North Eastern Regional Power Committee

MINUTES OF THE 127th OPERATION COORDINATION SUB-COMMITTEE MEETING OF NERPC

Date : 14/12/2016 (Wednesday)

Time : 10:00 hrs

Venue : "Hotel Nandan", Guwahati.

The List of Participants in the 127th OCC Meeting is attached at **Annexure – I**

Shri P.K. Mishra, Member Secretary, NERPC welcomed all the participants to the 127th OCC meeting. He noted the presence of participants from all the utilities except Nagaland. Member Secretary further apprised the members of the great pain taken by S.E.(O),NERPC in getting the 17th RPC meeting minutes signed by RPC members. He further stressed that CDAC project is stalled at the moment inspite of RPC approval. He requested all the states to nominate nodal officers in this OCC meeting. Member Secretary informed that from now on Action taken agenda would be included after confirmation of minutes in order to highlight long pending actions.

The forum unanimously vetted the suggestions of Member Secretary, NERPC.

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

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 126th MEETING OF OPERATION SUB-COMMITTEE OF NERPC.

The minutes of 126th meeting of Operation Sub-committee held on 15th November, 2016 at Guwahati were circulated vide letter No. NERPC/SE (O)/OCC/2016/4556-4591 dated 25th November, 2016.

Item D.23 Recorded:

Sr. Manager, NEEPCO informed that all their plants have DAS installed.

The observation given by NEEPCO on Item D.26 of 126th OCC is given below

"Sr. Manager, NEEPCO informed that all plants except Khandong, Doyang, Kopili have DAS installed".

Item D.26 Recorded:

After detailed deliberation it was decided that clearance given by the 1st. party in case of URS power sale in market/exchange, is to be treated as standing clearance. The 1st. party would not have option to recall once it is sold in market.

The observation given by TSECL on Item D.26 of 126th OCC is given below

"It was discussed & decided that consent from beneficiary utility is required for sale of intraday un-requisitioned power through URS by generators. The beneficiary state shall continue to have right to Schedule un-requisitioned power depending up-on demand & supply availability during intraday operation".

Deliberation of the sub-Committee:

DGM(MO),NERLDC clarified that standing clearance by states are pertaining to the cases when generators intend to sell power in the market/exchange. However, in case of scheduling of URS power among beneficiaries which has been in practice, there would be right to recall by original beneficiary as usual.

The Sub-committee confirmed the minutes of 126th OCCM of NERPC with the above modifications as no further comments/observations were received from the constituents.

ITEMS FOR DISCUSSION

B.1. OPERATIONAL PERFORMANCE AND GRID DISCIPLINE DURING NOVEMBER, 2016

As per the data made available by NERLDC, the grid performance parameters for November, 2016 are given below:

NER PERFORMANCE DURING NOVEMBER, 2016

	Energy Met (MU)		w.r.t. Oct,16 % inc (+) /dec (-)	Energy Reqr. (MU)		w.r.t. Oct,16 % inc (+) /dec (-)	% inc (+) /dec (-) of energy reqr vs met. In Nov,16
States	**Nov-16**	**Oct-16**		**Nov-16**	**Oct-16**		
Ar. Pradesh	57.73	61.67	-6.39	58.87	63.04	-6.61	-1.97
Assam	694.49	812.85	-14.56	706.25	834.99	-15.42	-1.69
Manipur	60.66	61.72	-1.72	62.19	64.22	-3.16	-2.52
Meghalaya	136.75	149.79	-8.71	136.75	149.79	-8.71	0.00
Mizoram	41.52	38.90	6.74	42.74	40.17	6.40	-2.94
Nagaland	58.56	66.71	-12.22	59.82	68.16	-12.24	-2.15
Tripura	51.96	130.59	-60.21	53.00	131.88	-59.81	-2.00
Region	**1101.68**	**1322.23**	-16.68	**1119.62**	**1352.26**	-17.20	-1.63

	Demand Met (MW)		w.r.t. Oct,16 % inc (+) /dec (-)	Demand in (MW)		w.r.t. Oct,16 % inc (+) /dec (-)	% inc (+) /dec (-) of Demand vs met. In Nov,16
States	**Nov-16**	**Oct-16**		**Nov-16**	**Oct-16**		
Ar. Pradesh	127	126	0.79	127	128	-0.78	0.00
Assam	1524	1615	-5.63	1531	1673	-8.49	-0.46
Manipur	151	145	4.14	152	145	4.83	-0.66
Meghalaya	312	301	3.65	312	300	4.00	0.00
Mizoram	96	95	1.05	97	95	2.11	-1.04
Nagaland	126	130	-3.08	128	130	-1.54	-1.59
Tripura	266	284	-6.34	266	284	-6.34	0.00
Region	**2314**	**2439**	-5.13	**2377**	**2466**	-3.61	-2.72

REGIONAL GENERATION & INTER-REGIONAL EXCHANGE IN MU

Month---->	**Nov-16**	**Oct-16**
Total Generation in NER (Gross)	1180.98	1437.79
Total Central Sector Generation (Gross)	947.74	1116.88
Total State Sector Generation (Gross)	233.24	320.90
Inter-Regional Energy Exchange		
(a) NER-ER	**33.07**	**13.15**
(b) ER-NER	**460.46**	**418.31**
(c)NER-NR	**401.67**	**396.19**
(d)NR-NER	52.14	10.16
© Net Import	77.85	19.13

AVERAGE FREQUENCY (Hz)

Month---->	**Nov-16**	**Oct-16**
	% of Time	% of Time
Below 49.9 Hz	9.28	5.72
Between 49.9 to 50.05 Hz	72.20	74.78
Above 50.05 Hz	18.50	19.50
Average	50.00	50.00
Maximum	50.27	50.25
Minimum	49.99	49.74

Manager, NERLDC highlighted the reduction in energy requirement for Manipur, Meghalaya and Tripura vis-à-vis the previous year.

MSPCL representative clarified that prepaid metering implemented in Manipur has reduced the energy consumption drastically.

SE, SLDC, MeECL informed that unscheduled load shedding, reduction in industrial load and non-precipitation of OA agreements resulted in reduced requirement. NERLDC requested MeECL to provide captive generation figures in daily operational report. MeECL agreed.

Sr. Manager, TSECL informed that the main reason for the reduction in requirement in November was due to the early onset of winter.

The forum requested MSPCL, MeECL and TSECL to kindly give a presentation in next OCC meeting on the reduction in energy consumption and the overall load growth in respective states.

ITEMS FOR DISCUSSION

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

During 126th OCC meeting, the status as informed by NTPC, NEEPCO, POWERGRID, DoP Ar. Pradesh and DOP, Nagaland is as follows:

SN	Items	Status as given in 127th OCC Meeting	Status as given in 126th OCC Meeting
a. New Projects			
1	Trial operation and CoD of Unit -II of Bongaigoan TPS of NTPC	Synchronization by January, 2017 & CoD by 31.03.2017	Synchronization by November, 2016 & CoD by 31.03.2017
2	400/220kV, 2x315 MVA ICT of NTPC at Bongaigaon	January,2017	December, 2016
3	Trial operation and CoD 36MW STG of Monarchak GBPP of NEEPCO	December, 2016 (subject to gas availability)	December, 2016 (subject to gas availability)
4	Kameng HEP of NEEPCO two units (2 x 150 MW) Next two units (2x150 MW)	Unit #1 Oct'17 Unit #2&#3 Nov'17 Unit #4 Dec'17	Unit #1 Oct'17 Unit #2&#3 Nov'17 Unit #4 Dec'17
5	Pare HEP of NEEPCO (2 x 55 MW)	Unit #1 July'17 Unit #2 Aug'17	Unit #1 July'17 Unit #2 Aug'17
6	400 kV D/C Silchar - Melriat line of PGCIL	June, 2017.	March, 2017.
7	220kV Rangia - Salakati of AEGCL	December, 2016	December, 2016
8	132kV Monarchak – Surjamaninagar D/C of TSECL	March, 2017	March, 2017
9	400/132 kV, 2nd 125 MVA ICT at Pallatana	Synchronized on 08.10.2016 COD expected by 25.12.2016	Synchronized on 08.10.2016 COD expected by 25.12.2016
10	132kV Pasighat – Aalong of Ar. Pradesh	December, 2016.	December, 2016.
11	132kV Doyang– Wokha	December, 2016.	December, 2016. (Nagaland requested NEEPCO to expedite)

12	220 kV, 20 MVAR Line Reactor& bay at AGBPP on 220 kV NewMariani – AGBPP line	15.12.2016 -test charged 20.12.2016 - CoD	15.12.2016 (Problem with foundation of reactor need to be rectified)
13	132kV Surjamaninagar Bay at OTPC	31.08.2017	March, 2017.
14	400kV D/C Balipara – Kameng	March 2017.	December 2016.
15	RHEP 80 MVAR Bus Reactor	Tendering in process.	Approved by SCM/RPC. Tendering to be done.
16	SLDCs (Ar. Pradesh, Manipur, Mizoram, Nagaland)	Manipur - Dec'16, Mizoram- Jan'17, Nagaland-handover of building by Dec'16, AP- Work started.	Manipur - Dec'16, Mizoram- Jan'17, Nagaland-handover of building by Dec'16, AP- Work started.
17	400/220 kV 315 MVA ICT-II at Bongaigaon	Manufacturing stage	Manufacturing stage
18	220/132 kV, 2x160 MVA ICTs at Balipara	By 31st August 2017(LOA date).	By 31st August 2017.
19	220/132 kV, 1x160 MVA ICT with GIS Bay at Kopili	By 31st August 2017(LOA date).	By 31st August 2017.
20	400/132 kV, 1x315 MVA ICT-III at Silchar	December, 2017(LOA date).	December, 2017.
21	Replacement of 2x315 MVA ICTs with 2x500 MVA ICTs at Misa (PG)	December, 2017(LOA date).	December, 2017.
22	400 kV Silchar – Misa D/C	Under TBCB	Under TBCB
23	1x125 MVAR Bus Reactor at 400 kV at Balipara	December, 2017(LOA date).	December, 2017.
24	1x125 MVAR Bus Reactor at 400 kV Bongaigoan	December, 2017(LOA date).	December, 2017.
25	Bays at Hailakandi & 132V Silchar-Hailakandi	March, 2017.	March, 2017.
b. Elements under breakdown/ upgradation			
26	63MVAR Reactor at Byrnihat of Me.PTCL	Forum requested MeECL& PGCIL to jointly discuss with CGL.	CGL to visit site.
27	Up-gradation of 132 kV Lumshnong-Panchgram line	Reports given to be analyzed by MePTCL.	Reports given to be analyzed by MePTCL.

28	Switchable line Reactors at 400kV Balipara & Bongaigoan	Balipara - Oct'16 Bongaigaon - Dec'16.	Balipara - Oct'16 Bongaigaon - Dec'16.
29	PLCC Panels at Loktak end of Loktak – Ningthoukhong 132 kV feeder and Loktak - Rengpang 132 kV feeder	Work(s) have been included in tender for additional line of 132kV Loktak-Ningthoukong	Work(s) have been included in tender for additional line of 132kV Loktak-Ningthoukong
30	LILO of 132kV Ranganadi – Nirjuli at Pare of NEEPCO by PGCIL	Jan'17	Dec'16
31	LILO of 132kV Ranganadi – Itanagar (Chimpu) at Pare of Ar. Pradesh	Bay at Pare under construction Bay 1: December 2016 Bay 2: March 2017	Bay at Pare under construction Bay 1: December 2016 Bay 2: March 2017
32	400KV 80MVAR Bus Reactor at OTPC Palatana	OTPC informed there has been no response from BHEL. Forum suggested that OTPC initiate commercial action. By 31.12.2016	By 31.12.2016

The Sub-committee noted as above.

C.2 <u>Monthly MU requirement & availability of each state of NER as per format:</u>

The following figures of state wise MU requirement and availability were taken from draft LGBR 2016-17 of NERPC. State wise MU requirement and availability for these months are to be checked. Constituents may kindly verify if the above data are correct.

Requirement:

Name of State	Apr16	May16	Jun16	Jul16	Aug16	Sep16
Ar. Pradesh	67	71	68	73	73	73
Assam	775	791	816	872	872	847
Manipur	82	77	76	80	80	80
Meghalaya	170	175	165	175	175	170
Mizoram	42	42	42	45	45	45
Nagaland	65	68	72	77	77	72
Tripura	112	122	122	122	128	122
NER	**1313**	**1346**	**1361**	**1424**	**1450**	**1409**

Name of State	Oct16	Nov16	Dec16	Jan17	Feb17	Mar17
Ar. Pradesh	73	68	68	68	59	74
Assam	816	714	714	714	648	740
Manipur	85	88	95	92	88	90
Meghalaya	185	195	210	220	185	190
Mizoram	46	46	48	48	42	42
Nagaland	74	68	71	69	68	68
Tripura	133	112	122	128	102	128
NER	**1412**	**1291**	**1328**	**1339**	**1192**	**1332**

Availability:

Name of State	Apr16	May16	Jun16	Jul16	Aug16	Sep16
Ar. Pradesh	46	58	82	92	79	74
Assam	483	544	649	737	703	682
Manipur	58	69	85	108	102	99
Meghalaya	100	149	191	250	258	258
Mizoram	38	44	54	63	59	57
Nagaland	42	51	66	83	79	77
Tripura	185	204	204	222	213	208
NER	**950**	**1119**	**1330**	**1557**	**1493**	**1455**

Name of State	Oct16	Nov16	Dec16	Jan17	Feb17	Mar17
Ar. Pradesh	67	52	54	51	45	55
Assam	648	567	580	567	502	564
Manipur	95	81	76	71	61	69
Meghalaya	209	150	138	125	115	123
Mizoram	54	48	44	43	39	45
Nagaland	71	55	54	50	45	50
Tripura	225	211	224	222	190	217
NER	**1370**	**1163**	**1171**	**1130**	**997**	**1121**

In 123rd OCC meeting, as per suggestion by Member Secretary, NERPC it was decided that a comparison of actual vs figures projected in LGBR 2016-17 is to be prepared from now on.

S.E.(C&O),NERPC highlighted that in case of Meghalaya the difference is glaring. S.E, SLDC, Meghalaya informed that revised figures for 2016-17 had already been provided to NERPC and requested NERPC to incorporate the same.

The revised figures for Meghalaya may be made furnished again for incorporation.

The comparison of the projected figures as per LGBR (2016-17) and actual figures are given below:

Requirement:

Name of State	Oct16(actual)	Oct16(LGBR)	Nov16(actual)	Nov16(LGBR)
Ar. Pradesh	63.04	73	58.87	68
Assam	834.99	816	706.25	714
Manipur	64.22	85	62.19	88
Meghalaya	149.79	185	136.75	195
Mizoram	40.17	46	42.74	46
Nagaland	68.16	74	59.82	68
Tripura	131.88	133	53.00	112
NER	**1352.26**	**1412**	**1119.62**	**1291**

Availability:

Name of State	Oct16(actual)	Oct16(LGBR)	Nov16(actual)	Nov16(LGBR)
Ar. Pradesh	61.67	67	57.73	52
Assam	812.85	648	694.49	567
Manipur	61.72	95	60.66	81
Meghalaya	149.79	209	136.75	150
Mizoram	38.90	54	41.52	48
Nagaland	66.71	71	58.56	55
Tripura	130.59	225	51.96	211
NER	**1322.23**	**1370**	**1101.68**	**1163**

The Sub-committee noted as above.

C.3 Monthly MW requirement & availability of each state of NER:

The following figures were taken from LGBR 2016-17 of NERPC. These figures are to be reviewed.

A. Peak Demand in MW

Name of State	Apr16	May16	Jun16	Jul16	Aug16	Sep16
Ar. Pradesh	142	142	137	137	142	147
Assam	1451	1472	1498	1508	1560	1539
Manipur	168	168	168	163	168	163
Meghalaya	320	320	320	320	320	320
Mizoram	90	90	95	90	90	90
Nagaland	125	125	125	140	140	140
Tripura	270	291	296	296	301	291
NER	**2651**	**2693**	**2724**	**2739**	**2801**	**2775**

Name of State	Oct16	Nov16	Dec16	Jan17	Feb17	Mar17
Ar. Pradesh	143	132	132	137	137	147
Assam	1513	1508	1518	1456	1352	1466
Manipur	163	179	184	179	179	173
Meghalaya	370	380	390	390	370	340
Mizoram	95	95	101	101	90	95
Nagaland	140	135	135	135	125	125
Tripura	321	275	260	250	250	281
NER	**2790**	**2749**	**2760**	**2688**	**2558**	**2707**

B. Peak Availability in MW

Name of State	Apr16	May16	Jun16	Jul16	Aug16	Sep16
Ar. Pradesh	127	144	195	165	140	138
Assam	1012	1134	1305	1249	1170	1222
Manipur	131	173	184	196	179	181
Meghalaya	257	304	373	433	455	482
Mizoram	83	100	123	117	108	111
Nagaland	109	129	145	142	134	137
Tripura	324	355	369	365	350	357
NER	**2043**	**2340**	**2695**	**2675**	**2534**	**2627**

Name of State	Oct16	Nov16	Dec16	Jan17	Feb17	Mar17
Ar. Pradesh	154	140	129	128	127	179
Assam	1251	1202	1169	1152	1108	1278
Manipur	188	175	147	151	142	188
Meghalaya	442	360	340	312	346	386
Mizoram	117	109	99	98	101	120
Nagaland	142	129	124	122	120	141
Tripura	386	369	373	370	355	392
NER	**2681**	**2484**	**2381**	**2331**	**2298**	**2682**

C. Off Peak Demand in MW (08:00 Hrs)

Name of State	Apr16	May16	Jun16	Jul16	Aug16	Sep16
Ar. Pradesh	78	78	75	75	78	81
Assam	943	898	944	950	952	939
Manipur	109	109	109	106	109	106
Meghalaya	223	230	230	230	230	230
Mizoram	59	59	62	59	59	59
Nagaland	75	75	75	84	84	84
Tripura	184	198	201	201	205	198
NER	**1670**	**1639**	**1689**	**1698**	**1706**	**1689**

Name of State	Oct16	Nov16	Dec16	Jan17	Feb17	Mar17
Ar. Pradesh	79	73	73	75	75	81
Assam	983	935	956	932	852	909
Manipur	106	116	120	116	116	112
Meghalaya	230	235	240	240	230	230
Mizoram	62	62	66	66	59	62
Nagaland	84	81	81	81	75	75
Tripura	218	187	177	170	170	191
NER	**1760**	**1687**	**1708**	**1677**	**1581**	**1661**

D. Off Peak Availability in MW (08:00 Hrs)

Name of State	Apr16	May16	Jun16	Jul16	Aug16	Sep16
Ar. Pradesh	40	50	99	122	102	100
Assam	734	824	1014	1126	1048	1068
Manipur	65	87	119	168	152	148
Meghalaya	198	230	305	416	428	445
Mizoram	50	61	88	102	93	93
Nagaland	72	84	105	123	115	116
Tripura	362	303	326	345	331	335
NER	**1420**	**1640**	**2054**	**2402**	**2269**	**2304**

Name of State	Oct16	Nov16	Dec16	Jan17	Feb17	Mar17
Ar. Pradesh	81	56	59	57	72	69
Assam	982	927	956	935	927	985
Manipur	132	115	92	84	94	102
Meghalaya	377	295	290	261	303	318
Mizoram	86	75	72	69	78	82
Nagaland	103	89	92	89	93	95
Tripura	343	317	335	329	322	339
NER	**2104**	**1875**	**1896**	**1824**	**1888**	**1989**

A comparison of demand for the month of October & November is given below:

Name of State	Oct16(act)	Oct16(LGBR)	Nov16(act)	Nov16(LGBR)
Ar. Pradesh	128	143	127	132
Assam	1673	1513	1531	1508
Manipur	145	163	152	179
Meghalaya	300	415	312	425
Mizoram	95	95	97	95
Nagaland	130	140	128	135
Tripura	284	321	266	275
NER	2466	2790	2377	2749

Deliberation of the sub-Committee:

In actual versus LGBR, considerable difference was observed in Meghalaya, Nagaland, Tripura.

The forum requested that states may check the reasons for such variation as to whether due to forecasting error or other reasons, and intimate.

The Sub-Committee noted as above.

C.4 Implementation of Automatic Demand Management Scheme (ADMS)

In order to comply the Hon'ble CERC's Order, the OCC of NERPC agreed to implement the ADMS in atleast one sub-station of each state in NER on pilot basis (preferably in State Capitals) initially and accordingly the estimates were prepared and the cost is given as below:

Sr. No	State	Estimated Cost (Crore)	Scope of work
1	Arunachal Pradesh	4.5	Supply, installation and commissioning of RTU System in 1 no. of 132/33kV Substation & 2 no. of 33kV Substations including ADMS Software and hardware with Fibre Optic communication link & accessories between 33kV and 132kV S/Stns - (Chimpu).

2	Nagaland	5.0	Supply, installation and commissioning of RTU System in 1 no. of 132/33kV Substation & 2 no. of 33kV Substations including ADMS Software and hardware with Fibre Optic communication link & accessories between 33kV and 132kV S/Stns- (Nagarjan).
3	Mizoram	5.1	Supply, installation and commissioning of RTU System in 1 no. of 132/33kV Substation & 2 no. of 33kV Substations including ADMS Software and hardware with Fibre Optic communication link & accessories between 33kV and 132kV S/Stns – (Luangmual)
4	Manipur	4.5	Supply, installation and commissioning of RTU System in 1 no.of 132/33kV Substation & 2 no. of 33kV Substations including ADMS Software and hardware with Fibre Optic communication link & accessories between 33kV and 132kV S/Stns – (Kongba) .
5	Tripura	5.0	Supply, installation and commissioning of RTU System in 1 no. of 132/33kV Substation & 2 no. of 33kV Substations including ADMS Software and hardware with Fibre Optic communication link & accessories between 33kV and 132kV S/Stns – (S.M. Nagar).
6	Assam	4.3	Supply, installation and commissioning of RTU System in 1 no. of 132/33kV Substation including ADMS Software and hardware with Fibre Optic communication link & accessories between 33kV and 132kV S/Stns – (Kahilipara).
7	Meghalaya	1.9	Supply and Commissioning of ADMS Software with necessary hardware in SLDC – (NEHU).

