North Eastern Regional Power Committee

Agenda For

146th OCC Sub-Committee Meeting

Time of meeting : 10:00 Hrs.

Date of meeting : 17th July, 2018 (Tuesday)

Venue : "Hotel Nandan", Guwahati.

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 145th MEETING OF OPERATION SUB-COMMITTEE OF NERPC.

The minutes of 145th meeting of Operation Sub-committee held on 19th June, 2018 at Guwahati were circulated vide letter No. NERPC/SE (O)/OCC/2016/4556-4591 dated 26th June, 2018.

The Sub-committee may confirm the minutes of 145th OCCM of NERPC as no comments/observations were received from the constituents.

ITEMS FOR DISCUSSION

B.1. ACTION TAKEN:

1. IMPLEMENTATION OF PROJECTS FUNDED FROM PSDF:

The status as informed in 145th OCC:

State	Protection System	ADMS	Capacitor Installation	SAMAST**
Arunachal Pradesh	A/C opened. NIT to be floated soon.	Revised DPR submitted	-	DPR submitted for Techno-Economic Appraisal.
Nagaland	Pack-A: completed Pack-B: Aug'18 Pack-C: Aug'18 Pack-D: Completed.	Revised DPR yet to be submitted	To re-submit proposal to NERPC for Study.	DPR submitted for Techno-Economic Appraisal
Mizoram	LOAs completed. First tranche of funds requisitioned.	Revised DPR submitted	Appraisal Committee is yet to approve	DPR submitted for Techno-Economic Appraisal
Manipur	LOAs issued.	Revised DPR submitted	Submitted to NERPC for Study before sending to NPC/NLDC.	DPR submitted for Techno-Economic Appraisal

Tripura	Could not be updated due to absence of officials.	Revised DPR submitted	To submit proposal to NERPC for Study.	DPR submitted for Techno-Economic Appraisal
Assam	PLCC- tender evaluation complete. LOA to be one after approval. Substation auxiliary and diagnostics tools - Tendering in process. All LOAs by Jul'18.	Revised DPR submitted	-	DPR submitted for Techno-Economic Appraisal
Meghalaya	MePTCL- All LOAs awarded. Earthing Package Tendering in Progress. Balance items by July'18 MePGCL – Erection complete. UC by 30.06.2018.	Revised DPR submitted	-	DPR submitted for Techno-Economic Appraisal

The status of implementation of the above schemes (physical as well as financial progress) may please be reviewed and the entities are requested to expedite implementation of the schemes. The entities may also be advised to furnish status as per format by first week of every month on regular basis to Member Convener, PSDF Project Monitoring Group (AGM, NLDC, POSOCO) with a copy to NPC & NERPC. The LOAs of R&M Scheme are to be furnished to NERLDC/NERPC regularly.

States may please intimate the latest status.

2. Long Outage of Important Grid Elements:

Name of the Element	Name of Utility	Status as informed in 145th OCC	Latest status
63MVAR Reactor at Byrnihat to replace with 80MVAR Reactor	MePTCL	SCM MoM yet to be issued.	
400KV 80MVAR Bus Reactor at Palatana	OTPC	Insulation level very low. By Aug'18.	

DHEP Unit 2	NEEPCO	In service w.e.f. 24.05.2018.	
400/220 kV, 315 MVA ICT-II at BgTPP	NTPC	In service w.e.f. 05.06.2018.	
Repairing of R-ph bushing of 63MVAR L/R at Balipara for 400kV Balipara-Bongaigaon -II (*out since 17.02.18)*	NERTS	By Nov'18	
400/132kV 125MVA ICT-II at Palatana (*out since 08.07.2018)*	OTPC	-	

Utilities may please intimate the latest status.

3. <u>Furnishing of various data for reliable grid operation</u>:

<table>
<tr><td>Data regarding</td><td>Status as of 145th OCC</td><td>Latest status</td></tr>
<tr><td>DAS output for FRC calculation</td><td>Event Date: 10.05.18; OTPC, DHEP and RHEP provided information.
NERLDC once again requested all generators to provide DAS data at the earliest for FRC calculation.</td><td></td></tr>
<tr><td>Operating Procedures</td><td><table><tr><th>Items</th><th>Data submitted by</th></tr><tr><td>OP of States</td><td>Submitted only by AEGCL, MePTCL and TSECL</td></tr><tr><td>OP of Transmission System</td><td>Not submitted by any constituents</td></tr><tr><td>OP of Generating Stations</td><td>Not submitted by any generators</td></tr><tr><td>OP of GIS</td><td>Not submitted by any constituents</td></tr></table></td><td></td></tr>
<tr><td>Data related to Power Map.</td><td><table><tr><th>Items</th><th>Data submitted by</th></tr><tr><td>Communication (PLCC/OPGW/ GPRSVSAT/ Satellite</td><td>NERTS, Meghalaya, Assam & Mizoram provided the data.</td></tr></table></td><td></td></tr>
<tr><td>Patrolling report(s) for T/L**.</td><td>No constituents have furnished the report</td><td></td></tr>
</table>

NERLDC may please inform the status.

4. Monitoring of Corrective actions as decided in PCC forum:

Name of the Element	Action to be taken	Name of Utility	Status as of 145th OCC	Latest status
132 kV Dimapur - Doyang 1 & 2 Lines	Installation of Numerical Relay at Doyang	NEEPCO	By Dec'18	
AGTCCPP- LFO	AVR replacement	NEEPCO	By Oct'18	
132kVPK Bari-Kumarghat	Installation of Line differential relay	NERTS	By Dec'18	
132kV AGTCCPP-Agartala D/C.	Line differential relay to be installed	NERTS	By Dec'18	
132kV PKBari	Installation of Numerical Relay under R&M (*high priority).* TSECL to divert NR to AGTCCPP.	TSECL	By Aug'18	
132kV Rokhia-79Tilla D/C	DPR to be installed	TSECL	By Aug'18	

Concerned utilities may please inform the status.

5. DIFFERENCE IN ACTUALS VS LGBR:

Energy Requirement:

Name of State	Apr18 (actual)	Apr18 (LGBR)	May18 (actual)	May18 (LGBR)
Ar. Pradesh	69.80	68.35	71.77	70.26
Assam	680.19	612.74	738.04	778.29
Manipur	64.99	64.76	68.18	67.46
Meghalaya	131.74	149.00	138.92	143.00
Mizoram	53.94	45.67	40.70	47.82
Nagaland	69.72	66.35	72.75	74.90
Tripura	155.05	99.18	101.52	98.38

Energy Availability:

Name of State	Apr18 (actual)	Apr18 (LGBR)	May18 (actual)	May18 (LGBR)
Ar. Pradesh	50.27	58.89	70.09	70.50
Assam	650.76	720.23	738.28	810.91
Manipur	70.23	76.30	95.07	86.53
Meghalaya	140.32	149.76	191.42	204.20
Mizoram	64.83	62.69	71.74	72.60
Nagaland	55.39	56.26	67.15	66.14
Tripura	276.86	267.05	252.31	281.99

Demand:

Name of State	Apr18 (actual)	Apr18 (LGBR)	May18 (actual)	May18 (LGBR)
Ar. Pradesh	130.38	141	128.33	145
Assam	1532.51	1447.42	1625.51	1665.49
Manipur	192.89	170.68	179.01	169.41
Meghalaya	307.28	320.10	370.59	334.40
Mizoram	98.37	94.60	95.98	94.60
Nagaland	155.71	128.56	147.06	140.94
Tripura	304.80	299.20	275.65	282.80

B.2. OPERATIONAL PERFORMANCE AND GRID DISCIPLINE DURING JUNE, 2018

As per the data made available by NERLDC, the grid performance parameters for June, 2018 are given below:

NER PERFORMANCE DURING JUNE, 2018

	Energy Met (MU)		w.r.t. May,18 % inc (+) /dec (-)	Energy Reqr. (MU)		w.r.t. May,18 % inc (+) /dec (-)	% inc (+) /dec (-) of energy reqr vs met. In Jun,18
States	**Jun-18**	**May-18**		**Jun-18**	**May-18**		
Ar. Pradesh	62.78	64.83	-3.16	63.73	65.75	-3.07	-1.49
Assam	897.70	711.96	26.09	936.53	752.57	24.44	-4.15
Manipur	65.26	65.95	-1.05	66.32	66.97	-0.97	-1.60
Meghalaya	149.63	144.44	3.59	149.63	144.44	3.59	0.00
Mizoram	53.00	50.36	5.24	53.66	51.16	4.89	-1.23
Nagaland	67.87	62.87	7.95	76.21	71.21	7.02	-10.94
Tripura	121.86	107.28	13.59	124.75	112.51	10.88	-2.32
Region	**1418.10**	**1207.70**	**17.42**	**1470.82**	**1264.62**	**16.31**	**-3.58**

	Demand Met (MW)		w.r.t. May,18 % inc (+) /dec (-)	Demand in (MW)		w.r.t. May,18 % inc (+) /dec (-)	% inc (+) /dec (-) of Demand vs met. In Jun,18
States	**Jun-18**	**May-18**		**Jun-18**	**May-18**		
Ar. Pradesh	133	123	8.13	138	138	0.00	-3.62
Assam	1750	1596	9.65	1782	1626	9.59	-1.80
Manipur	172	172	0.00	179	179	0.00	-3.91
Meghalaya	326	368	-11.41	326	371	-12.13	0.00
Mizoram	93	87	6.90	103	96	7.29	-9.71
Nagaland	129	119	8.40	129	147	-12.24	0.00
Tripura	276	276	0.00	281	276	1.81	-1.78
Region	**2564**	**2611**	**-1.80**	**2640**	**2709**	**-2.55**	**-2.88**

REGIONAL GENERATION & INTER-REGIONAL EXCHANGE IN MU

Month---->	**Jun-18**	**May-18**
Total Generation in NER (Gross)	1623.369	1450.399
Total Central Sector Generation (Gross)	1221.425	1149.117
Total State Sector Generation (Gross)	401.944	301.282
Inter-Regional Energy Exchange		
(a) NER-ER	**38.21**	**113.72**
(b) ER-NER	**307.54**	**192.00**
(c)NER-NR	**309.33**	**185.91**
(d)NR-NER	**0.00**	**0.00**
© Net Import	-40.00	-107.63

AVERAGE FREQUENCY (Hz)

Month---->	**Jun-18**	**May-18**
	% of Time	% of Time
Below 49.9 Hz	11.84	22.52
Between 49.9 to 50.05 Hz	76.96	70.06
Above 50.05 Hz	11.18	7.43
Average	49.98	49.95
Maximum	50.24	50.22
Minimum	49.60	49.57

C. OLD ITEMS

1. Status of Generating Units, Transmission Lines in NER:

During 145th OCC meeting, the status as informed by different beneficiaries is as follows:

SN	Items	Status as given in 145th OCC Meeting		Status as given in 146th OCC Meeting	
		Timeline for completion	**Furnishing of detail parameters**	**Timeline for completion**	**Furnishing of detail parameters**
a. New Elements					
1	400/220kV, 315 MVA ICT-1 of NTPC at Bongaigaon	By June'18	To be submitted to NERLDC.		
2	Kameng HEP of NEEPCO two units (2 x 150 MW) Next two units (2x150 MW)	Dec'18	Already submitted.		
3	Pare HEP of NEEPCO (2 x 55 MW)	Unit#II - DoCO 21.05.2018 Unit #I - DoCO 28.05.2018.	Not applicable.		
4	400 kV D/C Silchar - Melriat line of PGCIL	Aug'2018	To be submitted to NERLDC.		

5	132kV Monarchak – Surjamaninagar D/C of TSECL	SCM MoM yet to be issued.	To be submitted to NERLDC.		
6	SLDCs (Ar. Pradesh, Manipur, Mizoram, Nagaland)	Nagaland-DoCO to be finalized Ar. Pradesh**, Manipur - CoD Mizoram-ToC date to be confirmed. Except DG set(WIP), all other works are completed. Additional supply of RTUs & minor pending works by 4months.	Not applicable.		
7	400/220 kV 315 MVA ICT-II at Bongaigaon	Modification required in GIS Hall. Oct'2018	To be submitted to NERLDC.		
8	220/132 kV, 160MVA ICT-II at Balipara	ICT#II - delayed, Sept''18	To be submitted to NERLDC.		
9	220/132 kV, 1x160 MVA ICT with GIS Bay at Kopili	Sept, 2018.	To be submitted to NERLDC.		
10	400/132 kV, 1x315 MVA ICT-III at Silchar	By June-18 through Bus #2	To be submitted to NERLDC.		
11	Replacement of 2x315 MVA ICTs with 2x500 MVA ICTs at Misa (PG)	ICT-I : Nov'18 ICT-II : Dec'18	To be submitted to NERLDC.		
12	400 kV Silchar – Misa D/C	2019	To be submitted to NERLDC.		
13	1x125 MVAR Bus Reactor at 400 kV at Balipara	Sept, 2018(LOA date).	To be submitted to NERLDC.		
14	1x125 MVAR Bus Reactor at 400 kV Bongaigoan	Sept, 2018(LOA date).	To be submitted to NERLDC.		

