



Government of India
Ministry of Power
North Eastern Regional Power Committee
Meghalaya State Housing Finance Co-Operative Society Ltd. Building
Nongrim Hills, Shillong – 793003.



ISO 9001:2008

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No. NERPC/SE (O)/PCC/2013/4726-55

Date: 16th August, 2013

To,

1. Managing Director, AEGCL, Bijuli Bhawan, Guwahati – 781 001
2. Director (Distribution), Me. ECL, Lumjingshai, Short Round Road, Shillong – 793 001
3. Director(Transmission), Me.PTCL, Lumjingshai, Short Round Road, Shillong – 793 001
4. CGM, (LDC), SLDC Complex, AEGCL, Kahelipara, Guwahati-781 019
5. Chief Engineer (WE Zone),Department of Power ,Govt. of Arunachal Pradesh, Itanagar- 791 111
6. Chief Engineer (EE Zone),Department of Power, Govt. of Arunachal Pradesh, Itanagar- 791 111
7. Chief Engineer (TP&MZ),Department of Power, Govt. of Arunachal Pradesh, Itanagar- 791 111
8. Engineer-in-Chief (P&E), Department of Power, Govt. of Mizoram, Aizawl – 796 001
9. Chief Engineer (P), Electricity Department, Govt. of Manipur, Keishampat, Imphal – 795 001
10. Chief Engineer (P), Department of Power, Govt. of Nagaland, Kohima – 797 001
11. General Manager, TSECL, Agartala – 799 001
12. ED (O&M), NERTS, PGCIL, Dongtieh-Lower Nongrah, Lapalang, Shillong -793 006
13. ED (O&M), NEEPCO Ltd., Brookland Compound, Lower New Colony, Shillong-793003
14. ED (Commercial), NEEPCO Ltd., Brookland Compound, Lower New Colony, Shillong-793003
15. ED (O&M), NHPC, NHPC Office Complex, Sector-33, Faridabad,Haryana-121003
16. GM (Plant), OTPC, Badarghat Complex, Agartala, Tripura - 799014
17. GM, NERLDC, Dongtieh, Lower Nongrah, Lapalang, Shillong -793 006
18. Member Secretary, ERPC, 14 Golf Club Road, Tollygunge, Kolkata-700033
19. Chief Engineer, GM Division, Central Electricity Authority, New Delhi – 110066

Sub: Minutes of the 12th PCC Meeting held on 8th August, 2013 at Guwahati.

The Minutes of the 12th PCC Meeting of NERPC held on 08.08.2013 at “Hotel Grand Starline”, Guwahati is enclosed for favour of kind information and necessary action please.

The minutes is also available on the website of NERPC www.nerpc.nic.in

Encl: As above

/s/ / Yours faithfully,

(B. Lyngkhoi / B. Lyngkhoi)

, / Superintending Engineer (O)

Copy to:

1. Chief Engineer, AEGCL, Bijuli Bhavan, Guwahati - 781001
2. Chief Engineer, APGCL, Bijuli Bhavan, Guwahati - 781001
3. Chief Engineer, DISCOM, Bijuli Bhavan, Guwahati - 781001
4. Head of SLDC, Me.ECL, Lumjingshai, Short Round Road,Shillong – 793 001
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. DGM (C&M), OTPC, 6th Floor, A-Wing, IFCI Tower -61, Nehru Place, New Delhi – 110019.

North Eastern Regional Power Committee

MINUTES OF THE 12th

PROTECTION COORDINATION SUB-COMMITTEE MEETING

OF NERPC

Date: 08.08.2013 (Thursday)

Time: 10:00 hrs

Venue: "Hotel Grand Starline," Guwahati.

The List of Participants in the 11th PCC Meeting is attached at **Annexure - I**

Shri S. K. Ray Mohapatra, Member Secretary I/C, NERPC welcomed all the participants to the 12th PCC meeting. He briefed about the discussion in the 88th OCC meeting viz. requisition based scheduling, UFR based load shedding & identification of feeders for such load shedding and inspection of one third of UFRs in NER. Further, he also stated that the total estimated cost projected in DPR prepared for rectification of deficiencies in substations/ generating stations is about Rs. 816 Crores (for seven states excluding NEEPCO, NHPC and POWERGRID). He mentioned that funding for entire amount projected in the DPR may not be available and hence constituents should plan accordingly to rectify the deficiencies in their system, which is essential for reliable operation. Further, he expressed concern about the frequent trippings in Meghalaya & Manipur system including generating station at Loktak of NHPC. This has become a regular feature. Reduction in trippings is essential for safe and secure operation of the grid and he requested the concern constituents to look into the matter seriously for improvement in the situation. He informed that Protection philosophy for transmission system, Islanding Scheme and SPS etc. proposed for NER system, shall be discussed in this meeting.

He requested all members for active participation during discussion in the meeting as protection system plays a vital role in security and safety of the grid.

Thereafter, Member Secretary I/C requested Shri B. Lyngkhoi, SE (O), NERPC to take up the agenda items for discussion.

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 11th MEETING OF PROTECTION SUB-COMMITTEE OF NERPC.

SE (O), informed that the minutes of the 11th meeting of the PCC held on 10th July, 2013 at Guwahati were circulated vide letter No. NERPC/OP/PCC/2013/3561-90 dated 17th July, 2013.

POWERGRID vide mail dated 23.07.2013 wanted **Item No. C.2** to be modified as below:

Item No: C.2- Minutes recorded: "On enquiry about the status of DPR, DGM, POWERGRID informed that DPR has already been prepared and has been sent to corporate office for approval before submission to CEA and NERPC and the estimated cost is about Rs. 23.7 crores".

Minutes to be recorded as: "On enquiry about the status of DPR, DGM, POWERGRID informed that the matter will be discussed with concerned authority and revert back accordingly"

The estimated cost projected in the DPR for rectification / renovations of substations / generating stations is given below:

Name of Utility	Estimated Cost (Rs. In Crores)
Ar. Pradesh	33.454
Assam	381.584
Manipur	40.815
Meghalaya	183.659
Mizoram	65.247
Nagaland	37.525
Tripura	73.618
NEEPCO	40.74
NHPC	5.549
POWERGRID	To Revert back.
Total	[Rs. 862.19 crores excluding PGCIL]

No other comments or observations were received from any of the constituents, the minutes of 11th PCC meeting was confirmed.

ITEMS FOR DISCUSSION

B. FOLLOW UP ACTION

B.1. Independent third party audit of protection system

SE (O) stated that the funding for entire amount projected in the DPR may not be available and hence constituents should gear up or plan accordingly to rectify the deficiencies in their system. MS (I/C) informed that the issue of funding from Govt. of India / PSDF was discussed during the 2nd NPC meeting held at CEA, Delhi on July 16, 2013 and CEA has proposed to Min. of Power for considering 20% funding from PSDF. The fund accumulated in PSDF from NER is only about Rs. 110 crores. The rectification / renovations work proposed in DPR cannot be taken up with this nominal fund. The minutes of meeting of NPC is awaited. The outcome will be intimated to all the constituents so that they can take up the issue with the Competent Authority and the matter can be discussed further in the coming TCC/RPC meeting scheduled to be held on 4th & 5th September, 2013 at Agartala. The rectification / renovations of substations / generating stations are essential for safety, security and reliable operation of the system.

The estimated cost projected in the DPR for rectification / renovations of substations / generating stations in NER is given below:

Name of Utility	Estimated Cost (Rs. In Crores)
Ar. Pradesh	33.454
Assam	381.584
Manipur	40.815
Meghalaya	183.659
Mizoram	65.247
Nagaland	37.525
Tripura	73.618
NEEPCO	43.74
NHPC	5.137
POWERGRID	(To Revert Back)
Total	[Rs. 862.19 crores excluding PGCIL]

The Sub-committee noted as above.

B.2 Protection Philosophy in respect of transmission System:

During the 12th PCC meeting, the Committee decided to adopt the following Protection Philosophy in NER after detailed deliberation.

