

**MINUTES OF THE 32nd PROTECTION COORDINATION
SUB-COMMITTEE MEETING OF NERPC**

Date : 22/04/2015 (Wednesday)
Time : 10:00 hrs
Venue : "Hotel Nandan", Guwahati.

The List of Participants in the 32nd PCC Meeting is attached at **Annexure - I**

Shri P.K. Mishra, Member Secretary, NERPC welcomed all the participants to the 32nd PCC meeting. He informed that nominations from the constituents for training program on numerical relay have already been received by NERPC. Since numbers of nominations are more, therefore, accommodating all the nominations in one phase is not possible as POWERGRID has already indicated that only 25 members can be accommodated in one slot. In view of the above, he directed that some more phases have to be arranged by POWERGRID in near future so that the remaining members can be trained. He also requested all the members to actively participate in the meeting so that old pending agenda should be resolved and not be repeated again and again.

DGM (AM), NERTS stated that some mechanism should be adopted so that expenditure regarding training at Misa can be borne by other constituents also.

Member Secretary stated that tentative expenditure may kindly be intimated by the POWERGRID so that methodology could be worked out for future training on numerical relay. POWERGRID agreed.

Thereafter, Member Secretary requested Sh. B. Lyngkhai, Director/SE(O) to take up the agenda items for discussion.

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 31st MEETING OF PROTECTION SUB-COMMITTEE OF NERPC.

The minutes of 31st meeting of Protection Sub-committee held on 20th March, 2015 at Agartala were circulated vide letter No. NERPC/SE (O)/PCC/2015/4520-4555 dated 31st March, 2015.

NLDC has furnished their observation and to be incorporated in **Item A.4** “**Standardization of Disturbance Recorder Channels**”: as below:

Recorded:

SE(O) informed that as decided in the 30th PCC meeting, the meeting between NERTS, NERLDC & NERPC was held in Shillong on 04.03.2015 and the standard procedure has been finalized and the attached in the minutes.

Amendment - to be Recorded:

SE(O) informed that as decided in the 30th PCC meeting, the meeting between NERTS, NERLDC & NERPC was held in Shillong on 04.03.2015 and the standard procedure has been finalized and the same is attached at **Annexure A-4 (I & II)**. ***NLDC submitted that in the present list of signals, a trigger signal for “Reverse Zone Trip” maybe added to ensure the disturbance record generation in the event of a reverse zone protection operation.***

DGM (AM) stated that the recorded part of NERPC is correct and separate triggering for “**Reverse Zone Trip**” is not required as the DR will automatically get triggered due to opening of CB in such case.

NLDC has furnished their observation and to be incorporated in **Item A.9** “**Training on Numerical Relay**”: as below:

Recorded:

NLDC informed that provision is available in PSDF for capacity building and requested NERPC/NERLDC to give a proposal to them including the TA/DA and cost of training etc., so that they can examine the matter.

To be Recorded:

NLDC informed that provision is available in PSDF for capacity building and requested NERPC/NERLDC to give a comprehensive proposal to NLDC-PSDF Secretariat -so that - the scheme may be processed further.

GM, NERLDC informed that under item A.9 the issue is regarding system operators training in Basic level which was earlier conducted in Bangalore. He stated that

they have approached NPTI to conduct the training on the subject in Guwahati, which they have agreed if at-least 10 or more participants are confirmed. They have agreed that boarding & lodging will be provided on payment basis. Further, GM, NERLDC informed that effort will be made to fund the training cost from LDC development fund as per norms and not PSDF funding as mentioned above. Further, he stated that the certification issued to system operator is valid for three years only and after that they again have to undergo training & exam to get the certification.

Member Secretary summarized & stated that there are three trainings to be carried out. First is the numerical training at Misa, second is the basic level training & certification for system operator to be conducted in Guwahati by NPTI and lastly is the capacity building to be funded from LDC funding or PSDF. He requested NERLDC, NERTS & NERPC to prepare the module for capacity building training so that consolidated proposal can be sent to NLDC for funding.

The Sub-Committee confirmed the minutes of 31st PCCM of NERPC as No observations or comments were received from the constituents

ITEMS FOR DISCUSSION

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

For reliable operation of Power system it is required to implement 3-Phase Auto Reclosure Scheme in all the 132kV lines associated with to Kopili and Khandong HEP of NEEPCO. The lists of such lines are:

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

During 30th PCC meeting, Sr. Manager, NEEPCO informed that 3-phase auto-reclosure scheme in 132 kV Khiehriat – Khandong #1 has already implemented in February, 2015. However, the following lines are yet to be implemented:

- a) 132kV Khandong – Umrangso - Haflong
- b) 132kV Kopili – Khandong # 1

Deliberation of the sub-Committee

After detailed deliberation, the sub-committee decided that at Khandong end it should be kept as check synchronization mode and at Khilehriat (PG) end it should be made as dead line charging mode. The Sub-committee requested NERTS and NEEPCO to co-ordinate amongst them and implement the 3-Phase Auto-reclosure at the earliest.