The 17th TCC/RPC approved the above estimates and Member Secretary, NERPC requested all NER States to send the proposal to NLDC/CEA at the earliest for funding from PSDF so that ADMS can be implemented in the region as directed by Hon'ble CERC.

In 126th OCCM, S.E (C&O), NERPC requested the constituents to once again send their proposals to NLDC/CEA as early as possible.

Deliberation of the sub-Committee:

DGM,SLDC,AEGCL informed that in case of estimates prepared by different vendors price variation arises which may pose a problem at the time of approval by Appraisal Committee. The forum requested NERPC to prepare common formats for normalization. S.E.(C&O),NERPC once again reiterated that since monitoring of PSDF projects is to be done at regional level including technical progress and fund

utilization. All the utilities are requested to regularly submit the status of different projects to NERPC.

The Sub-Committee noted as above.
Action: All state utilities, SLDCs.

C.5 Reactive Power Planning:

In the 4th meeting of NPC, it had been agreed that states should adopt a proactive approach in the matter of reactive power planning, and that the provisions regarding reactive power planning similar to those mandated in the IEGC for the CTU should be included in the respective State Grid codes.

It was informed in the meeting that Sub-Committee of PSDF had forwarded few schemes of capacitor installation by states to respective RPC for approval of RPCs. It was of the view that RPC might be able to justify the requirement of capacitor installation of state.

After detailed deliberation, it was agreed that the proposal of capacitor installation planning by states/entities would be referred to RPCs and to PSDF Sub-Committee routed through RPCs and the proposal would be vetted by the respective RPC.

In 125th OCCM, S.E (C&O), NERPC once again reiterated the need for this scheme and requested all the states to finalize their estimate before the forthcoming TCC/RPC meetings.

The DPR cost furnished by Mizoram & Nagaland is Rs. 16.87 Cr and 25 Cr respectively and the system study has been carried out by ERDA, New Delhi.
The 17th TCC/RPC approved the above DPR cost of Mizoram & Nagaland.

Member Secretary, NERPC requested Mizoram & Nagaland to send the proposal to NLDC/CEA at the earliest for funding from PSDF.

In 126th OCCM, S.E (C&O), NERPC requested the other states to finalize their proposals and submit the same at the earliest.

Deliberation of the sub-Committee:

After detailed deliberation it was decided that only those states which have a low voltage problem needs to prepare DPR in this regard. It was noted that Mizoram and Nagaland have already completed the exercise of identification of low voltage nodes in their state and drawn up a DPR, by engaging consultant. All SLDCs have to carry out

the exercise of identifying low voltage nodes and inform by next OCC meeting whether this project is at all required for their respective states.

The Sub-Committee noted as above.

Action: All state utilities, SLDCs of Ar. Pradesh, Assam, Manipur, Meghalaya and Tripura.

C.6 Reasons For Demand - Supply Gap And Its Variation:

It was deliberated in the 4th NPC meeting that monthly power supply position prepared & published by CEA based on the data furnished by the states reflected shortages in almost all the states. However, a number of those states intimated adequate availability of power. This meant that the deficit/shortage in such states was actually not the deficit in true sense but demand-supply gap due to reasons other than shortage of power. The other reasons for the demand-supply gap could be inadequate availability of power, transmission constraint, distribution constraint, financial constraint, etc. The reason for demand-supply gap needed to be clearly mentioned to reflect true picture of power supply position in different states and also to invite attention of various agencies including policy makers to the specific problem areas in the power sector for suitable solution.

After deliberation it was decided in the meeting that all the RPCs would advise the states in their respective regions to intimate broad break-up of demand-supply gap due to various reasons, or at least, the main reason(s) for demand-supply gap in each month.

In 125th OCCM, Sr. Engineer, NERLDC informed that AEGCL, TSECL are providing the detailed breakup of shortfall figures. Meghalaya and Mizoram are reporting nil shortfall while no figures are being received from DoP, Ar. Pradesh, MSPCL and DoP Nagaland.

In 126th OCCM, S.E.(C&O),NERPC informed the forum that as per communication received from GM Division CEA, unscheduled load shedding and scheduled load shedding for peak demand met instance is to be provided. Accordingly, all the constituents & NERLDC were requested to indicate the latter from November, 2016 onwards. The forum requested DoP Ar. Pradesh, MSPCL and DoP Nagaland to submit the shortfall figures periodically.

Deliberation of the sub-Committee:

S.E.(C&O), NERPC once again requested the SLDCs to indicate breakup of short fall figures clearly. He requested NERLDC to provide the breakup in monthly reports clearly and highlight the cases where not provided.

NERLDC expressed that differences are coming up on account of several reasons, and proper accounting of captive load and generation is to be done by SLDCs. In case the captive power consumption is not included, the overall demands met of the states are reflecting less than actual. All SLDCs were requested to check and reflect the captive generation figures in their daily operational reports.

NERPC will circulate the Installed Capacity figures compiled by them for ratification by all.

The Sub-Committee noted as above.

Action: SLDCs, NERPC, NERLDC.

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	2		21.93	718.9
Kopili-II	1			
Kopili	4		161.52	606.3
Ranganadi	3		Subject to inflow	
Doyang	3		30	322.1
Loktak	3		250	768.91
AGBPP	-	-	-	-
AGTPP	-	-	-	-

Hydro planning

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

Deliberation of the sub-Committee:

The Committee discussed and approved the proposed shutdown by Generating Stations and the same is given in Annexure – D.2 (along with trans-element).

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 124th OCCM, SE(C&O) strongly opined that constituents should inform to NERPC/NERLDC in case shutdown is not avail as approved in the OCC meeting and should mention clearly the reason for not availing the shutdown. The full list of shutdown would be placed in the next OCC by NERLDC so that proper record can be made in future for generating units as well as transmission lines. All constituents endorsed the view of SE(C&O).

Deliberation in the meeting

S.E.(C&O),NERPC once again requested NERLDC to present the abstract of shutdowns approved/availed in every OCC hereon. NERLDC agreed.

The sub-Committee discussed and approved the proposals received from the constituents regarding transmission elements and generating units for December, 2016 - January, 2016 and the same has already been uploaded in website of NERPC.

D.3 Estimated Transmission Availability Certificate (TAC) for the month of August & September, 2016:

NETC and POWERGRID have submitted the outage data for the month of August & September, 2016. So the attributability of outage of the said elements may please be finalized.

The forum once again advised NETC&POWERGRID to submit data in a time bound manner as decided previously.

The Sub-Committee noted as above.

D.4 Furnishing of Technical and Commercial data for computation of PoC Charges and Losses for Q1 of 2017-18 (April 2017 – June 2017):

In the 3rd Validation Committee meeting for PoC application period Oct'15-Dec'15, held on 30th September 2015, at NLDC conference Hall, CERC had proposed a methodology for ratification of projected data at RPC form.

In line with the decision in the Validation Committee meeting, Members may please submit generation, demand and YTC data for Q1 of 2017-18..

Deliberation in the meeting

Sr. Engineer, NERLDC informed that a formal communication in this regard has not yet been received from NLDC. He requested all the utilities may submit PoC data for Q1 of 2016-17 by 31.01.2017.

The Sub-Committee noted as above.
Action: All utilities.

D.5 Assessment of Total Transfer Capability (TTC), Transmission Reliability Margin (TRM) and Available Transfer Capability (ATC) by SLDC on respective Inter-State Transmission Corridor

Updated PSSE Base Cases have been **mailed to all the SLDCs on 01.12.16**. All SLDCs are requested to assess the Total Transfer Capability (TTC), Transmission Reliability Margin (TRM) and Available Transfer Capability (ATC) **for the month of January'16** using these cases, and submit the study cases and results to NERLDC **by 15th December, 2016**.

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 conducted by NERLDC will be shown during the meeting**.**

SLDCs are requested to check the TTC of their control areas as computed by NERLDC and **issue comments, if any by 20th December'16.**

If no comments received from any states, 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.

Deliberation in the meeting

Sr. Engr. (SO-II), NERLDC once again requested SLDCs to host the state wise TTC/ATC figures on their website for information dissemination. Member Secretary, NERPC informed that as per discussions in 6th NRCE meeting that Task-I &II assigned to M/s Powertech Labs is for devising methodology for calculation of optimum transfer capability and calculating transfer capability for entire country. In the meantime NERLDC was suggested to continue with the present practice of calculation of TTC/ATC/TRM at state periphery in consultation with SLDCs.

NERLDC requested the states to give comments by 20th Dec'16 on calculated figures.

The Sub-Committee noted as above.

Action: All SLDCs/RLDC.

D.6 Information of Events of Load crash on account of inclement weather conditions:

As per directives of DPE & MoP, Govt. of India, NERLDC have to prepare reports indicating events in the Grid that occurred on account of inclement weather conditions, particularly events involving load crash. For preparation of these reports, the following inputs are required from affected states:

a. Date and Time-frame of such incidence ii. Affected areas
b. Reason for load crash iv. Tripping of LT feeders (33 kV / 11 kV level). SLDCs may indicate affected areas if detailed information is not available.
c. Quantum of load crash and generation loss v. Details of Restoration
d. Any corrective measures (presently taken / suggested for future)

A sample format which is being used by NERLDC for event reporting has been circulated earlier.

As and when such events occur, SLDCs are requested to inform about the event to NERLDC immediately after the incident and prepare a report as per the above format and send the same to NERLDC at rtsdnerldc@gmail.com and nerldc@yahoo.co.in. It is pertinent to mention here that AEGCL, MePTCL & TSECL are sending the Load crash reports to NERLDC on regular basis.

In 123rd OCCM, AEGCL informed that RHEP generation suddenly comes and it is altering the schedule to a great extent. This is resulting in underdrawal at high

frequency resulting in penalty for states. The forum suggested that these instances of sudden generation due to inclement weather should also be included in NERLDC report.

NERLDC informed that load crash report for May, 2016 has been submitted by Assam, Manipur, Mizoram, Meghalaya and Tripura. The forum requested other states to kindly submit the report to NERLDC as and when events of load crash were observed by them.

NERLDC also requested all SLDCs to include the restoration time of these events, so as to enable NERLDC to compute the amount of energy un-served on account of these incidences.

In 124th OCCM, AGM (SO-I), NERLDC informed that except DoP Ar. Pradesh and DoP Nagaland Load Crash Report of other States are being submitted periodically. He further requested that all constituents should send data in the event of load crash along with restoration time. (Start time when the load crash happened and end time when it was restored); if there is no load crash a nil load crash report to be sent by15th of every month.

The latest status as informed by NERLDC in 126th OCC:

Arunachal Pradesh	Not furnishing
Assam	Yes
Manipur	Yes
Meghalaya	Yes
Mizoram	Yes
Nagaland	Yes
Tripura	Yes (But not as per format)

NERLDC requested all the SLDCs to also indicate the restoration details & corrective measures adopted, in the load crash reports.

Deliberation in the meeting

After detailed deliberation it was decided to drop the agenda item as almost all the states are submitting the data on a regular basis.

Arunachal Pradesh and Tripura were requested to give information as per format.

The Sub-committee noted as above.

D.7 Furnishing of UFR Report and status of Implementation:

As per recommendation of enquiry Committee, the status of installation of UFR in NER has been circulated earlier. It is gathered that, 17 MW quantum is yet to be implemented in Manipur.

The 123rd OCC forum decided that monthly report is not being furnished. As per clauses of relevant regulations, and Order of Hon'ble CERC in matter of Petition no. 113/MP/2014, NERLDC and NERPC are mandated to submit status of UFR operation and non-operation to CERC. SLDCs were thus requested to submit UFR operation details (feeder-wise quantum of load relief to be indicated) on monthly basis, and even if no UFR operated in particular month, it should indicated as NIL.

In 124th OCCM, MSPCL informed that UFR has been commissioned to shed extra 17MW and details would be provided by 31.08.2016. S.E.(O),NERPC informed that DoP Ar. Pradesh has already achieved the stipulated load relief. He further requested all utilities to kindly submit UFR operation report for the preceding month within the first week.

AGM (SO-I), NERLDC requested all utilities to provide UFR operation data for GD-V on 16th April'16 and GD-IV on 9th July'16 as per format by 20th August'16.

Deliberation in the meeting

The latest status as informed by NERLDC in 127th OCC:

Arunachal Pradesh	Furnished for Sept'16
Assam	Furnished for Nov'16
Manipur	Furnished for Aug'16
Meghalaya	Furnished for Nov'16
Mizoram	Furnished for Nov'16
Nagaland	Furnished for Oct'16
Tripura	Furnished for Oct'16

The forum requested all the SLDCs/state utilities to certify healthiness of the relays while submitting the UFR operation report monthly.

The Sub-committee noted as above.

Action: All utilities as above.

D.8 Load Forecast Error:

At present day-ahead hourly load forecast data on daily basis is being prepared by NERLDC based on the data sent by SLDCs. It has been observed that there is a huge difference between the forecasted load and the actual demand met.

A comparison between the forecasted load and the actual demand met of all the states of NER was circulated earlier.

In 123rd OCC meeting, Sr. Engineer, NERLDC appraised the communication regarding proper load forecasting received from ED, NLDC. It was informed that states have to give 15 min block-wise data by 11:00 Hrs for next day, which would be used by RLDC to develop the 1st line of forecast. The methodology being followed by states for load forecasting was to be discussed and made uniform, so as to prevent wide variations between forecast and actual figures.

Manager, NERLDC informed that states have to give 15 min block-wise data by 11:00 Hrs for next day. At present Mizoram & Meghalaya are furnishing 15 min forecasting data. He also intimated that the new SCADA has a package for load forecasting which may be explored. The load forecast error was discussed during the meeting.

During 124th OCCM, after detailed discussion DGM, SLDC, AEGCL informed about the difficulty in forecasting due to unpredictable weather. The forum suggested NERLDC to help constituent in forecasting by suggesting better methods.

AGM (SO-I), NERLDC requested all SLDCs to provide the procedure by which load forecast is currently being done by the SLDCs.

In 125th OCCM, AGM (SO-I), NERLDC stated that presently all SLDCs are furnishing day ahead load forecast data and it is observed that these figures vary considerably with actual drawal figures and requested all SLDCs to follow some procedure either with the help of previous day actual drawal pattern or similar day load pattern depending on the weather forecast or any other method which they feel suitable. In real time in case of any unforeseen change the same can be managed by partial requisition or URS requisition or purchase from market etc., whichever is suitable. He once again requested the SLDCs to provide the procedures being followed.

In 126th OCCM, NERLDC displayed a comparison graph of one particular day in October, depicting the variations in Load forecast versus Actuals. The variations were quite significant, and even the diurnal trend of load was not being captured in the load forecasts.

NERLDC requested all SLDCs to share the forecast methodology being followed, for improvement and bringing in accuracy in the forecasts.

Deliberation in the meeting

Sr. Engineer, NERLDC informed that high error in load forecast versus actual existed for the most of the NER states, and Manipur load forecast has been found to be the best amongst forecast of other SLDCs of NER. The forum requested MSPCL to kindly highlight through a brief presentation in next OCC meeting about the method followed by them to forecast load.

All SLDCs agreed to review their load forecast methodology and share with OCC forum.

The Sub-committee noted as above.

Action: MSPCL, All SLDCs.

D.9 Submission of Weekly Outage Report by Utilities.

NERLDC has provided format for submission of weekly outage report by all utilities of NER. The weekly outage reports are required for analysis of Tripping/ Grid Disturbances by Sub-group Committee of NERPC. In absence of the reports it is very difficult to find out the root cause.

MSPCL, MePTCL, P&E, Mizoram, DoP, Nagaland, BgTPP, AGBPP, AGTPP, DHEP, Loktak, Palatana and Kopili are furnishing the details on weekly basis regularly.

DoP, Arunachal Pradesh, AEGCL Ranganadi and Khandong are not furnishing as per the format. DoP, Arunachal Pradesh, AEGCL Ranganadi and Khandong are requested to furnish the details as per the formats.

TSECL is not furnishing the details. NERLDC has requested TSECL repeatedly to furnish the weekly outage report but till now no report has been received. Many disturbances related to Tripura system cannot be analyzed properly in absence of these reports.

In 125th OCCM, Sr. Manager, TSECL agreed to submit weekly outage reports to NERLDC. NERLDC requested DoP, Arunachal Pradesh, AEGCL Ranganadi and Khandong to furnish the details as per the formats.

In 126th OCC meeting, NERLDC intimated that TSECL is presently giving the weekly outage data since 01.09.2016 and had given till last week.

It was, however, noted that the weekly outage report being furnished does not have complete details required for analysis of grid events. The reasons for tripping as per weekly outage report is same as that noted during real-time operations in most cases. NERLDC requested all constituents to provide more relevant data in the weekly outage report.

Deliberation in the meeting

Sr. Engineer, NERLDC informed that all the utilities are submitting the weekly outage reports. After detailed deliberation it was decided to drop the agenda item.

The Sub-committee noted as above.

D.10. NER common data centre (DC) and disaster recovery (DR) centre

As per R-APDRP Scheme the cost of DC & DR beyond the sanctioned amount of GOI and other associated costs to run & operate both the DC & DR are to be shared by all the NER States on the basis of No. of Towns approved under the R-APDRP Schemes. It is noticed that there is inordinate delay in receiving the share from various beneficiary states against the claim raised by APDCL & TSECL. This is causing difficulties in managing the regular O & M operation. Matter be discussed for expediting the release of money by all the NER states.

The 17th TCC referred the matter to OCC forum for discussion.

In 126th OCC meeting, Sr. Manager, TSECL informed that since commercial operation of the DR centre at Agartala bills were raised to the other six states but no payment has been made till date, though it was decided at the time of conception that DC&DR centre operating costs are to be shared among all the states. The forum urged TSECL to provide details in elaborate manner. Sr. Manager, TSECL agreed to revert back in next OCC meeting.

Deliberation in the meeting

Sr. Manager, TSECL informed that the detailed cost breakup and contribution by each state has already been provided to respective utilities. EE, SLDC, Ar. Pradesh opined that since it is a commercial issue the matter may be referred to CCM for fruitful deliberation. The forum ratified the operational aspect and requirement of DC&DR centre. However the commercial aspects need to be straightened out, so the matter was referred to next CCM of NERPC.

The Sub-committee noted as above.

Action: NERPC.

D.11. State-wise energy requirement for 2017-18 and growth w.r.t. 2016-17

CEA vide letter dated. 28.09.2016 stated that as per instructions from MoP the assessment and finalization of generation targets for 2017-18 has been preponed by two months. Considering the urgency it is desired that all SLDCs furnish energy requirement and demand growth for 2017-18.

Deliberation in the meeting

S.E.(O),NERPC requested the members to energy requirement and demand growth for 2017-18 at the earliest.

The Sub-committee noted as above.

Action: All SLDCs.

D.12. Certification of open cycle generation of AGBPP for FY 15-16:

As per methodology decided in 87th OCC meeting and modus operandi decided in 19th & 20th CCM the open cycle generation of AGBPP for FY 15-16 is to be certified. Accordingly it is requested of NERLDC to kindly verify "the generator operation in OC mode due to some fault and problem is resolved in a reasonable time, with DC revision". After verification by NERLDC, certification would be done by NERPC.

In 126th OCC the forum requested NERLDC/NERPC to complete the procedure and present the certification in next OCC meeting, so that members may ratify.

Deliberation in the meeting

Manager, NERLDC informed that the verification for FY 15-16 is under process. He also suggested that the exercise be made periodical so that no backlogs remain. S.E.(C&O), NERPC welcomed the suggestion and requested NEEPCO to submit the outage data monthly.

The Sub-committee noted as above.

Action: NERLDC/NERPC/NEEPCO.

D.13. SPS- Testing without information on dated 23/08/2016:

At 14:21 Hrs OTPC – Palatana GT-1 & GT-2 Generator Line breaker tripped, and both GT-1 & GT-2 came into House load. On analyzing the tripping event it was found that 400 KV Silcher- Byrnihat trip signal received at Palatana end, that lead to tripping of GT-1 & GT-2 Generator Line breakers on SPS-3 protection.

In 126th OCC the forum requested NERTS to kindly clarify whether SPS actually operated and whether a mal-operation occurred.

Deliberation in the meeting

Manager, OTPC informed that the misunderstanding had been mutually resolved with NERTS and suggested the item may be dropped. The forum agreed.

The Sub-committee noted as above.

D.14. Renovation and Modernization of Umiam Stage-III HEPP (2 x 30 Mw)

In line with the policy for taking up Renovation & Modernization (R & M) of old hydroelectric power plants initiated by the Ministry of Power, Government of India, MeECL has decided to take up R & M of Umiam Stage-III HEPP (2 x 30 Mw) commissioned in 1979,considering the aggravated condition of the power plant.

In 126th OCCM, S.E., MePGCL informed that Umiam Stage-III has already completed its useful life having been in service for 37 years since commissioning. He requested that R&M cost be funded from PSDF.

S.E.(C&O),NERPC informed that R&M of power plants are not specifically funded from PSDF under PSDF regulations. However they may be funded under extraordinary Cl.4.1.(e). He requested MePGCL to submit the proposal at the earliest so that the matter may be followed up with NLDC/CERC.

