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 – 793003
Nongrim Hills, Shillong – 793003.

ISO 9001:2008

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No. NERPC/OP/OCC/2013/ ***4789-815*** Date: 25th April, 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. Engineer-in-Chief (P&E), Department of Power, Govt. of Mizoram, Aizawl – 796 001
8. Chief Engineer (P), Electricity Department, Govt. of Manipur, Keishampat, Imphal – 795 001
9. Chief Engineer (P), Department of Power, Govt. of Nagaland, Kohima – 797 001
10. General Manager, TSECL, Agartala – 799 001
11. GM, NERLDC, Dongtieh-Lower Nongrah, Lapalang, Shillong -793 006
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 (O&M), NHPC, NHPC Office Complex, Sector-33, Faridabad,Haryana-121003
15. GM (Plant), OTPC, Badarghat Complex, Agartala, Tripura - 799014
16. Member Secretary, ERPC, 14 Golf Club Road, Tollygunge, Kolkata-700033
17. Chief Engineer, GM Division, Central Electricity Authority, New Delhi – 110066

Sub: Minutes of the 8th PCC Meeting held on 10th April, 2013 at Guwahati.

The Minutes of the 8th PCC Meeting of NERPC held on 10.04.2013 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**

भवदीय / Yours faithfully,

बी. लिंगखोई

(बी. लिंखोई /B. Lyngkhoi)
अधीक्षण अभियंता / 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, MeECL, 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 8th PROTECTION COORDINATION SUB-COMMITTEE MEETING OF NERPC

Date: 10.04.2013 (Wednesday)

Time: 10:30 hrs

Venue: "Hotel Grand Starline," Guwahati.

The List of Participants in the 8th PCC Meeting is attached at **Annexure – I**

Shri S. K. Ray Mohapatra, Member Secretary I/C, NERPC welcomed all the participants to the 8th PCC meeting. Further, he briefed about the discussion in the 84th OCC meeting to the participants in the PCC meeting and stated that the protection audit in respect of Sub-Stations/Generating Stations of 132kV and above voltage class in NER has been completed in February, 2013.The report highlighting the deficiencies in NER system along with recommendations and implementation plan was to be submitted by March 2013. He also informed that as desired by Ministry of Power (MoP) & CEA, the constituent states have to prepare and submit the DPR for rectification of various deficiencies in substations / generating station of 132kV and above voltage class to NERPC. For execution of work, funding arrangement is being planned by MoP and constituent states of the region should not miss the opportunity. Also he stated that some of the important agenda items like major grid disturbance, setting of Zone – 3, finalization of Islanding Scheme, SPS would be discussed. He requested all the participants to actively participate in the meeting for fruitful outcome.

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

SE(O), NERPC informed that healthiness of protection system is very important for safe and reliable operation of the grid. Further he stated that as informed by MS I/C the constituents should prepare the DPR at the earliest to take the advantage of funding from Ministry of Power for improvement of their system for the benefit of their states and the region.

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 7th MEETING OF PROTECTION SUB-COMMITTEE OF NERPC.

SE (O), informed that the minutes of the 7th meeting of the PCC held on 13th March, 2013 at Guwahati were circulated vide letter No. NERPC/OP/PCC/2013/1785-1812 dated 26th March, 2013.

No comments or observations were received from any of the constituents, the minutes of 7th PCC meeting was confirmed.

ITEMS FOR DISCUSSION

B. FOLLOW UP ACTION

B.1. Independent third party audit of protection system

The Chairperson, CEA vide his D.O letter No. 7/AI/GD/GM/2012/397-407, addressed to Hon'ble Chairperson, NERPC had requested for completion of independent third party audit of protection system and to ensure operationalisation of Under Frequency Relay (UFR) and df/dt relay based automatic load shedding within one month. In response to above letter NERPC vide letter No. NERPC/OP/OCC/2012/5687-702 had circulated extract of CEA & CERC regulation and some formats, with typical example (which can be downloaded from NERPC website), to help in collecting various information. No. of groups need to be formed to carry out the protection audit. The action plan needs to be discussed so that the work can be completed as early as possible.

However, the self-certification (by STUs / CTU) in respect of operationalisation of Under Frequency Relay (UFR) and df/dt relay based automatic load shedding may please be submitted in the prescribed format to NERPC and CEA at the earliest.

During 79th OCC meeting, SE (Comml), NERPC informed that as recommended by Enquiry Committee, the third party independent audit for the Protection systems in NER is to be completed as early as possible and presently Ministry of Power and CEA are also monitoring the progress in various regions it very closely. Therefore, for the benefit of the NER, the upgradation of protection system is very much required for smooth and reliable operation of grid and action should be initiated at the earliest. Further, he informed that third party independent audit of Protection systems for Northern region has already been completed by PGCIL in association with CPRI and other regions have also started their action plan. He informed that in NER there are about 135 Nos. of substations/ generating stations of 132kV and above voltage class and also proposed to carryout protection audit for all these substations / generating stations as 132kV system forms the backbone of NER unlike other regions. Since arrangement of funds is the major constraint in NE region, small groups /teams have to be formed taking representation from NER constituents. The committee decided to form teams comprising of four (4) members from different state utilities/owner, PGCIL/NEEPCO/NHPC and NERPC/NERLDC. NERPC will co-ordinate the audit and prepare the further course of action in consultation with NERLDC and POWERGRID. The nominated member of NERPC/NERLDC will be the co-ordinator of each group.

NERPC, in consultation with POWERGRID and NERLDC, had prepared the detailed plan for carrying out the audit of protection system of all 132 kV and above voltage class substations/generating stations in NER. All the constituents were requested to nominate their representatives for the audit and the proposed dates were to be finalized during OCC/PCC meeting. NERPC vide letter dated 26th and 30th November, 2012 had requested PGCIL and other constituents to provide logistic support inform of road transport and stay at various places in NER.

During the 82nd OCC meeting, MS I/C, NERPC informed that as per the planning out of nine (9) routes identified the audit of protection system pertaining to route no. 1, 4, 6, 7 and 8 have been completed and presently audit in respect of route no. 2 and 5 is going on which will be completed by 11th February, 2013. These routes cover most of the 400/220/132kV Sub-Stations and Generating stations in Ar. Pradesh, Assam, Manipur, Mizoram, Nagaland and Tripura. The audit of rest of two (2) routes (route no. 3 and 9) will commence from 11th February, 2013. Further, he stated that as on date protection audit in respect of about 100 substations / generating stations has been completed and rest of the work is likely to be

completed by February, 2013.

During the 83rd OCC and 7th PCC meeting, MS I/C, NERPC briefed the members about the deficiencies observed in some of the audited sub-stations and highlighted the inadequacy of diagnostic tools in most of the stations. The formats of reports were also highlighted to the members for perusal.

GM, NERLDC suggested that shortage of man-power may also be highlighted in the reports as round the clock manning of sub-stations is very important for effective and efficient management of the systems.

MS I/C requested all the constituents to extend their help to compile the audit report of their Sub-stations/Generating Stations. He stated that the report is to be finalized and is likely to be submitted by March 2013.

The protection audit of the region has been completed and deficiency of audited substations / generating stations has been brought out. The deficiencies need to be rectified at the earliest to ensure safe secure operation of the grid. CEA vide letter dated 25-03-2013 has advised NERPC to discuss the matter with STUs and generating companies of the region for preparation of DPR, cost estimate and action plan for implementation etc. for rectification of deficiencies. The format prepared by PGCIL (received from GM, CEA) for preparation of cost estimate was forwarded in advance to all constituents through mail dated 01-4-2013.

Deliberation of the Committee

MS (I/C) informed that the audit of protection system in respect of substations / generating stations of 132kV and above voltage class in the region was completed in the month of February 2013.The report highlighting the deficiencies of audited substations / generating stations in NER system along with recommendations and implementation plan was to be submitted by March 2013. Findings of the auditing teams were mailed to all constituent states. He also informed that as desired by MoP & CEA, the constituent states have to prepare and submit the DPR for rectification of various deficiencies in substations / generating station. For execution of the work, funding arrangement is being planned by MoP and hence constituent states of the region should not miss the opportunity. The format prepared by PGCIL (received from GM, CEA) for preparation of cost estimate was forwarded in advance to all constituents through mail dated 01-4-2013.