A.2 Implementation of 3-Phase Auto Reclosure scheme of Radially fed 132kV Lines associated with Ranganadi HEP:

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

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

During 29th PCC meeting, DGM, NERTS informed that the work at 132 kV Nirjuli-Gohpur has already been completed.

Regarding 132 kV Ranganadi-Nirjuli & 132 kV Ranganadi- Ziro, NEEPCO informed that relay testing will be carried out by 15.02.2015 and the work is likely to be completed by February, 2015.

Sr. Manager, NEEPCO informed that AREVA engineers have visited the site but since Ar. Pradesh has not given permission for shutdown of above lines, the work could not be completed. Further, he stated that Ar. Pradesh should inform NEEPCO in advance so that they can tie up with AREVA to complete the remaining lines.

During 31st PCC meeting, EE, SLDC, Ar. Pradesh informed that due to many VIP visits during the month of February, 2015, the shutdown could not be given by them. He requested NEEPCO to avail the shutdown on any dates after 10.04.2015.

Deliberation of the sub-Committee

Since no representative from AR. Pradesh was present, the status could not be updated.

The sub-committee requested NEEPCO to take up the matter with Ar. Pradesh so that SPAR on above lines could be completed.

A.3 Implementation of the recommendations of the Protection Audit:

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

Last Protection audit of NER was carried out w.e.f. November, 2012 to March, 2013.

It is now required to carry out Third party protection audit along with independent audit of Fault Recording Instruments.

During 31st PCC meeting, SE(O) informed that as decided in the 30th PCC meeting, NERPC has forwarded the **Annexure A.3 (I)** to Task Force of CEA and Member Secretary of Task Force had intimated vide mail dated 13.03.2015 which is reproduced as below:

“Your request has been examined by undersigned and the work towards preparing new format is appreciated. However, in order to maintain the uniform practice of the auditing by various audit groups, the audit format and the fault clearance check list provided by Ramakrishna Task Force may please be followed. The same is available at Section 8 and Section 9 of the report of the sub-committee under Task Force and the above report is available on CEA website (GM Div. under GO&D wing)

Further, in case it is felt by audit group that more information is required to be collected for sake of completeness of audit, the same may be collected as supplementary tables”.

After detailed deliberation, MS, NERPC requested all the constituents to furnish the data as per check list of Task Force in Annexure – A.3 (II) within 15 (fifteen) days so that audit report can be sent to Task Force. Further, the data as per Annexure A-3

(I) may also be furnished as supplementary information so that detail information can be kept ready for future reference.

The Sub-committee members requested NERPC to forward the **Annexure-A.3 (II)** to constituents once again so that data should be furnished within 15 days.

Deliberation of the sub-Committee

DGM (AM) stated that standard O&M scheduling is very important for all major equipments and requested all constituents to implement it. Further, he stated that DGA test should be carried out for safety of the equipments and constituents can avail the facility either from POWERGRID or CPRI, Guwahati at the nominal fee.

Assam stated that they have the DGA test kit and they will carry out the suggestion above. Regarding the data in Annexure A.3 (II), they stated that they will submit within April, 2015.

Meghalaya also stated that they will submit within April, 2015.

OTPC has already submitted the above data as per Annexure – A.3 (II)

The sub-committee also requested all constituents to furnish the data as per check list of Task Force in Annexure – A.3 (II) and the data as per format of NERPC in Annexure A.3 (I) within 15 (fifteen) days so that third party protection audit can be done at the earliest.

After detailed deliberation, the sub-committee requested NERPC to hold the special meeting to finalize the standard scheduling of O&M comprising of NERLDC, NERTS, NERPC, NEEPCO, Assam & Meghalaya etc., at the earliest so that the best O&M practices can be evolved in the region.

A.4 Standardization of Disturbance Recorder Channels:

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

During 31st PCC meeting, SE(O) informed that as decided in the 30th PCC meeting, the meeting between NERTS, NERLDC & NERPC was held in Shillong on 04.03.2015 and the standard procedure has been finalized and the same was attached with 31st PCC Minutes.

