भारत सरकार Government of India
विद्युत मंत्रालय Ministry of Power
उत्तर पूर्वी क्षेत्रीय विद्युत समिति
North Eastern Regional Power Committee
एन ई आर पी सी कॉम्प्लेक्स, डोंग पारमाओ, लापालाङ, शिल्लोंग-७९३००६, मेघालय
NERPC Complex, Dong Parmaw, Lapalang, Shillong - 793006, Meghalaya

ISO 9001:2008

Ph. No: 0364 - 2534039
Fax No: 0364 - 2534040
Website: www.nerpc.nic.in

No. NERPC/SE (O)/PCC/2015/***4520-55*** Dated: March 05, 2015

To,

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

Sub: Minutes of the 30th PCC Meeting & System Studies Meeting- Reg.

Sir,

The Minutes of the 30th PCC Meeting & System Studies Meeting of NERPC held on 23.02.2015 at "Hotel Nandan", Guwahati is enclosed for favour of kind information and necessary action please**.**

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

Encl: As above

भवदीय / Yours faithfully,

बी. लिंगखोइ

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

Copy to:

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

वी. लिंगारेड्डी

निदेशक / **Director/ SE**

North Eastern Regional Power Committee

MINUTES OF THE 30th PROTECTION COORDINATION SUB-COMMITTEE MEETING OF NERPC

Date : 23/02/2015 (Monday)
Time : 10:00 hrs
Venue : "Hotel Nandan", Guwahati.

The List of Participants in the 30th PCC Meeting is attached at **Annexure – I**

Shri P.K. Mishra, Member Secretary, NERPC welcomed all the participants to the 30th PCC meeting. He stated that all the participants are very well acquainted with the system and protection is one of the important meeting and the issues have to be discussed in thread bear for the benefit of the region. He welcomed GM, NERLDC and stated that with his long associated in power sector, many important issues can be resolved during the meeting. He requested all the constituents to actively participate in this meeting for fruitful deliberation.

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

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 29th MEETING OF PROTECTION SUB-COMMITTEE OF NERPC.

The minutes of 29th meeting of Protection Sub-committee held on 22nd January, 2015 at Guwahati were circulated vide letter No. NERPC/SE (O)/PCC/2015/3916-3951 dated 6h February, 2015.

The Sub-Committee confirmed the minutes of 29th PCCM of NERPC as No observations or comments were received from the constituents

I T E M S F O R D I S C U S S I O N

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

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

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

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

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 – Haflong

b) 132kV Kopili – Khandong # 1

Further, he informed that many times they have requested Alsthom engineers to carry out the remaining lines but to no avail. He requested NERTS to extend possible assistance for successful implementation of the scheme.

DGM, NERTS stated that he will look into the matter and intimate to NEEPCO accordingly.

The sub-committee requested NERTS to extend help to NEEPCO so that the scheme can be completed at the earliest.

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

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

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

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.

Deliberation of the sub-Committee

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.

The sub-committee requested Ar. Pradesh to take up the matter at the earliest so that SPAR on above lines can be completed for their own benefit.

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

As per para no 27 of CERC order in Petition No. 220/MP/2012 on 21.02.14,the deficiencies, if any, in Category-A (the deficiencies which can be corrected without any procurement) shall be rectified by the concerned STU and CTU within 2 months of issue of the order and compliance report in this regard shall be submitted to NERPC. **All deficiencies of Category-B (deficiencies involving procurement of equipment) shall be rectified within 6 months of issue of the order**. In this

regard, reasons of non-availability of fund or delay in procurement process shall not be accepted. The procurement and implementation is to be completed by each STU using their own fund which can be reimbursed through a common request of funding through PSDF forwarded through NERPC as per procedure recently approved by Government of India.

During 26th PCC meeting, DGM, POWERGRID informed that issue of implementation of Bus Bar protection system at Dimapur S/S as recommended under category-B has already been taken up. Target Completion : January, 2015

After detailed deliberation, it was agreed that check list may be prepared by NERPC/NERLDC as per protection audit and the same shall be reviewed in every PCC/OCC meetings about the status of progress.

Deliberation of the sub-Committee

SE(O), NERPC informed that check list for above protection has been prepared by NERPC & NERLDC separately. The same is enclosed at **Annexure – A.3 (I&II)** respectively.

DGM, NERTS stated that since both the format are prepared based on the suggestions given by Task Force, constituents can compare both the formats and see that only one format can be combined by taking due care as per task force suggestions.

GM, NERLDC stated that since the format has been given by the Task Force, it would not be prudent to deviate from it.

DGM, NERTS reiterated that there was no deviation from the format given by Task Force but it was rather an improvement of it as many parameters given in the format are not reflected/in-completed information.

SE(O) requested the constituents to give their opinion on the issue.

OTPC informed that the format given by Task Force is very simple and they have already filled up in all respect.

Assam, Ar. Pradesh, Meghalaya, Manipur felt that the format given by NERPC is containing more details and will help in the long run.

After detailed deliberation, the sub-committee requested NERPC to forward the format prepared by NERPC to Task Force/CEA to give their comments if the format prepared by NERPC is acceptable to them. In the meantime constituents should furnish the data in both the formats within 15 days time so that once the consent is received from Task Force/CEA the audit can be started at the earliest.

A.4 Implementation of Auto Reclosure Scheme in 132kV Jiribam (PG) - Loktak and 132kV Imphal (PG) – Loktak Line:

The external Auto Reclose Relay Type VARM and MGA are already obsolete and without service support from OEM. At Loktak HEP, the AR Relay Type VARM and MGA of 132kV Jiribam (PG) and 132kV Imphal (PG) are not tested since 2008 and so healthiness could not be ensured. Further, during March'14 NHPC has installed Numerical DPR Type P442 of M/S Alstom Make in the said feeders. Further, the Old / Obsolete CBs are already replaced with SF6 CB. Hence, Auto Reclosure Scheme may be implemented in 132kV Jiribam (PG) - Loktak and 132kV Imphal (PG) – Loktak Line immediately by activating internal Auto Reclosure of Numerical DPR to avoid use of obsolete Auto Reclose Relay Type VARM and MGA.

Deliberation of the sub-Committee

Manager, NHPC informed that SPAR on above lines has already been implemented on 16.02.2015.

The sub-committee noted as above.

A.5 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.