Protection philosophy in NER

(A) Line Protection

SN	Protection	Setting
1	Distance Protection: Zone - 1	The setting shall be 80 % of the protected line length. <ul style="list-style-type: none"> • Time Delay = Instantaneous
2	Distance Protection: Zone - 2	For single circuit line, the setting shall be [100% of the protected line length (length of principal line section) + 50% of the shortest line emanating from far end bus bar] or [120% of the protected line] whichever is higher. For double circuit line, the setting shall be 150% of the protected line length (length of principal line section) to take care of the effect of mutual compensation. However, it must be ensured that Zone-II setting does not enter into lower voltage level through transformer. It may be restricted to 50% of total transformer impedance to have discrimination with Zone-III. <ul style="list-style-type: none"> • TZ2 = 300ms (for lines less than 100kms) • TZ2 = 500ms (for lines more than 100kms)
3	Distance Protection: Zone - 3	The setting shall be [120% of protected section + 100% of the longest line emanating from the far end bus bar] or [100% of the protected line + 100% of the longest line emanating from the far end bus bar + 20% -30% of the shortest line emanating from the far end of the second line considered], whichever is lower. It must be ensured that Zone-III setting does not enter into lower voltage level through transformer. It should be restricted to (protected section + 90% of total transformer impedance) <ul style="list-style-type: none"> • TZ3 = 1.0 secs.
4	Distance Protection: Reverse Zone	Reverse reach shall be 20% of the shortest line & 10% of longest line emanating from that bus <ul style="list-style-type: none"> • TZ3R = 1.0 – 1.2 secs.
5	Lines with Series and other compensations	80% of the protected line with Permissive Over Reach (POR) Scheme should be adopted. 100 milli seconds time delay for allowing correct distance measurement after the series capacitor is

	in the vicinity of Sub-station	bypassed. <ul style="list-style-type: none"> • 100 ms
6	Power swing blocking	Block tripping in all zones (except Zone 1) for all lines. Out of step tripping to be applied on all inter regional tie lines. <ul style="list-style-type: none"> • De-block time delay = 2 Secs.
7	Protection for broken conductor	Negative sequence current to positive sequence current ratio more than 0.2 ($I_2/I_1 \geq 0.2$). Only for alarm. <ul style="list-style-type: none"> • 3.5 – 5.0 Secs.
8	Carrier Communication & Protection	Protection using carrier communication (PLCC / OPGW) is to be provided for all 400 kV, 220 kV and 132 kV lines (where auto-reclosure is in operation). Each 400 kV and 220 kV line shall be provided with two (2) protection channels in addition to one speech + data channel for each direction. In case of 220kV and 132kV lines, the speech and data channel can also be used for protection, wherever possible.
9	Back up protection	For 220 kV, 132kV and 66kV lines with only one distance Protections (i.e Main-I), back up protection by IDMT O/C and E/F is also to be provided.
10	Directional Earth fault protection	400 kV & 220 kV lines with two (2) Numerical Distance Protections Relays (i.e. Main-I & Main -II), shall be supplemented with activation of inbuilt IDMT Directional Earth Fault (DEF) protections to detect very high resistance fault, which cannot be detected by Distance relay. <ul style="list-style-type: none"> • TDEF = TZ3 + 100ms
11	Auto Re-closing with dead time	Single Phase Auto Reclose Scheme <ul style="list-style-type: none"> • Dead time = 1.0 sec, • Reclaim time = 25 sec.
		Three Phase Auto Reclose Scheme <ul style="list-style-type: none"> • Dead time = 1.0 sec, • Reclaim time = 25 sec.
12	Over Voltage Protection	Two stage Over voltage protection to be provided for 400kV lines <ul style="list-style-type: none"> • Stage # II setting for all lines are same as below: VS2= 140% & TS2= 100ms • Stage # I setting of multiple circuits connected between two same stations to be graded with time & voltage For example, the Over Voltage settings for four circuits connected between two stations A & B shall be as follows: • Circuit # 1 : VS1= 110% & TS1= 5 s Circuit # 2 : VS1= 110% & TS1= 6 s Circuit # 3 : VS1= 112% & TS1= 5 s Circuit # 4 : VS1= 112% & TS1= 6 s

		O/V relay for 400kV lines shall be connected to trip concerned line breaker(s), start LBB, block auto reclosure and send direct trip command.
13	Disturbance Recorder (DR), Event Logger (EL) and Fault locator (FL)	To be provided as a standard for all 400kV & 220kV lines on both ends. DR, EL & FL, being inbuilt feature in Numerical Relays, such features should also be used even at 132kV and 66kV level.
14	Time Synchronising Equipment (TSE)	To be provided as a standard for all 400kV, 220kV and 132kV/66kV substations.

(B) Bus bar and LBB Protection

SN	Protection	Setting
1	LBB protection and bus bar protection	<p>Bus bar & LBB protection to be provided at 400kV & 220kV level for substations and Generating stations having multiple feeds. Bus bar & LBB protection may also be provided at 132kV level for important substations having multiple feeds.</p> <p>LBB current should be in pick up condition always</p> <ul style="list-style-type: none"> LBB Time delay = 200ms.

(C) Protection for Inter Connecting Transformer (ICT)

[400kV/220kV/132kV/66kV Class]

SN	Protection	Setting
1	Differential protection	<p>Differential Relay to be provided for Internal Fault in Transformer</p> <ul style="list-style-type: none"> Trip
2	Restricted Earth Fault (REF) protection	<p>REF to be provided for Internal Earth Fault in Transformer</p> <ul style="list-style-type: none"> Trip
3	Back up Directional (IDMT) O/C & E/F protection on HV and LV side with non-directional High Set Element	<p>Back up protection to be provided for Internal and external Fault.</p> <ul style="list-style-type: none"> Directional Trip for IDMT Non-directional Trip for HS
4	Over Fluxing (OF) protection	<p>Over Flux Relay be provided for protection from Over Fluxing</p> <ul style="list-style-type: none"> (V/f)=1.1 for alarm & (V/f)=1.4 for tripping
5	Over Load Relay	<p>Over Load Relay to be provided for Over Load Alarm</p> <ul style="list-style-type: none"> 110% of rated current TOL = 5 Secs
6	Buchholz protection	<p>Buchholz Relay to be provided for detection of incipient internal fault in Transformer</p> <ul style="list-style-type: none"> Tripping for both stages

		(The contacts for both stages shall be paralleled so that tripping command goes to CB(s) in both stages.) However, the existing practice of two stage tripping may be reviewed by utilities
7	Winding Temperature Indicator (WTI)	WTI to be provided for preventing the transformer winding from High Temperature Operation. <ul style="list-style-type: none"> • Cooling, • Alarm • Trip The temperature settings shall be as per manufacturer's recommendations.
8	Oil Temperature Indicator (OTI)	OTI to be provided for preventing the transformer oil from High Temperature Operation. <ul style="list-style-type: none"> • Alarm • Trip The temperature settings shall be as per manufacturer's recommendations.
9	Pressure Relief Device (PRD)	PRD to be provided for protection of transformer tank from blasting due to development of high internal pressure during heavy internal fault <ul style="list-style-type: none"> • Trip
10	Magnetic Oil Gauge (MOG)	MOG to be provided for Low oil level Alarm. <ul style="list-style-type: none"> • Alarm
11	Oil Surge Relay (OSR)	OSR to be provided for OLTC against sudden oil surge <ul style="list-style-type: none"> • Trip
12	Surge Arresters	Gapless Surge Arresters shall be provided on both primary and secondary sides of transformers, located outdoors with overhead connection.
		The Protection of transformer could be divided into two groups (Group-A & Group-B) and each group should be connected to separate DC source. Both Group -A & Group-B protection shall give trip impulse to circuit breaker of ICT. The Group-A should include Differential protection, back up protection (on HV side), over fluxing protection (on HV side), high oil temperature tripping, PRD tripping and Delta winding protection (wherever applicable). The Group-B should include REF protection, back up protection (on LV/MV side), over fluxing protection (on LV/MV side), high Winding temperature tripping, OSR tripping, low oil level tripping and Buchholz tripping.

(D) Protection for Reactor

SN	Protection	Setting
1	Differential protection	Differential Relay to be provided for Internal Fault in Transformer <ul style="list-style-type: none"> • Trip
2	Restricted Earth Fault (REF) protection	REF to be provided for Internal Earth Fault in Transformer <ul style="list-style-type: none"> • Trip
3	Back up Impedance Protection	Back Up Impedance protection to be provided for protection of reactor from winding fault <ul style="list-style-type: none"> • Impedance setting around 60% of winding • Time Delay 1000ms
4	Buchholz protection	Buchholz Relay to be provided for detection of incipient internal fault in Transformer <ul style="list-style-type: none"> • Tripping for both stages (Matter to reviewed again later)

5	Winding Temperature Indicator (WTI)	WTI to be provided for preventing the transformer winding from High Tem. Operation. <ul style="list-style-type: none"> • Alarm • Trip The temperature settings shall be as per manufacturer's recommendations.
6	Oil Temperature Indicator (OTI)	OTI to be provided for preventing the transformer oil from High Tem. Operation. <ul style="list-style-type: none"> • Alarm • Trip The temperature settings shall be as per manufacturer's recommendations.
7	Pressure Relief Device (PRD)	PRD to be provided for protection of transformer tank from blasting due to development of high internal pressure during heavy internal fault <ul style="list-style-type: none"> • Trip
8	Magnetic Oil Gauge (MOG)	MOG to be provided for Low oil level Alarm. <ul style="list-style-type: none"> • Alarm
9	Surge Arresters	Gapless Surge Arresters (SAs) shall be provided on HV side. The Neutral Grounding reactor shall also be provided with SAs.
		The Protection of reactor could be divided into two groups (Group-A & Group-B) and each group should be connected to separate DC source. Both Group-A & Group-B protection shall give trip impulse to circuit breaker of reactor. The Group-A should include Differential protection, back up protection, high oil temperature tripping, and PRD tripping. The Group-B should include REF protection, high Winding temperature tripping, low oil level tripping and Buchholz tripping.