15	Tuirial HEP of NEEPCO	Agreed date of Commercial operation - 27.04.2018 for Unit#I&II	Already submitted to SLDC Mizoram.		
16	33kV bay at 220kV Mariani(AS) S/Sn	Security Paid. Agreement made. Meter to be installed by ASEB.	Not applicable.		
17	33kV Tezu-Tezu(AP)	Completed long back. **Item to be dropped**	Not applicable.		
18	33kV bay for 132kV Badarpur(PG) S/Sn	APDCL to submit revised estimate as earlier estimate was based on 33kV feeder from same source.	Not applicable.		
19	Dedicated 33kV feeder at Khliehriat Substation from Lumshnong.	MePDCL requires ROW clearance certificate from POWERGRID. PGCIL taken up with district authority.	Not applicable.		
20	Construction of 132 kV Imphal (PG) - Yurembam III & IV lines with high capacity conductor by MSPCL	RoW problem. Tentative Completion: Jul'18	To be submitted to NERLDC.		
21	LILO of 132kV Aizawl-Jiribam at Tipaimukh by MSPCL	Completed.	Not applicable.		
22	132kV Ranganadi - Chimpu S/C	June'18	Already submitted		
23	132kV Tezu - Namsai S/C	Charged. CoD by June'18	Already submitted		
24	MW Vaction OPGW project	All nodes are reporting. Srikona-Silchar-Badarpur-Kolashib-Aizwal completed.DOCO 01.04.18. Rectification by Sept18.	Not applicable.		

25	VOIP Exchange Project under NER FO exp/Add coom OPGW	All SLDC & NERLDC is now connected over VOIP Exchange. Completed in 31.03.2018	Not applicable.		
26	NER FO Expansion/Add req of OPGW	Present Status: Out of the list as per 18th RPC: WIP: Silchar-Melriat, SMN-Palla, SM-79T, 79Tila-rc Nagar, Badarpur-Jiribam, Completed OPGW: Khandong-Haflong, Doyang-Dimapur, Doyang-Mokokchung(St) Mok-Mariani, Mariani-PG-Kathalguri. Equip: Supplied/ Comm pending	Not applicable.		
27	URTDSM project	Supply & Installation completed:13/14 location 18nos. PMUs in 4 locations integrated	Not applicable		
b. Elements under breakdown/upgradation					
28	Up-gradation of 132 kV Lumshnong-Panchgram line	To be approved by Techno-Economic sub-group for funding from PSDF.	Not applicable.		
29	Switchable line Reactors at 400kV Balipara & Bongaigoan	Aug'18	To be submitted to NERLDC.		
30	PLCC Panels at Loktak end of Loktak – Ningthoukhong	Oct'2018	Not applicable.		

	132 kV feeder and Loktak - Rengpang 132 kV feeder				
31	LILO of 132kV Ranganadi – Itanagar (Chimpu) at Pare of Ar. Pradesh	Erection works at Ranganadi, Pare and Chimpu complete. Tentative CoD June'18	To be submitted to NERLDC.		
32	Re-conductoring of 132kV Umiam Stg#I - Umiam Stg-III	DPR prepared and submitted for approval	Not applicable.		
33	Upgradation of ULDC FO node	Target completion : June 2018	Not applicable.		
34	Upgradation of 132kV Silchar-Imphal to 400kV	August'18	To be submitted to NERLDC		

Concerned constituents may kindly intimate the status.

D. NEW ITEMS

D.1 Generation Planning (ongoing and planned outages)

NEEPCO & NHPC may kindly intimate the availability for hydro stations:

Generating Station	Units running	MW	MU	Reservoir
Khandong				
Kopili				
Kopili-II				
Ranganadi			Subject to inflow	
Doyang				
Loktak				
AGBPP	-	-	-	-
AGTPP	-	-	-	-

The outage of other generating stations may be approved considering the present water levels in reservoirs.

The Committee may discuss and approve the proposed shutdown by Generating Stations as given in Annexure – D.2 which is available in NERPC website.

D.2 Outage Planning Transmission elements

It was agreed in the 99th OCC meeting that shutdown will be availed only after approval is given by the OCC forum. It was also agreed that deferment/revision of outages elements other than already approved in OCC will be henceforth put/displayed in the website of NERPC (**under Operational Activities/OCC Approved shutdown**) as per CERC regulations/ CEA guidelines etc for ensuring smooth & secure grid operation.

Furnishing request of shut down of the element, which was approved by NERPC, by Indenting Agency (ISTS licensees/STUs/Generating Companies) to NERLDC: Planned shutdown approved by NERPC shall be considered for implementation by NERLDC on D-3 basis. If an outage is to be availed on say 10th of the month, the shutdown availing agency would reconfirm to NERLDC on 7th of the month by 10:00 Hr. This practice is necessary to ensure optimal capacity utilization and the time required for associated system study/coordination by/amongst RLDC/NLDC.

In 142nd OCCM, SE (O&P), NERPC suggested that henceforth shutdown list may be prepared under following categories:

- **(i)** New Construction Related Shut Down
- **(ii)** Existing System Improvement Related Shut Down.
- **(iii)** Existing System Normal Maintenance Related Shut Down
- **(iv)** Communication Related Shutdown
- **(v)** R&U works Related Shut Down under PSDF

The forum further decided that the modalities of communication related shutdown should be finalised. Members requested NERPC to invite POWERGRID telecom in next OCCM alongwith with officials (handling communication issues) from all utilities for this purpose.

In 143rd OCCM, SE(O&P), NERPC once again reiterated that shutdowns which are not being availed will not be entertained in the following month and would only be accorded in the next to next month. He hoped that in view of greater complexity in grid operation due to communication issues, the list of important links would be finalised by NERLDC very soon. He also requested NERTS to impress upon POWERGRID Telecom to attend the next OCCM positively.

The sub-Committee may kindly discuss and approve the transmission line outages proposed by Constituents for July,2018-August,2018 which is available in the website of NERPC.

D.3 Estimated Transmission Availability Certificate (TAC) for the month of February, 2017 to April, 2018:

NETC and POWERGRID have submitted the outage data for the month of February, 2017 to April, 2018. So the attributability of outage of the said elements may please be finalized.

Members may please discuss.

D.4 Assessment of Total Transfer Capability (TTC), Transmission Reliability Margin (TRM) and Available Transfer Capability (ATC) by SLDC on respective Inter-State Transmission Corridor

Updated PSS/E Base Cases have been **mailed to all the SLDCs on 04.07.18**. All SLDCs are requested to assess the Total Transfer Capability (TTC), Transmission Reliability Margin (TRM) and Available Transfer Capability (ATC) for the month of June'18 using these cases, and submit the study cases and results to NERLDC by **26.07.18**.

NERLDC has assessed the state control area wise, state subsystem wise and group of control-area wise TTCs for NER Grid, on behalf of SLDCs of NER. The study results will be presented in the meeting. SLDCs are requested to check the TTC of their control areas as computed by NERLDC and **give comments, if any, by 26.07.18.**

If no comments received from any SLDCs of NER, TTC, ATC & TRM figures of State control area and group of control areas as assessed by NERLDC will be considered as final and may be uploaded on website.

As per discussions in 122nd OCC meeting of NERPC, all SLDCs of NER may host the assessed TTC / ATC / TRM figures on their website for information dissemination.

Members may discuss.

D.5. SPS mock testing & existing SPS scheme related:

In 143rd OCCM SE(O&P), NERPC informed that testing would be carried out tentatively in the first week of May,2018. He requested AEGCL, MeECL, NERTS, OTPC and NERLDC to depute concerned personnel for the said purpose.

In the Special Meeting on SPS-3 held at NERPC Shillong on 03.05.2015, the matter of mock testing was discussed. Members suggested that after implementation of the procedure on 07.05.2018, the date of mock testing may be finalized in the 144th OCCM.

In 144th OCCM it was decided that by 30.05.2018 NERTS would resolve the issues leading to generation of anomalous SPS-3 signal from Silchar. Subsequently after confirmation OTPC would turn on SPS-3 at Palatana. NETC was requested to increase patrolling and regular maintenance operation(s) for Palatana evacuation corridor(i.e. 400kV Palatana-Silchar I&II, 400kV Silchar-Byrnihat and 400kV Silchar-Azara). Further it was decided that in the intervening period 400kV Silchar-Byrnihat and 400kV Silchar-Azara shutdown would be decided on a case to case basis.

On 15.05.2018 NERTS while working on some filter logic implementation at Silchar S/S (for SPS-3), DT for 400kV Palatana-Silchar -II was sent to Palatana. This happened while Line-I was under approved shutdown, resulting in SPS-2 operation at Palatana. Subsequently NERTS informed that any rectification works for SPS-3 at Silchar S/S under live line conditions would result in the following:-

1. Sending of DT signals of Individual line(Palatana-1 &2).

2. Sending of SPS2 signal.

All these undesired events are possible due to congested wiring of all Signal wiring in Palatana 2 relay panels and Palatana 1 Ch- 2 PLCC panels at Silchar substation.

To resolve the stalemate a meeting was held at NERPC and the minutes was circulated in the 145th OCC Meeting.

In 145th OCC, Director/SE(O&P), NERPC stated that creation of separate asset would streamline the scheme and prevent any untoward incident in the future. The approximate cost of ₹ 90 lakhs may be shared by all Utilities of NER.

Members accorded in-principle approval to the suggestion of Director/SE(O&P), NERPC and requested NERPC to take up the matter in next TCC/NERPC Meetings for cost sharing. However, for speedy implementation the forum requested OTPC to procure on behalf of all the beneficiaries, the cost of which would be reimbursed later on. OTPC requested POWERGRID, NERTS to provide technical support, if required, for the same and POWERGRID agreed.

NERLDC highlighted about the disturbance in Southern part of NER due to tripping of 400 kV Silchar-Azara and 400 kV Silchar- Byrnihat and requested the forum to switch ON SPS-3 at Palatana end. NERLDC also told that due to rainy seasons, the 400 kV Silchar-Azara and 400 kV Silchar- Byrnihat is prone to trippings which can again lead to disturbance.

The forum decided that until procurement of new assets, SPS will be in OFF condition and requested to expedite the procurement of new assets.

OTPC/NERTS may please intimate the status.

D.6. <u>Update on Real Time Energy Assessment for Effective Grid Management:</u>

In 139th OCCM, CDAC representative stated that they would require the proprietary protocol from the meter manufacturer(s) to proceed further with the Project. DGM(MO), NERLDC explained that as per practice followed in other Regions like NR, ER etc., AMR provider, Meter manufacturer and Powergrid sign a tripartite agreement to enable passing of the protocol to AMR provider. A sample of draft agreement in ER (TCS is AMR provider) was provided to CDAC and it was advised that CDAC should initiate process and circulate a draft agreement for the present case. CDAC agreed to do the needful and stated that they would develop protocol converter accordingly.

CDAC has furnished the draft tripartite agreement which is to be signed between CDAC, POWERGRID-NERTS and meter manufacturer(s).

In 145th OCCM, Director/SE(O&P), NERPC informed that CDAC would start field trials for Assam by June'18.

NERPC may please intimate the status.

D.7. Recording of operational instructions over VOIP in RLDC:

As per 139th OCC discussion establishment of recording system for all real time instructions and conversations thro' VOIP network was supposed to be established within Feb'18. It is very important to establish the recording system at the earliest as all verbal communication/ conversations among RLDCs, SLDCs and stations are getting lost. Recording status at SLDC also may be discussed.

In 145th OCCM, NERTS informed that LOA has been placed and supply would be done by Aug'18.

NERTS may please intimate the latest status.

D.8. Integration of new RTUs at RHEP:

GE supplied RTU at RHEP will be provided for accommodating the two new 132 kV extension bays being constructed by us at RHEP in the first-second week of March 2018. Integration of new RTU with existing RTU at RHEP and NERLDC control centre shall be required. Hence special permission may be required through appropriate forum in this regard.

In 143rd OCCM, Sr. Manager, NEEPCO informed that as per discussion in 9th NETeST forum for 132kV RHEP-NDTL line, a team from NERLDC, NERTS would visit RHEP on 24.04.18 to sort out the RTU problem. For 132kV RHEP-Chimpu line he informed that RTU is under procurement and same would be installed by Dec'18. However NERLDC requested to install RTU at RHEP at the earliest possible time as current RTU is not reliable, hence creating grid monitoring problem.

A team from NERLDC and NERTS visited RHEP on 27.04.2018 and made the following recommendations:

- The S900 RTU may be replaced with new C264 RTU or existing bays may be integrated with installed C264 RTU.
- The old transducers for existing bays are to be replaced with MFTs.

NEEPCO has agreed to integrate the existing bays with installed C264 RTU.

In 145th OCCM, Sr. Manager, NEEPCO informed that works are going on at an accelerated pace and tentative completion is Oct'2018. NERLDC requested that integration be completed as early as possible, since Ranganadi is a very important station and unavailability of data impairs grid operation.

NEEPCO may please intimate the latest status.

D.9. Ensuring proper functioning of Under Frequency Relays(UFR) & df/dt Relays:

In 7th NPC meeting held on 08.09.17 it was agreed that mock test is good enough to test the healthiness of the UFR & df/dt relays. The frequency of site inspection was proposed to be upto six months. RPC may carry out periodic inspection, in line with provisions of IEGC and furnish inspection reports to NPC.

In 142nd OCCM, SE(O&P),NERPC informed that as mandated periodical inspection of UFR needs to be carried out. In this regard he requested help of NERTS by providing suitable kits.

