

North Eastern Regional Power Committee

Agenda For

35th PCC Sub-Committee Meeting

Time of meeting : 10:00 Hrs.

Date of meeting : 14th July, 2015 (Tuesday)

Venue : "Hotel Pragati Manor", Guwahati.

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 34th MEETING OF PROTECTION SUB-COMMITTEE OF NERPC.

The minutes of 34th meeting of Protection Sub-committee held on 16th June, 2015 at Guwahati were circulated vide letter No. NERPC/SE (O)/PCC/2015/4520-4555 dated 26th June, 2015.

No observations or comments were received from the constituents. The Sub-committee may discuss & confirm minutes of 34th PCCM of NERPC.

ITEMS FOR DISCUSSION

A.1 Implementation of 3-Phase Auto Reclosure Scheme of Radially fed 132kV Lines connected to Ranganadi HEP:

At present, the power flows to Nirjuli, Gohpur and Ziro radially from Ranganadi HEP and any transient fault in line causes undesirable outages. Hence, to avoid outages during transient fault it is essential to implement 3- Phase Dead Line charging of following 132kV Lines.

- a) 132kV Ranganadi – Nirjuli Line (Dead Line Charging at RHEP)
- b) 132kV Nirjuli – Gohpur Line (Dead Line Charging at Nirjuli)
- c) 132kV Ranganadi – Ziro Line (Dead Line Charging at RHEP)

During 34th PCC meeting, EE, SLDC, Ar. Pradesh requested NEEPCO to intimate their plan atleast one week in advance so that necessary action can be taken by them.

The sub-committee requested NEEPCO to take up the matter with M/S Alstom immediately to finalize the implementation program and intimate Ar. Pradesh in advance for necessary Shut Down. Further, NERPC will monitor the status of action taken by NEEPCO on weekly basis to expedite the implementation of long pending Auto Reclose Scheme.

NEEPCO/Ar. Pradesh may kindly intimate the status.

A.2 Implementation of the recommendations of the Protection Audit:

As per Sl. no 9.1.1 & 9.1.4 of Report on Enquiry Committee on Grid Disturbance in Northern Region on 30th July 2012 and in Northern, Eastern & North-Eastern Region on 31st July 2012, thorough Third Party protection audit needs to be carried out periodically along with independent audit of Fault Recording Instruments.

As decided in 32nd PCCM, all the constituents are requested to furnish the data as per check list of Task force in **Annexure A.2 (II)** and the data as per format of NERPC in **Annexure A.2 (I)** for future reference.

<i>Status of submission of data related to Third Party Protection Audit</i>			
<i>Name of Constituent</i>	<i>As per format of Task Force</i>	<i>As per format of NERPC</i>	<i>Remarks</i>
<i>DoP, Ar. Pradesh</i>	<i>Not submitted</i>	<i>Not submitted</i>	
<i>AEGCL</i>	<i>Yes (only checklist submitted)</i>	<i>Not submitted</i>	<i>Details of Protection not submitted</i>
<i>MSPCL</i>	<i>Not submitted</i>	<i>Not submitted</i>	
<i>MePTCL</i>	<i>Not submitted</i>	<i>Yes (Khliehriat, Mawphlang, EPIP I, Mawlai, NEHU, NEIGRIHMS, Ronkhon, Sohra, EPIP II, Lumshnong, Nangalbibra, Nongstoin & Umiam)</i>	<i>Leshka, Umiam Stg I, Umiam Stg II, Umiam Stg III, Umiam Stg IV, Umtru not submitted. Private owned S/S not submitted.</i>
<i>P&E Deptt, Mizoram</i>	<i>Not submitted</i>	<i>Not submitted</i>	
<i>DoP, Nagaland</i>	<i>Not submitted</i>	<i>Yes (Kohima, Wokha, Meluri, Kiphire, Dimapur, Mokokchung)</i>	

TSECL	<i>Not submitted</i>	<i>Not submitted</i>	
POWERGRID	<i>Not submitted</i>	<i>Not submitted</i>	
NEEPCO	<i>Not submitted</i>	<i>Yes (Khandong & Kopili)</i>	<i>Ranganadi, Doyang, AGBPP, AGTPP not submitted</i>
NTPC	<i>Not submitted</i>	<i>Not submitted</i>	
NHPC	<i>Not submitted</i>	<i>Not submitted</i>	
OTPC	<i>Yes</i>	<i>Not submitted</i>	

The sub-committee requested all the remaining constituents who have not furnished the data both as per check list of Task Force in Annexure – A.2 (II) and also, as per the format of NERPC in Annexure A.2 (I) above at the earliest.

Constituents may kindly intimate the status.

A.3 Standardization of Disturbance Recorder Channels:

Disturbance Recorders on Transmission elements are necessary for post disturbance analysis, and identification & rectification of any protection mal-operation. As per CBIP's manual on Protection of Generators, GT, Transformers and Networks, it is recommended to have minimum 8(eight) analog signals and 16(sixteen) binary signals per bay or circuit. Also, it should have a minimum of 5 sec of total recording time, minimum pre-fault recording time of 100 msec and minimum post-fault recording time of 1000 msec.

During 34th PCC meeting, DGM (AM), NERTS informed that standardization for transformers & reactors are being finalized by their Corporate Centre for the whole country, the report would be circulated as soon as it is received from them. He also informed that suggestion by GM, NERLDC for NER States have already been communicated by them. He stated that the final report is expected by 30th June, 2015 and the same will be intimated to NERPC/NERLDC accordingly.

NERTS may kindly intimate the current status.