(E) Protection for Bus Coupler / Bus Transfer bay

SN	Protection	Setting
1	Bus coupler or Bus transfer bay protection	Non Directional over current and Earth fault protection.

The Sub-committee noted as above. Constituents are requested to go through above protection philosophy and suggest correction /modification, if required, so that matter can be discussed further and finalized before putting the proposal for approval of TCC/RPC. The Sub-committee has also decided to include Generator Protection Philosophy for NER and requested Central and State Generating companies in NER (NEEPCO, NHPC, NTPC & OTPC; Assam, Meghalaya, Tripura) to submit their practices so that the draft can be prepared for discussion.

B.3 SPS scheme for Pallatana

During 84th OCC meeting, the committee reviewed the nomination for System Study Group; the nominations were as given below:

Ar. Pradesh – Shri Tarik Mize, Executive Engineer.

Assam – Navjit Patir, AEGCL.

Manipur – Shri N. Jasobanta Singh, AE & Shri Th. Bimol Singh, AE

Mizoram- Sh. C.C.Lalrimwala, SDO & Sh. Zoramdina, AE

Meghalaya – Sh. D.J. Lyngdoh, AEE, SLDC & Sh. L. Nongkhlaw, AEE, SLDC

Nagaland- Sh. S. Longkumer, SDO, Sh. H. Assumi, SDO & Sh. C. Walling, SDO

Tripura – Sh. Mrinal Paul, Manager & Sh. Anwesh Choudhury, Manager.

NEEPCO – Sh. Bhaskar Goswami, Sr. Manager.

NERLDC – Sh. A. Mallick, CM & Sh. Anupam Kumar, Engineer

NERTS – Sh. P. Kanungo, DGM & Sh. Supriya Paul, Dy Manager (Sh. M. Madhavanad, DM as alternate member)

OTPC – Sh. Tapas Karmakar, Asstt. Manager

NERPC – Sh. Lalrinsanga, EE & Sh. S.M. Jha, EE

IIT, Guwahati - nomination will be taken up by NERPC Secretariat.

During 84th OCC meeting, NERLDC gave the presentation on system studies associated with System Protection Scheme (SPS) under following conditions:

Case 1: Tripping of generating unit of OTPC at Palatana

Case 2: Tripping of 400 kV D/C Palatana-Silchar line

Case 3: Tripping of 400 kV Silchar-Byrnihat line,

NERLDC informed that the study was carried out by taking the base case of NER peak and off-peak conditions in July, 2013.

During off-peak hours, the above trippings may not create serious problem. But during peak hours, above trippings may lead to grid disturbance.

As pre-condition, for successful operation of the proposed System Protection Scheme (SPS), the following lines should be kept in open condition for all the three cases mentioned above

- 132 kV D/C Khliehriat(PG) – Khliehriat(MeECL) lines at Khliehriat(MeECL)
- 132 kV Khliehriat(MeECL) – NEHU line
- 132 kV Khliehriat(MeECL) – NEIGRIHMS line
- 132 kV Pailapool – Jiribam line at Jiribam end

The scheme for all the three cases will be as follows:

Case 1: When Palatana unit trips:

- i. When generator at Palatana trips a signal will be generated from trip relay of the unit.

- ii. This signal should trip the CB of 132 kV Silchar – Srikona D/C & 132 kV Silchar – Panchgram lines at Silchar.
- iii. Subsequent to tripping of 132 kV Silchar – Panchgram line, the CB at Badarpur of 132 kV Badarpur – Panchgram line should be tripped.
- iv. After these trippings an instant load of 80 MW will be relieved during off-peak hours & 130 MW will be relieved during peak hours which will prevent the system from cascade tripping
- v. Then manual demand disconnection/management should be imposed.

Case 2: When 400 kV Palatana-Silcher (D/C) lines trip

- i. When both the ckts of 400 kV Palatana – Silchar lines trips, a signal will be generated from trip relays at Silchar
- ii. This signal should trip the CBs at Silchar end of 132 kV Silchar – Srikona D/C & 132 kV Silchar – Panchgram lines.
- iii. Subsequent to tripping of 132 kV Silchar – Panchgram line, the CB at Badarpur end of 132 kV Badarpur – Panchgram line should be tripped.
- iv. After these trippings an instant load of 80 MW will be relieved during off-peak hours & 130 MW will be relieved during peak hours which will prevent the system from cascade tripping
- v. Then manual demand disconnection/management should be imposed.

Case 3: 400 kV Silchar – Byrnihat line

- i. When 400 kV Byrnihat – Silchar lines trip, signal will be generated from trip relays at Silchar
- ii. This signal should trip CB of GTG/STG of Generating Unit at Palatana. But unit may run in Full Speed No Load (FSNL) condition.
- iii. An instant relief of load of 230/130 MW will prevent the system from cascade tripping.
- v. Then manual demand disconnection/management should be imposed.

The committee deliberated in details about trippings under above three conditions and requested POWERGRID to check the feasibility for implementation of the above schemes. Further, the committee requested all constituents to go through

the schemes and give their suggestions/comments before finalization of the schemes.

During the 87th OCC meeting, OTPC had informed that the proposed SPS pertaining to tripping of generating Unit#1 (Case-I) has already been implemented successfully in consultation with POWERGRID. However, discussion is required with BHEL, POWERGRID, NERLDC and NERPC before implementation of the SPS for Case II & III. OTPC suggested for reduction in generation instead of tripping of STG. NERLDC also agreed for reduction in generation.

The representative of OTPC requested for a meeting of representatives of above organizations either at Palatana or at NERTS, Shillong to resolve the matter at the earliest.

The OOC & PCC Sub-committee decided that the issue shall be discussed and finalized on 23rd July, 2013 at NERTS, Shillong and requested OTPC to attend the above meeting along with representative of BHEL.

Deliberation of the Committee

As per decision of 87th OCC/PCC meeting the matter could not be discussed on 23rd July 2013 due to unavoidable reasons. During 88th OCC meeting, DGM, POWERGRID had informed that the end-to-end testing of SPS scheme was carried out jointly with the representatives of Pallatana on 26.07.2013. At present, the scheme has been kept in SWITCHED OFF condition.

SE (O) highlighted that apart from the above three SPS, NERLDC has proposed to implement one more SPS corresponding to tripping of Byrnihat – Silchar 400kV line when there is no generation from the OTPC's Power plant at Palatana. He requested NERLDC to give the presentation on the new SPS proposed. The presentation on the new SPS scheme is enclosed at **Annexure- B.3**.

After detailed deliberation, the Sub-committee decided that the issue shall be discussed further and finalized on 20th August, 2013 at NERLDC, Shillong and requested OTPC to attend the above meeting along with representative of BHEL. During 88th OCC meeting it has been decided that the members of system study group will also be requested for participation in the meeting. This will be the first meeting of system study group. The issues relating to various system studies required for NER network and individual state network shall be discussed so that

constituent states can carry out various studies independently in consultation with NERLDC.

The Sub-committee noted as above.

B.4 Automatic demand management, Implementation of islanding schemes

During the 87th OCC meeting and 11th PCC meeting, the committee had decided the following islanding scheme and associated frequencies levels for creation of islands in NER:

<u>SN</u>	<u>Islanding Scheme</u>	<u>Frequency</u>
1.	Island comprising of generating units of AGBPP, NTPS & LTPS and loads of Upper Assam system & Deomali area [Total Generation: 380-400MW and load: 200-300MW]	48.80 Hz
2.	Island comprising of generating units of AGTPP, generating units at Baramura, Rokhia & Gumati (Hydro) and loads of Tripura system & Dullavcherra area [Total Generation: 150-160MW and load: 110-150MW]	48.20 Hz
3.	Isolation of NER from NEW grid at ER-NER boundary with rest of the generation and load of NER	47.90 Hz

Further, the committee suggested for discussion with ER regarding isolation of NER from NEW grid at ER-NER boundary. All constituents were requested to study the proposal so that the matter can be discussed further for finalization.

Deliberation of the Committee

MS I/C informed that the islanding scheme 1 & 2 mentioned above was agreed by the committee and hence these two schemes should be implemented at the earliest. There is no financial implication for UFRs as the inbuilt feature of Numerical relays, provided for protection of the corresponding line (s) at identified location would be used.

The implementation plan, proposed by NERPC in 88th OCC meeting was discussed and finalizes as follows.