DGM(AM),NERTS stated that Frequency Injection Kit is available in PGCIL stations and any logistical help may be provided. He further requested that an action plan in this regard may be devised and handed over for future course of action.

In 145th OCCM, DGM(AM), NERTS opined that 1/3 rd UFR nos may be inspected by covering Assam, Meghalaya and Tripura in July'18 itself. The forum requested NERTS would arrange all logistics and transport for the inspection. The forum approved the suggestion and requested NERPC to draw up a fresh schedule and circulate the same forthwith.

Regarding provision of OMICRON Relay Testing Kit, each of the transmission utilities of Assam and Tripura were requested to confirm availability.

NERLDC requested the forum to conduct third party audit of the substations which will be visited during the inspection also. The members agreed to the same.

NERPC may please intimate the latest status.

D.10. <u>Audit of PSS</u>:

In the Special Meeting held at NERPC on 28.05.2018 the following were decided:-

- Members noted that PSS inspection would be futile and recommended that SRT may be submitted by all plants who have not done since last 3 years, at the moment.
- As per prevalent regulations only units above 50 MW are supposed to activate PSS mandatorily.

The Minutes was circulated in the 145th OCC Meeting.

In 145th OCCM, Members approved the suggestions given by Sub-Group. Sr. Manager, NEEPCO informed that SRT reports for Pare, Ranganadi and Monarchak have already been submitted and the suitability of the same may be confirmed. NERPC/NERLDC agreed to revert back. The forum requested BgTPP and Palatana GBPP to also provide their SRTs at the earliest. NTPC representative informed that since BgTPP was commissioned in 2016 the SRTs available at the time of commissioning may be accepted, which will be submitted shortly.

Members may please discuss.

D.11 <u>Geospatial Energy Portal for NITI Aayog:</u>

NITI Aayog is developing a user friendly GIS based Energy Map of India, which would provide true locations of all energy resources in India including power plants, coal and oil reserves, transmission lines, refineries, etc.

Ministry of Power (MoP), GoI has designated Central Electricity Authority (CEA) as the nodal agency to collect all the required data/information pertaining to the

Power Sector of India by collecting it from different Utilities of Power Sector and submit it to NITI Aayog for early development of the Geospatial Energy Map of India.

Accordingly, CEA vide letters dated 09.02.2018 and 01.05.2018 requested Heads of DISCOMs/Power Departments to furnish the information regarding the name, voltage level, capacity, longitude and latitude of 33 kV and 66 kV Substations and lines as per proforma. However, information is still awaited from most of the utilities

Non furnishing of above information by DISCOM was discussed in a meeting taken by Chairperson, CEA on 26.04.2018, wherein it was advised that all RPCs may be requested to take up the issue in the OCC meetings for furnishing the information in a time bound manner.

The details of the sub-stations required are attached at Annexure-D.17(already circulated in 144th OCCM). Corresponding utilities are requested to provide the missing details in the annexure at the earliest.

In 145th OCCM Director/SE(O&P),NERPC informed that the data has already been submitted by P&ED Mizoram and MePDCL. He thanked SLDC Meghalaya and SLDC Mizoram for the prompt action. He requested all remaining utilities to submit the same by 26th June'18.

NERPC may please intimate the status of submission.

D.12 Non-availability of SOE records of Biswanath Chariali, Ranganadi, Dimapur & Bongaigaon:

The SOE records of both BNC and RHEP do not appear for any breaker operations in any of the elements of both the stations. This causes lack of proper visibility for the system operators in real time and causes hindrance in proper & quick decision making.

NERLDC has also informed that SOE and Alarm records for Dimapur and Bongaigaon(Interregional links and others) do not appear for any breaker operation in any of the elements of the stations.

In 145th OCCM, DGM(AM), NERTS informed the following w.r.t. different stations:

- *Dimapur :* NTAMC Integration work in progress. After completion of the work Dimapur SOE will be available. Completion by : November-2018.
- Bongaigaon : All Data OK as per Site.(Details given in Anex) For resolving the issue better, joint visit(PGCI & RLDC) at respective site is proposed
- HVDC BNC : All Data OK as per Site.(Details given in Anex) For resolving the issue better, joint visit(PGCI & RLDC) at respective site is proposed
- RHEP : RTU configuration is not in POWERGRID Scope. RLDC may contact respective concern utility.

NERTS/NERLDC may please intimate the status.

D.13 Poor Governor Response during sudden drop of frequency

On 23.04.2018 at 10:42 Hrs, there was a sudden decrease of frequency from 50.02 HZ to 49.72Hz in which Palatana has shown an increase of 49MW instantly. Whereas the other NER generators has shown almost a NIL response. Reasons may be intimated.

In 144th OCCM, NERLDC informed the forum that on 23.04.2018 at 10:42 Hrs, there was a sudden decrease of frequency from 50.02 HZ to 49.72Hz. During calculation of Frequency Response, it has been observed that most of the generators in NER has shown NIL response except for Palatana.

Sr. Manager, NEEPCO informed that TGBPP responded very well with GTG contributing 7MW and STG almost 2MW. He also informed that Kopili reservoir was very low but still increased generation by 0.75MW inspite of LFO issues. Further the vanes were at full capacity. For AGBPP, he informed that the unit(s) were in temperature control mode which did not allow to respond due to dip in frequency. The forum requested NHPC and NTPC to revert back with the reasons for poor response.

In 145th OCCM, NERLDC gave a detailed presentation. It was stated by NERLDC is regularly carrying out calculation of FRC to ascertain governor response. It was explained that non-response by Governor would be treated as a violation of IEGC provision.

Sr. Manager, NEEPCO informed that Khandong & Kopili-Stg-II were running at full capacity, while AGTCCPP did not have any reserve capacity for generation. Manager, NHPC informed that Loktak HEP was generating at full capacity. NTPC agreed to revert back on the governor non-operation **during the event at 1651 Hrs on 06.05.2018**.

NHPC & NTPC may please intimate the status.

D.14 Disruption in Agartala PMU Data

PMU Data of Agartala got disrupted on (i) 04:53 hrs of 30/04/2018 to 20:00 Hrs of 01/05/2018; and (ii) 16:41 Hrs of 02/05/2018 to 10:32 Hrs of 03/05/2018. On enquiry it was found out that the 132 KV Dhalabil-Agartala S/C Line was under shut down on these period.

This indicates that the CVT input for agartala PMU has been taken from line CVT of Dhalabil-Agartala S/C Line. To avoid any such disruption in future, it is required to shift the CVT input of PMU to Bus CVT of Agartala.

In 144th OCCM, NERLDC informed the forum that PMU Data of Agartala got disrupted on 04:53 hrs of 30/04/2018 to 20:00 Hrs of 01/05/2018; and 16:41 Hrs of 02/05/2018 to 10:32 Hrs of 03/05/2018. On both the occasion, it was found out that the 132 KV Dhalabil-Agartala S/C Line was under shut down on these period.

After detailed deliberation it was surmised that line CVT of 132kV Dhalabil-Agartala is being used for PMU. NERLDC requested TSECL to shift the connection to 132kV Bus. TSECL agreed to do the needful by May'18.

TSECL may please intimate the status.

D.15 Construction Power for GIS bay at Kopili Switchyard:

PGCIL is taking power from NEEPCO for construction of GIS bay at Kopili SY. During its operation, auxiliary AC supply will also be drawn from Kopili Power Station which will increase normative auxiliary consumption of 1% of Kopili Power Station. Hence this issue also to be discussed in the OCC meeting.

Providing auxiliary ac supply to the newly constructed PGCIL owned GIS substation at kopili SY, from the allowable 1% of the generation on chargeable basis or any other recovery mechanism that the forum may decide.

The 145th OCC forum requested NEEPCO to explore the following:

- The approximate power consumption for GIS O&M activities.
- Whether the consumption is within the allowable 1% APC.

NEEPCO agreed to revert back.

NEEPCO may please deliberate.

D.16 Crossing of 400 kV D/C Silchar-Melriat and 132 kV D/C Bawktlang - Sihmui Line

POWERGRID is constructing 400 kV D/C Silchar —Melriat Line as part of Pallatana Transmission System. During check survey, it has been observed that this line has to cross the 132 kV D/C Bawktlang-Sihmui line already constructed by P&E Department, Govt. of Mizoram. As per the proposed route alignment, the Loc No. 244 of the 400 kV line has to be erected at 10m distance from the Loc No. 86 of the 132 kV Line, which is not possible. Also there is no suitable place to relocate the Loc 244.

A number of possibilities have been explored jointly with P&E Deptt., Mizoram to divert either of the two lines and the only feasible option has been intimated to Mizoram vide our letter No. NEAZL/CONST/P&E/2018 dtd. 21.05.18, in which 4 Nos towers of the 132 kV Line are to be diverted by erecting 5 Nos new towers. POWERGRID proposes to bear the cost of this diversion. A sketch of the propose arrangement is attached here with for kind reference.

It may please be noted that the matter is being pursued with P&E Deptt. Mizoram since January'2017 and a number of joint verification have been carried out but a consensus is yet to be reached.

In 145th OCCM DGM(AM), NERTS informed that 400kV Silchar - Melriat commissioning works are going on at an accelerated pace, and the diversion is an utmost necessity. Sr. Executive Engineer, P&ED Mizoram informed that in principle concurrence of P&ED Mizoram is there to the shifting of 132kV Bawktlang-Sihmui D/C. He also stated that estimate is being prepared by Executive Engineer(Trans), Kolasib and the same once approved would be given to NERTS. DGM (AM), NERTS requested Mizoram to allow POWERGRID to carry out the job immediately in parallel to approval of estimate to avoid delay in completion of the project.

NERTS/P&ED Mizoram may please intimate the status.

D.17. Registration of all existing and upcoming electricity generating units cf the country of capacity 0.5 MW and above under National Level Data Registry System

Under the National Level Data Registry System, all the existing and upcoming electricity generating units of the country of capacity 0.5 MW and above would have to get registered with CEA and get a unique registration number from CEA For this impose, a detailed framework was prepared by CEA and the same has been approved by Ministry of Power, Government of India.

For implementing the aforementioned National Level Data Registry System, CEA is preparing a E-Registration Portal and operationalization of E-Registration Portal may take 2 to 3 months time . Once the E-Registration Portal of CEA is ready, all the stakeholders would be informed accordingly by CEA for registering and feeding the data. It is therefore, requested to nominate a nodal officer and intimate the name, mobile, email, address of the same to the undersigned at the e-mail address pslfcea@yahoo.com It is further intimated to keep the concerned officer in readiness for doing the needful.

Till the E-Registration Portal of CEA is operationalized, all the existing procedure of furnishing data will continue as per existing provisions and laws.

Accordingly all generating utilities may please submit the relevant details of the nodal officer.

In 145th OCCM Director/SE(O&P), NERPC apprised the members of the novel initiative of MoP to create a National Data Registry for generating stations. He requested members to peruse the annexure and comply accordingly.

Generating utilities may please intimate the details of nodal officers.

D.18. Regional Committee for Load Forecasting

In 20th FOLD meeting held on 25th January 2018, members agreed about the Industry-Academia partnership for the load forecasting. The most important benefit of SLDC academia association shall promote capacity building at SLDC level on load forecasting leading to development of in-house capability.

Further, it was also decided that a competition among LDCs on daily load forecast would be organized. A committee may be constituted comprising members from SLDCs, RLDCs and NLDC, to evaluate the forecast by each LDC, based on a pre-defined performance matrix.

In view of the discussion in 20th FOLD meeting, a committee for NER region to evaluate the performance of the LDCs on load forecasting will be formed and the committee will comprise the following members:

a. One member from NERLDC
b. One member from at least 2 SLDCs of the NER region

The committee will evaluate the accuracy of the day ahead forecast (based on the Root Mean Square Error) of the participating LDC on monthly basis till 31st Mar'19.

Subsequent to evaluation at Regional Level, a committee at National Level comprising members from NLDC, RLDCs and SLDCs will be formed for evaluation of the winner(s).

Based on the details received from LDCs, and the accuracy of the forecasting model, the committee after the completion of the FY 2018-19, will decide the award(s) to be given to the concerned LDCs.

In 145th OCCM NERLDC informed the forum as decided during 20th FOLD Meeting, it was requested to approach academic institutions for developing Load Forecast Model. A competition will be held and a committee will be formed to analyze the results.

After detailed deliberation the forum decided to form a committee to spearhead the load forecasting initiative:-

Smt. Momai Dey, Sr. Engineer, NERLDC
Shri T. Gidon, Executive Engineer, SLDC Meghalaya
Smt. Barsha Kashyap, DM SLDC Assam

The committee was requested to submit a monthly report on the activities undertaken to improve load forecasting.

The Committee may please present its report.

D.19. Blackout of 220 kV Misa(PG) and Kopili HEP on 21st May'18

220 kV Misa Bus and Kopili Power Station were connected with rest of NER Grid through 220 kV Misa-Dimapur 1 & 2 Lines, 220 kV Misa-Byrnihat (Killing) 1 & 2 Lines, 220 kV Misa-Samaguri 1 & 2 Lines, 220 kV Misa-Mariani (PG) Line, 400/220 kV, 315 MVA ICT 1 & 2 at Misa Substation, 220 kV Misa-Kopili 1, 2 & 3 Lines, 132 kV Kopili-Khandong 1 Line and 132 kV Bus-Coupler of Khandong Substation. 132 kV Khandong - Kopili 2 line and Khandong U 1 & 2 were connected with Bus B and 132 kV Kopili - Khandong 1 Line, 132 kV Khandong - Khleihriat 1 & 2 Lines and 132 kV Khandong - Umrangshu Line were connected with Bus A.

