



भारत सरकार Government of India

विद्युत मंत्रालय Ministry of Power

उत्तर पूर्वी क्षेत्रीय विद्युत समिति

North Eastern Regional Power Committee

एन ई आर पी सी कॉम्प्लेक्स, डोंग पारमाओ, लापालाङ, शिल्लोंग-७९३००६, मेघालय  
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No. NERPC/SE (O)/OCC/2020/1765-1805

Dated: December 01, 2020

To,

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

**Sub: Minutes of 172<sup>nd</sup> OCC Meeting.**

**Sir/Madam,**

Please find enclosed herewith the minutes of 172<sup>nd</sup> OCC Meeting held at NERPC's Conference Hall, Shillong on the **12<sup>th</sup> November, 2020** for your kind information and necessary action. The minute is also available on the website of NERPC, **www.nerpc.nic.in**.

Any comments/observations may kindly be communicated to NERPC Secretariat at the earliest.

**Encl: As above**

भवदीय / Yours faithfully,

बी. लिंगखोइ

बि. लिंगखोइ / B. Lyngkhoi  
निदेशक / **Director (O & P)**

Copy to:

1. CGM, AEGCL, Bijuli Bhawan, Guwahati – 781001
2. CGM, APGCL, Bijuli Bhawan, Guwahati – 781001
3. CGM, DISCOM, Bijuli Bhawan, Guwahati – 781001
4. Head of SLDC, MeECL, Lumjingshai, SR Road, Umjarain, Shillong – 793022
5. Head of SLDC, Dept. of Power, Govt. of Arunachal Pradesh, Itanagar – 791111
6. Head of SLDC, Dept. of Power, Govt. of Nagaland, Dimapur – 797103
7. Head of SLDC, MSPCL, Imphal – 795001
8. Head of SLDC, P&E Deptt. Govt. of Mizoram, Aizawl – 796 001
9. Head of SLDC, TSECL, Agartala – 799001
10. Chief Engineer(Elect), Loktak HEP, Vidyut Vihar, Kom Keirap, Manipur- 795124
11. DGM (O&M), OTPC, Badarghat Complex, Agartala, Tripura – 799014
12. Director, NETC, 1st Floor, Corporation Tower, AMBIS Mall Complex, NH-8, Gurgoan – 122001.

वी. लिंगखोड  
निदेशक / **Director (O & P)**

**North Eastern Regional Power Committee**

**MINUTES OF THE 172<sup>nd</sup> OPERATION COORDINATION**

**SUB-COMMITTEE MEETING OF NERPC**

**Date** : 12/11/2020 (Thursday)  
**Time** : 10:30 hrs  
**Venue** : “NERPC Conference Hall”, Shillong.

The List of Participants in the 172<sup>nd</sup> OCC Meeting is attached at **Annexure – I**

Member Secretary, NERPC welcomed the participants to the 172<sup>nd</sup> OCC meeting. He thanked the members for regularly attending the meeting over Video-Conferencing to resolve crucial issues of the region.

Thereafter Member Secretary requested Sh. B. Lyngkholi, Director(O&P), NERPC to take up the agenda items for discussion.

**A. CONFIRMATION OF MINUTES**

**CONFIRMATION OF MINUTES OF 171<sup>st</sup> MEETING OF OPERATION COORDINATION SUB-COMMITTEE OF NERPC.**

The minutes of 171<sup>st</sup> meeting of Operation Sub-committee held on 16<sup>th</sup> October, 2020 at Shillong were circulated vide letter No. NERPC/SE (O)/OCC/2019/2674-2711 dated 29<sup>th</sup> October, 2020.

*The Sub-committee confirmed the minutes of 171<sup>st</sup> 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 172<sup>nd</sup> OCC:

State	R&U scheme	ADMS	Capacitor Installation	SAMAST**	Line Differential Protection
Ar. Pradesh	Package-I (Diagnostic tools) Materials supplied. 30% payment released. Utilization certificate for 60%	Requisition for 3 <sup>rd</sup> tranche sent.	-	TESG approval awaited	-

	<p>to be sent. P-II (for PLCC &amp; communication) LOA issued. P-III (Substation equipment) NIT by Nov'20</p> <p>Work delayed due to COVID situation. Station-wise status to be updated</p>				
Nagaland	<p>All completed except for PLCC package. Delayed due to COVID situation Station-wise status to be updated.</p>	<p>Second tranche of disbursed. Requisition to be sent for 3<sup>rd</sup> installment.</p>	-	<p>TESG approval awaited</p>	<p>Lines identified. Under DPR preparation stage.</p>
Mizoram	<p>Completed. 10% remaining claim to be submitted ASAP.</p>	<p>Final 10% requisition submitted.</p>	<p>To reply to TESG queries.</p>	<p>TESG approval awaited.</p>	<p>Lines identified for installation of DPR viz.  132kV Aizawl - Luangmual and 132kV Kawmzawl - Khawiva.</p>
Manipur	<p>Package-II: completed Package-I: WIP Delayed due to COVID situation Station-wise status to be updated.</p>	<p>60% disbursed. Final 10% requisition to be sent immediately.</p>	<p>LOA issued. Requisition to be sent for first tranche.</p>	<p>TESG approval awaited.</p>	<p>Lines identified. LDP for 132kV Imphal-Imphal and 132kV Jiribm-Jiribam proposed. Under DPR preparation stage.</p>
	<p>33kV System Integration with SLDC</p>	<p>In tendering stage</p>			
	<p>Reliable Communications for grid connectivity</p>	<p>In tendering stage</p>			

Tripura	Work completed. 10% remaining claim to be sent ASAP. Station wise status to be updated.	10% fund disbursed. Requisition to be sent for 20% immediately.	Study results to be submitted alongwith DPR	TESG approval awaited.	Only single line 132kV 79Tilla to Budhjangn agar. DPR to be prepared.
Assam	LOA issued. WIP, delayed due to COVID situation Station-wise status to be submitted.	30% funds disbursed. Requisition to be sent for 60% immediately.	-	Under finalization stage for LOA.	Lines identified. Under DPR preparation stage.
Meghalaya	MePTCL Completed in all respects. MePGCL - 10% claim to be submitted ASAP.	Final tranche of 10% disbursed. Project complete in all respects.	-	Under finalization stage for LOA.	WIP. Delayed due to COVID situation

***Deliberation of the sub-Committee:***

Director(O&P), NERPC noted that for ADMS project work has been almost completed in all the states, however there has been significant delay in the fund requisition and disbursement process. He requested the utilities of Arunachal Pradesh, Assam, Nagaland and Tripura to expedite the process.

***The Sub-Committee noted as above.***

***Action: All state utilities/NERPC.***

**B.2. OPERATIONAL PERFORMANCE AND GRID DISCIPLINE DURING OCTOBER, 2020**

As per the data made available by NERLDC, the grid performance parameters for October, 2020 are given below:

**NER PERFORMANCE DURING OCTOBER, 2020**

States	Energy Met (MU)		w.r.t. Sep,20 % inc (+) /dec (-)	Energy Reqr. (MU)		w.r.t. Sep,20 % inc (+) /dec (-)	% surplus (+) /shortfall (-) of energy In Oct,20
	Oct-20	Sep-20		Oct-20	Sep-20		
Ar. Pradesh	66.1	64.98	1.72	66.42	65.23	1.82	-0.48
Assam	988.56	989.37	-0.08	1012.66	1026.97	-1.39	-2.38
Manipur	82.13	81.8	0.40	82.48	82.15	0.40	-0.42
Meghalaya	176.37	164.05	7.51	176.37	164.05	7.51	0.00
Mizoram	64.25	57.25	12.23	64.57	57.68	11.95	-0.50
Nagaland	75.69	69.94	8.22	76.05	70.31	8.16	-0.47
Tripura	245.68	252.01	-2.51	245.86	252.13	-2.49	-0.07
<b>Region</b>	<b>1698.78</b>	<b>1679.4</b>	<b>1.15</b>	<b>1724.41</b>	<b>1718.52</b>	<b>0.34</b>	<b>-1.49</b>

States	Demand Met (MW)		w.r.t. Sep,20 % inc (+) /dec (-)	Demand in (MW)		w.r.t. Sep'20 % inc (+) /dec (-)	% surplus (+) /shortfall (-) of demand In Oct,20
	Oct-20	Sep-20		Oct-20	Sep-20		
Ar. Pradesh	125	129	-3.10	130	157	-17.20	-3.85
Assam	1987	1964	1.17	1987	2073	-4.15	0.00
Manipur	214	213	0.47	219	243	-9.88	-2.28
Meghalaya	336	334	0.60	336	334	0.60	0.00
Mizoram	109	108	0.93	109	108	0.93	0.00
Nagaland	155	154	0.65	160	154	3.90	-3.13
Tripura	314	315	-0.32	314	315	-0.32	0.00
<b>Region</b>	<b>3269</b>	<b>3104</b>	<b>5.32</b>	<b>3284</b>	<b>3271</b>	<b>0.40</b>	<b>-0.46</b>

**REGIONAL GENERATION & INTER-REGIONAL EXCHANGE IN MU**

Month---->	Oct-20	Sep-20
Total Generation in NER (Gross)	1849.45	1796.79
Total Central Sector Generation (Gross)	1493.05	1439.50
Total State Sector Generation (Gross)	356.40	357.29
<b>Inter-Regional Energy Exchange</b>		
(a) NER-ER	2.12	0.00
(b) ER-NER	385.03	363.99
(c)NER-NR	455.79	411.51
(d)NR-NER	0.00	0.00
© Net Import	-72.88	-47.52

**AVERAGE FREQUENCY (Hz)**

Month---->	Oct-20	Sep-20
	% of Time	% of Time
Below 49.9 Hz	1.78	2.10
Between 49.9 to 50.05 Hz	82.90	80.45
Above 50.05 Hz	15.32	17.45
Average	50.01	50.01
Maximum	50.15	50.14
Minimum	49.99	49.98

**Deliberation of the sub-Committee:**

NER grid performance for the month of October'20 was presented by NERLDC. (Attached at **Annexure-B.2**)

**The Sub-Committee noted as above.**

**C. ITEMS FOR DISCUSSION**

**C.1 Generation Planning (ongoing and planned outages)**

a. Present per day MU and projected number of days of operation.

Plants	Reservoirs level in meter	MU content	Present DC (in MU)	No of days as per current generation
Khandong + Kopili stg II	724.85	39.75	<b>1.16</b>	34
Kopili			<b>0</b>	Will be "0" until further intimation.
Doyang	322.85	30	<b>0.55</b>	55
Loktak	769.29	113	<b>2.48</b>	46

The outage of other generating stations may be approved considering the present water levels in reservoirs and long-term outage of Kopili HEP.

**Deliberation of the sub-Committee:**

NERLDC highlighted that due to unavailability of Kopili HEP, constituents should plan for procurement of power for proper portfolio management.

NERLDC also highlighted that proper planning of Hydro Generation needs to be done Based on number of days of water availability.

***The Sub-Committee discussed and approved the proposed shutdown by Generating Stations as given in Annexure – D.2 which is available in NERPC website.***

**C.2 Outage Planning Transmission elements**

It was agreed in the 99<sup>th</sup> 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 10<sup>th</sup> of the month, the shutdown availing agency would reconfirm to NERLDC on 7<sup>th</sup> 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.

It was decided in the previous OCCM that shutdown would be granted from the 1<sup>st</sup> day of the following calendar month to the 30<sup>th</sup>/31<sup>st</sup> day of the same month.

***The sub-Committee discussed and approved the transmission line outages proposed by Constituents for December, 2020 which is available in the website of NERPC.***

**C.3 Estimated Transmission Availability Certificate (TAC) for the month of October,2020:**

NETC and POWERGRID have submitted the outage data for the month of October, 2020. So, the attributability of outage of the said elements may please be finalized.

***The Sub-Committee noted as above.***

**C.4 Charging of 132kV Sihhmui S/S and related issues:**

Decisions as per deliberation in previous meeting(s):

- Present condition of idle charging from Melriat end as anti-theft measure to remain in place. For charging of 132 kV Bays of Melriat – Sihhmui D/C at Sihhmui Substation, 132 kV Sihhmui Bus and 132/33 KV, 12.5 MVA Transformer at Sihhmui Substation, fresh application is to be applied to NERLDC and approval to be obtained.
- NERTS-POWERGRID to apply afresh for charging clearance/First Time Charging and Trial operation certificate for 132kV Melriat-Sihhmui including bays at both ends after obtaining clarification from NERPCTP, CEA.
- NERTS, P&ED Mizoram to inform about the conclusions of their bilateral discussions regarding tariff by Oct'20.
- After bilateral discussions if tariff related issues are still not resolved a special meeting to be held.
- Meanwhile till the matter is resolved, NERTS and P&ED Mizoram to abide by the decisions of the Special Meeting held on 24.07.2020

***Deliberation of the sub-Committee:***

Sr.EE, SLDC, P&ED Mizoram informed that it has been decided to handover the temporary bays of P&ED Mizoram to POWERGRID at 132kV Sihhmui S/Sn. Sr.DGM(AM), NERTS stated that bilateral meeting would be held for permanent exchange of bays and also approval of NERPCTP would be requested accordingly.