A.4 Reporting of failure of equipment/towers of transmission lines to Standing Committee of Experts:

CEA vide letter dated 04.02.2015 has intimated that as per Section 73 of Electricity Act 2003, CEA is to carry out investigation of failure of substations/generating stations and failure of transmission line towers. Accordingly two Standing Committees have been constituted taking representation from academic institutes, Research Institutes like CPRI and utility to investigate the cause of failures:

- (a) Standing Committee of Experts to investigate the failure of Transmission line towers of 220 kV and above voltage level of Power utilities.
- (b) Standing Committee of Experts to investigate the failure of Equipments of 220 kV and above substations/Generating stations of power utilities.

In view of above, it is requested that all utilities may please report the incidences of failure immediately after occurrence of such failure to Chief Engineer (SE&TD), CEA with copy to NERPC.

The format for reporting the first hand information about the failure of equipment in substations/generating stations and failure of transmission line towers are attached at **Annexure – A.4**

During 32nd PCC meeting, Meghalaya representative stated that Recent failure of one 63 MVAR reactor at 400 kV S/S Byrnihat of Me.ECL would be sent to CEA for investigation as directed above as suggested by SE(O) to CEA within one week.

During 34th PCC meeting, SE(O) informed that NERPC had written to Director (T), Meghalaya but the reply is still awaited.

The Sub-committee requested NERPC to take up the matter with Me. PTCI once again.

Meghalaya may kindly intimate the status.

A.5 Status of R&M Implementation of NER from PSDF:

The Sub-committee requested all the constituents to intimate the status of progress to NERPC regularly so that the same could be intimated to CERC.

Latest available status is enclosed at **Annexure - A.5.**

Constituents may kindly intimate the status.

A.6 Furnishing Protection Details of Transmission Lines, Transformers, Reactors and Bus Bars:

During 34th PCC meeting, SE(O) informed that as NERPC had written to all concerned constituents as per directive of the Sub-committee and the reply is awaited.

Meanwhile NERLDC has prepared the list in tabular format as decided during 34th PCC meeting and the status of pending data to be submitted by the concerned constituents are given below:

Status of submission of data related to Protection Systems as per CEA regulations							
Sl No	Name of Constituent	Transmission Line	Transformers	Reactor	Bus-Bar & LBB	Bus Coupler	Remarks
1	DoP, Arunachal Pradesh	<i>Not submitted</i>	<i>Not submitted</i>	<i>Not Applicable</i>	<i>Not submitted</i>	<i>Not submitted</i>	
2	AEGCL	<i>Submitted</i>	<i>Submitted</i>	<i>Submitted</i>	<i>Not submitted</i>	<i>Not submitted</i>	<i>AEGCL informed Bus Bar & LBB Relays at Azara & Rangia was installed</i>
3	MSPCL	<i>Submitted</i>	<i>Submitted</i>	<i>Not Applicable</i>	<i>Submitted</i>	<i>Submitted</i>	
4	MePTCL	<i>Submitted</i>	<i>Submitted</i>	<i>Submitted</i>	<i>Submitted</i>	<i>Submitted</i>	
5	P&E Deptt, Mizoram	<i>Submitted</i>	<i>Submitted</i>	<i>Not Applicable</i>	<i>Submitted</i>	<i>Submitted</i>	
6	DoP, Nagaland	<i>Submitted</i>	<i>Submitted</i>	<i>Not Applicable</i>	<i>Submitted</i>	<i>Submitted</i>	
7	TSECL	<i>Submitted</i>	<i>Submitted</i>	<i>Not Applicable</i>	<i>Submitted</i>	<i>Submitted</i>	
8	POWERGRID	<i>Submitted</i>	<i>Submitted</i>	<i>Submitted</i>	<i>Submitted</i>	<i>Not Submitted</i>	
9	NEEPCO	<i>Submitted (AGBPP, AGTPP, Ranganadi, Doyang, Kopili)</i>	<i>Submitted (AGBPP, AGTPP, Ranganadi, Kopili)</i>	<i>Submitted (Ranganadi)</i>	<i>Submitted (AGBPP, Ranganadi,, AGTPP, Kopili)</i>	<i>Submitted (AGBPP, Ranganadi,, AGTPP, Kopili)</i>	<i>Details of Khandong, Kopili STG-II & Doyang not submitted</i>
10	NTPC	<i>Not submitted</i>	<i>Not submitted</i>	<i>Not Applicable</i>	<i>Not submitted</i>	<i>Not submitted</i>	
11	NHPC	<i>Submitted</i>	<i>Submitted</i>	<i>Not Applicable</i>	<i>Submitted</i>	<i>Submitted</i>	
12	OTPC	<i>Not submitted</i>	<i>Not submitted</i>	<i>Not submitted</i>	<i>Not submitted</i>	<i>Not Submitted</i>	

Concerned constituents may kindly intimate the current status.

ITEM NO. A.7	Frequent Tripping of 33 KV System of DoP, Ar. Pradesh at Nirjuli and Ziro:
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The frequent tripping of 33kV system of DoP, Ar. Pradesh is matter of concern. The issue was discussed in 9th, 10th, 11th and 12th TCC meetings. The present status of tripping of 33kV Feeders at Nirjuli and Ziro Sub Station is as below:

(a) Tripping 33kV Feeders at Ziro

SN	Feeder	Jan'10 – Jul'13		Aug'13 - July'15	
		Nos.	Nos. / Month	Nos.	Nos. / Month
1	Kurung- Kamey	813	18.90	387	16.12
2	Old Ziro Feeder	462	10.75	254	10.58
3	Kimin Feeder	1296	30.13	827	34.45
	Total	2571	59.79	1468	61.16

(b) Tripping 33kV Feeders at Nirjuli

SN	Feeder	Jan'10 – Jul'13		Aug'13 - July'15	
		Nos.	Nos. / Month	Nos.	Nos. / Month
1	AP – 1	267	6.20	77	3.20
2	AP – 2	613	14.25	129	5.37
3	AP – 4	84	1.95	196	8.16
	Total	964	22.41	402	16.75

Arunachal Pradesh is requested to take necessary action on priority to reduce no. of faults in 33kV feeders owned by DoP, Govt. of Arunachal Pradesh to avoid further failure of transformers/equipments at Nirjuli and Ziro Sub Stations.