At 15:31 Hrs on 21.05.2018, 220 kV Misa-Dimapur 1 & 2 Lines, 220 kV Misa - Byrnihat (Killing) 1 & 2 Lines, 220 kV Misa - Samaguri 1 & 2 Lines, 220 kV Misa-Mariani (PG) Line, 400/220 kV, 315 MVA ICT 1 & 2 at Misa substation, 220 kV Misa-Kopili 1, 2 & 3 Lines, 132 kV Kopili - Khandong 1 Line and 132 kV Bus-Coupler of Khandong Substation tripped.

Due to tripping of these elements, 220 kV Misa Bus and Kopili Power Station were separated from rest of NER Grid and subsequently Kopili Power Station and 220 kV Misa were blacked out.

At first 220 kV Misa Bus-A charged through ICT-I at Misa at 16:08 Hrs and following lines connected to Bus-A restored progressively.

- 132 kV Khandong - Khliehriat I at 15:59 Hrs.
- 220 kV Misa- Kopili I at 16:12 Hrs.
- 220 kV Misa- Samaguri I at 16:16 Hrs.
- 220 kV Misa- Dimapur II at 16:21 Hrs.
- 220 kV Misa- Byrnihat II at 16:29 Hrs.

While charging the lines connected to Bus-B by shifting to Bus-A; at 16:34 Hrs, the total restored lines got tripped once again resulting voltage failure of 220 kV Misa Bus. After detailed inspection, restoration of lines started at 17:18 Hrs through 400/220 kV ICT-I at Misa.

In 145th OCCM NERLDC gave presentation on the incident. DGM (AM), NERTS stated that the detail analysis and findings to be done by sub group immediately after the occurrence any GD – III & above level grid disturbance and place the recommendation to OCC for implementation by concerned agencies. In this case sub group analysis and findings yet to be placed. Members requested NERPC to hold a Protection Sub-group meeting at the earliest for RCA.

The Sub-group meeting was held on 29.06.2018, the MoM is attached at **Annexure-D.19.**

Members may please discuss.

D.20. Overloading Problem of 132 kV Pare-Ranganadi I and 132 kV Pare – Lekhi Lines

After commissioning of two units of PARE HEP (NEEPCO), the generation with full capacity is 110 MW and the power evacuation is through 132 kV Pare-Ranganadi and Pare-Lekhi lines. Whenever 132 kV Nirjuli-Gohpur line remains closed and the Gohpur load (14-18MW) is fed radially from Nirjuli, it creates overloading of 132 kV Pare-Lekhi line (90-95 MW) during peak hours and during off peak hours, overloading takes place at 132 kV Pare-Ranganadi line (90-94 MW). Hence to avoid any tripping due to overloading, load management/generation reduction has become the daily issues in real time condition.

In 145th OCCM NERLDC representative explained the overloading in 132 KV Pare-Ranganadi line mainly during evening peak load hours. It was felt that commissioning of Ranganadi-Pare-Chimpu lines would provide solution to the issue. Ar. Pradesh representative stated that the line(s) were ready for charging, only signing of connection agreement between NEEPCO and Ar. Pradesh was to be done. He stated that matter was pending with State Govt. and was expected any time. He agreed to pursue with State Govt.

Till that time, it was agreed to control overloading with load management at Gohpur. It was also agreed not to supply Gohpur from Nirjuli during peak load hours.

NERLDC/NEEPCO/DoP Ar.Pradesh may please intimate the status.

D.21. High MVAR Drawl by Bangladesh

It has been observed mostly during peak hours that, Bangladesh drawal reaches 190 MW with reactive power consumption of 60-70 MVAR and sometimes even more. Any generation outage at Tripura during these periods (say outage of Monarchak/ Rokhia) causes severe low voltage issue at Agartala and hence AGTCCPP Units /132 kV system are compelled to supply very high quantum of MVAR to maintain Agartala Bus voltage which is not desirable for safety of the grid system. To prevent such issues, action needs to be taken to restrict MW/MVAR drawal by Bangladesh.

In 145th OCCM Director/SE(O&P, NERPC informed the forum that the issue would be discussed with CEA/NLDC how to resolve the issues pertaining to power supply from Tripura. The detail would be communicated subsequently.

NERPC/TSECL may please intimate the status.

D.22. LILO of 132 kV Jiribam-Aizawl at Tipaimukh S/S charged without following normal procedures.

S/D for LILO work of 132 kV Jiribam-Aizawl line (PG) at Tipaimukh S/S (Manipur) was taken on 1st June 2018 by Manipur. The same LILO Tipaimukh S/S (Manipur) was charged for the first time from Jiribam end on 3rd June 2018 at 1017 hrs and finally closed successfully at 11:34 hrs. However, this was allowed as a special case so that reliability of power supply to Mizoram is not affected. Till date, Telemetry data (RTU) & Voice communication systems are yet to be made available as mandated by IEGC. Manipur is requested to complete all formalities at the earliest possible.
In 145th OCCM NERLDC representative stated that Telemetry data (RTU) & Voice communication systems are yet to be made available as mandated by IEGC at Tipaimukh Substation by MSPCL. MSPCL representative agreed to the same.

NERLDC also requested all concerned to follow the prescribed procedure as stipulated by CERC in case of first time charging of any new element.

NERLDC may please intimate the status.

D.23 Providing Power Supply to OTPC Plant Colony from Palatana Plant-Installation of SEM thereof

The housing colony of Palatana Plant is under construction and is likely to be completed within a year or so. The colony is situated around 7 (Seven) kilometer away from Palatana plant. For a reliable power supply to the colony, it is proposed that power supply to the colony be arranged from Palatana Plant itself. The total power consumption of the Colony is expected to be around 2 (Two) MW. It is proposed to draw power from 6.6 kV station bus of Palatana Plant to the Colony. The Colony power consumption shall be treated as drawal of TSECL and TSECL shall raise bill to OTPC as per their applicable Tariff structure. OTPC and TSECL shall finalize the modalities of construction of line, billing etc. through mutual discussion and agreement.

This agenda is placed before the Operation Co-ordination Committee for discussion and approval for installation of SEMs so that colony power drawal shall reflect in REA as consumption of TSECL.

In 145th OCCM GM, OTPC informed the forum that due to paucity of land in the power plant complex the colony had to be constructed about 7km away. For reliable power supply to the colony; OTPC is planning to lay 6.6kV cable from power plant, which will be fed via Station Transformer. He also stated that OTPC plans to become consumer of Tripura and upon installation of SEM, bills may be raised by the latter.

APDCL representative raised the following issues:-

- Installation of distribution line and operation by generating company.
- Billing issue.
- whether TSECL is able to supply power to the colony

Members further opined that CEA and CERC clarification is required so that no existing regulations are violated.

DGM(MO), NERLDC stated the following:-

- TSECL is to confirm.
- Protection issues to be sorted out because a generator would be connected to distribution consumer.
- As per current regulations metering is upto 132kV level (However, in NER, as an exception, it is done for 33 KV also in case of old legacy lines of Assam-AP, Assam-Nagaland, Assam-Bhutan) So regulatory modifications/guidelines are required before installation of SEM.

The forum agreed in-principle drawal of power by OTPC township directly from the power plant, subject to views and decision of CEA and CERC in this regard. It was decided that the NERPC would take up the matter with CERC and would be resolved within 30.06.2018.

TSECL,NERPC,OTPC may please intimate the status.

D.24 <u>Surplus in NER and backing down of hydro ISGS:</u>

In 145th OCCM it was stated that due to sudden rains resulting in spillage in Ranganadi HEP coupled with load crash in States, all NER States were drawing much less than their schedule during early hours of 13.06.2018. This resulted in export to ER to the tune of 800 MW against schedule of around100 MW. NERLDC took action by coordinating with States and all thermal units were reduced to Technical minimum level. In-spite of that still there was deviation in inter-Regional schedule and one unit of BgTPP was sent under Reserve Shutdown wef 1230 Hrs on 13.06.2018. Also the reservoir based hydro Stations which were not spilling were asked to reduce generation.

NERLDC requested all the States and Generators to cooperate in such situation to maintain Grid Security. The States were advised to explore the option of intra-day market in such a situation of sustained underdrawal, this would be beneficial to the States in view of shortage in other Regions during Summer season.

NTPC-BgTPP stated that it would be preferable for them to go under RSD rather than running in part load close to 55%. NERLDC clarified that once U-3 of BgTPP is commissioned, backing down would be frequent during monsoon and NTPC units would be needed during peak load hours only. Accordingly, NTPC may opt to operate the units accordingly by preferring the option of RSD.

NEEPCO representative stated that hydro units should not be asked to back down in monsoon when there is spilling like situation. NERLDC clarified that respective generating station would have to declare spilling backed up by water level data and in such a case generator would not be asked by NERLDC to back down.

In case of Loktak, it was agreed that Power Channel water level would be considered by NERLDC.

It was apprehended that with the commissioning of Pare HEP and probable commissioning of BgTPP U-3 and Kameng HEP, there would be substantial surplus during monsoon mainly in off-peak and proper planning would be required by beneficiary States and generators to tackle such situation.

Members may please discuss.

D.25 Increase of Reliability of Power Flow to Bangladesh

At present, power is fed to Bangladesh through 132 kV Suryamaninagar – Comilla D/C (400 kV charged at 132 kV). At Suryamaninagar end, adopted CT ratio is 1000:1, Overcurrent Plug Setting Multiplier (PSM) is 0.8. This calculates to a power flow of about 183 MVA (1.7321*Voltage*CT Ratio * PSM) in single circuit.

With the above settings and in high power flow scenario to Bangladesh (~192 MW as contracted), in case of tripping of one circuit of 132 kV Suryamaninagar – Comilla D/C, the reliability is greatly reduced as the other circuit will not able to cater the power flow. Changing the PSM value at Suryamaninagar to "1" will allow power flow of about 229 MVA via single circuit of 132 kV Suryamaninagar – Comilla D/C.

For safe and reliable power transfer to Bangladesh, it is propose the set the PSM at Suryamaninagar to a higher value so that full contracted power flow to Bangladesh can be transferred even if one circuit trips.

Members may discuss the PSM value to be set at Suryamaninagar and restrictions, if any, at Comilla end.

In 145th OCCM Director/SE(O&P), NERPC took strong note of the unilateral action of TSECL to increase power flow to 160MW without intimating the forum. Since bays at Surjamaninagar are being maintained by NERTS, any increase in power flow ordains changes to be made in protection settings. DGM(AM), NERTS opined that changing PSM would be futile since it is meant for O/C protection of particular line. He suggested that Overload Relay with higher time setting may be installed. Members approved the suggestion and requested NERPC to take up the matter with NPC/NLDC/MoP regarding uncontrolled load pattern of Bangladesh.

At present due to any outage in the Palatana-SMNagar corridor, whether ICT/line the power flow to Bangladesh is affected. Tripura may please inform its views and clarify on the contracted load to Bangladesh.

NERPC/TSECL may please intimate the status.

D.26 Flexibility in generation and scheduling of thermal power station to reduce emissions:

In 145th OCCM Director/SE(O&P), NERPC informed that MoP vide letter dated 05.04.2018 has informed of the policy regarding 'Flexibility in generation and scheduling of thermal power station to reduce emissions'. He also explained the backdrop of the unique proposed procedure:-

- The concept of Flexible utilization of coal by the generating companies was introduced in 2016. This has resulted in usage of coal within own basket to the nearby generating stations.
- Thus has reduced unnecessary transportation costs and reduction in power generation cost.
- Now after large scale integration of renewables the burden of renewables obligation has fallen on DISCOMs. This would be counteractive in balancing the grid.
- So in order for generators to share the responsibility this framework is being introduced. After feedback from all the concerned utilities this would be made operational.

The detailed framework was circulated**.**

NERPC requested the members especially generating utilities to provide their comments ASAP.

Members may please discuss.

AGENDA ITEM FROM NHPC:

D.27 Generation backing down details:

FRL: 768.50 m
MRL: 769.23m

DATE	DC Loktak (MU)	DC given by NERLDC (MU)	Diff (MU)	Power Channel Level (EL in m)	Ithai Barrage Level (EL in m)	Spillage in cumecs at Ithai Barrage
12.06.18	2.457	2.427	0.03	766.79	769.2	159.82
13.06.18	2.457	1.90075	0.55625	766.94	769.3	271.93
16.06.18	2.457	2.45575	0.00125	767.32	769.14	210.64
18.06.18	2.457	2.2755	0.1815	767.49	768.81	297.89
23.06.18	2.457	2.3908	0.0662	767.85	768.54	146.5
29.06.18	2.457	2.309	0.148	768.02	768.72	156.54
01.07.18	2.457	2.3573	0.0997	768.02	768.5	141.92
02.07.18	2.457	2.3625	0.0945	768.02	768.53	115.44
03.07.18	2.457	2.2478	0.2092	768.02	768.97	102.1
04.07.18	2.457	1.83431	0.62269	768.02	768.91	102.22
05.07.18	2.457	2.05725	0.39975	768	768.95	79.58
09.07.18	2.457	2.43725	0.01975	768.01	768.80	156.99
		Total =	2.42879 MU			

Frequent backing down of Generation of Loktak Power Station is observed from Previous month i.e., 12th June 2018. At the same time spillage of Water from ithai barrage and the same had been communicated to NERLDC through mails and telephone also. In this context for better understanding of Loktak Power Station as per discussions held in 145th OCC meeting NERLDC officers along with officers of SLDC, Manipur visited Loktak Power Station, NHPC on dated 22 June 2018. The same was explained to the officers on visit why we should not back down the generation of Loktak Power station during Monsoon season except in Emergency situation (for fast response).