The committee discussed in detail the findings (highlighting various deficiencies in the NER system) and the recommendations of the protection audit team. The committee also reviewed the format for DPR and requested POWERGRID to simplify the format as it is very complicated. POWERGRID was also requested to assist constituent states of the region in preparation of DPR so that same can be submitted in time as it would be difficult on their part to prepare DPR in absence of cost data pertaining to various equipment/ relays/ materials etc.

It was decided that constituent states (7) of the region would provide the required inputs to PGCIL in respect of each substation / generating stations of 132kV and above voltage class taking into account following broad areas.

- Modification in switching Scheme
- Replacement of existing EM/Static relays by numerical relays / Bay Control and Protection Units (BC&PUs) & Substation Automation System (SAS) and providing TSE, DR & EL
- Replacement of old obsolete equipment (CB, Surge Arrester, Isolators, Earthing switches, CTs, PTs/CVTs) and material
- Establishment of reliable communication link and Providing carrier intertrip facility
- Improvement in DC system and providing DG set
- Improving existing Earthing system
- Providing required Fire Fighting system/ arrangement for transformers / reactors
- Providing Modern diagnostic tools.
- Any other improvement required

All constituents agreed to co-ordinate with POWERGRID and submit the DPR at the earliest.

CTU and Central sector generating companies have to prepare their DPR separately.

The Sub-committee noted as above.

B.2. <u>Major Grid Disturbances during November, 2012 to March, 2013</u>:

There was no major grid disturbance during March 2013 and there were three major grid disturbances during November, 2012 to February, 2013. Two during December, 2012 (i.e. 14.12.2012 & 29.12.2012) and one in January, 2013 (i.e. 20.01.2013).

During 7th PCC, NERLDC and POWERGRID was requested to deliberate on following points for each incidence in detail:

(a) Sequence of operation including tripping of lines / generators
(b) Areas affected and quantum of load
(c) Operation / mal operation of various relays associated with transmission lines and Various generators
(d) Cause of such incidence
(e) Sequence of restoration operation and time taken to restore the normalcy

NERLDC gave the presentation on the detail occurrences of the grid disturbances. The incidences were discussed in detail and the committee felt that more tripping details are required for complete investigation. The committee requested POWERGRID and State utilities to look into the matter of above grid disturbances and prepare a report covering details of trippings, sequence of operation and probable cause of such trippings etc. so that the committee can deliberate further on above disturbances. POWERGRID and Assam agreed to collect the complete details and submit their report in next PCC meeting.

POWERGRID and Assam were requested to submit the data at the earliest.

The Sub-committee noted as above.

B.3. <u>Z-3 Protection settings in respect of transmission lines</u>

In the aftermath of twin major grid disturbances in NEW grid on 30th & 31st July, 2012, the Zone-3 protection settings of different transmission lines (132 kV & above) assumed high importance and loadability of transmission lines based on Zone-3 settings need to be reviewed on urgent basis. In view of above all constituents are requested to furnish the existing Zone-3 protection settings (at both ends) of 132kV and above voltage class lines.

During 5th PCC meeting, the sub-committee decided that the Z-3 setting should be done properly to differentiate between load encroachment and Z-3 fault. Committee decided to discuss further in detail after getting information from various utilities.

During 6th PCC meeting, philosophy adopted by POWERGRID for settings of different zones including Z-3 settings was circulated.

During 7th PCC, the committee requested POWERGRID to give a sample calculation based on their philosophy for better understanding of various settings. POWERGRID agreed to give a sample calculation in the next PCC meeting.

POWERGRID has submitted the sample relay setting calculation for a typical line which is enclosed at **Annexure B.3 (I)** and same will be mailed to the constituents.

Assam representative also brought into the notice the basic relay setting philosophy as per IEEE; the same is enclosed at **Annexure B.3 (II)**.

The committee requested all the constituents give their suggestion/comments on Zone -3 protection philosophy so that it can be finalized in next OCC/PCC meeting.

The sub-Committee noted as above.

B.4. SPS scheme for Pallatana

It was observed from load flow studies carried out by NERLDC that tripping of Pallatana unit during peak hours would cause loading of Kopili ICT (160 MVA). To save the situation shedding of around 100 MW of load would be required in the 132 KV pocket through SPS.

During 76th OCC meeting, DGM, NERLDC had informed that a special protection scheme is required to be planned for shedding the above load. The committee advised NERPC Secretariat to design the SPS in consultation with NERLDC, Assam, Meghalaya, Tripura, NEEPCO, NHPC and OTPC.

POWERGRID representatives had informed that not only SPS but protection schemes are also required to be reviewed before commissioning of Pallatana GBPP. Also from the load flow study it was observed that in certain lines there will be reverse flow of power due to tripping of Pallatana.

The committee had requested POWERGRID to study the protection schemes and

prepare a report.

During 77th OCC meeting, DGM, NERLDC stated that in case of tripping of Pallatana unit, around 120 MW of load shedding through SPS would be required in Mizoram, Tripura and South Assam (each 40 MW) and some load shedding would be required in Meghalaya. POWERGRID informed that the implementation of SPS for tripping of far off lines/loads will be difficult as there will be co-ordination problem because of non-availability of communication links and NERLDC should find some other nearby lines or SPS can be linked with Kopili ICT. NERLDC had informed that some radial lines in NER system have been identified for disconnecting during emergency conditions to save the grid and SPS can be implemented on those lines which are available in 132 kV Pocket. All the constituents agreed for implementation of SPS on these lines and also for emergency disconnection of listed lines in case of necessity. NERLDC was to prepare the SPS scheme in consultation with NERPC & POWERGRID.

During 78th OCC meeting, the committee requested NERLDC to prepare the SPS scheme of Pallatana in consultation with NERPC and POWERGRID.

During 79th OCC meeting, NERLDC informed that lines have been identified in NER system for disconnection during emergency conditions to save the grid. SPS can be planned accordingly. The committee requested NERLDC to give the list of lines associated with tripping of Unit-1 at Pallatana and POWERGRID was requested to plan the implementation of the SPS scheme.

Since the 400kV Silchar – Byrnihat line is commissioned, there will not be any requirement for backing down of state generation. However tripping of above line / tripping of generator at Pallatana may cause grid disturbance.

The System Protection Scheme (SPS) associated with tripping of generating unit of OTPC at Pallatana or tripping of 400 kV Silchar-Byrnihat line, prepared by NERLDC, was deliberated during 83rd OCC meeting. GM, NERLDC emphasized that implementation of the SPS is essential to maintain grid security under above contingency conditions. The tripping of above generating unit or 400kV line may cause grid disturbance which may even lead to grid collapse. The scheme involves immediate tripping of few identified lines at 132kV level within two hops from the Silchar bus. It was agreed that the scheme will require carrier inter-tripping provision for effective load shedding.

DGM, NERTS informed that the existing PLCC channels are fully utilized and there

is no spare channel for such carrier inter-tripping and new channels need to be established additionally.

During 7th PC meeting, it was agreed that NERTS would examine the scheme in details and would initiate necessary action for successful implementation of the proposed protection scheme at the earliest possible time and the status of implementation plan would be reviewed in next PCC meeting. SE (O) informed that a Power system study group has also been created in the region taking representation from various constituents including IIT (Guwahati) to carry out studies relating to SPS, islanding scheme etc.

SE (O) informed the status of nomination for System Study Group; the nominations were as given below:

Ar. Pradesh - Nomination will be intimated shortly.
Assam – Nomination will be intimated at the earliest.
Manipur – Shri N. Jasobanta Singh, AE & Shri Th. Bimol Singh, AE
Mizoram- Nomination will be intimated soon
Meghalaya – Sh. D.J. Lyngdoh, AEE, SLDC & Sh. T. Gidon, AEE, SLDC
Nagaland- Nomination will be intimated soon.
Tripura – Sh. Mrinal Paul, Manager & Sh. Anwesh Choudhury, Manager.
NEEPCO - Nomination will be intimated soon.
NERLDC – Sh. A. Mullick, CM & Sh. Anupam Kumar, Engineer
NERTS – Sh. P. Kanungo, DGM & Sh. Supriya Paul, Dy Manager
OTPC – Sh. Tapas Karmakar, Asstt. Manager
NERPC – Sh. Lalrinsanga, EE & Sh. D.K. Bauri, EE

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

MS I/C requested NERLDC to give the presentation on system studies and other related issues pertaining to System Protection Scheme (SPS) associated with 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: <u>When Palatana unit trips:</u>

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: <u>When 400 kV Palatana-Silcher (D/C) lines trip</u>

i. When both the ckts of 400 kV Palatana – Silchar lines trip, a signal will be generated from trip relays at Silchar

ii. This signal should trip the C 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: <u>400 kV Silchar – Byrnihat line</u>

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.