Deliberation in the meeting

S.E.(O), NERPC informed that the reply from CEA is awaited and members would be apprised about the status in next OCC meeting.

The Sub-committee noted as above.
Action: MePGCL/NERPC/CEA.

D.15 Reporting of commissioned transmission elements for TARANG App.

TARANG (Transmission App for Real Time Monitoring and Growth) Mobile App & Web Portal has been developed by REC Transmission Projects Company Ltd (RECPTL) for progress monitoring of transmission systems on Pan-India basis, which was launched by Hon'ble Minister of State for Power on 17th August 2016. The app can be downloaded on smartphones or be accessed through its website (www.tarang.website). As part of the responsibility charter, POSOCO has been assigned the responsibility to update the systems under operation in the 'Completed Transmission Systems' section of the app.

In order to provide this information to the Ministry of Power, it is requested to provide the details of commissioning of transmission elements in respective state for each month by the 3rd day of the next month to NERLDC.

In 126th OCCM, Sr. Engineer, NERLDC emphasized the need for furnishing this data for TARANG app devised by Ministry of Power, Govt. of India for information to the public. It was also mentioned that during recent visit to Guwahati on 11.11.2016, the same was emphasized by Joint Secretary (Power). NERLDC requested all utilities to submit the data to: nerldc@yahoo.co.in by 3rd of every month for the previous month.

Deliberation in the meeting

Sr. Engineer, NERLDC informed that whatever elements have been commissioned in previous month need to be mailed to NERLDC by 3rd of every month. DGM, SLDC, AEGCL requested that respective transmission utilities may be approached for the required data. DGM(MO),NERLDC clarified that the details of any EHV commissioned elements within a State are supposed to be available with SLDCs, so there should not arise any difficulty in this regard.

It was agreed that SLDCs would furnish the data.

The Sub-committee noted as above.
Action: All SLDCs.

D.16. Frequency control through Primary response from governor action on generating units

In continuation to discussions in 125th OCC meeting on this matter, and letter from ED-NLDC dtd. 10th October'16, it is requested that all generators may take urgent action to ensure Primary response as per stipulation [As per Sec.1(4) of Part-II of CEA's Grid Connectivity standards, 0-10% droop for hydro generator governors ; 3-6% droop for Thermal generator governors].

Also, as per Section 11.2.(i) of CEA's Technical Standards for Construction, all generating stations must store important analog data in 1 seconds interval.

NEEPCO has informed that AGTPP and Ranganadi HEP have properly working DAS, that are capable of storing Machine side data like Voltage, frequency, Active power generation, Reactive power generation, Line currents, etc. Also, it was confirmed in last OCC that DAS at AGBPP is installed but not time-synchronized.

All generating stations may confirm that their governors are properly tuned for giving primary response as per regulations.

Also, NEEPCO may intimate the status of installation of DAS for their remaining generating stations.

In 126th OCCM, Sr. Manager, NEEPCO informed that all their plants have DAS installed. AGM(SO-I),NERLDC clarified that in case of oscillations/ disturbance response of generators(in ms) cannot be captured by SCADA due to low resolution of data.

NERLDC requested NEEPCO to ensure that all their installed DAS are time synchronized and data during events is not lost. Also, the resolution of data of DAS to be checked by NEEPCO and ensured that at least 1 sec resolution data is available.

Deliberation in the meeting

Sr. Engineer, NERLDC once again reiterated that DAS is required for analyzing response of governors and their absence severely impairs calculation of FRC. Sr. Manager, NEEPCO informed that installation of DAS in case of old generating units of Kopili, Khandong and Doyang involves huge financial involvement. He assured that management would be apprised of the requirement and any decision taken in this regard would be informed to the forum.

The Sub-committee noted as above.
Action: NEEPCO.

D.17. Strengthening of Southern Part of NER Grid:

Major loads in Southern part of NER grid to power systems of South Assam, Tripura (including radial load to Bangladesh), Mizoram & Manipur, are fed through 400/132 kV substation at Silchar (PG).

Also, maximum generation capacity of NER is present in Southern part of NER Grid (Palatana = 726 MW; AGTPP = 130 MW; Loktak = 105 MW; Monarchak = 101 MW Generation capacity of Tripura, Mizoram)

Major upcoming corridors are planned or already under operation / execution to major load centers in Southern part of NER Grid like 400 kV Silchar – Misa D/C, 400 kV Silchar – Melriat D/C, 400 kV Silchar – Palatana D/C, 400 kV Silchar – Byrnihat – Bongaigaon, 400 kV Silchar – Azara – Bongaigaon, 400 kV Silchar – Imphal D/C and 400 kV Silchar – P.K.Bari D/C.

In case of eventuality of 400/132 kV Silchar Sub-station, Southern Part of NER Grid will be insecure.

In view of this issue, it is proposed to implement the following for strengthening of Southern Part of NER Grid:

400 kV Imphal (PG) – Melriat D/C
400 kV Melriat – Palatana D/C
400 kV Surjamaningar – Bangladesh Node – West Bengal Node D/C

In 126th OCCM, Sr. Engineer (SO-II), NERLDC said that for Southern part of NER Grid, all the important corridors are originating from 400 kV Silchar substation. In case of any eventuality causing outage of 400 kV Silchar (PG) substation, the entire Southern part of NER Grid would collapse. With increased load being served in utilities of NER, it is necessary to plan a parallel corridor bypassing 400 kV Silchar, so as to ensure security of the entire NER Grid.

The proposal was agreed in principle by the forum.

The forum requested NERLDC to conduct further studies and revert back, so that it can be placed in upcoming SCM of NER.

Deliberation in the meeting

Sr. Engineer, NERLDC presented the study results which are attached in **Annexure-D.17.** DGM, SLDC, AEGCL opined that the long pending redundancy link up-gradation for Palatana i.e. 400 kV Silchar-P.K. Bari-Surjamaninagar-Palatana should be commissioned on priority. DGM(MO),NERLDC also suggested that this would enable having more reliability for evacuation of Palatana. Once Palatana to PK Bari is through, there could be PK Bari to Melriat as well bye-passing Silchar to take care of the proposed scenario.

The proposal for this additional node through construction of link between 400 Imphal - Melriat D/C and 400 kV Melriat - Palatana D/C was agreed in principle by the forum. It was proposed to put this as an Agenda item in next SCM of NER, for further studies etc. by CTU / CEA.

The Sub-committee noted as above.
Action: TSECL/NERTS/NERLDC.

D.18 Revision of restoration procedure documents-furnishing latest updating state network/SLD/DG set details etc.--letter issued from NERLDC on 24/10/16

NERLDC is going for revision of restoration procedure shortly, so it is very important to incorporate all latest state network/SLD/DG set details. A letter in this reference

has already been sent but reply from constituents has not received till today. It was requested to all the constituents to send the information at the earliest.

Deliberation in the meeting

NERLDC informed that most of the utilities had submitted the details and suggested that the item may be dropped. Members agreed.

The Sub-committee noted as above.

D.19. Electricity Demand Patterns of all states of NER for 2008-2016

A report has been prepared by POSOCO for analysis of Demand Patterns of years 2008-2016 periods. Based on the report, patterns can be identified for meeting the demand in respect of time of day, day of year, evening / morning peak, seasons, etc.

The report has been mailed to all the states of NER on 17th Nov'16. It is requested that concerned persons of states may go through the report and mark their comments in respect of the specific state-wise pattern observed in meeting demand. This would help identifying constraints / characteristics of load / others in states of NER. Any specific inputs like local holiday, festivals etc may please be mentioned as mapped with the profile of Demand met.

Mapping of the load patterns is required in respect of the following parameters:

a. Constraints in power drawal from ISTS system due to congestion / constraint in ISTS lines.

b. Constraints in power drawal from ISTS system due to congestion / constraint in Intra-State lines

c. Constraints in load serving by DISCOM on account of non-adequate Distribution Transformation capacity, leading to chopping-off of Peak Demands, Low power availability due to Financial Constraints of DISCOM / Regulation of Power Supply, etc.

d. Disturbance in state on account of militancy, etc. leading to poor growth of economy Imposition of Demand restriction by DISCOM to reduce AT&C losses. Political decisions in state leading to high growth / decay of demand Prevailing Climatic conditions.

e. Human behavior like early riser, Office closing and starting times, etc., Type of loads – Residential (Lighting, Heating, Air-conditioning etc), Commercial (Heavy industry

requiring constant power supply, etc.), Tariff mechanism of states = Time of use, etc. Availability of Peak Load / Base Load plants in state Etc.

For getting constraints in meeting load or characteristics of load, report may be forwarded to concerned persons in DISCOM for comments. All the comments may be compiled together by SLDC and send to NERLDC via email to nerldc@yahoo.co.in

Deliberation in the meeting

Sr. Engineer, NERLDC gave a detailed presentation which is attached in **Annexure-D.19.** After detailed deliberation it was decided that SLDCs would analyze the observations from Long-term demand analysis of states of NER Grid, based on presentation by NERLDC and report of NLDC, in consultation with all stake-holders of SLDCs including DISCOMs. The SLDCs would give a short presentation in next OCC meeting presenting their observations.

The Sub-committee noted as above.
Action: TSECL/NERTS/NERLDC.

D.20. Finalization of the Annual Load Generation Balance Report (LGBR) for Peak as well as Off-peak scenarios and the Annual outage plan for 2017-18 by 31.12.16 as per IEGC

As per IEGC, each SLDC shall submit LGBR for its control area, for peak as well as off-peak scenario, by 31st October for the next financial year, to respective RPC Secretariat. The annual plans for managing deficits/surpluses in respective control areas shall clearly be indicated in the LGBR submitted by SLDCs.

As per IEGC, all SEBs/STUs, Transmission Licensees, CTU, ISGS, IPPs, MPPs and other generating stations shall provide to the respective RPC Secretariat their proposed outage plan in writing for the next financial year by 31st October of each year. These shall contain identification of each generating unit/transmission line/ICT etc., the preferred date for each outage and its duration and where there is flexibility, the earliest start date and latest finishing date.

For performing system studies, load forecasting, outage management and various other activities, it is necessary that LGBR report for the upcoming Financial Year is available beforehand. All entities are requested to furnish their details to NERPC for finalization of LGBR.

For purpose of system studies, it is requested that Demand Figures of states for the months of April'17, May'17, and June'17 be indicated to NERLDC.

Deliberation in the meeting

After detailed deliberation it was decided that the utilities would submit their figures at the earliest to NERPC.

NERLDC intimated that for computation of TTC/ATC figures on 5 months ahead basis, the LGBR figures as indicated by NERPC are required. To facilitate TTC calculations, the forum was requested to submit figures for April'17, May'17 and June'17 at the earliest to NERLDC.

The Sub-committee noted as above.
Action: NERPC, All SLDCs.

D.21. Status of reactors under outage in NER Grid

400 kV Nodes in NER Grid are experiencing high voltage during Off-Peak hours. As per information available with NERLDC, the following reactors are under outage:

63 Mvar Line Reactor of 400 kV Balipara - Bongaigaon III line at Bongaigaon is under out since 12.11.16.

400 kV, 50 Mvar Bus Reactor at Misa is under outage since 03.12.16.
400 kV, 63 Mvar Bus Reactor at Byrnihat is under outage since 09.12.14
400 kV, 80 Mvar Bus Reactor at Palatana is under outage since 15.03.16
200 kV, 2x12.5 Mvar Bus Reactor at Samaguri is under long outage.
132 kV, 2x2 Mvar Bus Reactor at Dharmanagar is under long outage.

It is requested to inform the status of restoration of the above reactors at the earliest.
Apart from the above reactors, it is also requested to provide commissioning status of the following reactors:

20 Mvar Line Reactor of 220 kV AGBPP - New Mariani (PG) line at AGBPP

Conversion of line Reactors of 400 kV Balipara - Bongaigoan I & II lines at Balipara and Bongaigaon to Bus reactors (4 Nos.)

400 kV, 1x125 Mvar Bus Reactor at Balipara
400 kV, 1x125 Mvar Bus Reactor at Bongaigaon.
400 kV, 1x80 Mvar Bus Reactor at Ranganadi.
220 kV, 1x31.5 Mvar Bus Reactor at Mokokchung (PG).

In view the Critical voltage profile of NER Grid in Off-Peak hours, it is suggested no shutdown of Reactors in NER Grid shall be availed unless in case of Emergency.

Deliberation in the meeting

DGM (AM), NERTS informed the following:

1. 400kV 50 MVAR Bus Reactor at Misa is under gasket replacement and filtration will be brought back in service shortly.
2. 400kV, 63 MVAR, Balipara – III Line reactor at Bongaigaon suffered winding failure and required to be sent to factory for repair. Out of two spare reactors for Biswanath-Chariali one would be shifted to Bongaigaon to restore Balipara-III Line Reactor.
3. Commissioning of 20 MVAR line reactor of 220kV AGBPP-New Mariani at AGBPP - would be completed by 20.12.2016

NERLDC expressed seriousness in outage of several reactors, and particularly when Lean hydro is ongoing. The matter of outage of Palatana reactor was discussed in detail. Presently voltage profile at Palatana is critical, and restoration is necessary. Palatana informed issues with BHEL in that they are not getting any reply from BHEL. The forum suggested OTPC should take up with BHEL in a 15 days time frame, and intimate what is the future course of action within 1 month to OCC forum. In case of delay by BHEL, OTPC should make arrangement for restoration by engaging 3rd party vendors.

Status of Restoration of other reactors:

1. 400kV, 63 MVAR, Balipara – III Line reactor at Bongaigaon suffered winding failure and required to be sent to factory for repair. Out of two spare reactors for Biswanath-Chariali one would be shifted to Bongaigaon to restore Balipara-III Line Reactor. After repair of damaged reactor, the same would be replenished to BNC.
2. 20 MVAR line Reactor at AGBPP => Expected by 20th Dec, 2016.
3. 50 MVAR BR at Misa => Shutdown taken for additional 2 days for Gasket replacement. Will return to service shortly.
4. 63 MVAR BR at Byrnihat => CGL yet to visit site although they accepted the offer. PG/MePTCL to follow up for early restoration.
5. 2x12.5 BR at Samaguri => AEGCL to inform status in next meeting
6. 2x2 MVAR BR at Dharmanagar => TSECL to inform status in next meeting.

The Sub-committee noted as above.

Action: NERTS/MeECL/OTPC/AEGCL/TSECL.

D.22. Validation of PSSE SAV Case used for PoC calculations

Checking of the Base Case information is absolutely essential for computation of correct PoC Charges and Losses.

Excel file containing data of PSSE Network that will be used for performing studies for Q4 of 2016-17 (Jan'17 to Mar'17) was mailed to all the constituents on 25th November'16. The fields that need to be checked were highlighted in Yellow and a brief explanation is also indicated. It was requested to check the Excel File thoroughly so that it represents the present network.

As per discussions in Validation Committee Meeting of NER on 24.11.2016 for PoC, it was requested to intimate the following for consideration in base case:

New Generating stations declared/expected to be declared COD till 31st December 2016

New ISTS lines those expected COD is by 1st February 2017

Comments on base case have been received only from SLDC-Assam, SLDC-Meghalaya, SLDC-Tripura, OTPC and NETC. Utilities were requested to send their comments by 30th November 2016, for consideration in Jan'17 – Mar'17 case.

All utilities are requested to give their comments at the earliest.

Also, BgTPP-NTPC, NERTS-POWERGRID and NEEPCO / DoP, Nagaland are requested to confirm CoD of following elements before 1st February 2017:

- 400/220 kV, 2x315 MVA ICTs at Bongaigaon => By Dec'16 as per 126th OCC
- 220 kV, 20 MVAR line reactor at AGBPP => By 15th December as per 126th OCC
- 132 kV Doyang - Wokha S/C => By 15th December as per 126th OCC

Deliberation in the meeting

NERLDC intimated that it was necessary that PoC BaseCase is validated by the DICs, as checking of technical data had been done last in 2011-12 period and many new elements has been commissioned since. After detailed deliberation the forum requested the concerned SLDCs to validate base case data for Q4, and give comments to NERLDC by 20.12.2016.

Regarding expected CoD of different elements it was decided to refer to the dates provided in 127th OCCM for Q4.

The Sub-committee noted as above.
Action: All SLDCs.

D.23. Timely submission of data for preparation of reports

Various reports prepared by NERLDC for onward reporting to various agencies and information dissemination. For preparation of these reports, the following information is required by NERLDC as per the stipulated timeframe:

Monthly Unit-wise generation of Generating plants (Central / State / Private) by 01st date of every month for previous month (For Unit-wise generation report)

Maximum demand met figures by States by 01st of every month for previous month (For Power Supply Position report)

Projected Node-wise Demand and Generation Figures of 5 months ahead (ex. For April'17 in month of Dec'16) by 10th of every month, for Monthly TTC/ATC computations

Monthly Power Supply Position (PSP) and Unit-wise Generation (UG) report of NER are prepared by NERLDC by 1st of every month for onward reporting to CEA, MoP, NERPC.

Inspite of repeated requests to NTPC for furnishing the Unit-wise generation details, the details are not being received on time. This is causing delay in reporting to NERPC/CEA / MoP.

The matter had been specifically raised with BgTPP-NTPC vide email dtd. 01st November'16. However, NTPC did not submit their unit-wise generation data of Nov16. Similar issue is being faced for Monthly TTC computations, where BgTPP-NTPC is not furnishing their projected injection figures on time, after repeated requests.

Deliberation in the meeting

The matter was discussed at length and NTPC accepted that they had some difficulty at their end due to which data was being sent late. They also agreed to furnish necessary data as per timeframe. In case of any problem, Sh. R.V. Patnaik of NTPC shall co-ordinate.

The Sub-committee noted as above.
Action: NTPC.

D.24. Comments on Staff Paper or Draft Regulations

Honourable CERC has notified the following Staff Paper or Draft Regulations:
Staff Paper on National Open Access Registry vide public notice 25th November'16. It is available at http://www.cercind.gov.in/2016/draft_reg/SP.pdf.

The comments/suggestions of the stakeholders are invited on the above staff paper latest by 20.12.2016.

Deliberation in the meeting

The forum requested NERPC to organize a special meeting cum workshop to discuss the draft as well as existing important regulations. The same was agreed to be convened by NERPC before next OCC.

The Sub-committee noted as above.
Action: NERPC.

D.25. Constraint in Bipolar Operation of +/- 800 kV HVDC Biswanath Chariali – Agra:

As communicated by NLDC, in case of operation of the HVDC Bipole BNC-Agra link for power flow in Agra-BNC direction, it is not possible to operate the Bipole link in Constant Power mode. In this scenario for operation in Agra-BNC direction, only constant current mode is possible wherein upon tripping of any pole, the other will not share load and the filters may also not disconnect.

During lean hydro (winter) months, NER may import power from NR through this Bipole link to relieve congestion of Eastern-Regional grid. In constant current mode operation, if the filter banks do not trip immediately after reduction of power flow through the link, the 400 kV Nodes in NER may experience severe overvoltage (due to low fault level of around 4000 MVA at 400 kV Biswanth Chariali) that may lead to tripping of the 400 kV lines from Biswanth Chariali, Ranganadi, Balipara, Bongaigaon, and trigger a major disturbance in NER.

Considering the importance of this link in operation of NER grid, NERTS may intimate the following:

- Issues related to operation of +/- 800 kV Agra-BNC bipole in Constant Power Mode
- Time required for disconnection of Filter Banks at BNC in case while running in Constant Current Mode, 1 Pole gets blocked / tripped?

- Maximum possible Power Flow in Agra to BNC direction (separately for different modes of operation)

Deliberation in the meeting

NERLDC explained that in case of power flow in Agra-BNC direction in Bipolar mode, the poles operated independently of each other and thus the cause of concern in grid operation, particularly in Lean Hydro season in NER. The matter was discussed at length.

S.E.(C&O),NERPC concluded that POWERGRID to depute concerned person from Biswanath-Chariali HVDC to attend next OCCM for fruitful deliberation of agenda items pertaining to HVDC operation, and clarification of any queries of forum members.

The Sub-committee noted as above.
Action: POWERGRID.

D.26 LFO in NER Grid from 09:20 Hrs on 08th Dec' 2016 at AGTPP.

A low frequency oscillation has been observed in NER Grid from around 09:20 Hrs on 08th Dec'16.

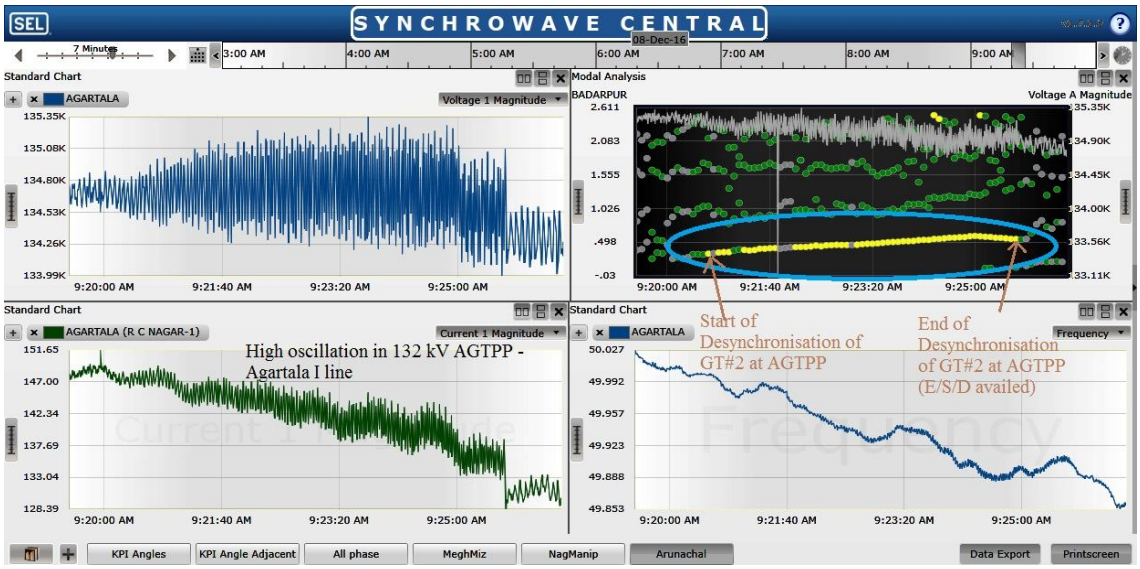
The beginning of oscillation coincides with beginning of Desynchronization process of AGTPP GT # 2 that was taken under Emergency Shutdown. Also, one lobe of continuous oscillation end coincides with the time of actual Desynchronization of AGTPP GT # 2.