The Sub-committee requested NERTS, NERLDC & NERPC to have a joint meeting once again to finalize the standardization pertaining to Transformers, Reactors etc.

As directed by the Sub-committee, the special meeting was conducted again on 06.04.2015 at NERLDC, Shillong and DGM (AM), NERTS informed that standardization for transformers & reactors are being finalized by their Corporate Centre for the whole country, the report would be circulated as soon as it is received from them.

Deliberation of the sub-Committee

GM, NERLDC requested NERTS to consider the peculiarity of NER system where 132 kV level is pre-dominant and hence this should be kept in mind while finalizing the procedure.

DGM (AM), NERTS informed that suggestion in this regard has already been communicated by them to their corporate office.

The Sub-committee noted as above.

A.5 Submission of formats for charging/first time synchronization of new elements:

Information related to charging/first time synchronization of new elements/units is to be furnished to NERLDC (two month in advance). All the activities related to charging/first time synchronization of new elements are to be completed before charging/first time synchronization of new elements. The technical data of the elements are also necessary for preparation of Base Case for system study for NER system.

In the previous meetings, MS, NERPC requested all the members to intimate the Nodal Officer from their organization so that correspondence could be taken up with them by NERLDC directly. The name of Nodal Officer along with contact number as intimated by constituents is given below:

Constituent	Name of Nodal Officer	Contact No	Email id:
Ar. Pradesh	N. Perme, EE, SLDC	09436288643	sldcitnagar@gmail.com
Assam	B.C. Borah, DGM, LDC	09435119248	sldcaseb@rediffmail.com
Manipur	L. Haokip, Manager	08575004401	l.haokip@mspdcl.com
Mizoram	Vanlalrema, SE, SLDC	09436140353	sldc_mizoram@rediffmail.com
Meghalaya	F.E. Kharshiing, SE, SLDC	09612170657	sldc.shg@gmail.com
	H.F. Shangpliang, EE, MRT	09863315562	hector_fd@rediffmail.com
Nagaland	Atoho Jakhalu, EE, SLDC	09436002696	atoho.jk@gmail.com
Tripura	Mrinal Pal, Manager	09436137022	mrinalpaulnit@gmail.com
NEEPCO	Bhaskar Goswami, Sr. Mgr	09436163983	pbhaskargoswami@yahoo.com
NHPC	R.C. Singh, Manager	09436894889	rcsloktak@yahoo.com
NERTS	Supriya Paul, Dy. Mgr.	09436302995	nerts_os@yahoo.in
	Deep Bhaumick, Engineer	09436335255	-do-
OTPC	Narendra Gupta, Manager	09774233426	nk.gupta@otpcindia.in
NTPC	J. Bhattacharyya, AGM(EMD)	09435720036	jayanbhattacharjee@ntpc.co.in
	G. K. Kundu, AGM(EEMG)	09401826314	

Deliberation of the sub-Committee

NERLDC has informed that protection system of the element is to be checked & rectified in case of observance of any protection deficiency before charging/first time synchronization of new elements.

The sub-committee requested NERPC to hold the special meeting comprising of nodal officers of constituents, NERLDC & NERPC at the earliest so that the issues related to first time charging of transmission element and first time synchronization of generating unit can be resolved.

Date & Venue of the meeting would be intimated by NERPC shortly.

A.6 Reporting of failure of equipment/towers of transmission lines to Standing Committee of Experts:

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

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

In view of above, in 30th PCC meeting, MS, NERPC requested that all utilities may report the incidences of failure immediately after occurrence of such failure to Chief Engineer (SE&TD), CEA with copy to NERPC.

The format for reporting the first hand information about the failure of equipment in substations/generating stations and failure of transmission line towers are attached at **Annexure – A.6**

Deliberation in the Meeting:

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

DGM (AM) intimated that they have already sent the information to CEA regarding failure of above equipment at Bongaigoan

The Sub-committee suggested that even though the Standing Committee is meant for 220 kV and above, but considering the pre-dominant 132 kV level in NER, the proposal for investigation for failure of critical equipment/tower of critical transmission lines of 132 kV level should be sent to CEA on request.

A.8 Implementation of activities as decided in joint meeting amongst NERLDC, NERPC & constituents of NER on 29.12.2014:

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

The constituents of NER agreed upon the following:

- a. Testing of all existing relays and schemes within 2 months by all constituents to assess the healthiness of existing protective relays.
- b. Review of relay settings based on history of tripping.
- c. Availability of Distance Protection scheme.
- d. Attempts would be made to avoid any tripping on account of vegetation growth, which is frequent in NER.
- e. Single Phase / Three phase Auto Reclose Scheme of transmission lines of voltage level 132 kV and above under List of Important Grid Elements of NER are to be adopted, wherever available. The status of implementation will be monitored in monthly OCC/PCC meetings.

