



भारत सरकार Government of India

विद्युत मंत्रालय Ministry of Power

उत्तर पूर्वी क्षेत्रीय विद्युत समिति

North Eastern Regional Power Committee

मेघालया स्टेट हाउसिंग फिनांस को-आपरेटिव सोसायटी लि. बिल्डिंग

Meghalaya State Housing Finance Co-Operative Society Ltd. Building

नांग्रिम हिल्स, शिल्लोंग – 793003

Nongrim Hills, Shillong – 793003.



ISO 9001:2008

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No. NERPC/OP/OCC/2013/1785-1812

Date: 26th March, 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, Dongtiah-Lower Nongrah, Lapalang, Shillong -793 006
12. ED (O&M), NERTS, PGCIL, Dongtiah-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 7th PCC Meeting held on 13th March, 2013 at Guwahati.

The Minutes of the 7th PCC Meeting of NERPC held on 13.03.2013 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. लिंगखोई /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 7th

PROTECTION COORDINATION SUB-COMMITTEE MEETING OF NERPC

Date: 13.03.2013 (Wednesday)

Time: 14:30 hrs

Venue: "Hotel Grand Starline," Guwahati.

The List of Participants in the 7th PCC Meeting is attached at **Annexure - I**

Shri S. K. Ray Mohapatra, Member Secretary I/C, NERPC welcomed all the participants to the 7th PCC meeting. He informed that as advised by Ministry of Power, Govt. of India and communicated by CEA, the PCC meeting is to be conducted every month. He expressed that frequent meetings and discussion on protection related issues are essential for smooth operation of the system. Further, he briefed about the status of third Party Protection audit of NER system. He informed that the protection audit in respect of Sub-Stations/Generating Stations of 132kV and above voltage class in NER has been completed and the report is to be submitted shortly. He requested all the participants of the constituents to discuss various protection issues pertaining to the system for the benefit of the NE Region.

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.

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 6th MEETING OF PROTECTION SUB-COMMITTEE OF NERPC.

The minutes of the 6th meeting of the PCC held on 11th December, 2012 at Guwahati were circulated vide letter No. NERPC/OP/PCC/2012/7148-64 dated 31st December, 2012.

No comments or observations were received from any of the constituents, the minutes of 6th 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.

The protection audit of NER has been completed as per schedule except few stations in Meghalaya due to local problem and the report on Protection audit along with recommendations will have to be submitted by March, 2013

MS I/C informed that the following points needs to be discussed for finalization of the Audit report of NER

- (a) The deficiencies in the NER system
- (b) Preparation of audit report and recommendations
- (c) Planning for the course of action and time frame of implementation of recommendations of protection audit
- (d) Funding for implementation of recommendations of protection audit
- (e) Any other relevant matter

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 Sub-committee noted as above.

B.2. Major Grid Disturbances during November, 2012 to February, 2013:

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).

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 which is enclosed at **Annexure-B.2**. 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 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.

The Sub-committee noted as above.

B.3. Z-3 Protection settings in respect of transmission lines

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.

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.

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.

Deliberation of the Committee

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.

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.

The sub-Committee noted as above.

B.5. Automatic demand management, SPS & Islanding schemes

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.

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.

The sub-Committee noted as above.

B.6. Protection issues relating to running of Generating Unit – I at Pallattana in full capacity for 72 hrs

The trial run for Generating Unit-I at Palatana is in progress. PGCIL / NERLDC may inform the committee about any abnormality observed in operation of protection system during trial run of the machine. Further PGCIL may also inform if any special measures / precaution are to be taken by constituents during continuous run of Unit at full / base load for 72 hours, taking into account the available transmission elements in the NER system.

During the 6th PCC meeting, GM, OTPC informed that 400 kV Silchar – Pallatana-II had tripped several times due to overvoltage. The same was discussed with POWERGRID and the problem was resolved by changing the cable and modifying the over current settings.

After detail deliberation, the committee requested NERLDC to check the downstream loading pattern of various lines. Accordingly, if required, additional jumpering/strengthening may be planned.