SN	Islanding Scheme	Lines required to be opened	UFR Location	Implementing Agency
1	ISLAND AT 48.80 Hz: Island comprising of	(a) 220 kV New Mariani (PG) – AGBPP	UFR-1 [At New	POWERGRID

	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)]	(b) 220 kV New Mariani (PG) – Misa	Mariani (PG)]	POWERGRID AEGCL
		(c) 220 kV Mariani – Misa	UFR-2 [At Mariani, Samaguri of AEGCL]	
		(d) 220 kV Mariani – Samaguri		
		(e) 132 kV Mokukchung – Mariani		
		(f) 132 kV Dimapur (PG) – Bokajan	UFR-3 [At Dimapur (PG)]	POWERGRID
2	<u>ISLAND AT 48.20 Hz:</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)-150MW (peak)]	132 kV Palatana – Udaipur	UFR-1 [At Palatana]	OTPC/ POWERGRID
		132 kV Palatana – Surjamani Nagar		
		132 kV Silchar – Dullavcherra	UFR-2 [At Silchar]	POWERGRID
		132 kV AGTPP – Kumarghat	UFR-3 [At Kumarghat]	POWERGRID
		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		

NOTE: The UFR as in-built feature of Numerical relays provided for protection of the corresponding line (s), if available, at identified location shall be used.

The isolation of islanded pocket from rest of the NER grid is only the first stage. The operation of UFRs has to be with certain time delay (say about 0.2 secs). But after isolation from rest of the grid, the load and generation matching should take place automatically in the islanded pocket either by reduction of generation or adjustment of loads. The input from SCADA and use of Programmable Logic Controller (PLC) etc. may be required. Otherwise islanded pocket may not survive due to load generation mismatch. Detail engineering is required for automatic load generation matching for successful operation of the island. Regarding the Case – III above, the matter was highlighted in 2nd NPC meeting held at CEA, Delhi on July 16, 2013. The SE (O), WRPC volunteered to help for studying the third islanding scheme proposed in the NER system i.e. isolation of NER from ER at ER-NER boundary. All the relevant data collected from NERLDC, has already been forwarded

to WRPC for studying the case After completion of study, SE(O), WRPC will share his views on above proposal and accordingly the outcome will be communicated to constituents of the region.

The Sub-committee noted as above.

B.5 Frequent Tripping Of 33kV System of DOP, AP at Nirjuli and Ziro:

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 - Jun'13		Tripping in July'13	
		Nos.	Nos. / Month	Nos.	Nos. / Month
1	Kurung- Kamey	766	18.23	47	47
2	Old Ziro Feeder	440	10.47	22	22
3	Kimin Feeder	1208	28.76	88	88

(b) Tripping 33kV Feeders at Nirjuli

SN	Feeder	Jan'10 - Jun'13		Tripping in July'13	
		Nos.	Nos. / Month	Nos.	Nos. / Month
1	AP - 1	262	6.23	5	5
2	AP - 2	590	14.07	23	23
3	AP - 4	82	1.95	2	2

During the 11th PCC meeting, representative from DoP, Ar. Pradesh informed that matter has been intimated to the higher authority and trippings have come down in some feeders. However, he informed that he will pursue the matter for further improvement.

DGM, POWERGRID stated that this issue has been discussed many times in OCC/PCC meetings but there was no appreciable improvement in the situation. He requested NERPC to take up the matter in the next TCC/RPC meetings.

Deliberation of the Committee

The Sub-committee decided to take up the matter for discussion in the next TCC/RPC meetings as no appreciable improvement has been observed in the situation even after discussing the matter number of times in OCC/PCC meetings.

The sub-Committee noted as above.

B.6 T- Connection of Lekhi & Bhalukpong sub-Station

During the 11th PCC meeting, the representative of Ar. Pradesh informed that the clearance from Department of Environment & Forest is still pending for which work of LILO at Bhalukpong will be delayed. The LILO arrangement at Lekhi is likely to be completed soon. The issue of forest clearance has been intimated to the higher authority and the pile foundation work is likely to be completed by September, 2013.

Deliberation of the Committee

The Sub-committee decided to take up the matter for discussion in the next TCC/RPC meetings as no appreciable improvement has been observed in the situation even after discussing the matter number of times in OCC/PCC meetings.

The sub-Committee noted as above.

B.7 Installation of Harmonic Filters:

During the 87th OCC meeting held on 09.07.2013, representative from DoP, Ar. Pradesh informed that the material for the above work has already been procured as per the specification of POWERGRID and the material has reached the site. He requested POWERGRID to send their representative to check and verify so that Ar. Pradesh can pursue with Satyam Steel Plant to install the filters at the earliest. POWERGRID agreed.

POWERGRID vide letter dated 24.07.2013 informed that they have deputed their engineer to visit the plant on 10.07.2013 and found that they were carrying out the installation work. However, on 11.07.2013 the GM of the plant informed that the filters got burned during charging. Further, POWERGRID engineer verified the purchase order and challan of the equipment and found out that the purchase order is as per the specification of CPRI, however, the challan is not as per the specifications.

The installation of Harmonic Filter took place after prolonged period of 2/3 years and unfortunately, when the same was charged immediate failure occurred. The matter is required to be investigated properly for installation of proper equipment and accordingly DoP, Ar. Pradesh may take up the issue strongly with M/S Satyam

Steel Plant for early installation of filters so that the problem of harmonic stress on the equipments can be eliminated.

Deliberation of the Committee

SE (O) highlighted the discussion in the 88th OCC meeting.

DoP, Ar. Pradesh; no power supply will be given to them. The matter will be intimated once they have rectified the same. The status will be reviewed in the next OCC/PCC meetings.

The sub-Committee noted as above.

B.8 Un-authorized dismantling of POWERGRID owned 2 Nos PLCC panels at 132 kV Khliehriat (Me. ECL) substation.

Me. ECL has dismantled 2 Nos BPL make PLCC panels of 132 kV Khliehriat (PG)-Khliehriat (MeECL) # I at Khliehriat (MeECL) station without informing/ discussing POWERGRID. Thus at present the PLCC link between these two stations through the PLCC link is out of service.

During the 10th PCC meeting, representative from Me. ECL informed that order for procurement of PLCC materials has already been placed and PLCC panels of POWERGRID will be re-installed in July, 2013.

Deliberation of the Committee

Representative from Me. ECL informed that the work has already been completed in the month of July, 2013.

The sub-Committee noted as above.

B.9. Installation of 2nd Distance Protection Relay (DPR) for 220KV and above System

The status of installation of 2nd DPR in respect of following lines as given in 11th PCC is as follows:

SN	Station	Line	Utility	Status
1	Kopili HEP	220 KV Misa #1	NEEPCO	By July, 2013
2	Kopili HEP	220 KV Misa #II	NEEPCO	By July, 2013
3	Kopili HEP	220 KV Misa #III	NEEPCO	By July, 2013
4	Kathalguri PH	220 KV Misa	NEEPCO	Completed
5	Kathalguri PH	220 KV Mariani	NEEPCO	Completed
6	Samaguri SS	220 KV Balipara	AEGCL	Oct, 2013
7	BTPS SS	220 KV Salakati # I	AEGCL	Oct, 2013
8	BTPS SS	220 KV Salakati # II	AEGCL	Oct, 2013

Also the committee advised Assam to install Main -II (Distance protection) at Tinsukia end of Kathalguri-Tinsukia 220kV D/c line.

Deliberation of the Committee

The status of installation of 2nd DPR in respect of following lines as given in 12th PCC is as follows:

SN	Station	Line	Utility	Status
1	Kopili HEP	220 KV Misa #1	NEEPCO	Completed
2	Kopili HEP	220 KV Misa #II	NEEPCO	Completed
3	Kopili HEP	220 KV Misa #III	NEEPCO	Completed
4	Kathalguri PH	220 KV Misa	NEEPCO	Completed
5	Kathalguri PH	220 KV Mariani	NEEPCO	Completed
6	Samaguri SS	220 KV Balipara	AEGCL	Oct, 2013
7	BTPS SS	220 KV Salakati # I	AEGCL	Oct, 2013
8	BTPS SS	220 KV Salakati # II	AEGCL	Oct, 2013

DGM, POWERGRID enquired from Assam about the status of two relays handed over to them.

Assam informed that they intend to install the relays at Samaguri Sub Station (for 220kV Balipara – Samaguri line) and Tinsukia Sub Station (for 220kV Kathalguri – Tinsukia line).

POWERGRID informed that they replenished the relays with Micom P442 and requested Assam to install the relays at BTPS (for BTPS - Salakati # 1 & 2 220kV line). Further, POWERGRID stated that the 220kV BTPS - Salakati Line # 1 & 2 is very important so far as NER-ER connectivity is concerned and in case of disturbance DR data can be exchanged between Salakati and BTPS for analysis and corrective measures.

Assam stated that since the line of BTPS is very short (3-4 KM approx), possibility of using Line differential relays may be explored.

Subcommittee recommended Assam to consider installation of Line Differential relays for above lines.

The sub-Committee noted as above.