Director(O&P), NERPC requested NERTS to discuss with P&E Dept., Mizoram once again and if necessary NERPC would convene a meeting to resolve charging of 132kV Sihhmui S/Sn.

***The Sub-Committee noted as above.***

***Action: NERTS, P&ED Mizoram.***

**C.5 RGMO analysis for events dated 11<sup>th</sup> June, 2020**

Decisions as per discussions in previous meetings:

- OTPC- Discussions ongoing with OEM for anomaly in unit response.
- NTPC – All three units tuned in July'20.

***Deliberation of the sub-Committee:***

Sr. Manager, OTPC informed that OEM visit has been delayed to COVID restrictions.

***The Sub-Committee noted as above.***

***Action: OTPC.***

**C.6 Charging of 33kV Khupi-Kimi line at 132kV:**

The following were decided in the 54<sup>th</sup> PCC Meeting held on 22.01.2020 at Guwahati:

1. 132kV Khupi-Kimi line charged at 33kV presently, shall be converted to 132kV.
2. 132kV Seppa bay at Khupi to be used for 132kV Khupi-Kimi (Kameng).
3. Insulator, line inspection to be carried out by DoP, Arunachal Pradesh.

NEEPCO vide mail dated 31.08.2020 has expressed willingness to charge the line at 132kV level.

In this respect in addition to the completion of the above works at Sl.No.(1) to (3) the following are also pre-requisites:

- (i) Availability of Distance Protection at both ends
- (ii) Healthiness of PLCC system.

In 170<sup>th</sup> OCC meeting AE, SLDC, DoP Ar. Pradesh informed the forum that insulator, line inspection for 132kV Kimi-Khupi line shall be carried out by Oct'20. However, for handing over/taking over, he requested that the matter may be discussed with the highest level of DoP Ar. Pradesh. DGM, NEEPCO stated that NEEPCO is ready for handing over and charging of the line at 132kV level. The forum noted that the following sequence of events may be followed for charging of the line at 132kV level:

- (i) Handing over/taking over of the line
- (ii) Application for FTC to NERLDC.

In 171<sup>st</sup> OCCM AE, SLDC, DoP Ar. Pradesh informed that Insulator, Line Inspection has been delayed due to COVID restrictions. He assured that the same would be completed at the earliest. Regarding handing over of the line DGM, NEEPCO informed that the highest levels of Govt. of Ar. Pradesh have been approached but to no avail. He requested the intervention of the forum in this matter.

**Deliberation of the sub-Committee:**

CE, DoP Ar. Pradesh suggested that a joint inspection committee may be formed and the nominations for DoP Ar. Pradesh shall be communicated by SE (SO&PSC), DoP Ar. Pradesh. Director(Planning), NEEPCO stated that earlier it was bilaterally decided that 01<sup>st</sup> April, 2020 would be the date for handing over of Khupi-Kimi line, he requested for early resolution so that agreement for handing and taking over may be signed.

Regarding 132kV Balipara-Khupi CE, DoP Ar. Pradesh stated that DoP Ar. Pradesh is ready for taking over of the line and any date may be fixed after 15<sup>th</sup> November, 2020.

Further in response to NERLDC query it was clarified that only one T-connection at Bhalukpong exists for 132kV Balipara-Khupi line.

***The Sub-Committee noted as above.***

***Action: NEEPCO, DoP Ar. Pradesh.***

### **C.7 Phase Rotation & Related Mismatch Issues in NER:**

Subsequent to discussions in various Sub-Group and OCC meetings a Special Meeting was held on 28<sup>th</sup> October, 2020 to resolve the long pending issue of Phase Rotation and resulting mismatch issues for PMU and DR.

The following were decided in the Special Meeting:

- (i) Taking 400kV Bongaigaon as reference, all bay marking to be done afresh alongwith all bay elements.
- (ii) Since ports for relay already assigned and changing them would require OEM involvement, the secondary connections to the relays and PMUs to be done afresh subsequent to bay marking
- (iii) At first the activities to be completed for 400kV Azara, 400kV Byrnihat, 400kV Silchar and 400kV Palatana by 1st week of Nov'20.
- (iv) For New Stations after charging phase sequence and bay marking to be submitted to NERLDC for verification.

#### **Deliberation of the sub-Committee:**

Sr.DGM(AM), NERTS informed that work would be completed progressively in Silchar by Nov'20. However, shutdown would be required since secondary connections have to be changed. Director(O&P), NERPC requested NERTS, AEGCL, MePTCL and OTPC to complete the stated activities at the earliest.

NERLDC requested NERTS to submit a working procedure in this aspect. Further it was informed that it will not be possible for NERLDC to verify after changes are implemented in new substations due to absence of PMUs in these substations. NERTS, POWERGRID agreed to provide necessary assistance in the said verification.

***The Sub-Committee noted as above.***

***Action: NERTS, AEGCL, MePTCL, OTPC.***

### **C.8 Testing of Primary Governor response of NER Generating units as per IEGC**

#### **C1.5.2(g):**

M/S Solvina vide its mail to NERLDC dated 2nd November'20 informed that they have received work orders from all the assigned generating units of NER and shared the

tentative test schedule for NER Generators. The tentative testing schedule is as mentioned below:

Region	Station	No. of generators	Suggested Schedule		Duration (days)
			Test Start	Test End	
NER	NEEPCO Ranganadi	3	23-Nov	28-Nov	6
NER	NEEPCO Tuirial	2	29-Nov	2-Dec	4
NER	NEEPCO-Monarchak	2	9-Nov	12-Nov	4
NER	NEEPCO-Kopili	1	21-Nov	22-Nov	2
NER	NEEPCO-Khandong	2	17-Nov	20-Nov	4
NER	NEEPCO- Pare	2	9-Dec	12-Dec	4
NER	OTPC- Palatana	2	11-Dec	14-Dec	4
NER	NTPC Bangaigaon TPP	3	17-Dec	22-Dec	6
NER	NHPC Loktak	3	23-Dec	28-Dec	6

NEEPCO, OTPC, NTPC, NHPC are requested to confirm the test schedule. Since, Hydro season is nearing its end, it is proposed to test the hydro units by December'20 tentatively.

**Deliberation of the sub-Committee:**

NERLDC stated that PFR testing work has not yet commenced and dates are suggestive only. Final dates have to be decided after discussion in the forum. NERLDC requested the Hydro generating stations to complete the tests before commencement of lean hydro season.

DGM, NEEPCO stated the following:

(i) Presently Monarchak is getting very low gas, when Palatana goes under planned maintenance then gas supply is expected to be higher. *In order to fix such a period for PFR testing the forum requested NEEPCO to write to OTPC, so that OTPC may intimate a firm date.*

(ii) For Tuirial HEP he requested that the dates may be deferred due to the prevailing lockdown restrictions in Mizoram.

(iii) For Ranganadi HEP the first machine would go under AMP from 08<sup>th</sup> Dec'20. He requested that test may be rescheduled to 28<sup>th</sup> Dec'20 to 4<sup>th</sup> Jan'21. But if inflow is not sufficient during that period, the test may be carried out in April/May 2021.

(iv) For Khandong and Pare the schedule may be followed but the low water level may be noted.

NTPC requested that the schedule be postponed to Mar'21 due to overhauling of one machine in 13 Dec'20 to 17 Jan'21 and of another machine after that.

Sr. Manager, OTPC requested that the schedule be postponed to May '21 due to prevailing restrictions inside Palatana campus.

After detailed deliberation the forum agreed to the following schedule:

Region	Station	No. of generators	Schedule	Duration (days)
NER	NEEPCO Ranganadi	3	28th Dec'20 to 4th Jan'21	6
NER	NEEPCO Turial	2	To be decided later	4
NER	NEEPCO-Monarchak	2	During AMP of at least one module of Palatana	4
NER	NEEPCO-Kopili	1	Under long shutdown	2
NER	NEEPCO-Khandong	2	1st Dec'20 to 4 <sup>th</sup> Dec'20	4
NER	NEEPCO- Pare	2	9th Dec'20 to 12 <sup>th</sup> Dec'20	4
NER	OTPCL- Palatana	2	In May'21	4
NER	NTPC Bongaigaon TPP	3	In Mar'21	6
NER	NHPC Loktak	3	23rd Dec'20 to 28 <sup>th</sup> Dec'20	6

**The Sub-Committee noted as above.**

**Action: NEEPCO, OTPC, NTPC, NHPC.**

**C.9 Non-availing of important shutdown after providing availing confirmation or after receiving post OCC approval:**

It has been observed on few occasions that utilities have not availed shutdowns of important elements like 400 kV Byrnihat-Bongaigaon, 400 kV Azara-Bongaigaon, etc. on the day of shutdown after receiving NERPC approval or after providing D-3 availing request to NERLDC. Details of few such shutdowns during Oct'20 are mentioned below:

Sl. No.	Element Name	SD Category	Availing Entity	Reason	Date of Approval by NERPC/ Receipt of D-3 Availing status	Approved Date
1	400KV-AZARA-BONGAIGAON-1	Post OCC	AEGCL	for works under PSDF scheme	15-10-2020	18-10-2020
2	400KV-BONGAIGAON-BYRNIHAT (KILLING)	170th OCC Approved	NERTS	For rectification of Panel wiring and AMP of Bay equipments	30-09-2020	03-10-2020

On receipt of D-3 availing request for shutdown of these important elements, NER-ER import/export capability is reduced in consultation with NLDC, affecting power transactions by all NER utilities, to enable the shutdown. The non-availing of shutdown without prior intimation not only leads to wastage of entire effort right from OCC till shutdown coordination (on D-3, D-2 & D-1) but also leads to unwanted revision of ATC affecting NER utilities. Thus, all utilities are requested to carry out proper planning and strictly avoid such unwanted course of action.

***Deliberation of the sub-Committee:***

AEGCL informed that due to unavailability of MRT personnel on the day of S/D of 400 kV Bongaigaon-Azara, the shutdown was not availed and the same was informed one day ahead. NERLDC stated that the information one day ahead was not useful as the ATC was already reduced and Power Market was already closed by then.

NERTS informed that the S/D of 400kV Bongaigaon-Byrnihat could not be availed due to rain on the day of S/D. CGM, NERLDC informed that non-availing of shutdown of elements affecting inter-regional ATC results has far reaching operational and commercial implications. After detailed deliberation the forum requested all utilities of NER including NERTS, AEGCL to desist from such actions in the future. Further it was advised to all utilities to inform availing/non-availing status on D-3 basis only.

***The Sub-Committee noted as above***

***Action: all utilities.***

**D. ITEMS FOR STATUS REVIEW**

**D.1 Restoration of Assets damaged at Kopili HEP due to failure of Penstock:**

As per decisions in previous meeting(s):

- (i) Detailed ownership and scope of work finalized in the 168<sup>th</sup> OCC meeting
- (ii) Immediate restoration of one 220kV line, one 132kV line and 160MVA ICT at Kopili S/S via AIS by NERTS as temporary measure – deadline: November'20.
- (iii) Kiosk arrangement/ hardware which is being presently used and shall also be a part of permanent restoration shall be jointly decided by NERTS/NEEPCO.
- (iv) Prior to permanent restoration the BoQ shall be shared by NERTS with the forum.

In 171<sup>st</sup> OCCM Director(O&P), NERPC informed that the matter was discussed in length in the 2<sup>nd</sup> NERPC-TP meeting wherein it was decided that the issue of temporary as well as permanent arrangement are pertained to restoration of existing element and not for planning of new element and hence not cover under TOR of NERPC-TP.

CGM, NERLDC stated that as per System Requirement the temporary restoration of one 220kV line, one ICT and one 132kV line is required for Meghalaya particularly for the lean hydro season.

Sr.GM, Misa, NERTS stated that temporary restoration at this stage would be difficult as there are many activities like earthing, construction of cable trench, construction of control room etc. those are of permanent in nature and will have its own lead-time like doing permanent restoration since it involves new procurement and construction. Further, during 2<sup>nd</sup> NERPCTP Meeting members already opined non-requirement of Temporary restoration. Accordingly, Sr.GM, Misa, NERTS stated that the agenda for permanent restoration would be placed in 3<sup>rd</sup> NERPCTP meeting for necessary inclusion of additional scope in NERSS – III project.

