भारत सरकार Government of India
विद्युत मंत्रालय Ministry of Power
उत्तर पूर्वी क्षेत्रीय विद्युत समिति
North Eastern Regional Power Committee
मेघालया स्टेट हाउसिगं फिनांस को- आपरेटिव सोसायटी लि. बिल्डिगं
Meghalaya State Housing Finance Co-Operative Society Ltd. Building
नांग्रिम हिल्स, शिलोंग - ७९३००३
Nongrim Hills, Shillong – 793003.

ISO 9001:2008

Ph. No: 0364 - 2520050
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Website: www.nerpc.nic.in

No. NERPC/SE (O)/PCC/2014/**2018-2053** Dated: September 22, 2014

To,

1. Managing Director, AEGCL, Bijuli Bhawan, Guwahati – 781 001
2. Managing Director, APDCL, Bijuli Bhawan, Guwahati – 781 001
3. Managing Director, APGCL, Bijuli Bhawan, Guwahati – 781 001
4. Director (Generation), Me. PGCL, Lumjingshai, Short Round Road, Shillong – 793 001
5. Director (Distribution), Me. ECL, Lumjingshai, Short Round Road, Shillong – 793 001
6. Director(Transmission), Me. PTCL, Lumjingshai, Short Round Road, Shillong – 793 001
7. Managing Director, MSPDCL, Electricity Complex, Keishampat, Imphal – 795 001
8. Managing Director, MSPCL, Electricity Complex, Keishampat, Imphal – 795 001
9. CGM, (LDC), SLDC Complex, AEGCL, Kahilipara, Guwahati-781 019
10. Chief Engineer (WE Zone),Department of Power ,Govt. of Arunachal Pradesh, Itanagar- 791111
11. Chief Engineer (EE Zone),Department of Power, Govt. of Arunachal Pradesh, Itanagar- 791111
12. Chief Engineer (TP&MZ),Department of Power, Govt. of Arunachal Pradesh, Itanagar- 791111
13. Engineer-in-Chief (P&E), Department of Power, Govt. of Mizoram, Aizawl – 796 001
14. Chief Engineer (P), Department of Power, Govt. of Nagaland, Kohima – 797 001
15. General Manager, TSECL, Agartala – 799 001
16. Group General Manager, NTPC, Bongaigoan Thermal Power Project, P.O. Salakati, Kokrajhar- 783369
17. ED, NERTS, PGCIL, Dongtieh-Lower Nongrah, Lapalang, Shillong -793 006
18. ED (O&M), NEEPCO Ltd., Brookland Compound, Lower New Colony, Shillong-793003
19. ED (Commercial), NEEPCO Ltd., Brookland Compound, Lower New Colony, Shillong-793003
20. ED (O&M), NHPC, NHPC Office Complex, Sector-33, Faridabad,Haryana-121003
21. GM (Plant), OTPC, Badarghat Complex, Agartala, Tripura - 799014
22. GM, NERLDC, Dongtieh, Lower Nongrah, Lapalang, Shillong -793 006
23. Member Secretary, ERPC, 14 Golf Club Road, Tollygunge, Kolkata-700033
24. Chief Engineer, GM Division, Central Electricity Authority, New Delhi – 110066

Sub: Minutes of the 25th PCC Meeting - Reg.

Sir,

The Minutes of the 25th PCC Meeting of NERPC held on 09.09.2014 at "Hotel Nandan", Guwahati is enclosed for favour of kind information and necessary action please**.**

Any comments or observations may kindly be communicated at the earliest.

With warm regards,

Encl: As above

भवदीय / Yours faithfully,

बी. लिंगखोइ

बि. लिंगखोइ / B. Lyngkhoi
निदेशक **/ Director/ SE**

Copy to:

1. CGM, AEGCL, Bijuli Bhavan, Guwahati - 781001
2. CGM, APGCL, Bijuli Bhavan, Guwahati - 781001
3. CGM, DISCOM, Bijuli Bhavan, Guwahati - 781001
4. Head of SLDC, Me.ECL, Lumjingshai, Short Round Road, Umjarain, Shillong – 793 022
5. Head of SLDC, Department of Power, Govt. of Arunachal Pradesh, Itanagar- 791 111
6. Head of SLDC, Department of Power, Dimapur, Nagaland
7. Head of SLDC, Electricity Department, Govt. of Manipur, Keishampat, Imphal – 795 001
8. Head of SLDC, Department of Power, Govt. of Mizoram, Aizawl – 796 001
9. Head of SLDC, TSECL, Agartala – 799 001
10. Chief Engineer(Elect), Loktak HEP,Vidyut Vihar, Kom Keirap, Manipur- 795124
11. Addl. GM (EED), NTPC Ltd., Bongaigoan Thermal Power Project, P.O. Salakati, Kokrajhar- 783369
12. DGM (C&M), OTPC, 6th Floor, A-Wing, IFCI Tower -61, Nehru Place, New Delhi – 110019.

वी. लिंगारेड्डी

निदेशक / **Director/ SE**

North Eastern Regional Power Committee

MINUTES OF THE 24th PROTECTION COORDINATION SUB-COMMITTEE MEETING OF NERPC

Date : 09/09/2014 (Tuesday)
Time : 14:00 hrs
Venue : "Hotel Nandan", Guwahati.

The List of Participants in the 24th PCC Meeting is attached at **Annexure – I**

Shri B. Lyngkhoi, SE (Operation), NERPC welcomed all the participants to the 25th PCC meeting. He expressed concerned about the less participants of the members in PCC sub-committee. He stated that the full participants are only in the OCC sub-committee, whereas the other sub-committee like PCC, CC meetings is not at all satisfied. He stated that many important issues are to be discussed especially grid incidences, but the meeting cannot resolved fully due to absence from many of the constituent states. He informed that after the request by many of the constituents to host the PCC meeting separately so that issues can be discussed in thread bear and hence NERPC has arranged the meeting accordingly. He requested all the constituents to look into the matter seriously and hoped that in future participants to other sub-committee should be in full capacity. He mentioned that issue of Transmission Availability shall be discussed thoroughly in this meeting so that the same can be fined tuned in coming OCC meeting. He then requested all the members to actively participate in the meeting for fruitful outcome of the meeting.

Thereafter, the agenda items for discussion were taken up.

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 24th MEETING OF PROTECTION SUB-COMMITTEE OF NERPC.

The minutes of 24th meeting of Protection Sub-committee held on 12th August, 2014 at Guwahati were circulated vide letter No. NERPC/SE (O)/OCC/2014/1695-1730 dated 22nd August, 2014.

NERLDC vide mail dated 24.08.2014 has communicated their observations in respect of 24th PCC minutes of the meeting as below:

On Item No. A.1 under Sustained Oscillations in NER on 5th July, 2014 at 00:24 hrs.

Recorded:

The sub-committee is of the view that since PMUs are already installed in NER, the question of providing data to NERLDC is not required since the same can be obtained from these PMUs, hence NERLDC should explore from the facilities availed in the PMUs.

To be recorded:

"PMUs are not installed at all the locations of NER. PMUs installed at NER may indicate only behavior of system parameters at those locations only. 40 ms interval PMU data are available which are not sufficient to diagnose the problem. As such, output of DR, Event Logger, Fault Locator & Data Acquisition system of the elements are required for root cause analysis. After each triggering, output of DR, Event Logger, Fault Locator & Data Acquisition system of the elements will be sent to NERLDC within 24 hours for root cause analysis".

NERLDC wanted to include on Item No. B.2 under root cause of tripping of ISTS elements due to problem in downstream system and the issue relating to TAC as discussed in 24th PCC meeting as below:

SE (O) informed that as per Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014-19, the Transmission System Availability factor for a calendar month (TAFM) w.e.f. 1st April, 2014 shall be calculated by the respective transmission licensee, got it verified by the concerned RLDC and certified by the Member Secretary, Regional Power Committee of the region concerned, separately for each AC and HVDC transmission system. He highlighted some of the important points on the regulation regarding transmission availability calculations as follows:

- For Ac system, two trippings per year shall be allowed
- After two trippings in a year, additional 12 hours outage shall be considered in addition to the actual outage
- In case of outage of a transmission element affecting evacuation of power from the generating station, outage hour shall be multiplied by a factor of 2.

The weightage factor for each category of transmission elements shall be calculated as per regulation.

DGM, NERLDC informed that if the tripping of ISTS elements are due to problem in state system then state power utility have to agree for this. Moreover, tripping of these ISTS elements reduces reliability of the system and the grid may be in vulnerable condition. State power utilities are required to take appropriate action to prevent this type of problems. The tripping beyond 1 hop should also be critically analyzed for the same reason.

With the above amendments, the sub-committee confirmed the minutes of 24th PCC meeting as no other observations or comments were received from the constituents.