Ar. Pradesh may kindly intimate the current status.

A.7 Grid Incidences during June, 2015:

The following numbers of Grid Disturbances (GD) occurred during the period w.e.f 1st June, 2015 to 30th June, 2015 :-

SI No	Control Area	Grid Disturbance in nos.	
		1 st June, 2015 to 30 th June, 2015	1 st January, 2015 to 30 th June, 2015
1	Palatana	0	5
2	AGBPP	0	1
3	AGTPP	0	4
4	Ranganadi	1	4
5	Kopili	0	1
6	Khandong	0	1
7	Doyang	0	2
8	Loktak	0	4
9	Arunachal Pradesh	12	34
10	Assam	13	38
11	Manipur	3	37
12	Meghalaya	15	24
13	Mizoram	2	7
14	Nagaland	1	14
15	Tripura	0	3

SI No	Category of GD	Grid Disturbance in nos.	
		1 st June, 2015 to 30 th June, 2015	1 st January, 2015 to 30 th June, 2015
1	GD 1	36	120
2	GD 2	0	3
3	GD 3	0	0
4	GD 4	0	0
5	GD 5	0	1
	Total	36	125

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

A.8 Root cause analysis of Grid Disturbances:

i. Repeated tripping of 132 kV Khliehriat (PG) – Khliehriat (MePTCL) I & II lines resulting numerous grid disturbances in Meghalaya System

During the month of June, 2015, there were 17 nos. Grid Disturbances in Khliehriat (including Lumshnong) area of Meghalaya.

w.e.f 08.06.15 to 30.06.15, there were 4 nos. events involving tripping of 132 kV Khliehriat (PG) – Khliehriat (MePTCL) I & II lines, resulting in 7 nos. Grid Disturbances.

- a. **At 0221 Hrs on 13.06.15**, 132 kV Khliehriat (PG) - Khliehriat (MePTCL) I & II lines (Line 1: **Khliehriat (PG) - DP, ZIII, R-Y-B & Khliehriat (MePTCL)- Not furnished** and Line 2: **Khliehriat (PG) - DP, ZIII, R-Y-B & Khliehriat (MePTCL)- Not furnished**) tripped. Due to tripping of these elements, there

was loss of load in Khliehriat (including Lumshnong) area of Meghalaya and generation loss in Leshka HEP.

Load loss: 44 MW in Meghalaya

Generation Loss: 122 MW in Meghalaya (Leshka)

- b. **At 1308 Hrs on 18.06.15**, 132 kV Khliehriat (PG) - Khliehriat (MePTCL) I & II lines tripped (Line 1: **Khliehriat (PG) - DP, ZIII, R-Y-B & Khliehriat (MePTCL) - Not furnished** and Line 2: **Khliehriat (PG) - Not furnished & Khliehriat (MePTCL) - Not furnished**) tripped. Due to tripping of these elements, there was loss of load in Khliehriat (including Lumshnong) area of Meghalaya and generation loss in Leshka HEP.

Load loss: 79 MW in Meghalaya

Generation Loss: 126 MW in Meghalaya (Leshka)

- c. **At 0214 Hrs on 20.06.15**, 132 kV Khliehriat (PG) - Khliehriat (MePTCL) I & II lines tripped (Line 1: **Khliehriat (PG) - DP, ZIII, R-Y-B & Khliehriat (MePTCL) - Not furnished** and Line 2: **Khliehriat (PG) - DP, ZIII, R-Y-B & Khliehriat (MePTCL) - Not furnished**) tripped. Due to tripping of these elements, there was loss of load in Khliehriat (including Lumshnong) area of Meghalaya and generation loss in Leshka HEP. 132 kV Khandong – Khliehriat (PG) I also tripped (Khandong – Not furnished & Khliehriat(PG) – Earth Fault).

Load loss: 40 MW in Meghalaya

Generation Loss: 126 MW in Meghalaya (Leshka)

- d. **At 0048 Hrs on 21.06.15**, 132 kV Lumshnong – Khliehriat (MePTCL) line tripped (**Lumshong - Not furnished & Khliehriat (MePTCL) - Distance Protection**). Due to tripping of this element, Lumshnong area of Meghalaya separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Load loss: 16 MW in Meghalaya

- e. **At 2112 Hrs on 22.06.15**, 132 kV Lumshnong – Panchgram (AEGCL) line tripped (**Lumshong - Earth Fault & Panchgram (AEGCL) - Not furnished**). Due to tripping of this element, Lumshnong area of Meghalaya separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Load loss: 7 MW in Meghalaya

- f. **At 1749 Hrs on 26.06.15**, 132 kV Lumshnong – Panchgram (AEGCL) line tripped (**Lumshong- Earth Fault & Panchgram (AEGCL)- Not furnished**). Due to tripping of this element, Lumshnong area of Meghalaya separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Load loss: 14 MW in Meghalaya

- g. At 1918 Hrs on 26.06.15, 132 kV Khliehriat (PG) - Khliehriat (MePTCL) I & II lines (Line 1: **Khliehriat (PG) - DP, ZIII, R-B-E & Khliehriat (MePTCL) - No tripping** and Line 2: **Khliehriat (PG) - DP, ZIII, R-B-E & Khliehriat (MePTCL)- No tripping**) tripped. Due to tripping of these elements, there was loss of load in Khliehriat (including Lumshnong) area of Meghalaya and generation loss in Leshka HEP.