EE, SLDC, Meghalaya stated that during winter i.e. lean hydro season Meghalaya would face shortfall if the link is not restored by 2<sup>nd</sup> week of Nov'20.

After detailed deliberation the following were decided:

- a. Joint Study by Meghalaya SLDC and NERLDC by 23<sup>rd</sup> Oct'20 to assess the impact of the unavailability of the Misa-Kopili-Khandong link on Meghalaya drawal during the lean hydro season.
- b. For the proposal for permanent restoration, agenda will be in 3<sup>rd</sup> NERPCTP Meeting for necessary inclusion of additional scope in NERSS – III project.

**Deliberation of the sub-Committee:**

Sr.GM, Group-in-Charge, Misa, NERTS stated that no concrete decision could be taken in the 2<sup>nd</sup> NERPCTP meeting, further he clarified that in case of restoration work done by present bay owner NEEPCO or deposit work by NERTS the NERPCTP approval would not be required. He suggested that permanent restoration to be done and if done under PoC then a Special Meeting of NERPCTP may be convened at the earliest.

NERLDC informed the Joint study results as follows:

- In absence of Misa-Kopili-Khandong link, 2x25MW Khandong generation is required otherwise load shedding is seen in Capital Area based upon availability of Leshka generation.
- Overloading of 132kV Badarpur-Panchgram and 132kV Umiam Stg-III to Umiam Stg-I lines observed.
- 132kV Srikona-Panchgram to be brought into service as early as possible, so that constraint won't be there.
- 132kV Umtru-Kahelipara D/C to be closed.

- Desired generation 40MW from Leshka and 42 MW from Khandong in peak period. NEEPCO agreed to provide at least 36MW in peak hours during lean hydro season from Khandong.

After detailed deliberation the forum approved for permanent restoration and requested NERPC to arrange for CEA meeting.

**The Sub-Committee noted as above.**

**Action: NERPC.**

**D.2 Status update of important grid elements under prolonged outage impacting system operation:**

Sl. No	Element	Owner	Status as informed in the 171 <sup>st</sup> OCCM	Latest status
1	132kV Dimapur - Imphal	NERTS	Loc No.350 RoW still to be cleared. By Nov'20	By Nov'20
2	220kV Sonabil-Samaguri-I	AEGCL	To be charged after inspectorate clearance.	Charged on 6 <sup>th</sup> Nov'20
3	63MVAR L/R for 400kV Palatana-SilcharCkt-I	OTPC	1 <sup>st</sup> week of Nov'20	1 <sup>st</sup> week of Dec'20
4	132kV Jiribam – Rengpang	MSPCL	Oct'20	Dec'20
5	220KV-Agia-BTPS-I	AEGCL	Oct'20	Completed. EI clearance awaited.
6	25 MVAR tertiary reactor 1,2 & 3 at Balipara	NERTS	Reactor 4 was revived on 06 <sup>th</sup> Oct'20 and 3 nos was taken under outage	Ready for taking into service.
7	132kV Rangia-Rowta	AEGCL	-	Pile foundation completed. Conductor re-stringing to start by Nov'20. Completion by Feb'21
8	132kV Mariani – Mokokchung(out since April'2008)	AEGCL	-	After favourable study results line would be charged.
9	FSC of 400kV Balipara – Bongaigaon-4(out since 02 <sup>nd</sup> Sep'20)	NERTS	-	Procurement involved. Tentatively by Mar'21

**The Sub-Committee noted as above.**

**Action: all utilities as above.**

**D.3 Status of commissioning for Upcoming projects:**

<b>Sl. No</b>	<b>Name of the element</b>	<b>Utility</b>	<b>Status as informed in 171<sup>st</sup> OCC meeting</b>	<b>Latest status</b>
1	LILO of 132kV Surjamaningar-Budhjungnagar-I at Surjamaningar(ISTS)	TSECL	Nov'20	WIP by Nov'20
2	LILO of 132kV P.K.Bari-Ambassa at P.K.Bari(ISTS)	TSECL	Nov'20	WIP by Dec'20
3	400kV Palatana-Surjamaningar D/C	NERTS	Dec'20	Dec'20
4	400kV Silchar – P.K.Bari D/C	NERTS	Dec'20	Dec'20
5	132kV Monarchak-Surjamaningar	TSECL	Sep'20	By Mar'21. Exact reasons for delay and status to be sent to CEA.
6	PLCC for 132kV Loktak-Ningthoukong and 132kV Loktak-Rengpang	MSPCL	Dec'20	Included in R&U. By Mar'21
7	Construction of 2 <sup>nd</sup> bay at Balipara for 220kV Balipara-Sonabil-2	AEGCL	NIT by Oct'20	NIT by Nov'20
8	Bay at 132kV Agia S/Sn for 132kV Agia-Nangalbibra-II	AEGCL	Bay ready, panel to be commissioned by 1 <sup>st</sup> week of Dec'20	1 <sup>st</sup> week of Dec'20
9	Upgradation of 132kV Lumshnong – Panchgram line	MePTCL	Final PSDF approval by Nov'20	To be updated
10	Diversion of 132kV Bawktlang-Sihhmui	NERTS	WO placed. By Jan'20	By Jan'21
11	PLCC for 132kV Karong-Kohima	MSPCL	-	NERPC to write to MD, MSPCL

**The Sub-Committee noted as above.**

**Action: all utilities as above.**

**D.4 Mapping of NERLDC Tripping portal and PDMS tripping portal:**

In 170<sup>th</sup> OCCM NERPC informed that Techno-Commercial offer has been received from M/s PRDC. Following are the activities for integration:

1. Mapping of NERLDC fields to PDMS Tripping incident fields (that are required for PDMS)
2. Identification of RESTful end points for each Create/Update/Delete operation performed in Tripping incident portal
3. Development of RESTful API
4. Setting up an integration with SFTP for attachment association Techno Commercial Proposal for NERPC tripping portal integration
5. Integration & Testing
6. Deployment
7. Acceptance Testing

Further upon suggestion of Member Secretary i/c, NERPC it was decided that the quoted amount of INR 12lakh may be booked under PDMS project subject to PSDF approval.

**Deliberation of the sub-Committee:**

Director(O&P), NERPC stated that the revised cost for tripping integration after negotiation is INR 10 lakhs and suggested that the same may be booked from PSDF funds for PDMS project as already decided in 171<sup>st</sup> OCCM. The forum concurred and also approved the excess funds required to be booked from suitable fund by NERPC.

***The Sub-Committee noted as above.***

***Action: NERPC.***

**D.5 Preparation of List of Important Grid Elements:**

In the Special Meeting (for improvement of Data Availability) held on 18<sup>th</sup> August,2020 it was decided that List of Important Grid Elements has to be prepared by NERLDC (for ISTS and important intra-state elements) and by SLDCs (for intra-state elements).

Status of preparation of list of Important Grid Elements as per 172<sup>nd</sup> OCCM:

Arunachal Pradesh	No representative
Assam	Submitted on 06 <sup>th</sup> Nov'20
Manipur	To be submitted
Meghalaya	To be submitted
Mizoram	To be submitted
Nagaland	submitted
Tripura	To be submitted
NERLDC	Prepared and submitted.

***The Sub-Committee noted as above.***

***Action: all SLDCs as above.***

**D.6 Immediate restoration of 220kV Bus-Coupler Bay at Samaguri(AEGCL) & keeping both buses in service at 220kV Sub-stations in Assam power system:**

In 171st OCCM AGM, SLDC, AEGCL informed that the matter has been intimated to the headquarters for early implementation. The forum requested Assam to furnish the substation wise issues and reasons for keeping the Bus Coupler in open condition for all 220 kV Substation where Bus Coupler has been kept open. NERLDC requested that the mapping of Bus Coupler bay to SCADA has to be completed for all the stations.

**Deliberation of the sub-Committee:**

DGM, AEGCL informed that necessary studies would be undertaken and some breakers would be closed by Nov'20.

***The Sub-Committee noted as above.***

***Action: AEGCL.***

**D.7 Renewal of Maintenance and Support Contract for PSS/E user licenses:**

During the 159th OCCM of NER, NERLDC informed that Maintenance and Support(M&S) Contract for PSS/E User Licenses used by NLDC/RLDCs/SLDCs had expired in 2018 and requested all SLDCs to give their consent for price negotiation by NLDC with M/s Siemens on their behalf.

Accordingly, consent had been received from the SLDCs and the same had been forwarded to NLDC, POSOCO for taking up with M/s Siemens for the price. The price had been negotiated with M/s Siemens. The same had been communicated with the utilities by NERLDC vide letter NERLDC/SO-II/270 dated 02.07.2020.

POSOCO has already procured for 5 RLDCs and 1 NLDC at the negotiated price and hence the updated versions of PSS/E are available with POSOCO.

SLDCs are requested to mention the status of the plan of procurement so that the updated versions are available for all. This would enable smooth system studies for safe and secure operation of the Grid.

In 170th OCC meeting NERLDC informed the forum that only Assam and Meghalaya have taken the initiative for contract procurement.

POWERGRID vide mail dated. 09.10.2020 has intimated that POWERGRID has renewed the M&S services of PSS®E license by SIEMENS Ltd. for further 5 years starting from August, 2020 for CERC, RPCs, CEA & STUs and POWERGRID shall bear the cost of above renewal alongwith issue of new dongles for PSSE ver 35(with back compatibility feature). The following details are required for the same:

**Entity name:**  
**Dispatch Address:**  
**Primary contact:**  
**Secondary contact:**  
**Email Id:**  
**Mobile Number:**

In 171<sup>st</sup> OCCM NERPC informed that M&S (alongwith upgradation) for the list of dongles as attached in Annexure D.7 would be done by CTU free of cost. In this respect all the SLDCs were requested to intimate whether they would opt to switch to the dongles mentioned in the Annexure to avail the scheme offered by POWERGRID. EE, SLDC, Meghalaya informed that Meghalaya has already opted for the same and the mentioned dongles are in custody of SLDC, Meghalaya. All the other SLDCs were requested to intimate likewise.

**Deliberation of the sub-Committee:**

The forum requested SLDCs of Ar. Pradesh, Manipur, Mizoram, Nagaland and Tripura to give their consent and the dongle numbers available with the SLDCs at the earliest.

***The Sub-Committee noted as above.***

***Action: all SLDCs as above.***

**D.8 Utilization of Transfer Bus and Bus Coupler Breaker during rectification of Main Circuit Breaker for 132 kV Dimapur-Doyang line 2:**

In 171<sup>st</sup> OCCM DGM, NEEPCO informed that the wiring of Selector Switch to the BC is yet to be done and also Trip Transfer scheme has to be completed. Further LBB has to be commissioned for all the feeders. For the said activities' OEM is involved and due to COVID situation the work is delayed although every effort is being made for an early completion.

NERLDC mentioned that the unwanted outage of the line should be avoided and Bus Coupler CB must be utilized as and when the issues are resolved.

**Deliberation of the sub-Committee:**

DGM, NEEPCO informed that OEM has been consulted and tentative completion is by Jan'21.

***The Sub-Committee noted as above.***

***Action: NEEPCO***

**D.9 Furnishing of data sheet on daily basis for preparation of daily PSP report:**

In compliance to Regulation 5.5.1 (b) of IEGC 2010, NERLDC is preparing Daily Power Supply Position (PSP) report pertaining to NER. Most of the NER constituents are

furnishing the data required for preparation of PSP report in formats agreed in 148th OCC Meeting on Sept.'18, apart from the following:

- (i) Manipur
- (ii) Mizoram
- (iii) Arunachal Pradesh

**Deliberation of the sub-Committee:**

NERLDC requested the utilities as above to submit the daily reports in the revised format.

***The Sub-Committee noted as above.***

***Action: all utilities.***

**D.10 SEMs to be Procured**

In 171st OCCM NERTS informed that Procurement of 100 SEMs and 20 DCDs have been completed and internal process is ongoing for procurement of additional 50 SEMs.

**Deliberation of the sub-Committee:**

The forum requested NERTS to expedite the process.

***The Sub-Committee noted as above.***

***Action: NERTS.***

**D.11 SEM time drift:**

In 170th OCCM NERTS informed that they would try to replace the SEMs as listed in 170th OCC Meeting by Sep'20 but due to restricted movement, pace of works has been severely hampered. Director (Comml.), NERPC requested NERTS to study and table exhaustive report in the OCC forum for quick resolution of time drift issues.