ITEMS FOR DISCUSSION

A.1 Implementation of 3-phase Auto Reclosure Scheme in all lines connected to Khandong and Kopili HEP:

There are several instances of 3-Phase Successful Auto Reclosure of 132kV Badarpur-Khlieriat line of Powergrid. Now, in NER, the various 132kV lines connected to Kopili and Khandong HEP are passing through the areas having high isokeraunic level for which Single & Multi Phase Tripping on account of lightening occurs. Hence, for reliable operation of Power system it is required to implement 3-Phase Auto Reclosure Scheme in all the 132kV lines connected to Kopili and Khandong HEP of NEEPCO. The lists of such lines are:

a) 132kV Khliehriat – Khandong # 1
b) 132kV Khliehriat – Khandong # 2
c) 132kV Haflong – Khandong
d) 132kV Kopili – Khandong # 1
e) 132kV Kopili – Khandong # 2

During 24th PCC meeting, NEEPCO initially expressed objection considering stress on their machine during 3-Phase reclosing on persisting fault in line. DGM, NERTS explained the function of 3-Phase Auto Reclosure Scheme and clarified NEEPCO that Khandong end will be selected as Check Synchronizing Mode in such case the question of 3-Phase reclosing of CB on persisting at Khandong end does not arise. The representatives of NEEPCO understood the scheme and appreciated the explanation on the matter.

After deliberation, SE(O), NERPC instructed to implement the scheme for above lines for better performance of NER Grid.

Deliberation of the sub-Committee

NEEPCO representatives informed the members that the scheme is agreed in principle but the breakers need replacement. The breakers have been procured accordingly and they are expected to be replaced by December 2014 / January 2015 by obtaining shut down.

It was discussed that charging of any feeder at Khandong through transfer bus is not possible because of lower capacity of main bus conductor. Strengthening of Khandong bus has already been discussed in earlier RPC forum. NEEPCO will intimate the status by next OCC & expedite thereof.

POWERGRID intimated that meanwhile 3phase auto-reclosure will be implemented for the circuits given below:

1) 132kV Khandong –Khliehriat-II
2) 132kV Kopili-Khandong-II where both end bays are owned by POWERGRID and relays and CBs are suitable for TPAR

The sub-committee noted as above.

A.2 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)

In the 99th OCC meeting, members agreed to the proposal of NERTS (**for A.1 & A.2** above). NEEPCO representative informed that they will make a study on the issue and revert back in the next OCC.

During 24th PCC meeting, representatives from NEEPCO and AEGCL agreed to the proposal. The status may be reviewed in next PCC/ OCC meeting.

Deliberation of the sub-Committee

NEEPCO representatives informed the members that wiring problems are experienced in the above lines. Design cell of NEEPCO has been intimated for rectification of the same and response is awaited. Proposal for implementation of the scheme is to be finalized by Engineering Cell and exact status may be intimated in next OCC / PCC meeting.

DGM, NERTS informed the members that 3-Phase Auto Reclosure scheme with dead line charging at Nirjuli is already implemented.

The sub-committee noted as above.

A.3 Implementation of islanding scheme in NER

During the 94thOCC meeting, the committee had decided the following islanding scheme and associated frequencies levels for creation of islands in NER:

SN	Islanding Scheme	Lines required to be opened	UFR Location	Implementing Agency
1	**ISLAND AT 48.80 Hz with 5 Sec delay:** Island comprising of generating units of AGBPP (Gas), NTPS (Gas) & LTPS (Gas) and loads of Upper Assam system & Deomali area (Ar. Pradesh) **[Total Generation: 380-400MW and load: 200MW (off peak)-300MW (peak)]**	(a) 220 kV New Mariani (PG) – AGBPP	UFR-1 [At New Mariani (PG)]	**PGCIL**
		(b) 220 kV Mariani – Misa	UFR-2 [At Mariani, Samaguri of AEGCL]	**AEGCL**
		c) 220 kV Mariani – Samaguri		
		(d) 132 kV Mokokchung – Mariani		
		(e) 132 kV Dimapur (PG) – Bokajan	UFR-3 [At Dimapur (PG)]	**PGCIL**
		(f) Generators to be desynchronized for reduction of generation [if Generation > Load in the islanded pocket]		

		(g) De-synchronization / isolation of one GT and one ST from each of two modules of AGBPP, which are in operation, leading to reduction of generation of about 80-90 MW [i.e each module will contribute to reduction of about 40-45 MW (GT:30MW+ST:15MW)].	At AGBPP [UFRs of line bays & Generator to be used]	**NEEPCO**
		(h) Lines required to be opened for load shedding of 30MW (off-peak) and 50MW (peak) [if load > generation in the islanded pocket]		
		(i) 132kV Tinsukia – Ledo S/C line (at 48.7Hz instantaneous).	UFR [At Tinsukia]	**AEGCL**
		(j) 66kV Tinsukia – Rupai S/C line (at 48.6Hz instantaneous)		**AEGCL**
		(k) 132kV Jorhat – Bokakhat line (at 48.5Hz instantaneous)	UFR [At Jorahat / Bokakhat]	**AEGCL**
2	**<u>ISLAND AT 48.50 Hz with 5 Sec delay :</u>** Island comprising of generating units of AGTPP (Gas), generating units at Baramura (Gas), Rokhia (Gas) & Gumati (Hydro) and loads of Tripura system & Dullavcherra area (Assam) **[Total Generation: 150-160MW and load: 110MW (off-peak) &170-180MW (peak)]**	132 kV Palatana – Udaipur	UFR-1 [At Palatana]	**OTPC**
		132 kV Palatana – Surjamani Nagar		
		132 kV Silchar – Dullavcherra	UFR-2 [At Silchar]	**PGCIL**
		132 kV AGTPP – Kumarghat	UFR-3 [At Kumarghat]	**PGCIL**
		132 kV P K Bari – Kumarghat		
3	**<u>ISLAND AT 47.90 Hz:</u>** Isolation of NER from NEW grid at ER-NER boundary with rest of the generation and load of NER	To be decided after system study		

The following officers were nominated for the meeting of the subgroup:

Assam: Sh. Gunajit Bhuyan, AGM (MRT) & Sh. Ashutosh Bhattacharji, Mgr
Meghalaya: Sh. F.E. Kharshiing, SE, SLDC & Sh. H. Shangpliang, EE (MRT)
PGCIL: Sh. P. Kanungo, DGM, Sh. M. Madhavan, Mgr & Sh. Supriya Paul, Dy Mgr
NEEPCO: Sh. Tanya Taji, Sr. Mgr & Sh. Jaypal Roy, Mgr.
NERLDC: Sh. P.P. Bandapodhyay, DGM & Sh. A. Mullick, CM
NERPC: Sh. B. Lyngkhoi, SE(O) and Sh. S.M. Jha, EE(O)
OTPC: Sh. S. R. Das, Mgr (E)

In the meeting of Operation and Protection sub-group, it was brought to the notice that most of UFRs associated with two islanding schemes not operated and it was decided to reduce the time delay setting of UFR to 2 sec (in place of 5 sec). Assam had informed that there is some change in load connected with NTPS and subgroup had requested Assam to provide details of connected load. Assam & NEEPCO was also requested to intimate about the low frequency setting for tripping of Gas based Generators at NTPS (of Assam), at AGBPP & AGTPP (of NEEPCO) and to intimate frequency at which machines at NTPS, AGBPP & AGTPP tripped on 19-03-2014 so that the matter can be discussed further.

During the meeting the DGM, POWERGRID suggested to reduce the time delay setting of UFR to 500ms instead of 2 sec as proposed in last subgroup meeting. The subcommittee felt that following information should be collected before deciding about the final setting of UFRs.

During 24th PCC meeting, the issue has been discussed in thread bear and the status is as given below:

1. <u>ISLAND AT 48.80 Hz with 5 Sec delay</u>:

Island comprising of generating units of AGBPP (Gas), NTPS (Gas) & LTPS (Gas) and loads of Upper Assam system & Deomali area (Ar. Pradesh)

[Total Generation: 380-400MW and load: 200MW (off peak)-300MW (peak)]

A. POWERGRID, NERTS has to implement the revised time setting of UFR from existing 5 Secs to 500 ms for the following lines:

a) 220 kV New Mariani (PG) – AGBPP, at New Mariani (PG)

DGM, NERTS informed that the UFR will be installed by mid-week of September 2014. Relay setting of the same will be delayed by 500 ms.

B. AEGCL has to implement the revised time setting of UFR from existing 5 Sec to 500 ms for the following lines:

b) 220 kV Mariani – Misa, at Mariani

c) 220 kV Mariani – Samaguri, at Samaguri

d) 132 kV Mokokchung – Mariani, at Mariani

On request of AEGCL, DGM, NERTS agreed to help for implementation of revised time setting of UFR from existing 5 Sec to 500 ms at Mariani by September 2014.

(e) 132 kV Dimapur (PG) – Bokajan, at Dimapur (PG)

DGM, NERTS informed that the UFR will be installed by mid-week of September 2014. Relay setting of the same will be delayed by 500 ms.

C. NEEPCO has to implement the revised time setting of UFR from existing 5 Sec to 500 ms for the following generation:

(f) Generators to be desynchronized for reduction of generation [if Generation Load in the islanded pocket]

(g) De-synchronization / isolation of one GT and one ST from each of two modules of AGBPP, which are in operation, leading to reduction of generation of about 80-90 MW [i.e each module will contribute to reduction of about 40-45 MW (GT:30MW+ST:15MW)]

The scheme is proposed to be implemented at AGBPP utilizing UFRs of line bays & Generator.