Loktak Power Station want to give detailed presentation on Loktak Lake & Ithai Barrage for better understanding and further not to backdown the generation of Loktak to utilize the renewable resources in better way.

NHPC may please deliberate.

AGENDA ITEMS FROM NERLDC:

D.28. Furnishing Technical and Commercial data for computation of PoC Charges and Losses for Q3 of 2018-19 (Oct 2018 – Dec 2018):

All the power utilities are requested to furnish Technical and Commercial data for computation of PoC Charges and Losses for Q3 of 2018-19 (Oct 2018 – Dec 2018) by 16th Jul'18.

Utilities are requested to submit the technical and commercial data.

NERLDC may please deliberate.

D.29. Updated Operating Procedures of NER July 2018 (Final)

In 145th OCCM, NERLDC informed the forum that Draft Updated Operating Procedures of NER July 2018 is available in NERLDC website for comments and suggestions from regional entities of NER. Password was shared among the members.

No comment has been received from power utilities of NER.

The final version of compiled document on Operating Procedures of NER July 2018 is made available in pdf format in NERLDC website (www.nerldc.org) with password protection. Password may be obtained from SO-II Department, NERLDC.

NERLDC may please deliberate.

D.30. Updated Power Map of NER July 2018 (Final)

In 145th OCCM, NERLDC informed the forum that Draft Updated Power Map of NER July 2018 is available in NERLDC website for comments and suggestions from regional entities of NER. Password was shared among the members.

No comment has been received from power utilities of NER.

The final version of compiled document on Power Map of NER July 2018 is made available in pdf format in NERLDC website (www.nerldc.org) with password protection. Password may be obtained from SO-II Department, NERLDC.

Power utilities of NER are requested to furnish geographical co-ordinates of the nodes as per format attached in **Annexure –D.30**.

NERLDC may please deliberate.

D.31. Review of Automatic Under Frequency Load Shedding (AUFLS) relay settings in Indian Power System

In the 7th meeting of NPC on 8th September 2017, it was agreed that the present AUFLS scheme in Indian Power System need to be reviewed. Under frequency load shedding relays are meant to act in cases of grid frequency dip below a set level due to significant mismatch of load generation in the system.

The present UFLS scheme in Indian Power System is set to operate in 4 stages of 0.2 Hz steps, viz. at 49.2 Hz, 49.0 Hz, 48.8 Hz and 48.6 Hz. Recent events in the Indian

Power System indicate that frequency response characteristics (FRC) has improved from around 5000 MW/Hz in 2015 to 15000 MW/Hz at present.

Frequency response of grid in the recent events indicates that it is very unlikely that frequency dips due to credible contingencies of loss of large generation complexes or loss of tie lines would cause operation of UFR relays at present settings.

For modification of AUFLS scheme for Indian Power System, following aspects can be considered:

a. *Raise the frequency of operation of each stage of AULFS by 0.4 Hz, and set the revised AUFLS scheme in 4 stages at 49.6 Hz, 49.4 Hz, 49.2 Hz and 49.0 Hz.*

b. *Limit the total trip time for modified AUFLS to 200 milliseconds (including measurement time, relay operation time, and breaker operation time)*

c. *Design AUFLS scheme for at least 25% of load-generation mismatch in Indian Power System.*

d. *Define the terms of 'Synthetic Inertia' and 'fast frequency response' and include appropriately in the Grid Standards*

e. *Co-ordinate under frequency trip relays of Pump storage plants in pumping mode with modified AUFLS scheme, and set the trip frequency to around 49.8 Hz.*

f. *Geographically distribute the AUFLS trip relays to prevent over voltages.*

NERLDC may please deliberate.

D.32. <u>Absorption of Reactive Power by generators:</u>

For testing of reactive power absorption capabilities a draft procedure (circulated in 143rd OCCM) has been prepared by NERLDC with inputs from Southern Region where similar tests have been conducted. Members were requested to provide their valuable comments. Generators where AVR is not installed may please provide the time schedule for installation.

SE(O&P), NERPC requested all the members to kindly peruse the draft procedure and provide their valuable comments prior to next OCC.

In 144th OCCM, Sr. Manager, NEEPCO informed that testing as per suggested procedure is impracticable. Since the capability curve is at rated terminal voltage, it is not suggested to vary the system voltage. **After detailed deliberation the forum decided that testing would be done as per common practice of other regions.** Members requested NERPC/NERLDC to frame the procedure in line with other regions.

NERLDC may please deliberate.

D.33. <u>One day Workshop on "Power System Protection"</u>

NERLDC is organizing a one day workshop on "Power System Protection" at NERLDC, Shillong for the benefit of stakeholders of the region on 25th July'18.
The following topics are planned to be covered in this workshop from Power Station perspective:

a. Electrical Protection and Control System
b. Mechanical Protection System
c. Instrumentation

The following topics are planned to be covered from Substation perspective:
a. Transmission Line Protection
b. Transformer & Reactor Protection
c. Protection related to HVDC system

The following topics are planned to be covered from Distribution System perspective:
a. Protection in Distribution System
b. Brief Introduction of Automatic Demand Management System (ADMS)

NTPC, NHPC, NEEPCO, OTPC, POWERGRID & APDCL are requested to nominate persons acquainted with the subject for delivering presentation in the above mentioned topics.

NERLDC may please deliberate.

D.34. Outage of 400/132 kV, 125 MVA ICT-II at Palatana, OTPC since 08.07.18

400/132 kV, 125 MVA ICT-II at Palatana, OTPC tripped due to OSR operation at 01:32 Hrs on 8th Jul'18 since then it is out of service.

OTPC was requested to furnish the following details:

a. Preliminary Report of tripping of 400/132 kV, 125 MVA ICT 2 at Palatana (tripped due to OSR operation at 01:32 Hrs on 8th Jul'18)
b. List of activities done for identification of root cause of the event till date.
c. List of other activities (day wise) are to be carried out for early restoration of this element.

In absence of 400/132 kV, 125 MVA ICT 2 at Palatana, loading of 400/132 kV, 125 MVA ICT-1 at Palatana remains high especially during the peak hours. So for safe and secure operation of Tripura Power System, it is very important to restrict the ICT-1 loading within limit by restricting Tripura drawl from the grid.

NERLDC may please deliberate.

METERING RELATED ITEMS

D.35. Procurement of additional 70 Laptops:

NERTS-POWERGRID explained the following in 145th. OCC Meeting:

Procurement of laptop had two parts:
a) Laptops
b) M S Office std.2016 paper License.

However, bidder has indicated that MS office std.2016 paper licenses are out of date and cannot be supplied.
As such further process for placement of award could not be moved.
NERTS wanted to know: --

I. Whether to go for procurement of Laptops only through the current NIT which is under evaluation and procurement of M S office through a separate tender.

II. Whether to cancel the current NIT under evaluation and go for fresh tendering for both LAPTOP and MS Office.

On enquiry, DGM(AM), NERTS informed that procurement of MS Office through separate tender would take little time.

Accordingly, OCC agreed for option (i) for procurement of Laptops through current tender under evaluation and separate procurement of MS Office through separate tendering.

POWERGRID was advised to complete entire activity within Sept'18.

NERTS may intimate status.

D.36. Installation of new L&T SEMs in NER:

NERTS-POWERGRID intimated the following in 145th. OCC meeting:

"Installation of SEM meters at different sites already taken up.

Balipara : Work in Progress. Completion by 19.06.2018

For other location: SEM meters are being dispatched/collected by different location from central store. Installation will be completed by 31.06.2018 as per target.

Note: On 14-06-2018, installation of 2 nos. of SEMs at Chimpu end is completed as desired by POSOCO.

As installation of SEMs will be completed soon. Hence POSOCO may please suggest whether to proceed with the installation as New SEMs will require new DCD or new software with USB/Optical data cord. If utilities fail to provide laptop/desktop for software installation, collection of SEM will not be possible till procurement/issue of new DCDs which are under procurement."

DGM(MO), NERLDC stated that taking into account above factor, early procurement of Laptop and DCDs would be crucial. He requested NERTS to stick to the timeline for both the activities and until then, any further installation of new Meters in new locations has to be in consultation with NERLDC.

NERTS may intimate status.

D.37. AMR in NER:

NERTS provided the web-link for the tender as under:
www.pgcileps.buyjunction.in

NERTS intimated in 145th. OCC meeting that so far no response received from any party even after extension of bid sale date. Extended bill sale date in 20.06.2018 and OBD by 28.06.2018. Based on response from the party further schedule for LOA will be provided.

NERTS may intimate status.

D.38. Testing of SEMs at accredited laboratory:

In 145th. INERTS intimated the tender documents were under preparation and gave the following tentative schedule:

Tentative Bid Sale: July-2018
Tentative OBD: September-2018
Tentative LOA : October-2018

NERTS may intimate status.

D.39. Procurement of DCD:

In the 145th. OCC meeting, NERTS intimated that the procurement would have to be made under quantity variation to existing LOA which involve GST amendment to the old LOA also.

The schedule: -

Tentative date of issue of Amendment: 14.07.2018
Tentative date for GST LOA: 07.08.2018
Tentative supply: September-2018

NERTS may intimate status.

D.40. Erratic reading of SEM:

1. Dullavcherra end of 132 KV Dullavcherra-Dharmanagar feeder
2. Jiribam(PG) end of 132 kV Jiribam(PG)-Jiribam(Manipur)
3. Dimapur(PG) end of 132 Dimapur(PG)-Bokajan(Assam)
4. Imphal(PG) end of 132 kV Loktak feeder

NERTS may intimate status.

D.40. Commissioning of RS-485 scheme in all ISGS of NER:

NERTS intimated following in 145th. OCC meeting:

Tentative Bid Sale: July-2018
Tentative OBD: September-2018
Tentative LOA: October-2018

NERTS may intimate status.

D.41. Installation of SEM for 33/11 KV Bhutan feeder in Assam system

Following were recorded in 145th. OCC meeting:
APDCL thanked NERTS for the cooperation in this regard for installarion of meter.
Director-NERPC intimated that a meeting with ERPC would be scheduled on this.

NERTS may intimate status.

D.42. Time drift in SEMs.

Status of large time drift as discussed in 145th. OCC meeting is as below:

a) NTPC-BgTPP (main meters time drift of about 8 minutes)
b) Bongaigaon (PG) (in the range of 10 minutes)
c) Dimapur (PG)
d) Imphal (Manipur) (in the range of 10-12 minutes)
e) 79 tilla (Tripura) (in the range of 10-12 minutes)
f) Silchar (PG) (in the range of 10-12 minutes)
g) Rangia / Motonga (in the range of 10-12 minutes)
h) Nirjuli(PG) (in the range of 15-25 minutes)
i) Agartala (in the range of 10-12 minutes)
j) Salakati (in the range of 5 minutes)
k) PK'Bari (in the range of 10-12 minutes)
l) Imphal(State end) (in the range of 10-12 minutes)

NERTS intimated in 145th. OCC meeting as below:

Bongaigaon (PG): Regularly being done.
Dimapur (PG): Drift correction started.
Nirjuli (PG): Drift correction regularly carried out.
Rangia/Motonga: Correction will be started from this week.
Decisions in 145th. OCC meeting:
Regarding Silchar (PG), as Elster meters were there and time correction cannot be done, it was agreed that all meters would be replaced by L&T make after procurement of DCDs.
Regarding NTPC-BgTPP, it was agreed that POWERGRID-Bongaigaon would extend one-time assistance in providing guidance for time correction of SEMs.
It was agreed that the two large time drifted main meters in 400 KV BgTPP-Bongaigaon D/C lines would be replaced by new Meters. Also two Elster make check meters in these lines would be replaced by L&T make meters.

Status regarding corrective action may be discussed.

D.43 Replacement of SEMs.

2 SEMs at Palatana are reported faulty and the same need to be replaced.
It was agreed in 145th. OCC meeting that two defective SEMs at OTPC, Palatana would be replaced by new Meters. It was also agreed that one spare SEM would be provided to OTPC to enable quick replacement in case of any malfunctioning while providing time correction command.

NERLDC may please deliberate.

D.44 Billing for SEMs / DCDs / Accessories procured by POWERGRID-NERTS

It was agreed that POWERGRID-NERTS would raise bills to all the States of NER in proportion to weighted average entitlement from NER ISGS. For procurement during a particular year, weighted average entitlement as on 31st. March of the year would be considered. For example, for all procurement during 2016-17, weighted average entitlement as indicated in the REA of March'17 would be taken for billing.

NERLDC may please deliberate.