The oscillations are continuously going on near 132 kV Agartala bus, as observed from PMU, and are prominently in voltage. There is no significant effect on Active power / frequency. At present, there is about 5-6 A oscillation in current on 132 kV Agartala - AGTPP I line.

Considering the above situation and request from AGTPP; to bring down voltage from 136 kV (Which is normal) to 132 kV (Nominal); it is suspected that AVRs at units of AGTPP are acting in a manner leading to growth of oscillations.

It is also to be mentioned that Sustained Low Frequency oscillations around 0.4 Hz is being observed at 132 kV Agartala PMU over the last few days.
AGTPP is requested to view this matter seriously and check their terminal voltage, excitation currents, and also furnish to NERLDC the Event Logger from 09:15 Hrs of 8th Dec'16 onwards.

AGTPP, Palatana, Monarchak and TPGL is requested to provide data of 1 milli-second resolution of Terminal voltage of units / MW generation / MVAR generation.



Deliberation in the meeting

NERLDC explained the phenomenon of LFO, oscillation in Voltage, and requirement for seriousness in such matter. NERLDC requested all utilities to co-operate in this matter. It was noted that even after requests to AGTPP-Control Room and Sh. Joypal Roy, Sr. Manager (NEEPCO), data for analysis of LFO is not being received by NERLDC.

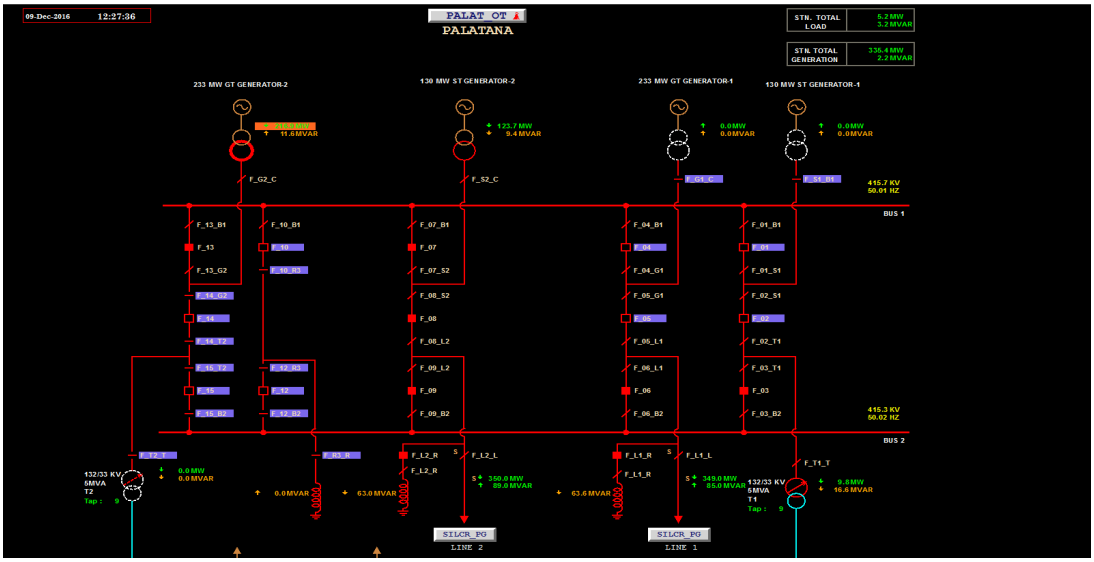
Sr. Manager (NEEPCO) informed that DAS is installed at AGTPP-Extension. NERLDC requested NEEPCO to furnish this data at the earliest corresponding to case of 08th December'16.

All generators were requested to remain alert in respect of reporting / monitoring of oscillations.

The Sub-committee noted as above.
Action: NEEPCO.

D.27. Breaker arrangement at Palatana:

OTPC, Palatana machine tripped at 1155 hrs on 07.12.16. OTPC, Palatana are keeping only one tie breaker closed for BUS 1 and BUS 2. So tripping of that tie CB is isolating Generator side BUS and Line side BUS. In normal circumstance all the Tie Breaker should be in service and parallel elements [e.g. 400 kV Silchar -Palatana D/C lines] should not be connected from the same BUS.



Deliberation in the meeting

DGM(AM),NERTS informed that for one-and-half breaker scheme the tie breakers should always be in service. In case it is required to isolate any feeders/generators, disconnectors are to be kept open. OTPC agreed.

The Sub-committee noted as above.
Action: OTPC.

D.28. Shut Down for OPGW related works:

Discussion and approval from NERPC is required for OPGW replacement activity for proper co-ordination.

Deliberation in the meeting

DGM (AM), NERTS stated that AR for line is turned off during OPGW stringing/replacement in order to avoid accidents. It is a very prevalent exercise throughout the world and does not involve outage of the line. Members unanimously agreed that no approval is required in this regard and concerned utility should inform SLDC/RLDC before the exercise.

The Sub-committee noted as above.

D.29. Dedicated voice communication and Data channel:

Dedicated voice communication with Substations and Generating Stations needs to be checked daily. Currently in most of the stations only one link is installed. In some stations VOIP phones are out (NLDC, Doyang, Kathalguri etc). Redundant of links need to be established on priority. Details of status of voice communication are attached in **Annexure-D.29.**

SCADA data from KATHALGURI, DOYANG, KOPILI, KHANDONG, RANGANADI, ITANAGAR, ZIRO etc are out since long due to which Grid management activity is severely affected.

RTU Outage details are given below:

Sl. No.	Station Name	Date of Outage
1	Ranganadi	21.05.16
2	Ziro	07.08.16
3	Kopili	09.05.15
4	Doyang	24.01.15
5	Khandong	16.09.16
6	Khatalguri	25.07.16
7	Haflong	14.09.16
8	Itanagar	01.08.16

Deliberation in the meeting

Sr. Manager, NEEPCO informed the following:

- RTU for RHEP is at tendering stage.
- AGBPP RTU commissioned. By Jan 2017 data would be received at NERLDC subject to link restoration.
- RTUs for Kopili, Khandong and Doyang in final stage of LOA.

NERTS and DoP Ar. Pradesh were requested to update the status by next OCC meeting.

The Sub-committee noted as above.
Action: NEEPCO/NERTS/DoP Ar. Pradesh.

D.30. NETC-Palatana-Bongaigaon transmission system: protection work at 8 nos. locations of 400 kV D/C Palatana-Silchar line vulnerable due to massive land slide and soil erosion

Palatana-Bongaigaon 400 kV D/C transmission system was developed for evacuation of power from 726.6 MW capacity, Gas Based Combined Cycle Power Plant (GBCCPP) of ONGC Tripura Power Company (OTPC) situated at Palatana, Tripura. The length of transmission system is 663 Km. 5 assets of the transmission system were commissioned in phases from 2012 to 2015.

Palatana-Silchar 400 kV D/C transmission line was commissioned in the month of July 2012 and is passing through 73 KMs of forest stretch in the state of Tripura. During construction, hill cutting was minimized by using uneven leg extensions for better stability.

During last year, this region experienced frequent earthquakes of high intensity and heavy monsoon with incessant rains which is not a normal phenomenon. The horizontal seismic forces are said to have created voids in soil in lower strata and water seepage caused sinkage of land mass.

There were several road blockage and land-slides experienced last year and the subject transmission line corridor also got affected.

Due to foregoing, 8 towers location of 400 kV D/C Palatana-Silchar transmission lines are badly affected which is beyond the control of NETC. Temporary measures were taken in few most vulnerable locations by POWERGRID who is Project Management Consultant for this project. These measures are not working satisfactorily and hence immediate steps shall be taken for protection of 8 nos. towers before onset of next monsoon.

The details of locations with site photographs and estimated expenditure enclosed at **Annexure D.30**. The estimated expenditure of Rs. 70.77 Lakhs has been worked out by POWERGRID.

Therefore, it is proposed to build protection wall at 8 locations on immediate basis. Booking of such expenditure is proposed to be met through PoC mechanism.

Deliberation in the meeting

The forum approved the protection work for 400kV Palatana-Silchar D/C through PoC mechanism and referred the matter to next TCC/RPC.

The Sub-committee noted as above.
Action: NERPC.

D.31. Re-conductoring of 132kV Kopili-Khandong # 1 with HTLS Conductor:

The transformation capacity of Kopili is going to become 2X160MVA, 220/132kV after installation of 2nd ICT which is under progress. However, there are two 132kV circuits between Kopili and Khandong HEP. The Circuit # 2 is strung with ZEBRA conductor but, the Old Circuit # 1 is strung with ACSR Panther conductor. Thus capacity of Circuit # 1 is not sufficient to evacuate power between Kopili and Khandong in the

event of outage of Circuit # 2. Thus, to have (N-1) scheme in transmission between Kopili and Khandong HEP the existing ACSR Panther Conductor is to be replaced with HTLS Panther equivalent conductor in Circuit # 1.

Deliberation in the meeting

DGM (AM), NERTS informed that the replacement of 60MVA ICT with 160MVA ICT and construction of 132kV GIS Sub Station at Kopili HEP is in progress. Further, for construction of 132kV Khandong # 1 GIS Bay there will be requirement of one month shutdown for dismantling of AIS Bay, Casting of foundation for GIS Duct, installation of GIS Duct and commissioning of the Bay. The tentative month of shutdown is expected to be May 2017 during which 132kV Kopili – Khandong Line # 1 will also be out of service. Hence, if re-conductoring of the line can be taken up along with shutdown of the bay a major shutdown for reconductoring can be avoided.

The requirement of re-conductoring agreed by the members and recommended for approval in next NERPC. Further, Member Secretary advised POWERGRID to take up with CEA for advance approval before next Standing Committee Meeting so that the re-conductoring work can be taken up during shutdown of 132kV Khandong # 1 bay at Kopili HEP.

The Sub-committee noted as above.
Action: NERPC/NERTS.

D.32. Transmission Line Surge Arrester – An Alternative to arrest Frequent Tripping of 132kV Lines in NER during Monsoon:

In North Eastern Region around 70% Trippings of Lines are mainly due lightening. Again more than 80% Lightning related tripping are in 132kV Lines. In order to arrest tripping of 132kV Transmission lines of NER during lightning installation of TLSA is must.

A presentation on TLSA is attached at **Annexure D.32** for necessary discussion.

Deliberation in the meeting

DGM (AM), NERTS given presentation on Transmission Line Surge Arrestor. He stated that despite of counterpoise earthing and additional shield wire earthing of POWERGRID's Transmission Line in NER there are no. of Tripping of 132kV Lines during lightening. He again stated that downstream faults are also more during lightening. So far as improvement of tower footing resistance by Chemical Earthing is concerned it is stated that alternatively installation of TLSA is economical.

DGM (AM), NERTS informed that POWEGRID is installing TLSA in 132kV Khandong-Khliehriat Line # 1, 132kV Badarpur -Khliehriat Line and 132kV Aizawal – Kumarghat Line of experimental basis and observe the performance of the Lines during lightening. He stated that if the performance improves NER should go for installation of TLSA in 132kV Lines. So far as cost is concerned, he suggested that constituents should approach for PSDF funding and POWERGRID will recover from PoC Mechanism. The forum appreciated the presentation and suggestion of POWERGRID.

The Sub-committee noted as above.
Action: NERPC/All state transmission utilities.

D.33. Nomination of members for implementation of CDAC project:

Member Secretary, NERPC informed the forum that CDAC board had already approved the project and it is stalled because of no response from SLDCs. He requested all the SLDCs to nominate persons for the same in this OCCM.

DGM(MO),NERLDC suggested that with the approved monetary quantum, a suitable specs should be finalized for the product to be provided by CDAC so as to enable maximum benefit to the utilities.

Member Secretary, NERPC hoped that the committee formed would be able to chalk out these issues and provide a roadmap also. Thereafter members nominated officials for the committee as follows:

- DoP Ar. Pradesh- Shri N. Perme, E.E., SLDC
- Assam - Shri J.K. Baishya, DGM,SLDC and Shri Dipesh Ch. Das, AGM,SLDC
- Manipur- Shri H. Shantikumar Singh, GM, SLDC and Ms. Laishram Ritu, Mgr.
- Meghalaya- Shri F.E. Kharshiing, S.E.,SLDC & Sh. D.J. Lyngdoh, EE, SLDC
- Mizoram- Shri Vanlalrema, SE,SLDC and Shri Lalduhawma,EE
- Nagaland- Shri A. Jakhalu, E.E.(Trans) and Shri R. Iralu, SDO(Trans)
- Tripura- Shri D. Paul, Sr. Manager and Smt Sampa Sen, Sr. Manager
- NERLDC – Shri N.R. Paul, AGM (SO-I) and Shri R. Sutradhar, DGM (MO)
- NERPC – Shri B. Lyngkhoi, Director (O&C) – **Convener** & Shri Abhijeet Agrawal, AD/AEE

The Sub-committee noted as above.

The forum felicitated Shri B. Medhi, Manager (SO-I), NERLDC on his contribution to various Sub-committees of NERPC and all members wished his success to the new assignment on his joining POWERGRID.

Shri Medhi also thanked the OCC forum of NERPC and stated that he will continue to work in the same spirit as he was in NERLDC for the betterment of the region.

Date & Venue of next OCC meeting

It is proposed to hold the 128th OCC meeting of NERPC on second week of January, 2016. However, the exact date and venue will be intimated in due course.

The meeting ended with thanks to the Chair.

*****

Annexure-I

List of Participants in the 127th OCC Meetings held on 14.12.2016

SN	Name & Designation	Organization	Contact No.
1.	Sh. N. Perme, EE, SLDC	Ar. Pradesh	09436288643
2.	Sh. B.C. Bordoloi, CGM, SLDC	Assam	-
3.	Sh. J. K. Baishya, DGM, SLDC	Assam	09435041494
4.	Sh. I. Tahbildar, Dy. Manager, APDCL	Assam	09864799857
5.	Sh. D. Dhar, Dy. Manager, SLDC	Assam	09957035126
6.	Sh. Dipesh Ch. Das, AGM, SLDC	Assam	09954110254
7.	Smti. Roseleena Parveen, AM, APDCL	Assam	08011842597
8.	Sh. A.N. Dev Choudhury, AGM (Comml.)	Assam	09854120791
9.	Sh. K. Sarmah, DGM	Assam	-
10.	Sh. K. Goswami, DGM	Assam	-
11.	Ms Laishram Ritu, Manager	Manipur	09612882984
12.	Ms Jayela Wahengbam, Asst. Manager	Manipur	09856875084
13.	Sh. F.E. Kharshiing, SE, SLDC	Meghalaya	09863066960
14.	Sh. R. Majaw, SE (EM)	Meghalaya	09436110871
15.	Sh. B. Wankhar, EE (MO)	Meghalaya	09436105914
16.	Sh. Lalduhawma, EE, SLDC	Mizoram	09436144113
	No Representatives	**Nagaland**	**-**
17.	Sh. Debabrata Pal, Sr. Manager (Comml.)	Tripura	09436500244
18.	Sh. Joypal Roy. Sr. Mgr. (E/M)	NEEPCO	09435577726
19.	Sh. Jatin Ch. Deka, Sr. Manager (E)	NEEPCO	09435339739
20.	Sh. R. Sutradhar, DGM (MO)	NERLDC	09436302714
21.	Sh. Rahul Chakrabarti, Sr. Manager (SO-II)	NERLDC	09402507543
22.	Sh. Ankit Jain, Sr. Engineer (SO-I)	NERLDC	09436335381
23.	Sh. B. Medhi, Manager (SO-I)	NERLDC	09436335376
24.	Sh. P. Kanungo, DGM (AM)	PGCIL	09436302823
25.	Sh. R.K. Ram, Engg. (E)	NHPC	09402838785
26.	Sh. Narendra Gupta, Manager (O)	OTPC	09774233426
27.	Sh. R.V. Patnaik, AGM (OS)	NTPC	09438233243

28.	Sh. Narottam Chakraborty, AM	NETC	07896022335
29.	Sh. P.K. Mishra, MS	NERPC	-
30.	Sh. B. Lyngkhoi, Director/S.E (C&O)	NERPC	09436163419
31.	Sh. S. Mukherjee, AEE	NERPC	08794277306

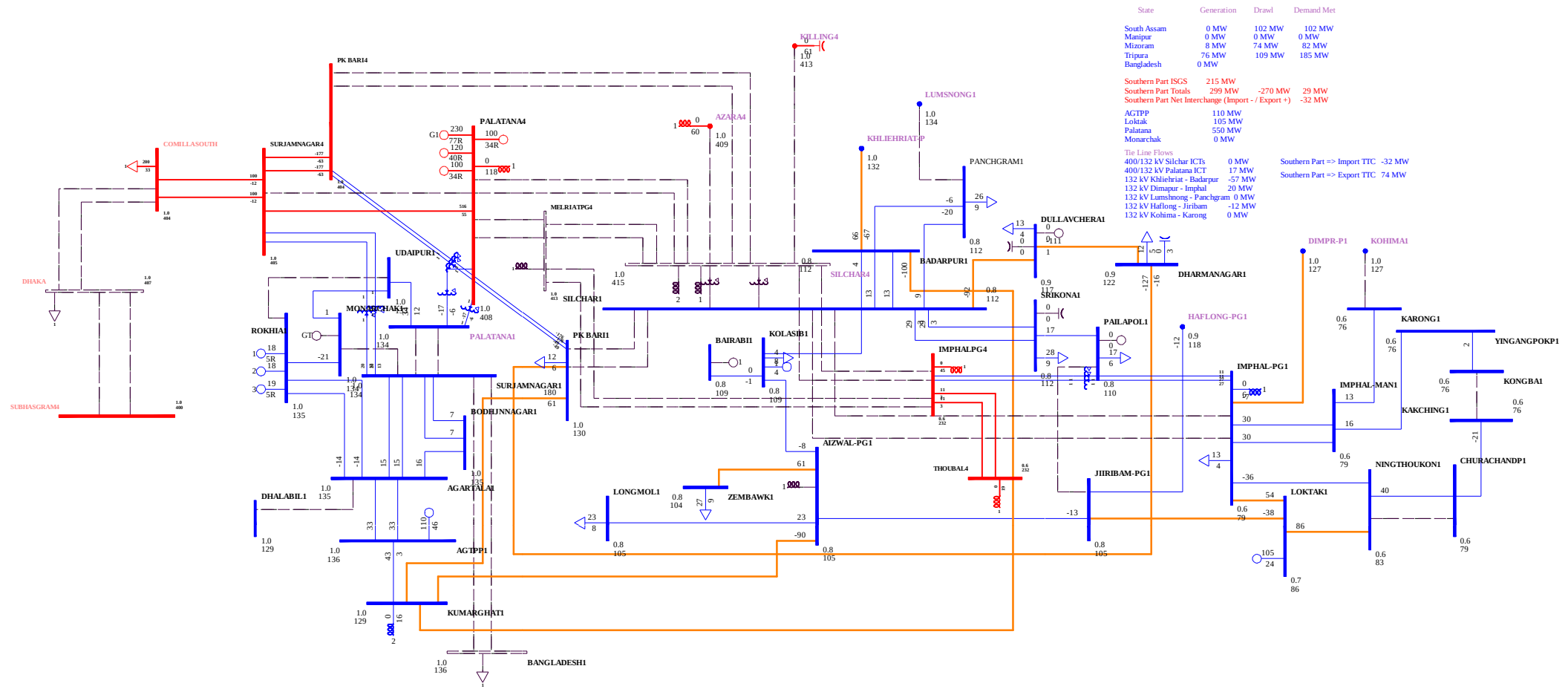
PROPOSED SHUTDOWN OF ELEMENTS FOR 127th OCCM- BAR CHART