Sr. Mgr., NEEPCO stated that matter will be looked into and the status would be intimated in the next PCC meeting.

(h) Lines required to be opened for load shedding of 30MW (off-peak) and 50MW (peak) [if load > generation in the islanded pocket]

(i) 132kV Tinsukia – Ledo S/C line (at 48.7Hz instantaneous) at Tinsukia

(j) 66kV Tinsukia – Rupai S/C line (at 48.6Hz instantaneous) at Tinsukia

(k) 132kV Jorhat – Bokakhat line (at 48.5Hz instantaneous) at Jorhat/Bokakhat

The above settings are existing setting based on frequency discrimination. Representatives of AEGCL opined some delay in tripping based on time discrimination and proposed to include 200ms and 100ms delay for 132kV Tinsukia – Ledo S/C line and 66kV Tinsukia – Ledo S/C line respectively. DGM, NERTS stated that once the island is formed immediate load generation balancing is essential for survival of the island and so the additional delay will be detrimental as delay by frequency discrimination already exists. He further informed that NERLDC as system operator may study and suggest the setting for above three lines.

It was agreed that the time delay setting of islanding scheme at 48.80 Hz will be reduced to 500ms instead of 5 Sec. AEGCL was requested to furnish the relay setting and CB response time for NTPS. NEEPCO was also requested to furnish the same for AGBPP.

NERLDC may inform the forum about the settings to be adopted for above three lines in next PCC Meeting.

2. <u>ISLAND AT 48.50 Hz with 5 Sec delay</u> :

Island comprising of generating units of AGTPP (Gas), generating units at Baramura (Gas), Rokhia (Gas) & Gumati (Hydro) and loads of Tripura system & Dullavcherra area (Assam)

[Total Generation: 150-160MW and load: 110MW (off-peak) &170-180MW (peak)]

A. POWERGRID, NERTS has to implement the revised time setting of UFR from existing 5 Sec to 500 ms for the following lines:

(a) 132 kV Silchar – Dullavcherra, at Silchar
(b) 132 kV P.K. Bari – Kumarghat, at Kumarghat
(c) 132 kV AGTPP – Kumarghat, at Kumarghat

DGM, NERTS informed that the revised timing will be implemented by mid-week of September 2014.

B. OTPC has to implement the revised time setting of UFR from existing 5 Sec to 500 ms for the following lines:

(d) 132 kV Palatana – Udaipur, at Pallatana
(e) 132 kV Palatana – Surjamani Nagar, at Pallatana

OTPC agreed to revise the timing by mid-week of September 2014.

3. ISLAND AT 47.90 Hz:

Isolation of NER from NEW grid at ER-NER boundary with rest of the generation and load of NER.

To be decided after system study.

It was agreed that the time delay setting of islanding schemes at 48.50 Hz and 47.90 Hz will be reduced to 500ms instead of 5 Sec. It was agreed to form a study group after getting detail of relay setting from Pallatana.

Further, any subsequent study by the study group after getting detail of relay setting from Pallatana will be taken up in parallel. A suitable date of meeting will be fixed after obtaining the relevant issue / data pertaining to the above islanding schemes.

Deliberation of the sub-Committee

POWERGRID informed that the revised time settings have already been implemented for the aforesaid lines which belong to POWERGRID.

The Sub-committee agreed to have a system study group to study the issues of Islanding Scheme in detail. The system study group will also finalize the settings required for Palatana SPS Case II & III. Exact date and venue will be intimated by NERPC/ NERLDC.

A.4 Testing of protective relays of downstream system of 132kV Khliehriat (Me.ECL) Sub Station:

All downstream faults of 132kV Khliehriat (Me.ECL) Sub Station gets reflected to 132kV Khliehriat (PG) Sub Station causing greater isolation of system. Hence, it is essential that Me.ECL should carry out testing of downstream Relays at 132kV Khliehriat (Me.ECL) Sub Station and based on the condition of relays further course

of action may be decided. In case the relays are found defective POWERGRID will revise the existing relay setting at 132kV Khliehriat (PG) Sub Station in such a way that expedite tripping of both 132kV Khliehriat – Khliehriat Line # 1 & 2 occurs during downstream fault to avoid undesirable isolation of Lines at upstream.

It was decided in the 99th OCC meeting that POWERGRID and Me.ECL will conduct a joint inspection and checking of relays on 25/07/2014 to identify the problems and suggest remedial action.

During 24th PCC meeting, representatives from Me. PTCL informed the members that relays in some of the feeders have been tested and the settings are also checked. Detail reports may be submitted within one month after necessary correction/ rectification of setting. Me. PTCL agreed to pursue with concerned officer so that relay setting of 132kV Khliehriat - Khliehriat (PG) Line can be modified.

DGM, POWERGRID intimated the forum that refection of fault in downstream lines connected to 132kV Khliehriat (Me.ECL) Sub Station still persists to NER Grid through 132kV Khliehriat (Me.ECL) – Khliehriat (PG) Line 1 & 2 which causes multiple tripping of other healthy lines of NER Grid. DGM, POWERGRID further informed that the relay setting of 132kV Khliehriat (Me.ECL) – Khliehriat (PG) Line 1 & 2 will be minimized and inter-tripping of Line 1 & 2 will be made so that during any disturbance in Meghalaya downstream system immediate isolation of Meghalaya System from NER Grid at Khliehriat (PG) can be done to avoid undesirable tripping of upstream healthy lines in Grid. Such contingent arrangement will remain in place till the protection and switchgear of MeECL System is not made healthy.

Further, DGM, POWERGRID informed that the existing earthing system of 132kV Khliehriat (Me.ECL) Sub Station requires lots of improvement to meet the present practice / requirement of Earthing. He further informed that the power supply module of Distance Relay of POWERGRID installed at Me.ECL Station in 132kV Khliehriat – Khliehriat Line # 1 already burnt twice during lightening due to poor earthing. Thus, unless improvement of earthing is done the replacement / rectification of relay will not help. Meanwhile, a joint review of earthing of 132kV Khliehriat (Me.ECL) Sub Station has already been done by POWERGRID and Me.ECL and the report will be submitted to NERPC shortly.

Deliberation of the sub-Committee

Me.ECL representatives informed the members that relays in NEHU and NEIGRIHMS feeders have been tested. Lumshnong feeder may be tested during proposed shutdown on 24.09.2014.

Further, it was informed that a proposal has been made to identify new site for proper earthing of Khliehriet sub-station. Latest status may be intimated in next PCC.

It was requested to highlight the joint inspection report in next PCC meeting and the same may also be highlighted in CERC hearing.

Further POWERGRID informed that till protection system, switchgear & earthing system are improved, relay setting of Khliehriat (PG)-Khliehriat (Me.ECL) Ckt-1&2 will be minimized along with inter-tripping of both ckts at PG end to avoid reflection of downstream fault of Me.ECL Network in to 132kV NER upstream Grid viz Khandong (NEEPCO) & Khliehriat (PG bus)

The sub-Committee noted as above.

A.5 Intermittent Tripping of the 132kV Haflong – Jiribam Line due to construction activity by APDCL:

The 132kV Haflong – Jiribam line has tripped in the following occasions due to poor electrical clearance with a 33kV Line being constructed by APDCL.

Sl No.	Date of Tripping	Time of Tripping	Fault in the span	Village
1.	14.06.14	11:04	Loc.82- Loc.83	Reco Village
2.	15.06.14	09:22	Loc.82- Loc.83	--do--
3.	01.07.14	13:05	Loc.79- Loc.80	--do--

It is learnt that the 33 kV Haflong – Harangajao line is being diverted to facilitate construction of 4-Lane Highway. The diverted line crosses our 132 kV Haflong – Jiribam Line at more than one place. But APDCL has not informed POWERGRID about the proposed diversion of their line crossing the 132kV Line. Following the fault distance shown by relay, our patrolling party found conductors being strung beneath our 132 Line in a dangerous way causing faults.

APDCL may consult POWERGRID beforehand to carry out such construction activities in the vicinity of POWERGRID's EHV Lines.

In the 99th OCC meeting, Assam representative assured that they will take up corrective measures and report to NERPC.

Deliberation of the sub-Committee

AEGCL representatives informed the members that the issue has been resolved.

The sub-Committee noted as above.

A.6 Root cause analysis of tripping of ISTS elements due to problem in downstream system:

It has been observed that in many instances the tripping of ISTS elements is attributed due to problems in downstream system of state. Due to tripping of these ISTS elements, reliability of the system is reduced. Root cause of tripping of the elements within the state are required to be analyzed and the concerned state also may confirm the same as tripping is now related to availability of the ISTS elements. The tripping beyond 1 hop should also be critically analyzed for the same reason.

Deliberation of the sub-Committee

NERLDC informed that if the tripping of ISTS elements are due to problem in state system then state power utility have to agree for this. The tripping beyond 1 hop should also be critically analyzed for the same reason and outage attributable is to be decided by PCC sub-committee forum.