As per Sl No A7 of MOM of 28th PCCM of NERPC, the forum requested NERTS to help NERLDC to finalize the DR Channels and NERLDC will present the same in next PCC Meeting

The Channels at 400 kV lines may be selected as per followings:-

Analog Channel: I_R, I_Y, I_B, I_N, V_{RN}, V_{YN}, V_{BN}, V_{OD}

Digital Channel: Main 1 Carrier receive, **Main 1 Trip**, Line O/V Stage I/Stage II, **Reactor Fault Trip**, Stub Protection Optd., **Main II Trip**, Main II Carrier Receive**, Direct Trip CH A/B**, CB I Status R PH, **CB I Status Y PH**, CB I Status B PH, **CB II Status R PH**, CB II Status Y PH, **CB II Status B PH**, Bus Bar trip, Main**/Tie CB LBB Optd.,** DEF

The Channels at 220 kV lines may be selected as per followings:-

Analog Channel: I_R, I_Y, I_B, I_N, V_{RN}, V_{YN}, V_{BN}, V_{OD}

Digital Channel: Main 1 Carrier receive, **Main 1 Trip**, Stub Protection Optd., **Main CB Status R PH**, Main CB Status Y PH, **Main CB Status B PH**, TBC CB Status R PH, **TBC CB Status Y PH**, TBC CB B PH, **Bus Bar trip**, Main/TBC CB LBB Optd., **DEF**

The Channels at 132 kV lines may be selected as per followings:-
Analog Channel: I_R, I_Y, I_B, I_N, V_{RN}, V_{YN}, V_{BN}, V_{OD}

Digital Channel: Main 1 Carrier receive, **Main 1 Trip**, Stub Protection Optd., **Main CB Status R PH**, Main CB Status Y PH, **Main CB Status B PH**, BC CB Status R PH, **BC CB Status Y PH**, BC CB B PH, **E/F** & O/C)

Deliberation in the Meeting

DGM, NERTS informed that standardization of channels will be done jointly with NERLDC, NERPC in line with POWERGRID's practice at the earliest.

The Sub-committee requested NERTS, NERLDC & NERPC to have a joint meeting on 04.03.2015 and finalize the standards.

A.6 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.

NEEPCO is requested to furnish the information/data of **Monarchak Unit I & II** at the earliest as per the formats formulated by NERLDC.

It has been observed that some of the undertakings submitted by concerned utilities (Transmission licensee as well Generators) for first time synchronization of unit or charging/trial operation of new transmission elements are not satisfying the requirement at the time of synchronization/charging.(like telemetering issues, inter-face meters etc.).

Deliberation in the Meeting

NERLDC gave a presentation on the formats for first time synchronization of new elements and the same is attached at **Annexure – A.6**

Further, NERLDC informed that data from HVDC, Bishwanath Chariali has not been received till date.

NERTS informed that they will look into the matter and informed to NERLDC at the earliest.

Sr. Manager, NEEPCO informed that all the parameters like telemetry, metering, machine data has already been sent to NERLDC & NERPC. The Connectivity Agreement with Tripura has already been prepared and is likely to be signed by Tripura soon.

GM, NERLDC suggested that it would be better if all the constituents nominate their nodal officers so that they can follow up the matter with utilities (Transmission licensee as well Generators).

The sub-committee requested all the constituents to furnish the name of Nodal Officers to NERLDC with a copy to NERPC within March, 2015. Further, all the concerned utilities are requested to furnish all the information as per formats & requirements to NERLDC at least one week in advance before charging of new elements and to resolve all the issues like telemetering, protection, interface meter, statutory clearance etc., before charging of new elements.

A.7 Furnishing of Event Logger (EL) & Disturbance Recorder (DR) output of event:

As per section 5.2.r of IEGC, information/data including Disturbance Recorder & Event Logger output is to be sent to NERLDC **within 24 hrs** of occurrence of any event.

The DR files (Comtrade format), EL files, Sequential Event Recorder outputs and any other protection related information may be sent to nerldcprotection@gmail.com

DR & EL outputs of events as per **Annexure –A.7** have not been received after the joint meeting of NERPC, NERLDC and all constituents of NER held on 29.12.14.

During the 29th PCC meeting, the Sub-committee decided that all information/data including Disturbance Recorder & Event Logger output (if activated) should be sent to NERLDC within 24 hrs of occurrence of any event. NERLDC may kindly intimate NERPC in case of non-compliance so that necessary action can be taken up with Competent Authority.

Deliberation in the Meeting:

Members opined that many of the elements in NER do not have such facilities, it would be difficult for them to furnish the above data. Further, they stated that once the R&M scheme of protection system is implemented after getting the PSDF fund, the DR, EL etc., can be furnished by them.

The Sub-committee once again stated that those elements which have the facilities (including Disturbance Recorder & Event Logger output if activated/available) should be sent to NERLDC within 24 hrs of occurrence of any event. NERLDC may kindly intimate NERPC in case of non-compliance so that necessary action can be taken up with Competent Authority.

A.8 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, it is requested that all utilities may please 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.8**

Deliberation in the Meeting:

SE(O) stated that recent failure of one 63 MVAR reactor at 400 kV S/S Byrnihat of Me.ECL should be sent to CEA for investigation as directed above. Meghalaya agreed.

The Sub-committee noted as above.

A.9 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 29th PCC meeting, the Sub-committee requested all the constituents to furnish latest status of the above activities by 15.02.2015 so that report on latest status of the above activities can be submitted on 26.02.2015 before Hon'ble CERC.

Deliberation in the Meeting:

DGM (SO-II), NERLDC requested all the constituents to submit the status after the meeting so that a joint report will be prepared for onward submission during the hearing at CERC which is scheduled to be held on 26.02.2015. All constituents agreed.

The Sub-committee noted as above.