In initial phase the tripping of 400 kV Silchar – Pallatana-II line was observed several times due to overvoltage. In recent past, as such no problem has been encountered in protection system associated with Palatana Generating unit and associated transmission system.

The sub-Committee noted as above.

B.7. 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 meeting 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.

Manipur representative informed that the renovation of old Sub-stations is in progress.

The Sub-committee noted as above.

B.8. Frequent Tripping Of 33kV System of DOP, AP at Nirjuli and Ziro

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. The present tripping rate during last 2/3 months is as below:

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.

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

The Sub-committee noted as above.

B.9. T- Connection of Lekhi & Bhalukpong sub-Station and installation of harmonic filters at Banderdua

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 may inform the current status of LILO arrangement at Lekhi & Bhalukpong and installation of harmonic filters at Banderdua.

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

The Sub-committee noted as above.

B.10. 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.

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 Sub-committee noted as above.

B.11. 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.

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 Sub-committee noted as above.

B.12. Non-Functioning of 48V Battery Bank at Samaguri (AEGCL) Sub Station

POWERGRID had informed that the 48V Battery Bank at 220/132kV Samaguri Sub Station of AEGCL was defective and the load was being fed directly by the charger. POWERGRID had replaced obsolete PLCC (ETI) and CB (MOCB) & Battery with Charger was to be put in service.

During 4th PCC meeting, the representative of Assam had informed about the commissioning of the new battery and charger and POWERGRID was to verify the status as reported by Assam.

POWERGRID informed that while checking the system, when the charger was switched off, the PLCC went out of service. The connection is required to be rechecked and also it appears that there is earth fault in DC system.

During 5th PCC meeting, Assam informed that there may be some connection error as recently new battery and charger has been replaced because of some problem in old battery system and regarding the earth fault in DC system, they are finding difficulty to locate the fault. The committee requested Assam to recheck the connection and try to resolve the issue at the earliest taking the help of POWERGRID.

POWERGRID informed that their personnel had visited Samaguri S/S and found that the Battery Bank (feeding the POWERGRID PLCC Panels) was disconnected from the Charger and as a result when the charger was switched off or AC power was not available the PLCC panels went out of service. This was due to problem (in charging) in the new charger. Hence, the load of the PLCC panels was shifted from the new 48V Charger (that was not functioning) to the 48V charger for ULDC to avoid power interruption to the PLCC panels. The PLCC panels are now running with the ULDC charger & battery bank.

During 6th PCC meeting, Assam representatives informed that the problem of new charger will be resolved by M/s AREVA by April, 2013.

The committee requested Assam to resolve the problem at the earliest as the ULDC charger is getting overloaded with the existing arrangement; the same may be shifted to new charger after rectification of the problem.

Assam informed that they will do the needful to rectify the problem.

The Sub-committee noted as above.

B.13. 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 7th 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	June, 2013
7	BTPS SS	220 KV Salakati # I	AEGCL	June, 2013
8	BTPS SS	220 KV Salakati # II	AEGCL	June, 2013

The Sub-committee noted as above.

B.14. 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.

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 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 existing CTs may be required. Assam was requested to look into these aspects while going for implementation of bus bar protection scheme.

The Sub-committee noted as above.

B.15. Parallel Operation of 3x20 MVA Transformer with 160 MVA Auto-transformer at Kopili

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 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.

The Sub-committee noted as above.

B.16. 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	<p>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.</p> <p>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.</p>
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 machines are very old (Manufactured in 1983) and there is no provision of and it is not possible to implement RGMO.

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.17. 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.18. Non furnishing of data to NERLDC by utilities of NER

NERLDC informed that data pertaining to normal operation as well as those pertaining to major incidence (recent grid incidence, heavy oscillations of Ranganadi & Doyang machines on 26.08.12 from 0215 Hrs to 0245 Hrs) is not being furnished by NEEPCO. These information are required for analysis of the problems.

During 6th PCC meeting, NERLDC informed that requisite data relating to Ranganadi HEP has been submitted by NEEPCO. NEEPCO was requested to provide the details NERLDC in respect of Doyang HEP.

The sub-Committee noted as above.

B.19. 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.

The Sub-committee noted as above.