The sub-committee noted as above.

A.7 Outage of entire Power Station:

Due to tripping of Station Transformer of AGBPP at 2129 Hr of 28.08.14, there was total generation loss (190 MW) of AGBPP. Status of other Station Transformer of AGBPP at the time of tripping & reason of tripping of the Station Transformer of AGBPP is to be discussed as the matter is very serious.

At 0426 Hr on 28.08.14, 132 kV AGTPP - Agartala I & II, 132 kV AGTPP-Kumarghat, 132 kV Agartala - Rokhia I & II, 132 kV Agartala - Surajmaninagar I, 132 kV Surajmaninagar - Budhjungnagar I & II & 132 kV Palatana-Surajmaninagar lines tripped. Due to tripping of 132 kV AGTPP - Agartala I & II, 132 kV AGTPP- Kumarghat lines, there was total generation loss (73 MW) of AGBPP.

Deliberation of the sub-Committee

AGBPP: - NEEPCO representatives informed the members that on 28.08.14, Station transformers 1 & II were charged from same bus resulting in operation of LBB protection. One of the station transformers was therefore disconnected resulting in failure of auxiliary supply which causes tripping of the generating station.

The sub-Committee noted as above and agreed that proper care should be taken to prevent such incidences in future.

AGBPP: - Referred to OCC meeting.

A.8 Transmission Availability verification for ISTS elements:

Availability certification of ISTS elements – POWERGRID & NETC submitted outage reports of their lines for certification for the first time for this control period i.e. 2014-19. Being the first certificate to be issued for the control period 2014-19 the same may be thoroughly deliberated by the constituents vis a vis the new tariff regulation so that any inadvertent mistake can be detected & corrected before issuance of certificate by NERPC.

Procedure for calculation of Transmission system availability factor for a month as per CERC Regulation 2014-19.

As per Central Electricity Regulatory Commission (Terms and conditions of Tariff) Regulations, 2014-19 .Transmission System Availability factor for a calendar month (TAFM) w.e.f. 1st April 2014 shall be calculated by the respective transmission licensee, got verified by the concerned RLDC and certified by the Member Secretary, Regional Power Committee of the region concerned separately for each AC and HVDC transmission system.

The important points on the regulation are as follows:

1. For AC System, two trippings per year shall be allowed.
2. After two trippings in a year additional 12 hrs outage shall be considered in addition to the actual outage.
3. In case of outage of a transmission element affecting evacuation of power from a generating station, outage hour shall be multiplied by a factor of 2.

Clarification: whether those transmission elements connected to generators only shall be considered or transmission elements not connected with generator but generation loss occurred due to such trippings. Certification of loss of generation may be certified by NERLDC/NERPC

4. The weightage factor for each category of transmission elements shall be as under:

a. For each circuit of AC line- Surge Impedance Loading (SIL) for uncompensated line multiplied by ckt-km.

Clarification: whether transmission elements of mixed conductor type lower SIL shall be considered. Spare ICT/ reactor etc. will not be considered for certification. Line for loop in/loop out lines and contingency scheme actual line length and SIL will be taken.

b. For compensated line, Surge Impedance Loading shall be as certified by the Regional Power Committee Secretariat considering the compensation on the line.

Clarification: Reactive compensation is considered irrespective of ownership of the reactive elements on line. For Static VAR Compensator fixed compensation shall be taken in calculation, whereas for TCSC like variable compensation, Average of percentage compensation shall be taken in calculations. For combined (fixed plus variable) compensation, fixed plus average of variable compensation will be considered.

c. For shunt compensated line the reduced value of SIL shall be in accordance with the location of the reactor. Similarly, in case of the lines with series compensation the higher SIL shall be taken as per the percentage of compensation.

5. The availability for each category transmission elements shall be calculated based on the weightage factor, total hrs under consideration and non-available hrs for each element of that category. The formulae for calculation of Availability of each category of the transmission elements are as per Appendix-V.

Clarification: If planned maintenance approved in OCC and the transmission licensee failed to avail on that day and availed on some other day what will be the status.

6. The Transmission elements under outage due to following reasons shall be deemed to be available:

a. Shut down availed for maintenance or construction of elements of another transmission scheme. If the other transmission scheme belongs to the transmission licensee, the Member Secretary, RPC may restrict availability period to that considered by him for the work involved.

b. Switching off of a transmission line to restrict over voltage and manual tripping of switched reactors as per the direction of RLDC.

7. Outage time of transmission elements for the following contingencies shall be excluded from the total time of the element under period of consideration.

a. Outage of elements due to acts of God and force major events beyond the control of the transmission licensee. However, onus of satisfying the Member Secretary, RPC that the element outage was due to aforesaid events and not due to design failure shall rest with the transmission licensee. A reasonable restoration time for the element shall be considered in accordance with Central Electricity Regulatory Commission (Standard of Performance of inner-State transmission licensees|) Regulations, 2012 as amended from time to time and any additional time taken by the transmission licensee for restoration of the element beyond the reasonable time shall be treated as outage time attributable to the transmission licensee. Circuits restored through ERS (Emergency Restoration System) shall be considered as available.

Clarification: Tripping due to lightening, thunderstorm and other reason like flood, earthquake etc. NERLDC/NERPC may certify the same.

b. Outage caused by grid incident/disturbance not attributable to the transmission licensee, e.g. Faults in substation or bays owned by the other agency causing outage of the transmission licensee's elements and tripping of lines, ICTs, HVDC, etc. due to grid disturbance. However, if the element is not restored on receipt of direction from RLDC while normalizing the system following grid incident/disturbance within reasonable time, the element will be considered not available for the period of outage after issuance of RLDC's direction for restoration.

Some of the suggestions are given below for further discussion and finalization:

1. Submission of outage data of the month to NERLDC by the transmission licensee pertaining to previous month (say data of January shall be submitted by February)
2. Verification of duration of outage by NERLDC after receiving outage data of the month from the transmission licensee for verification of reasons of outage and ascertaining whether outage is attributable to transmission licensee or others (say by 1st week of March).
3. Simultaneously place the data in next OCC of NERPC for identifying the outages which caused generator backing down (say by 1st week of March)
4. Outcome/decision of PCC meeting and OCC meeting shall be intimated to NERLDC within a week after the meeting (say by 15th March)
5. NERLDC will verify and submit the data to NERPC Secretariat (say by 25th March)

Outage details (after verifying outage duration) of April – June, 2014 pertaining to NERTS and NETC are attached for discussion. Accordingly revised verification will be made by NERLDC for April – June '14.

Deliberation of the sub-Committee

The sub-Committee noted as above and after deliberation, the agenda item is referred to OCC meeting for further deliberations.

A.9 Implementation of the recommendations of the Protection Audit:

As per para no 27 of CERC order in Petition No. 220/MP/2012 on 21.02.14,the deficiencies, if any, in Category-A (the deficiencies which can be corrected without any procurement) shall be rectified by the concerned STU and CTU within 2 months of issue of the order and compliance report in this regard shall be submitted to NERPC. **All deficiencies of Category-B (deficiencies involving procurement of equipment) shall be rectified within 6 months of issue of the order**. In this regard, reasons of non-availability of fund or delay in procurement process shall not be accepted. The procurement and implementation is to be completed by each STU using their own fund which can be reimbursed through a common request of funding through PSDF forwarded through NERPC as per procedure recently approved by Government of India.

Deliberation of the sub-Committee

SE(O) stated that SLD of sub-stations, switching & power stations is one of the requisite information relating to preparation of DPR for R&U scheme for funding from PSDF and he mentioned that the revised formats as desired by NLDC/ CEA have been circulated to all the beneficiaries and requested them to furnish the updated status by 15th September 2014 so that the same may be pursued with NLDC/ CEA. He requested all the constituents to submit the DPR to NLDC and CEA with a copy to NERPC at the earliest.

AEGCL informed that Single Line Diagrams (SLDs) of some sub-stations in which the equipments required to be replaced may take some time. However, they assured that the same will be prepared and sent as early as possible. Further, AEGCL informed that DPR for R&U scheme has already sent by them to NLDC & CEA with a copy to NERPC.

Meghalaya & Nagaland have assured that the DPR for above scheme will be sent within one week.

Further, POWERGRID informed that issue of implementation of Bus Bar protection system at Dimapur S/S as recommended under category-B has already been taken up. Target Completion : Jan'15

The sub-committee noted as above.

A.10 Issues related to Grid Disturbances/ Incidences as per CEA Standards, 2010, tripping of multiple elements, reduction of TTC due to tripping of critical elements:

The following numbers of grid disturbances occurred w.e.f 04.08.14 to 24.08.14:-

SN	Control Area	Number of Grid Disturbance
1	Assam	4
2	Manipur	2
3	Meghalaya	1
4	Mizoram	1
5	Nagaland	1
	Total	**9**

Due to tripping of following critical elements, TTC of NER-ER Corridor reduced & reliability of NER Grid reduced:-

Sl No	Name of tripping of Critical Element	Quantum of reduction of TTC of NER-ER Corridor in MW
1	220 kV Sarusajai – Samaguri II	50

*D*etails of above are attached in **Annexure-A.10** for information to members.