**Deliberation of the sub-Committee:**

The forum requested NERTS to replace the time drifted SEMs as early as possible.

***The Sub-Committee noted as above.***

***Action: NERTS.***

**D.12 Integration of SEMs with laptop/PC for data downloading:**

Decisions as per deliberation in the previous OCC forum:

- i. Implementation of RS-485 scheme for data downloading in one station preferably a generating station
- ii. If trial operation is successful then the scheme is to be extended to all stations where SEM quantity is greater than 10.
- iii. Trial/Pilot to be set up at OTPC Palatana.

OEM support to be sought by NERTS for early implementation of the scheme.

**Deliberation of the sub-Committee:**

NERTS informed that OEM i.e. M/s L&T is willing to execute the pilot free of cost. The forum requested NERTS to expedite.

***The Sub-Committee noted as above.***

***Action: NERTS.***

**D.13 Second Meter List for replacement:**

In 170<sup>th</sup> OCCM NERLDC presented a second list of 29 SEMs (in addition to first list of 22 SEMs approved in 169<sup>th</sup> OCC Meeting) consisting of 25 Elster make SEMs & 4 defective SEMs. NERLDC requested to replace all the Elster make SEMs as procurement of same was blacklisted in 2015 and vendor support is not available.

In 171<sup>st</sup> OCCM NERTS was requested to expedite the process of replacement/new installation of meters.

**Deliberation of the sub-Committee:**

NERTS informed that installation of SEM is under progress, most of the SEMs has been re-distributed to the nearby Powergrid locations for installation in the listed substation and is expected to be completed before next OCCM

***The Sub-Committee noted as above.***

***Action: NERTS.***

**D.14 New Meter and CMRI requirement:**

In 170<sup>th</sup> OCCM NERLDC submitted a list of requirements of SEM and CMRI for new locations. It was agreed that meters will be installed in new locations where check/backup meters are not available, and DCD will be provided from the recent procurement. Also, NERTS will give the details of meter requirement for their substation from where they draw power for aux. consumption and will install the meters (as decided in 39<sup>th</sup> CCM).

**Deliberation of the sub-Committee:**

However regarding installation of meter for drawing of power for aux. consumption, NERTS expressed their inability to install the meter as 5A CTs are not available and the SEMs are having only 1A CT secondary connection.

***The Sub-Committee noted as above.***

***Action: NERTS.***

**D.15 SEM data collecting Laptop related issues:**

The 171<sup>st</sup> OCC forum requested NERTS to expedite process of resolving all laptop related issues. Dir. Commercial, NERPC advised NERLDC to list the distribution of the 20 nos DCD based on priority of requirement. NERTS agreed to do the time drift correction activities of the SEM installed at State S/S from where they collect and send the data to NERLDC and DCD shall not be provided to those S/S.

**Deliberation of the sub-Committee:**

NERLDC informed that 17 locations have been identified which have laptop (including lack of optical cable) related issues and DCD is to be provided for time drift corrections viz. Lekhi, Agia, Azara, BTPS, Samaguri, Tinsukia, Durlavcherra, Kahelipara, Sarusajai. Meghalaya informed that they have received 2 nos. of DCD for Umtru & Mendipathar; rest 1 for Byrnihat (Killing) will be taken shortly. NERTS was requested to resolve the issues at the stated locations at the earliest by providing DCDs.

***The Sub-Committee noted as above.***

***Action: NERTS.***

**D.16 Procurement of SEM & DCD/Laptop for future requirements:**

In 170<sup>th</sup> OCCM NERLDC presented the estimation 125 nos. SEMs and 15 nos. CMRIs shall be required for future projects and maintaining spare. List of SEMs and CMRIs was presented by NERLDC. The forum also decided that procurement will be done on single tender basis from L&T to synchronize with the existing metering system.

**Deliberation of the sub-Committee:**

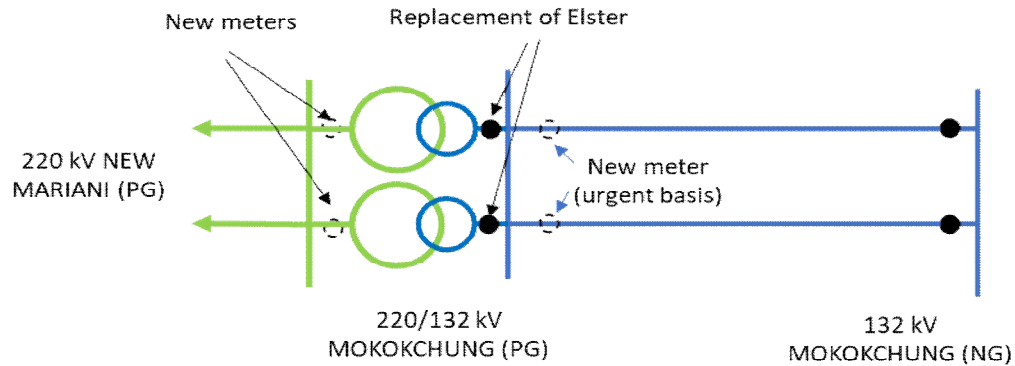
After detailed deliberation it was decided that 10 more nos. of CMRIs shall be procured along with the already estimated 125 nos. SEMs and 15 nos. CMRIs. Sr.DGM (AM), NERTS informed that under the existing contract, quantity variation clause shall be exercised.

***The Sub-Committee noted as above.***

***Action: NERTS.***

**D.17 Replacement/Installation of new SEM at Mokokchung sub-station:**

The 171<sup>st</sup> OCC forum decided that replacement/ New installation of SEM at Mokokchung-PG Substation shall be done as per the diagram below:



**Deliberation of the sub-Committee:**

NERTS informed that the installation shall be completed by Nov'20

**The Sub-Committee noted as above.**

**Action: NERTS.**

**D.18 Sign Reversal Problem:**

For sign reversal problem is persisting in the following lines the following were decided in the 171<sup>st</sup> OCCM:

- a. Imphal (Man) end (NP-9544-A) of 132 kV Imphal (Man) - Imphal (PG) -I. MSPCL to rectify the connections by 23<sup>rd</sup> Oct'20
- b. Karong end (NP-9667-A) of 132 kV Karong - Kohima line. Also, Kohima end of 132 kV Karong - Kohima line reads appx. 20-25% less than that of Karong end. DoP Nagaland to replace the CT at Kohima by Oct'20

**Deliberation of the sub-Committee:**

DGM, SLDC, MSPCL informed that connections have been rectified at Karong and Yurembam end.

SDO, SLDC, DoP Nagaland informed that the SEM at Kohima has been replaced and the discrepancy is yet to be observed again after replacement. Further he also informed that the CT replacement process is underway.

**The Sub-Committee noted as above.**

**ADDITONAL AGENDA ITEMS:**

**AGENDA ITEM FROM AEGCL:**

**D.19 LILO of 132kV Badarpur-Kumarghat at Karimganj:**

Due to the urgent nature of power situation at Karimganj the LILO work at Karimganj for 132kV Badarpur-Kumarghat has been completed as per decision of the 165<sup>th</sup> OCC. However, the approval of NERPCTP is to be obtained to put the LILO in effect.

**Deliberation of the sub-Committee:**

The forum noted the urgent situation at Karimganj and requested NERPC to arrange for CEA meeting at the earliest.

***The Sub-Committee noted as above.***

***Action: NERPC.***

**AGENDA ITEM FROM NERTS:**

**D.20 Shutdown of 800kV HVDC BNC-APD-Pole 1 for OPGW work:**

The 800kV HVDC BNC-AGRA line was commissioned in the year 2015. Earth wire was installed over Pole-1 of the line for the entire line length i.e. 1772 Km except for a small section of about 5Km between Loc. 452 to 456, 585 -592, 592 - 593 and Loc.593 - 594 in Assam. Earthwire installation in these sections couldn't be done due to severe ROW related obstruction. Attempt were made many a times to complete the laying of balance portion of earthwire with the help of security forces and district administration but could not be completed due to severe resistance from villagers and fringe groups.

For attending construction related pending earthwire installation works and hence to improve the system against future lightning related maltrippings in the mentioned spans, the shutdown of 800 kV HVDC BNC-APD Pole-1 is requested from 08.12.20 (08:00 Hrs) to 13.12.20 (18:00 Hrs) on continuous basis for completion earthwire installation works under construction and existing system improvement related shutdown. During this period, Pole-2 shall be in service with it's full capacity to carry 1500 MW from BNC to Agra. Also, depending upon readiness of sections after each working day at site, if possible than shutdown of Pole-1 shall be returned in evening hours. It is further assured that effort shall be made to put the pole-1 in to service if work is halted for any reason. It may be mentioned that government administration is now ready to provide security forces during these days for the mentioned works.

**Deliberation of the sub-Committee:**

The forum approved the shutdown as above.

***The Sub-Committee noted as above.***

**ADDITIONAL AGENDA FROM TSECL:**

**D.21 Additional VPS for Tripura SLDC**

Tripura grid has expanded and the present VPS is deemed insufficient to cater to the full network. Further after commissioning of 400kV stations the same are to be mapped to SCADA

**Deliberation of the sub-Committee:**

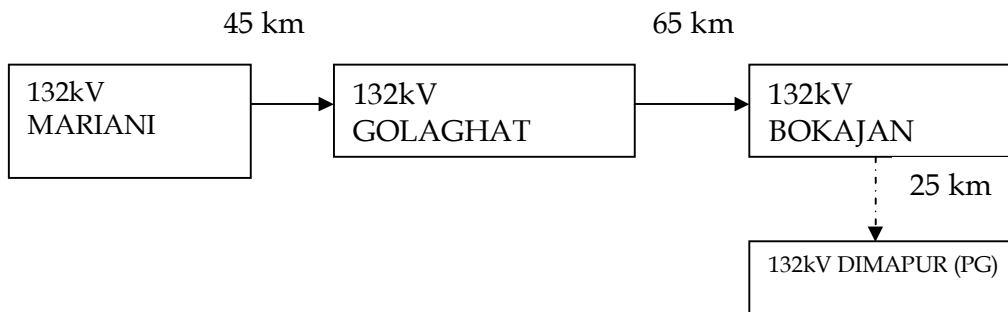
The forum requested NERLDC & NERTS to explore the possibility of quantity variation for VPS under the EMS-SCADA upgradation project of NER. Regarding integration of 400kV stations, NERLDC was requested to assist SLDC Tripura.

**The Sub-Committee noted as above.**

**Action: NERLDC, NERTS**

**E. ITEMS FOR INFORMATION**

**E.1 Low Voltage Profile at 132kV Bokajan GSS:**



Due to unavailability of ICT at Dimapur (PG) GSS, Bokajan GSS is being fed radially from Mariani GSS via Golaghat GSS. Low voltage profile is being observed at Bokajan GSS (mostly industrial load suffering in off peak hours). It is requested to consider radial loading of 132kV Bokajan-Dimapur (PG) line for voltage improvement at Bokajan GSS (132kV Golaghat - Bokajan may then be kept open).

In 171<sup>st</sup> OCCM it was decided that NERLDC would do a System Study considering the worst contingency in Nagaland System and revert back to the forum.

A Special Meeting was convened on 23<sup>rd</sup> October, 2020 to discuss power supply to Bokajan from Dimapur, wherein after careful consideration of all the different aspects of Study it was decided to extend power supply to Bokajan from Dimapur. However, the quantum of power drawn from Dimapur shall not exceed 15MW under any circumstances.

Subsequently on 27<sup>th</sup> Oct'20 132kV Dimapur-Bokajan was charged and power supply was restored.

***This is for information only.***

**Date & Venue of next OCC meeting:**

It is proposed to hold the 173<sup>rd</sup> OCC meeting of NERPC on second week of December, 2020. However, exact date and venue will be intimated in due course.