MS I/C, NERPC informed that the SPS should be in place before trial operation of Unit #1 of OTPC for safe operation of the grid and requested POWERGRID & OTPC to take early necessary action for designing the scheme including inter-tripping arrangement for successful implementation of the proposed SPS scheme. All constituents agreed to give their comments in the next OCC/PCC meeting to finalize the SPS.

The sub-Committee noted as above.

B.5. <u>Automatic demand management, SPS & Islanding schemes</u>

As a defense mechanism from possible grid collapse and also to ensure safe & secure operation of grid it is essential to put in place i) Automatic demand management schemes in every state, ii) SPS & iii) Islanding schemes as discussed in 76th OCC meeting. Additional UFRs & df/dt relays may be required for

implementation of the schemes. The Sub-committee had decided to discuss further in detail.

Moreover, for survival of different parts/pockets (with identified generation along with some load) of NER grid in the event of grid disturbance, it has been proposed that islanding schemes may be planned & implemented.

During 76th OCC meeting, DGM, NERLDC stated that some islanding schemes need to be planned so that the islands survive during any grid disturbance so that start-up power can be extended to other generating stations.

During 77th OCC meeting, two proposals for islanding scheme were discussed. In both proposals, first step is isolation of NER from NEW Grid at a particular frequency by tripping of 400kV D/C line and 220kV D/C line connecting ER and NER. In one case it has been proposed for formation of two Sustainable Small System (SSS) and then Unit islanding and ultimately Safe shutdown of Generating units when frequency falls to different levels. The frequency level at which actions are to be initiated is to be finalized after discussion.

The Committee requested all the constituents to study the islanding schemes and communicate their comments/suggestions at the earliest so that the islanding scheme for NER can be finalized.

Further, DGM, NERLDC informed that the list of radial lines in NER system, which can be tripped during emergency to save the grid, have been identified. During emergency there may not be time to co-ordinate with SLDC (like written message etc.) before taking such action. However, formal communication shall be made by NERLDC afterwards.

During 79th OCC meeting, the committee felt that further study is required before finalizing the islanding scheme for NER. The committee requested all the NER constituents to study their systems and give suggestions/comments, if any before finalization of the same. All constituents had agreed.

During the 6th PCC meeting, NERLDC informed that automatic demand management, SPS and islanding schemes were planned and submitted to CEA and POWERGRID for further action. The scheme will be mailed to all the constituents. MS (I/C) stated that the frequency level at which actions are to be initiated, the location of UFR & df/dt relays, their setting (in view of revised frequency band specified by CERC) and communication link required etc. needs to be studied for

implementation of islanding scheme. The sub-committee had suggested that NERPC, NERLDC and POWERGRID may discuss and plan accordingly for implementation.

During 7th PCC meeting, the committee requested NERLDC and NERPC to study the system and prepare few islanding scheme for the region requiring minimum number of line opening and keeping in view the system operation as well as implementation aspects. NERELDC was requested to discuss / to give presentation on planned islanding scheme for the region.

Deliberation of the Committee

DGM, NERLDC gave the presentation for following ~~two~~ islanding schemes:

1) Isolation of NER from the NEW grid
2) 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]
3) Island comprising of generating units of AGTPP, generating units at Baramura, Rokhia & Gumati and loads of Tripura system & Dullavcherra area [Total Generation: 150-160MW and load: 110-150MW]

The handouts of the presentation are enclosed at **Annexure B.5**. The Committee discussed in details for both the islanding schemes. Further, the committee invited comments/suggestion from constituents before finalizing the schemes in the next OCC/PCC meetings. The frequency level at which isolation of NER form NER grid should take place needs to be deliberated further as the gas based units cannot operate at very low frequency (say 47.9 Hz as proposed by NLDC for islanding).

NERLDC was requested to study and plan any other SPS required (other than SPS for Pallatana) for the region.

The sub-Committee noted as above.

B.6. Non Operation of Protective Switchgear of DOP, Manipur

Undesirable tripping of 132kV Imphal (PG) – Imphal (S) Line and 132kV Dimapur – Imphal Line during fault in Manipur system due to non-operation of protective switchgear of Manipur system is being observed since long.

The issue was discussed in details during 9th TCC & NERPC Meeting held on 11th & 12th August 2010. During the meeting, Manipur had informed that necessary action is being taken to replace old and outdated equipments.

In the 4th PCC meting the status could not be updated as Manipur representatives were not present.

During the 5th PCC meeting, Manipur representative informed that the renovation of old Sub-stations is being done in phased manner as per CEA guidelines. Presently renovation work of Yerumbum S/S is in process and subsequently two more S/S (Karong and Kackching) will be taken up.

POWERGRID informed that they have reduced the time delay setting of Zone-3 so that the 132kV Imphal-Imphal line gets tripped before spreading of the fault to other areas.

During the 6th PCC meeting, Manipur representative informed that the renovation of old Sub-stations is going on. Under the renovation scheme all old equipments (CB, CT, PT etc.) will be replaced.

During 7th PCC meeting, Manipur representative informed that the renovation of old Sub-stations is in progress.

During 8th PCC meeting, Manipur representative again informed that the renovation of old Sub-stations is in progress and the work would be completed soon.

The Sub-committee noted as above.

B.7. <u>Frequent Tripping Of 33kV System of DOP, AP at Nirjuli and Ziro</u>

During 9th TCC & NERPC Meeting, the issue was discussed in details and Arunachal Pradesh had informed that various measures to reduce no. of faults on 33 KV lines owned by Dept. of Power, Govt. of Arunachal Pradesh have been initiated.

During 10th TCC & NERPC Meeting POWERGRID had again expressed concern for non-reduction of no. of faults in 33kV Feeders. Arunachal Pradesh had again assured to take necessary action urgently to reduce no. of faults in their 33kV lines.

During 4th PCC Meeting the Sub-committee had requested POWERGRID to monitor the status of trappings for one more month and the same would be reviewed again in the next PCC meeting.

During the 5th PCC meeting it was brought to the notice of the representative of Ar. Pradesh that the tripping is still on higher side as reflected below.

A. 132/33kV Ziro Sub Station

Sl. No.	33 KV feeder	Jan' 12 & FEB' 12	
		Nos.	Tripping/month
1	Kurung Kamey	32	16
2	Old Ziro	24	12
3	Kimin	62	31

B. 132/33kV Nirjuli Sub Station

Sl. No.	33 KV feeder	Jan' 12 to Aug' 12	
		Nos.	Tripping/month
1	AP #1	88	11
2	AP #2	124	15.5
3	AP #4	10	1.25

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

Ar. Pradesh representative stated that the topography of Ar. Pradesh is very difficult because of which maintenance of these lines is getting difficult.

Further, POWERGRID informed that there is no improvement in tripping.

No. of trippings during September '12 – November '12 are as below:

A. 132/33kV Ziro Sub Station (Tripping of 33kV Feeders)

Sl. No.	33 KV feeder	Oct – Nov '12	
		Nos.	Tripping/month
1	Kurung Kamey	16	8
2	Old Ziro	13	6.5
3	Kimin	22	11

B. 132/33kV Nirjuli Sub Station (Tripping of 33kV Feeders)

Sl. No.	33 KV feeder	Sep '12 to Nov '12	
		Nos.	Tripping/month
1	AP #1	20	6.67
2	AP #2	74	24.67
3	AP #4	2	0.67

During 6th PCC meeting, SE(O) informed that the NERPC secretariat has already taken up the matter with CE, DoP, Ar. Pradesh and has requested Ar. Pradesh to take necessary action early for reducing the faults in their 33 kV lines.

During 7th PCC meeting, the status could not be updated as representatives from Ar. Pradesh were not present in the meeting.

The representative of Ar. Pradesh informed that the matter will be taken up again with higher authority.

The Sub-committee noted as above.

B.8. <u>T- Connection of Lekhi & Bhalukpong sub-Station and installation of harmonic filters at Banderdua</u>

During 4th PCC meeting, POWERGRID had informed that 132kV Ranganadi-Nirjuli Line is being tapped (i.e. operating with T – connection) to feed Lekhi Sub Station instead of LILO since Aug/Sept 2008 and had requested Dept. of Power, Ar. Pradesh to expedite the action for LILO of Ranganadi – Nirjuli line at Lekhi sub-station.