Load loss: 52 MW in Meghalaya

Generation Loss: 126 MW in Meghalaya (Leshka)

Category as per CEA Standards: GD-I (for events from SI. i to vii)

Analysis of events:

Due to tripping of these elements, power supply to Khliehriat or Lumshong area of Meghalaya was interrupted repeatedly. It is suspected that there may be uncleared fault in Meghalaya system or delayed fault clearance. As a result, several transmission lines tripped. In most of the cases, Leshka machines tripped.

DR output at both ends of above elements required for proper analysis of the events.

MePTCL, MePGCL, NEEPCO & NERTS, POWERGRID may elaborate.

ii. **Disturbance in Manipur system:**

- a. At 1027 Hrs on 24.06.15, due to tripping of 132 kV Loktak- Ningthoukhong line (**Loktak - DP, ZI, R-B-E & Ningthoukhong - Not furnished**) & 132 kV Ningthoukhong - Imphal (PG) line (**Ningthoukhong - Not furnished & Imphal (PG) - No tripping**), power supply to Ningthoukhong area of Manipur interrupted.

Load loss: 63 MW in Manipur.

Category as per CEA Standards: GD-I

Analysis of events:

It is suspected that there may be persistence fault in MSPCL system. DR output at both ends of above elements required for proper analysis of the events.

NHPC, MSPCL, & NERTS, POWERGRID may elaborate.

iii. **Disturbance in Arunachal Pradesh and Gohpur area of Assam**

- a. At 0501 Hrs on 02.06.15, 400 kV Balipara - Ranganadi I (**Balipara (PG) - Over voltage & Ranganadi (NEEPCO) - Direct trip received**) line tripped and at 0502 Hrs on 02.06.15, 400 kV Balipara - Ranganadi II (**Balipara (PG) - Not furnished & Ranganadi (NEEPCO) - Not furnished**) line tripped.

Due to tripping of these elements, power supply to Ziro & Capital area of Arunachal Pradesh and Gohpur area of Assam interrupted. There was also generation loss in Ranganadi HEP.

Load loss: 54 MW in Arunachal Pradesh & Assam
Generation Loss: 117 MW at Ranganadi (NEEPCO)

- b. **At 2353 Hrs on 04.06.15**, 132 kV Lekhi- Nirjuli (**Lekhi- Earth fault & Nirjuli- No tripping**) line tripped. Due to tripping of this element, Nirjuli area of Arunachal Pradesh and Gohpur area of Assam separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Load loss: 48 MW in Arunachal Pradesh & Assam

- c. **At 1045 Hrs on 05.06.15**, 132 kV Lekhi - Nirjuli (**Lekhi - Not furnished & Nirjuli - Earth fault**) and 132 kV Gohpur - Nirjuli (**Gohpur - Not furnished & Nirjuli - Not furnished**) lines tripped. Due to tripping of this element, Nirjuli area of Arunachal Pradesh and Gohpur area of Assam separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Load loss: 30 MW in Arunachal Pradesh & Assam

- d. **At 1305 Hrs on 10.06.15**, 132 kV Lekhi - Nirjuli (**Lekhi - Not furnished & Nirjuli - Not Furnished**) line tripped. Due to tripping of this element, Nirjuli area of Arunachal Pradesh and Gohpur area of Assam separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Load loss: 25 MW in Arunachal Pradesh & Assam

- e. **At 0547 Hrs on 13.06.15**, 132 kV Lekhi - Nirjuli (**Lekhi - Not furnished & Nirjuli - No tripping**) line tripped. Due to tripping of this element, Nirjuli area of Arunachal Pradesh and Gohpur area of Assam separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Load loss: 32 MW in Arunachal Pradesh & Assam

- f. **At 1527 Hrs on 15.06.15**, 132 kV Lekhi - Nirjuli (**Lekhi - Over Current & Nirjuli - No tripping**) line tripped. Due to tripping of this element, Nirjuli area of Arunachal Pradesh and Gohpur area of Assam separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Load loss: 38 MW in Arunachal Pradesh & Assam

- g. **At 1058 Hrs on 18.06.15**, 132 kV Lekhi - Nirjuli (**Lekhi - Over Current & Nirjuli - No tripping**) line tripped. Due to tripping of this element, Nirjuli area of Arunachal Pradesh and Gohpur area of Assam separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Load loss: 19 MW in Arunachal Pradesh & Assam

h. At 1048 Hrs on 20.06.15, 132 kV Lekhi - Nirjuli (**Lekhi - Earth fault & Nirjuli - Not furnished**) line tripped. Due to tripping of this element, Nirjuli area of Arunachal Pradesh and Gohpur area of Assam separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Load loss: 56 MW in Arunachal Pradesh & Assam

i. At 1112 Hrs on 20.06.15, 132 kV Lekhi - Nirjuli (**Lekhi - Earth fault & Nirjuli - Not furnished**) line tripped. Due to tripping of this element, Nirjuli area of Arunachal Pradesh and Gohpur area of Assam separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Load loss: 39 MW in Arunachal Pradesh & Assam

j. At 1112 Hrs on 20.06.15, 132 kV Lekhi - Nirjuli (**Lekhi - Earth fault & Nirjuli - Not furnished**) line tripped. Due to tripping of this element, Nirjuli area of Arunachal Pradesh and Gohpur area of Assam separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Load loss: 39 MW in Arunachal Pradesh & Assam

k. At 0420 Hrs on 27.06.15, 132 kV Lekhi- Nirjuli (**Lekhi - Earth fault & Nirjuli - Not furnished**) line tripped. Due to tripping of this element, Nirjuli area of Arunachal Pradesh and Gohpur area of Assam separated from rest of NER Grid and subsequently collapsed due to no source in this area.