SN	Name of Element	Time	
1.TRANSMISSION LINES			
	132kV Transmission lines		
1	132 Khandong - Kopili Ckt # 1	08.00 to 16.00	Annual Maintenance of Bay equipments at kopili , line outage due to absence of transfer bus scheme at Kopili switchyard (system constraint)
2	132 Khandong - Kopili Ckt # 2	08.00 to 16.00	Annual Maintenance of Bay equipments at kopili , line outage due to absence of transfer bus scheme at Kopili switchyard (system constraint)
3	132kV Dimapur -Imphal T/L	08.00 to 16.00	Shifting of tower involving erection, destringing , restringing of new tower at Loc. 271 (Rescheduled S/D).
4	132kV Silchar -Imphal # 1 T/L	08.00 to 16.00	Shifting of tower including erection, destringing, restringing and dismantling of old tower of location No. 244/0 (Rescheduled S/D)
5	132kV Silchar -Imphal # 2 T/L	08.00 to 17:00	Shifting of tower including erection, destringing, restringing and dismantling of old tower of location No. 244/0 (Rescheduled S/D)
6	132kV Kopili-Khl-Umrangshu T/L	08.00 to 16:00	Bay AMP, Jungle and Bamboo Cutting in Line.
7	132 kV S/C Khlieriat – Khlieriat # 1 Line	08.00 to 15:00	For replacement of defective insulators at Loc.no. 6 & 7
8	132 kV S/C Khandong – Khliehriat # 2 Line	08.00 to 15:00	For replacement of defective insulators at Loc./no. 17.
	220kV Transmission lines		
13	220kV Misa - Byrnihat Ckt # 1 (MeECL line)	08.00 to 16:00	Annual Maintenance of Bay equipments , Tandelta of CT, CRM of Iso , DCRM , Timing of CB
14	220kV Misa -kopili Ckt # 1	08.00 to 16:00	For cutting of bamboo/tree along the line corridor; cutting necessitated before compensation payment between Loc.1264 & 1265. Replacement offbroken insulator atLoc.203(DA+0) atbottom & top conductorof CKT- I(507 & 03 Nosnarch broken).
15	220kV Misa -kopili Ckt # 2	08.00 to 16:00	For cutting of bamboo/tree along the line corridor; cutting necessitated before compensation payment between Loc.1264 & 1265. Replacement offbroken insulator atLoc.203(DA+0) atbottom & top conductorof CKT-II (03Nos broken)
16	220kV New Mariani-Misa Ckt	08.00 to 16:00	For attending Hot spot at Loc. 820 onwards.
17	220kV Misa-Dimapur CKT# 1	08.00 to 16:00	For cutting trees in falling height and providing addl. PG clamp on jumper already with P.G.clamp
18	220kV Misa-Dimapur CKT# 2	08.00 to 16:00	For cutting trees in falling height and providing addl. PG clamp on jumper already with P.G.clamp
	400kV Tansmission Lines		
19	400 kV Bongaigaon-Balipara Ckt #1	08.00 to 16:00	For taking CKT I & II of on ERS towers for installation of one new intermediate suspension tower between loc No 556 & 557.
20	400 kV Bongaigaon-Balipara Ckt #2	08.00 to 16:00	Also completion of the new tower erection work to take both CKTs in normal out of ERS towers S/D.
21	400kV Balipara -BNC Ckt 1	08.00 to 13:00	System upgradation NTAMC project isolator wiring adaptation and and alignment work , line and LR out of service
22	400kV Balipara -BNC Ckt 2	08.00 to 13:00	System upgradation NTAMC project isolator wiring adaptation and and alignment work , line and LR out of service
23	400 kV Bongaigaon-Balpara Ckt #3	09.00 to 12:00	System upgradation NTAMC project isolator wiring adaptation and and alignment work , line and LR out of service
24	400 kV Bongaigaon-Balpara Ckt #4	09.00 to 12:00	System upgradation NTAMC project isolator wiring adaptation and and alignment work , line and LR out of service
	400kV HVDC BNC		
25	400/132/33 KV , 200 MVA ICT#2	08.00 to 16:00	Annual maintenance of ICT and bay equipments, attending Oil leakage, Breaker timing, CT Tan delta, CT oil Sampling etc
26	400/132/33 KV , 200 MVA ICT#1	08.00 to 16:00	Annual maintenance of ICT and bay equipments, Shield wire stringing over ICT, Breaker timing, CT Tan delta, CT oil Sampling etc
	400kV BALIPARA SS		
53	ICT # 1 & Bus Reactor #1 Tie Bay	08.00 to 16:00	Annual Maintenance of Bay equipments , no outage of element.
54	ICT # 1 & Main Bay	08.00 to 16:00	Annual Maintenance of Bay equipments , no outage of element.
55	50 MVAR Bus Reactor #1 Main Bay	08.00 to 16:00	Annual Maintenance of Bay equipments , no outage of element.
56	Misa #2 Main Bay	08.00 to 16:00	Annual Maintenance of Bay equipments , no outage of element.
57	Misa #2 & BNC #2 Tie Bay	08.00 to 16:00	Annual Maintenance of Bay equipments , no outage of element.
58	Misa #1 & BNC #1 Tie Bay	08.00 to 16:00	Annual Maintenance of Bay equipments , no outage of element.
59	220kV Bus coupler Bay	08.00 to 16:00	Annual Maintenance of Bay equipments , no outage of element.
61	33kV Incomer Bay of ICT#1	08.00 to 16:00	Annual Maintenance of Bay equipments , no outage of element.
62	132kV Bus Coupler Bay	08.00 to 16:00	Annual Maintenance of Bay equipments , no outage of element.
63	132kV Khupi Bay	08.00 to 16:00	Annual Maintenance of Bay equipments , no outage of element.
64	400/220/33 kV , 315 MVA ICT #1	08.00 to 16:00	Annual Maintenance of ICT and bay equipments , ICT shall be out of service.
65	315 MVA ICT #2 Main Bay	08.00 to 16:00	Annual Maintenance of Bay equipments , no outage of element.
	400kV BONGAIGAON S/S		
66	400/220 kV 315MVA ICT	10:00 to 11:00	For ICT Phase Change Over
	400kV Silchar S/S		
48	400kV Bus Reactor - 1 Main Bay	9.00 to 15:00	Annual Maintenance of Bay equipments. (Reactor shall remain charged via tie bay)
49	400/132 kV ICT - 1 Main Bay	9.00 to 15:00	Annual Maintenance of Bay equipments. (ICT shall remain charged via tie bay)
50	400/132 kV ICT - 1	08.00 to 15:00	Annual Maintenance of ICT and Bay equipments.
52	400kV Bus 1	08.00 to 15:00	Annual Maintenance of Bus and associated equipments. All lines shall remain charged through Bus 2
53	400kV Bus 2	08.00 to 15:00	Annual Maintenance of Bus and associated equipments. All lines shall remain charged through Bus 1
	400kV Misa Substation		
56	50 MVAR Bus Reactor and Bay	07.00 to 15:00	Already approved S/D , Reactor Gasket replacement work , The reactor is almost 20 years old & for **enhancement of useful life, such overhauling has been recommended.**
57	Tertiary Reactor # 1	08.00 to 15:00	Hot spot rectification Work
58	Tertiary Reactor # 2	10.00 to 13:00	Hot spot rectification Work
61	33 KV Incomer Bay	08.00 to 16:00	Annual Maintenance activities
62	220kV Byrnihat # 1 Bay	08.00 to 16:00	Annual Maintenance activities
	132kV Kopili Power House		
63	220 / 132 KV, 160 MVA ICT	08.00 to 16:00	Annual Maintenance of ICT and Bay equipments , ICT shall be out of service.
	132kV Zinc Substation		
67	132/33kV ICT	10.00 to 14:00	For SFRA testing of ICT , ICT shall be out of service
	220kV Dimapur Substation		
68	132kV Dimapur - I Bay	08.00 to 15:00	Annual Maintenance of Bay equipments , The line (state) shall be out of service.
	NEEPCO		
1	RHEP U1	C/S/D from 0000 Hrs of 05/01/17 to 2400 Hrs at 24/01/17	APM works
2	AGBPP GTG 1	C/S/D from 0000 Hrs of 27/01/17 to 2400 Hrs of 22/02/17	Control System Upgradation Works through OEM M/sMitsubishi Corporation,Japan
3	R.C.Nagar-Agartala CKT-I	08.00 to 15:00	1. CHANGING OF LINE BREAKER 2.DISTANCE PROTECTION RELAY REPLACEMENT : NUMERICAL TYPE
4	R.C.Nagar-Agartala CKT-II	08.00 to 15:00	DISTANCE PROTECTION RELAY REPLACEMENT : NUMERICAL TYPE
5	R.C.Nagar-Kumarghat CKT-III	06.00 to 15:00	1. CHANGING OF LINE BREAKER 2. DISTANCE PROTECTION RELAY REPLACEMENT : NUMERICAL TYPE
	ASSAM		
1	220 kV Samaguri-Sonabil D/C	0800 to 1600 Hrs	Jungle Cutting Works
2	132 kV Sonabil-Dopota	0800 to 1600 Hrs	Jungle Cutting Works
3	220 Kv Agia -Boko	08.00 to 17:00	jungle cutting and jumper repairing.
4	220kV Agia -Azara	08.00 to 17:00	jungle cutting and jumper repairing.
5	400kV Azara-Silchar	08.00 to 16:00	Maintainance Work
6	400kV Azara-Bongaigaon	08.00 to 16:00	Maintainance Work
7	132kV Srikona-Pailapool	09.00 to 17:00	Line Maintainance Work
	During S/D period Pailapool will draw power from Jiribam		
	MEGHALAYA		
1	220 kV Misa-Byrnihat D/C	08.00 to 16:00	For refitting tower members at Loc 207 and for jungle clearing works.
2	132 kV Umtru-Kahilipara D/C	08.00 to 16:01	for jungle clearing works.
3	132 kV Umtru-Sarusajai D/C	15:30 to 16:30	Preventive maintenance works for line side terminal equipments, including replacement of damaged conductors, greasing of isolator blades etc.
	NHPC		
1	Unit I	C/S/D from 0000 Hrs of 15/01/17 to 2400 Hrs of 05/02/17	C/S/D from 0000 Hrs of 15/01/17 to 2400 Hrs of 05/02/17
2	Unit II	C/S/D from 0000 Hrs of 07/02/17 to 2400 Hrs of 26/02/17	C/S/D from 0000 Hrs of 07/02/17 to 2400 Hrs of 26/02/17
3	Unit III	C/S/D from 0000 Hrs of 05/03/17 to 2400 Hrs of 22/03/17	C/S/D from 0000 Hrs of 05/03/17 to 2400 Hrs of 22/03/17
	OTPC		
1	400 kV Palatana-Silchar II	0800 to 1600 Hrs	For Protection Relay Testing
2	401 kV Palatana-Silchar I	0800 to 1600 Hrs	For Protection Relay Testing
3	132 kV Palatana-Suryamaninagar(line-2)	0900 to 1500 Hrs	Daily S/D for 7 days for conversion of single moose to twin moose of 132 kV Line 2 Bay.Starting date of S/D subjected to availability of clamps & connectors.Material expected arrive at site within 25/12/16
	POWERGRID(INTERREGIONAL)		
1	HVDC Agra-BNC Pole 1	0800 to 1800 Hrs	System Testing in integration with Pole - 1 (Power Flow Test)-Multi Terminal
2	HVDC Agra-BNC Pole 2	C/S/D from 0800 Hrs of 27/01/17 to 1800 Hrs of 30/01/17	Integration of Pole - 4 w.r.t Pole - 2 at Agra
3	400 kV NSLG-Bongaigaon I	0700 Hrs to 1700 Hrs	Insulator Replacement in Crossings
4	400 kV NSLG-Bongaigaon II	0700 Hrs to 1700 Hrs	Insulator Replacement in Crossings
5	400 kV NSLG-Bongaigaon I & II Line	0700 Hrs to 1700 Hrs	800 kV LILO work
6	400 kV NSLG-Bongaigaon III & IV(ENICL Line)	0900 Hrs to 1700 Hrs	LILO works at 400 kV Binaguri-Bongaigaon III & IV at 400 kV Alipurduar S/S
	NETC		
1	Azara-Bongaigaon	0800 to 1600 Hrs	To attend the balance rectification works.
2	Byrnihat-Bongaigaon	0800 to 1600 Hrs	To attend the balance rectification works.
3	Silchar-Azara	0800 to 1600 Hrs	To attend the balance rectification works.
4	Silchar-Byrnihat	0800 to 1600 Hrs	To attend the balance rectification works.

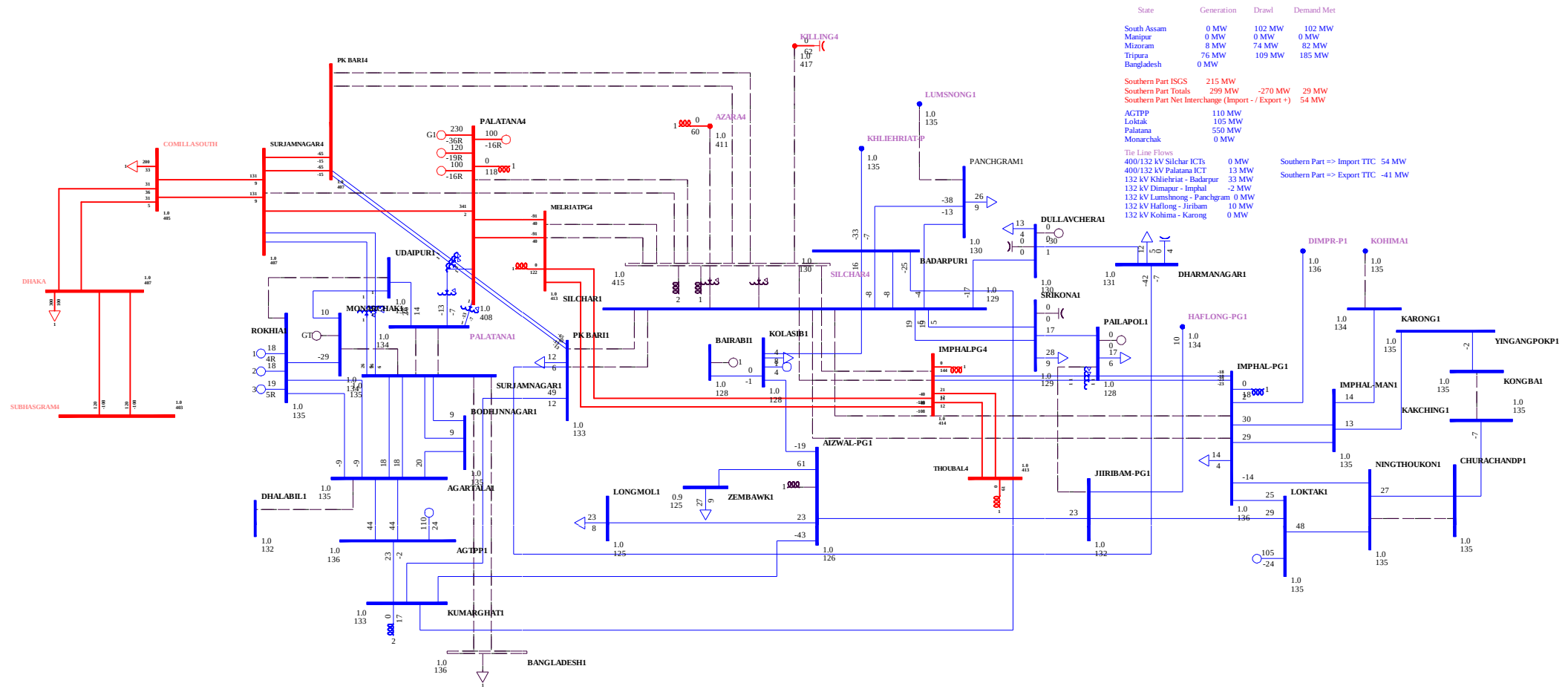
Day-time Shutdown

Continuous S/D

1 - Southern part of NER Grid with Network under execution



2 - Southern part of NER Grid with Network under execution & Planned Alternate Route to Silchar



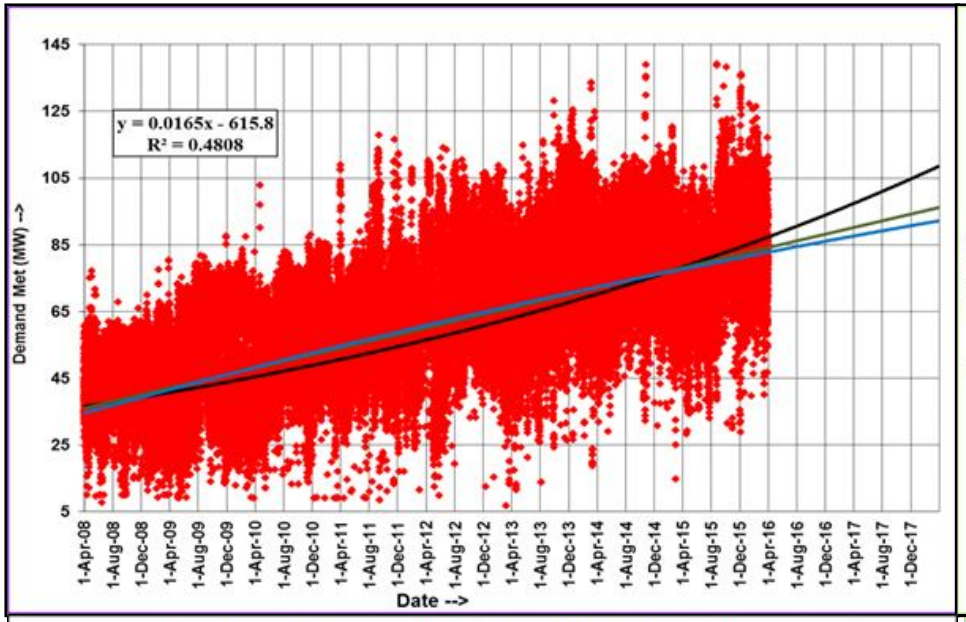
Electricity Demand Pattern Analysis for North-Eastern Region

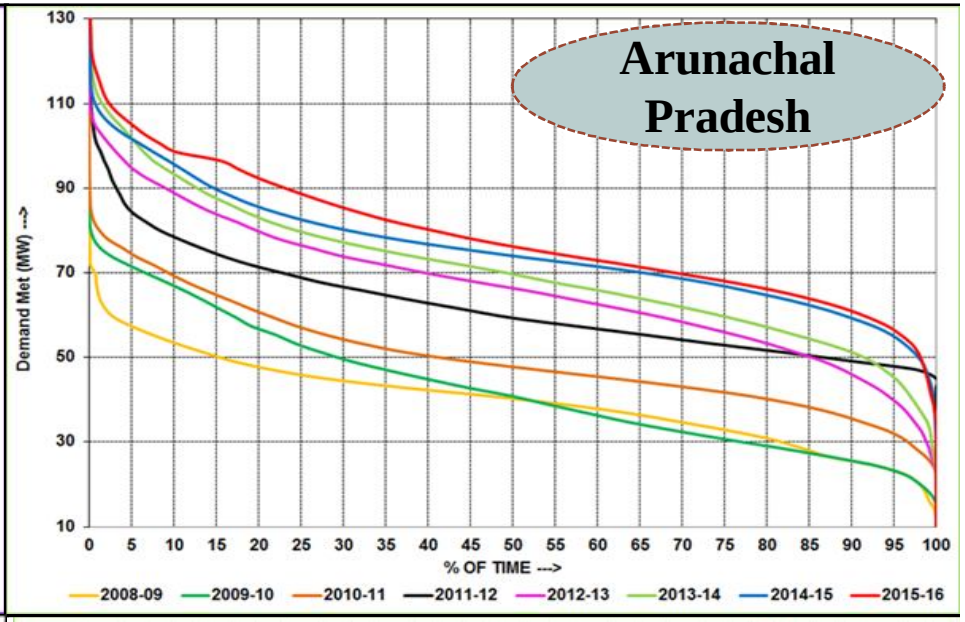
Electricity Demand Pattern Analysis

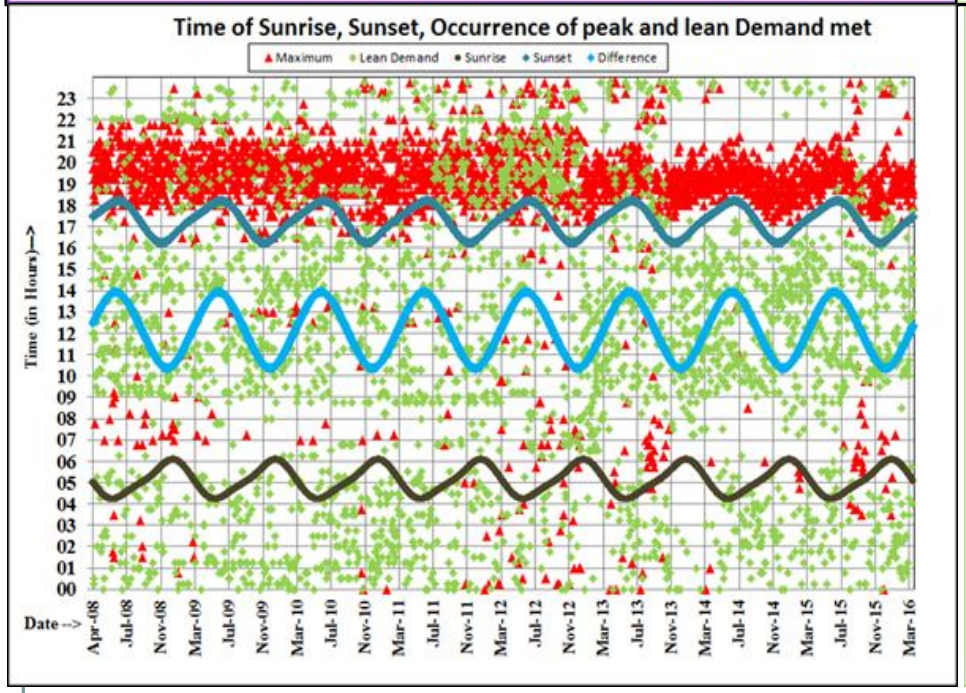
- Multi-year, demand pattern analysis
  - Five minute data for eight (8) years considered
  - Diurnal, seasonal, monthly, yearly analysis

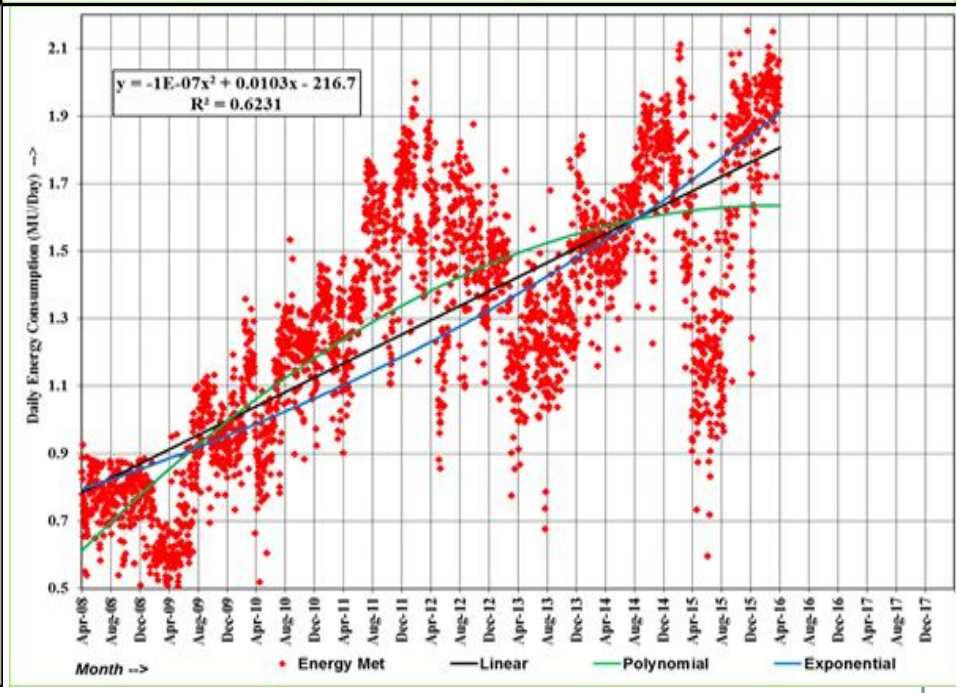
- Answers we seek from analysing the past
  - Growth story and its likely trajectory (future investments)
  - Power procurement strategies to be adopted
    - Base load, peak power, seasonal effect
    - Flexibility and need for Demand Response
    - Banking opportunities, pumped storage
  - How can solar / wind power complement in meeting the load?