\*\*\*\*\*

**Annexure-I****List of Participants in the 172<sup>nd</sup> OCC Meeting held on 12.11.2020**

<b>SN</b>	<b>Name &amp; Designation</b>	<b>Organization</b>	<b>Contact No.</b>
1	Sh. Bar Takum, CE(P)	Ar. Pradesh (MS Team)	-
2	Sh. Henkar R.Bado, SE (E), TP&M Zone	Ar. Pradesh (MS Team)	-
3	Sh. Nangkong Perme, SE (E), SO&PSC,	Ar. Pradesh (MS Team)	
4	Sh. Sange Phuntso, EE( E), SLDC	Ar. Pradesh (MS Team)	
5	Sh. P.Buchi, AE	Ar. Pradesh (MS Team)	-
6	Sh. G.Yinyo, JE	Ar. Pradesh (MS Team)	-
7	Ms..Pura Anu, JE (E), Elect.Transmission Circle	Ar. Pradesh (MS Team)	
8	Ms. Binpi Lendo, JE (E), SLDC	Ar. Pradesh (MS Team)	
9	Sh. Gem Tada, JE(E), SLDC	Ar. Pradesh (MS Team)	
10	Sh. J.Toko Batte, JE (E) SLDC	Ar. Pradesh (MS Team)	
11	Sh. Hibu Bama, EE(E), Transmission Division -II	Ar. Pradesh (MS Team)	
12	Sh. Bimal Borah, DGM (O)(SLDC)	Assam (VC)	-
13	Sh. Nabanit Hazarika, AGM, AEGCL	Assam (MSTeam)	-
14	Sh. R.Goswami, AGM (SLDC)	Assam (VC)	-
15	Sh. Mriganka Bhuyan, AGM (SLDC), AEGCL	Assam (MS Team)	-
16	Smti. Barsha Kashyap, DM, SLDC	Assam (MS Team)	-
17	Sh. Gunajit Bhuyan, DGM, AEGCL	Assam (VC)	
18	Sh. L.Dinesh Chandra Singh, GM, SLDC	Manipur (VC)	
19	Sh. Hidam Roshikanta,, DM	Manipur (VC)	-
20	Sh. N.Saranjit, Manager (I/c)	Manipur (VC)	-
21	Smti. Hanna S.Rangnamei, Manager (E) (SLDC)	Manipur (VC)	-
22	Sh. Ramy Raja, DM	Manipur (VC)	-
23	Smti. Laishram Ritu, DGM, SLDC	Manipur (VC)	
24	Smti. Steffi Okram, Manager (E) (SLDC)	Manipur (MS Team)	-
25	Sh. Rokobeito Iralu, SDO	Nagaland (VC)	-

26	Sh. Asangba Tikhir, EE SLDC	Nagaland (VC)	-
27	Sh. Tia Kava, JE	Nagaland (VC)	-
28	Sh. Kevi, JE, SLDC	Nagaland (VC)	-
29	Sh. T. Gidon, EE (SLDC)	Meghalaya (VC)	-
30	Sh.K.Sohlang, EE (Market Operation)	Meghalaya (VC)	-
31	Sh. D.J.Lyngdoh, EE, SM	Meghalaya (VC)	-
32	Sh. J.H.Laithangliana, SE	Mizoram (VC)	-
33	Sh. Benjamin L. Tlumtea, Sr. EE (SLDC)	Mizoram (VC)	-
34	Smti. Kristine VL Sailo, AE	Mizoram (VC)	-
35	Sh. V. Lalhmingliana, JE	Mizoram (VC)	-
36	Sh. L. Sailo, JE	Mizoram (VC)	-
37	Sh. Anil Debbarma, DGM (SLDC)	Tripura (VC)	09612589250
38	Sh. Mrinal Paul, Manager	Tripura (MS Team)	-
39	Sh. R.Sutradhar, CGM	NERLDC (VC)	-
40	Sh. S.C. De, Sr.GM	NERLDC (VC)	09436335369
41	Sh. Sourav Mandal, Dy. Mgr (SO-I)	NERLDC (VC)	09402102354
42	Sh. Kritika Debnath, Engineer	NERLDC (VC)	09436930830
43	Sh. U. Kataki, CGM	PGCIL (MS Team)	09435505418
44	Sh. P.Kanungo, Sr. GM (AM)	PGCIL (MS Team)	-
45	Sh. Joypal Roy, DGM	NEEPCO (MS Team)	08837200069
46	Sh. Narendra Kumar Gupta, Sr. Manager (O)	OTPC (MS Team))	09774233426
47	Sh. Kangkan Paul, DM (EEMG)	NTPC (MS Team)	-
48	Sh. Sajeev Mohandas, DGM (EEMG)	NTPC(MS Team)	09496006403
49	Sh. Parikshit Roy	STERLITE (MS Team)	-
50	Sh. Biswajit Mukherjee,	STERLITE (MS Team)	-
51	Sh. Vineet Kumar,	STERLITE (MS Team)	-
52	Sh. Satish Kumar, AD, NPC	CEA ( MS Team)	-
53	Sh. Abraneel Das,	SIEMENS (MS Team)	-
54	Sh. Shubhyash Gupta	SIEMENS (MS Team)	-

55	Sh. Sharmishtha Dutta	SIEMENS (MS Team)	-
56	Sh. S.S. Kaushik	SIEMENS (MS Team)	-
57	Sh. Amitabh Singhal	SIEMENS (MS Team)	-
58	Sh. A.K.Thakur, Member secretary	NERPC	-
59	Sh. B. Lyngkhoi, Director (O&P)	NERPC	09436163419
60	Sh. S.M.Aimol, Director (Comml.)	NERPC	-
61	Sh. S. Mukherjee, Dy. Director	NERPC	08794277306
62	Sh. Rajib Das, AE	NERPC	-
63	Sh. S. Chatturvedi, AE	NERPC	-