Load loss: 45 MW in Arunachal Pradesh & Assam

Category as per CEA Standards: GD-I

Analysis of Events:

Relay settings of 132 kV Lekhi – Nirjuli line at both ends are to be checked. It is also to be checked whether these tripping are due to vegetation problem.

DR outputs have been received from Ranganadi for event on 0502 Hrs on 02.06.15. DR outputs have been received from Nirjuli (PG) for events on 06.06.15.

DR output at both ends of above elements required for proper analysis of the events.

AEGCL, DoP, Arunachal Pradesh & NERTS, POWERGRID may elaborate.

iv. Disturbance in AGTPP, Palatana and Tripura power system

Since no representative from Tripura was present, the 34th PCC Sub-committee suggested to discuss the issue related to trippings in AGTPP, Palatana and Tripura power systems in the 110th OCC meeting.

Due to presence of no representatives in 33rd PCC meeting also, trippings related to AGTPP and Tripura system could not be discussed. The 33rd PCC sub-

committee had requested NERPC to take up the matter with AGTPP, NEEPCO & TSECL to find out the reason of above tripping so that the same can be taken up in the 34th PCC meeting. But, the same could not be discussed again in 34th PCCM due to no representative of TSECL being present in the meeting.

- a. **At 1526 Hrs on 29.05.15**, due to tripping of 132 kV Agartala – Dhalabil line, 132 kV Baramura – Jirania line, 132 kV AGTPP - Agartala I line (**AGTPP - DP, Z-III, R-E & Agartala - No tripping**) & 132 kV AGTPP - Agartala II line (**AGTPP- DP, Z-III, R-E & Agartala - No tripping**), power supply to Tripura system was interrupted and all running units of AGTPP tripped (**No information from AGTPP regarding unit tripping**). 132 kV Palatana - Surajmani Nagar line & 132 kV Palatana – Udaipur line also tripped, Due to tripping of 132 kV Palatana - Surajmani Nagar line & 132 kV Palatana – Udaipur line, Palatana Module II tripped (**Due to tripping of Gas Booster Compressor**). Tripping of Palatana machines triggered SPS I at Silchar with load relief of 70 MW at South Assam.

Generation loss: 469 MW [Palatana = 335 MW, AGTPP = 76 MW]

Load Loss: 70 MW in Tripura

Category as per CEA Standards: GD-II

Analysis of events:

Due to tripping of all outgoing feeders of AGTPP, all the running units of AGTPP tripped. Due to tripping of 132 kV Palatana – Udaipur line and 132 kV Palatana – Surjamaninagar line, auxiliary system of Palatana Module II failed and subsequently Gas Booster Compressor (GBC) of Palatana Module II tripped.

In this event on 29-May-2015, the 400/132 kV, 125 MVA ICT at Palatana was out of service. Since supply to Auxiliaries of Palatana units are taken from 132 kV Grid of Tripura, outage of 132 kV Palatana – Udaipur S/C and 132 kV Palatana – Surjamaninagar S/C led to failure of supply to Auxiliary system of Palatana units and hence tripping of Palatana units. If another 400/132 kV ICT at Palatana were in place, this type of incident could have been averted. This transformer would also ensure enhanced reliability of supply and also satisfied the N-1 contingency criteria as specified in CEA's Manual on Transmission Planning Criteria, Jan'13.

As an alternative arrangement, in such cases, if UATs at Palatana are of sufficient capacity, the Auxiliary supply failure would not have occurred. OTPC, Palatana may explore the provision of enhancement of UAT to sufficient capacity.

DR output at both ends required for proper analysis of the events.

NEEPCO, TSECL, OTPC & NERTS, POWERGRID may elaborate.

- b. **At 0247 Hrs on 22.04.15**, 132 kV AGTPP- Agartala I (**AGTPP- Tripped on voltage jerk & Agartala- No tripping**), 132 kV AGTPP- Agartala II (**AGTPP- Tripped on voltage jerk & Agartala- No tripping**) & 132 kV AGTPP- Kumarghat (**AGTPP- Tripped on voltage jerk & Kumarghat- No tripping**).
Generation loss: 80 MW in AGTPP.

- c. At 0014 Hrs on 24.04.15, 132 kV AGTPP- Agartala I (**AGTPP- DP,Z-II, R-Y-B & Agartala- No tripping**), 132 kV AGTPP- Agartala II (**AGTPP- DP,Z-II, R-Y-B & Agartala- No tripping**) & 132 kV AGTPP- Kumarghat (**AGTPP- DP,Z-II, R-Y-B & Kumarghat- No tripping**).

Generation loss: 59 MW in AGTPP.

Category as per CEA Standards: GD-I

Analysis of events:

Due to tripping of all outgoing feeders from AGTPP, all the running units of AGTPP tripped. It is requested to furnish DR outputs at both ends for above event for further analysis.

DR has been received from Kumarghat for tripping of 132 kV AGTPP- Kumarghat line on 24.04.15 at 0014 Hrs.

NEEPCO, TSECL & NERTS, POWERGRID may elaborate.

A.9 Tripping of inter-regional lines of NER-ER:

During the period w.e.f April to June, 2015, there were 49 nos. of tripping of inter-regional lines of NER-ER. Due to these tripping of inter-regional Lines, reliability of NER Grid was reduced & there was near miss grid disturbances. The matter is very serious & required detailed deliberation.