No individual has sufficient experience, education, native ability, and knowledge to ensure good fortune, without the co-operation of other people"—Napoleon Hill









To expect the unexpected shows a thoroughly modern intellect. "--Oscar Wilde

Arunachal Pradesh

- Growth rate:
  - Growth visible in Average and Minimum demand, while Maximum demand is showing signs of saturation
  - Period of continuous growth in Demand met seen from 2009 – 2012
  - Overall positive trend seen in Energy Met, the growth pattern is not consistent
  - In 2015-16, minimal YoY growth seen in Maximum demand *[Demand restriction by state likely due to transformation constraints]*

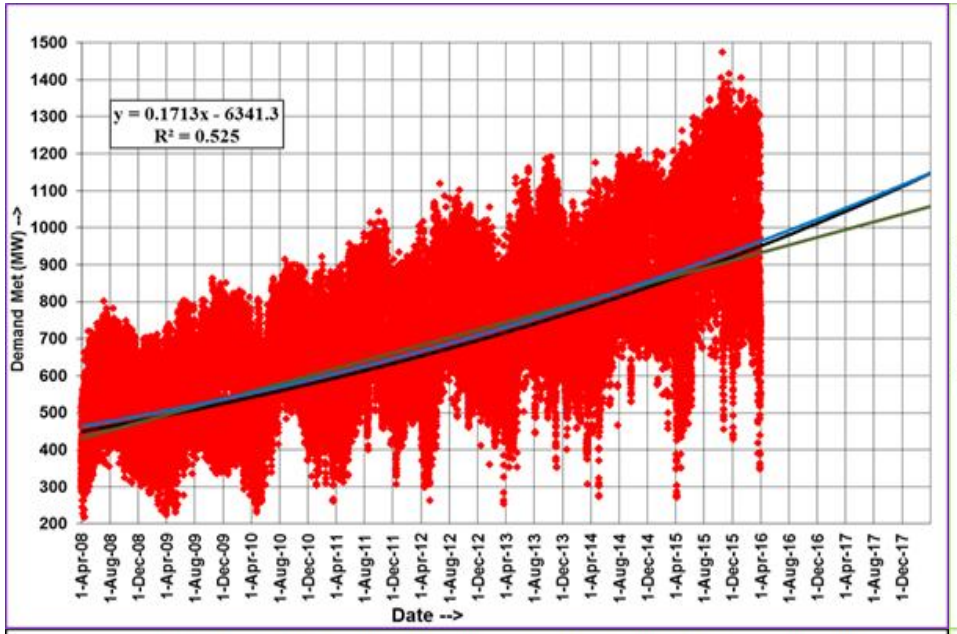
- Seasonal Trend:
  - Morning and Evening Peak visible in all Months.
  - Steepest morning Peak from November-February
  - September month shows highest duration of Evening and Morning Peak. October demand met curve is the flattest. *[Likely link between high power availability from Ranganadi]*

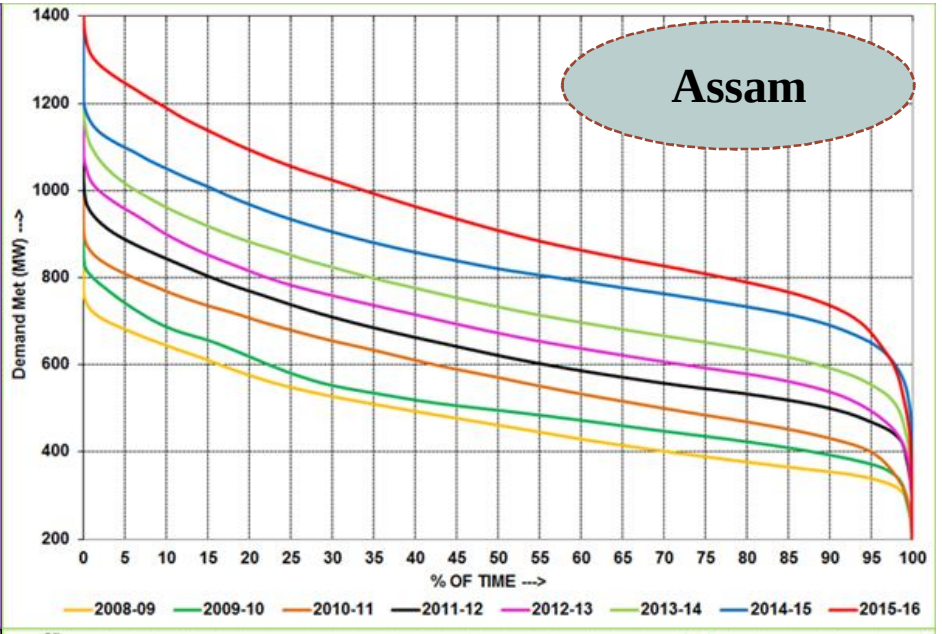
Arunachal Pradesh – contd...

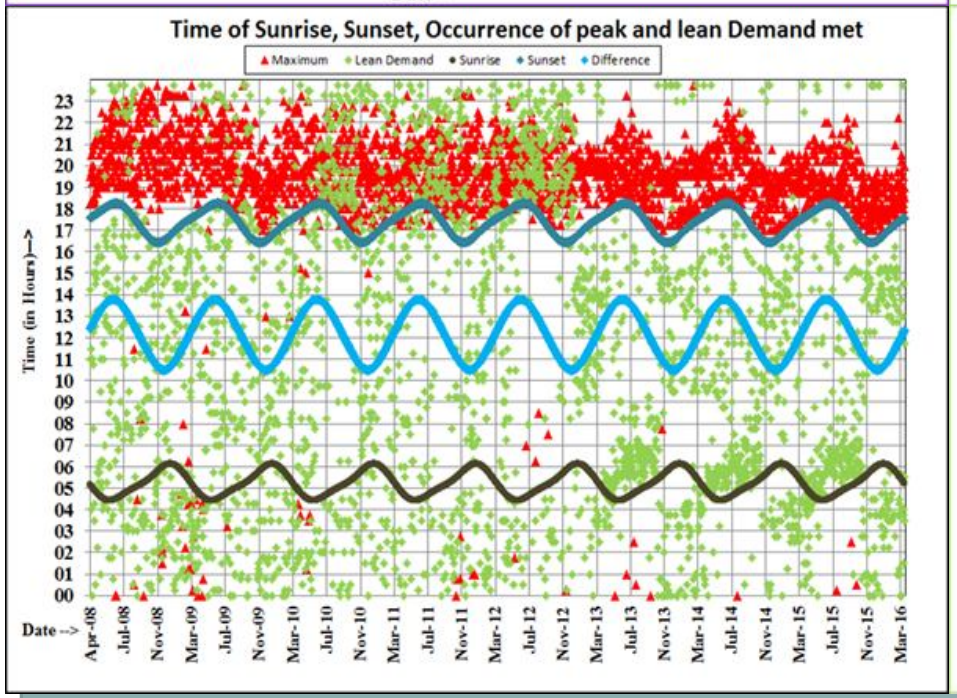
- Seasonal Trend_contd...:
  - Maximum demand met in state in September – October
  - Duration of Evening peak same in Winter and Summer, but Winter peak onset 1 hour earlier
  - Several scattered occasion of Morning Peak in 2015-16 found from August-January [Likely cause? / Early and Harsh winter?]

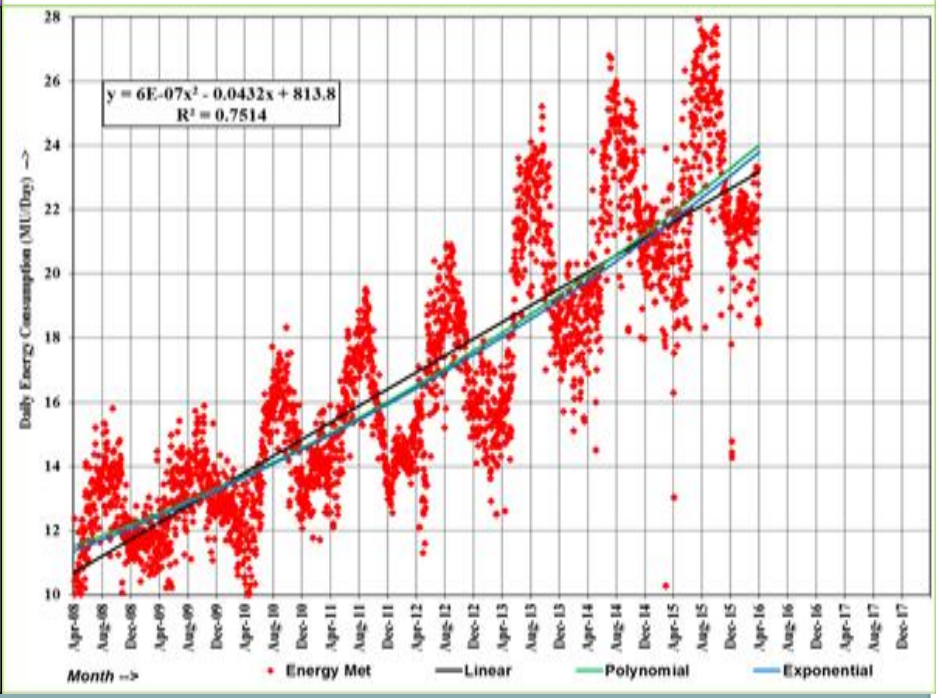
- Load Profile:
  - Maximum demand is 90 percent more than Average Demand, and Minimum demand is 70 percent less than Average Demand.
  - Suggestion:
    - Arunachal Pradesh should never go for Base-load plants
  - Load factor improved consistently from 2010-2016, and percentage of Minimum upon Maximum is increasing since 2009.

[Likely more customers being fed, but Restriction in Transmission / Transformation capacity]









Prophesy is a good line of business, but it is full of risks. "--Mark Twain in Following the Equator

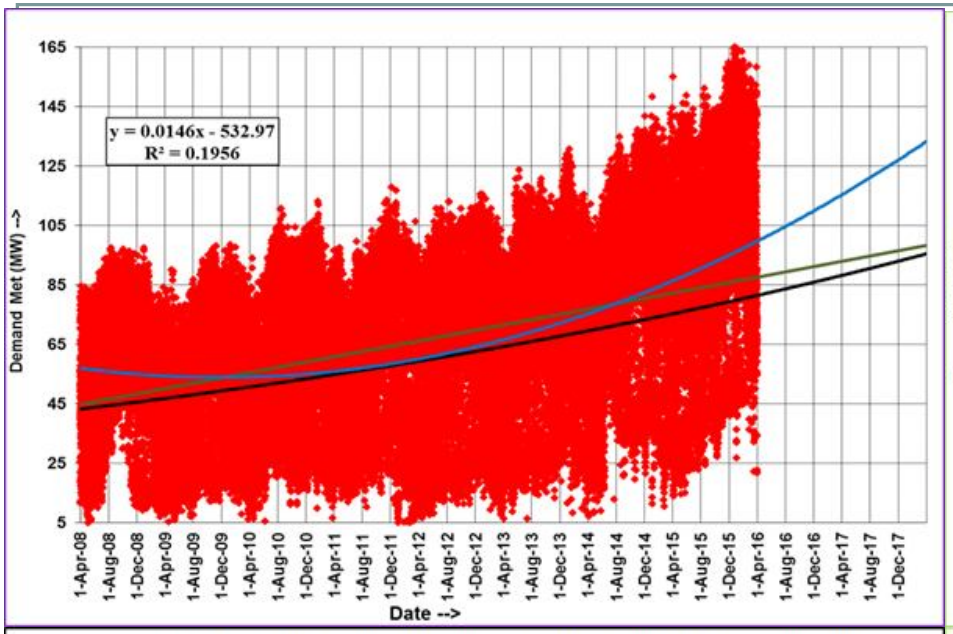
Assam

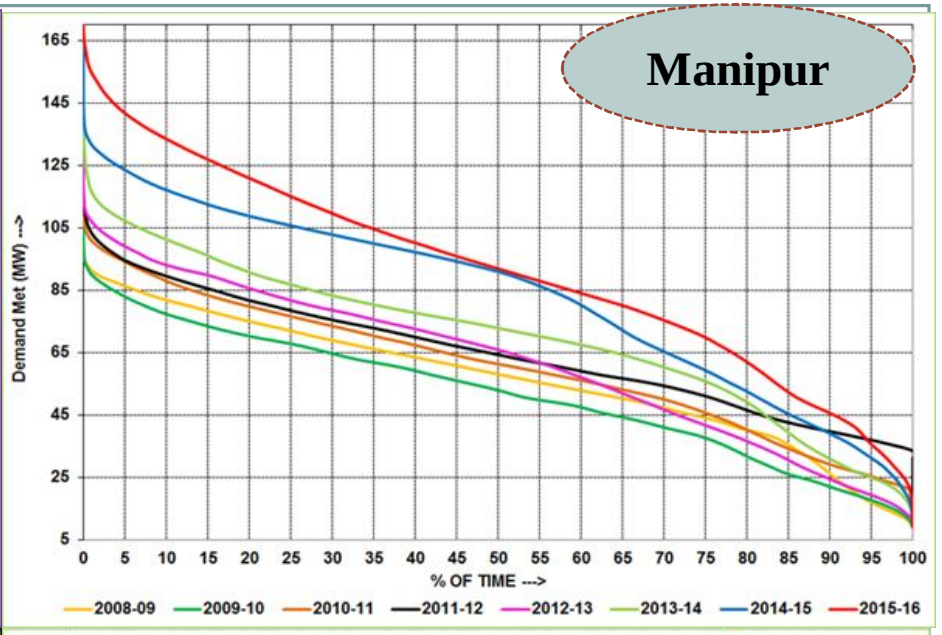
- Growth rate:
  - Increasing trend of Maximum, Average, Minimum demand
  - Higher growth in Maximum demand than in Minimum
  - High growth rate in 2015-16 *[Likely Political reason / Addition of Transformation capacity]*
  - Consistent growth in Energy Met, but Rate of Growth of Energy consumption is reducing
- Seasonal Trend:
  - Maximum energy consumption between June-October *[Likely due to maximum availability and Festivals]*
  - Evening Peak is visible in all months, with prominence from May till December. Maximum magnitude of evening peak in July-August
  - Morning peak visible only from May to October, with Maximum Demand of Peak in October *[Likely due to Puja / Diwali / festive season]*
  - Maximum difference between Minimum and Maximum demand in March-April-May *[Likely due to low availability]*

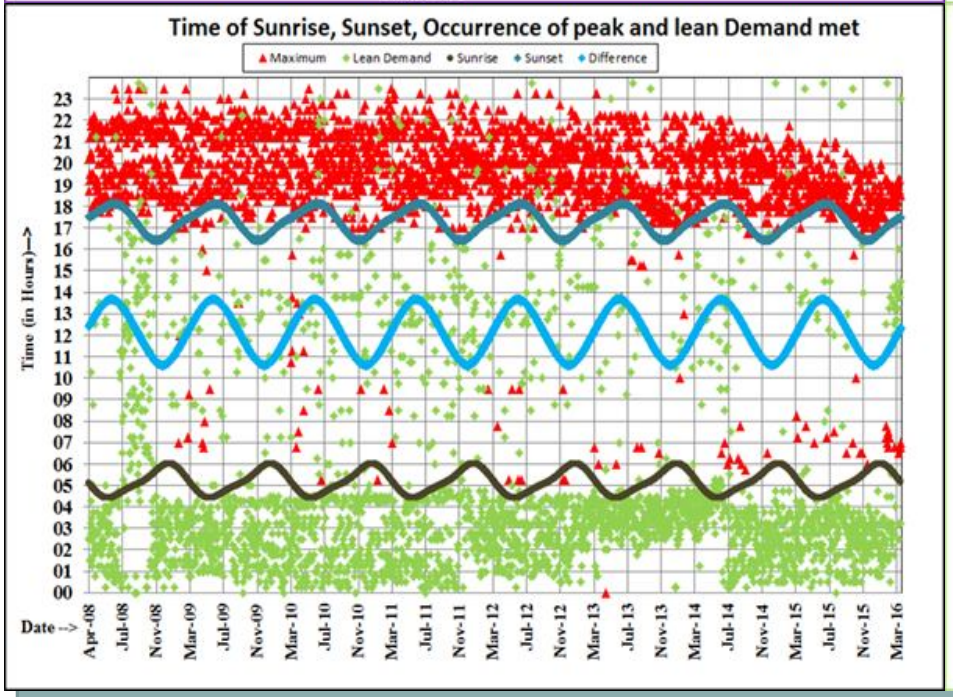
Assam – contd...

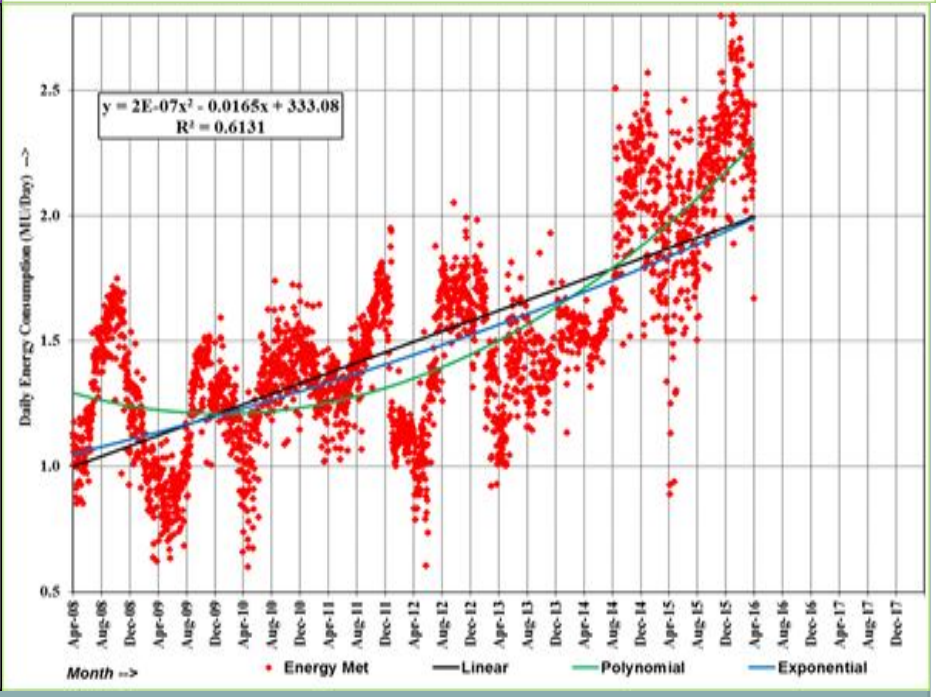
- Seasonal Trend_contd...:
  - Maximum Ramp Rate in Demand Met in May
  - Morning Peak visible only from November – February *[Likely due to Winter ; Early sunrise]*
  - Evening peak closely follows Sunset timing, and occurs 1 hour earlier in Winter than in Summer *[Office timings / Daylight saving]*

- Load Profile:
  - Minimum demand as percentage of average is very low (60 percent less), while Maximum demand is 40% higher than average. *[Likely urbanization]*
  - Suggestion:
    - Assam should plan so that their own base-load plant or tie-up from Baseload ISGS are only sufficient to meet the Minimum demand, and for Peak periods Assam may plan for share of Peak-load plants / set up Hydro plants / Procure from Market depending on economics
    - Assam may explore Solar PV plants, since Maximum demand during Mid-day hours
  - Load factor improved consistently from 2011-2015 *[Likely transformation capacity of Distribution is increasing / More number of customers being served]*