A.10 Grid Incidences during January, 2015:

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

Sl No	Control Area	Grid Disturbance in nos.	
		1st January, 2015 to 31st January, 2015	Jan'15 to Jan'15(till 31st)
1	Palatana	0	0
2	AGBPP	0	0
3	AGTPP	0	0
4	Ranganadi	0	0
5	Kopili	0	0
6	Khandong	0	0

7	Doyang	0	0
8	Loktak	2	2
9	Arunachal Pradesh	6	6
10	Assam	6	6
11	Manipur	5	5
12	Meghalaya	0	0
13	Mizoram	1	1
14	Nagaland	2	2
15	Tripura	0	0

Sl No	**Category of GD**	**Grid Disturbance in nos.**	
		1st January to 31st January, 2015	Jan'15 to Jan'15
1	GD 1	13	13
2	GD 2	0	0
3	GD 3	0	0
4	GD 4	0	0
5	GD 5	0	0
	Total	**13**	**13**

Deliberation in the Meeting:

This is for information to the members. Remedial actions are to taken by the concerned power utilities of NER.

A.11 Root Cause analysis of tripping of multiple elements:

i. Disturbance in Capital & Ziro area of Arunachal Pradesh and Gohpur area of Assam: (6 nos.)

a. At **2202 Hrs on 01.01.15**, 400 kV Balipara-Ranganadi II **(Balipara- No tripping & Ranganadi-Over Voltage)** tripped.

400 kV Balipara- Ranganadi I kept open since 2154 Hrs on 01.01.15.

Rise in Ranganadi Bus voltage: 427 kV to 437 kV (as per NERLDC SCADA data)

Load loss: 64 MW in Arunachal Pradesh & 14 MW in Assam.

b. At **1311 Hrs on 02.01.15**, 400 kV Balipara-Ranganadi II **(Balipara- No tripping & Ranganadi-Over Voltage)** tripped.

400 kV Balipara- Ranganadi I kept open since 2154 Hrs on 01.01.15.
Ranganadi Bus voltage: 419 kV (as per NERLDC SCADA data)

Load loss: 68 MW in Arunachal Pradesh & 12 MW in Assam.

c. At **2311 Hrs on 03.01.15**, 400 kV Balipara-Ranganadi II **(Balipara- Direct trip received & Ranganadi-Over Voltage)** tripped.

400 kV Balipara- Ranganadi I kept open since 2154 Hrs on 03.01.15.
Rise in Ranganadi Bus voltage: 428 kV to 438 kV (as per NERLDC SCADA data)

Load loss: 46 MW in Arunachal Pradesh & 12 MW in Assam.

d. At **1235 Hrs on 09.01.15**, 400 kV Balipara-Ranganadi II **(Balipara-No tripping & Ranganadi-Over Voltage)** tripped.

400 kV Balipara-Ranganadi I kept open since 2143 Hrs on 07.01.15.
Ranganadi Bus voltage: 422 kV (as per NERLDC SCADA data)

Load loss: 25 MW in Arunachal Pradesh & 10 MW in Assam.

e. At **1119 Hrs on 27.01.15**, 400 kV Balipara- Ranganadi II **(Balipara-Direct Tripped received & Ranganadi-Carrier Received Channel I & II, Auto Reclose lockout)** tripped.

400 kV Balipara- Ranganadi I kept open since 2151 Hrs on 22.01.15.

Load loss: 43 MW in Arunachal Pradesh & 12 MW in Assam.

f. At **1221 Hrs on 27.01.15**, 400 kV Balipara- Ranganadi II **(Balipara-Direct Tripped received & Ranganadi-Carrier Received Channel I & II, Auto Reclose lockout)** tripped.

400 kV Balipara- Ranganadi I kept open since 2151 Hrs on 22.01.15.

Load loss: 43 MW in Arunachal Pradesh & 12 MW in Assam.

Category as per CEA Standards: GD-I

Analysis of events:

It is suspected that there may be mal-operation of relay at Ranganadi /problem of carrier inter tripping. It is requested to furnish DR outputs at Balipara ends for above events for further analysis. As informed by Rangandi DR is not available. It is requested to Ranganadi HEP, NEEPCO to install DR & EL at the earliest.

NERTS, POWERGRID and Ranganadi HEP, NEEPCO may elaborate.

Deliberation in the Meeting:

Sr. Manager, NEEPCO informed that the problem for **a to d** above was due to initiation of relay on over voltage at Ranganadi end and the problem has now been rectified.

Regarding Sl. **e & f** above, Sr. Manager, NEEPCO informed that one receive card was faulty and the problem has now been rectified.

DGM (SO-II), NERLDC informed that DR from Ranganadi end has not been received by them. Sr. Mgr., NEEPCO informed that they will send shortly.

The Sub-committee noted as above.

ii. Disturbance in Manipur system (4 nos.)

a. At **2020 Hrs on 15.01.15**, 132 kV Imphal (PG)- Imphal (S) I **(Imphal(PG)-Earth fault & Imphal (S)-Not furnished)** line tripped.

132 kV Imphal(PG)- Imphal(S) II is under shutdown w.e.f 0949 Hrs on 23.12.14.

Load loss: 56 MW in Manipur.

b. At **1302 Hrs on 19.01.15**, 132 kV Loktak- Imphal (PG) **(Loktak-DP,Z1,B-E & Imphal(PG)-DP,Z1,B-E)**, 132 kV Loktak- Ningthoukhong **(Loktak-DP,Z1,B-E & Ningthoukhong-Not furnished)** & 132 kV Ningthoukhong-Imphal (PG) **(Ningthoukhong-Not furnished & Imphal(PG)-DP,Z2,B-E)** line tripped. Loktak Unit-3 also tripped due to loss of voltage. 132 kV Loktak-Rengpang was hand tripped at 1305 Hrs on 19.01.15.

132 kV Loktak- Jiribam was under Plannned shutdown w.e.f 0708 Hrs on 19.01.15.

Load loss: 16 MW in Manipur & **Generation loss:** 8 MW in Loktak.

c. At **1534 Hrs on 19.01.15**, 132 kV Dimapur(PG)- Imphal (PG) **(Dimapur (PG)- DP,Z2,R-B-E & Imphal(PG)- DP,Z1,B-E)**, line tripped. Loktak Unit-3 also tripped due to loss of voltage.

132 kV Loktak- Jiribam was under Plannned shutdown w.e.f 0708 Hrs on 19.01.15.

Load loss: 76 MW in Manipur & **Generation loss:** 8 MW in Loktak.

d. At **1832 Hrs on 24.01.15**, 132 kV Loktak- Ningthoukhong **(Loktak-DP,Z1,R-Y-B & Ningthoukhong- Not furnished)** & 132 kV Ningthoukhong-Imphal (PG) **(Ningthoukhong- Not furnished & Imphal(PG)- DP,Z2,B-E)** line tripped.