उ.पू.क्षे ग्रिड प्रदर्शन

# NER GRID PERFORMANCE

*For the month October 2020*

*North Eastern Regional Load Despatch Centre*

*POSOCO, Shillong*

**Highlights of  
the Month**

**Frequency  
Profile**

**Voltage  
Related Issues**

**Transmission  
Element Issues**

**Operational  
Issues**

**Network  
Related Issues**

**Hydro  
Reservoir  
Levels**

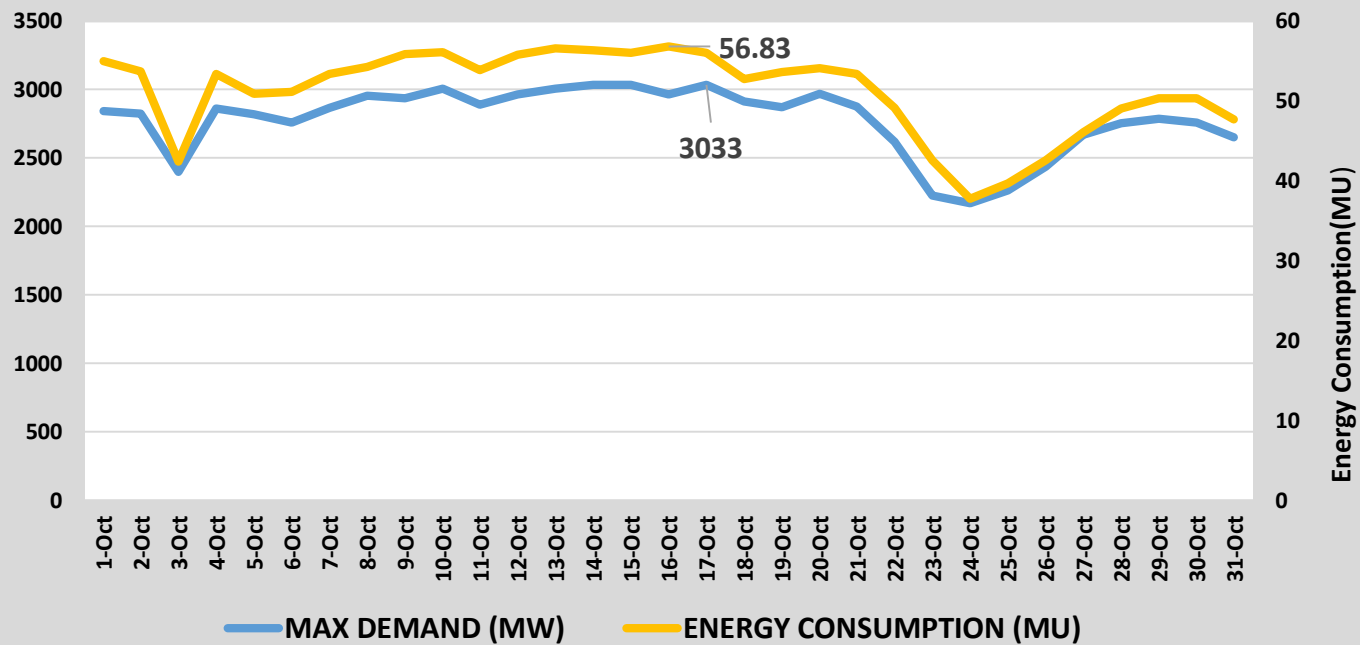
**Metering Issues**

**Telemetry  
Availability  
Status**

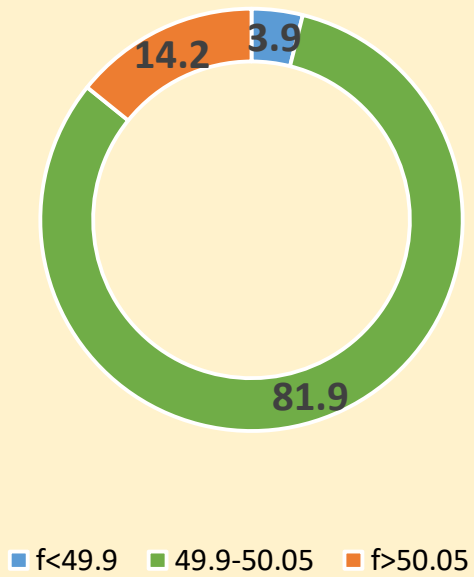
# Maximum MW and MU in NER: Oct 2020



## Maximum Demand (MW) and Energy Consumption (MU)



## FREQ PROFILE FOR OCT'20



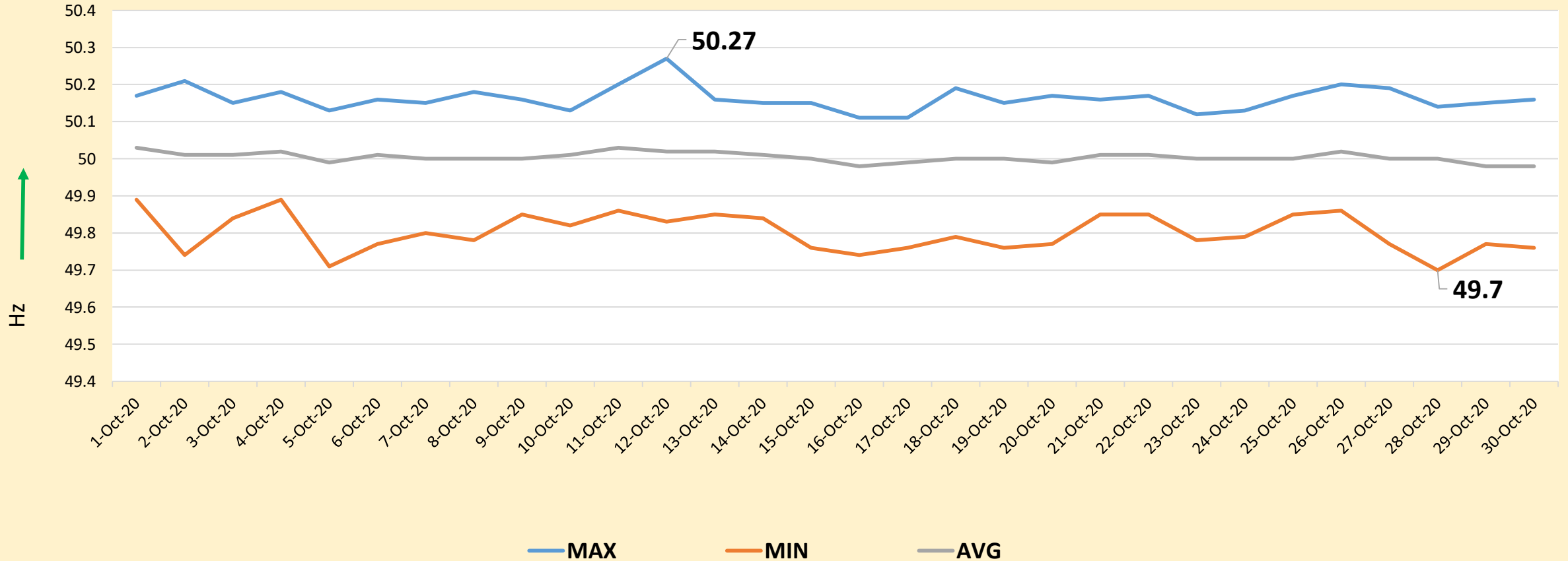
No. of GD	20
No. of GI	10

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# Frequency Profile



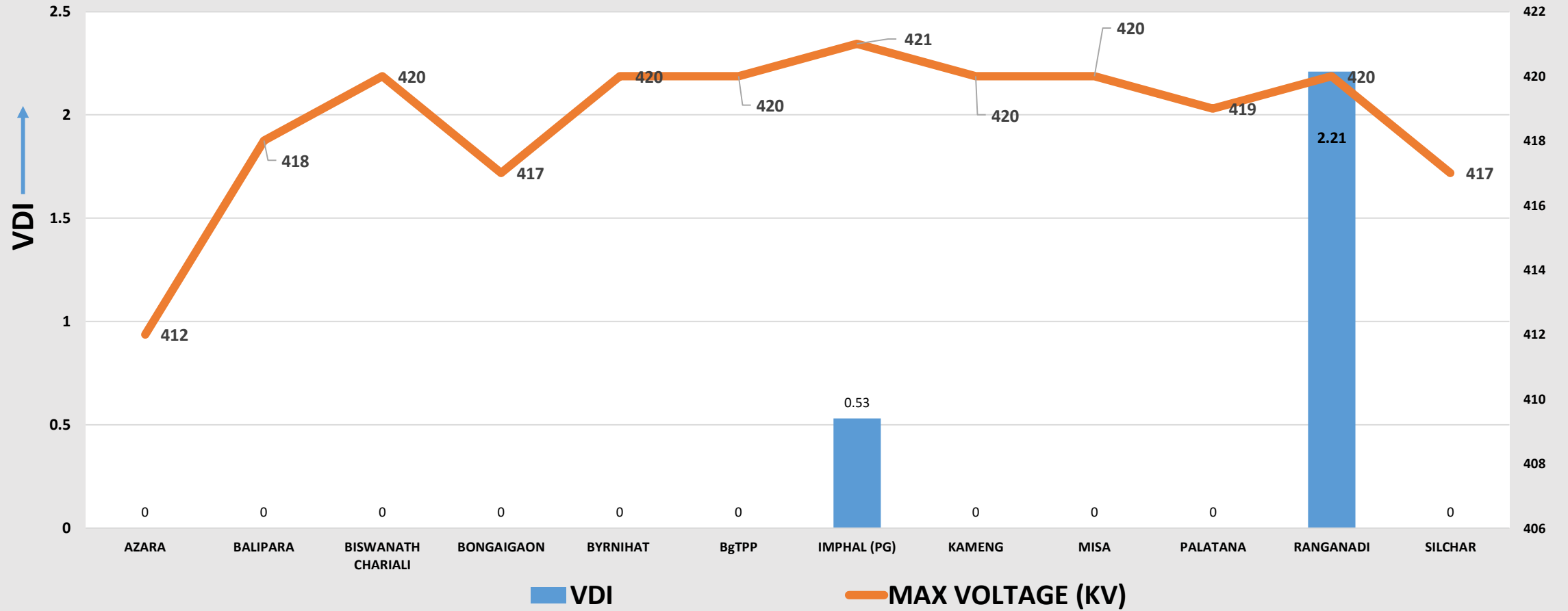
## FREQUENCY PROFILE OCT 2020



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# VDI (400 KV) FOR OCT 2020

No. of 400 kV lines kept open for over voltage - Nil



## D.2. Status update of important Reactors under prolonged outage:

- 63MVAR L/R for 400kV Palatana-Silchar Ckt-I (Out since Apr'19) – by OTPC ~*Target mentioned in 171<sup>ST</sup> OCCM – 1<sup>ST</sup> WEEK OF NOV'2020*
- 25 MVAR Tertiary Reactor 1, 2 & 3 at BALIPARA ( Reactor 1 & 2- Out since 10.08.2020 and Reactor 3 out since 06.10.2020) – by NERTS

# Transmission Elements Issues



## Measures to mitigate harmful impacts of Power Transmission lines/other transmission infrastructures on Elephants and other wild animals

- Letter received from RIO dated 29/10/2020
- Since 2009 more than 640 elephants died in India due to electrocution. 10 deaths in FY2020-21
- **Major Cause – negligence and non-compliance of CEA (measures relating to Safety and Electric Supply), Regulations 2010 and amendments thereof.**
- Measures to mitigate as per recommendation by committee formed by Ministry of Environment Forest & Climate Change along with CEA and MoP etc:
  - ⑩ Sagging transmission lines to be rectified by transmission utilities, state transcos and DISCOMs
  - ⑩ Joint inspection of every transmission line passing through protected areas
  - ⑩ All electrical accidents to be investigated by electrical inspector and suitable measures to be taken up.
  - ⑩ DISCOMs should use BC (Aerial bunched cables) or underground cable. In case of overhead lines, clearances above ground of the lower cover conductor of 11kV/33kV should be as per CEA safety regulations 2010
  - ⑩ Replacement of existing line with insulated cables/underground cables on priority basis.
  - ⑩ Shifting of transmission line and structures

# Transmission Elements Issues



## D.2. Status update of important grid elements under prolonged outage impacting system operation

Sl. No	Element	Owner	Remarks	Status updated in 171st OCCM
1	132kV Dimapur - Imphal	NERTS	Out since 25.07.2018	By Nov'2020
2	220kV Sonabil-Samaguri-I	AEGCL	Out since 14.01.2019	Restored on 06.11.2020
3	132kV Srikona-Panchgram	AEGCL	Out since 14.01.2019	DPR approval stage
4	132kV Jiribam – Rengpang	MSPCL		By Oct.'20
5	220KV-Agia-BTPS-I	AEGCL	Out since 15.03.2020	Electrical Inspector clearance pending
6	132KV-Pare-Itanagar-1	Arunachal Pradesh	Out since 12.07.2020	By Nov.'20
7	132KV-Ranganadi-Itanagar-1	Arunachal Pradesh	Out since 12.07.2020	By Nov.'20
8	132 kV Rangia-Rowta	AEGCL		
9	132 kV Mariani - Mokokchung	AEGCL	Out since April 2008	
10	FSC of 400 KV Balipara-Bongaigaon-4	NERTS	Out since 02.09.2020	

# Transmission Elements Issues



## D.6 Immediate restoration of 220 kV Bus Coupler bay at Samaguri (AEGCL) & keeping both buses in service at 220 kV substations in Assam power system:

- Single bus operation in 220kV S/s is affecting the safe and secure operation of the NER grid especially Assam Power System.
- Single bus operation is observed in other 220 kV substations of Assam Power system by keeping Bus-Coupler in open condition:

- |                 |             |
|-----------------|-------------|
| 1. Sarusajai    | 5. Namrup   |
| 2. Jawaharnagar | 6. Tinsukia |
| 3. Sonabil      | 7. Samaguri |
| 4. Mariani      | 8. Sonapur  |

- Deliberation in 171st OCCM:
  - Assam to furnish substation wise issues and reasons for keeping Bus coupler open
  - Mapping of Bus Coupler CB/isolator Status to SCADA to be completed for all substations

# Transmission Elements Issues



## D.8. Utilization of Transfer Bus and Bus Coupler Breaker during rectification of Main Circuit Breaker for 132 kV Dimapur-Doyang line 2

- Issues to be resolved for utilization of Bus Couple as deliberated in 171<sup>st</sup> OCCM-
  - wiring of Selector Switch to the BC is to be done
  - Trip Transfer scheme has to be completed.
  - Further LBB has to be commissioned for all the feeders
- *Status to be furnished by NEEPCO*

## C.6. Charging of 33kV Khupi-Kimi line at 132kV:

- Status to be furnished by NEEPCO and Arunachal Pradesh

# Operational Issues



## C.7 Phase Rotation & Related Mismatch Issues in NER

- Taking 400kV Bongaigaon as reference, all bay marking to be done afresh along with all bay elements.
- Secondary connections to the relays and PMUs to be done afresh subsequent to bay marking
- Activities to be completed for 400kV Azara, 400kV Byrnihat, 400kV Silchar and 400kV Palatana by 1st week of Nov'20
- For New Stations after charging phase sequence and bay marking to be submitted to NERLDC for verification.

# Operational Issues



## C.8 Testing of Primary Governor response of NER Generating units as per IEGC

### C1.5.2(g):

- M/S Solvina vide its mail to NERLDC dated 2nd November'20 informed that they have received work orders from all the assigned generating units of NER and shared the tentative test schedule for NER Generators. The tentative testing schedule is as mentioned below:

Region	Station	No. of generators	Suggested Schedule		Duration (days)
			Test Start	Test End	
NER	NEEPCO Ranganadi	3	23-Nov	28-Nov	6
NER	NEEPCO Turial	2	29-Nov	2-Dec	4
NER	NEEPCO-Monarchak	2	9-Nov	12-Nov	4
NER	NEEPCO-Kopili	1	21-Nov	22-Nov	2
NER	NEEPCO-Khandong	2	17-Nov	20-Nov	4
NER	NEEPCO- Pare	2	9-Dec	12-Dec	4
NER	OTPCL- Palatana	2	11-Dec	14-Dec	4
NER	NTPC Bangaigaon TPP	3	17-Dec	22-Dec	6
NER	NHPC Loktak	3	23-Dec	28-Dec	6

NEEPCO, OTPC, NTPC, NHPC are requested to confirm the test schedule.

Since, High Hydro season is nearing its end, it is proposed to complete tests at hydro units by December'20 tentatively

# Operational Issues

## C.9. Non-availing of important shutdown after providing availing confirmation or after receiving post OCC approval

- On few occasions that utilities have not availed shutdowns of important elements like 400 kV Byrnihat-Bongaigaon, 400 kV Azara-Bongaigaon, etc. on the day of shutdown after receiving NERPC approval or after providing D-3 availing request to NERLDC

Sl. No.	Element Name	SD Category	Availing Entity	Reason	Date of Approval by NERPC/ Receipt of D-3 Availing status	Approved Date
1	400KV-AZARA-BONGAIGAON	Post OCC	AEGCL	for works under PSDF scheme	15-10-2020	18-10-2020
2	400KV-BONGAIGAON-BYRNIHAT (KILLING)	170th OCC Approved	NERTS	For rectification of Panel wiring and AMP of Bay equipments	30-09-2020	03-10-2020

- NER-ER import/export capability is reduced in consultation with NLDC, affecting power transactions by all NER utilities, to enable the shutdown
- Utilities are requested to carry out proper planning and strictly avoid such unwanted course of action.

# Operational Issues



## **D.7. Renewal of Maintenance and Support Contract for PSS/E user Licenses:**

- SLDC Meghalaya already has opted for the process of upgradation by CTU
- Other SLDCs may please mention plan of procurement at their end.

## **D.9 Furnishing of data sheet on daily basis for preparation of daily PSP report**

- As discussed in 171<sup>st</sup> OCCM, we are receiving data in required format from all apart from the following states:
  - Manipur
  - Mizoram
  - Arunachal Pradesh

# Operational Issues

**Accurate Load forecasting by SLDCs as per IEGC c1.5.3 for better system operation:**

- RMSE for actual data in comparison to that forecasted data by the states for the month of Oct.'20 are as follows:

Day	Arunachal Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Tripura
Median	15	12	9	10	33	9	14

# Network Issues Grid Disturbance during Oct 2020

## POWER MAP OF NORTH EASTERN REGIONAL GRID (UNDER OPERATION)



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# Number of Days as per Current Hydro Generation



Plants	Reservoir Level in meters (as on 10/11/2020)	MU Content	Present DC (MU)	No of days as per current Generation
Khandong + Kopili STG II	724.85	39.75	1.16	34
Kopili	-	-	-	-
Doyang	322.85	30	0.55	55
Loktak	769.29	113	2.48	46

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# METER RELATED AGENDA

## D.15 SEMs to be Procured: Procurement of 50 more SEMs for new Sterlite & KMTL projects

- a. NERTS informed that the internal process is ongoing for procurement of 50 SEMs for new Sterlite & KMTL projects
- b. Status may be furnished by NERTS

(D.16, D.18 , D.19 & D.20 clubbed)

## SEM Replacement / Installation at new location; New DCD Distribution

- a. NERTS to expedite the process of replacement/new installation of meters as listed in 169th and 170th OCCM
- b. NERTS is requested to install new SEMs in the location in 400kV SS where they draw power for aux consumption
- c. NERLDC is to provide a list for distribution of 20 nos. DCD based on priority of requirement
- d. Status may be furnished by NERTS
- e. List of Location for distribution of DCD is as in next slide

(D.16, D.18 , D.19 &  
D.20 clubbed)  
SEM Replacement /  
Installation at new  
location; New DCD  
Distribution