B.10. Non Operation of Protective Switchgear of DOP, Manipur & NHPC

As intimated in the last OCC and PCC meetings the default protection schemes of Manipur system are not working properly; however the matter could not be discussed in details as no representative was present from Manipur. Further on 16-07-13 at 0910 hrs, MOCB of 33kV Mongsangei feeder burst at Imphal S/S(Manipur

state) causing tripping of. 132 kV Imphal(PG)-Imphal(state),132 kV Loktak - Ningthoukhong, 132 kV Loktak - Imphal(PG) and all running units of Loktak causing power disruption to Manipur and insecurity in the grid. Had the protection schemes of Manipur were in working condition the fault would have not reflected outside Manipur system.

The matter has become extremely serious and the forum is requested to deliberate the issue irrespective of presence of member from Manipur.

Further, POWERGRID vide mail dated 01.08.2013 informed that in several cases Loktak connected transmission lines are getting tripped due to non-operation of protective switchgear in 132 kV Loktak - Ningthoukhong and 132 kV Loktak - Rengpang lines. This is resulting greater isolation of 132 kV System undesirably affecting 132kV portion of NER Grid. Please refer SN: 4, 6, 9 & 10 of **Annexure-C.1**. Protective Switchgear of DOP, Manipur is required to be made functional immediately.

Deliberation of the Committee

NHPC representative informed that Numerical Relays have already been procured long time back, but the agency (M/S Alstom) who are supposed to come and install the relays have not attended in-spite of their repeated requests.

POWERGRID requested them to pursue with M/S Alstom and in case they need any assistance POWERGRID will also help NHPC in pursuing M/S Alstom.

The Sub-committee expressed concerned about the frequent tripping in Manipur system due to absence / non-operation of required protection system or switchgears and such situation is creating problem not only in Manipur system but in the NER grid as well. Since no representative from DoP, Manipur was present, the Sub-committee requested NERPC to take up the matter with Manipur and the tripping lists pertaining to Manipur should be sent to them and request them to attend the frequent tripping in their system for the safety of NER grid.

The sub-Committee noted as above.

B.11. Frequent disturbances in Loktak- Manipur Sub-system:

Around 20 to 21 disturbances have been experienced in this sub-system since April, 2013. Matters related to corrective actions to be taken were discussed in details in 86th OCC & 10th PCC meetings. No improvement noticed. Involved entities may please intimate the latest status.

Deliberation of the Committee

Please refer Item No. B.10 above.

The sub-Committee noted as above.

B.12. Parallel Operation of 3x20 MVA Transformer with 160 MVA Auto-transformer at Kopili

The committee discussed about the importance of bringing the 3x20MVA transformer back into service. Sr. Mgr. (E/M), NEEPCO informed that the matter has been taken up with POWERGRID. It has been observed that the 3x20MVA, transformer can only operate at Principal tap and there is no back up O/C+E/F protection on 220kV side of transformer. However, all efforts are to be taken to complete the work by July, 2013. The sub-committee suggested that all required protection should be in place before operation of the transformer. The status will be reviewed in the next PCC meeting.

Deliberation of the Committee

Sr. Manager, NEEPCO informed that Kopili HEP is facing serious problem due to acidic nature of water and most of the engineers are busy with restoration of the plant. However, all efforts will be put by NEEPCO to complete all required tests at the earliest before bringing the transformers into service and parallel operation of above transformer is likely to be completed by August, 2013. The relay co-ordination will be done in consultation with PGCIL.

The sub-Committee noted as above.

C. NEW ITEMS

C.1 Major Grid Disturbances during June, 2013 to July, 2013:

There was no major grid disturbance during the month of July, 2013.

Committee may like to note.

However, the following major events occurred in NER during July, 2013 and Committee discussed the remedial solution as below:

Repeated tripping of elements in and around Sarusajai area

1. At 1759 Hrs on 11.06.13, 220 kV Bus at Sarusajai S/S tripped, leading to tripping of 220 kV Sarusajai – Langpi D/C, 220 kV Sarusajai – Samaguri D/C, 220 kV Sarusajai – Agia S/C, 220 kV Sarusajai – Boko S/C & 220/132 kV ICT I, II & III.
2. At 1251 Hrs on 23.06.13, 220 kV Sarusajai – Boko, 220 kV Sarusajai – Agia , Samaguri – Sarusajai I & II, 220 kV Sarusajai – Langpi I & II, 220/132 kV ICT, 3 x 100 MVA tripped.

During 11th PCC meeting, representative from Assam informed that the CT blasted again and even after replacement of the CT blasted again. There is no bus bar protection at 220kV level of the substation at Sarusajai and the CB also did not operate at Sarusajai end. It is difficult to pin point the problem as DRs are yet to be received from Agia & Boko. After receiving the data, analysis will be done and corrective action will be taken accordingly.

Deliberation of the Committee

Representative from Assam informed that there was some problem with jumpers and the problem has been rectified.

The sub-Committee noted as above.

Tripping related to AEGCL, Samaguri:

On 19.07.2013 220 kV Balipara – Samaguri line tripped with 8.4 km fault distance from Samaguri end and 43.1 km from Balipara end. Balipara end A/R Operated.

Deliberation of the Committee

Representative from Assam informed that the fault was in Y- phase and the DPR operated correctly. However, auto reclosing scheme is not kept in service because of the obsolete CB (i.e MOCB) which is not suitable for SPAR. Further, necessary patrolling will also be carried out to monitor the tripping.

POWERGRID suggested for bypassing SPAR / keeping SPAR out of service at Balipara end till AEGCL replace the CB and put SPAR in service.

The sub-Committee noted as above.

Tripping related to NEEPCO (Doyang).

On 26.06.13 132 kV Dimapur-Doyang-2 line tripped from Doyang end only with the indication of 3-Ph trip relay. On enquiry NEEPCO informed that, no actuating relay operated. Thus the tripping is apparently because of mal-operation of master trip relay.

Deliberation of the Committee

Sr. Mgr. (E/M), NEEPCO informed that mal operation had occurred due to some human error, which will not be repeated in future.

The sub-Committee noted as above.

Tripping related to NEEPCO (Ranganadi).

The removal of High set element of Over Current relay at RHEP of 132 kV Nirjuli-Ranganadi line was discussed in various PCC meetings.

Deliberation of the Committee

Sr. Mgr. (E/M), NEEPCO informed that he will revert back about the setting / removal of HS element.

The sub-Committee noted as above.

Other major trippings.

The Committee discussed the trippings and remedial solution as enclosed in Annexure C.1

A. Frequent disturbances in Loktak-Manipur sub-system: Around 20 to 21 disturbances have been experienced in this sub-system since April, 2013. Matters related to corrective actions to be taken were discussed in details in 86th OCC & 10th PCC meetings. Further the following major events occurred in NER w.e.f. 27th June'13 to 28th July'13 in Imphal/Ningthoukhong area:

- i. At 1336 Hrs on 29.06.13, 132 kV Loktak - Jiribam (POWERGRID), and 132 Loktak - Imphal (Manipur), 132 kV Loktak - Ningthoukhong (Manipur), 132 kV Loktak - Rengpang (Manipur) lines and three units of Loktak tripped.
(Generation loss: 105 MW, Load loss: 75 MW).

- ii. At 1835 Hrs on 14.07.13, 132 kV Loktak–Jiribam, 132 kV Loktak–Imphal S/C, 132 kV Loktak-Ningthoukhong, 132 kV Dimapur - Imphal S/C and 132 kV Imphal(PG) - Imphal S/C lines tripped.
(Generation loss: 91 MW, Load loss: 106 MW).
- iii. At 0910 Hrs on 16.07.13, three units of Loktak, 132 kV Loktak – Imphal, 132 kV Loktak – Ningthoukhong, 132 kV Imphal(PG)–Imphal, 132 kV Dimapur – Imphal & 132 kV Loktak - Jiribam tripped.
(Generation loss: 105 MW, Load loss: 75 MW).
- iv. At 1947 Hrs on 17.07.13, 132 kV Dimapur – Imphal, 132 kV Loktak– Jiribam, 132 Loktak – Imphal, 132 kV Loktak – Ningthoukhong, 132 kV Imphal(PG)–Imphal & all three units of Loktak tripped.
(Generation loss: 105 MW, Load loss: 105 MW).

Due to the above trippings power supply to Manipur was affected and also the Grid security depleted. Action taken by all concerned entities specially by Manipur may be deliberated. Had the protection schemes of Manipur were in working condition the fault would have not reflected outside Manipur system.

Deliberation of the Committee

Since representative from DoP, Manipur was not present in the meeting, the Sub-committee requested NERPC to take up the matter with Manipur and the tripping lists pertaining to Manipur should be sent to them and request them to attend the frequent tripping in their system for the safety of NER grid.

The sub-Committee noted as above.

B. Multiple tripping of elements in and around Jiribam (Manipur area):

- i. At 2346 Hrs on 17.07.13, 132 kV Jiribam - Loktak S/C, 132 kV Jiribam - Haflong S/C, 132 kV Jiribam - Aizawl S/C & 132 kV Jiribam - Badarpur S/C tripped resulting in blackout of Jiribam (PG) & Jiribam (Manipur) substation.
(Load Loss: 3 MW).
- ii. At 1852 Hrs of 31-07-13 all outgoing feeders from Jiribam S/S (PG) tripped at the remote ends.