Details of tripping of inter-regional Lines are provided in **Annexure -A.9.**

NERTS, POWERGRID & ENICL may elaborate.

A.10 Implementation of activities decided in joint meeting among NERLDC, NERPC & constituents of NER on 29.12.14

A meeting was held at NERLDC between NERPC, NERLDC and constituents of NER as per directive of Hon'ble CERC in response to Petition No. 113/MP/2014 on 29.12.14.

The constituents of NER agreed upon the following:

- a. Testing of all existing relays and schemes within 2 months by all constituents to assess the healthiness of existing protective relays
- b. Review of relay settings based on history of tripping and non-availability of Distance Protection Relays would be done.
- c. Attempts would be made to avoid any tripping on account of vegetation growth, which is frequent in NER

- d. Single Phase / Three phase Auto Reclose Scheme of transmission lines of voltage level 132 kV and above under List of Important Grid Elements of NER are to be adopted, wherever available. The status of implementation will be monitored in monthly OCC/PCC meetings.

It is requested to power utilities of NER to intimate the latest status of the above activities.

Many of tripping of transmission & distribution lines occurred due to vegetation problem. Tripping of transmission & distribution lines can be reduced if bush/jungle cutting done regularly. It was observed that number of tripping of transmission & distribution lines increases during the period of monsoon.

Members may like to discuss.

A.11 List of critical sub-stations in NER:

During 34th PCC meeting, SE(O) informed that CEA held the 1st meeting of the grid committee on 22.05.2015 under Chairmanship of Member (GO&D), CEA and it was decided that NERPC has to prepare a list of 15 critical sub-stations of 132 kV voltage level and above in consultation with NERLDC and forward the same to CEA and NLDC (POSOCO) immediately. He requested NERLDC to help NERPC in finalization of above critical sub-stations. NERLDC agreed.

The list of 15 critical sub-stations in NER based on severity was prepared by NERPC in consultation with NERLDC and the same is as below:

SN	Name of Sub-Station	Owner of Sub-Station	State	Voltage Level in kV
1	Bongaigaon-Salakati	POWERGRID	Assam	400/220/132
2	Balipara	POWERGRID	Assam	400/220/132
3	Misa	POWERGRID	Assam	400/220
4	Silchar	POWERGRID	Assam	400/132
5	Azara	AEGCL	Assam	400/220/132
6	Byrnihat	MePTCL	Meghalaya	400/220/132
7	Sarusajai	AEGCL	Assam	220/132/33
8	Ranganadi	NEEPCO	Ar. Pradesh	400/132
9	Yurembam	MSPCL	Manipur	132/33
10	Ningthoukhong	MSPCL	Manipur	132/33
11	Khliehriat	MePTCL	Meghalaya	132/33
12	Dimapur	DoP, Nagaland	Nagaland	132/66
13	Lekhi	DoP, Ar. Pradesh	Ar. Pradesh	132/33
14	Zuangtui	Mizoram	Mizoram	132/33
15	Agartala	TSECL	Tripura	132/33

Members may like to note.

Any other item:

Date and Venue of next PCC

It is proposed to hold the 36th PCC meeting of NERPC on first week of August, 2015. The exact venue will be intimated in due course.

Format for intimating the failure of Transmission line Towers

1. Name of Transmission line with voltage level:
2. Length of line (km):
3. Type of configuration:
[(S/C, D/C, S/C strung on D/C towers,
narrow base etc.)]
4. Number of Towers and Type of Towers failed:
[suspension/ tension/ dead end/ special tower/
river crossing tower/ Powerline crossing/ Railway crossing etc.,
with/ without extension
(indicate the type & length of extension)]
5. Tower location no. with reference to nearest substation (indicate name):
6. Name and size of conductor:
7. No. of sub-conductors per bundle and bundle spacing:
8. Number and size of Ground wire/ OPGW (if provided):
9. Type of insulators in use (Porcelain/ Glass/ Polymer):
10. Configuration of insulators (I/ V/ Y/ tension):
11. No. of insulators per string and No. of strings per phase:
12. Year of construction/ commissioning:
13. Executing Agency:
14. Weather condition on the date of failure:
15. Terrain Category
16. Wind Zone (1/2/3/4/5/6) and velocity of wind:
17. Details of earthing of tower (pipe type/ Counter poise):
18. Line designed as per IS: 802 (1977/1995/ any other code):
19. The agency who designed the line:
20. Any special consideration in design:
21. Date and time of occurrence/ discovery of failure:
22. Power flow in the line prior to failure:
23. Any missing member found before/ after failure of towers:
24. Condition of foundation after failure:
25. Brief description of failure:
[alongwith photographs(if available), other
related information like tower schedule,
newspaper clipping for cyclone/ wind storm etc.]
26. Probable cause of failure:
27. Details of previous failure of the line/ tower:
28. Whether line will be restored on ERS or Space tower will be used:
29. Likely date of restoration:
30. Present Status:
31. Details of any Test carried out after failure:
32. Any other relevant information:

Profoma for details of equipment failure
(Information should be in detail and test reports should be furnished)

1. Name of Substation :
2. Utility/ Owner of substation :
3. Faulty Equipment :
4. Rating :
5. Make :
6. Sr. No. :
7. Year of manufacturing :
8. Year of commissioning :
9. Date and time of occurrence/ discovery of fault :
10. Fault discovered during :
(Operation/ maintenance)
11. Present condition of equipment :
12. Details of previous maintenance :
13. Details of previous failure :
14. Sequence of events/ Description of fault :
15. Details of Tests done after failure :
16. Conclusion/ recommendation :

Annexure – A.5

Rs. In Crore.