D.45 Utilization of Laptop for Metering

Fourteen no. of Laptops were distributed for exclusive use in Metering activities in June'17. It is observed that there is no response from Samaguri and 79 Tilla regarding utilisation of the Laptops. For Samaguri & 79 Tilla SEM data are still being downloaded and sent to NERLDC by Powergrid personnel.

Matter may be discussed to withdraw the Laptop(s) in case of non-utilisation

NERLDC may please deliberate.

Any other item:

Date and Venue of next OCC

It is proposed to hold the 147th OCC meeting of NERPC on second week of August, 2018. The date & exact venue will be intimated in due course.

*****

ANNEXURE-D.19

Proceedings of the Sub-group meeting on 29.06.2018

The list of Participants is attached at Annexure-I.

The following disturbances/ important trippings were discussed:-

1. 220kV Misa blackout and Loss of Kopili & Khandong generation on 21.05.18

Findings of the Sub-group:-

- Feeders connected to Bus-A: 220kV Misa-Dimapur-II, 400/220 kV 315MVA ICT-I, 220kV Misa-Samaguri-I, 220kV Misa-Kopili-I, 220kV Misa-Byrnihat-I, 220kV Misa-Mariani Old
- Feeders connected to Bus-B: 220kV Misa-Samaguri-II, 220kV Misa-Byrnihat -II, 220kV Misa-Kopili-III, 220kV Misa-New Mariani, 220kV Misa-Dimapur-I, 220kV Misa-Kopili-II, 400/220kV 315MVA ICT-II.
- The detail sequence of events/tripping of each element with DR timings is attached at **Annexure-II.**
- 220kV Misa- Old Mariani (AS) was under shutdown with earth switch connected at both ends. Bus isolator (of Bus-A) was in closed condition.
- Bus Bar Protection of Bus-B kept blocked beforehand due to spill current.
- The Y-ph PT connected to 220 kV bus B blasted causing bus fault. Subsequently it converted into R-Y-N fault and then into a R-Y-B fault. Surface flashover occurred on R&B Ph-PTs due to explosion of Y-ph PT and spilling of burning insulation oil on them.
- Since Bus-bar protection was blocked, all the feeders connected to Bus-B at Misa tripped either at remote ends on Z-2 or at local end on Z-4 at 540 msec of fault initiation. ICT-2 which was feeding the fault tripped on backup protection after 2 sec.
- Due to circulating(induction from 220kV New Mariani(PG)) current flow in 220kV Old Mariani, LBB protection for Old Mariani feeder at Misa operated, which triggered opening of remote breakers at 220kV Misa Bus-A. Thus fault feeding from Bus-A was cleared at 320ms of fault initiation.
- ICT-2 connected to Bus-B continued to feed the fault for 2s until B/U protection operated.
- Deterioration in voltage profile of 220kV Bus at Misa, Sarusajai & 400kV Misa Bus as per PMU was analysed and presented by NERLDC. While charging 220 kV Misa – Byrnihat 2 line at 16:30 Hrs

from Misa end, fault was extended to healthy bus (Bus-A) due to closing of Bus-A isolator without opening Bus-B isolator. This resulted in tripping of all the restored lines emanating from 220 kV Misa.

Remedial Actions to be taken:-

- CVT and CT are very old at Misa. All PT&CT including the damaged ones are to be replaced at the earliest.
- The residual life assessment is to be carried out by NERTS, POWERGRID for all major equipment as per clause no. 30 of CEA (Grid Standards) regulations, 2010
- ICT-2 delayed fault clearance is to be analysed by NERTS.
- O/C settings for 132 kV Khliehriat – Khandong -I to be checked.
- Z-2 overlapping of 220 kV Misa - Samaguri and 220 kV Samaguri - Sarusajai to be checked.
- At Kopili S/S, Kopili units are to be distributed in both buses and accordingly 220 kV Kopili - Misa lines & ICT are to be distributed by NEEPCO.
- At Khandong S/S, Khandong units are to be distributed in both buses and accordingly all 132 kV lines emanating from Khandong are to be distributed by NEEPCO.
- Operating procedure of all elements is to be made available to the control room operator
- Bus isolators are to be opened before aviling shut down of any element/bay.
-

Actions already taken:

- Necessary steps have been taken by NERTS to ensure that bus isolators do not remain in closed condition when line is under shutdown.

2. Faults in 132 kV 79 Tilla - Rokhia D/C

Findings of the Sub-group:-

- Fault in the line is tripping of 132kV Monarchak-Rokhia line.

Remedial Actions to be taken:-

- Rokhia E/F relay to be made directional. Or
- Directional Earth Fault function of DPR is to be enabled and then disable backup earth fault relay (EM).

3. Tripping of 400kV Silchar-Byrnihat and 400kV Silchar-Azara lines

On 18.06.2018(01:39 hrs) both 400 kV Silchar-Azara line and 400 kV Silchar-Byrnihat line as well as 400 kV Bongaigaon-Byrnihat line tripped on DP. This led to grid disturbance in Southern part of NER grid.

Findings of the Sub-group:-

- Both 400 kV Silchar-Azara line and 400 kV Silchar-Byrnihat line tripped on R-Y-B-E fault. This was due to lightning.
- However fault locations for both the lines were different.
- 400kV Bongaigaon-Byrnihat tripped on Z-I DP from Bongaigaon end due to relay overreach (Micom P444), when parallel line is earthed at both ends.
- R-ph CB failed to open at Dimapur end of 132 kV Dimapur - Imphal line. LBB operated at Dimapur(PG). All elements emanating from 132 kV Dimapur(PG) tripped.
  Imphal end of 132 kV Dimapur - Imphal line tripped on Earth fault Protection.

Remedial actions to be taken:-

- Tower top patrolling by NERTS to be undertaken to identify the exact location of the fault.
- Reason for DPR (Main-2) overreach at Bongaigaon is to be investigated by NERTS.
- Earthing through chemical treatment/installation of TLSA in the lightning prone areas with high tower footing resistance for both 400 kV Silchar-Azara and 400 kV Silchar-Byrnihat is to be done after the rainy season.
- A separate group of settings for Micom P 444 to be activated with Zone 1 setting =60% when the parallel circuit is earthed at both ends for maintenance.
- Reasons for non-operation of R-ph CB for 132kV Dimapur-Imphal to be investigated by NERTS.
- Enabling SPS-3 at Palatana and Silchar

4. Repeated trippings of 132 kV Doyang-Mokokchung line and 132 kV Mokokchung-Mokokchung D/C

Findings of the Sub-group:

- Due to downstream faults at Mokochung(NAG) ,132 kV Doyang-Mokokchung line and 132 kV Mokokchung-Mokokchung D/C are tripped.

Remedial actions to be taken:

- As Mokokchung(NAG) has conveyed the impossibility of reducing settings further, timings at 132 kV Mokokchung(PG) and 132kV Doyang to be increased.
- Relay and protection system healthiness of all elements to be checked at Mokokchung(NAG).

5. Tripping of 132 kV Khliehriat-Khliehriat D/C on 09.05.18

On 09.05.18 at 08:48 hrs 132 kV Khliehriat-Khliehriat D/C tripped as well as 132 kV NEHU-Mawlai line and 132 kV NEHU-Umiam line

Findings of the Sub-group:

- As intimated by MePTCL, fault was in Khliehriat(MePTCL) Bus.

Remedial actions to be taken:

- Reasons for non-tripping of 132 kV NEHU-Khliehriat line from NEHU end and 132 kV Mustem – Khliehriat line from Mustem end are to be investigated.
- Reasons for non-operation of bus bar protection at Khliehriat(ME).
- In separate incident(s) 132 kV Khliehriat-Khliehriat Line 2 is tripping on Z-III. However, Line 1 was not tripping indicating fault was cleared by the protection of faulty section (beyond 132 kV Khliehriat(MePTCL)). So, Z-III timing of 132 kV Khliehriat (PG) for 132 kV Khliehriat-Khliehriat Line 2 is to be checked.

6. Tripping of Silchar ICTs

Repeated trippings of Silchar ICTs have observed in June.

Findings of the Sub-group:

- All opto inputs to Main protection (Schneider P633 relay) viz. Buccholz, PRD etc. are becoming high upon restart of Main-I relay of the two ICTs. This is resulting in tripping of ICT.

Actions already taken:

- Matter has been referred to OEM. Meanwhile to prevent such mal operation, delay of 19 mS has been introduced to all binary inputs.

7. Tripping of ICT at Bongaigaon(PG) and 400 kV Bongaigaon - BgTPP 2 line

Root cause: Due to DC earth fault (cable fault).

This issue has been attended.

8. Jiribam(PG) blackout on 6th Jun'18

Root cause: Fault in 132 kV Jiribam(PG) – Pailapol line.

DPR at Jiribam(PG) picked up in Z-3.

Other lines from Jiribam(PG) also picked up the fault in Z-3 from remote end.

Remedial Action:

Z-3 timing of 132 kV Jiribam – Pailapol line has been reduced to 200 msec at Jiribam(PG)

9. Tripping of 400 kV Silchar – Palatana D/C on 11th May'18

Root Cause: Jumper failure of 400 kV Silchar – Palatana - 1 line at Loc No 590

Remedial Measures: Non attempt of Auto recloser at Palatana of 400 kV Silchar – Palatana 2 line to be investigated by OTPC

10. Tripping of 220 kV Misa – Byrnihart 1 line on 9th May'18

Root Cause: As informed by NERLDC, no fault was observed in the PMUs. Tripping was likely Mal-operation of earth fault relay at Misa.

Remedial Measures: This issue of earth fault relay is to be attended by NERTS.

Annexure-I

List of Participants in the Sub-Group Meeting held on 29th June, 2018

SN	Name & Designation	Organization	Contact No.
1.	Sh. kitbok Kynjing, AE, MePTCL	Meghalaya	09485170070
2.	Sh. Subhash Kumar, Engineer	NERLDC	09485185898

3.	Sh. Chitra Thapa, Engineer	NERLDC	08135989964
4.	Sh. Jerin Jacob, Engineer	NERLDC	09402120113
5.	Sh. Samar Ch De, AGM	NERLDC	09436335367
6.	Sh. H.Talukdar, CM	NERTS	7002353946
7.	Sh. Nayan Jyoti Dev, Dy.Manager	NEEPCO	09435577727
8.	Sh. Ankit Jain, Sr. Engineer	NERLDC	09436335381
9.	Sh. Keshab Borah, AE	NERLDC	07002323608
10	Sh. F. Iqbal, EE	NERPC	
11	Sh. S. Mukherjee,AEE	NERPC	

List of Nodes of North Eastern Region

Sl. No.	Name of Substation	Voltage Level	Geographical Co-ordination	
			Latitude	Longitude
POWERGRID				
1	Balipara	400/220/33 kV	$26^0$52’22	$92^0$46’0.8”
2	Biswanath Chariali	400/132 kV	$26^0$44’39.6”	$93^0$13’11.3”
3	Bongaigaon	400/220/33 kV	$26^0$30’0”	$90^0$22’25.9”
4	Misa	400/220/33 kV	$26^0$08’51.3”	$92^0$46’53.7”
5	Silchar	400/132/33 kV	$24^0$49’41”	$92^0$43’14”
6	Dimapur	220/132 kV	$25^0$53’7.4”	$93^0$44’35”
7	Mokokchung	220/132 kV	$26^0$16’37.8”	$94^0$28’35.9”
8	Mariani (PG)	220 kV	$26^0$37’18.3”	$94^0$19’43.6”
9	Salakati	220/132 kV	$26^0$27’56.3”	$90^0$22’14.4”
10	Aizawl	132 kV	$23^0$44’56.6”	$92^0$40’46.5”
11	Badarpur	132 kV	$24^0$52’8.1”	$92^0$35’0”
12	Haflong	132 kV	$25^0$11’59.3”	$93^0$01’3.8”
13	Imphal	132 kV	$24^0$46’59.3”	$93^0$52’13.6”
14	Khliehriat	132 kV	$25^0$20’44.3”	$92^0$22’15.6”
15	Kumarghat	132/33 kV	$24^0$08’44.9”	$92^0$01’19”
16	Jiribam	132/33 kV	$24^0$47’26”	$93^0$07’42”
17	Melriat	132 kV	$23^0$46’12.1”	93°39’32.7”
18	Nirjuli	132/33 kV	$27^0$07’35.3”	$93^0$45’3.6”
19	Roing	132/33 kV	27055’52.7”	96011’11.0”
20	Tezu	132/33 kV	28009’17.6”	95049’58.1”
21	Ziro	132/33 kV	$27^0$32’1.37”	$93^0$50’99.3”