Deliberation of the sub-Committee

The sub-Committee noted as above. NERLDC was requested to highlight only grid disturbances above GD-IV, after finding the cause of tripping from detailed system studies so that remedial measures only may be decided in the PCC forum. For System Study, Disturbance Recorder output of the related transmission elements is required.

A.11 Grid Disturbance during July, 2014:

On 25.07.14 at 05:14:18.820 Hr, 400 kV Balipara – Ranganadi II line tripped (Balipara: Directional E/F with 1922 msec delay, DT receive & Ranganadi: Carrier receive, Overvoltage protection), at 05:14:15.920 Hr, 400 kV Balipara – Ranganadi I line tripped from Ranganadi end only (Balipara : Tie CB tripped, Main CB did not trip & Ranganadi : DP, Z1, R-E). The 400 kV Balipara – Ranganadi I line was Hand Tripped from Balipara later.

Due to tripping of above lines, power supply to Ziro & Itanagar areas of Arunachal Pradesh & Gohpur area of Assam disrupted.

At 05:14:24.800 Hr, 220 kV Samaguri – Balipara line tripped (Samaguri – DP, Z1, B-E & Balipara – No tripping), at 05:14:25.107 Hr, 400 kV Misa – Balipara II line tripped (Misa – Directional E/F with 1800 msec delay & Balipara – No tripping) & at 05:14:25.186 Hr 400 kV Misa – Balipara I line tripped (Misa – DT received & Balipara – Overvoltage protection).

Due to tripping of 400 kV Misa – Balipara D/C lines & 220 kV Samaguri – Balipara S/C line, Southern part of NER Grid (NER Grid except Ziro, Itanagar & Khupi areas of Arunachal Pradesh & Gohpur, Depota & Dhaligaon area of Assam) was connected with rest of NER Grid through narrow corridor 220 kV BTPS – Agia line.

After tripping of above elements, at 05:14:27.585 Hr, 220/132 kV, 2x50 MVA ICT at Balipara tripped, which led to disruption of power supply in Depota area of Assam & Khupi area of Arunachal Pradesh.

At around 05:21 Hr, **220 kV Azara – Sarusajai D/C lines** & 220 kV Azara – Boko and 220 kV Boko – Sarusajai S/C tripped. Due to tripping of these elements, Southern part of NER Grid separated from rest of NER Grid. Frequency of the Southern part of NER Grid shot upto 51.15 Hz (as per PMU).

At 05:34:10.880 Hr, Southern part of NER Grid collapsed due to load generation mismatch.

Load Loss: 1384 MW & Generation Loss: 1564 MW

The following issues related to above grid disturbance have been discussed and some of the suggestions/remedies are given below:-

a. Cause of fault in 400 kV Balipara - Ranganadi lines and how did the fault get cleared.

Observation: Auto extinguished.

b. Main CB at Balipara end of 400 kV Balipara – Ranganadi I line did not open. Why it was not opened?

Observation: Due to low gas pressure, the main circuit breaker could not operate. Already rectified.

c. No operation of LBB at Balipara end when Main CB at Balipara of 400 kV Balipara – Ranganadi I line did not open. What was the reason for non-operation of LBB?

Observation: Relay was defective. Already rectified.

d. Exact time of opening of 400 kV Balipara-Ranganadi I from Balipara. How it was opened.

Observation: The line was not opened till restoration. Already rectified.

e. From DR at Balipara end, it is seen that 400 kV Balipara – Ranganadi II tripped on DEF on reverse direction. Whether EF protection feature is directional.

Observation: The EF protection is directional.

f. **220 kV Balipara – Samaguri line tripping in Zone-I & exact time of tripping from DR**. 400 kV Balipara – Misa II did not trip & 220 kV Balipara – Samaguri from Balipara (carrier aided tripping)

Observation: Reports submitted by AEGCL to NERLDC.

g. Tripping details of Ranganadi Units. Can Ranganadi machines operate with 132 kV radial loads in islanded mode? If not, what are the problems?

Observation: Ranganadi can operate in islanded mode provided that machine load should not be less than 110 MW.

h. Cause of tripping of 400/132 kV ICTs at Ranganadi.

Observation: There were no trippings of ICTs at Ranganadi.

i. 400/220 kV ICT at Bongaigaon tripped on Back Up protection from 400 kV. Why it was tripped from 400 kV side.

Observation: The exact timing of tripping may be provided by NERLDC to identify the exact cause of tripping.

j. Reason for no tripping of 400 kV Bongaigaon - Balipara D/C lines when fault was persisting and was being seen by Bongaigaon end of the lines. Status of DEF features in numerical relay at Bongaigaon end.

Observation: As DEF of 400 kV Bongaigaon – Balipara D/C lines was not activated, DEF of 400 kV Bongaigaon – Balipara D/C lines was not operated. POWERGRID have informed that DEF of 400 kV Bongaigaon – Balipara D/C lines was activated after this grid disturbance.

k. Tripping details of 220 kV Azara - Sarusajai D/C lines, 220 kV Azara – Agia line & 220 kV Azara – Boko line. Whether 220 kV BTPS – Agia line tripped. If tripped, tripping details.

Observation: Reports submitted by AEGCL to NERLDC.

l. Cause of tripping of 220 kV Misa – Samaguri I line.

Observation: Failure of LA due to high voltage.

m. Time taken in voltage build up at Balipara i.e. 96 sec by PMU Plots.

Observation: From DR printout, around 96 seconds is required to extinguish the fault.

n. Oscillations in Balipara Bus Voltage at 0521 Hrs.

Observation: To be intimated by PGCIL.

o. Tripping of 400 kV Silchar – Byrnihat line.

Observation: To be intimated by PGCIL.

p. Tripping of 132 kV Loktak – Jiribam line.

Observation: Manual tripping due to partial grid disturbance.

q. Furnishing of Sequence of Event (SOE) from SCADA by AEGCL

Observation: To be intimated by AEGCL.

r. Furnishing of Event Logger output of entire Balipara, Azara, Agia, Sarusajai and Samaguri substations.

Observation: To be intimated by NERTS & AEGCL.

s. Furnishing of UFR operation (element wise load relief in MW with frequency vs load identified in MW with frequency)

Observation: To be intimated by all constituents concerned.

t. Status of Single Phase Auto Reclose (SPAR) Scheme at Ranganadi on 400 kV Ranganadi - Balipara I & II.

Observation: Discussed in agenda item no. A.2.

u. DEF features of Numerical Relay in all elements to be activated.

Observation: POWERGRID have informed that DEF of 400 kV Bongaigaon – Balipara D/C lines was activated. Constituents are requested to intimate the status of activation of DEF feature where external backup is not available.

v. DR digital status need proper configuration (In many cases CB shows that the phase opens in digital status while the analog value shows the phase in service)

Observation: NERLDC was requested to highlight specific instances.

w. In Loktak DR, the fundamental frequency was found to be 45 Hz. Such may lead to wrong conclusion. This is to be configured as 50 Hz.

Observation: Loktak - Jiribam relay to be corrected by NERTS/ NHPC.

x. Many of the Digital status are missing.

Observation: NERLDC was requested to highlight specific instances.

y. Naming convention like Z1 or T1 in DR output.

Observation: Z1 = Zone 1; T1 = time setting of Zone 1.

z. Healthiness of Disturbance Recorder of two numerical relays is to be checked.

Observation: Agreed.

aa. After each triggering, Disturbance Recorder output & Event Logger output of each numerical relay is to be sent to NERLDC for analyzing the events.

Observation: Agreed.

bb. Time synchronization of Disturbance Recorder, Event Logger and RTUs is to be checked so that SCADA SOE is matching.

Observation: Agreed.

cc. Furnishing element wise list of installed Numerical Relay, Disturbance Recorder, Event Logger and SPAR. In case of 400 kV & 220 kV, furnishing relay details of Main I & Main II for each element.

Observation: To be intimated by the constituuents.

dd. Details of Machine tripping.

Observation: Constituents are requested to submit.

ee. Status of Power System Stabilizers (PSS) in the generating units whether in service or out of service.

Observation: NEEPCO & OTPC were requested to submit the same.

ff. Furnishing of tuned frequency range of PSS in generating units.

Observation: NEEPCO submitted reports. OTPC was requested to submit the same.

gg. Exciter, PSS & Governor data/plots of the machine (millisecond duration).

Observation: Constituents are requested to send required information.

hh. Software used for Disturbance Recorder & Event Logger is to be sent to NERLDC for analyzing the events.

Observation: NERTS may provide the required software.

<u>Deliberation of the sub-Committee</u>

The sub-Committee requested NERLDC to give presentation with remedial measure in next PCC after carrying out system studies based on the inputs given above to identify the root causes and to suggest remedial measures pertaining to grid disturbance on 25.07.14. The process may be followed for future cases of grid disturbances, if so any.

B.1 Major Events in North-Eastern Regional Grid during the period August, 2014

NERLDC informed that there was no major Grid Disturbances occurred in NER during August, 2014.