S. No	SUBSTATION	STATE
1	LEKHI	ARUNACHAL PRADESH
2	AGIA	ASSAM
3	AZARA	ASSAM
4	BTPS	ASSAM
5	SARUSAJAI	ASSAM
6	YUREMBAM	MANIPUR
7	TINSUKIA	ASSAM
8	DULLAVCHERA	ASSAM
9	KAHILIPARA	ASSAM
10	UMTRU	MEGHALAYA
11	MENDIPATHAR	MEGHALAYA
12	BYRNIHAT	MEGHALAYA
13	JIRIBAM	POWERGRID
14	DIMAPUR	POWERGRID

## D.20 SEM data collecting Laptop related issues

- a. NERTS to expedite process of resolving all laptop related issues
- b. Status may be furnished by NERTS

## D.21 Procurement of SEM & DCD/Laptop for future requirements: 125 nos. SEMs and 15 nos. CMRIs shall be procured for future projects & maintaining spare on single tender basis from L&T

- a. NERTS to initiate the process of procurement
- b. Status may be furnished by NERTS

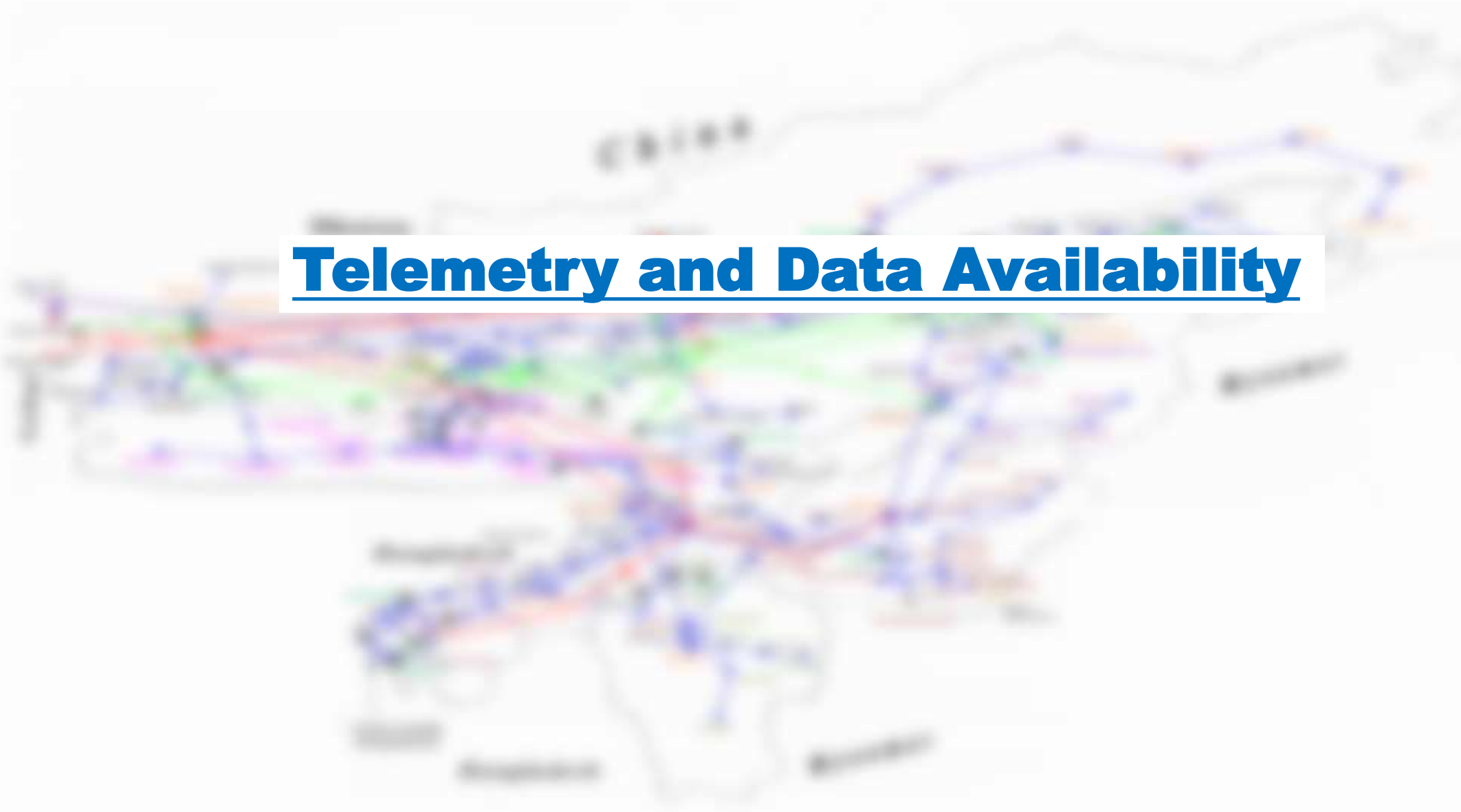
## D.23 Sign reversal problem:

- a. MSPCL to rectify the connections by Oct'20
  - i. Imphal (Man) end of 132 kV Imphal (Man) - Imphal (PG) -I
  - ii. Karong end of 132 kV Karong - Kohima line
- b. DoP Nagaland to replace the CT at Kohima by Oct'20
  - i. Kohima end of 132kV Karong-Kohima line reads 20-25% less of that of Karong end
- c. Status may be furnished by Manipur & Nagaland respectively

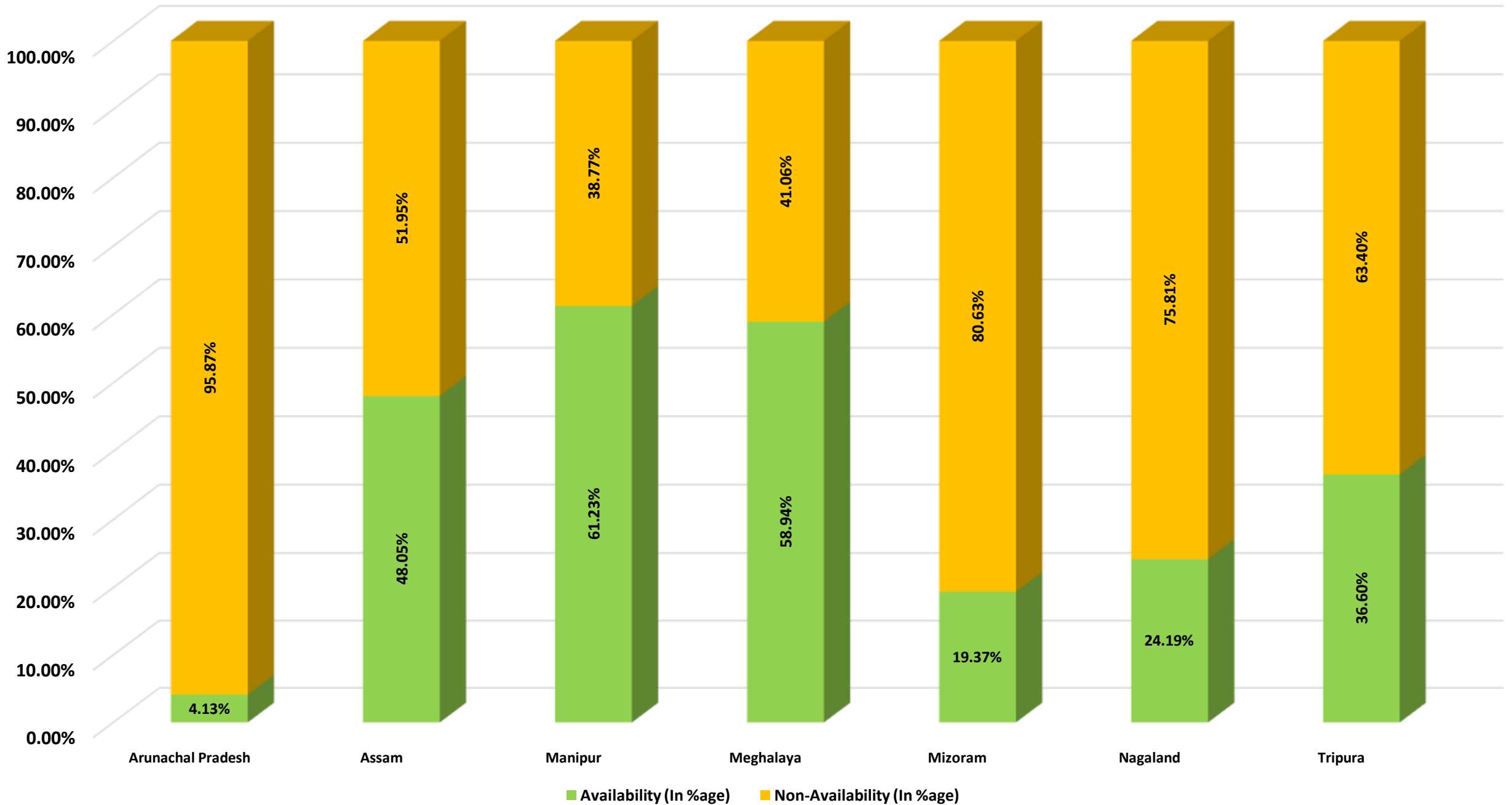
## D.17 Integration of SEMs with laptop/PC for data downloading:

- a. NERTS to co-ordinate with OEM for early implementation of the scheme
- b. Status may be furnished by NERTS

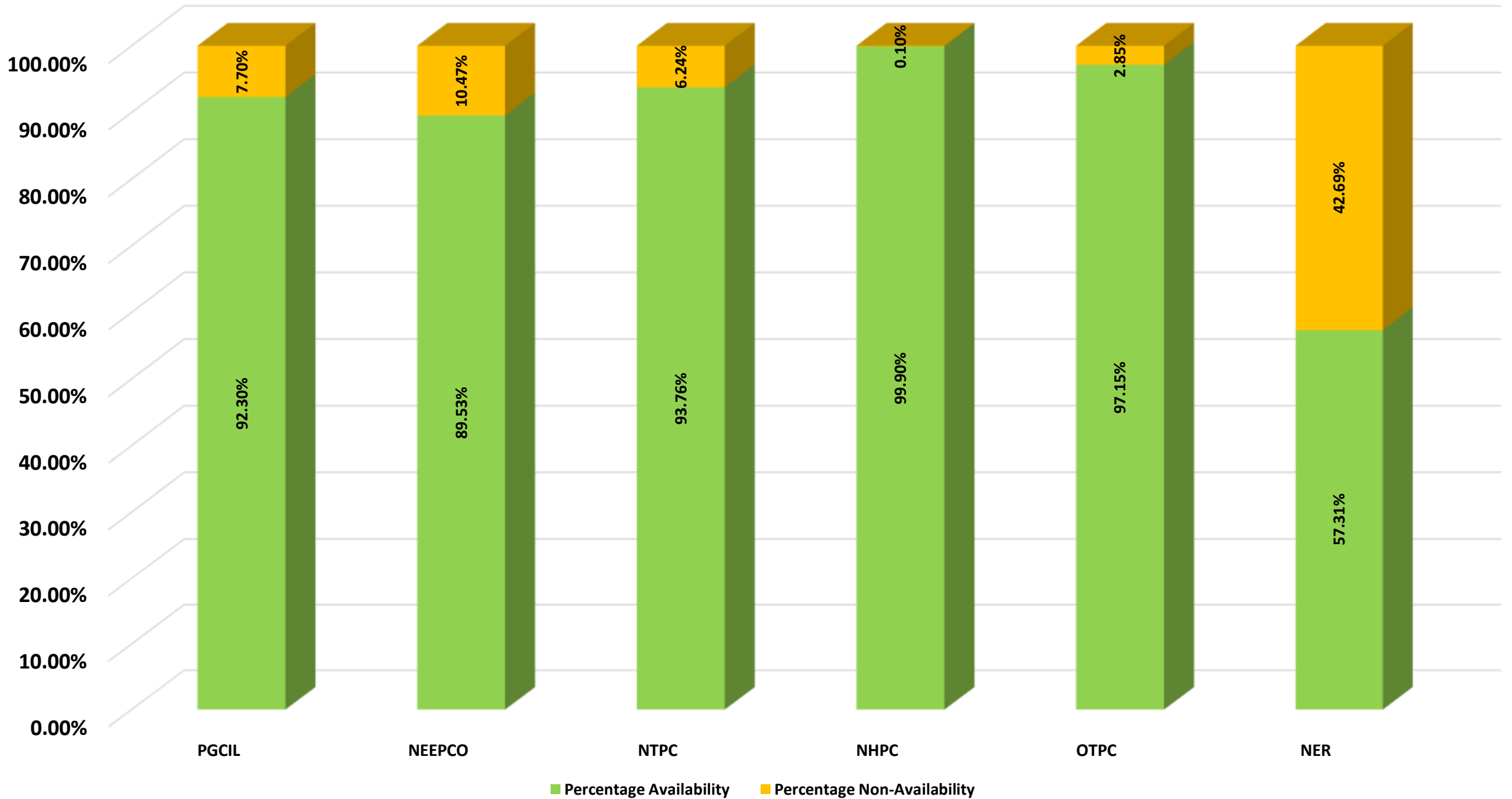
# Telemetry and Data Availability



## Telemetry Statistics for NER States (Average availability of data for the Month of Oct'20)

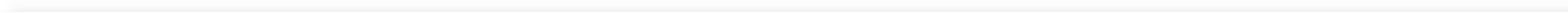


# Telemetry Statistics for Central Sector of NER (Average availability of data for the Month of Oct'20)





*Thank You*



# POSO - TESTING OF PRIMARY FREQUENCY RESPONSE OF GENERATING UNITS AS PER IEGC CLAUSE 5.2(g)

**RC-IN SE SV SCD**  
**5<sup>th</sup> Dec 2020**  
**India**



# Content



- Introduction of Team
- Generating Units where test conducted
- Execution Concept
- Expectation from Generating Units
- Frequency Simulation Concept (Internal/External)
- Test procedure