A forecast is never accurate; however you must explain variances-Anonymous

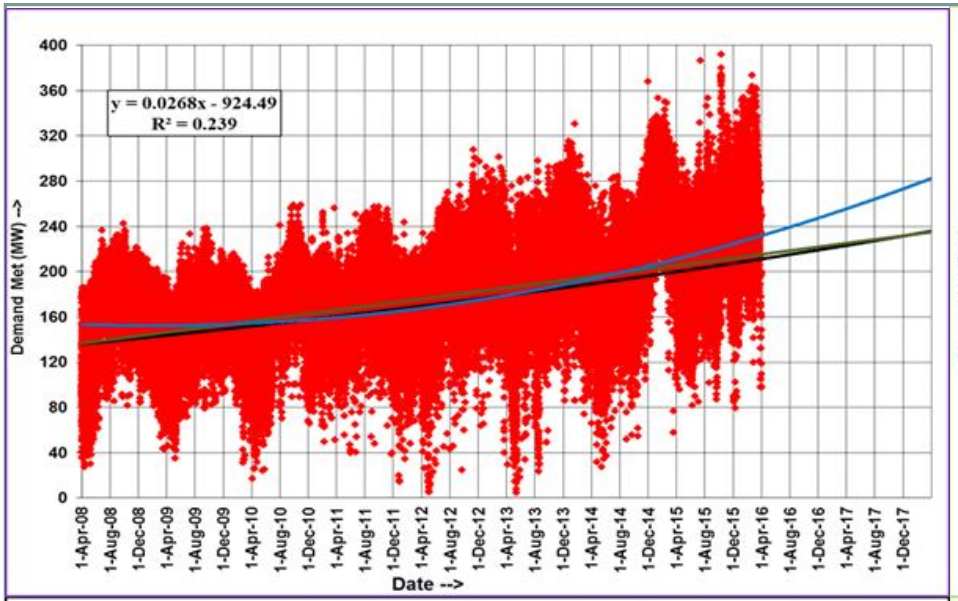
Manipur

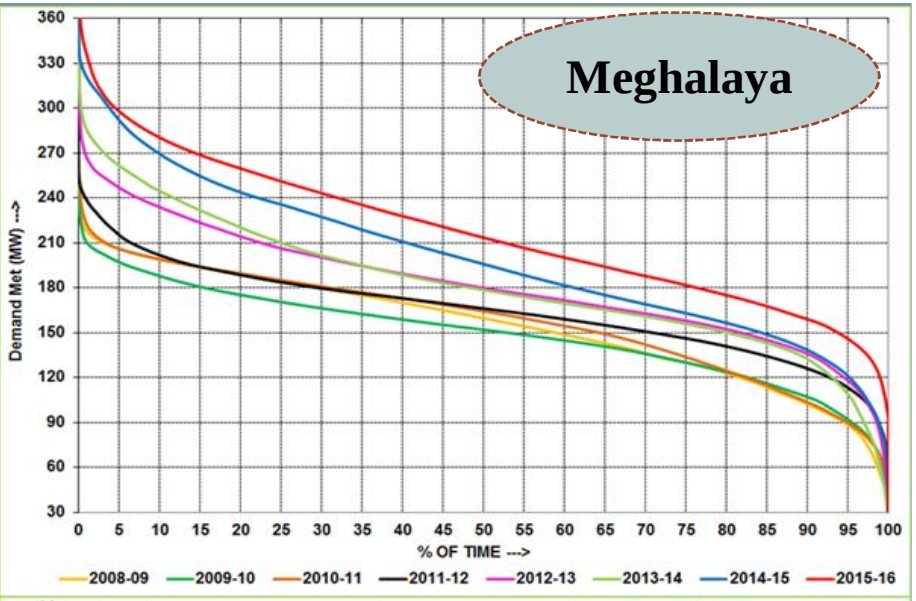
- Growth rate:
  - Exponentially increasing trend of Maximum, Average, Minimum demand ; with much higher growth in Maximum demand
  - No growth from 2008-2013
  - High increase in YoY Maximum demand seen in 2015-16 and 2014-15, compared to previous years [Likely better law and order situation/ Political reasons / Growth in Transmission & Transformation capacity]
  - High growth rate in Energy consumption since 2014 onwards
  - High growth potential
- Seasonal Trend:
  - Morning Peak visible in all months *[Indicates people of Manipur are early riser]*
  - Typical trend: Morning and Evening Peak magnitudes are close in all months. In February, Morning Peak is almost similar to Evening Peak.
  - Highest demand met in October-December *[Likely effect of festive season and cold weather]*

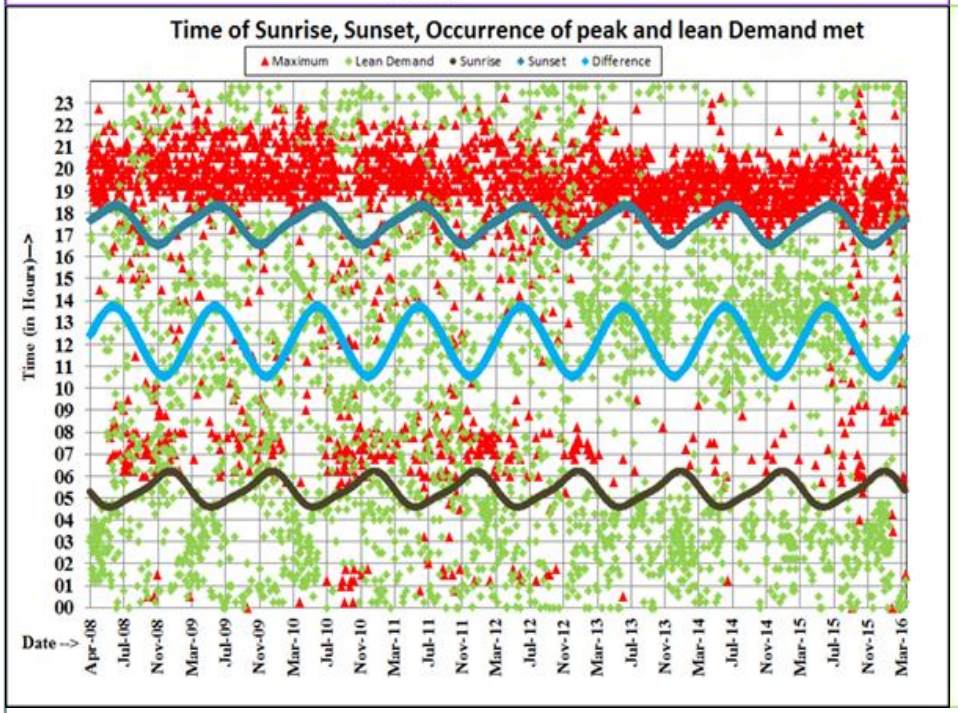
Manipur– contd...

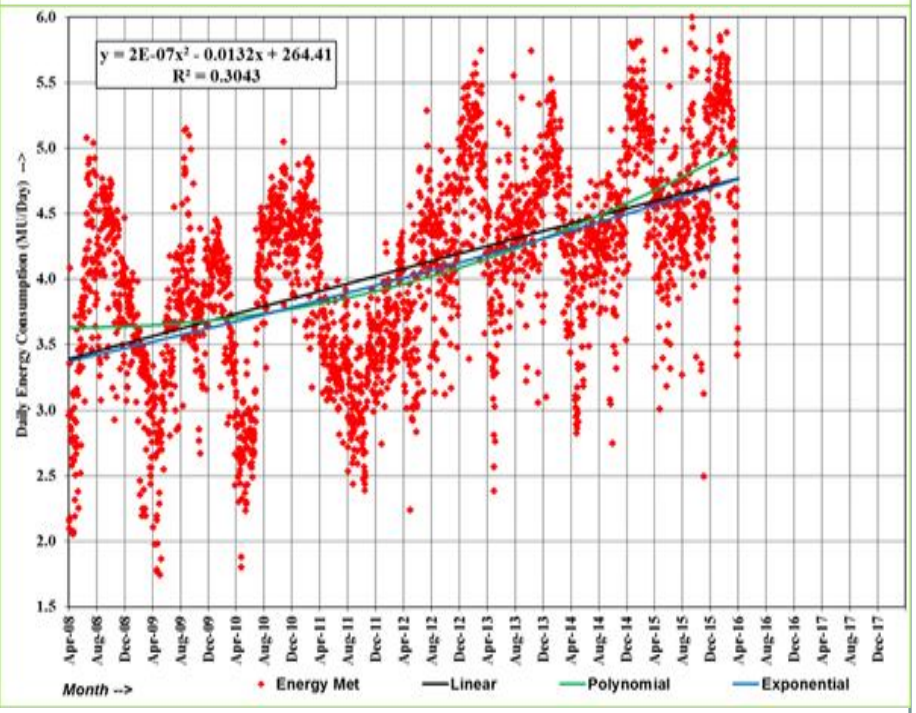
- Load Profile:
  - Maximum demand is 90 percent higher than Average, and Minimum demand is 90 percent lower than average.

  [High difference between Peak and Lean indicates the load is mostly residential]
  - Suggestion:
    - Manipur should never go for Base-load plants
    - The peak load can either be met through Peak load plants or by purchasing through Market
  - Periods of severely low demand exist in Night hours till around 4 a.m. *[Likely cause?]*
  - Ramp rates in Morning and Evening Peaks increased to a large extent in 2015-16 *[Maximum difference on YoY basis being in May, June, December-March]*









The herd instinct among forecasters makes sheep look like independent thinkers. "--Edgar R. Fiedler

Meghalaya

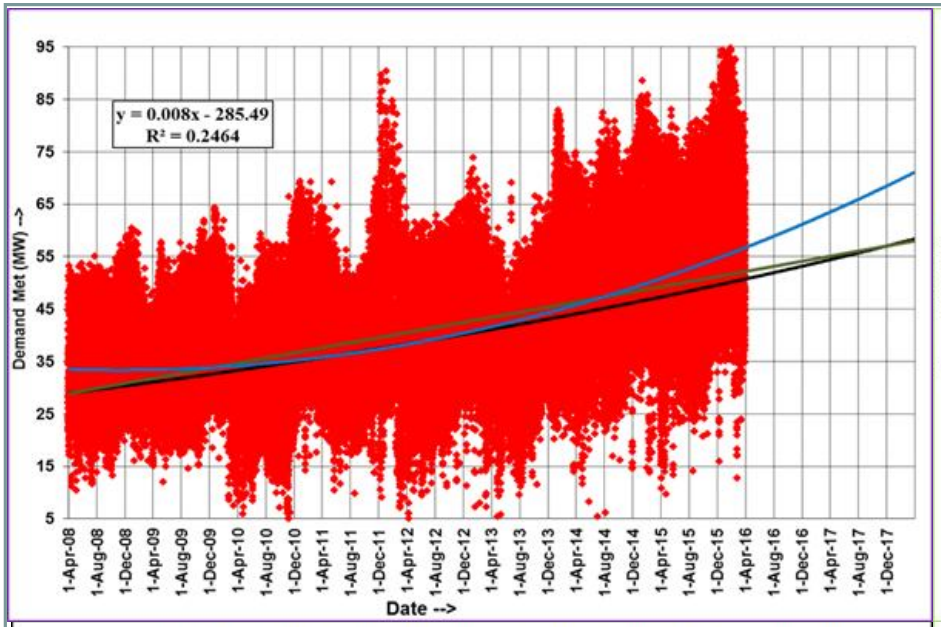
- Growth rate:
  - Increasing trend of Maximum, Average, Minimum demand ; with much higher growth in Maximum demand
  - High growth in YoY Peak Demand in 2014-15 and 2015-16
  - Growth chopped off in 2015-16 *[Most likely on account of Regulation of Power Suppply by NEEPCO for non-payment of huge dues]*
  - Decline in YoY energy met seen in 2011 and 2013 *[? Due to low rainfall?]*

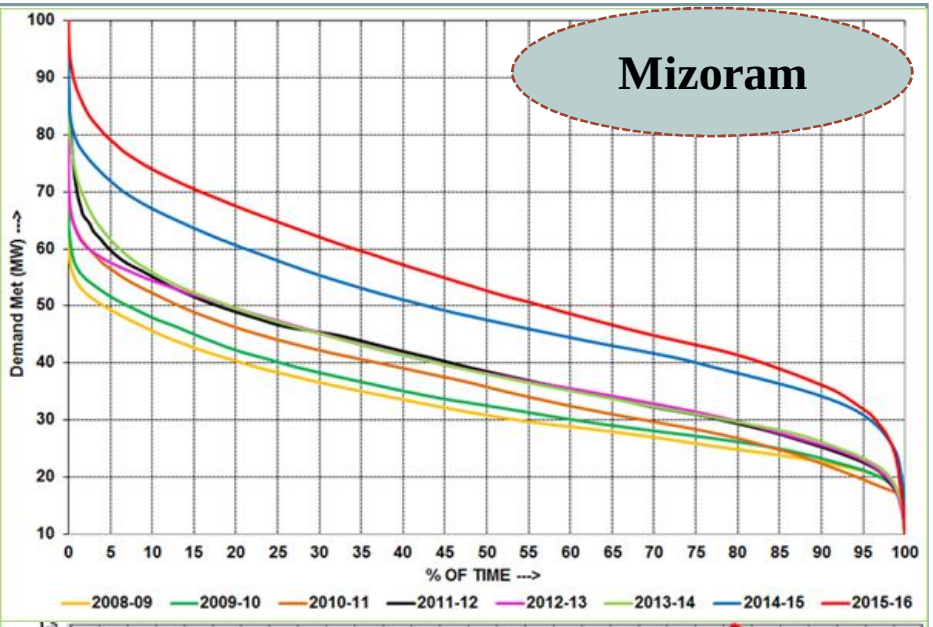
- Seasonal Trend:
  - Maximum demand met seen in months of October and December. Demand consistently high in these months [Festival seasons – Christmas, Durga Puja, Diwali etc.]
  - Strong presence of Morning and Evening Peak in April-September, and November-January

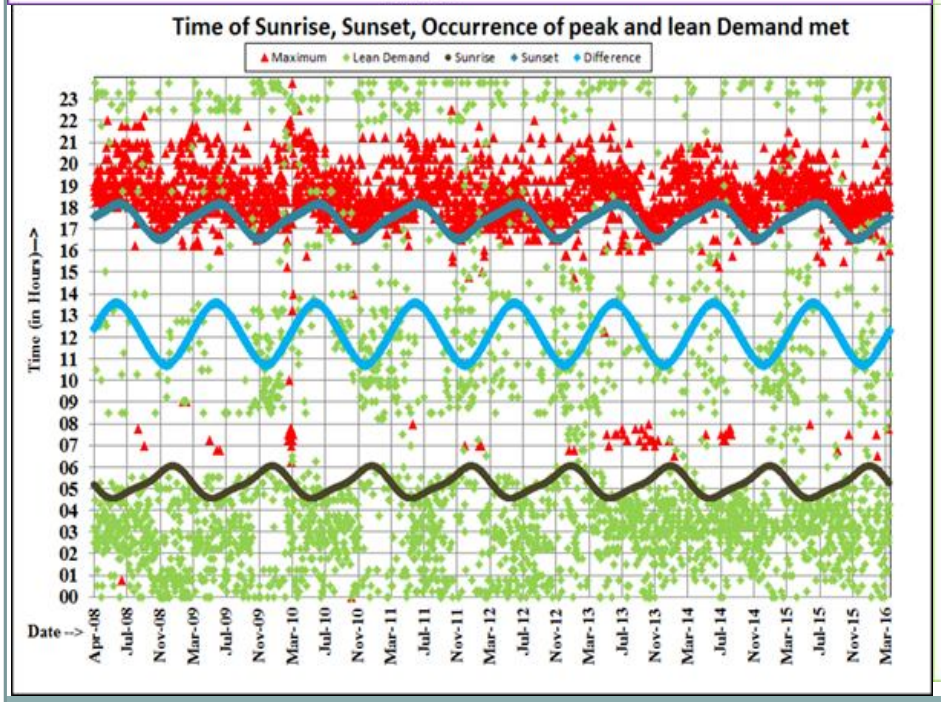
Meghalaya – contd...

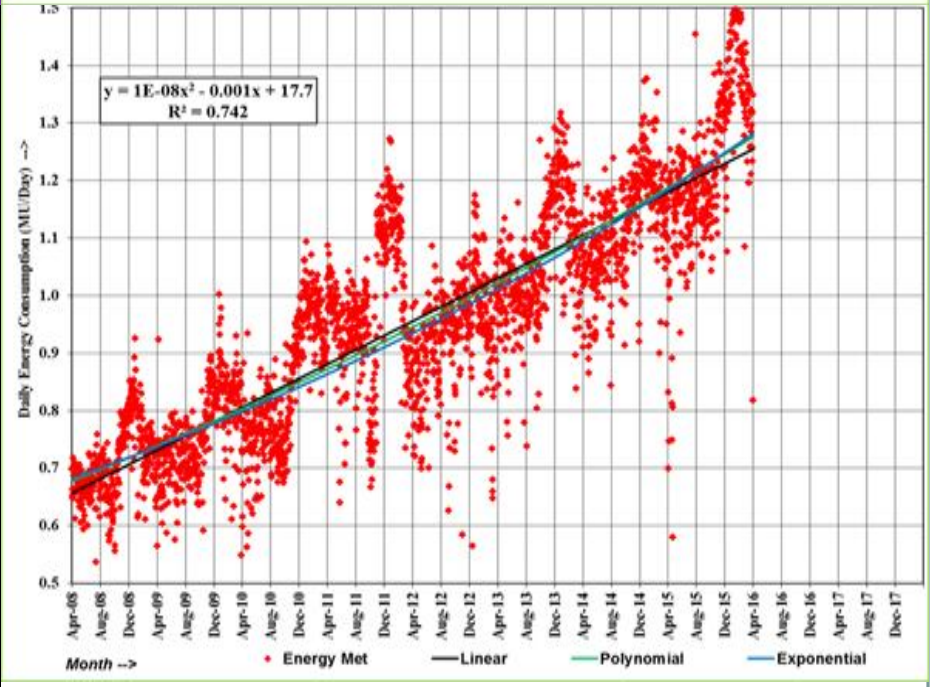
- Seasonal Trend_contd...:
  - Evening peak in October lower than Morning peak *[Pleasant temperatures in Evening likely, with Onset of Winter]*
  - Flatter demand curves in October, February, March
  - Highest evening Peak ramp rates in April-July
  - Evening Peak longer in Winter than in Summer *[Pleasant Summer; In winter heating loads come up. Most festivals are also in Winter]*

- Load Profile:
  - Maximum demand is 70 percent higher than Average and Minimum demand is 80 percent lower than average.
    - Meghalaya should fully utilize Hydro potential
    - Presence of occasional Morning peak closely following Sunrise from around 0500 Hrs onwards *[People of Meghalaya are early risers]*
  - A notch in Demand seen around 4.15 hours, corresponding to Office holiday around 4.30 Hours









It is far better to foresee even without certainty than not to foresee at all. "-Henri Poincare

Mizoram

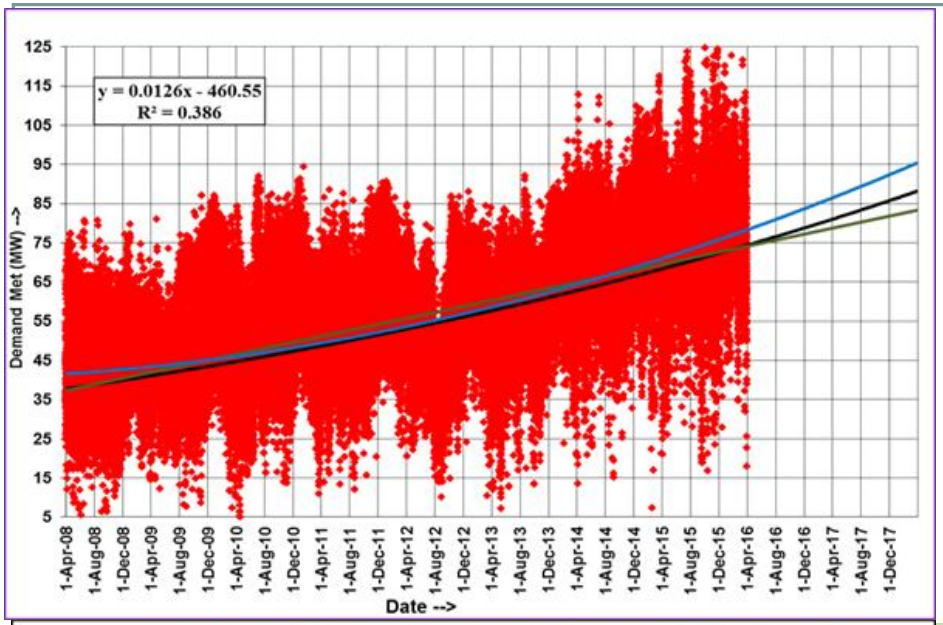
- Growth rate:
  - Increasing trend of Maximum, Average, Minimum demand
  - Consistent high growth of Peak Demand seen from 2013 onwards
  - Growth in Maximum demand much higher compared to Minimum. Growth picked up from 2010 onwards
  - Growth in Energy consumption has reduced in 2015-16 compared to that in 2014-15 *[Signs of saturation in Distribution]*
  - In 2011-12, Demand met almost at level of current demand met. *[Data error / Any other factor for high demand?]*
  - Growth in 2015-16 concentrated mostly to Maximum demand *[Indicates that number of customers served are not increasing]*