Deliberation of the Committee

Please refer Item No. A above.

The sub-Committee noted as above.

C. Multiple tripping of elements in and around Khliehriat area:

- i. At 1904 Hrs on 29.06.13, 132 kV Khandong - Khliehriat I (POWERGRID) line & 132 kV Khandong - Kopili II (POWERGRID) line tripped.
(System reliability depleted)
- ii. At 1128 Hrs on 08.07.13, Unit 1, 2 and 3 of Leshka HEP, 132 kV Khliehriat (PG) - Khliehriat II tripped. [Khliehriat(PG) - Khliehriat I was under outage].
(Generation loss: 119 MW, Load Loss: 60 MW).
- iii. At 0932 Hrs on 09.07.13, Unit 1, 2 and 3 of Leshka HEP tripped resulting in Grid Disturbance in Meghalaya, Tripura, South Assam and Mizoram (Grid Disturbance II).

(Before the incident, Drawl of Tripura, Mizoram, South Assam & Meghalaya (Khliehriat side) was 61 MW, 28 MW, 83 MW & 28 MW respectively, Generation of Tripura, Leshka (Meghalaya) & AGTPP was 71 MW, 87 MW & 74 MW respectively, 132 kV Umium St II –Umiam St IV D/C & 132 kV Umiam – Umtru D/C was kept open for system requirement & 132 kV Loktak –Jiribam II was under shut down since 1717 Hr on 08.07.13). After the incident, 132 kV Khandong – Khliehriat I & II tripped on O/C (83 MW each) and subsequently 132 kV Khandong – Haflong tripped on O/C).
(Generation loss: 275 MW, Load loss: 245 MW).
- iv. At 2149 Hrs on 30.07.13, 132 kV Khliehriat(PG) – Badarpur S/C, 132 kV Khliehriat (PG) - Khliehriat I and II tripped.

Deliberation of the Committee

DGM, POWERGRID informed that Me.ECL has not provided DPR at 132kV Khliehriat (PG) # 2 Bay at 132kV Khliehriat (Me.ECL) Sub Station. He insisted that DPR is required to be installed immediately as with the presence 132kV Khliehriat (PG) – Khliehriat (Me.ECL) # 1, 132kV Khliehriat (Me.ECL) Sub Station remains connected with south Assam pocket during fault in 132kV Khliehriat (PG) – Khliehriat (Me.ECL) # 2 and thus, DPR will clear the fault correctly.

Representative from Meghalaya informed that Distance Protection Relay is not available and the procurement of relay is under process. The same will be installed after receiving of relay.

The Sub-committee suggested for joint inspection by a team comprising of representatives from NERPC, POWERGRID and Me. ECL to visit Khliehriat sub-station to identify the problem.

NERPC agreed and the date of inspection shall be intimated in advance to POWERGRID & Me. ECL

The sub-Committee noted as above.

D. Unit tripping/ Power Station Blackout :

- i. At 1007 Hrs on 06.07.13, GTG-I of Palatana tripped followed by tripping of STG-I of Palatana.
- ii. At 0035 Hrs on 27.07.13, Unit 1, 2 & 3 of Leshka, Unit 1 & 2 of Umiam Stg. 1 & Unit 1 & 2 of Umiam Stg. 2 tripped. Due to these events there was Power Station blackout at Leshka, Umiam Stg.I & Umiam Stg II. (Generation Loss: Leshka- 126 MW, Umiam Stg.I- 8 MW & Umiam Stg.II – 4 MW and Load loss (Meghalaya): 45 MW).

Deliberation of the Committee

Representative from OTPC informed that the issue has already deliberated in 88th OCC meeting and the problem is due to gas/gas pipelines. OTPC has taken up the matter with ONGC. The status will be intimated accordingly.

Meghalaya representative informed that concerned Division has been requested to look into the matter.

The sub-Committee noted as above.

E. Repeated Tripping/ Cascade tripping :

- i. 132 kV Aizawl - Jiribam S/C tripped at 1118 Hrs and 1128 Hrs on 22.07.13.
- ii. 132 kV AGTPP - Kumarghat S/C tripped at 1157 Hrs and 1305 Hrs on 23.07.13.
- iii. 220/132kV ICT- I & II at Balipara tripped at 1423 Hrs (Load loss: Assam- 64 MW & AP- 10 MW) & 2055 Hrs (Load loss: Assam- 83 MW & AP- 30 MW) on 25.07.13.
- iv. 220/132 kV ICT- I, II & III at Sarusajai tripped at 2004 Hrs on 25.07.13 (load loss: 270 MW).
- v. 220/132 kV ICT- I, II & III at Sarusajai tripped at 1922 Hrs on 26.07.13 (load loss: 260 MW).

- vi. At 0916 Hrs on 09.07.13, 220 kV Birpara - Salakati I tripped. At 0932 Hrs on on the same day , 220 kV Birpara - Salakati II tripped.
- vii. At 1448 Hrs on 30.07.13, 220 KV Birpara – Salakati I and II tripped followed by repeated tripping of 220 kV Birpara – Salakati I at 1532 Hrs on 30.07.13.

F. Tripping of critical elements:

- i. At 1545 Hrs on 02.07.13, 220 kV Misa - Byrnihat I & II tripped.
- ii. At 1013 Hrs on 12.07.13, 220 kV Misa - Byrnihat I tripped.
- iii. At 1709 Hrs on 15.07.13, 400 kV Misa - Balipara I trpped.
- iv. At 2329 Hrs on 21.07.13, 220 kV Misa - Byrnihat I tripped.
- v. At 1744 Hrs on 03.07.13, 400 kV Bongaigaon - Balipara I tripped.
- vi. At 1125 Hrs on 19.07.13, 220 kV Balipara - Samaguri S/C tripped.
- vii. At 1645 Hrs on 04.07.13, 400 kV Silchar – Byrnihat tripped.
- viii. At 0916 Hrs on 09.07.13, 220 kV Birpara - Salakati I tripped.
- ix. At 0933 Hrs on 09.07.13, 220 kV Birpara - Salakati II tripped.
- x. At 1645 Hrs on 12.07.13, 132 kV Rangia - Deothang S/C tripped.
- xi. At 1330 Hrs on 23.07.13, 220 kV BTPS - Agia S/C and 220 kV Sarusajai - Boko S/C tripped. (Load Loss (Assam): 85 MW).
- xii. At 1905 Hrs on 23.07.13, 400 kV Silchar - Byrnihat S/C tripped (Load loss- Manipur: 20 MW, Tripura: 6 MW)
- xiii. At 1905 Hrs on 23.07.13, 132 kV Ranganadi - Nirjuli S/C tripped (Load loss (AP): 44 MW).

Deliberation of the Committee

Please refer **Annexure – C.1.**

The sub-Committee noted as above.

G. AGBPP Unit tripping due to problem of Gas Compressor:

- i. At 0917 Hrs on 10.07.13, the gas engine II and IV stalled resulting into tripping of unit I, II, III, IV, V, VI and VII. (Generation loss: 200 MW).
- ii. At 1219 Hrs on 11.07.13, the gas engine III stalled resulting into tripping of unit III and IV. (Generation loss: 140 MW).
- iii. At 1841 Hrs on 11.07.13, the gas engine I and III stalled resulting into tripping of unit II, IV, VII and IX. (Generation loss: 100 MW).
- iv. At 1756 Hrs on 15.07.13, the gas engine IV stalled resulting into tripping of unit II, III and IV. (Generation loss: 60 MW).
- v. At 1241 Hrs on 25.07.13, the gas engine I stalled resulting into tripping of unit II, IV and VII. (Generation loss: 80 MW).
- vi. At 1250 Hrs on 15.07.13, the gas engine IV stalled resulting into tripping of unit I, III and V. (Generation loss: 72 MW). (Due to Sl. No. 5 & 6, total Generation loss: 152 MW).

Member may kindly deliberate the above incidents. With growing demand every MW is important and all effort should be made that all protection scheme are operating in the intended manner. NERLDC has been requesting to all power utilities of NER

time and again for furnishing details of every incident in line with IEGC and CEA Grid Standard Regulations. This data/information is required for detailed investigation and for taking remedial measures. Most of the detail information of above events are still awaited all members are requested to expedite sending of the details.

Deliberation of the Committee

The Sub-committee enquired from NEEPCO about the preventive action being taken by AGBPP to reduce frequent tripping of machines till the commissioning of high capacity gas engines.

Sr. Manager, NEEPCO informed that all efforts are being taken to reduce the frequent tripping of the plant. Moreover, during the winter season, the plant is more stable compared to summer season and the commissioning of gas engines of higher capacity (likely to be completed by March 2014) will resolve the problem of frequent tripping.