SE, Ar. Pradesh had informed that the LILO arrangement at Lekhi S/S would be completed by January, 2012. However, till date the LILO arrangement has not been completed at Lekhi Sub Station.

POWERGRID informed that some corrective action is to be taken otherwise the transformer at Nirjuli substation will again fail.

Assam stated that the tapping of line should be stopped as it is not advisable and the LILO should be restored at the earliest in the interest of the Region.

Ar. Pradesh representative stated that he will take up the matter to their higher authority to complete the job as early possible.

During 5th PCC meeting, SE(Com.) emphasized that T-connection is not a healthy practice and should normally be avoided as such arrangement leads to unwanted trippings of main line.

The committee had requested NERPC Secretariat to take up the matter with DoP, Ar. Pradesh to complete the LILO at the earliest.

During the 6th PCC meeting, NEEPCO representatives stated that there is one more T-connection at Bhalukpong in Ar. Pradesh at 132 kV Balipara-Khupi line which was earlier approved by NERPC Chairman for 3 months on temporary based to make necessary LILO arrangements. The same LILO is still not completed; the committee may request Ar. Pradesh to complete the LILO at the earliest as in case of fault the line gets tripped and the construction power to Kameng Project gets interrupted.

POWERGRID representatives informed that Ar. Pradesh has not installed harmonic filters at Banderdua as agreed by Ar. Pradesh in 13th NERPC meeting held on 10.07.2012 at Faridabad which is being generated by Steel Plant at Banderdua.

The status could not be updated as Ar. Pradesh representatives were not present in the meeting.

The committee had requested NERPC Secretariat to take up all the issues with Ar. Pradesh at the earliest to improve the healthiness of NER grid.

During 6th PCC meeting, SE (O) informed that the NERPC secretariat has already taken up the matter with CE, DoP, Ar. Pradesh and has requested DoP, Ar. Pradesh to take necessary action for early completion of LILO arrangement at Lekhi substation and Bhalukpong.

Ar. Pradesh was to inform the current status of LILO arrangement at Lekhi & Bhalukpong and installation of harmonic filters at Banderdua.

During 7th PCC meeting, the status could not be updated as representatives from Ar. Pradesh were not present in the meeting.

The representative of Ar. Pradesh informed that the matter will be taken up again with higher authority.

The Sub-committee noted as above.

B.9. Commissioning of Line CVTs of 132kv Khliehriat (PG) - Khliehriat (Me.ECL) Line # II

The CVTs of Khliehriat (Me.ECL) Bay # II at Khliehriat (PG) Sub Station have been erected but not commissioned till date. Presently the voltage input for Distance relay as well as for Back up protection relay is being taken from Bus CVT installed in POWERGRID, Khliehriat Sub-station. Matter was informed to R.E (Me.ECL), Khliehriat for taking necessary action in this connection.

During 4th PCC meeting, the representative of Meghalaya informed that they will take up the matter and request the concern division to commission the CVTs of Khliehriat at the earliest

During 5th & 6th PCC meeting, Me.ECL representatives stated that they will take up the matter again with R.E., MEECL and the work will be completed at the earliest. The committee had also requested NERPC Secretariat to take up the matter with Me.ECL. NERPC secretariat has already taken up the matter with Me.ECL.

During 7th PCC meeting, the Me.ECL representatives informed that the matter had been taken up with the concerned person and the work is likely to be completed by March, 2013.

The representative of Me.ECL informed that the work is likely to be completed very soon.

The Sub-committee noted as above.

B.10. Installation of BMK at Khliehriat (MeECL) Bay # II at Khliehriat (PG) Station

CM, POWERGRID had informed that during the commissioning of Khliehriat (MeECL) Bay # II at POWERGRID's Khliehriat Sub Station, MeECL had excavated pit for installation of BMK and the pit was a safety hazard. Matter was referred to R.E (Me.ECL), Khliehriat for taking necessary action.

During 4th PCC meeting, the representative of Meghalaya had informed that the concern division would be requested to look into the matter. The status quo is still maintained even after 8 months.

During 5th & 6th PCC meeting, Me.ECL representatives stated that they will take up the matter with R.E., Me.ECL and the work will be completed at the earliest. The committee had also requested NERPC Secretariat to take up the matter with Me.ECL. NERPC secretariat has already taken up the matter with Me.ECL.

During 7th PCC meeting, the Me.ECL representatives informed that the matter had been taken to the concerned person and the work is likely to be completed by March, 2013.

The representative of Me.ECL informed that the work is likely to be completed very soon.

The Sub-committee noted as above.

B.11. Installation of 2nd Distance Protection Relay for 220KV and above System

POWERGRID had already installed 2nd Distance Protection Relay (DPR) for all 220kV and above voltage level lines as per the CEA regulation.

As per CEA regulation, where two distance protection has been provided, it is also required to ensure that separate directional earth fault relay is either provided or activated in case of Numerical distance relay to take care of high resistance faults.

During 4th PCC Meeting the Sub-committee recommended to replace obsolete relays with numeric relay complying with IEC 61850 protocol in phased manner.

During 5th PCC meeting Assam stated that two of their DPRs are being utilized by POWERGRID in Misa-Samaguri Lines; as soon as they receive their DPRs from POWERGRID it will be installed in BTPS lines. POWERGRID informed that it will take 3-4 months.

During 6th PCC meeting, POWERGRID informed that SPAR of Balipara end of 400 kV Ranganadi- Balipara line operated, but Ranganadi end did not operate. As a result the 400kV line remained charged upto Ranganadi, which is a serious matter as far as safety is concerned.

NEEPCO informed that one of the distance relay, in which the SPAR feature was disabled, operated at Ranganadi end. As per their normal practice, the SPAR feature is enabled only in Main-I relay to avoid multiple shots for CB. However, the matter will be discussed with their Design wing to resolve the problem.

POWERGRID informed that the SPAR feature is to be enabled in both the Relays and to avoid the multiple shots at same time a standalone auto reclosure relay may be used.

MS (I/C), NERPC informed that if distance relays are numerical type, then both relays must have auto reclosure as an inbuilt feature. The manufacturer of the relay may also be consulted to sort out problem.

The status of installation of 2nd DPR in respect of following lines as given in 8th PCC is as follows:

SN	Station	Line	Utility	Status
1	Kopili HEP	220 KV Misa #1	NEEPCO	By Apr' 2013
2	Kopili HEP	220 KV Misa #II	NEEPCO	By Apr' 2013
3	Kopili HEP	220 KV Misa #III	NEEPCO	By Apr' 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

POWERGRID informed that BTPS-Salakati- I& II are short lines; therefore line differentials protection is preferred over distance protection.

Assam representatives also agreed in principle that line differential protection is preferred for short line like BTPS-Salakati- I& II line.

Further, POWERGRID informed that they will be receiving 75AS13 relay shortly; so they will return Assam 75AS13 relays in lieu of their 75AS22 relays taken from Assam.

The Sub-committee noted as above.

B.12. Installation of Bus Bar Protection in 220kV System

On 17-05-12 at 01:43 hrs, the following multiple trippings occurred due to failure of post insulator of R-ph Isolator in Mariani Bay at Samaguri S/S:

1. 220kV Misa-Samaguri # I & II at Samaguri (AEGCL) end tripped on Backup DEF (fault also detected by DPR of these two feeders at Samaguri end in Z3 (reverse)).
2. 220kV Balipara-Samaguri Line tripped on Backup DEF at Samaguri end.

3. 400/220kV ICT tripped at Misa S/S on Directional E/F.
4. Misa-Kathalguri Line tripped at Misa S/S on O/V.
5. Misa-Mariani Line tripped at Misa S/S on O/V.

Result:

The above trippings led to total voltage loss at Misa S/S & consequently all the connecting lines viz. 220 kV D/C Misa-Kopili, 220 kV D/C Misa-Byrnihat & 220 kV D/C Misa-Dimapur had tripped. Further, power flow to the 132kV pocket through 132 kV Khandong-Kopili-II (36 MW) was interrupted. Also, power flow to Dimapur S/S through the 220 kV Dimapur-Misa lines was also interrupted.

Subsequently, the 132kV Dimapur-Imphal & 132kV Jiribam-Loktak-II lines tripped with indication of Power Swing and generation units at RC Nagar Thermal Plant tripped on under-frequency.

The above events led to total power interruption.