During 31st PCC meeting, SE(O) stated that once the R&M of sub-stations is over, all those facilities will be in place. Further, he informed the Sub-committee about the Hon'ble CERC Order and the direction given by Commission to NER constituents regarding the hearing on 26.02.2015 is reproduced as below:

- a. Take proactive actions like taking Board's approval, floating of NITs, selection of bidders etc., and place the award of work as and when fund from PSDF is released.
- b. In case of constraints of funds, the States of NER (who have not got funds from PSDF) may explore the possibility of arranging funds from PSDF; and
- c. Complete the implementation of the recommendations of third party Protection Audit within 12 months from the date of placement of award for purchase of equipments.

NERPC is directed to monitor the progress of each constituent and file the report to the Commission for every quarter.

He requested all the constituents to start the preliminary works regarding tendering etc., at the earliest so that as soon as the fund is released tendering can be initiated.

Sh. N.L. Jain, AGM, NLDC informed that DPR from all the constituents of NER have been received except Manipur. NLDC requested NERPC to take up the matter with Manipur so that funding for Manipur could also be taken up by them.

Deliberation in the Meeting:

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

Latest available status updated in the meeting was as follows:

Arunachal Pradesh : **DPR has already been submitted to NLDC/CEA**

Assam: **DPR has been approved by the Appraisal Committee**

Manipur: **DPR was under finalization by Manipur and would be submitted shortly**

Meghalaya: **DPR has already been submitted to NLDC/CEA**

Mizoram: **Revised DPR was again re-submitted to NLDC/CEA**

Nagaland: **DPR has been approved by the Appraisal Committee**

Tripura: **Revised DPR has to be sent again.**

A. 9 Training on Numerical Relay:

DGM (AM), NERTS informed that the likely dates to impart training at Misa is 27th & 28th April, 2015. The list of first batch participants is enclosed at **Annexure – A.9.**

The Sub-committee noted as above.

A.10 Furnishing Protection Details of Transmission Lines, Transformers, Reactors and Bus Bars:

a. Transmission Line

As per section 43.4.c (Schedule V) of Technical Standards for construction of Electrical Plants and Electric Lines Regulation, 2010, Protection system of **400 kV lines** consists of Main I, Main II, DEF, Two Stage Over Voltage, Auto Reclosing and

Carrier Aided Inter Tripping. Protection system of **220 kV lines** consists of Main I, Main II/Over Current & DEF, Auto Reclosing and Carrier Aided Inter Tripping. Protection system of **132 kV lines** consists of Main I, Over Current & DEF, Auto Reclosing and Carrier Aided Inter Tripping.

AEGCL, MSPCL, MePTCL, P&E, Mizoram, POWERGRID, NEEPCO (only AGBPP, Ranganadi HEP, Doyang HEP & AGTPP), NHPC has furnished the information.

DoP, Arunachal Pradesh, DoP, Nagaland, NEEPCO (for Khandong, Kopili & Kopili Stg II), OTPC were requested to furnish Protection Details of Transmission Lines as per enclosed format in Annexure - A.11.

b. Transformer

As per section 43.4.c (Schedule V) of Technical Standards for construction of Electrical Plants and Electric Lines Regulation, 2010, Protection system of **Transformer** consists of Differential Protection, Over Flux Protection, REF Protection, Backup Directional Over Current and Earth Fault Protection (HV & LV side)/Impedance Protection, Buchholz, WTI, OTI, MOG, OSR for OLTC, PRD, SA, Tertiary Winding Protection, Over Load Alarm.

AEGCL, MSPCL, MePTCL, P&E, Mizoram, POWERGRID, NEEPCO (only AGBPP, Ranganadi HEP & AGTPP), NHPC has furnished the information.

DoP, Arunachal Pradesh, DoP, Nagaland, NEEPCO (for Khandong, Kopili & Kopili Stg II), OTPC were requested to furnish Protection Details of Transformer as per enclosed format in Annexure - A.11.

c. Reactor

As per section 43.4.c (Schedule V) of Technical Standards for construction of Electrical Plants and Electric Lines Regulation, 2010, Protection system of **Reactor** consists of Differential Protection, REF Protection, Backup Definite Time Over Current and Earth Fault Protection/Impedance Protection, Buchholz, WTI, OTI, MOG, SA.

AEGCL, MePTCL, NEEPCO (Rangaandi HEP) and POWERGRID have furnished the information.

