokchung(PG)	Over Voltage	Not Furnished	No	No					
48	220 kV Mariani(PG)-Mokokchung (PG) I	POWERGRID	**POWERGRID**	**10/28/2016 23:11**	Mariani(PG)	No tripping	Not Furnished	No	No	-	-	10/29/2016 6:43	No SPS	-
					Mokokchung(PG)	Over Voltage	Not Furnished	Yes	No					
49	220 kV Mariani(PG)-	POWERGRID	**POWERGRID**	**10/30/2016 0:42**	Mariani(PG)	Over Voltage	Not Furnished	No	No			10/30/2016 11:51	No SPS	

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
49	Mokokchung (PG) I	POWERGRID	**POWERGRID**	**10/30/2016 0:42**	Mokokchung(PG	Direct Trip received	Not Furnished	Yes	No	-	-	10/30/2016 11:51	No SPS	-
50	220 kV Mariani(PG)-Mokokchung (PG) I	POWERGRID	**POWERGRID**	**10/30/2016 23:38**	Mariani(PG)	Direct Trip received	Not Furnished	No	No	-	-	Not yet restored	No SPS	-
					Mokokchung(PG	Over Voltage	Not Furnished	Yes	No					
	Root Cause	Over Voltage relay mal-operated.												
	Remedial Measures	Settings of Over Voltage relay to be changed as the IEGC band allows max. steady state Vrms up to 245 kV.												
51	132 kV Salakati-Gelephu	POWERGRID	**POWERGRID & BPC**	**10/26/2016 22:14**	Salakati	DP, ZI, B-E, 15.79 kms	Not Furnished	No	No	-	-	10/26/2016 22:47	No SPS	
					Gelephu	Not Furnished	Not Furnished	No	No					
	Root Cause	Fault in the line as Zone I initiated at Salakati end.												
	Remedial Measures	POWERGRID to furnish DR output of Salakati end of this line to conclude root cause & remedial measures.												
52	+/- 800 kV Biswanath Charali-Agra II	POWERGRID	**POWERGRID**	**10/26/2016 21:36**	Biswanath Charali	**AC filter bus protn at BNC**	Not Furnished	No	No	-	-	10/26/2016 22:42	No SPS	-
					Agra		Not Furnished	No	No					
	Root Cause	-												
	Remedial Measures	-												
53	400 kV Balipara-Biswanath Charali 1V	POWERGRID	**POWERGRID**	**10/27/2016 12:49**	Balipara	A/R, B-E	Not Furnished	Yes	No	-	-	Not yet restored	No SPS	-
					Biswanath Charali	DP, B-E, ZI, 17.82 kms	Not Furnished	No	No					
	Root Cause	DR indicates B-E fault with fault current gradually increasing up to 4 kA at Balipara & 3.4 kA at BNC end.Angle between Vb & Ib around 12 degree at initial stage of fault indicates chances of **high resistive vegetation fault.**Likely same case that of tripping of this line on 5th Oct'16.AR at BNC end sucessful.As intimated by POWERGRID,trees from outside corridor likely to have caused the tripping and could not be cleared due to ROW problem.												

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
	Remedial Measures	NERTS may furnish reason for AR failure at Balipara as this is not concluded from DR.Vegetation clearance to be done by POWERGRID and status to be reported.												
54	400 kV Bongaigaon - New Siliguri III	ENICL	**POWERGRID**	**10/27/2016 11:53**	Bongaigaon	Earth Fault	Not Furnished	Yes	Yes	-	-	10/27/2016 12:07	No SPS	-
					New Siliguri	DP, B-E, ZI, 17.82 kms	Not Furnished	No	No					
	Root Cause	DR indicates R-E fault with fault current of 2.4 kA.Angle between Vr & Ir around 25 degrees indicates fault due to vegetation fault.												
	Remedial Measures	POWERGRID may intimate reason for non operation of DPR & check already furnished relay indications.												
55	132 kV Aizwal - Zuangtui	POWERGRID	**POWERGRID & P&ED, Mizoram**	**10/27/2016 18:40**	Aizawl	DP, ZIII, R-Y Phase, Earth Fault	Not Furnished	No	No	-	-	10/27/2016 19:36	No SPS	-
					Zuangtui	Earth Fault	Not Furnished	No	No					
	Root Cause	Likely due to downstream fault.												
	Remedial Measures	POWERGRID to provide DR of Aizwal end for this event. DoP Mizoram to inform status of implementation of settings provided by POWERGRID.Matter discussed in previous PCCMs.												
56	+/- 800 kV Biswanath Charali-Agra I	POWERGRID	**POWERGRID**	**10/29/2016 5:34**	Biswanath Charali	Emergency stop from Agra end	Not Furnished	No	No	-	-	10/29/2016 9:37	No SPS	-
					Agra	Emergency stop due to PLC Filter Capacitor Bank problem	Not Furnished	No	No					
	Root Cause	-												
	Remedial Measures	-												
57	132 kV Dimapur	POWERGRID	**POWERGRID**		Dimapur (PG)	DP, ZI, B-E	Not Furnished	No	No					