Load loss: 30 MW in Manipur.

Category as per CEA Standards: GD-I

Analysis of events:

It is suspected that there may be fault in MSPCL system. It is requested to furnish DR outputs at both ends for above events (except Sl. No. ii.c) for further analysis.

MSPCL, NHPC & NERTS may elaborate

Deliberation in the Meeting:

DGM (SO-II), NERLDC stated that DR has not been received from Manipur and further he enquired about the status of R&M in Manipur.

Manipur representative informed that R&M at Ningthoukhong and Yurembam has already been completed and as per his record DP was picked up at Ningthoukhong.

The Sub-committee requested Manipur to send the relay flag and DR as mentioned so that analysis can be carried out by NERLDC. Sub-committee further requested NERPC to host the meeting in Imphal in the month of April, 2015 so that members can visit the sub-stations in Manipur and to help the frequent tripping of downstream.

iii. Disturbance in Mizoram system (1 no.)

a. At **0742 Hrs on 26.01.15**, 132 kV Badarpur – Kolasib **(Badarpur- DP,Z3, Y-E & Kolasib- No tripping)** & 132 kV Aizawl- Kolasib **(Aizawl- DP, Z3, Y-B-E & Kolasib- No tripping)** line tripped.

   Load loss: 7 MW in Mizoram.

Category as per CEA Standards: GD-I

Analysis of events:

It is suspected that there may be fault in Mizoram system.

P&E, Mizoram & NERTS may elaborate.

Deliberation in the Meeting:

Since Mizoram representatives were absent the matter could not be updated.

Additional Agenda:

1. GM, NERLDC informed that many of the engineers in NER do not have experience in operating of numerical relays, it would be helpful if POWERGRID can arrange a workshop where Numerical Relay facilities are available so that impart training to handle the relay can be made for the benefit of the region.

   DGM, NERTS informed that such facilities are available in Misa sub-station and at the same time some accommodation of around 20-25 participants can be arranged there. He requested NERPC to write to their Management so that at least two days workshop can be arranged by them.

   All constituents appreciated the idea and requested NERPC to write to NERTS, POWERGRID for the workshop.

   The Sub-committee noted as above.

Date and Venue of next PCC

It is proposed to hold the 31st PCC meeting of NERPC on 19th March, 2015. The exact venue will be intimated in due course.

****

Annexure-I

List of Participants in the 30th PCC Meetings held on 23/02/2015

SN	Name & Designation	Organization	Contact No.
1.	Sh. N. Perme, EE	Ar. Pradesh	09436288643
2.	Sh. Karuna Sarma, AGM, AEGCL	Assam	09435013532
3.	Sh. G.K.Bhuyan, AGM	Assam	09854015601
4.	Sh. Th. Bimal Singh, Manager, MSPCL	Manipur	09856245139
5.	Sh. Roshan Oinam, Manager, MSPCL	Manipur	09863895218
6.	Sh. A.G. Tham, AE, Me. PTCL	Meghalaya	09774664034
	No Representatives	**Mizoram**	
	No Representatives	**Nagaland**	
	No Representatives	**Tripura**	
7.	Sh. T. S. Singh, General Manager	NERLDC	09436302717
8.	Sh. Amaresh Mallick, DGM(SO-II)	NERLDC	09436302720
9.	Sh. Bhaskar Goswami, Sr. Mgr. (E/M)	NEEPCO	09436163983
	No Representatives	**ENICL**	
10.	Sh. Deepak Chetia, AM (O&M/EMD)	NTPC	09435325996
11.	Sh. R.C.Singh, Manager (E)	NHPC	09436894889
12.	Sh. P.Kanungo, DGM(OM)	NERTS	09436302823
13.	Sh. Tapash Karmakar, AM (Electrical)	OTPC	09435239314
14.	Sh. P.K.Mishra, MS	NERPC	09968380242
15.	Sh. B.Lyngkhoi, Director/S.E (O)	NERPC	09436163419
16.	Sh. S.M. Jha, E.E	NERPC	08731845175

GENERAL INFORMATION

01. Name of Sub Station :
02. Owner of The Sub Station :
03. Date of first commissioning :
04. Type of Bus Switching Scheme :
05. Whether SLD collected or Not : Refer Annexure – I

AUDIT TEAM

SN	Name	Organisation	Date of Audit	Signature
1.				
2.				
3.				

LIST OF AUXILIARIES

SN	Code	Name / Description	DOC
1	DC-1	220/110V Battery Bank - 1	
2	DC-2	220/110V Battery Bank - 2	
3	DC-3	48V Battery Bank - 1	
4	DC-3	48V Battery Bank - 1	
5	AC-1	---KVA, ***/****KV Transformer	
6	AC-2	---KVA, ***/****KV Transformer	
7	DG-1	____KVA DG Set	
8	DG-2	____KVA DG Set	

LIST OF ELEMENTS

SN	Name / Description	DOC
1	Bay 1: _____	
2	Bay 2: _____	
3	Transformer 1 : _____	
4	Transformer 1 : _____	
5	Reactor 1: _____	
6	Reactor 2: _____	
7	Line 1: _____	
8	Line 2: _____	
9	Etc	

1.0 AUXILIARIES

1.1 DC Sources

SN	Description	DC – 1	DC – 2	DC – 3	DC – 4
1	Checking Cleanliness Battery cell terminals and application of petroleum jelly, if required				
2	No. of Cells Per Bank				
3	Capacity				
4	Electrolyte Level				
5	Sample Checking of Sp. Gravity				
6	Healthiness of Charger				
7	Measurement of Voltage with				
	(a) Charger ON				
	(b) Charger OFF				
8	Positive to Earth			NA	NA
9	Negative to Earth			NA	NA
10	Healthiness EF Relay			NA	NA
11	Discharge Test Capacity				
12	Checking of tightness of VRLA Battery and dusting/ cleaning.				
13	Servicing of Air Conditioners for VRLA Batteries.				