OTPC was requested to furnish **Protection Details of Reactor** as per enclosed format in **Annexure -A.11**.

d. Bus Bar & LBB

As per section 43.4.c (Schedule V) of Technical Standards for construction of Electrical Plants and Electric Lines Regulation, 2010, Bus Bar Protection and Local Breaker Backup Protection are to be provided in **220 kV and above voltage** interconnecting sub-station and all generating station switchyards.

MePTCL, POWERGRID, NEEPCO (AGTPP, AGBPP & Ranganadi HEP) & NHPC have furnished the information.

DoP, Arunachal Pradesh (Deomali), AEGCL (BTPS, Agia, Boko, Sarusajai, Langpi, Samaguri, Jawaharnagar, Mariani, Tinsukia), NEEPCO (Kopili) & OTPC were requested to furnish Bus Bar Protection and Local Breaker Backup Protection as per enclosed format in Annexure -A.11.

e. Bus Coupler

MSPCL, MePTCL, P&E, Mizoram, NEEPCO (only AGBPP, Ranganadi HEP & AGTPP) & NHPC have furnished the information.

DoP, Arunachal Pradesh, AEGCL, DoP, Nagaland, POWERGRID, NEEPCO (for Doyang, Khandong, Kopili & Kopili Stg II) & OTPC were requested to furnish Bus Coupler Protection as per enclosed format in **Annexure -A.11**.

Protection System Database prepared based on information furnished by power utilities of NER, which is attached at Annexure - A.11). Power utilities of NER were requested to check & validate the same.

NERLDC informed that constituents may send the data in NERLDC email as below:

nerldcoutage@gmail.com – for any outage events

nerldcprotection@gmail.com – for Protection related issues and

nerldc@yahoo.co.in – for general purposes.

OTPC has furnished the above data during the meeting.

Deliberation in the Meeting:

After detailed deliberation, the Sub-committee requested all the constituents to furnish the above information to NERLDC latest by 10.05.2015.

A.11 Grid Disturbances during March, 2015:

The following numbers of Grid Disturbances (GD) occurred during the period **w.e.f 1st March to 31st March, 2015:**

SI No	Control Area	Grid Disturbance in nos.	
		1 st March, 2015 to 31 st March, 2015	Jan'15 to Mar'15(till 31st)
1	Palatana	3	4
2	AGBPP	0	1
3	AGTPP	0	1
4	Ranganadi	0	1
5	Kopili	0	1
6	Khandong	0	1
7	Doyang	0	2
8	Loktak	0	4
9	Arunachal Pradesh	6	14
10	Assam	7	16
11	Manipur	5	17
12	Meghalaya	0	1
13	Mizoram	1	3
14	Nagaland	2	9
15	Tripura	1	2

SI No	Category of GD	Grid Disturbance in nos.	
		1 st March, 2015 to 31 st March,15	1 st Jan'15 to 31 st March, 2015
1	GD 1	16	38
2	GD 2	1	2
3	GD 3	0	0
4	GD 4	0	0
5	GD 5	0	1
	Total	17	41

Deliberation in the Meeting:

This is for information to the members. Remedial actions to be taken by the concerned power utilities of NER to avoid such disturbances in future.

A.12 Root Cause analysis of Grid Disturbances:

i. Disturbance in Manipur system

- a. At 1650 Hrs on 20.03.15, 132 kV Imphal (PG) - Imphal (MSPCL) I line tripped (**Imphal (PG)- Earth fault & Imphal (MSPCL)-No tripping**) & 132 kV Imphal (PG) - Imphal (MSPCL) II line tripped (**Imphal (PG)- Earth fault & Imphal (MSPCL)-No tripping**). Tripping of these two lines led to load loss in Capital area of Manipur.

Load loss: 60 MW in Manipur.

- b. At 1748 Hrs on 20.03.15, 132 kV Loktak- Ningthoukhong S/C tripped (**Loktak- Over-current & Ningthoukhong-No tripping**) & 132 kV Ningthoukhong- Imphal (PG) line tripped (**Ningthoukhong- No Tripping & Imphal (PG) - Earth Fault**). Tripping of these 2 lines led to load loss in Ningthoukhong area of Manipur.

Load loss: 20 MW in Manipur.

- c. At 1440 Hrs on 27.03.15, 132 kV Loktak- Ningthoukhong line tripped (**Loktak- DR Awaited from Ningthoukhong**) & 132 kV Ningthoukhong- Imphal (PG) line tripped (**Ningthoukhong- DR Awaited & Imphal (PG)- Awaited**). Tripping of these 2 lines led to load loss in Ningthoukhong area of Manipur.