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
57	(PG) - Kohima	& DoP Nagaland	**& DoP,Nagaland**	**10/29/2016 13:15**	Kohima	Not Furnished	Not Furnished	No	No	-	-	10/29/2016 13:30	No SPS	-
	Root Cause	Likely due to fault in the line as Zone I initiated at Dimapur end.Root cause could not be concluded due to unavailabilty of DR outputs from Dimapur End.												
	Remedial Measures	POWERGRID to submit DR outputs from Dimapur End.												
58	132 kV Jiribam - Aizwal	POWERGRID	**POWERGRID**	**10/30/2016 16:24**	Jiribam	DP, ZI, B-E , 51.95 kms	Not Furnished	Yes	Yes	-	-	10/30/2016 16:45	No SPS	-
					Aizawl	DP, ZI, B-E	Not Furnished	Yes	Yes					
	Root Cause	From DR,Fault cleared in 1sec (Z-III timing) at Jiribam end.DR indicates B-E fault with fault current gradually increasing up to 0.92 kA at Aizwal end & 0.36 kA at Jiribam end.Angle between Vb&Ib around 31 degrees indicates fault likely due to vegetation.												
	Remedial Measures	POWERGRID to check relay indication of Jiribam end.Resistive reach setting of DPR to be according to Ramakrishna Task force recommendations.												

क्रम सं. / Sl. No.	ट्रिपिंग तत्वका नाम / Name of tripping element	मालिक / Owner	डाटा प्रदान करना है / Data to be furnished by	सी.आर. ऑपरेटर के द्वारा प्रदान की गई घटना के तारिख और समय / Date & Time of Event provided by CR operator	नोड का नाम / Name of Node	सी.आर. ऑपरेटर के द्वारा प्रदान की गई रिले संकेत / Relay indications provided by CR operator	ऑटो रीक्लोजर का ऑपरेशन / Operation of Auto Reclose	24 घंटे के भीतर डी.आर. पेश किया (हां / नहीं) / DR output furnished within 24 hours (Y/N)	24 घंटे के भीतर ई.एल. पेश किया (हां / नहीं) / EL output furnished within 24 hours (Y/N)	लोड और जनरेशन की हानि (मेगावाट में) / Effect (Loss of Load & Generation in MW)	सी.ई.ए ग्रिड मापदंड के अनुसार कौन सा श्रेणी/ Category as per CEA Grid Standards	सी.आर ऑपरेटर के द्वारा प्रदान की गई दिनांक और रेस्टॉरेशन की समय / Date and time of restoration provided by CR operator	एस.पी.एस संचालन के विवरण / Details of SPS Operation	एमयू में कमी/ Loss in MU
59	220 kV Mariani(PG)-Mokokchung (PG) I	POWERGRID	**POWERGRID**	**10/31/2016 22:34**	Mariani(PG)	Direct Trip received	Not Furnished	No	No	-	-	11/1/2016 9:36	No SPS	-
					Mokokchung(PG)	Over Voltage	Not Furnished	Yes	No					
	Root Cause	Over Voltage relay mal-operated.												
	Remedial Measures	Settings of Over Voltage relay to be changed as the IEGC band allows max. steady state Vrms up to 245 kV.												

North Eastern Regional Power Committee

MINUTES OF THE PCC SUBGROUP MEETING

Date : 24/10/2016 (Monday)

Time : 11:00 Hrs

Venue : "NERLDC Conference Hall", Shillong.