The sub-Committee noted as above.

C. Major Events in North-Eastern Regional Grid:

List of multiple tripping of elements and tripping of important elements in North-Eastern Regional Grid during the period **w.e.f. 01st June, 2014 to 30th June, 2014** are attached along-with (Letters for **Furnishing Event information** on weekly basis are being sent to the power utilities of NER by e-mail w.e.f 13th January, 2014).

Constituents are requested to furnish details of tripping reported in the letters to NERLDC through e-mail.

Deliberation of the sub-Committee

It was agreed that group email may be created for sending all related information involving system protection. The group email created is pcc_ner@gmail.com and password will be intimated in next PCC meeting.

Any other item:

D.1 Status of Fiber Optical connectivity up to Loktak Power Station from Imphal (PG) and Jiribam - 2 (PG) through OPGW - NHPC agenda:

Representative from NHPC informed that the communication in Loktak station is not good enough resulting in inadequate system operation planning.

Deliberation of the sub-Committee

DGM, NERTS informed that the scheme is covered under NER Expansion Scheme (covering 1960 kms of OPGW). The issue is taken up with PGCIL (LD&C) for tendering which may require another 2 years for implementation.

D.2 Sensitive generator protection setting at Palatana - NERTS agenda:

DGM, NERTS informed that Pallatana is tripping due to tripping of one circuit of Silchar-Byrnihat line even though the other circuit still remains for evacuation. Such sensitive tripping is to be prevented as it results in unnecessary loss of generation.

Deliberation of the sub-Committee

OTPC was requested to submit the setting of generator protection in next PCC so that the same may be prevented in future.

D.3 Protection setting at Haflong sub-station - AEGCL agenda:

DGM, AEGCL informed that due to fault in downstream of Haflong (33 kV side), Haflong (PG) trips which needs to be rectified.

Deliberation of the sub-Committee

POWERGRID has already furnished revised setting to AEGCL for further review.

It was agreed that NERTS will help in modifying the relay of Haflong downstream feeders. AEGCL was requested to co-ordinate with NERTS for rectification of the same.

Date and Venue of next PCC

It is proposed to hold the 26th PCC meeting of NERPC on third week of October, 2014. The exact venue will be intimated in due course.

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Annexure-I

List of Participants in the 25th PCC Meetings held on 09/09/2014

SN	Name & Designation	Organization	Contact No.
1.	Sh. Nangkong Perme, EE	Ar. Pradesh	09436288643
2.	Sh. G.K.Bhuyan, AGM(Protection), AEGCL	Assam	09854015601
3.	Sh. K.K.D. Goswami ,DGM(MRT), AEGCL	Assam	09954707570
4.	Sh.Budha Chandra Sharma,DGM	Manipur	09436020911
5.	Sh. A.G. Thum A.E (MRT)	Meghalaya	09774664034
6.	Sh. S. Saha A.E (PLCC)	Meghalaya	09436112798
7.	Sh.A. Jakhalu, EE (Trans)	Nagaland	09436002696
8.	Sh. Amaresh Mallick, DGM (SO II)	NERLDC	09436302720
	No Representatives	**Mizoram**	
	No Representatives	**Tripura**	
9.	Sh. B.K. Chakraborty, DGM	NEEPCO	
10.	Sh. Tanya Taji, Sr. Manager	NEEPCO	
11.	Sh. Joypal Roy, Sr. Manager (E/M)	NEEPCO	
12.	Sh. Narothan Chakraborty, Asst. Manager	NETC	07896022335
13.	Sh. C.L. Khayuingam, DM(E)	NHPC	09402880207
14.	Sh. A. Patir, G.M (O&M)	NERTS (PGCIL)	09436302529
15.	Sh. P. Kanungo, DGM (OS)	NERTS (PGCIL)	09436302823
16.	Sh. Thakor Prasad Pandey, DGM (O&M)	OTPC	08794718423
17.	Sh. Narendra Gupta, Manager(O)	OTPC	09774233426
	No Representatives	**NTPC**	
18.	Sh. B. Lyngkhoi, Director/S.E(O)	NERPC	09436163419
19.	Sh. Lalrinsanga, A.S	NERPC	09436161886
20.	Sh. S.M. Jha, EE	NERPC	08731845175

Events in NER Grid from 04.08.14 to 24.08.14

Sl. No.	Name of tripping element/ Description	Owner	Date & Time of Event provided by CR operator	Operation of Auto Reclose (Lockout/ sucessfully operated)	Relay indications provided by CR operator	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
A. Multiple / Repeated tripping										
1	132 kV Aizawl- Kumarghat	POWERGRID	06.08.14 at 1846 Hrs	Not available	Wrong Operation by operator at Aizwal (PG)	Load Loss: 55 (Mizoram)	GD-I	1904 Hrs on 06.08.14	No SPS	Not reduced
	132 kV Aizawl- Kolasib							1918 Hrs on 06.08.14		
	132 kV Aizawl- Jiribam							1905 Hrs on 06.08.14		
	132 kV Aizawl- Zemabawk							1915 Hrs on 06.08.14		
	132 kV Aizawl- Luangmaul	Mizoram						1913 Hrs on 06.08.14		
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)	All the outgoing feeders emanating from Aizawl (PG) substation tripped due to wrong operation by the operator. **(Antecedent Generation : 1631 MW , Antecedent Load : 1897 MW)**								
2	132 kV Dimapur- Kohima	Nagaland	11.08.14 at 1007 Hrs	Not available	Dimapur-DP, Y-ph & Kohima- Not available	Load Loss: 15 (Nagaland)	GD-I	1011 Hrs on 11.08.14	No SPS	Not reduced
	132 kV Dimapur- Bokajan	AEGCL			Dimapur- Not available & Bokajan Dir E/F			1143 Hrs on 11.08.14		
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)	132 kV Dimapur- Kohima and 132 kV Dimapur- Bokazan tripped. Due to tripping of these line power supply to Kohima area distrupted. **(Antecedent Generation : 1415 MW , Antecedent Load : 1496 MW)**								

Events in NER Grid from 04.08.14 to 24.08.14

Sl. No.	Name of tripping element/ Description	Owner	Date & Time of Event provided by CR operator	Operation of Auto Reclose (Lockout/ sucessfully operated)	Relay indications provided by CR operator	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
3	132 kV Khliehriat-Khliehriat(PG) I	POWERGRID	11.08.14 at 2124 Hrs	Not available	Khliehriat- No Tripping & Khliehriat(PG)- DP,Z3,Y-ph	Load Loss: 154 (Meghalaya) Generation Loss: 50 (Khandong) 126 (Leshka)	GD-I	2138 Hrs on 11.08.14	No SPS	Not reduced
	132 kV Khliehriat- Khliehriat(PG) II	MePTCL			Khliehriat- No Tripping & Khliehriat(PG)- DP,Z3,Y-ph			2142 Hrs on 11.08.14		
	132 kV Khliehriat- Khandong I	POWERGRID			Khliehriat- No Tripping & Kahndong- DP, Z3, Y-B ph, E/F			2150 Hrs on 11.08.14		
	132 kV Khliehriat- Khandong II				Khliehriat- No Tripping & Kahndong- DP, Z3, Y-B ph, E/F			2150 Hrs on 11.08.14		
	132 kV Khliehriat- Leshka II	MePTCL			Khliehriat- E/F & Leshka- Not available			2159 Hrs on 11.08.14		
	132 kV Khliehriat- NEHU				Khliehriat- E/F & NEHU- Not available			2206 Hrs on 11.08.14		
	132 kV Khliehriat- NEIGRIMS				Khliehriat- E/F & NEIGRIMS- Not available			2200 Hrs on 11.08.14		
	Khandong U 1	NEEPCO			Tripped on REF			1157 Hrs on 12.08.14		
	Kopili Stg-II U 1	NEEPCO			Tripped on Overspeed			2235 Hrs on 11.08.14		
	Leshka U 1	MeECL			Tripped					
	Leshka U 2									
	Leshka U 3									
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)	All the outgoing feeders emanating from Khliehriat (Meghalaya) substation except 132 kV Khliehriat- Leshka I tripped on E/F due to blasting of a CB at MPL (Lumsnong) Station. **(Antecedent Generation : 1818 MW ,**								