Load loss: 34 MW in Manipur.

Category as per CEA Standards: GD-I

Analysis of events:

It is suspected that there may be fault in MSPCL system in all of the 3 cases of load loss in Manipur as stated above. It is requested to furnish DR outputs at both ends for above events for further analysis.

Deliberation in the Meeting:

Since no representative from Manipur was present, the issue could not be discussed. The Sub-committee requested NERPC to arrange the meeting with senior officers of Power Dept. Manipur comprising representative from NERTS, NERLDC & NERPC to find out the root causes of disturbances as many such incidences have been occurred in Manipur.

A meeting will be convened in Manipur in this regard.

ii. **Disturbance in Capital & Ziro area of Arunachal Pradesh and Gohpur area of Assam:**

- a. At **1441 Hrs on 03.03.15**, 400 kV Balipara-Ranganadi I (**Balipara- Direct Trip received & Ranganadi-Over Voltage**) tripped.
400 kV Balipara- Ranganadi II was kept open to contain O/V since 1956 Hrs on 01.03.15
Load loss: 30 MW in Arunachal Pradesh & Assam.
- b. At **0716 Hrs on 05.03.15**, 400 kV Balipara-Ranganadi I (**Balipara- Direct Trip received & Ranganadi-Over Voltage**) tripped.
400 kV Balipara- Ranganadi II was kept open to contain O/V since 1956 Hrs on 01.03.15
Load loss: 73 MW in Arunachal Pradesh & Assam.
- c. At **0130 Hrs on 31.03.15**, 400 kV Balipara-Ranganadi I (**Balipara- Direct Trip received & Ranganadi-Over Voltage**) tripped.
400 kV Balipara- Ranganadi II was kept open to contain O/V since 2107 Hrs on 24.03.15
Load loss: 64 MW in Arunachal Pradesh & Assam.
Category as per CEA Standards: GD-I

Analysis of events:

400 kV Balipara – Ranganadi I line was feeding power to these areas.

It is suspected that there may be mal-operation of relay at Ranganadi/problem of carrier inter tripping. Settings of overvoltage relays at Ranganadi (NEEPCO) need to be checked.

It is requested to furnish DR outputs at Balipara ends for above events (except Sl. No. ii. a) for further analysis. As informed by Rangandi DR is not available.

This issue was discussed during last three PCC meetings. But the issue not yet resolved.

Deliberation in the Meeting:

It is requested to Ranganadi HEP, NEEPCO to install DR & EL at the earliest so that analysis could be done to avoid such type of incidences in future.

NERLDC also requested NEEPCO to make the reactor at Ranganadi switchable since high voltage is still observing at their end.

Sr. Manager, NEEPCO stated that this issue has been discussed many times and making reactor is not possible as isolator has to be operated manually and frequent opening/closing of equipment is not desirable as the life span of equipment may get shortened.

Assam also mentioned that because of frequent tripping of this line, power supply to Ar. Pradesh and Assam is deprived which is not agreeable.

After detailed deliberation, the Sub-committee requested NERPC to write to management of NEEPCO for taking 50 MVAR Line Reactor of 400 kV Balipara – Ranganadi line as Bus Reactor whenever required. Moreover, NEEPCO has to carry out the instruction of NERLDC whenever required.

iii. Disturbance in Mizoram system

- a. At 1840 Hrs on 23.03.15, 132 kV Badarpur- Kolasib (**Badarpur- DP, ZII, R-E & Kolasib- Not furnished**) & 132 kV Aizawl- Kolasib (**Aizawl- Earth Fault & Kolasib- Not Furnished**) line tripped.

Load loss: 8 MW in Manipur.

Category as per CEA Standards: GD-I

Analysis of events:

It is suspected that there may be fault in Mizoram system. It is requested to furnish DR outputs at both ends of 132 kV Aizawl- Kolasib line for above event for further analysis.

The similar type of disturbance occurred on 26.01.15 at 0742 Hrs at Kolasib Sub-station

Deliberation in the Meeting:

DGM (AM), NERTS informed that joint inspection between POWERGRID and Mizoram will be carried out shortly and the status will be intimated to NERLDC/NERPC.

The Sub-committee noted as above.

iv. Disturbance in Tripura system

- a. At 1301 Hrs on 25.03.15, 400kV Silchar- Palatana I line tripped (**Silchar- DP, ZI, B-E & Palatana- DP, ZI, B-E**) & 400kV Silchar- Palatana II line tripped (**Silchar- DP, ZI, R-E & Palatana- DP,ZI, R-E**).