Observation:

During the disturbance, huge flashover on line Isolator in the 220 kV Mariani bay at Samaguri (AEGCL) S/S was observed. And the post insulator of R-ph Isolator was found totally shattered. The fault was in Bus Bar Zone at Samaguri S/S (AEGCL). As there is no Bus Bar Protection installed in Samaguri S/S, such multiple faults occurred to clear the fault.

Further, the indication of E/F relays at Samaguri S/S during the above event shows that the relays operated for fault in the reverse directions.

POWERGRID, vide letter no. NESH/OS/1001/91 dtd. 22-05-12, have requested AEGCL to explore the possibility of implementation of Bus Bar Protection scheme and also to check & ensure the healthiness of the Directional Earth Fault relays.

During 5th PCC meeting, the matter was deliberated in detail and SE(Comml) reiterated that for all 220 kV and above voltage class substations, Bus-bar protection and LBB protection are mandatory as per the CEA's Regulations. Moreover, LBB protection is an inbuilt feature of modern numerical relay. Therefore, utilities should go for numerical busbar protection. He also highlighted

that the transmission system is expanding with addition of generation, system is becoming more complex and hence importance of busbar protection is also increasing. Even important 132kV substations should have bus bar protection. During 6th PCC meeting, Assam informed that they are planning for installation of Bus Bar Protection in 220kV substations at Mariani and Samaguri.

During the 6th PCC meeting, Assam representatives informed that relays did not pick up during the fault because of high resistive nature of the fault.

During 7th PCC meeting, MS (I/C), NERPC informed that in numerical distance relays, directional earth fault feature of the relay needs to be activated to sense high resistive fault. Further, he informed that for implementation of the Bus bar protection, the old CTs may need to be replaced as CT ratio may not be suitable and there may not be additional core, which can be dedicated for bus bar protection.

Assam informed that the Bus bar protection in Samaguri and Sarusajai S/S will be installed as early as possible.

The committee requested Assam to implement the Bus bar protection at the earliest for the benefit of NER.

During the discussion in 7th PCC meeting, it was brought to the notice that CTs of suitable ratio and adequate number of cores would be required for implementation of Bus-Bar protection and replacement of exiting CTs may be required. Assam was requested to look into these aspects while going for implementation of bus bar protection scheme.

Assam representatives informed that they have taken up the matter with their higher authority and will do the needful.

The Sub-committee noted as above.

B.13. <u>Parallel Operation of 3x20 MVA Transformer with 160 MVA Auto-transformer at Kopili</u>

Assam had informed that right from the time of the commissioning of 160 MVA Auto transformer of Power Grid at Kopili, the existing 3 numbers of 20 MVA, single phase transformers, supplied by NEEPCO, are not in working condition.

The NEEPCO representative had also informed that the above said transformers were not charged since March, 2011.

The committee had suggested NEEPCO to keep the 3x20 MVA transformers in charged condition so that it could be connected to grid in case of outage of 160 MVA Autotransformer.

NEEPCO informed that the 3x30 MVA Transformers was successfully charged from 220 kV side on 8th September, 2012.

During 5th PCC meeting, SE(Com), NERPC informed that these transformers should not be kept in charged condition for long period without load and other possibilities of utilization of these regional asset should be explored.

CM, POWERGRID stated that this transformer can be operated in isolation to feed radial load. Further, he informed that the parallel loading of transformer is possible if the percentage impedance of the both transformer bank is within the permissible limit, otherwise the loading of 160 MVA ICT will be limited. Assam informed that tripping of 160MVA transformer could lead to tripping of 3x20MVA transformers.

The Committee inquired from NEEPCO about the percentage impedance of both transformers. NEEPCO agreed to provide the information in the next OCC / PCC meeting.

The Committee requested POWERGRID to explore possibilities of effective utilization of these transformers as these regional assets should not be kept idle.

During 77th OCC meeting NEEPCO informed that the 3x30 MVA Transformers was successfully charged from 220 kV side on 8th September, 2012.

The Committee inquired from NEEPCO about the percentage impedance of both transformers to explore the parallel operation. NEEPCO agreed to provide the information in the next OCC meeting.

The Committee agreed and requested POWERGRID to explore for more possibility for utilizing these transformers as these are regional projects and cannot be kept idle. It was also decided that possibility will be explored for charging the ICT along with 132 kV Kopili – Khandong ckt-I in the event of shut down of 132 kV Kopili – Khandong ckt-II.

During 78th OCC meeting, NEEPCO submitted the percentage impedance of 3x20 MVA transformers to the committee. The committee requested POWERGRID to check with the existing 160 MVA ICTs percentage impedance and explore the possibility of parallel operation of both the transformer banks.

During 79th OCC meeting, POWERGRID informed that they have compared the percentage impedance of 3x20 MVA transformers with the existing 160 MVA ICT and found it to be within permissible limit. The vector group of the banks is to be checked to explore the possibility of parallel operation of 3x20 MVA transformers with the existing Kopili ICT. The committee requested POWERGRID and NEEPCO to make the necessary arrangement/tests required to check the possibility of parallel operation

During 6th PCC meeting, the representative of NEEPCO had requested NERPC Secretariat to write to their management to explore the possibility of parallel operation after carrying out necessary tests in association with PGCIL.

During the 7th PCC meeting, SE (O) informed that NERPC Secretariat has already communicated to NEEPCO, vide letter No. NERPC/OP/OCC/2013/4018-4020 dated 06-03-2013, regarding parallel operation of 3x20 MVA transformers with the existing 160 MVA ICT in co-ordination with POWERGRID.

NEEPCO representatives informed that the 3x 20 MVA transformer is being charged from 220 kV side, however, the parallel operation is yet to be done. The committee requested NEEPCO to complete the paralleling operation at the earliest.

DGM, NEEPCO informed that the percentage impedance of 3x20 MVA Auto-transformer provided earlier needs to be checked again. Therefore, a joint site visit of officers' of POWERGRID and NEEPCO is required for verification of data, for deciding about the test to be carried out to check the adequacy of rating of Kopili/Khandong bay equipment and bus capacity before going for parallel operation.

The committee requested POWERGRID and NEEPCO to go for a joint visit to the site for examining the feasibility of parallel operation.

The Sub-committee noted as above.

B.14. Ensuring FGMO/RGMO, AVR & PSS tuning for operation of units

In line with IEGC & other regulations, the following aspects are required to be ensured for operation of generating units:

i. Operation of generators under Free Governor Mode of Operation (FGMO) or Restricted Governor Mode of Operation (RGMO).
ii. Operation of Generating Units within capability limits as per Capability Curves.
iii. Proper settings of Automatic Voltage Regulator (AVR) and
iv. Proper tuning of Power System Stabilisers (wherever available).

During 5th PCC meeting, all constituents agreed to ensure above requirements and intimate the status in next OCC/PCC meeting.

During 6th PCC meeting, the status reviewed by the committee is as given below:

i. FGMO- As informed by NERLDC data received for Hydro machines
ii. RGMO- As informed by NERLDC RGMO is in order
iii. AVR- As informed by NEEPCO there is no AVR in their machines instead there is DVR in their machines
iv. PSS- No PSS in old machines. For new machines it is to be checked.

During the 82nd OCC meeting, NEEPCO has informed the status of Implementation of RGMO at NEEPCO Hydro Power Plants (AS ON 15.01.2013) and other locations are as below:

Ranganadi HEP 3X135 MW	The type of Governor is G40. Existing EHG of the units are not compatible for incorporating RGMO. Order for new microprocessor based EHG incorporating restricted mode operation has already been placed with the OEM, M/s BHEL on 30/03/2012. Considering the lead time for delivery and transportation time, it is expected that the system can be made operational in all units by March, 2014 after erection/commissioning during lean hydro season of 2013-14.
Doyang HEP-3X25 MW	The type of Governor is G40. Existing EHG of the units are not compatible for incorporating RGMO. Order for new microprocessor based EHG incorporating restricted mode operation has already been placed with the OEM, M/s BHEL on 10/10/2012. Considering the delivery schedule of 8 months from date of order & programming erection schedule during lean hydro season, it is expected that the system can be made operational by March'2014.