The List of Participants in the PCC Subgroup meeting is attached at **Annexure – I**

Shri L. B. Muanthang, Superintending Engineer, NERPC welcomed all the participants to the Committee. He expressed concern about non-participation of several states in PCC forum in spite of several reminders and assurances given by their authorities. He then asked the committee to take up the agenda items for discussion.

1. Pending Data related to third party audit to be submitted

DOP, Arunachal Pradesh, TSECL, AEGCL and AGTPP not yet submitted complete data as per CEA task force format.

- Compilation of data received
- Audit work to be taken up by the subgroup
- Finalize activities that are to be carried during protection audit.

Deliberation in the meeting

Dy. Manager, AEGCL– informed the forum about the difficulty faced in sending data in CEA Task Force format. The remaining data to be sent by the end of Oct16.

The forum noted that DoP, Arunachal Pradesh and TSECL has not yet furnished the data as per CEA Task Force. NEEPCO confirmed that they would send the complete data shortly.

The forum also decided that the Protection audit of Agartala, Surjamaninagar & Udaipur sub-stations of TSECL are required to be taken up urgently. In line with discussions of 44th PCC, DGM SO-II (NERLDC) suggested that nominee from each constituent should be finalized for purpose of conducting the audit.

Accordingly, the forum decided as follows:

For the upcoming protection audit of Agartala, Surjamaninagar & Udaipur sub-stations of TSECL from 7th to 9th November 2016, following members were nominated by the respective constituents:

1) AEGCL- Ashutosh Bhattacharya, Dy. Manager (9435332928)

2) NERTS- Deva Prasad Pal, Sr. Engineer (9435382360)

3) NERPC- Abhijeet Agrawal, AEE (9871266951)

4) NEEPCO- Prosenjit Sen, Sr. Manager (9436167999)

5) OTPC- Smruti Ranjan Das, Manager (9612400784)

6) Tripura- Mrinal Paul, Manager (9436137022)

Dy.Manager (AEGCL) also requested NERPC to write a letter to DGM (Protection), AEGCL for sending representative for protection audit. The forum requested NERPC to write a letter formally to state authorities so that the above nominated representatives are released for this purpose by respective organizations.

The Sub-Group noted as above.

Action: NERPC, AEGCL, TSECL, OTPC, NEEPCO, NERTS

2. Identification of short lines to install line differential protection.

NERLDC informed the forum that for purpose of installation of differential protection on Short lines, the identification exercise has been completed for all Substations of NER Grid. The same has also been mailed by NERLDC to all constituents for review. All constituents were requested to give any comments prior to finalization.

Dy. Manager, AEGCL informed that as per different vendors line differential is preferred for distance less than 5 Km. Line differential is feasible only with OPGW connectivity. It is to be installed along with distance protection in order to maintain selectivity. DGM(SO-II), NERLDC informed that in SRPC line differential is being implemented for line distances less than 35 Km. Sr. Engr (SO-II), NERLDC stated that as per literature, the definition of short line depends upon operational voltage level. For 150-400 kV range lines up to 40 kms, and for >400 kV range lines up to 20 kms length are considered as short line.

Considering non-availability of OGPW links in several short lines, the forum decided that OPGW communication needs to be established wherever necessary in the interest of the Grid. Accordingly identification of lines having OPGW of length 35 km. to be carried out. As the 1st stage, differential protection is to be installed on important short lines like 400 kV BgTPP – Bongaigaon D/C, 132 kV Silchar – Srikona D/C, 132 kV Imphal(PG) – Imphal(MSPCL) D/C etc. The list of lines for implementation will be further discussed in PCC forum.

The Sub-Group noted as above.

3. Preparation of Draft model maintenance procedures that are to be followed by utilities.

Deliberation in the meeting

The forum noted comments of Manager(NERTS) that all utilities have separate maintenance procedures and it may be put upon utility concerned for the maintenance aspect. Several utilities may have restrictions in available manpower for the purpose of maintenance activity.

Sr.Engr, NERLDC suggested that it will be prudent to consider the bare minimum routine activities that needs to be followed by all utilities in a particular periodicity. Since this will serve as a Model Procedure, adoption of the guidelines as per procedure will not be compulsory, but merely serve as the best practices to be adopted.

NERTS and AEGCL have already submitted their maintenance manual to NERLDC.