State	Name of Entity	Status	Funding Sought by Entity	Quantum of funding approved by Appraisal Committee (AC)	Quantum of funding approved by Monitoring Committee (MC)	Remarks/Actions taken by the States
Ar. Pradesh	DoP, AP	DPR submitted to CEA/NLDC- under examination of CEA – now it will be taken up in next meeting of the techno-economic sub-group	33.45	-	-	-
Assam	AEGCL	Scheme already approved by Monitoring Committee – MoP sanctioned awaited	382.48	299.37	299.37	NIT has already been called/published
Manipur	MSPCL	DPR submitted to CEA/NLDC- under examination of CEA – now it will be taken up in next meeting of the techno-economic sub-group	66.58	-	-	-
Meghalaya	Me. PTCL	Scheme already approved by Appraisal Committee & approval by Monitoring Committee is awaited	102.8	69.19 and recommended to MC	-	NIT is in progress and will be called/published soon
	Me. PGCL	DPR submitted to CEA/NLDC- under examination of CEA – now it will be taken up in next meeting of the techno-economic sub-group	48.16	-	-	-
Mizoram	DoP, Mizoram	Revised DPR submitted to CEA/NLDC- under examination of CEA – now it will be taken up in next meeting of the techno-economic sub-group	31.38	-	-	-
Nagaland	DoP, Nagaland	Scheme already approved by Monitoring Committee – MoP sanctioned awaited	39.96	39.96	39.96	NIT is in progress and will be called/published soon
Tripura	TSECL	Revised DPR submitted to CEA/NLDC- under examination of CEA – now it will be taken up in next meeting of the techno-economic sub-group	34.26			

Annexure-A.9

Details of Tripping of Inter-Regional Lines of NER-ER during April- June, 2015				
S. No.	Name of Transmission Line	Tripping Date and Time	Brief Reason/Relay Indication	Restoration Date and Time
1	400 kV Bongaigaon - New Siliguri II	4/4/2015 19:49	Bongaigaon- DP, ZI, B-E & New Siliguri- Not Furnished	4/6/2015 20:58
2	400 kV Bongaigaon - New Siliguri III	4/4/2015 20:38	Bongaigaon- DP, ZI, B-E & New Siliguri- Not Furnished	4/4/2015 21:05
3	400 kV Bongaigaon - New Siliguri IV	4/4/2015 21:50	Bongaigaon- DP, ZI, Y-E & New Siliguri- DP, ZI, Y-E	4/4/2015 22:22
4	400 kV Bongaigaon - New Siliguri III	4/8/2015 11:57	Bongaigaon- DP, ZI, B-E & New Siliguri- No tripping	4/8/2015 12:27
5	400 kV Bongaigaon - New Siliguri III	4/8/2015 18:00	Bongaigaon- DP, ZI, Y-E & New Siliguri- DP,ZI, Y-E	4/8/2015 18:10
6	400 kV Bongaigaon - New Siliguri IV	4/8/2015 18:00	Bongaigaon- DP, ZI, Y-E & New Siliguri- DP, Z2, R-Y-E	4/9/2015 13:15
7	400 kV Bongaigaon - New Siliguri III	4/10/2015 13:01	Bongaigaon- DP, ZI, B-E & New Siliguri- DP, ZI, B-E	4/10/2015 17:32
8	400 kV Bongaigaon - New Siliguri III	4/16/2015 9:51	Bongaigaon- DP, ZI, B-E & New Siliguri- DP, ZI, B-E	4/17/2015 18:28
9	400 kV Bongaigaon - New Siliguri IV	4/17/2015 23:02	Bongaigaon- DP, ZI, Y-E & New Siliguri- DP, ZI, R-Y-E	4/18/2015 12:32
10	400 kV Bongaigaon - New Siliguri III	4/22/2015 12:23	Bongaigaon- Direct trip received & New Siliguri- Overvoltage	4/22/2015 13:04
11	400 kV Bongaigaon - New Siliguri IV	5/2/2015 4:41	Bongaigaon- DP, ZI, Y-E & New Siliguri- DP, ZI, Y-E	5/2/2015 5:19
12	400 kV Bongaigaon - New Siliguri IV	5/4/2015 11:55	Bongaigaon- DP, ZI, B-E & New Siliguri- Not Furnished	5/4/2015 18:01
13	400 kV Bongaigaon - New Siliguri III	5/4/2015 16:42	Bongaigaon- Over Voltage & New Siliguri- Direct Trip	5/4/2015 20:14
14	400 kV Bongaigaon - New Siliguri III	5/5/2015 9:10	Bongaigaon- Direct Trip Received & New Siliguri- Over Voltage	5/7/2015 11:31
15	220 kV Birpara - Salakati II	5/7/2015 4:40	Birpara- DP, ZI, B-E & Salakati- DP, ZI, B-E	5/7/2015 5:51
16	220 kV Birpara - Salakati I	5/7/2015 18:52	Birpara- DP, ZII, R-E & Salakati- DP, ZI, R-E	5/7/2015 19:55
17	220 kV Birpara - Salakati II	5/7/2015 18:52	Birpara- DP, ZII, R-E & Salakati- DP, ZI, R-E	5/7/2015 20:06
18	400 kV Bongaigaon - New Siliguri III	5/7/2015 18:40	Bongaigaon- Direct Trip Received & New Siliguri- Over Voltage	5/7/2015 19:36
19	400 kV Bongaigaon - New Siliguri III	5/8/2015 17:09	Bongaigaon- Direct Trip Received & New Siliguri- Over Voltage	5/11/2015 10:58
20	220 kV Birpara - Salakati I	5/14/2015 23:29	Birpara- No tripping & Salakati- DP, ZI, R-E	5/15/2015 0:12
21	220 kV Birpara - Salakati II	5/14/2015 23:29	Birpara- DP, ZI, R-E & Salakati- DP, ZI, R-E	5/15/2015 0:27
22	400 kV Bongaigaon - New Siliguri III	5/18/2015 12:59	Bongaigaon- DP, ZI, R-E & New Siliguri- DP, ZI, R-E	5/18/2015 16:17
23	400 kV Bongaigaon - New Siliguri III	5/19/2015 14:11	Bongaigaon- DP, ZI, R-E & New Siliguri- DP, ZI, R-E	5/19/2015 19:41
24	400 kV Bongaigaon - New Siliguri III	5/20/2015 8:32	Bongaigaon- DP, ZI, R-E & New Siliguri- DP, ZI, R-E	5/23/2015 20:58
25	400 kV Bongaigaon - New Siliguri IV	5/20/2015 13:16	Bongaigaon- DP, ZIII, B-E & New Siliguri- Not Furnished	5/20/2015 13:54
26	220 kV Birpara - Salakati II	5/23/2015 19:59	Birpara- DP, ZI, B-E & Salakati- DP, ZII, B-E	5/23/2015 20:48
27	400 kV Bongaigaon - New Siliguri IV	5/23/2015 20:30	Bongaigaon- DP, ZI, Y-E & New Siliguri- DP, ZI, Y-E	5/24/2015 11:15