Kopili 4X50 MW	The type of Governor is G40 in all the units of KHEP. Existing Governors of the power Stations are not compatible for incorporation of RGMO. For 50 MW Unit-I & II of the Kopili Power Station, new Governor system has been placed with OEM along with R&M package in March'2011. Equipments received at site recently. Erection /commissioning will be carried out during R&M works as scheduled in the lean hydro season of 2013-14. Expected date of commissioning of the system is by March'2014.
Khandong 2X25 MW &	For 50 MW Kopili Unit-III, Unit-IV & Khandong 2X25 MW units, as the existing governing system are not compatible for RGMO operation. The matter has been taken up with BHEL, who is the OEM for the system. On receipt of financial offer from BHEL, order shall be processed for the system. It is expected that the system can be commissioned by March'2014.
Kopili Stage-II	The existing governor of 25 MW Stage-II PH is microprocessor based. However, for RGMO, the necessary software has to be loaded in the system. Offer from OEM already received and under process for placement of order. Expected date of commissioning is by March'2013.

Deliberation of the Committee

Assam: Karbi Langpi HEP-The provision of FGMO is available with the machine but the implementation of RGMO is not possible as per the OEM's recommendations as the machines are very old (Manufactured in 1983).

MeECL: Umiam Stage-III- Extension has been asked from CERC for putting FGMO.

NHPC: Loktak- Machines are operating with FGMO and sincere effort is being made to implement RGMO by October 2013.

NEEPCO - informed that PSS tuning has not yet been done for Unit-III of RHEP and same is likely to be completed by 2014.

Meghalaya informed that for Umiam Stage IV PSS has not been tested. The same would be Checked and intimated accordingly.

The sub-Committee noted as above.

B.15. Availability and Healthiness of DAS (Data Acquisition System), TSE (Time Synchronising Equipment), DR (Disturbance Recorder) and EL (Event Logger)

The availability of DAS, TSE, DR & EL at all the Generating stations and Grid substations (above 132 kV) is of paramount importance. If not available, the same are required to be provided as per clause no 4.6.3 of IEGC for recording the dynamic performance of the system. These data are to be archived in millisecond interval and have to be furnished to NERLDC whenever required for system study.

During 5th PCC meeting, committee had requested all constituents to intimate their action plan for putting DAS, TSE, DR & EL in place (if not available).

NEEPCO representative informed that in Ranganadi, above features will be implemented under HMI installation. The committee again requested all other constituents to intimate their action plan for putting DAS, TSE, DR & EL in place (if not available).

The sub-Committee noted as above.

B.16. Details of Installations and self-certification (by STUs and CTUs) in respect of operationalisation of Under Frequency Relays (UFRs) in NER systems and additional requirement of UFR and df/dt relays

During 79rd OCC, Manipur had informed that the UFRs have been installed on 33 kV Yurembum-Limukhong radial feeder as advised by the committee. In the process installation of all UFRs in the NER has been completed as per earlier decision of the committee. Further all constituents (STUs and CTUs) were requested to furnish the relevant information in the format prescribed by CEA. It was also discussed that the requirement of UFR and df/dt relays need to be reviewed based on the recommendation of the enquiry Committee constituted by the Ministry of Power headed by Chairperson CEA and revised frequency band specified by CERC (i.e. 49.7 to 50.2 Hz).

During the 82nd OCC meeting, SE (O), NERPC enquired from constituents whether the UFRs installed in the region have operated during the recent grid disturbances occurred on 14.12.2012 & 20.01.2013. He requested all the constituents to furnish the details of UFR operation. All constituents agreed.

As per clause no. 5.2(n) of IEGC, utilities are to submit UFR operation report on monthly basis to RPC. All constituent states are requested to inform the committee about the operation of UFR since its commissioning, particularly during grid disturbances, which is being monitored strictly by CEA/MoP after the grid disturbances on 30th & 31st July, 2012. The UFR operation detail may please be furnished to RLDC and NERPC as per format circulated.

All constituents agreed to submit the data in the prescribed format.

The Committee also suggested that if UFR operation can be linked to annunciation on control panel, then operation of UFR can be easily recorded.

The committee requested all the constituents to explore the possibility to record the operation of UFRs. It was also stressed for linking the UFR operation with the control panel annunciation system.

All State utilities agreed to explore the possibility and the status will be updated in the next PCC meeting.

Deliberation of the Committee

The committee requested all the constituents to submit the UFR operation detail to RLDC and NERPC.

All constituents agreed to submit the same.

Sub-committee noted as above.

B.17. Tripping of POWERGRID lines due to faults in networks of STU:

POWERGRID informed that tripping occurred in their lines due to faults of networks of STU as indicated below:

i. 132kV Aizwal – Zemabawk line tripped on 19/02/13 for downstream fault in 33kV Network of Mizoram.

ii. 132kV R C Nagar – Kumarghat tripped on 25/01/13 due to non-tripping of 79 Tilla-Rokhia line.

iii. 220kV Misa-Dimapur-I & II, 132kV Dimapur-Imphal, 132kV Dimapur-Doyang-I & II tripped on 19/01/13 due to opening of Jumper in Dimapur bay, Dimapur(ST) problem

TSECL representatives informed that they will examine the reason of tripping after getting the tripping detail of 132kV R C Nagar – Kumarghat line and intimate the status in the next PCC meeting.

The other tripping details will be discussed in the next PCC meeting after getting the details from Mizoram and Nagaland.

TSECL vide e-mail dated 38.03.13 has informed that as informed by POWERGRID representative in the 7th PCC meeting; where it was said that due to the disturbance in 132kV 79 Tilla Grid- Rokhia line a tripping occurred at 132 KV RC Nagar- Kumarghat line on 25.01.13. But, as per record of TSECL and of RC Nagar, no such disturbance had occurred on 25.01.13.

OTPC representative informed that the 400 kV Palatana-Silchar line tripping analysis may be done as it was tripping frequently.

All the constituents are requested to submit the tripping details of the lines for further analysis.

The Sub-committee noted as above.

C. NEW ITEMS

C.1 Additional Agenda:

a. Additional Agenda by TSECL:

TSECL informed that 400 kV Palatana- Silchar line is frequently tripping. Due to these trippings, Tripura system is also disturbed frequently. This forum is requested to look into the matter immediately.

The committee requested NERLDC/POWERGRID/OTPC to submit the detail tripping report for further analysis in the next PCC meeting.

b. Additional Agenda by Assam

Maintenance of 220 kV Misa bay at Samaguri:

Assam representative informed that the one isolator of the Misa bay is having some problem and needs to be attended urgently. Further, the 220 kV Misa bay belongs to POWERGRID and the bay is not maintained properly.

The committee requested POWERGRID to do the needful.

C.2 Date and Venue of next OCC

It is proposed to hold the 9th PCC meeting of NERPC on 10th May, 2013 (Friday). As per roaster, Ar. Pradesh will be the host for 9th PCC meeting. The exact venue will be intimated in due course.

The meeting ended with thanks to the Chair.

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Annexure-I

List of Participants in the 8th PCC meeting held on 10/04/2013

SN	Name & Designation	Organization	Contact No.
1.	Sh. Tarik Mize, EE, SLDC	Ar. Pradesh	09436059758
2.	Sh. P. C. Sharma, DGM, MRTC	Assam	09435119215
3.	Sh. G.K. Bhuyan, AGM, Prot. cell	Assam	09854015601
4.	Sh. A. Bhatcharjee DM, Prot. cell	Assam	09435332928
5.	Sh. B. Bordoloi, DGM	Assam	
6.	Sh. N. Brijit Singh, SE	Manipur	09436065214
7.	Sh. B. Nikhla, EE,	Meghalaya	09436314163
8.	Sh. L. Syngkon, AEE,	Meghalaya	09856009109
9.	Sh. A.G. Tham, AE, MRT	Meghalaya	09774664034
10.	Sh. Lalnunsanga, AE	Mizoram	09436144651
11.	Sh. B. Joy Singh, JE	Mizoram	09436365776
12.	No Representatives	Nagaland	
13.	Sh. B. Debbarma, DGM, SO	Tripura	09436450501
14.	Sh. Sankar Choudhury, SM	Tripura	09436503239
15.	Sh. P.P. Bandyopadhyay, DGM	NERLDC	09436302725
16.	Sh. B. Medhi, DM	NERLDC	09436335376
17.	Sh. P. Kanungo, DGM	NERTS	09436302823
18.	Sh. B. K. Chakraborty, DGM (E)	NEEPCO	09436309730
19.	Sh. Diganta Goswami, Sr. Mgr	NEEPCO	09435577655
20.	No Representatives	NHPC	09436894889
21.	Sh. Neti Sriniwas, DGM (E&C)	OTPC	09436768782
22.	Sh. S.K. Ray Mohapatra, MS I/C	NERPC	09818527857
23.	Sh.B. Lyngkhoi, SE (O)	NERPC	09436163419
24.	Sh. D.K. Bauri, EE	NERPC	09863317236