B.20. 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.

The Sub-committee noted as above.

B.21. Earth Fault in 220V DC System

POWERGRID informed that during the visit of their representative; persisting earth fault was observed in 220V DC System of following stations. The 220 V DC supply circuits were to be checked to sort out the problem on priority basis to avoid mal-operation of switchgear.

1. 220/132kV Samaguri Sub Station (AEGCL)
2. 220/132kV Mariani Sub Station (AEGCL)
3. 220kV Kathalguri Sub Station (NEEPCO)

The representative of Assam had informed that their sub-stations are very old (more than 40 years) and to locate the earth fault is very difficult. Moreover, it requires shut down of relevant feeders/ sub-stations.

The representative of NEEPCO also shared the same opinion with Assam and had requested POWERGRID to suggest some solution to this problem. Further, NEEPCO had also informed that the problem to some extent was identified and the same would be corrected.

During 4th PCC meeting, it was suggested that since the substations are very old replacement of equipment, protection system, cabling etc. should be taken up in phased manner.

POWERGRID had suggested that sometime earth fault occurs due to leakage of electrolyte and in such case cleaning of battery bank eliminates the earth fault.

Further, in case of fault in cable, it can be localized by switching off various DC circuits which may require shut down of feeders. POWERGRID was requested to enquire about the availability of diagnostic tool for locating earth faults.

The Sub-committee had requested NEEPCO & Assam to resolve the problem as discussed above and intimate the status in the next PCC meeting.

NEEPCO informed that after replacement of the battery bank of Switchyard side, there is improvement in the situation.

Assam representatives informed that the problem of earth fault in their system will be resolved and the committee will be informed once it is diagnosed.

The sub-Committee noted as above.

C. NEW ITEMS

C.1 Automated Meter Reading (AMR)

POWERGRID gave a presentation on Automatic Meter Reading (AMR); the handout of the presentation is enclosed at **Annexure-C.1**. The committee appreciated the efforts made by POWERGRID to make easier for meter data reading however, the same may be referred to OCC and CC for further deliberation.

The Sub-committee noted as above.

C.2 Other items

C.3 Date and Venue of next OCC

It is proposed to hold the 8th PCC meeting of NERPC on 10th April, 2013 (Wednesday). As per roaster, Ar. Pradesh will be the host for 8th 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 7th PCC meeting held on 13/03/2013**

SN	Name & Designation	Organization	Contact No.
1.	No Representatives	Ar. Pradesh	
2.	Sh. P. C. Sharma, DGM, MRTC	Assam	09435119215
3.	Sh. G.K. Bhuyan, AGM, Prot. cell	Assam	09854015601
4.	Sh. A. Bhattacharjee DM, Prot. cell	Assam	09435332928
5.	Sh. Bikram Bordoloi, MRTC	Assam	09435558545
6.	Sh. M. B. C. Sharma, EE	Manipur	09436020911
7.	Sh. A.G. Tham, AE, MRT	Meghalaya	09774664034
8.	Sh. Somen Saha	Meghalaya	09436112798
9.	No Representatives	Mizoram	
10.	No Representatives	Nagaland	
11.	Sh. A.S. Debbarma, Sr. Manager	Tripura	09862007591
12.	Sh. Mrinal Paul, Manager	Tripura	09436137022
13.	Sh. T. S. Singh, GM	NERLDC	09436302717
14.	Sh. A. Mallick, CM (SO II)	NERLDC	09436302720
15.	Sh. S. Paul, DM (OS)	NERTS	09436302720
16.	Sh. Diganta Goswami,	NEEPCO	0943577655
17.	Sh. Tanya Taji, Sr. Mgr	NEEPCO	09436045053
18.	Sh. R. C. Singh, Mgr.(E)	NHPC	09436894889
19.	No Representatives	OTPC	
20.	Sh. S.K. Ray Mohapatra, MS I/C	NERPC	09818527857
21.	Sh.B. Lyngkhai, SE (O)	NERPC	09436163419
22.	Sh, Lalrinsanga, AS	NERPC	09436161886
23.	Sh. D.K. Bauri, EE	NERPC	09863317236