1.2 AC Supply

SN	Description	AC – 1	AC – 2
1	Source of supply		
2	Reliability of Supply		
3	Average trippings per month		

1.3 DG Set

SN	Description	DG – 1	DG – 2

1	Make		
2	Rating		
3	Weather on Auto or Manual		
4	Fuel Level		
5	Average Hrs. Run / Month		

2.0 COMMON EQUIPMENTS / ITEMS

SN	Description	Status
1	**Bus Bar Protection**	
(a)	Bus Voltage	
(b)	Make & Model of Bus Bar relay	
(c)	Status of Healthiness	
(d)	Date of Stability Test	
(e)	Remarks (if any)	
2	**Event Logger**	
(a)	Make & Model	
(b)	Status of Healthiness	
(c)	Remarks (if any)	
3	**Time Synchroniser**	
(a)	Make & Model	
(b)	Status of Healthiness	
(c)	Remarks (if any)	
4	**Annunciation Scheme**	
(a)	Healthiness Annunciation	
(b)	Healthiness Hooter	
(c)	Remarks (if any)	
5	**Fire Alarm System**	
(a)	Availability	
(b)	Healthiness	
(c)	Remarks (if any)	
6	**Fire Fighting System**	
(a)	Availability	

SN	Description	Status
(b)	Healthiness	
(c)	Remarks (if any)	
7	**Earthing System**	
(a)	Earth Resistivity Value	
(b)	No. of Pits	Available / Required
(c)	Remarks (if any)	
8	**Switchyard Gravelling**	
(a)	Availability	
(b)	Remarks (if any)	

3.0 BAY

3.1 Bay 1: _____

(a) Lightning Arrestor

SN	Description	Status		
		R-Φ	Y-Φ	B-Φ
1	Make			
2	Rating			
3	Type			
4	Year Commissioning			
5	Last THRC Test & Values			

(b) Capacitive Voltage Transformer

SN	Description	Core	Status		
			R-Φ	Y-Φ	B-Φ
1	Make	All			
2	Rating	All			
3	Type	All			
4	Year of Comm	All			
5	Adopted Ratio	Core 1			
		Core 2			
		Core 3			

6	Ratio Measured	Core 1			
		Core 2			
		Core 3			
7	Error Calculated	Core 1			
		Core 2			
		Core 3			
8	Date of Testing	All			

(c) Current Transformer

SN	Description	Core	Status		
			R-Φ	R-Φ	R-Φ
1	Make	All			
2	Rating	All			
3	Type	All			
4	Year of Comm.	All			
5	Adopted Ratio	Core 1			
		Core 2			
		Core 3			
		Core 4			
		Core 5			
6	Ratio Measured	Core 1			
		Core 2			
		Core 3			
		Core 4			
		Core 5			
7	Error Calculated	Core 1			
		Core 2			
		Core 3			
		Core 4			
		Core 5			
8	Date of Testing	All			

(d) Circuit Breaker

SN	Description	Status
1	Make	

2	Rating				
3	Type				
4	Duty Cycle				
5	No. of Trip & Close Coils	Trip Coil =		Close Coil =	
6	Timing Date & Value	Date:	C =	O =	CO =
7	Healthiness of CB				
8	**LBB Protection**				
(a)	Type				
(b)	Make & Model				
(c)	Healthiness				
(d)	Date of Last Testing				
(e)	Setting				

4.0 TRANSFORMERS

4.1 Transformer – 1

SN	Description	Status
1	Make	
2	Rating	
3	Year of Manufacture	
4	Year of Commissioning	
5	Type of Cooling	
6	Type of Earthing	
7	Date of last DGA	
8	Date of last Oil Parameter	
9	Date of last Tan∂ & C	
10	Oil Level	
11	Oil Leakage	
12	Rusting / Painting	
13	**Differential Protection**	
(a)	Type	

SN	Description	Status
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Stability Test	
(e)	Setting	
14	**REF Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Stability Test	
(e)	Setting	
15	**Over Flux Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Test	
(e)	Setting	
16	**Back Up O/C Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Test	
(e)	Setting	
17	**Back Up E/F Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Test	
(e)	Setting	
18	**Healthiness Status**	
(a)	Buchholz Relay	
(b)	PRV	
(c)	OTI	

SN	Description	Status
(d)	WTI	
(e)	MOG	
(f)	Oil Surge Protection	

5.0 REACTORS

5.1 Reactor – 1:

SN	Description	Status
1	Make	
2	Rating	
3	Year of Manufacture	
4	Year of Commissioning	
5	Type of Cooling	
6	Type of Earthing	
7	Date of last DGA	
8	Date of last Oil Parameter	
9	Date of last Tan∂ & C	
10	Oil Level	
11	Oil Leakage	
12	Rusting / Painting	
13	**Differential Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Stability Test	
(e)	Setting	
14	**REF Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	

SN	Description	Status
(d)	Date of Stability Test	
(e)	Setting	
15	**Back Up Impedance**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Test	
(e)	Setting	
18	**Healthiness Status**	
(a)	Buchholz Relay	
(b)	PRV	
(c)	OTI	
(d)	WTI	
(e)	MOG	

6.0 TRANSMISSION LINE

6.1 Line – 1:

SN	Description	Status
1	Line Name	
2	Voltage	
3	Length	
4	Type of Conductor	
5	Line Configuration	
6	R1 (Ω/Km/Ph.)	
7	X1(Ω/Km/Ph.)	
8	R0 (Ω/Km/Ph.)	
9	X0 (Ω/Km/Ph.)	
10	R0M (Ω/Km/Ph.)	
11	X0M (Ω/Km/Ph.)	
12	No. of Tripping / Year	

SN	Description	Status
13	Infringement Clearance	
14	**Main – 1 Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Testing	
(e)	Zone 1 Setting	
(f)	Zone 2 Setting	
(g)	Zone 3 Setting	
(h)	Zone 3 Reverse Setting	
(i)	DEF Setting	
15	**Main – 2 Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Testing	
(e)	Zone 1 Setting	
(f)	Zone 2 Setting	
(g)	Zone 3 Setting	
(h)	Zone 3 Reverse Setting	
(i)	DEF Setting	
16	**Back Up O/C Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Testing	
(e)	Setting	PS/TS:
17	**Back Up E/F Protection**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Testing	

SN	Description	Status
(e)	Setting	PS/TS:
18	**Over Voltage Stage 1**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Testing	
(e)	Setting	
19	**Over Voltage Stage 2**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Date of Last Testing	
(e)	Setting	
20	**PLCC & Prot. Coupler**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness of Carrier	
(d)	Date of Last Testing	
21	**Auto Reclosure Scheme**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	
(d)	Selected Mode	
(e)	Setting	
(f)	Date of Last Testing	
22	**Disturbance Recorder**	
(a)	Type	
(b)	Make & Model	
(c)	Healthiness	