Annexure B.5

Island - 1

SCHEME

Island comprising of AGBPP,Upper Assam system & Deomali

When frequency falls down to 48.0* Hz, following lines shall trip with the help of AUFR :

i□ □□□ □□ Misa – □□ □□□ line at □□ □□□ end □□□ □□

ii□ □□□ □□ Mariani – □a□ a□uri line at Mariani end

iii□ □□□ □□ Mariani – Misa line at Mariani end □□□ □□

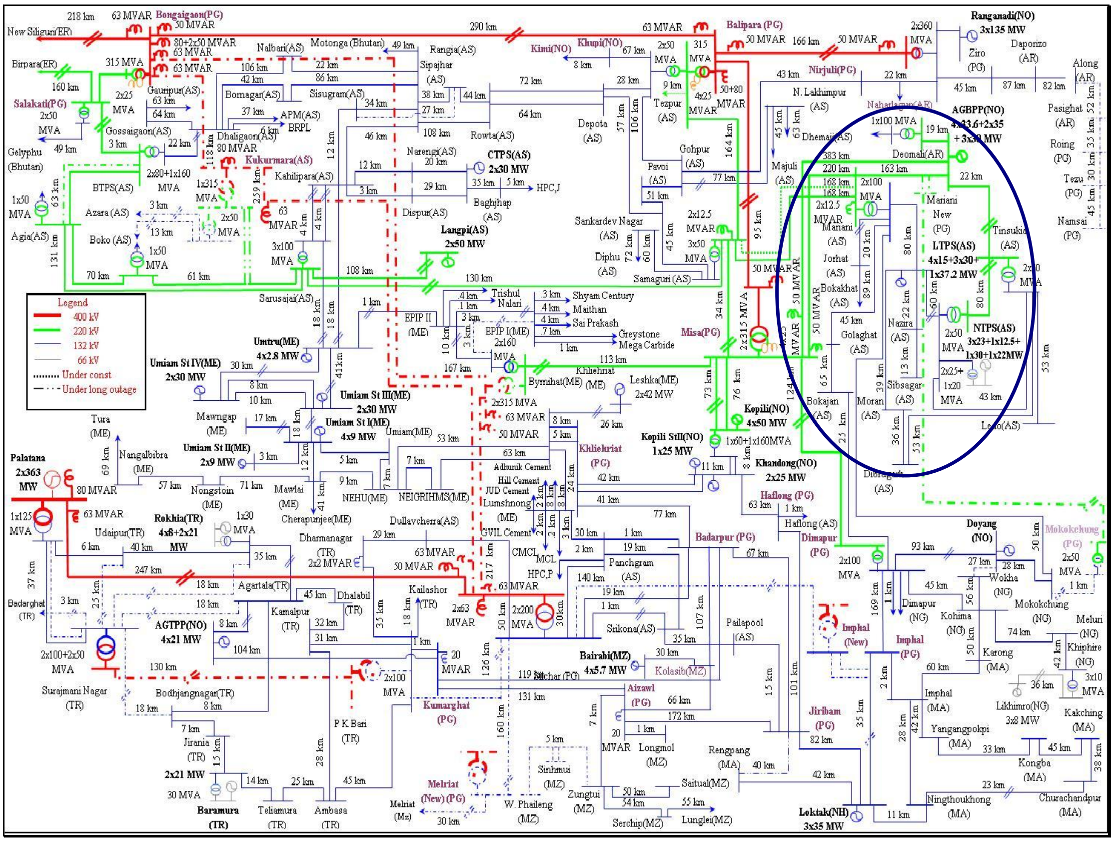
iv□ □□□ □□ Mo□u□chun□ – Mariani line at Mariani end

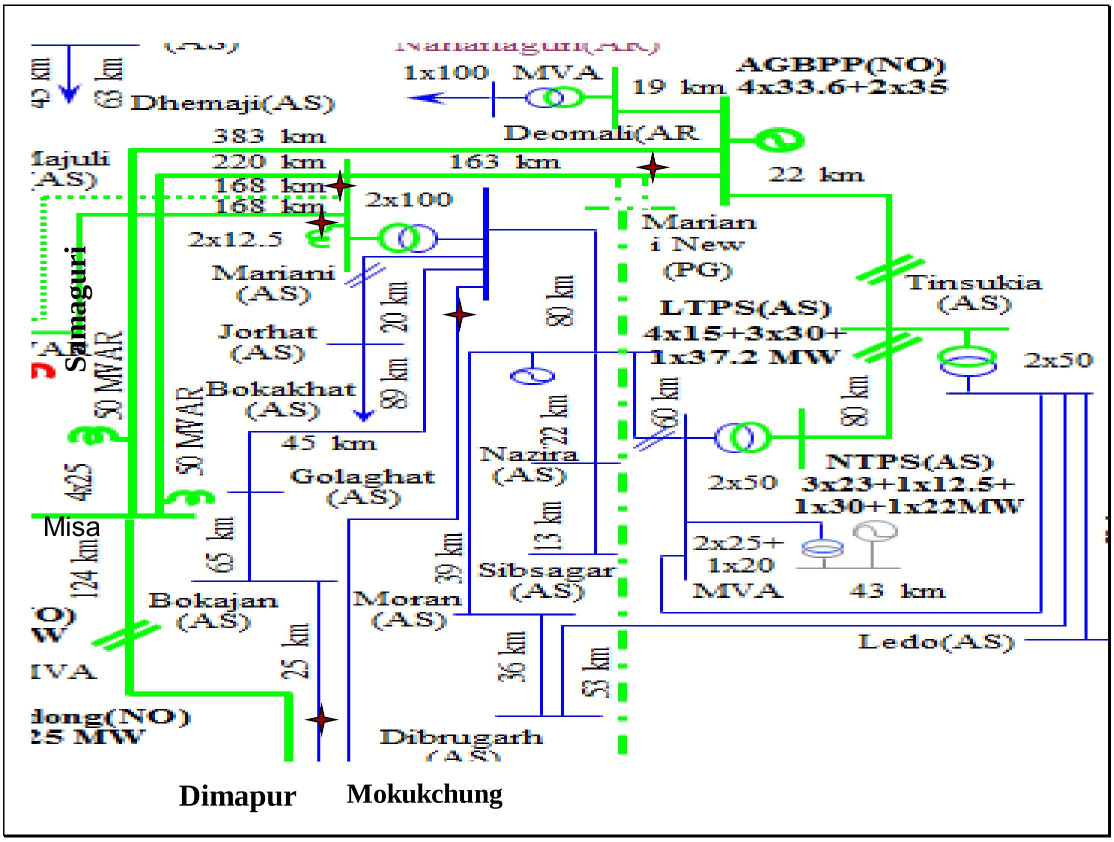
v□ □□□ □□ □i□ apur □□o□a□an at □i□ apur end □□□ □□

- □his will for□ an island co□ prisin□ of □□ □□□□□pper □ssa□ □ □eo□ ali□
- □he available □eneration in this island is around □□□ M□ □
- □he off□pea□ □ pea□ load pattern in this island is around □□□ M□ □ □□□ M□ respectively□

□*Exact freq for activation of UFRs will be decided after deliberation*

Annexure B.5


Legend
400 kV
220 kV
132 kV
66 kV
Under const
Under long outage


Dhemaji(AS)
1x100 MVA
19 km
AGBPP(NO)
4x33.6+2x35
Deomali(AR
383 km
220 km
168 km
168 km
163 km
22 km
Majuli
2x100
2x12.5
Mariani New (PG)
Mariani (AS)
Tinsukia (AS)
Jorhat (AS)
20 km
80 km
LTPS(AS)
4x15+3x30+
1x37.2 MW
2x50
Samaguri
50 MVAR
Bokakhat (AS)
89 km
22 km
60 km
80 km
45 km
Golaghat (AS)
Nazira (AS)
NTPS(AS)
3x23+1x12.5+
1x30+1x22MW
4x25
Misa
65 km
13 km
2x25+
1x20
MVA
43 km
124 km
39 km
Sibsagar (AS)
Bokajan (AS)
Moran (AS)
Ledo(AS)
25 km
36 km
53 km
Dibrugarh
Dimapur
Mokukchung

Load In Upper Assam system & Deomali of Ar. Pradeh

□□s per data sub□itted to NLDC for □OC)

SL NO	Node wise Load	Off Peak (MW)	Peak (MW)
1	Mariani	12	22
2	Jorhat	22	45
3	Golaghat	19	27
4	Bokajan	10	15
5	Diphu(66 kV)	6	9
6	Nazira	21	29
7	Lakwa	10	13
8	Namrup	20	24
9	Tinsukia	45	63
10	Didruragh	21	32
11	Ledo	9	15
12	Deomali	9	13
	Total	204	307

Generation:

AGBPP □□00 □□30 M□

NTPS □□0 M□

LTPS: 110 M□

- Island's frequency will shoot up sharply as available □eneration is hi□her than the load.
- If required installation of df□dt relay will be proposed
- □requency of this island shall be □aintained at around 50.3 Hz by ad□ustin□ □eneration.