Events in NER Grid from 04.08.14 to 24.08.14

Sl. No.	Name of tripping element/ Description	Owner	Date & Time of Event provided by CR operator	Operation of Auto Reclose (Lockout/ sucessfully operated)	Relay indications provided by CR operator	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
4	132 kV Loktak- Imphal(PG)	POWERGRID	13.08.14 at 0406 Hrs	Not available	Loktak- DP, Z2 & Imphal(PG)-Not Available	Load Loss: 62 (Manipur)	GD-I	0552 Hrs on 13.08.14	No SPS	Not reduced
	132 kV Dimapur(PG)- Imphal(PG)				Dimapur(PG)- DP, Z2, R-Y & Imphal(PG)- Not available			0559 Hrs on 13.08.14		
	132 kV Imphal- Imphal(PG) I				Imphal- No tripping & Imphal(PG)- E/F			0707 Hrs on 13.08.14		
	132 kV Imphal- Imphal(PG) II	POWERGRID/ MSPCL			Imphal- No tripping & Imphal(PG)- E/F			0610 Hrs on 13.08.14		
	132 kV Loktak-Ningthoukhong	MSPCL			Loktak- O/C, E/F & Ningthoukhong- No tripping			0625 Hrs on 13.08.14		
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)	132 kV Loktak- Imphal(PG), 132 kV Dimapur- Imphal(PG), 132 kV Imphal- Imphal(PG) I & II and 132 kV Loktak Ningthoukhong line tripped due to fault in 132 kV Yagangpokpi- Kakching line. **(Antecedent Generation : 1621 MW ,**									
5	220/132 kV, 100 MVA ICT I at Mariani	AEGCL	14.08.14 at 1211 Hrs	Not available	Tripped on E/F	Load Loss: 55 (Assam)	GD-I	1215 Hrs on 14.08.14	No SPS	Not reduced
	220/132 kV, 100 MVA ICT II at Mariani							1220 Hrs on 14.08.14		
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)	220/132 kV, 2x 100 MVA ICT I & II at Mariani tripped. **(Antecedent Generation : 1733 MW , Antecedent Load : 1453 MW)**								

Events in NER Grid from 04.08.14 to 24.08.14

Sl. No.	Name of tripping element/ Description	Owner	Date & Time of Event provided by CR operator	Operation of Auto Reclose (Lockout/ sucessfully operated)	Relay indications provided by CR operator	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
6	220 kV Agia- Boko	AEGCL	18.08.14 at 1102 Hrs	Not available	Agia- O/C & Boko- No Tripping	Load Loss: 20 (Assam)	GD-I	1115 Hrs on 18.08.14	No SPS	Not reduced
	220 kV Azara- Boko				Azara- E/F & Boko- No tripping			1119 Hrs on 18.08.14		
	220 kV Azara- Agia				Azara- Dir. E/F & Agia- No Tripping			1119 Hrs on 18.08.14		
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)	220 kV Agia- Boko, 220 kV Azara- Boko & 220 kV Azara- Agia lines tripped. Due to tripping of these line power supply disrupted in Boko(Assam). **(Antecedent Generation : 1848 MW , Antecedent Load : 1450 MW)**								
7	132 kV Badarpur- Khliehriat	POWERGRID	20.08.14 at 1130 Hrs	Not available	Tripped due to operation of Bus-bar Protection	Load Loss: 36 (Assam) & 18 (Mizoram)	GD-I	1141 Hrs on 20.08.14	No SPS	Not reduced
	132 kV Badarpur- Panchgram							1143 Hrs on 20.08.14		
	132 kV Badarpur- Jiribam							1144 Hrs on 20.08.14		
	132 kV Badarpur- Silchar I							1145 Hrs on 20.08.14		
	132 kV Badarpur- Silchar II							1146 Hrs on 20.08.14		
	132 kV Badarpur- Kolasib							1149 Hrs on 20.08.14		
	132 kV Badarpur- Kumarghat							1209 Hrs on 20.08.14		
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)	All the outgoing Feeders of Badarpur(PG) sub-station Tripped due to operation of Bus-bar Protection at Badarpur(PG). **(Antecedent Generation : 1528 MW , Antecedent Load : 1527 MW)**								

Events in NER Grid from 04.08.14 to 24.08.14

Sl. No.	Name of tripping element/ Description	Owner	Date & Time of Event provided by CR operator	Operation of Auto Reclose (Lockout/ sucessfully operated)	Relay indications provided by CR operator	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
8	132 kV Loktak- Imphal(PG)	POWERGRID	22.08.14 at 1650 Hrs	Not available	Loktak- E/F & Imphal(PG)-No tripping	Load Loss: 93 (Manipur)	GD-I	1705 Hrs on 22.08.14	No SPS	Not reduced
	132 kV Dimapur- Imphal(PG)				Dimapur- E/F & Imphal(PG)- No tripping			1702 Hrs on 22.08.14		
	132 kV Imphal- Imphal(PG) I				Imphal- No tripping & Imphal(PG)- E/F			1718 Hrs on 22.08.14		
	132 kV Imphal- Imphal(PG) II	POWERGRID/ MSPCL			Imphal- No tripping & Imphal(PG)- E/F			1716 Hrs on 22.08.14		
	132 kV Imphal (PG)- Ningthoukhong	MSPCL			Imphal- No tripping & Ningthoukhong- E/F			0625 Hrs on 22.08.14		
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)	132 kV Loktak- Imphal(PG), 132 kV Dimapur- Imphal(PG), 132 kV Imphal- Imphal(PG) I & II and 132 kV Loktak Ningthoukhong line tripped. Due to tripping of these line power supply disrupted in Manipur **(Antecedent**								
9	400 kV Silchar- Byrnihat	NETC	24.08.14 at 1121 Hrs	Not available	Silchar- DP, Z2, Y-ph & Byrnihat- Not Available	Load Loss: 48 (Assam)	GD-I	1143 Hrs on 24.08.14	SPS-4 operated (Load Relief: 45	Not reduced
	400 kV Silchar- Azara	NETC			Silchar- No Tripping & Azara- DP, Z1, Y-ph			1220 Hrs on 24.08.14		
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)	400 kV Silchar- Byrnihat and 400 kV Silchar- Azara line stripped. Due to Tripping of 400 kV Silchar- Byrnihat, SPS-4 operated with a load relief of 45 MW in South Assam. **(Antecedent Generation : 1533 MW ,**								

Events in NER Grid from 04.08.14 to 24.08.14

Sl. No.	Name of tripping element/ Description	Owner	Date & Time of Event provided by CR operator	Operation of Auto Reclose (Lockout/ sucessfully operated)	Relay indications provided by CR operator	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
B. Critical element tripping										
1	220 kV Samaguri- Sarusajai II	AEGCL	06.08.14 at 1005 Hrs	Not available	Tripped; Samaguri- DP, Z1, R-B ph and Sarusajai- DP,Z3, B-ph	-	-	1017 Hrs on 06.08.14	No SPS	50
2	400/220 kV, 315 MVA ICT II at Azara	AEGCL	12.08.14 at 0900 Hrs	Not available	Tripped	-	-		No SPS	Not reduced
3	400/220 kV, 315 MVA ICT II at Azara	AEGCL	20.08.14 at 1130 Hrs	Not available	Tripped on O/C	-	-	1255 Hrs on 21.08.14	No SPS	Not reduced
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)									

Events in NER Grid from 04.08.14 to 24.08.14

Sl. No.	Name of tripping element/ Description	Owner	Date & Time of Event provided by CR operator	Operation of Auto Reclose (Lockout/ sucessfully operated)	Relay indications provided by CR operator	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
C. Unit tripping										
1	AGBPP U-4	NEEPCO	07.08.14 at 0516 Hrs	NA	Tripped aue to tripping of GC-I	Generation Loss : 30	GI-I	0702 Hrs on 07.08.14	No SPS	Not reduced
2	AGBPP U-5	NEEPCO		NA		Generation Loss : 30		0746 Hrs on 07.08.14	No SPS	Not reduced
3	AGBPP U-9	NEEPCO	08.08.14 at 0432 Hrs	NA	Tripped due to problem in Extraction Pump	Generation Loss : 7	GI-I	0543 Hrs on 08.08.14	No SPS	Not reduced
4	Kopilli U-4	NEEPCO	09.08.14 at 2113 Hrs	NA	Tripped due to Excitation Problem	Generation Loss : 48	GI-I	0824 Hrs on 09.08.14	No SPS	Not reduced
5	Doyang U 1	NEEPCO	11.08.14 at 0858 Hrs	NA	Tripped due to Governor Problem	Generation loss: 20	GI-I	1043 Hrs on 11.08.14	No SPS	Not reduced
6	Khandong U 1	NEEPCO	12.08.14 at 1618 Hrs	NA	Tripped on reverse poer mode of operation	Generation loss: 25	GI-I	1700 Hrs on 12.08.14	No SPS	Not reduced
7	Kopili Stg-II U 1	NEEPCO	13.08.14 at 1605 Hrs	NA	Tripped due to low indication of Oil level at Oil pump Unit	Generation loss: 23	GI-I	1722 Hrs on 13.08.14	No SPS	Not reduced
8	AGBPP U1	NEEPCO	13.08.14 at 2209 Hrs	NA	Tripped	Generation loss: 28	GI-I	0106 Hrs on 14.08.14	No SPS	Not reduced
9	AGBPP U 4	NEEPCO	18.08.14 at 1321 Hrs	NA	Tripped due to tripping of GC II	Generation Loss: 29	GI-I	1435 Hrs on 18.08.14	No SPS	Not reduced
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)									