List of Nodes of North Eastern Region

Sl. No.	Name of Substation	Voltage Level	Geographical Co-ordination	
			Latitude	Longitude
NEEPCO				
1	Ranganadi	400/132 kV	27^{0}20' N	93^{0}45'E
2	AGBPP	220/132 kV	27^{0}24'27"N	95^{0}05'27" E
3	Kopili	220/132 kV	25^{0}32'N	92^{0}41'E
4	AGTCCPP	132 kV	23^{0}52'35" N	91^{0}22'20"E
5	Doyang	132 kV	26^{0}13'47"N	94^{0}15'58"E
6	Khandong	132 kV	25^{0}32'N	92^{0}41'E
7	Khupi	132/33 kV	26^{0}12'54.2"	92^{0}40'50.4"
8	Monarchak	132 kV	23^{0}26'26" N	91^{0}17'00"E
9	Turial	132 kV	24^{0}21.5' N	92^{0}53.2' E
10	Pare	132 kV	27^{0}12'46" N	93^{0}48'30"E
NHPC				
1	Loktak	132 kV	28^{0}9’17.6”	95^{0}49’58.1”
OTPC				
1	Palatana	400/132 kV	23 ^{0} 29 ’ 42 ”	91^{0}26’26.8 ”
NTPC				
1	BgTPP	400/220 kV	26^0 51'28"	90^0 54'93"
DoP, Arunachal Pradesh				
1	Along	132/33 kV	28°07'38.9" N	94°48'08.9" E
2	Bhalukphong	132/33 kV	27°01'29.27" N	92°36'57.97" E
3	Chimpu(Itanagar)	132/33 kV	27°04'26.15" N	93°36'40.36" E
4	Daporiju	132/33 kV	27°59'09.96" N	94°13'18.119" E
5	Deomali	220/132/33 kV	27°12'58.9" N	95°28'25.9" E
6	Lekhi	132/33 kV	27°06'55.2" N	93°32'42" E
7	Pasighat	132/66/33 kV	28^o 05’48’’ N	95^o 17’38.2’’ E

List of Nodes of North Eastern Region

Sl. No.	Name of Substation	Voltage Level	Geographical Co-ordination	
			Latitude	Longitude
AEGCL				
1	Azara	400/220 kV	N26 06.438	E91 33.738
2	Agia	220/132/66/33 kV	N26 05.688	E90 33.929
3	Boko	220/132/33 kV	N26 00.988	E91 10.981
4	BTPS	220/132/33 kV	N26 26.276	E90 21.530
5	Mariani	220/132/66/33 kV	N26 37.879	E94 20.130
6	Samaguri	220/132/33 kV	N26 24.320	E92 50.426
7	Jawhar Nagar	220/33 kV	N26 07.095	E91 49.254
8	Sarusajai	220/132/33 kV	N26 06.935	E91 45.220
9	Sonabil	220/132 kV	N26 48.172	E92 49.436
10	Sonapur	220/132 kV	N26 07.904	E91 59.941
11	Tinsukia	220/132/66/33 kV	N27 28.947	E95 22.683
12	Ashok Paper Mill(APM)	132/33 kV	N26 14.982	E90 33.574
13	Behiating	132/33 kV	N27 25.295	E94 55.211
14	Baghjap	132/33 kV	N26 10.157	E92 13.479
15	Bilasipara	132/33 kV		
16	Bokakhat	132/33 kV	N26 37.413	E93 39.371
17	Bokajan	132/66/33 kV	N26 01.256	E93 45.682
18	Bornagar	132/33 kV	N26 29.574	E90 54.308
19	Depota (Tezpur)	132/33 kV	N26 40.170	E92 45.024
20	Dhaligaon	132/33 kV	N26 30.601	E90 31.559
21	Dhemaji	132/33 kV	N27 26.356	E94 31.853
22	Dibrugarh	132/33 kV	N27 28.527	E94 56.211
23	Diphu	132/33 kV	N25 51.944	E93 26.452
24	Dispur	132/11 kV	N26 08.676	E91 47.257

List of Nodes of North Eastern Region

Sl. No.	Name of Substation	Voltage Level	Geographical Co-ordination	
			Latitude	Longitude
25	Dullavcherra	132/33 kV	N24 28.878	E93 26.397
26	Gauripur	132/33 kV	N26 05.704	E89 59.142
27	Ghoramari	132/33 kV		
28	Gohpur	132/33 kV	N26 52.139	E93 35.366
29	Golaghat	132/33 kV	N26 29.177	E93 58.528
30	Gossaigaon	132/33 kV	N26 28.193	E90 00.628
31	Haflong	132/33 kV	N25 11.956	E93 01.013
32	Hailakandi	132/66/33 kV	N24 41.868	E92 31.434
33	Jorhat (Garmur)	132/33 kV	N26 44.560	E94 14.671
34	Kamalpur	132/33 kV		
35	Kahilipara	132/33 kV	N26 08.418	E91 45.541
36	Khaloigaon	132/33 kV		
37	Khumtai	132/66/33 kV		
38	Kokrajhar	132/33 kV	N26 23.607	E90 18.085
39	Lanka	132/33 kV	N25 59.273	E92 55.500
40	Majuli	132/33 kV	N26 59.141	E94 10.154
41	Margherita	132/33 kV	N27 17.706	E95 43.804
42	Moran	132/33 kV	N27 08.662	E94 53.581
43	Nalbari	132/33 kV	N26 28.042	E91 25.683
44	Narengi	132/33 kV	N26 10.919	E91 49.522
45	Nazira (Gargaon)	132/33 kV	N26 56.250	E94 44.693
46	North Lakhimpur	132/33 kV		
47	Panchgram	132/33 kV	N24 52.343	E92 35.636
48	Pailapool	132/33 kV	N24 50.790	E93 01.444
49	Pavoi	132/33 kV		

List of Nodes of North Eastern Region

Sl. No.	Name of Substation	Voltage Level	Geographical Co-ordination	
			Latitude	Longitude
50	Rangia	132/33 kV	N26 27.161	E91 38.299
51	Rowta	132/33 kV	N26 43.335	E92 11.438
52	Rupai(Doomdooma)	132/33 kV	N27 35.830	E95 34.039
53	Sankardev Nagar	132/33 kV		
54	Sibsagar	132/33 kV		
55	Sipajhar	132/33 kV	N26 25.302	E91 59.478
56	Sisugram(Amingaon)	132/33 kV	N26 11.832	E91 41.952
57	Sonari	132/33 kV	N27 01.829	E95 03.193
58	Srikona	132/33 kV	N24 49.853	E92 43.904
59	Umrangshu	132/33 kV	N25 30.845	E92 44.104

APGCL

1	Langpi HEP	220 kV	N25 57.317	E92 31.031
2	Namrup TPS	220/132/66/33 kV	N27 11.088	E95 22.622
3	Lakwa TPS	132/33 kV	N26 59.198	E94 55.948

Assam Captive Power Plants

1	BRPL	133/33 kV	N26 30.00	E90 31.00
2	HPC-Jagiroad	132/33 kV	Abandoned	
3	HPC-Panchgram	132/33 kV	Abandoned	
4	TELCOM	132/33 kV		
5	Prag Basumi	132/33 kV		

MSPCL

1	Churachandpur (Kheljang)	132/33 kV	24^0 05’15”N	93^0 10’30”E
2	Elangkanpokpi	132/33 kV	$24^0$26'21.51"N	$93^0$55'59.54"E
3	Imphal (Yurembam)	132/33 kV	24^0 47’ 13”N	93^0 51’ 23”E
4	Hunding	132/33 kV	25^0 03’ 51” N	94^0 20’ 46” E

List of Nodes of North Eastern Region

Sl. No.	Name of Substation	Voltage Level	Geographical Co-ordination	
			Latitude	Longitude
5	Jiribam	132/33/11 kV	24^0 48’00”N	$93^0$06’00”E
6	Kakching	132/33 kV	24^0 28’ 41”N	94^0 00’45”E
7	Karong	132/33 kV	25^0 18’16”N	$94^0$09’40”E
8	Kongba	132/33 kV	24^0 46’ 41”N	93^0 58’ 13”E
10	Ningthoukhong	132/33 kV	24°34'02"N	93°45'46"E
11	Rengpang	132/33/11 kV	24^0 45’00”N	93^0 25’00”E
12	Yaingangpokpi	132/33 kV	24^0 54’40”N	$94^0$07’34”E

MePTCL

1	Byrnihat (Killing)	400/220/132 kV	26°-03'-57" N	92°-16'-128" E
2	Cherrapunjee	132/33 kV	25° - 15' - 15" N	91° - 42' - 30" E
3	EPIP I	132/33 kV	26°- 26.0237 " N	91° - 14.762" E
4	EPIP II (Norbong)	132/33 kV	25° - 27.513" N	91° - 42.332" E
5	Khliehriat	132/33 kV	25° - 22' - 15.52" N	92°-22'-26.29" E
6	Lumsnong	132/33/11 kV	25° - 10' - 33.7" N	92° - 23' - 38.6" E
7	Mendipather	132/33 kV	25°898 N	90°647 E
8	Mustem	132/33 kV	25°24'22.69" N	92°11'53.69" E
9	Nangalbibra	132/33 kV	25°30.795 N	90°12.759 E
10	NEHU	132/33 kV	25° - 34' - 51" N	91° - 53' - 15" E
11	NEIGRIHMS	132/33 kV	25° - 35' - 32" N	91° - 56' - 28" E
12	Nongstoin	132/33 kV	25° - 30.560" N	91° - 14.762" E
13	Mawlai	132/33/11 kV	25° - 35' - 26" N	91° - 51' - 51" E
14	Mwangap(Mawphlang)	132/33 kV	25° - 27.769" N	91° - 45.601" E
15	Myntdu Leshka	132 kV	25° - 17'	92° - 30'
16	Umiam	132/33 kV	25° - 40.054" N	91° - 54.597" E
17	Umiam Stg I	132 kV	25° - 42' - 2" N	91° - 52' - 20" E

List of Nodes of North Eastern Region

Sl. No.	Name of Substation	Voltage Level	Geographical Co-ordination	
			Latitude	Longitude
18	Umiam Stg II	132 kV	25° - 42' - 47" N	91° - 51' - 30" E
19	Umiam Stg III	132 kV	25° - 47' - 5" N	91° - 47' - 22" E
20	Umiam Stg IV	132 kV	25° - 50' - 19" N	91° - 44' - 40" E
21	Umtru	132/33 kV	26° - 50' - 55" N	91° - 49' - 15" E
22	New Umtru	132/33 kV	26° - 50' - 19" N	91° - 49' - 10" E
23	Tura	132/33 kV	25°32.852 N	90°13.923 E

Meghalaya Captive Power Plants

1	Adhunik Cement	132 kV	25° - 11' - 21.3" N	92° - 21' - 49" E
2	CMCL	132 kV	25°10'35.95" N	92°23'31.83" E
3	Hill Cement	132 kV	25°13'36.47" N	92°23'12.58" E
4	JUD Cement	132 kV	25°11'13.78" N	92°23'58.4" E
5	Maithan	132 kV	26°1'14.38" N	91°50'42.1" E
6	MCL	132 kV	25°12'11.8" N	92°23'10.0" E
7	MPL	132 kV	25°10'36.00" N	92°23'50.40" E
8	Nalari	132 kV	26°1'0.24" N	91°49'51.20" E
9	Sai Prakash	132 kV	26°3'4.09" N	91°52'4.42" E
10	Shyam Century	132 kV	26°1'42.36" N	91°50'57.00" E

P&ED, Mizoram

1	Bairabi	132/33 kV	24°11’53.9’N	92°32’35.2”E
2	Champai	132/33 kV	23°44’54’N	93°17’80”E
3	Khazawl	132/33 kV	23°30’01.1”N	93°11’55.5”E
4	Kolasib (Bawklang)	132/66/33 kV	24°14’24.6”N	92°41’41.3”E
5	Longmol	132/33/11 kV	23°44’39.6”N	92°41’00.5”E
6	Lunglei	132/33 kV	22°55’06”N	92°46’58.4”E
7	Saitual	132/33/11 kV	23°39’29.1”N	92°57’30.3”E

List of Nodes of North Eastern Region

Sl. No.	Name of Substation	Voltage Level	Geographical Co-ordination	
			Latitude	Longitude
8	Serchip	132/33 kV	23°21’22.0’N	92°50’20.8’E
9	Zungtui (Zemabawk)	132/33/11 kV	23°45’05.6”N	92°44’25.9”E

DoP, Nagaland

1	Dimapur	132/66/33/11 kV	25°88'40.8"N	93°73'80.04"E
2	Kiphire	132/66/33 kV	25°88'14.75"N	94°77'83.72"E
3	Kohima	132/33/11 kV	25°65'51.75"N	94°09'41.89"E
4	Meluri	132/33 kV	25°68'29.19"N	94°26'98.05"
5	Mokokchung	132/66/33 kV	26°17'07.59"N	94°28'44.94"
6	Wokha	132/33 kV	26°07'54.40"N	94°26'18.2"E
7	Chumukidima	66/33 kV	25°81'20.30"N	93°78'31.40"E
8	Dairy Farm	66/33 kV	25°9430.20"É	93°86'06.40"
9	Ganeshnagar	66/33 kV	25°75'45.60"N	93°58'13.50"E
10	Mon	66/33 kV	26°43'38.00"N	95°02'31.85"E
11	Naginimora	66/33 kV	26°48'08.94"N	94°48'35.98"E
12	Nitofarm	66/33 kV	25°8946.40"N	93°86'06.40"E
13	Powerhouse	66/33 kV	25°91'11.30"N	93°73'23.00"E
14	Tizit	66/33 kV	26°43'38.00"N	95°03'33.34"E
15	Tuli	66/33 kV	26°40'34.81"N	94°39'22.96"E
16	Tuengsang	66/33 kV	26°14'56.47"N	94°47'56.92"E
17	Zunheboto	66/33 kV	26°00'16.15"N	94°30'50.65"E