Annexure-A.9

Details of Tripping of Inter-Regional Lines of NER-ER during April- June, 2015				
S. No.	Name of Transmission Line	Tripping Date and Time	Brief Reason/Relay Indication	Restoration Date and Time
28	400 kV Bongaigaon - New Siliguri III	5/23/2015 21:38	Bongaigaon- DP, ZII, Y-E & New Siliguri- Not Furnished	5/23/2015 23:33
29	220 kV Birpara - Salakati I	5/24/2015 8:18	Birpara- Not Furnished & Salakati- DP, ZI, R-E	5/24/2015 9:03
30	400 kV Bongaigaon - New Siliguri III	5/26/2015 3:28	Bongaigaon- Direct Trip received & New Siliguri- Over Voltage	5/31/2015 9:27
31	220 kV Birpara - Salakati I	5/30/2015 9:18	Birpara- Not Furnished & Salakati- DP, ZII, R-Y-E	5/30/2015 11:23
32	220 kV Birpara - Salakati II	5/30/2015 9:18	Birpara- Not Furnished & Salakati- DP, ZII, R-Y-E	5/30/2015 11:35
33	400 kV Bongaigaon - New Siliguri IV	6/1/2015 21:44	Bongaigaon: DP, ZI, Y-E & New Siliguri: DP, ZI, Y-E	6/1/2015 22:13
34	220 kV Birpara - Salakati I	6/4/2015 2:44	Birpara: Earth Fault, R-ph & Salakati: Earth Fault, R-ph	6/4/2015 13:09
35	220 kV Birpara - Salakati II	6/4/2015 2:44	Birpara: Earth Fault, Y-ph & Salakati: Earth Fault, Y-ph	6/4/2015 13:20
36	220 kV Birpara - Salakati I	6/7/2015 0:13	Birpara: DP, ZI, R-E & Salakati: DP, ZI, R-E	6/7/2015 0:57
37	220 kV Birpara - Salakati II	6/7/2015 0:13	Birpara: DP, ZI, R-E & Salakati: DP, ZI, R-E	6/7/2015 0:58
38	400 kV Bongaigaon - New Siliguri IV	6/7/2015 1:29	Bongaigaon: DP, ZI, Y-E & New Siliguri: Not Furnished	
39	220 kV Birpara - Salakati I	6/7/2015 7:00	Birpara: DP, ZI, B-E & Salakati: No tripping	6/7/2015 9:12
40	220 kV Birpara - Salakati II	6/7/2015 22:25	Birpara: DP, ZI, R-E & Salakati: DP, ZI, R-E	6/7/2015 22:53
41	400 kV Bongaigaon - New Siliguri IV	6/8/2015 1:29	Bongaigaon: Not Furnished & New Siliguri: DP, ZI, Y-E	6/12/2015 9:46
42	220 kV Birpara - Salakati I	6/9/2015 3:35	Birpara: DP, ZI, Y-E & Salakati: DP, ZI, Y-E	6/9/2015 4:14
43	220 kV Birpara - Salakati II	6/9/2015 3:35	Birpara: DP, ZI, Y-E & Salakati: DP, ZI, Y-E	6/9/2015 4:15
44	400 kV Bongaigaon - New Siliguri II	6/9/2015 22:20	Bongaigaon: Not Furnished & New Siliguri: DP, ZI, R-E	6/9/2015 22:59
45	220 kV Birpara - Salakati I	6/9/2015 22:38	Birpara: Not Furnished & Salakati: DP, ZI, R-E	6/9/2015 23:13
46	220 kV Birpara - Salakati II	6/9/2015 22:38	Birpara: Not Furnished & Salakati: DP, ZI, R-E	6/9/2015 23:44
47	220 kV Birpara - Salakati I	6/12/2015 23:25	Birpara: Not Furnished & Salakati: DP, ZI, R-Y-B	6/13/2015 0:07
48	220 kV Birpara - Salakati II	6/12/2015 23:25	Birpara: Not Furnished & Salakati: DP, ZI, Y-B-E	6/13/2015 14:05
49	400 kV Bongaigaon - New Siliguri III	6/26/2015 12:21	Bongaigaon: DP, ZI, B-E & New Siliguri: DP, ZII, B-E	6/26/2015 14:27