Note : 1. All above informations are to be sent to NERLDC through e-mail

2. After each trigerring, DR output is to be sent to NERLDC

3. Y: Yes, N: No, NA: Not Applicable, CR: Control Room

Sl. No.	Name of tripping element/ Description	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	DR output furnished within 24 hours (Y/N) (if not provided within 24 hour, date & time of
A. Multiple / Repeated tripping										
1	132 kV Aizawl- Kumarghat									
	132 kV Aizawl- Kolasib									
	132 kV Aizawl- Jiribam									
	132 kV Aizawl- Zemabawk									
	132 kV Aizawl- Luangmaul									
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)									
2	132 kV Dimapur- Kohima									
	132 kV Dimapur- Bokajan									
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)									

Sl. No.	Name of tripping element/ Description	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	DR output furnished within 24 hours (Y/N) (if not provided within 24 hour, date & time of
	132 kV Khliehriat-Khliehriat(PG) I									
3	132 kV Khliehriat- Khliehriat(PG) II									
	132 kV Khliehriat- Khandong I									
	132 kV Khliehriat- Khandong II									
	132 kV Khliehriat- Leshka II									
	132 kV Khliehriat- NEHU									
	132 kV Khliehriat- NEIGRIMS									
	Khandong U 1									
	Kopili Stg-II U 1									
	Leshka U 1									
	Leshka U 2									
	Leshka U 3									
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)									

Sl. No.	Name of tripping element/ Description	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	DR output furnished within 24 hours (Y/N) (if not provided within 24 hour, date & time of
	132 kV Loktak- Imphal(PG)									
4	132 kV Dimapur(PG)- Imphal(PG)									
	132 kV Imphal- Imphal(PG) I									
	132 kV Imphal- Imphal(PG) II									
	132 kV Loktak-Ningthoukhong									
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)									
5	220/132 kV, 100 MVA ICT I at Mariani									
	220/132 kV, 100 MVA ICT II at Mariani									
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)									

Sl. No.	Name of tripping element/ Description	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	DR output furnished within 24 hours (Y/N) (if not provided within 24 hour, date & time of
	220 kV Agia- Boko									
6	220 kV Azara- Boko									
	220 kV Azara- Agia									
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)									
7	132 kV Badarpur- Khliehriat									
	132 kV Badarpur- Panchgram									
	132 kV Badarpur- Jiribam									
	132 kV Badarpur- Silchar I									
	132 kV Badarpur- Silchar II									
	132 kV Badarpur- Kolasib									
	132 kV Badarpur- Kumarghat									
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)									

Sl. No.	Name of tripping element/ Description	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	DR output furnished within 24 hours (Y/N) (if not provided within 24 hour, date & time of
	132 kV Loktak- Imphal(PG)									
8	132 kV Dimapur- Imphal(PG)									
	132 kV Imphal- Imphal(PG) I									
	132 kV Imphal- Imphal(PG) II									
	132 kV Imphal (PG)- Ningthoukhong									
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)									
9	400 kV Silchar- Byrnihat									
	400 kV Silchar- Azara									
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)									

Sl. No.	Name of tripping element/ Description	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	DR output furnished within 24 hours (Y/N) (if not provided within 24 hour, date & time of
B. Critical element tripping										
1	220 kV Samaguri- Sarusajai II									
2	400/220 kV, 315 MVA ICT II at Azara									
3	400/220 kV, 315 MVA ICT II at Azara									
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)									

Sl. No.	Name of tripping element/ Description	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	DR output furnished within 24 hours (Y/N) (if not provided within 24 hour, date & time of
C. Unit tripping										
1	AGBPP U-4									
2	AGBPP U-5									
3	AGBPP U-9									
4	Kopilli U-4									
5	Doyang U 1									
6	Khandong U 1									
7	Kopili Stg-II U 1									
8	AGBPP U1									
9	AGBPP U 4									
	Details of Analysis Done by PCC									
	Remedial measures taken									
	First Information report by the constituent									
	Description of Incident (For GD only)									

Note : 1. All above informations are to
2. After each trigerring, DR out
3. Y: Yes, N: No, NA: Not Appli

Sl. No.	Name of tripping element/ Description	EL output furnished within 24 hours (Y/N) (if not provided within 24 hour, date & time of	Output of Data Acquisation 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
A. Multiple / Repeated tripping											
1	132 kV Aizawl- Kumarghat										
	132 kV Aizawl- Kolasib										
	132 kV Aizawl- Jiribam										
	132 kV Aizawl- Zemabawk										
	132 kV Aizawl- Luangmaul										
	Details of Analysis Done by PCC										
	Remedial measures taken										
	First Information report by the constituent										
	Description of Incident (For GD only)										
2	132 kV Dimapur- Kohima										
	132 kV Dimapur- Bokajan										
	Details of Analysis Done by PCC										
	Remedial measures taken										
	First Information report by the constituent										
	Description of Incident (For GD only)										

Sl. No.	Name of tripping element/ Description	EL output furnished within 24 hours (Y/N) (if not provided within 24 hour, date & time of	Output of Data Acquisation 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
	132 kV Khliehriat-Khliehriat(PG) I										
3	132 kV Khliehriat- Khliehriat(PG) II										
	132 kV Khliehriat- Khandong I										
	132 kV Khliehriat- Khandong II										
	132 kV Khliehriat- Leshka II										
	132 kV Khliehriat- NEHU										
	132 kV Khliehriat- NEIGRIMS										
	Khandong U 1										
	Kopili Stg-II U 1										
	Leshka U 1										
	Leshka U 2										
	Leshka U 3										
	Details of Analysis Done by PCC										
	Remedial measures taken										
	First Information report by the constituent										
	Description of Incident (For GD only)										

Sl. No.	Name of tripping element/ Description	EL output furnished within 24 hours (Y/N) (if not provided within 24 hour, date & time of	Output of Data Acquisation 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
	132 kV Loktak- Imphal(PG)										
4	132 kV Dimapur(PG)- Imphal(PG)										
	132 kV Imphal- Imphal(PG) I										
	132 kV Imphal- Imphal(PG) II										
	132 kV Loktak-Ningthoukhong										
	Details of Analysis Done by PCC										
	Remedial measures taken										
	First Information report by the constituent										
	Description of Incident (For GD only)										
5	220/132 kV, 100 MVA ICT I at Mariani										
	220/132 kV, 100 MVA ICT II at Mariani										
	Details of Analysis Done by PCC										
	Remedial measures taken										
	First Information report by the constituent										
	Description of Incident (For GD only)										

Sl. No.	Name of tripping element/ Description	EL output furnished within 24 hours (Y/N) (if not provided within 24 hour, date & time of	Output of Data Acquisation 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
	220 kV Agia- Boko										
6	220 kV Azara- Boko										
	220 kV Azara- Agia										
	Details of Analysis Done by PCC										
	Remedial measures taken										
	First Information report by the constituent										
	Description of Incident (For GD only)										
7	132 kV Badarpur- Khliehriat										
	132 kV Badarpur- Panchgram										
	132 kV Badarpur- Jiribam										
	132 kV Badarpur- Silchar I										
	132 kV Badarpur- Silchar II										
	132 kV Badarpur- Kolasib										
	132 kV Badarpur- Kumarghat										
	Details of Analysis Done by PCC										
	Remedial measures taken										
	First Information report by the constituent										
	Description of Incident (For GD only)										

Sl. No.	Name of tripping element/ Description	EL output furnished within 24 hours (Y/N) (if not provided within 24 hour, date & time of	Output of Data Acquisation 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
	132 kV Loktak- Imphal(PG)										
8	132 kV Dimapur- Imphal(PG)										
	132 kV Imphal- Imphal(PG) I										
	132 kV Imphal- Imphal(PG) II										
	132 kV Imphal (PG)- Ningthoukhong										
	Details of Analysis Done by PCC										
	Remedial measures taken										
	First Information report by the constituent										
	Description of Incident (For GD only)										
9	400 kV Silchar- Byrnihat										
	400 kV Silchar- Azara										
	Details of Analysis Done by PCC										
	Remedial measures taken										
	First Information report by the constituent										
	Description of Incident (For GD only)										

Sl. No.	Name of tripping element/ Description	EL output furnished within 24 hours (Y/N) (if not provided within 24 hour, date & time of	Output of Data Acquisation 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
B. Critical element tripping											
1	220 kV Samaguri- Sarusajai II										
2	400/220 kV, 315 MVA ICT II at Azara										
3	400/220 kV, 315 MVA ICT II at Azara										
	Details of Analysis Done by PCC										
	Remedial measures taken										
	First Information report by the constituent										
	Description of Incident (For GD only)										

Sl. No.	Name of tripping element/ Description	EL output furnished within 24 hours (Y/N) (if not provided within 24 hour, date & time of	Output of Data Acquisation 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
C. Unit tripping											
1	AGBPP U-4										
2	AGBPP U-5										
3	AGBPP U-9										
4	Kopilli U-4										
5	Doyang U 1										
6	Khandong U 1										
7	Kopili Stg-II U 1										
8	AGBPP U1										
9	AGBPP U 4										
	Details of Analysis Done by PCC										
	Remedial measures taken										
	First Information report by the constituent										
	Description of Incident (For GD only)										

Note : 1. All above informations are to
2. After each trigerring, DR out
3. Y: Yes, N: No, NA: Not Appli