Island - 2

SCHEME

Island comprising of AGTPP,Tripura system & Dullavcherra

When frequency falls down to 48.0* Hz, following lines shall trip with the help of AUFR :

i) 132 kV □alatana – □daipur line at □alatana end

ii) 132 kV □alatana – □ur□a□ ani □a□ar line at □alatana end

UFR-1

iii) 132 kV □ilchar – □ullavcherra line at □ilchar end — UFR-2

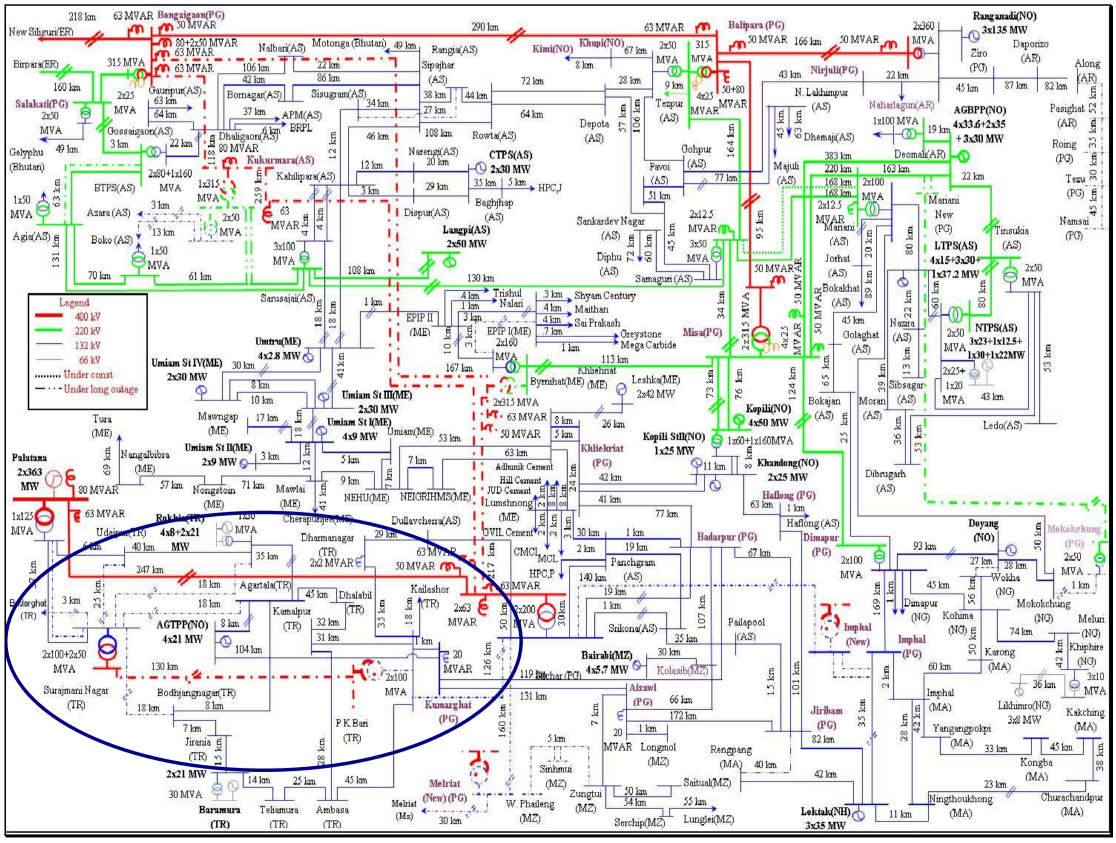
iv) 132 kV AGTPP – □u□ ar□hat line at □u□ ar□hat end

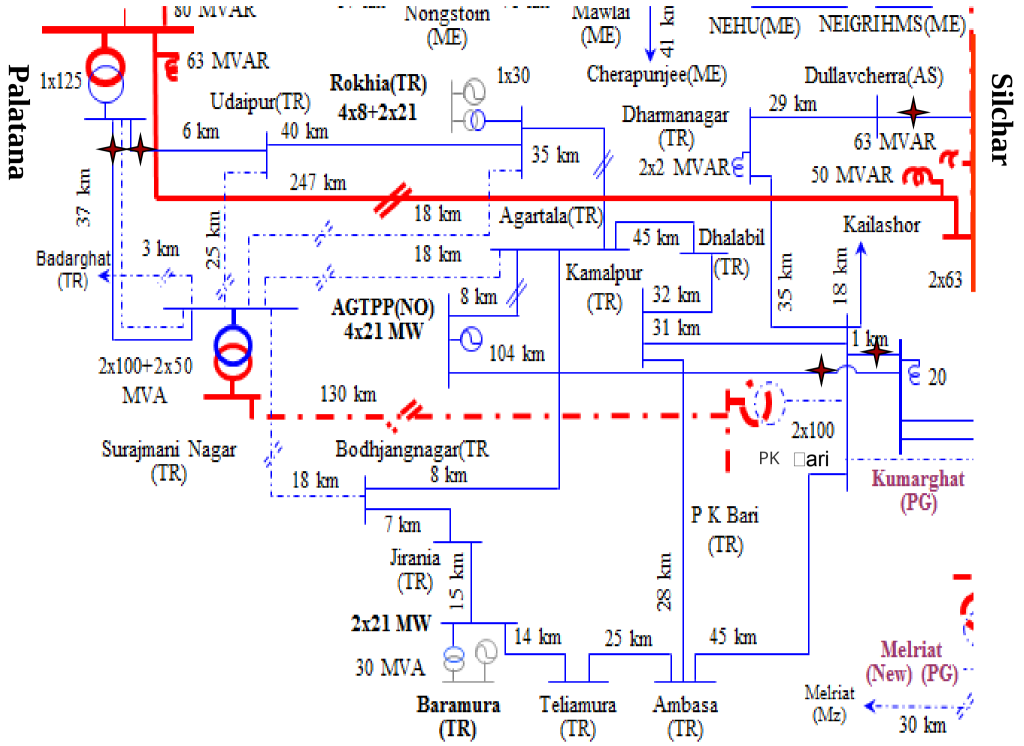
v) 132 kV P K □ari – □u□ ar□hat line at □u□ ar□hat end

UFR-3

- □his will for□ an island co□prisin□of AGTPP, □ripura syste□ & □ullavcherra;
- □he available □eneration in this island is around 160 M□ ;
- □he off□pea□ & pea□load pattern in this island is around 110 M□ & 15 □M□ respectively.

** Exact freq for activation of UFRs will be decided after deliberation*





Load In Tripura system & Dullavcherra of South Assam

□s per data sub□itted to NLDC for □OC)

SL NO	Node wise Load	Off Peak (MW)	Peak (MW)
1	Agartala	37	55
2	Ambassa	5	7
3	Dhalabil	5	7
4	P K Bari	9	13
5	Dharmanagar	9	14
6	Kailashar	5	8
7	Kamalpur	4	6
8	Udaipur	12	18
9	Rokhia	1	1
10	Baramura	1	1
11	Teliamura	4	6
12	Jirania	9	13
13	Bodhjungnagar	4	1
14	Dullavcherra	5	8
	Total	**110**	**158**

Generation:

AGTPP □□0□□5 M□

□ara□ura □40 M□

□o□hia : 45 M□

□u□ti □□-5 M□

- ➢Island's frequency will shoot up as available □eneration is hi□her than the load, if load relief with UFR operation □under e□istin□ sche□e) is successful and subsequent load-□en balance.
- ➢If required installation of df□dt relay will be proposed
- ➢□requency of this island shall be □aintained around 50.3 Hz by ad□ustin□□eneration at AGTPP.
- ➢□ripura should not vary any load / □eneration without prior inti□ation