The Sub-committee noted as above.

H. SPS in case of tripping of 400 kV Byrnihat – Silchar line:

It has been observed that southern part of NER Grid comprising Tripura, South Assam, Manipur, Mizoram, part of Meghalaya becomes insecure in this case tripping of this line irrespective of generation at Palatana. The SPS scheme when Palatana is generating is already deliberated and is under implementation. The SPS scheme when Palatana is not generating is to be discussed and finalized.

Deliberation of the Committee

Please refer **Item B.3** above.

The Sub-committee noted as above.

I. Non availability of telemetry system:

The issue of non availability of telemetry was deliberated in earlier OCC, UCC meetings but there is very little improvement especially in the state sector. Recently on 30-07-13 due to non availability of circuit breaker status, Kopli-Khandong ckt II status was wrongly intimated/inferred resulting in Grid disturbance in 132kV pocket while according emergency shutdown of Silchar-Byrnihat line. To avoid such type of incidents all Stake holders are requested to

ensure availability of CB and IS status in the control room as well as at RLDC. The details of availability of telemetry including CB/IS status from NERLDC perspective have been put up at NERLDC web site for information of all concerned as per direction of Hon'ble CERC. A brief summary of the telemetry status is also enclosed as **Annexure I**.

Deliberation of the Committee

The updated status of telemetry is enclosed at **Annexure - I**.

The Sub-committee noted as above.

C.2 Any other item

Deliberation of the Committee

Assam informed that the isolators at 220 KV Samaguri – Misa – I & II are in bad condition and requested POWERGRID for rectification at the earliest.

POWERGRID agreed.

The Sub-committee noted as above.

Date and Venue of next PCC

It is proposed to hold the 13th PCC meeting of NERPC in second week of September, 2013. As per roaster, Ar. Pradesh will be the host for 12th PCC meeting. The exact venue will be intimated in due course.

The meeting ended with thanks to the Chair.

Annexure-I

List of Participants in the 11th PCC meeting held on 10/07/2013

SN	Name & Designation	Organization	Contact No.
1.	Sh. Tarik Mize, EE, SLDC	Ar. Pradesh	09436059758
2.	Sh. G.K. Bhuyan, AGM, Prot. cell	Assam	09854015601
3.	Sh. A. Bhattacharjee DM, Prot. cell	Assam	09435332928
4.	No Representatives	Manipur	
5.	Sh. P. Chetry, EE (Killing SS)	Meghalaya	09436112679
6.	Sh. F. Langstieh, AEE (MRT)	Meghalaya	
7.	No Representatives	Mizoram	
8.	No Representatives	Nagaland	
9.	No Representatives	NTPC	
10.	Sh. B. Debbarma, DGM, SO	Tripura	09436450501
11.	Sh. A. Mallick, CM	NERLDC	09436302720
12.	Sh. A. Patir, GM	NERTS	09436302529
13.	Sh. P. Kanungo, DGM	NERTS	09436302823
14.	Sh. M Madhavanand, DM	NERTS	09436335250
15.	Sh. D.Goswami, Sr.Mgr. (E/M)	NEEPCO	09435577655
16.	Sh. R.Saikia, Manager (E/M)	NEEPCO	09435339834
17.	Sh. R.C. Singh, Manager	NHPC	09436894889
18.	Sh. Parshram Saha, Adviser (O&M)	OTPC	08794728670
19.	Sh. S.K. Ray Mohapatra, MS I/C	NERPC	09818527857
20.	Sh.B. Lyngkhoi, SE (O)	NERPC	09436163419
21.	Sh. S.M. Jha, EE (O)	NERPC	08731845175
22.	Sh. S. M. Aimol, EE	NERPC	08974002106

AEGCL RTU STATUS

Total No. RTU	50							
Partial Reporting	22	(Agia,Bokaj,Bokak,Boko,BTPS,Borna,Dibru,Depot,Gohpu,Jagir,Jorha, Kahel,Langp,Lakwa,Maria,Margh,NTPS,Rangi,Rowta,Samag,Sipaj,Tinsu)						
Full Reporting RTU	3	(Naran,Sarus,Sishu)						
Not Reporting RTU	25	(APM,Badar,BNC,Dhali,Dulla,Dhema,Diphu,Golan,Gosai,Gauri,Lanka, Moran,Nazir,Lakhi,Nalba,Sriko,Sibsa,Majul,Paila,Haflo,Panch,Doomd, Dispu,Golao,CTPS)						
*** In some station such as AGIA (Assam), the data quality showing good but actual data not matching with the SCADA data. So,data validation is very much required.								

TSECL RTU STATUS

Total No. RTU	15	
Partial Reporting	6	(Jiran,Barmu,Agart,Udaip,Rokhi,Dhala)
Full Reporting RTU	0	
Not Reporting RTU	9	(Kamal,Gourn,Budhj,Badha,PKBAR,Dharm,Gumti,Gamai,Ambas)

MeECL RTU STATUS

Total No. RTU	10	
Partial Reporting	5	(Umiam,Khlei,Mawla,Umia2,Byrni)
Full Reporting RTU	5	(Nehu,Umia3,Umia4,Umtru,Umia1)
Not Reporting RTU	0	

NAGALAND RTU STATUS

Total No. RTU	3	
Not Reporting RTU	3	(Dimap,Kohima,Mokak)

Manipur SCADA STATUS

Total No. RTU	4	
Not Reporting RTU	4	(Impha,Karong,Ningthou,Kakch)

Mizoram RTU STATUS

Total No. RTU	1	
Not Reporting RTU	1	(Aizawl)

CS RTU STATUS

POWERGRID RTU	18	(All Reporting)
ISGS RTU	8	(All Reporting)

All Constituents have agreed to look into the matter and the status will be intimated accordingly.

Annexure- C.1

SN	Name of Line/ICT (Line Length kM / MVA)	Tripping		Restoration		Relay Indication	Cause of Tripping	Corrective Measures / Action Taken
		Date	Time	Date	Time			
1	132 KV Khandong - Khelieriat - I	08.07.13	14:55	08.07.13	15:02	KHD: 67 A, B, C KHLT: N/T.	Over current pick up.	NEEPCO will check the status.
2	132 KV Jiribam - Loktak - II (82.4 kM)	08.07.13	17:17	09.07.13	20:27	LOK: 21RNZ1 JBM: 21RNZ1, 84.42 KM.	A bamboo fallen over cond in betn loc.95-96 cut by villagers from uphill.	Matter referred to administration of Manipur.
3	132 KV Khandong - Khleihriat-I	09.07.13	09:33	09.07.13	09:44	KHD : O/C, KHLT : N/T.	132KV Grid Failure, Leska m/c tripped with 115 MW generation.	Correct Operation
	132 KV Khandong - Khleihriat-II	09.07.13	09:33	09.07.13	10:15	KHD : O/C, KHLT : N/T.		
	132KV Haflong -Jiribam	09.07.13	09:33	09.07.13	09:42	HFG: 21RYBZ1, 39.3 KM Power swing JBM : N/T		
4	132KV Imphal-Imphal	14.07.13	18:38	14.07.13	19:18	Imphal: 67NX	33KV Bus broken, conductor burnt at Imphal State end. Loktak M/C also tripped, Lok-Nithokhong tripped	Matter referred to Manipur in various PCC meetings. The issue will be taken up in the next TCC/RPC meeting
	132 KV Loktak -Imphal	14.07.13	18:38	14.07.13	18:50	LOK: 21RBZ2 IMP: N/T		
	132 KV Jiribam - Loktak - II (82.4 kM)	14.07.13	18:38	14.07.13	18:50	JBM: N/T, Lok: O/C		
5	400KV Balipara-MISA-I	15.07.13	17:09	15.07.13	17:17	Misa: 85LO Balipara, Balipara: N/T	Tripped at Misa end on Direct Trip while installation of 2nd DPR.	Site instructed to take appropriate precaution during on-line working.
6	132KV Imhal-Imphal	16.07.13	09:15	16.07.13	09:25	Imphal PG: 67B Imphal (State): N/T	Tripped due to CB blasted at Imphal state end. Lok-Ningh tripped at Lok on Z-III	Same as SN: 4.
	132 KV Loktak -Imphal	16.07.13	09:15	16.07.13	09:50	Imphal: 67B Lok: N/T,		
7	132 KV Jiribam - Loktak - II (82.4 kM)	17.07.13	13:15	17.07.13	13:22	JBM: 21BNZ2, 83.31KM LOK: 21BNZ1	Transient fault.	Patrolling revealed no abnormality - matter refer to study.
8	132KV Haflong -Khandong	17.07.13	19:24	18.07.13	12:28	HFG: 21RNZ1, 54.8KM KHD: D/P	Fault was due to burning of R- Ph jumper at Loc.no.51.	Jumper replaced and line normalised. Line thermovision scanning is in process.