SE(P), NERPC suggested that PGCIL, NERLDC and AEGCL together will prepare the guidelines for common minimum maintenance procedure for transmission systems for all utilities. All constituents are requested to give their suggestions and feedback to them. Once the guidelines are ready it will be scrutinized and approved in next PCC meeting. Sh. H. Talukdar, PGCIL, Sh. Jerin Jacob (Eng.NERLDC)/Rahul Chakrabarti, (Sr. Engr, NERLDC) and Sh. Ashutosh Bhattacharjee, DM, AEGCL are nominated to draft the guideline within 30th November 2016. The nominated members can call on utilities whenever needed.

The Sub-Group noted as above.

Action: AEGCL, NERLDC & NERTS.

4. Calculation of Relay Setting as per recommendation of V. Ramakrishna task Force.

Deliberation in the meeting

The relay settings details as formulated by NERTS in line with recommendations of V.Ramakrishna Task Force on Power system contingencies, had been circulated to all constituents for comments by NERLDC.

Manager (AM), NERTS explained to the forum the relay settings as per the document. After thorough discussion, it was agreed that the same can be implemented at the earliest for uniformity in protection systems.

The forum also noted recommendations by Manager (NERTS) / D.M. (AEGCL) that high-set is preferably disabled in relays (ref. 6.3 of PGCIL relay setting recommendations).

DGM(SO-II), NERLDC suggested to place the same before PCC forum to take up implementation. The forum agreed.

The Sub-Group noted as above. Action: All Constituents.

5. Review of Zone II & Zone III setting.

Deliberation in the meeting

The matter has already been discussed and Zone-II / Zone-III setting changes are to be done as per Relay setting calculations of POWERGRID in line with V.Ramakrishna Task force report.

The Sub-Group noted as above.

6. Draft Manual for protection systems.

Deliberation in the meeting

Manager(AM), NERTS informed that draft manual for protection system already exist. The recommendations of V. Ramakrishna Task Force Report is to be used by the utilities for all purposes. Sr. Engr, NERLDC stated that CBIP has brought out an updated manual as of 2016 that contains detailed guidelines for Transmission line protection. The forum decided that the constituents may refer to it as guidelines for Protection systems for transmission. NERLDC will circulate the copy of the CBIP Protection Manual to all the constituents.

The Sub-Group noted as above.

Action: All Constituents.

7. Review of relay settings- Substation wise(including downstream state substation).

Deliberation in the meeting

DGM(SO-II), NERLDC informed that due to ill-coordination in relay settings between State systems and ISTS, frequent tripping of elements are happening. Most of the Grid disturbances in NER Grid are due to this.

P&E Dept., Mizoram and DoP, Nagaland will have to co-ordinate their relay settings with ISTS systems and implement as has been suggested by NERTS. He also requested SE(P), NERPC to write a letter to respective constituent in this regard.

The Sub-Group noted as above.

Action: NERPC

8. Details of PSS installed and activated in all Hydro stations.

Deliberation in the meeting

DGM(SO-II), NERLDC requested all power stations to provide details where PSS is installed. He also requested them to activate existing PSS after tuning and inform the same through mail.

Manager, NEEPCO informed that all hydro station of NEEPCO has PSS installed and activated. He will send mail along with details to NERLDC.

Manager, NHPC also informed that he will send detail about Loktak hydro station in mail.

The forum noted that enabling of PSS in July'16 by Doyang HEP (NEEPCO) and tuning of this PSS helped in damping out inter-plant oscillations in NER Grid. NERLDC requested NEEPCO to furnish details of Tuned frequency range etc. of existing PSS.

The Sub-Committee noted as above.

Action: NEEPCO, NHPC, All state utilities.

8. Review of Recommendations of Empowered Committee for Analysis of GD-V and GD-IV in NER.

Deliberation in the meeting

- DGM(SO-II), NERLDC indicated that TSECL had intimated to NERLDC that SPAR (Single Phase Auto Reclosure) is not available in 132 kV AGTPP – Agartala D/C lines, which was resulting in multiple tripping of this line on transient fault.

  Sr.Manager, NEEPCO confirmed that at AGTPP, their end CB is single phase.

  NERTS to take up for changing of A/R scheme to SPAR.

  It was decided that utilities should identify those transmission lines which have no SPAR scheme for implementation of the same.