TSECL

1	Agartala (79 Tilla)	132/33/11 kV	23° 51' 59.1"	091°17' 48.9"
2	Amarpur	66/11 kV	23° 31' 11.5"	091°39' 1.9"
3	Ambasa	132/33/11 kV	23° 55' 16.6"	091°50' 16.6"
4	Bagafa	66/33/11 kV	23° 18' 57.2"	091°33' 05.7"

List of Nodes of North Eastern Region

Sl. No.	Name of Substation	Voltage Level	Geographical Co-ordination	
			Latitude	Longitude
5	Badarghat	66/33 kV	23° 47'47.3"	091°16' 32.2"
6	Baramura	132/66 kV	23°48'36.4"	91°33'88.2"
7	Belonia	66/33 kV	23° 14' 43.4"	091°28' 37.6"
8	Bodhjungnagar	132/33 kV	23° 45' 09.5"	091°18' 10.0"
9	Boxnagar	66/11 kV	23° 36' 47.5"	091°10' 19.6"
10	Dhalabil	132/33/11 kV	24° 03' 07.8"	091°34' 45.0"
11	Dharmanagar (Mission Tilla)	132/33/11 kV	24° 21' 43.8"	092°11' 32.2"
12	Gakulnagar	66/11 kV	23° 42' 32.3"	091°15' 49.9"
13	Jirania	132/33/11 kV	23° 49' 09.9"	91°25' 55.2"
14	Kamalpur	132/11 kV	24° 10' 23.3"	91°48' 52.5"
15	Kailasohar	132/33/11 kV	24° 27' 34.0"	92°01' 55.7"
16	Ompi	66/11 kV	23° 41' 09.3"	91°38' 10.7"
17	P K Bari	132/33/11 kV	24° 08' 11.4"	92°00' 38.4"
18	Rabindranagar	132/66/33/11 kV	24° 08' 11.4"	92°00' 38.4"
19	Rokhia	132/66 kV	23° 27' 30.5"	91°16' 18.8"
20	Satchand	66/11 kV	23° 05' 31.9"	091°38' 33.3"
21	Sabroom	66/11 kV	23° 01' 21.8"	091°42' 22.8"
22	Surajmani Nagar	132/33 kV	23° 45' 09.5"	092°18' 10.0"
23	Teliamura (Gamaitilla)	132/66/33/11 kV	N-23.49.602'	E- 91.38.480'
24	Udaipur (Banduar)	132/66/33/11 kV	23° 31' 54.1"	091°30' 59.9"

List of Nodes of North Eastern Region

Sl. No.	Name of Substation	Voltage Level (in kV)	Geographical Co-ordination	
			Latitude	Longitude
POWERGRID				
1	Namsai	132/33	27^{0}41'34" N	95^{0}53'56.3"E
NEEPCO				
1	Kameng	400	27^{0}17'54" N	90^{0}37'39"E
2	Pare	132	27^{0}12'46" N	93^{0}48'30"E
NHPC				
1	Lower Subansiri		27^{0}3'15" N	94^{0}15'30"E
ARUNACHAL PRADESH				
From NERPSIP				
1	Bameng	132/33	27^{0}32'11.04"N	92^{0}57'46.08"E
2	Banderdewa	132/33	27°06'49.60"N	93°48'35.54"E
3	Changlang	132/33	27°06'39.40"N	95°39'57.80"E
4	Holongi	132/33	26°57'52.35"N	93°35'45.93"E
5	Jairampur	132/33	27°17'53.15"N	96°02'51.34"E
6	Khonsa	132/33	27°00'12.4"N	95°30'0.1"E
7	Likabali	132/33	27°40'03.0"N	94°41'14.7"E
8	Miao	132/33	27°28'47.28"N	96°10'18.26"E
9	Naharlagun	132/33		
10	Niglok	132/33	27°53'15.17"N	95°13'53.56"E
11	Pasighat (Napit)	132/33	28°01'46.8"N	95°17'45.5"E
13	Riloh	132/33	27°9'42.8"N	93°13'58.51"E
14	Sagali	132/33	27°14'55.95"N	93°30'12.40"E
15	Seisoja	132/33	26°55.789"N	93°00.675"E
16	Seppa	132/33	27°19'58.49"N	93°01'42.62"E
NERPSIP DMS				
1	Balemu	33/11		
2	Bana	33/11		
3	Khenwa	33/11		
4	Pipu	33/11		
5	Thriziono	33/11		
6	Riloh (Pakkeksang)	33/11		
7	Seijosa	33/11		
8	Diyun	33/11		
9	Kharsang	33/11		

10	Khimiyong	33/11		
11	Manmao	33/11		
12	Choukham	33/11		
13	Namsai	33/11		
14	Kanubari	33/11		
15	Longding	33/11		
16	Deomali	33/11		
17	Khonsa	33/11		
18	Changlang	33/11		
19	19Klimtao(Bumla)	33/11		
20	Mukta	33/11		
21	Thimbu	33/11		
22	AP Secretariate	33/11		
23	Raj Bhawan	33/11		
24	PappuNallah	33/11		
25	Doimukh(Midpu-II)	33/11		
26	GohpurTinali	33/11		
27	Jote	33/11		
28	Leporiang	33/11		
29	Lumla	33/11		
30	All IndiaRadio, Pasighat	33/11		
31	Jeying	33/11		
32	Likabali	33/11		
33	Mebo	33/11		
34	Napit	33/11		
35	Nari	33/11		
36	Ngopok	33/11		
37	Oyan	33/11		
38	Ruksin	33/11		
39	Gensi	33/11		
40	Gerukamukh(Kalaptukar)	33/11		
41	Hapoli	33/11		
42	Igo	33/11		
43	Koyu	33/11		
44	Raga	33/11		
45	Tirbin	33/11		
46	Yazali	33/11		

ASSAM

AEGCL

1	Karimganj	132/33		
2	Barpeta	132/33		
3	Dhekiajuli	132/33		
4	Hatchingmari	132/33		
5	Nagaon	132/33		
6	Jorhat(West)	132/33		
7	Bordubi	132/33		
8	Matia(Dudhnoi)	132/33		
9	Kamakhya	132/33		

NERPSIP

1	Amingaon	220/132		
2	Behiating	220/132		
3	Chapakhowa	132/33	27°55'16.69"N	95°45'38.79"E
4	GMCH GIS	132/33		
5	Hazo	132/33		
6	Paltan Bazar GIS	132/33		
7	Sarupathar	132/33		
8	Silapathar	132/33		
9	Tangla	132/33	26°38'34.24"N	91°54'44.37"E
10	Teok	132/33	N26 50.275	E94 26.203
11	Tezpur	132/33		

NERPSIP DMS

1	Silapathar-II S/S-2X5 MVA	33/11		
2	Hathimurah-2 S/S-2X5 MVA	33/11		
3	Mailo (New) S/S-2X5 MVA	33/11		
4	LGM Hospital S/S - 2X10 MVA	33/11		
5	GMC-2 (New) GIS-2X10 MVA	33/11		
6	Arya College (New) GIS-2X10 MVA	33/11		
7	Tarun Nagar (New) GIS-2X10 MVA	33/11		
8	GS Road (New) GIS - 2X10 MVA	33/11		
9	Romai (New) S/S-2X10 MVA	33/11		
10	Bogibil (New) S/S-2X5 MVA	33/11		
11	Dibrugarh (New) S/S-2X10 MVA	33/11		
12	Harsingha (New) S/S-2X5 MVA	33/11		
13	Sesa (New) S/S-2X5MVA	33/11		
14	Ramdiya (New) S/S-2X5 MVA	33/11		
15	Doomdoma-Hazo(New) S/S-2X5 MVA	33/11		
16	Chabipool -(New)S/S-2X10 MVA	33/11		

APGCL

1	LRPP	132		
2	NRPP	220		
3				

MANIPUR

MSPCL

1	Thoubal	400/132/33		
2	Thanlon	132/33		
3	Tipamukh	132/33		
4	Moreh	132/33		
5	Chandel	132/33		
6	Elangkangpokpi	132/33		

NERPSIP

1	Gamphajol	132/33	25^{0}2'8.79"N	93^{0}55'28.06"E
2	Tamenglong	132/33	24^{0}14'42"N	93^{0}07'21"E
3				

NERPSIP DMS

1	Porompat with 2x5 MVA	33/11		
2	Thangal with 2x3.15 MVA	33/11		
3	Sanjenbam with 2x5 MVA	33/11		
4	Tuilaphai with 2x3.15 MVA	33/11		
5	Kwakta (2x3.15MVA)	33/11		
6	Leimapokam (2x5MVA)	33/11		
7	Andro	33/11		
8	Hiyangthang	33/11		
9	New Keithelmanbi	33/11		
10	Pishum (GIS)	33/11		
11	Lamphel	33/11		
12	Takyel	33/11		
13	Top Khongangkhong	33/11		

MEGHALAYA

MePTCL

1	Ampati	132/33		
2	Lad Nongkrem	132/33		
3	Praharinagar	132/33		
4	Mawphlang	132/33		
5				

From NERPSIP

1	Mawngap	220/132		
2	New Shillong	220/132	25°37'43.87"N	91°59'37.48"E
3	Mynkre	132/33	25°14'3.30"N	92°22'8.26"E
4	Phulbari	132/33	25°51'10.55"N	90°5’7.56”E

NERPSIP DMS

1	Mynkre - 2X5 MVA	33/11		
2	Rymbai - 1X5 MVA	33/11		
3	Lumshnong / Bydihati - 1X5 MVA	33/11		
4	Latyrke (Sutnga) - 2X10 MVA	33/11		
5	Rajballa Bhaitbari - 1X5 MVA	33/11		
6	Chibinang - 1X5 MVA	33/11		
7	Rakshambre	33/11		

MIZORAM

Under NERPSIP

1	Lungsen	132/33	22.8745°N	92.5879°E
2	West Phailang	132/33	23.700589°N	92.484664°E
3	Marpara	132/33	23.2657°N	92.4135°E
4				

NERPSIP DMS

1	New South Bungtlang	33/11		
2				

NAGALAND

DoP,Nagaland

1	Zhadima	220/132		
2	Kohima RESS	132/33		
3	Doyang,Project NH-61	132/33		

Under NERPSIP

1	Longnak	132/33	26.463936	94.388528
2	Longleng	132/33	26.466692	94.854081
3	Zunheboto	132/33	26.036514	94.492947
4	Secretariat Complex Kohima	132/33	25.742116	94 .106701
5	Pfutsero	132/33	25.7421 16	94.31485
6				

NERPSIP DMS

1	Lalamati (Zubza)	33/11		
2	Zhadima (Chiephobozou)	33/11		
3	Pfutsero	33/11		
4	Podum Pukhri	33/11		
5	Tizit	33/11		

TRIPURA

TSECL

NIL

NERPSIP

1	Amarpur	132/33	23° 31' 11.5"	091°39' 1.9"
2	Bagafa	132/33	23° 18' 57.2"	091°33' 05.7"
3	Belonia	132/33	23° 14' 43.4"	091°28' 37.6"
4	Gokul Nagar	132/33	23° 42' 32.3"	091°15' 49.9"
5	Manu	132/33	N-23 degree 59.538	E- 91 degree 59.263'
6	Mohanpur	132/33	N- 23 degree 57.797'	E- 91 degree 22.302'
7	Rabindra Nagar	132/33	23° 27' 30.5"	91°16' 18.8"
8	Sabroom	132/33	23° 05' 31.9"	091°38' 33.3"
9	Satchand	132/33	23° 01' 21.8"	091°42' 22.8"

NERPSIP DMS

1	Karbook	33/11		
2	Muhuripur	33/11		
3	Dalak (Chelagang)	33/11		
4	Garjee	33/11		
5	Chittamara	33/11		
6	Maharani	33/11		
7	Chechua	33/11		
8	Ekinpur	33/11		
9	Manughat	33/11		
10	Rupaichari	33/11		
11	Barpathari	33/11		
12	Srinagar	33/11		
13	Gabardi	33/11		
14	Sekerkote	33/11		
15	Golaghati	33/11		
16	Durganagar	33/11		
17	Nidaya	33/11		
18	Nalchar	33/11		
19	Khowai	33/11		
20	Simna	33/11		
21	Barkathal	33/11		
22	Bamutia	33/11		
23	Lembucherra	33/11		
24	Champak Nagar	33/11		
25	Ranirbazar	33/11		
26	ADC Head Qtr	33/11		
27	Mungiakami	33/11		
28	Taidu	33/11		
29	Jawhar Nagar	33/11		
30	Chailengta	33/11		
31	Dhumachhera	33/11		
32	82 mile	33/11		
33	Tilla Bazar	33/11		
34	Durga Chowmohani	33/11		

List of Nodes of North Eastern Region

Sl. No.	Name of Substation	Voltage Level	Geographical Co-ordination	
			Latitude	Longitude
TBCB				
1	Bornagar	765 kV(initially to be operated at 400 kV)		
2	Rangia	400/220 kV		
3	PK Bari	400/132 kV		
4	Surajmaninagar	400/132 kV		
5	New Kohima	400/220 kV		
AEGCL				
1	Agamoni	220/132		
2	Sankardebnagar	220/132		
3				
4				
5				
DoP, Nagaland				
1	Zhadima	220/132		
2				
3				
4				
DoP,Arunachal Pradesh				
1	Doimukh	220/132		