Load loss: 136 MW in Tripura & 65 MW in South Assam.

Generation loss: 338 MW in Palatana, OTPC & 76 MW in Tripura.

Category as per CEA Standards: GD-II

Analysis of events:

Due to tripping of 400 kV Palatana- Silchar I & II line, evacuation path of Palatana generation was through 400/132 kV, 125 MVA ICT at Palatana only. No relay pickup observed from DR for 132 kV Palatana- Udaipur and 132 kV Palatana- Surajmaninagar furnished by OTPC. Tripura system collapsed due to this event which is suspected to be due to evacuation of generation of Palatana through Tripura system after tripping of 400 kV Silchar – Palatana D/C lines. SPS related to tripping of Palatana did not operate as SPS was connected to Module I of Palatana only, while Module 2 was generating at the time of disturbance. It is thus requested that SPS scheme related to tripping of Palatana be modified to include tripping of Module II as well, and ensure proper relay co-ordination at Palatana to prevent disturbance in Tripura system.

Deliberation in the Meeting:

OTPC informed that the flux setting is set at 1 sec, the ICT tripped on over fluxing.

NERLDC informed that on 21.04.2015 400 kV Silchar – Azara & Silchar-Byrnihat again tripped and indication shown that at Silchar it tripped showing Z2 B-P & at Byrnihat is Z1 –B-P.

GM, NERLDC requested NERTS and Meghalaya to look into the matter and give the full details about the incidences.

DGM (AM), NERTS & Meghalaya informed that they would look into the matter and intimate to NERLDC/NERPC accordingly.

NERLDC has informed that SPS III was not operated after tripping of 400 kV Silchar – Byrnihat line & 400 kV Silchar – Azara line on 21.04.15. The matter is very serious. It is suspected that SPS III is not yet implemented by OTPC.

OTPC informed that they would review the matter and inform to NERLDC/NERPC accordingly.

The Sub-committee noted as above.

Date and Venue of next PCC

It is proposed to hold the 33rd PCC meeting of NERPC in the second week of May, 2015. The exact venue will be intimated in due course.

Annexure-I

List of Participants in the 32nd PCC Meetings held on 22/04/2015

SN	Name & Designation	Organization	Contact No.
	No Representatives	Ar. Pradesh	
1.	Sh. B.C. Borah, AGM, SLDC	Assam	09435119248
2.	Sh. Anup Ch. Sinha, AM	Assam	09706881736
3.	Sh. G.K. Bhuyan, AGM	Assam	09854015601
	No Representatives	Manipur	
4.	Sh. D. J. Lyngdoh, EE (SM), SLDC	Meghalaya	09863063375
5.	Sh. C. W. Chen, AE, SLDC	Meghalaya	09863093311
6.	Sh. Lalduhawma, EE, SLDC	Mizoram	09436144113
7.	Sh. C.C. Lalrimawia, SDO, P&E Dept.	Mizoram	09436155551
8.	Sh. B. Joy. Singh, JE, MRT	Mizoram	09436365776
	No Representatives	Nagaland	
	No Representatives	Tripura	
9.	Sh. P. Kanungo, DGM (AM)	PGCIL	09436302823
10.	Sh. T.S. Singh, GM	NERLDC	09436302717
11.	Sh. A. Mallick, DGM (SO-II)	NERLDC	09436302720
12.	Sh. Rahul Chakrabarti, Sr. Engr. (SO-II)	NERLDC	09402507543
13.	Sh. Tanya Taji, Sr. Manager	NEEPCO	09436042053
	No Representatives	NTPC	
	No Representatives	ENICL	
14.	Sh. Rodik H., Dy. Manager (E)	NHPC	09402277414
15.	Sh. T. Karmakar, Asst. Mgr (Electrical)	OTPC	09435239314
16.	Sh. P.K. Mishra, MS	NERPC	09968380242
17.	Sh. B. Lyngkhai, Director/S.E (O)	NERPC	09436163419
18.	Sh. S.M. Jha, E.E	NERPC	08731845175