Annexure - A.7

DR of the following list of events not received

Sl. No.	Name of tripping element	Owner	DR to be furnished by	Date & Time of Event
1	400 kV Balipara - Ranganadi II	POWERGRID	**POWERGRID**	2202 Hrs on 01.01.15
2	400 kV Balipara - Ranganadi II	POWERGRID	**POWERGRID**	1311 Hrs on 02.01.15
3	400 kV Balipara - Ranganadi II	POWERGRID	**POWERGRID**	2311 Hrs on 03.01.15
4	132 kV Loktak - Ningthoukhong	MSPCL	**NHPC**	0228 Hrs on 05.01.15
5	400 kV Balipara - Bongaigaon I	POWERGRID	**POWERGRID**	1123 Hrs on 09.01.15
6	400 kV Balipara - Ranganadi II	POWERGRID	**POWERGRID**	1235 Hrs on 09.01.15
7	132 kV Imphal (PG) - Imphal (Manipur) I	POWERGRID	**POWERGRID**	2020 Hrs on 15.01.15
8	132 kV Dimapur (PG) - Kohima	DoP, Nagaland	**POWERGRID & DoP, Nagaland**	1545 Hrs on 17.01.15
9	132 kV Loktak - Imphal (PG)	POWERGRID	**POWERGRID, NPHC**	1302 Hrs on 19.01.15
	132 kV Loktak - Ningthoukhong	MSPCL		
	132 kV Ningthoukong - Imphal(PG)	POWERGRID / MSPCL		
10	132 kV Aizwal - Kumarghat	POWERGRID	**POWERGRID**	1128 Hrs on 22.01.15
				1142 Hrs on 22.01.15
11	132 kV Loktak - Ningthoukhong	POWERGRID / MSPCL	**POWERGRID & NHPC**	1832 Hrs on 24.01.15
	132 kV Ningthoukong - Imphal(PG)	POWERGRID / MSPCL		
12	400 kV Balipara - Ranganadi II	POWERGRID	**POWERGRID**	1119 Hrs on 27.01.15
13	400 kV Balipara - Ranganadi II	POWERGRID	**POWERGRID**	1221 Hrs on 27.01.15

Annexure – A.8

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 :

North Eastern Regional Power Committee

MINUTES OF SYSTEM STUDIES (SS) MEETING

Date : 23/02/2015 (Monday)
Time : 14:00 hrs
Venue : "Hotel Nandan", Guwahati.

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

Shri B. Lyngkhoi, Director/SE(O) informed that issue of SPS had been discussed in various OCC/PCC Meetings but with many new projects being added to the system, the issue of SPS is very important for safe and secure operation of the grid. He further stated that due to shortage of time, the issue could not be discussed in thread bear in OCC/PCC Meetings. It was requested by the constituents to have a separate meeting so that the issue can be finalized.

Thereafter, he requested NERLDC to give the presentation on the matter before proceeding further for discussion.

1. SPS scheme for Pallatana:

The following four (4) System Protection Scheme (SPS) associated with generating Unit#1 (363.3MW) of OTPC at Palatana has been planned for NER:

Case 1: Tripping of generating unit of OTPC at Palatana

Case 2: Tripping of 400 kV D/C Palatana- Silchar line (with generation from OTPC's plant at Palatana)

Case 3: Tripping of 400 kV Silchar-Byrnihat line (with generation from OTPC's plant at Palatana)

Case 4: Tripping of 400 KV Silchar – Byrnihat line (without generation from OTPC's plant at Palatana)

The OCC Sub-committee continuously review the status of implementation of the scheme and the status as intimated in the 99th OCC Meeting is given below:

Case I & Case IV: Already implemented.

Case II & III: GM, OTPC stated that implementation of SPS -2 & 3 mentioned above was discussed in detail and the scheme was finalized in the meeting held with BHEL at Palatana on 17.01.2014. Subsequently some modification has been carried out by BHEL and same will be circulated to all. The offer of BHEL is intimated by OTPC but the required schematic diagram as agreed in the 97th OCC meeting is unavailable.

OTPC had requested POWERGRID to look into following issues:

(a) SPS at OTPC end should not be modified with commissioning of 2nd Circuit of Silchar _ Bongaigaon 400kV line. ***It is agreed in earlier OCC meetings that the SPS associated with Palatana need to be reviewed including enhancement of load shedding and NERLDC was requested accordingly to review the SPS on 99th OCC meeting.***

(b) Trip command from two different sources should be available to desynchronize the machine to avoid unwanted tripping of generating Unit when the generation is more than 200MW. During 93rd OCC meeting, subcommittee had suggested OTPC for getting input from Circuit breakers at both ends of the line (Silchar & Byrnihat) through communication link and to discuss the matter with POWERGRID.

(c) Two out of three logics [i.e. inputs from circuit breaker (s), master trip relay (s) etc.] shall be utilized for de-synchronization of Gas Turbines. During 93rd OCC meeting, subcommittee had suggested OTPC to discuss the matter with POWERGRID.

Enhancement of quantum of load relief during SPS operation: The matter was deliberated in last OCC meeting and it was decided to convene meeting of identified committee for the review of SPS schemes to ensure higher load relief as well as changes to be incorporated in the schemes in view of changes in network topology.

Further OTPC informed the house the status of SPS-3 [NERLDC is of the opinion that the elaborate scheme furnished by M/s BHEL may not be necessary and tripping of the identified CB will be serve the purpose. In addition the SPS-3 requires to be upgraded to incorporate addition of Silchar-Azara 400 kV line.

The matter was studied and deliberated by the system study group of NERPC on 14.10.2014 at NERLDC, Shillong. The minutes are reproduced below: -

1. Lumshnong – Khliehriat will be disconnected and Lumshnong will be fed from Panchgram

Once Palatana trips, then Lumshnong S/s will be tripped and a load relief of 15 MW may be expected.

2. Dharmanagar - P.K. Bari will remain disconnected and Dharmanagar & Dullavcherra will be fed from Silchar S/S radially.

Once Palatana trips, then 132kV Sichar-Dullavcherra feeder will be tripped at Silchar End through SPS and relief of 14 MW load can be achieved.