# Introduction of Team



## Team from Siemens –

### Project Execution Team –

- Mr. Abhraneel Das (for NER and ER) ([Abhraneel.das@siemens.com](mailto:Abhraneel.das@siemens.com))
- Mr. T Ashok Kumar (for SR) ([t.ashokkumar@siemens.com](mailto:t.ashokkumar@siemens.com))
- Mr. Santosh Krishnan (for WR) ([santosh.krishnan@siemens.com](mailto:santosh.krishnan@siemens.com))
- Mr. Puneet Goyal (for NR) ([puneet.goyal@siemens.com](mailto:puneet.goyal@siemens.com))

### Technical Team –

- Mr. SS Kaushik (Operations head) ([ss.kaushik@siemens.com](mailto:ss.kaushik@siemens.com))
- Mr. Shubhyash Gupta (Technical Lead) ([shubhyash.gupta@siemens.com](mailto:shubhyash.gupta@siemens.com))
- Mr. Anurag Shekhar Chaturvedi (System Engineer) ([anurag.chaturvedi@siemens.com](mailto:anurag.chaturvedi@siemens.com))

# Generating Units where test Conducted



## Generating Units in NER allocated

- NEEPCO (Hydel)
- OTPCL (GAS)

## Generating Units in ER allocated

- Maithon Power Limited (Thermal)
- GMR Kamalanga Energy Limited (Thermal)
- JITPL (Thermal)

## Generating Units in SR allocated

- NTPC Simhadri (Thermal)
- Coastal Energen Pvt. Limited, Tuticorin (Thermal)

## Generating Units NR allocated

- NTPC Rihand (Thermal)
- NTPC Kildam (Hydel)
- ADHP (Hydel)
- NHPC Dhauliganga (Hydel)
- NHPC Sewa-2 (Hydel)

## Generating Units WR allocated

- NTPC Sipat (Thermal)
- NTPC Solapur (Thermal)
- NSPCL (Thermal)
- Japee Nigrie (Thermal)
- Reliance Energy Sasan (Thermal)

# Execution Concept



## Phase-I (Input Collection phase)

- The Input collection from the generating units as per annexures submitted before conductance of test.

## Phase-II (Testing Phase)

- The testing agency will ask for test conductance plan from the Generating unit.
- POSOCO/RLDC availability for witnessing the test physically/remotely.
- After receiving testing plan dates, the test will be conducted at site as per test procedure.
- The report of test conducted at site will be submitted to Generating Unit and POSOCO

## Phase-III (Reporting Phase)

- As per inputs for modelling of Governor, the simulation in modeling is done and report of same is shared with Generating Units and POSOCO
- The final report with comparison of test conducted at site and modeling simulation results will be submitted to POSOCO.

## Expectation from Generating Units

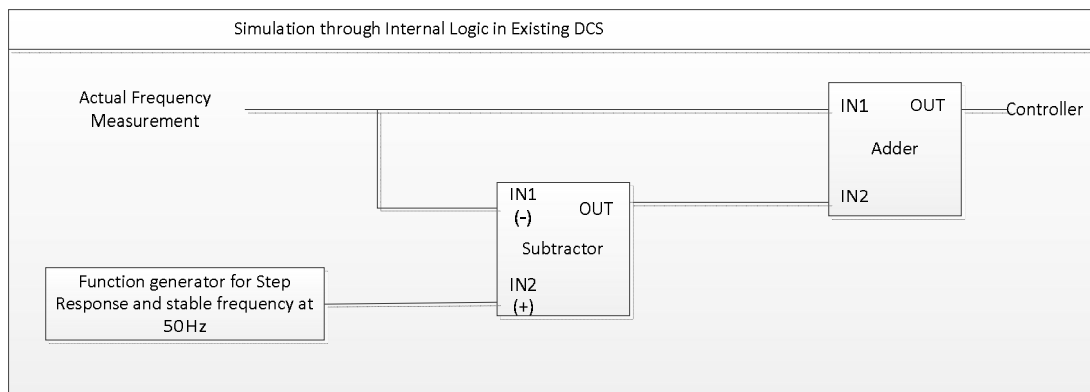
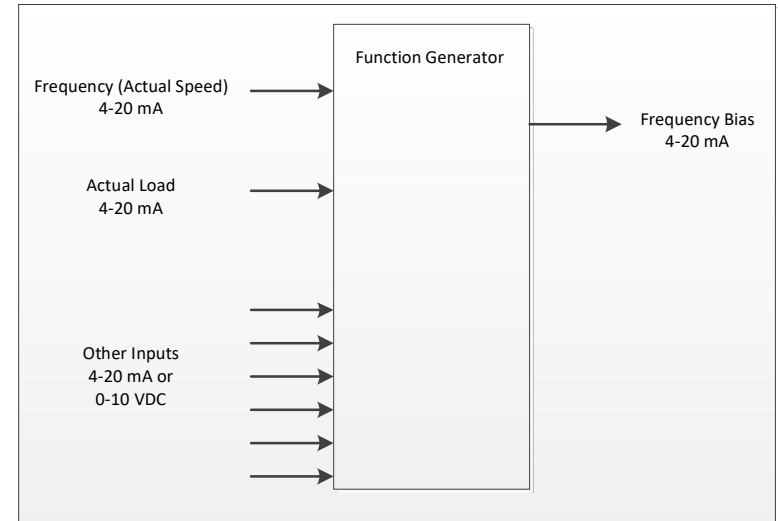
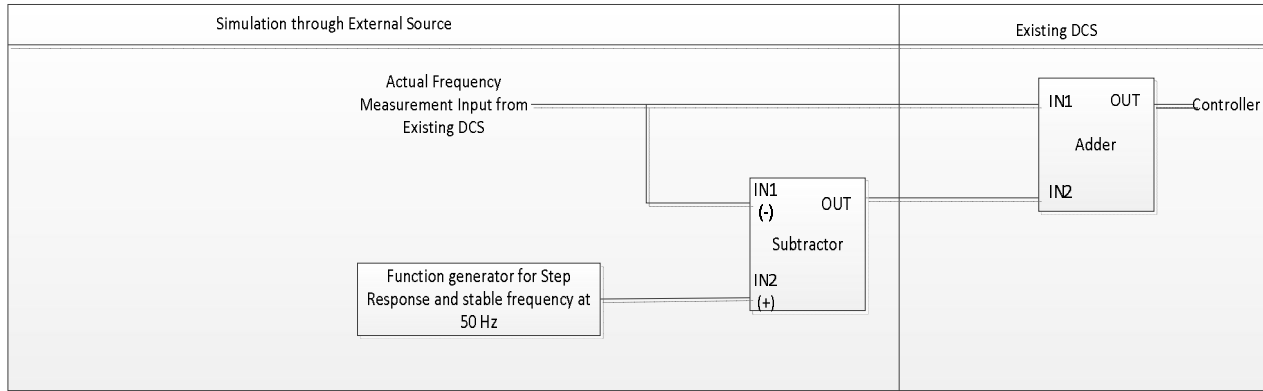
### **The expectation from the Units/Plants under the test as follow: -**

- The Unit should be synchronized with the grid during the conductance of test.
- The simulation of frequency is conducted from the governor logic in existing DCS, if provision is not available then frequency is simulated by external source.
- All the protection should be active during the test,
- In case of any discrepancy the test should be aborted through hardwired or software.
- The droop setting should not change during the test conductance.
- The time schedule for the test conductance from the regional dispatch center.
- AGC should be OFF during the test.
- The report of the test parameters should be exportable in .csv at 100ms resolution for test period +/- 5 minutes.

### **The Unit/Plant conditions for frequency simulation test: -**

- The test is conducted at three level of load, i.e. 95%-100% load range, 75%-80% load range and 60% or technical minimum load range (30% in case of Hydel/Hydro Units).
- The test is conducted for the time period of 5 minutes for each range.
- The Unit in which test is conducting should be at test load range for 15 minutes before and after the conductance of test

# Frequency Simulation Concept (Internal/External)



## Test Procedure

### Test to know the dead band factor –

- To know the dead band factor, 0.01 Hz frequency is simulated in steps of 0.01 Hz till 0.1Hz (i.e. 0.01 Hz, then 0.02 Hz, Then 0.03 Hz, then 0.04 Hz ..... 0.1 Hz) there should not be any response for dead band as per the IEGC guidelines.
- Repeat the above step for negative step response for the dead band, 0.01 Hz frequency is simulated in steps of (-)0.01 Hz till (-)0.1Hz (i.e. (-)0.01 Hz, then (-)0.02 Hz, Then (-)0.03 Hz, then (-)0.04 Hz ..... (-)0.1 Hz) there should not be any response for dead band as per the IEGC guidelines.

### Test conductance to know the performance of generating Unit for frequency simulation in RGMO and FGMO Mode-

- The above-mentioned steps are performed again at three different load ranges.
- As per directive from POSOCO on 26<sup>th</sup> November 2020, the test in two load ranges can be done on +/- 0.05 Hz, +/- 0.10 Hz and +/- 0.13 Hz. The steps in this condition are as per Annexure-A.

### Results extracted from above-mentioned test –

- The quantum of response (MW and MW/Hz contribution delivered) in steady state.
- The time constant of response [i.e. the time taken to deliver (2/3) of the above MW contribution after the frequency offset signal became active].
- The characteristic [linearity/non-linearity) and stability of the response [i.e. the time duration in seconds for which the response was maintained.)

# Annexure-A



**Annexure-1: Possible revision in number of steps and step size for carrying out tests**

Test No.	Signal type	Value(above 50 Hz)	Revised Step Value for two load levels	Test No.	Signal type(Below 50 Hz)	Value	Revised Step Value for two load levels
1	Step	50 to 50.04 Hz	Not Mandatory but desirable	1	Step	50 to 49.96 Hz	Not Mandatory but desirable
	Step	50.04 to 50 Hz	Not Mandatory but desirable		Step	49.96 to 50 Hz	Not Mandatory but desirable
2	Step	50 to 50.05 Hz	<u>Required</u>	2	Step	50 to 49.95 Hz	<u>Required</u>
	Step	50.05 to 50 Hz	<u>Required</u>		Step	49.95 to 50 Hz	<u>Required</u>
3	Step	50 to 50.06 Hz	Not Mandatory but desirable	3	Step	50 to 49.94 Hz	Not Mandatory but desirable
	Step	50.06 to 50 Hz	Not Mandatory but desirable		Step	49.94 to 50 Hz	Not Mandatory but desirable
4	Step	50 to 50.08 Hz	Not Mandatory but desirable	4	Step	50 to 49.92 Hz	Not Mandatory but desirable
	Step	50.08 to 50 Hz	Not Mandatory but desirable		Step	49.92 to 50 Hz	Not Mandatory but desirable
5	Step	50 to 50.10 Hz	<u>Required</u>	5	Step	50 to 49.90 Hz	<u>Required</u>
	Step	50.10 to 50 Hz	<u>Required</u>		Step	49.90 to 50 Hz	<u>Required</u>
6	Step	50 to 50.13 Hz	<u>Required</u>	6	Step	50 to 49.87 Hz	<u>Required</u>
	Step	50.13 to 50 Hz	<u>Required</u>		Step	49.87 to 50 Hz	<u>Required</u>
7	Step	50 to 50.15 Hz	Not Mandatory but desirable	7	Step	50 to 49.85 Hz	Not Mandatory but desirable
	Step	50.15 to 50 Hz	Not Mandatory but desirable		Step	49.85 to 50 Hz	Not Mandatory but desirable

# Any Question





Thanks

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