Format for intimating the failure of Transmission line Towers

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

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

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

LIST OF FIRST BATCH FOR NR TRAINING AT MISA ON 27th & 28th April, 2015

SN	Constituent	Name & Designation
1	PGCIL	Sh. P. Kanungo, DGM (AM)
2	PGCIL	Sh. M. Madhavananda, Manager (AM)
3	NERLDC	Sh. Nadeem Altaf, Sr. Engr.
4	NERLDC	Sh. Anupam Kumar, Sr. Engineer
5	NERLDC	Sh. Rahul Chakraborty, Sr. Engr.
6	NERLDC	Ms. Momai Dey, Engr.
7	NERPC	Sh. S. Mukherjee, AD-1/AEE
8	NERPC	Sh. S. Ranjan, AD-2/AE
9	Assam	Sh. Anjan Choudhury, Dy Mgr. MRT, Silchar
10	Assam	Sh. Nabanit Hazarika, Dy. Mgr. Samaguri SS
11	Assam	Sh. Pranab Saha, Dy. Mgr., SLDC
12	Assam	Sh. Kishore Ranjan Dutta, Asst. Mgr., Rupai
13	Assam	Sh. Bimal Ch. Borah, AGM
14	Meghalaya	Sh. T.Gidon, EE, SLDC
15	NEEPCO	Sh. N.J. Das DM
16	NEEPCO	Sh. Dhan Chandra Manta, Dy. Mgr (E/M)
17	Mizoram	Sh. C.C. Lalrimawia, SDO
18	Mizoram	Sh. Lalrinmawia, SDO
19	Mizoram	Sh. B. Joy Singh, JE, MRT
20	Nagaland	Sh. Rokobeito Iralu, SDO
21	Nagaland	Sh. Lengminlal Singson, SDO
22	Manipur	Sh. Gurumayum Tapan Kumar Sharma, Manager
23	Manipur	Sh. T.B Singh, Asstt Manager
24	Meghalaya	Sh. P.S.Nonglong, AE
25	Meghalaya	Sh. H.R.F Hadem, AE
26	Meghalaya	Sh.Kitboklang Myrthong, A.E
27	OTPC	Shri Mitangsu Saha, Executive
28	Arunachal	Sh. Taw Nagu, J.E (E), CED
29	Arunachal	Sh. D. B. Tadar, J.E (E), CED
30	Arunachal	Sh. C. Lakshumuiah, JE, CED

220 kV Transmission Line Protection Details

Sl. No.	Name of Line	Charged Voltage in kV	End specified for Protection	Protection Details										Data Recording System Details		
				Main I Protection exists (Type of Relay and Make) (Yes/No)	Main II Protection exists (Type of Relay and Make) (Yes/No)	Directional Instantaneous Definite Minimum Time(IDMT) type Earth Fault Relay exists (Yes/No)	Two stage Over-Voltage Protection exists (Yes/No)	Auto Reclosing (Single Phase / Three Phase) exists (Yes/No)	Carrier aided Inter-tripping exists (Yes/No)	Power Swing Blocking Feature exists (Yes/No)	Pole Discrepancy Relay exists (Yes/No)	Number of Core used for CT & VT, used for Main I	Number of Core used for CT & VT, used for Main II	Disturbance Recorder exists (Yes/No)	Event Logger / Sequential Event Recorder exists (Yes/No)	Fault Locator exists (Yes/No)

1. Owner of Line :

- Note 1) Main-I Protection indicates Distance Protection
 2) Main-II Protection indicates one of Distance Protection / Directional Comparison Protection / Phase Segregated Line Differential protection
 3) Type of Relay indicates it's operational mechanism - Numerical / Static / Electro-mechanical
 4) List of inbuilt features of Numerical Relays are also to be furnished alongwith

Transformer Protection Details

Sl. No.	Name of Transformer	LV side/ HV side	Differential Protection exists (Yes/No)	Over Fluxing Protection exists (Yes/No)	REF Protection exists (Yes/No)	Directional Over Current Protection exists (Yes/No)	Impedance Protection exists (Yes/No)	Buchholz Operation exists (Yes/No)	WTI Protection exists (Yes/No)	OTI Protection exists (Yes/No)	MOG with low oil level alarm exists (Yes/No)	OSR for OLTC exists (Yes/No)	PRD exists (Yes/No)	SA exists (Yes/No)	Tertiary Winding Protection exists (Yes/No)	Overload Alarm exists (Yes/No)
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1. Owner of Transformer :

1		LV side														
		HV side														
2		LV side														
		HV side														
3		LV side														
		HV side														
4		LV side														
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		HV side														
15		LV side														
		HV side														

Note : 1. REF : Restricted Earth Fault, 2. WTI : Winding Temperature Indicator., 3. OTI : Oil Temperature Indicator)
 4. MOG : Magnetic Oil Gauge, 5. OSR : Oil Surge Relay, 6. OLTC : On Load Tap Changer
 7. PRD : Pressure Relieve Device, 8. SA : Surge Arrestor
 9. List of inbuilt features of Numerical Relays are also to be furnished