DGM, NERTS informed the members that the incorporation of tripping of 132kV Sichar - Dullavcherra feeder in SPS-1 & SPS-2 will be completed by November 2014.

The Sub-committee requested POWERGRID to complete the wiring for all the cases above in co-ordination with OTPC and also requested OTPC to extend all help to POWERGRID if necessary.

The above suggestions may be reviewed by system study committee as and when required.

During 105th OCC meeting, DGM, NERTS informed the members that the incorporation of tripping of 132kV Silchar - Dullavcherra feeder in SPS-1 & SPS-2 has been completed in December 2014.

DGM, OTPC requested NERTS to send the schematic wiring to them for future reference. NERTS agreed.

Deliberation of the sub-Committee

SE(O) enquired from OTPC & POWERGRID about the status of remaining SPS Stage II & III above.

AM(E) , OTPC informed that schematic wiring has been received by them from POWERGRID and also informed that Stages II & III above have been completed.

The Sub-committee appreciated both OTPC & POWERGRID for completion of the scheme and put in record that all the four stages of Pallatana SPS have been completed in all respect. Hence agenda is now dropped.

2. New SPS scheme at Bongaigoan:

Further, New SPS for system **reliability against tripping of 400/220 kV, 315 MVA ICT at Bongaigaon -** with the commissioning of 400kV Bongaigaon – Azara line on 14.01.2015 at 1708 Hrs, lot of improvement in loading pattern of different elements were observed as follows:

1) Overloading problem of 400/220 kV, 315 MVA ICT at Bongaigaon no more exists

2) Overloading problem of 220 kV Salakati- BTPS D/C line also not being experienced since maximum power requirement of Guwahati and surrounding areas is being met through 400 kV Bongaigaon – Azara line.

3) Nangalbibra load of Meghalaya is being fed from Agia continuously since 220 kV Salakati- BTPS D/C line has become off-loaded.

System studies conducted by NERLDC related to tripping of 400 kV Bongaigaon – Azara line & 400 kV Bongaigaon – Byrnihat line. During peak period, it has been observed the followings:

1) 400/220 kV, 315 MVA ICT at Bongaigaon will be overloaded and may be tripped.

2) In case of tripping of 400/220 kV, 315 MVA ICT at Bongaigaon, 220 kV Binaguri – Birpara D/C lines will be overloaded and may be tripped.

3) In case of tripping of 220 kV Binaguri – Birpara D/C lines, 220 kV Samaguri – Sarusajai D/C lines will be overloaded and may be tripped.

4) In case of tripping of 220 kV Samaguri – Sarusajai & 220 kV Samaguri – Jawhar Nagar line, 400/220 kV, 2x315 MVA ICTs at Azara will be overloaded and may be tripped and

5) In case of tripping of 400/220 kV, 2x315 MVA ICTs at Azara, power supply of system comprising of North Bengal (Birpara loading), Bhutan, Part of Assam (Capital & Dhaligaon Areas) & Part of Meghalaya (Nangalbibra Area) will be disrupted.

To avoid this it is proposed to devise a SPS which will trip both ICTs at BTPS(Assam) giving a relief of about 120 MW radial load and thereby saving the system from above possible contingencies.

During 29th PCC meeting, the Sub-committee requested NERPC to co-ordinate the System Studies at the earliest so that issues related to SPS as suggested by NERLDC can be executed at the earliest for safe and secure operation of the grid.

Deliberation of the sub-Committee

DGM, NERLDC gave a presentation, which is at **Annexure – 2,** on the criticalities of the grid after the commissioning of 400 kV Bongaigaon – Azara line and 400 kV Bongaigaon – Byrnihat line and expressed concern about high loading of Bongaigoan ICT in case of tripping of 400 kV Bongaigaon – Azara Line and 400 kV Bongaigaon – Byrnihat line and possible cascade tripping which may lead to grid disturbance. He requested that as per presentation the grid is in danger unless a SPS with tripping of radial load (around 120 MW) at BTPS S/S is implemented at the earliest.

DGM (SO-II), NERLDC mentioned that study results are as follows:-

Case I: (Base Case)

Load flow on 400 kV Bongaigoan – Azara: 166 MW (From Bongaigaon)
Load flow on 400 kV Bongaigoan – Byrnihat: 77 MW (From Bongaigaon)
Load flow on 400/220 kV, 315 MVA ICT at Bongaigoan: 222 MW (From 400 kV)

Case II: (Tripping of 400 kV Bongaigoan - Azara Line)

Load flow on 400 kV Bongaigoan – Byrnihat: 137 MW (From Bongaigaon)
Load flow on 400/220 kV, 315 MVA ICT at Bongaigoan: 270 MW (From 400 kV)

Case III: (Tripping of 400 kV Bongaigoan - Byrnihat Line)

Load flow on 400 kV Bongaigoan – Azara: 198 MW (From Bongaigaon)

Load flow on 400/220 kV, 315 MVA ICT at Bongaigoan: 227 MW (From 400 kV)

Case IV: (Tripping of both 400 kV Bongaigoan - Byrnihat & 400 kV Bongaigaon - Azara Lines)

Load flow on 400/220 kV, 315 MVA ICT at Bongaigoan: 300 MW (From 400 kV) & ICT may trip

Case V: (Tripping of 400/220 kV, 315 MVA ICT at Bongaigoan)

Load flow on 220 kV Binaguri – Birpara I & II: 200 MW (each) (From Birpara)

Load flow on 220 kV Samaguri – Jawhar Nagar: 129 MW (From Samaguri)

Load flow on 220 kV Samaguri - Sarusajai: 124 MW (From Samaguri)

Case VI: (Tripping of 220 kV Samaguri – Jawhar Nagar & 220 kV Samaguri – Sarusajai)

Load flow on 400/220 kV, 2x315 MVA ICT at Azara : 2x300 MW (From 400 kV) & ICTs may trip

DGM (SO-II), NERLDC requested Assam to shed load of around 120 MW towards Dhaligoan side so as to relive the grid from collapse.

AGM, LDC, Assam stated that that SPS based load disconnection in case of tripping of 400/220 kV, 315 MVA ICT at Bongaigaon is required but shedding of load of 120 MW in Dhaligoan area is not possible and he proposed that ER should also share the above shedding for the benefit of both the regions.