  It was noted that most of trippings of transmission lines in NER Grid occur either on account of lightning strikes or due to vegetation infringement problem. It was decided that all utilities will identify the lightning prone areas and conduct check of high tower footing resistance in transmission lines in these areas. Since tripping of line on lightning occurs due to Arcing, to prevent that it is required to either maintain low value of tower footing resistance or go for installation of lightning arrester for the particular towers having consistent high footing resistance.

  It was noted that except for Arunachal Pradesh, Assam, Mizoram & Nagaland, other constituents are not submitting UFR reports to NERPC/NERLDC on regular basis. It is reiterated that the same to be submitted at the earliest. Even for the Grid Disturbance of Category-V in NER on 16th April 2016, reports of UFR operation were received only from Assam, Tripura and Mizoram. In absence of requisite information, analysis of Grid Disturbances are often inconclusive.

  NERPC/NERLDC requested all constituents to furnish the data of UFR operation on regular basis.

  It was also noted that while self-certification of UFRs have been done by utilities, periodic inspection of installed UFRs are to be carried out for checking healthiness

- For purpose of information regarding furnishing of communication outage during Grid disturbance of Category-V in NER, NERLDC had circulated a format as finalized by NLDC. However, no information had been received.

  NERLDC would once again mail all utilities for the requisite information. AEGCL/ MePTCL agreed to furnish the relevant data.

The Sub-Committee noted as above.

Action: NERPC, NEEPCO, PGCIL, AEGCL, MePTCL, TSECL, other state utilities.

10. **Analysis of GD, GI and element tripping in the month of Sep' 16.**

Deliberation in the meeting

The sub-committee analysed the Grid Disturbances, Grid Incidences, Element tripping and Unit trippings of NER Grid for the month of September'16. Details as per Annexure.

During the tripping analysis, NERPC/NERLDC observed that participants are attending the meeting without complete information, which is hindering the process of analysis. NERLDC is communicating to all constituents of NER the Weekly Event reports for information of utilities as well as for furnishing the requisite information for analysis of the events. EE(P), NERPC requested all constituents to come prepared to meetings of tripping analysis, as well furnish all information on time to NERLDC/ NERPC.

There were numerous tripping of 132 kV Balipara – Khupi line, even after vegetation clearance works were completed by NEEPCO after availing shutdown of this line. Sr. Manager(NEEPCO) also informed that getting information from Doyang HEP was difficult, which is hindering process of analysis of trippings from Doyang HEP. NERPC may take up separately with NEEPCO for resolving these issues.

The Sub- Committee noted as above.

The meeting ended with thanks to the Chair.

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Annexure-I

List of Participants in the PCC Sub Committee meeting held on 24/10/2016

SNo	Name & Designation	Organization	Contact No.
1.	Sh. Amaresh Mallick, DGM (SO-II)	NERLDC	09436302720
2.	Sh. Rahul Chakrabarti, Sr. Engr (SO-II)	NERLDC	09402507543
3.	Sh. Subhash Kumar, Engineer (SO-II)	NERLDC	09485185844
4.	Sh. N. R. Paul, AGM SO-I)	NERLDC	09436302723
5.	Sh. Ankit Jain, Sr. Engr. (SO-I)	NERLDC	09436335381
6.	Sh. Nadeem Altaf, Sr.Engr (SO-I)	NERLDC	09436335373
7.	Sh. H. Talukdar, Chief Manager, AM	PGCIL	09436335237
8.	Sh. Mukut Nath, AGM	AEGCL	08761028185
9.	Sh. Ashutosh Bhattacharya, D. M.	AEGCL	09435332928
10.	Sh. Joypal Roy, Sr. Manager (E)	NEEPCO	09435577726
11.	Sh. B. Nikhla, EE, SP	MePTCL	09436314163
12.	Sh. A.G. Thom, AEE, MRT	MePTCL	09774664034
13.	Sh. Jaydeep Das, Sr. Executive	OTPC	08731081454
14.	Sh. R.C. Singh, Mgr (E)	NHPC	09436894889
15.	Sh. L. B. Muanthang, SE	NERPC	09436731488
16.	Sh. P. N. Sarkar, EE	NERPC	09830027523
17.	Sh. S. Imam, AEE	NERPC	07421806242
18.	Sh. Abhijit Agrawal, AEE	NERPC	09871266951