SN	Name of Line/ICT (Line Length kM / MVA)	Tripping		Restoration		Relay Indication	Cause of Tripping	Corrective Measures / Action Taken
		Date	Time	Date	Time			
9	132 KV Jiribam - Loktak - II (82.4 kM)	17.07.13	19:47	17.07.13	20:06	JBM: N/T. LOK: 21BNZ1, 67A&B,	Tripped due fault in 132 KV LOK- Ningthoukong state line . LOK: Z I , B-ph.	1) Same as SN: 4. 2) At Loktak end Jiribam feeder protection directionality to be checked. 3) Upgradation of CT in 132 kv Dimapur-Imphal line is planned on 08.08.13 to avoid Over Load condition.
	132 KV Loktak -Imphal	17.07.13	19:47	17.07.13	20:16	IMP: 21BNZ2, 38.41KM. LOK: N/T		
	132 KV Dimapur -Imphal	17.07.13	19:47	17.07.13	20:05	DIM: 67AX IMP: N/T		
10	132 KV Jiribam - Loktak - II (82.4 kM)	17.07.13	23:47	18.07.13	00:09	JBM: N/T LOK: D/P	Tripped due to Y-ph BPI of state owned Transformer Blast.	Same as SN: 4.
	132 KV Jiribam - Aizawl	17.07.13	23:47	18.07.13	00:22	JBM: N/T AZL: 21YNZ2, 172.9 KM		
	132 KV Jiribam -Badarpur	17.07.13	23:47	18.07.13	00:27	JBM: N/T BDP: 21YNZ2, 71.2KM KM		
11	132 KV Aizawl - Kolasib	19.07.13	10:20	19.07.13	10:31	AZL: 67NX KOL: 67N	Transient fault.	Line patrolling revealed infringement from uphill side between Loc: 158-159.
12	220 KV Balipara- Samaguri	19.07.13	11:25	19.07.13	12:28	BLP: 21YNZ1, 43.1 KM. AR Optd SAM: 21YNZ1, 8.4 KM	Fault was in ASEB section. Total Line length 65 KM , Powergrid section 08 KM from Balipara.	Line patrolling to be carried out by AEGCL, status may be initiated in PCC meeting.
13	132KV Doyang - Dimapur -II	20.07.13	11:55	21.07.13	14:23	DOY: D/P. DMP: 21BNZ1, 65.61KM.	B-ph jumper opened at loc.23.	Jumper replaced and line normalised. Line thermovision scanning is in process.
14	132KV Haflong -Khandong	21.07.13	21:35	21.07.13	21:40	HFG: 21RNZ1, 37.4KM KHD: 21RNZ1.	Transient Fault with R-ph LA counter increment at HFG	Checking of Tower footing resistance & copper bonds intactness is in progress.
15	132 KV Jiribam - Aizawl	22.07.13	11:18	22.07.13	11:23	JBM: 21YNZ1, 121.4KM AZL: 67NX	Due to long span (1200 m) between LOC: 312-313, conductor swinging has been reduced ground	Retensioning of the span to be carried out in AUG'13. S/D proposed in 88th OCC.
16	132KV Kumarghat-Badarpur	22.07.13	11:32	22.07.13	15:06	BDR: 21YNZ1, 18.9KM, KGHT: 21YNZ2, 95.1 %	Bamboo felled by unknown villagers in the span LOC: 47-48.	Informed to nearest police station.

SN	Name of Line/ICT (Line Length kM / MVA)	Tripping		Restoration		Relay Indication	Cause of Tripping	Corrective Measures / Action Taken
		Date	Time	Date	Time			
17	132KV Aizawal-Kumarghat	22.07.13	17:33	22.07.13	17:45	AZL: 21RBZ1, 56.68Km KGT: 21RBZ1, 58.74KM	Transient fault.	Patrolling revealed no abnormality.
18	132 KV Jiribam - Aizawl	22.07.13	17:36	22.07.13	17:42	JBM: 21YNZ2, 148.3KM AZL: 21YNZ1, 58.74 KM.	Tripped during heavy Lightning, LA counter incremented at AZL.	Patrolling revealed no abnormality.
19	132 KV Kumarghat - R.C.Nagar (104 KM)	23.07.13	11:58	23.07.13	12:07	KUM: 21YNZ1, 80.7 KM RCN: 21YNZ1, 171.9 KM	A bamboo fallen over cond in betn loc. 103-104 cut by villagers from uphill.	Matter referred to administration of Tripura.
20	132 KV Aizawl - Kolasib	23.07.13	17:02	23.07.13	17:20	AZL: 21RYBZ1, 53.6% KOL: 21RYBZ1, 40.8KM	Heavy Lightning at AZL	Patrolling revealed no abnormality.
21	132 KV Jiribam - Aizawl	23.07.13	17:05	23.07.13	17:37	JBM: 21YBZ2, 118.8KM AZL: 21YBZ1, 62.7 KM	Tripped due to lightning. LA counter inceament at AZL.	Patrolling revealed no abnormality.
22	400 KV Silchar - Byrnihat	23.07.13	19:05	23.07.13	19:43	SIL: 21BNZ1, BYR: 21BNZ2, 178.7KM	Tripping due to lightning.	Installation of tower LAS proposal forwarded to CC.
23	132KV Ranganadi- Nirjuli	23.07.13	19:05			RNG: 21BNZ1, 5 KM NRJ: N/T (Radial feeder)	Conductor snapped between LOC.50-51 under impact of huge tree felled on line as a result of earth cutting by PWD(NH) DIV	Tower re-erected and line normalised. Furhter, matter referred to administration, Arunachal Pradesh.
24	132 KV Khandong - Kopili- II	24.07.13	11:26	24.07.13	11:36	KHD: 21BNZ1 KOP: 21BNZ1	Transient fault.	Patrolling revealed no abnormality.
25	132 KV Khandong - Kopili- I	25.07.13	00:38			KHD: 21RYBZ1 KOP: 21RYBZ1	Tower collapsed at LOC: 17.	Restoration expected by installing new complete tower by 31.07.13.
26	132KV Haflong -Khandong	25.07.13	02:08	25.07.13	19:30	HFG: 67NX KHD: 67NX.	Fault was due to flash over in B-ph insulator string at loc 59.	Insulator string replaced.
27	220KV Misa- Kopili-III	25.07.13	11:53	25.07.13	16:21	KOP: CB Auto Trip. Misa: N/T.	C.B. tripped at Kopili (NEPCO) end during maintenance work. Line not charged due to CB problem at Kopili end. Misa: N/T	NEEPCO will revert back

SN	Name of Line/ICT (Line Length kM / MVA)	Tripping		Restoration		Relay Indication	Cause of Tripping	Corrective Measures / Action Taken
		Date	Time	Date	Time			
28	132 KV Haflong - Jiribam	30.07.13	10:05	30.07.13	10:19	HFG: 21RYBZ1 JBM: N/T	132 kV Partial grid disturbance (PSB Optd). Analysis report attached as Annex-AA.	Correct Operation.
	132 KV Jiribam - Loktak - II	30.07.13	10:05	30.07.13	10:44	LOK: 21RYBZ1 JBM: N/T		
	132 KV Dimapur - Imphal	30.07.13	10:05	30.07.13	10:13	DIM: 67R IMP: N/T		
29	132 KV Salakati - Gelephu	30.07.13	13:13	30.07.13	13:37	SKT: 21YBZ2, 54.1KM	Downstream fault.	
30	132 KV Badarpur -Khlieriat	30.07.13	21:49	30.07.13	21:54	BDP: 21RYZ1, 44.23 Km. A/R Optd. KHLT: 21RYBZ1, 39.86 KM.	Tripped due lightening.	Tripped due lightening.
31	132 KV Badarpur -Khlieriat	31.07.13	12:53	31.07.13	12:59	BDP-N/T. KHLT: 21BNZ3, 240.8KM.	Due to high resistive fault & weak feed at Silchar SS, DEF feature picked up and further tripped on Zone-2. With which Khliehriat end Badarpur feeder.	Matter referred to ALSTOM for study the case suggest modified settings with weak feed & with generation from Pallatana.
	400KV Silchar - Byrnihat	31.07.13	12:53	31.07.13	14:09	SIL: 21BNZ2 & 3. BYR: 21BNZ1.		
32	132 KV Jiribam-Haflong	31.07.13	18:52	31.07.13	19:17	HFG: 21RNZ2, 120.5KM JBM: N/T	Tripped due to heavy lightening in and around Jiribam.	Tripped due to heavy lightening in and around Jiribam.
	132 KV Jiribam - Loktak - II	31.07.13	18:52	31.07.13	19:22	LOK: 21RNZ1 JBM: N/T		
	132 KV Jiribam- Aizwal	31.07.13	18:52	31.07.13	19:35	JBM: 21RNZ1, 7.5KM AZL: 21RNZ2, 163.2KM		
	132 KV Jiribam- Badarpur	31.07.13	18:52	31.07.13	19:52	JBM: 21RN BDP: N/T		