The Sub-committee decided to take up the issue with ERPC so that load relief of 120 MW has to be shared by Eastern Region as well as Assam.

3. SPS for AGTPP after commissioning of Pallatana (2nd Module), Monarchak and AGTPP (new units):

NERLDC informed that it has been observed from study results that after commissioning of Palatana 2nd Module, Monarchak Unit I & II and AGTPP Unit 5 & 6, 132 kV AGTPP – Kumarghat, 132 kV Monarchak – Udaipur, 132 kV Baramura – Teliamura & 132 kV Teliamura- Ambassa lines will be highly loaded.

In case of tripping of 132 kV AGTPP - Kumarghat line, following lines will be overloaded as below:

a. 132 kV Monarchak - Udaipur : 72 MW
b. 132 kV Dhalabil - Agartala : 84 MW
c. 132 kV Dhalabil - Kamalpur : 79 MW
d. 132 kV Baramura - Teliamura : 88 MW
e. 132 kV Teliamura - Ambassa : 86 MW
f. 132 kV PK Bari - Kumarghat : 92 MW
g. 132 kV PK Bari - Ambassa : 81 MW
h. 132 kV PK Bari - Kamalpur : 76 MW

To contain loading of the above lines, two units of AGTPP needs to be tripped on SPS. Study results are at **Annexure – 3.**

To contain over loading of the above lines, generation of AGTPP is to be backed down through SPS. The SPS may be designed & implemented at the earliest. Study results are at **Annexure – 3.**

Deliberation of the sub-Committee

NERLDC gave a presentation on above SPS and is at **Annexure – 3.**

DGM (SO-II), NERLDC stated that they conducted the system study by considering the AGTPP capacity of 130 MW (Combined Cycle) and to implement the SPS scheme, the quantum of load relief is 50 MW.

Sr. Manager, NEEPCO informed about the combination of AGTPP station as below:

2 GTs (20 MW each) + 1 ST (24 MW) = 64 MW
1 GT (20 MW) + 1 ST (12 MW) = 32 MW

Hence, he suggested that quantum of load relief of 50 MW as mentioned by NERLDC is not possible.

After detailed deliberation, the Sub-committee recommended to consider the load relief of 32 MW for the time being and if required, the same will be reviewed again.

4. Certification of capacity of Terminal Equipment (including relay) & Lines of voltage level of 66 kV and above

NRCE has issued the final operational guidelines for adopting seasonal ratings for thermal limit & Operational Guidelines for determination of TTC, ATC and TRM for the Short Term Horizon (0-3 Months). For determination of TTC, ATC and TRM for the Short Term Horizon (0-3 Months), certification of capacity of Terminal Equipment (including relay) & Lines of voltage level of 66 kV and above is required.

Deliberation of the sub-Committee

NERLDC have informed that NRCE (National Reliability Council of Electricity) have issued Operational Guidelines for determination of TTC, ATC and TRM for the Short Term Horizon (0-3 Months) which is at **Annexure - 4**.

As per sl no 2.vii of this guideline, before the increased thermal limit on account of emergency loading is used, the System Operator may confirm from the owner of the terminal equipment on both sides of the line if the terminal equipment is capable of carrying the emergency loading current and also if the relay settings are in accordance with the same. The terminal equipment owners will confirm the same. The confirmation may be done once before the start of the season, i.e. monsoon, winter, etc.

As per this guideline, ampacity of various conductors is as follow:-

At Ambient Temperature 20^0 C

1. ACSR Moose (597 sq mm) at Maximum Conductor Temperature 85^0 C : 1048.8 Amp
2. ACSR Moose (597 sq mm) at Maximum Conductor Temperature 75^0 C : 873.6 Amp
3. Zebra (484 sq mm) at Maximum Conductor Temperature 85^0 C : 922.8 Amp
4. Zebra (484 sq mm) at Maximum Conductor Temperature 75^0 C : 771.6 Amp
5. ACSR Panther (210 sq mm) at Maximum Conductor Temperature 75^0 C : 495.6 Amp
6. ACSR Panther (210 sq mm) at Maximum Conductor Temperature 65^0 C : 374.4 Amp

It is requested to owner of the terminal equipment whether the terminal equipment on both sides of the line is capable of carrying the emergency loading current (above fig) and also if the relay settings are in accordance with the same and if terminal equipment on both sides of the line is not capable of carrying the emergency loading current, then maximum emergency loading of the line in Amps is to be furnished at the earliest.

After detailed deliberation, the Sub-committee requested to owner of the terminal equipment to furnish these details at the earliest for consideration these figures for determination of TTC, ATC and TRM for the Short Term Horizon (0-3 Months).

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Annexure-I

List of Participants in System Studies Meeting held on 23/02/2015

SN	Name & Designation	Organization	Contact No.
1.	Sh. N. Perme, EE, SLDC	Ar. Pradesh	09436288643
2.	Sh. Karuna Sarma, AGM, AEGCL	Assam	09435013532
3.	Sh. G.K.Bhuyan, AGM	Assam	09854015601
4.	Sh. Th.Bimal Singh, Manager, MSPCL	Manipur	09856245139
5.	Sh. Roshan Oinam, Manager, MSPCL	Manipur	09863895218
6.	Sh. A.G. Tham, AE, Me. PTCL	Meghalaya	09774664034
	No Representatives	**Mizoram**	
	No Representatives	**Nagaland**	
	No Representatives	**Tripura**	
7.	Sh. T.S. Singh, General Manager	NERLDC	09436302717
8.	Sh. Amaresh Mallick, DGM(SO-II)	NERLDC	09436302720
9.	Sh. Bhaskar Goswami, Sr. Mgr. (E/M)	NEEPCO	09436163983
	No Representatives	**ENICL**	
10.	Sh. Deepak Chetia, AM (O&M/EMD)	NTPC	09435325996
11.	Sh. R.C. Singh, Manager (E)	NHPC	09436894889
12.	Sh. P.Kanungo, DGM(OM)	NERTS	09436302823
13.	Sh. Tapash Karmakar, AM (Electrical)	OTPC	09435239314
14.	Sh. P.K. Mishra, MS	NERPC	09968380242
15.	Sh. B. Lyngkhoi, Director/S.E (O)	NERPC	09436163419
16.	Sh. S.M. Jha, E.E	NERPC	08731845175