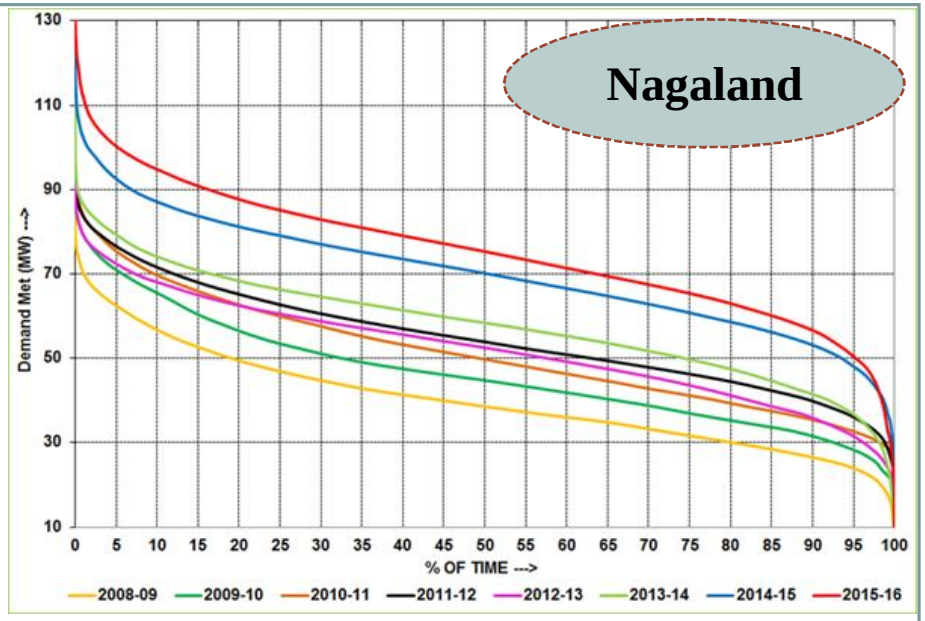
- Seasonal Trend:
  - Morning and Evening Peaks visible in all months
  - Highest ramp in Demand seen in December [Christmas, Other festivals]

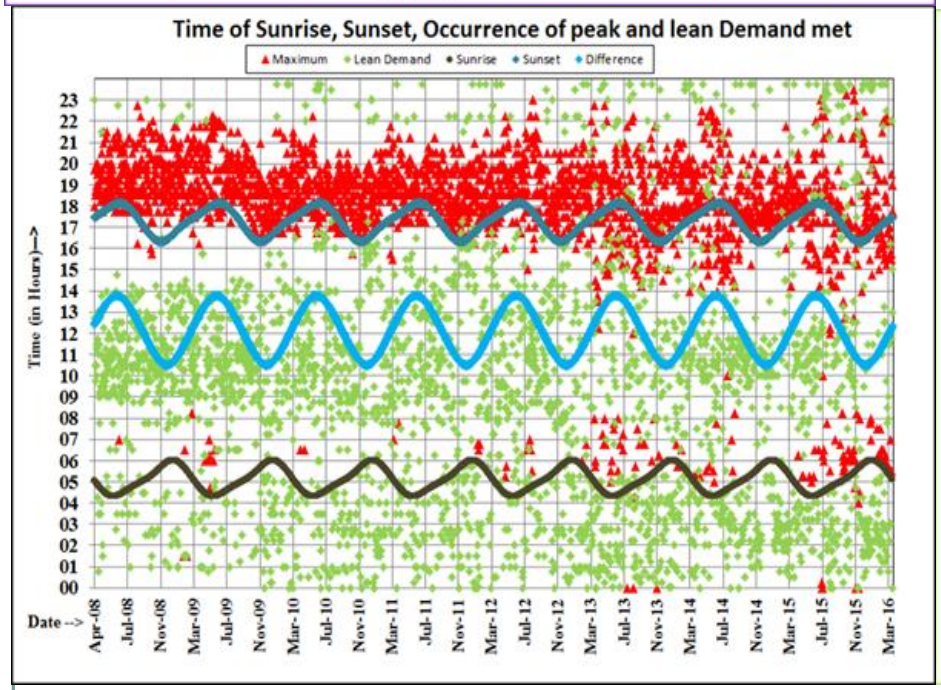
Mizoram – contd...

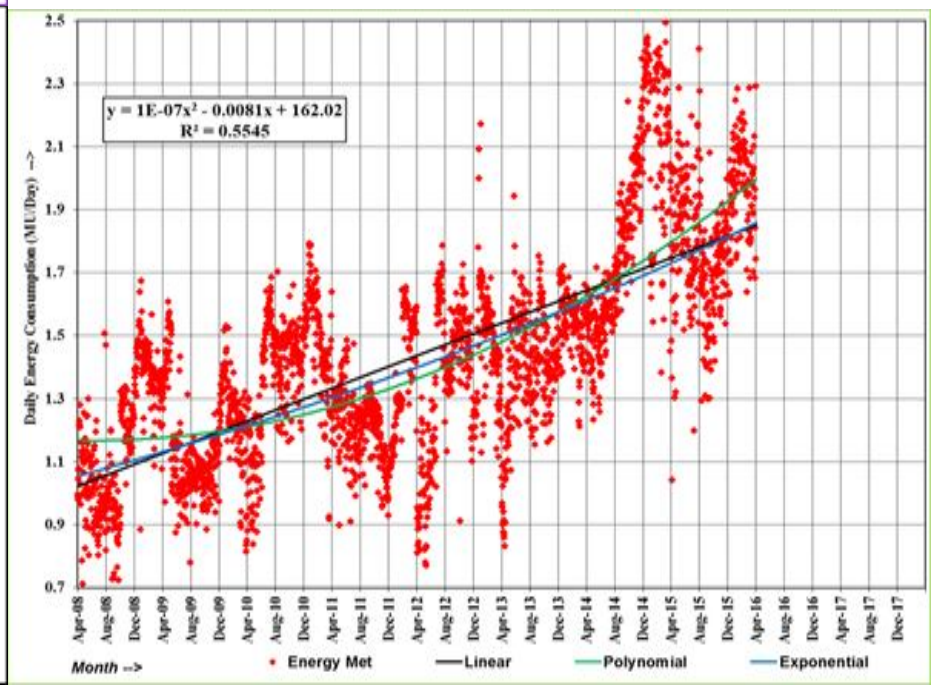
- Seasonal Trend_contd...:
  - Evening Peak prominently visible only in winter months (October – December'16) *[festival season of Christmas / New year ; Hilly state]*
  - Very low demand seen in months of June-September, with minimum Demand in April and August *[Reason? Pleasant weather?]]*
  - Monthly demand patterns are similar over the years, except erratic behavior in February and March *[Reasons?]*

- Load Profile:
  - Maximum demand is 100% higher than average and Minimum demand is 80% lower than average *[High volatility in demand met]*
    - Mizoram should build hydro plants to meet Peak demand
  - Morning peak occurs about 2 hours after sunrise *[Late riser? Cloudy skies?]*
  - A dip in Demand met is seen around 16:30 Hrs, which corresponds to the time of daily office holiday
  - Load factor improving consistently









If you have to forecast, forecast often. "--Edgar R. Fiedler

Nagaland

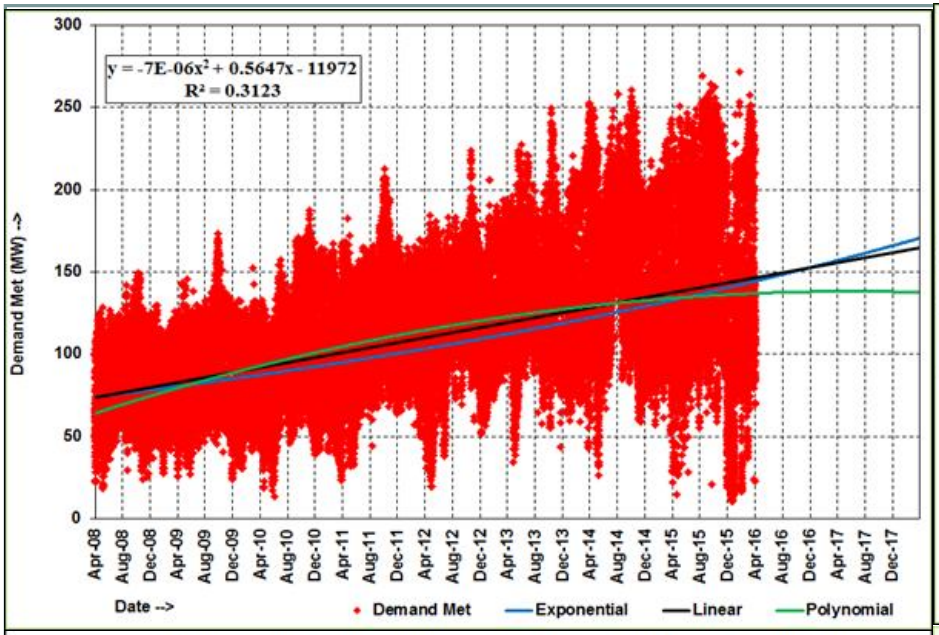
- Growth rate:
  - Low growth in Maximum Demand from 2009-10 to 2013-14.
  - Growth occurred between 2013-14 to 2015-16, but is showing signs of saturation
  - Minimum demand is growing, with high growth in 2015-16 *[Although more people are being served, the capacity is constrained in Transmission / Distribution. Urban area load growth saturated; No new business center / Industries coming up]*
  - Growth rate of energy consumption is reducing from 2015 onwards

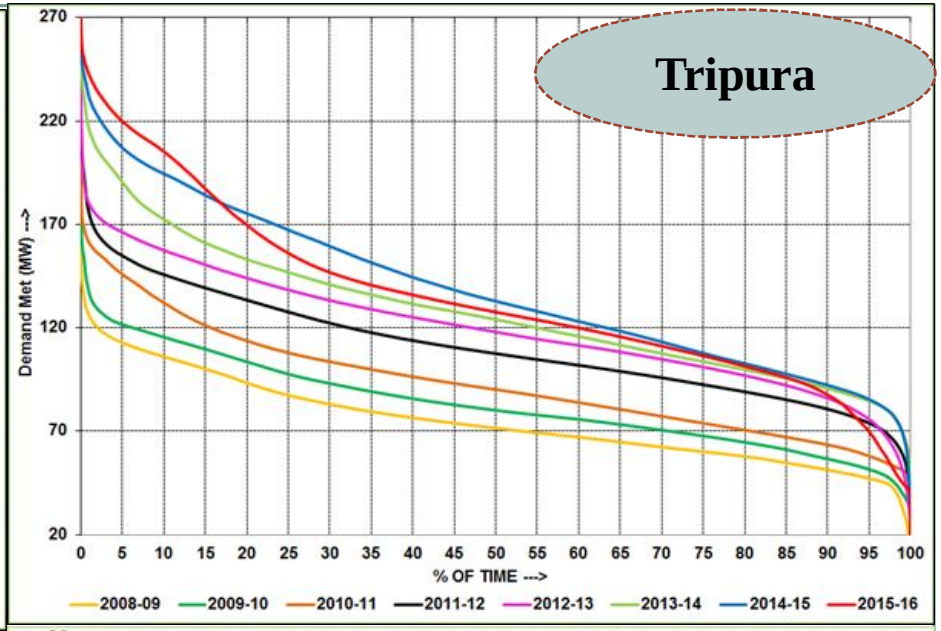
- Seasonal Trend:
  - Neither Morning or Evening Peak is visible across all months, barring June, September, October and December
  - In April and July, a distinct pattern is visible of 3 peaks = Morning, Day and Evening ; where Day Peak appears to be the highest *[Possible reasons?]*

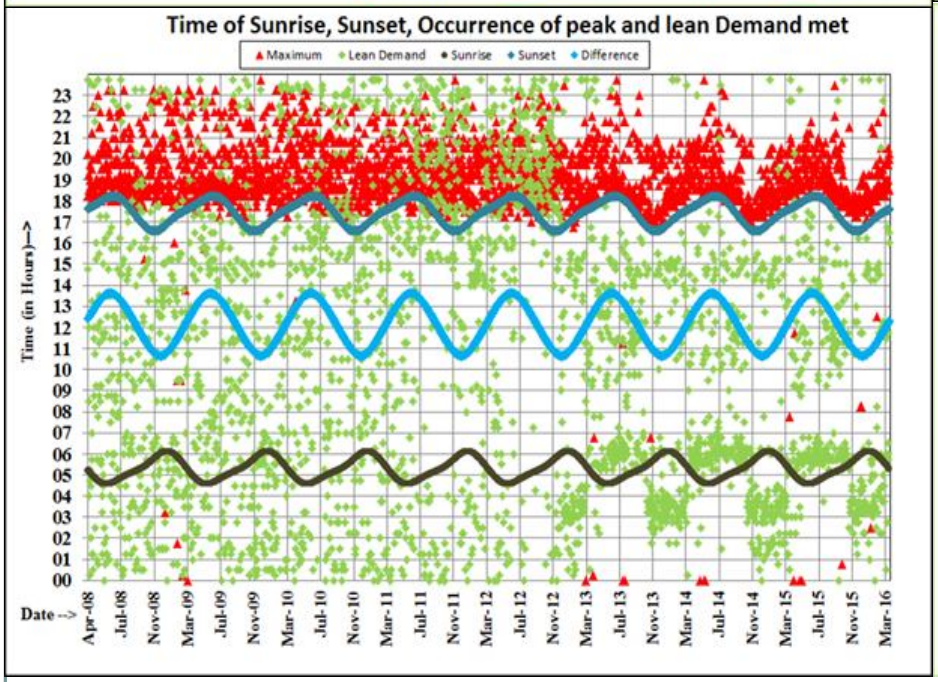
Nagaland – contd...

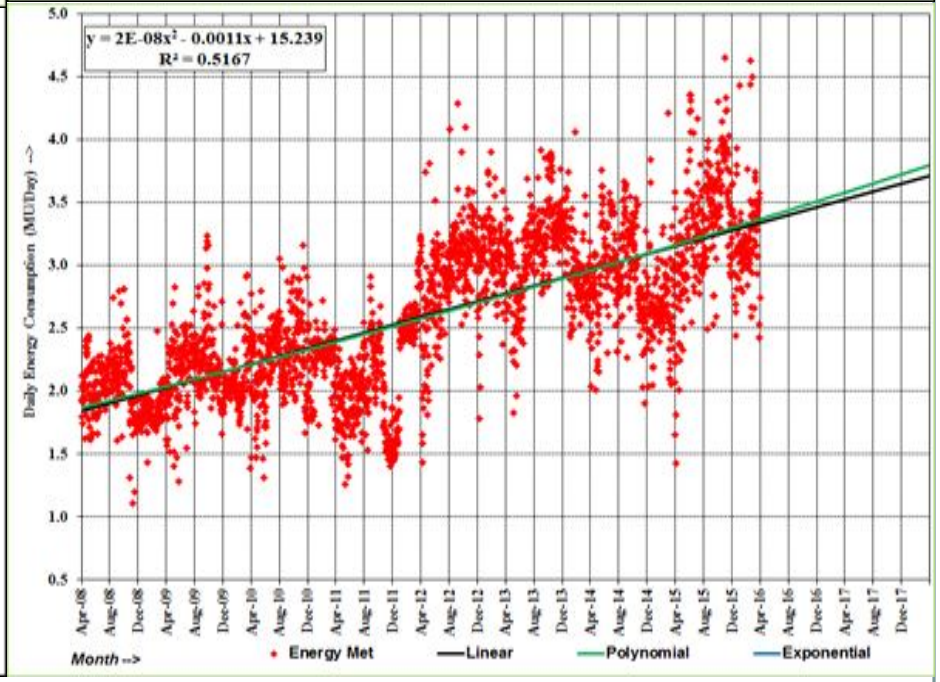
- Seasonal Trend_contd...:
  - The demand curve is flatter during the day than other states of NER
  - Maximum demand occurs around Christmas with Sharp Ramp (25th December) *[Christmas is the main festival of Nagaland]*
  - In December, the Highest Demand is observed during Morning hours *[Reasons?]*

- Load Profile:
  - Maximum Demand is 90 percent higher than Average while Minimum demand is 80 percent lower than average *[High volatility in demand met]*
    - Nagaland should build hydro plants to meet Peak demand
  - Duration of Peak demand is very low, and Peak wanes off from 2000 Hrs now instread of 2200 Hrs in 2008-09
  - Load factor steadily growing









"It is said that the present is pregnant with the future. " --Voltaire

Tripura

- Growth rate:
  - Maximum demand is steadily increasing ; with high growth from 2013-14 onwards
  - Growth occurred between 2013-14 to 2015-16, but is showing signs of saturation
  - No growth in minimum demand from 2012 onwards *[No growth in number of customers served?]*
  - Typical trend: Minimum demand & Average demand is Reducing from 2015-16 *[Reasons? Tripura shedding load to sell in market ?]*
  - Growth rate of energy consumption is reducing from 2015 onwards

- Seasonal Trend:
  - Morning peak visible only during winter period (October-February)
  - Evening peak touches maximum during Puja (October) and goes down from November(beginning of winter)

Tripura – contd...

- Seasonal Trend_contd...:
  - Typical pattern: A notch is Demand met is seen in Early Morning hours *[Around 5.30 am] => Reason?*
  - Day Peak visible in March – May, viz. 3 Peaks, with magnitude of Morning and Day peak being almost similar and much less than Evening peak *[Reasons?]*
  - Minimum demand met in January *[Winter]*
- Load Profile:
  - Maximum Demand is 90 percent higher than Average while Minimum demand is 70 percent lower than average *[High volatility in demand met]*
    - Tripura should go more for Peak load plants like Hydro
  - Solar will be beneficial since highest energy met in Summer months
  - Load factor steadily Reducing

Overall observations for NER

- High potential for growth exists
- Difference between maximum and minimum are increasing for all states, which indicate Lack of Industrialisation / Urbanisation / Constraints in Distribution side
- Highest demand occurs in Evening unlike that of Developed areas where Highest demand occur in Day
- Early sunrise and good correlation with sunrise indicates people are mostly early risers
- High volatility in Daily energy consumption indicates load is mostly Residential *[Since Industrial loads have a constant load profile]*
- Neither of the state should invest in Base Load plants and rather procure power from market at cheaper rates
- Growth in DISCOM side is not able to keep pace with transmission. Distribution side transformation capacity needs to increase to sustain the growth momentum

Desired Information for Further Analysis

- Per Capita Income of State
- GDP growth of state
- Urbanisation ; Development of new cities / Shifting of people from Rural to Urban areas
- Change in Political scenario of state
- Villages electrified and Approximate load of each village cluster
- Growth of state's own generation capacity in Installed & Actual [Grid connected / Isolated]
- Health of DISCOM
- AT&C Losses (Aggregate Technical and Commercial losses) ; How much is technical loss, and how much is commercial loss
- Power Purchase rate of Consumers (Domestic / Commercial / Industrial)
- Industrial Growth ; Major industrial complex / etc.
- Weather conditions

"A good forecaster is not smarter than everyone else, he merely has his ignorance better organised. "--Anonymous

Thanks for your Attention !

“We all do better when we work together. Our differences do matter, but our common humanity matters more.. "— Bill Clinton

Data Source and Assumptions

- **Analysis based on instantaneous 15 min and hourly demand met SCADA NLDC.**
- **Time period – 1st April'08 to 31st March'16.**
- **Maximum/Minimum/Average demand met during the day/months/years have been calculated by using 15 minutes instantaneous Demand data.**
- **Some discrepancies in data could also be present due to failure of communication at some point of time. In case of missing data following assumption have been made:**

  1. Loss of data for small period of time: Last data considered.
  2. Loss of data for long period: Same time period data of previous day considered.
  3. Loss of data for entire day: Previous day data has been considered
- **SCADA data is not time synchronised data.**
- **State Demand Met Calculation**
  - **Summation of internal generation and total drawl from the grid.**
- **Drawl of any state is calculated at the periphery of the state.**

ANNEXURE-D.29

Sl. No.	Station	ULDC Phone Nos.	Remarks
1	AGARTALA GAS	23640132/131	23640131 No. is not rspnding
2	AGARTALA SLDC	23810013/11	Not working
3	AIZAWL-PG	23640113	Ok
4	BADARPUR	23640134	Ok
5	BALIPARA	23640136/137	Ok
6	BONGAIGAON-PG 400KV	23640135/138	Ok
7	BONGAIGAON-PG 220 KV	Na	
8	MOKOKCHUNG	NA	
9	DIMAPUR-PG	23640142/143	Ok
10	DOYANG	23640145/120	Ok
11	HAFLONG	23640146	Ok
13	IMPHAL-PG	23640150/125/149/147	Ok
14	ITANAGAR	23640151	Not working
15	JIRIBUM	23640130	Not working
16	KATHALGURI	23640154	Ok
17	KHANDONG	23640117	Ok
18	KHLIEHRIAT PG	23640158	Ok
19	KOHIMA	Na	
20	KOLASIB	23640111	Not working
21	**KOPILI**	**23640114**	Ok
22	KUMARGHAT	23640112	Not working
23	LOKTAK	23640129	Ok
24	MISA	23640124	Ok
25	RANGANADI	23640119	Ok
26	***Silchar_PG***	***n/a***	
27	**Palatona**	**23640127**	Not working
28	**ZIRO PG**	**NA**	
29	**NEW MARIANI PG-**	**23640121**	Ok
30	**NTPC_BONGA**	**Na**	
31	**Byrnihat**	**n/a**	
32	**BNC**	**n/a**	

Annexure-D.29

SL. NO	Station Name	Date of Outage
1	Ranganadi	21.05.16
2	Ziro	07.08.16
3	Kopili	09.05.15
4	Doyang	24.01.15
5	Khandong	16.09.16
6	Khatalguri	25.07.16
7	Haflong	14.09.16
8	Itanagar	01.08.16

Annexure-A

Sl. No.	Tower Location	Estimated cost of protection work (in Rs.)	Photograph
01	Loc. 07 at Palatana, Udaipur	16,48,756.00	
02	Loc. 165 at Brahmacherra, Teliamura	2,81,938.00	
03	Loc. 449 at Chandpur, Near Churaibari	7,21,574.00	
04	Loc. 457 at Laxminagar, Near Churaibari	4,12,297.00	
05	Loc. 459 at Laxminagar, Near Churaibari	6,97,367.00	

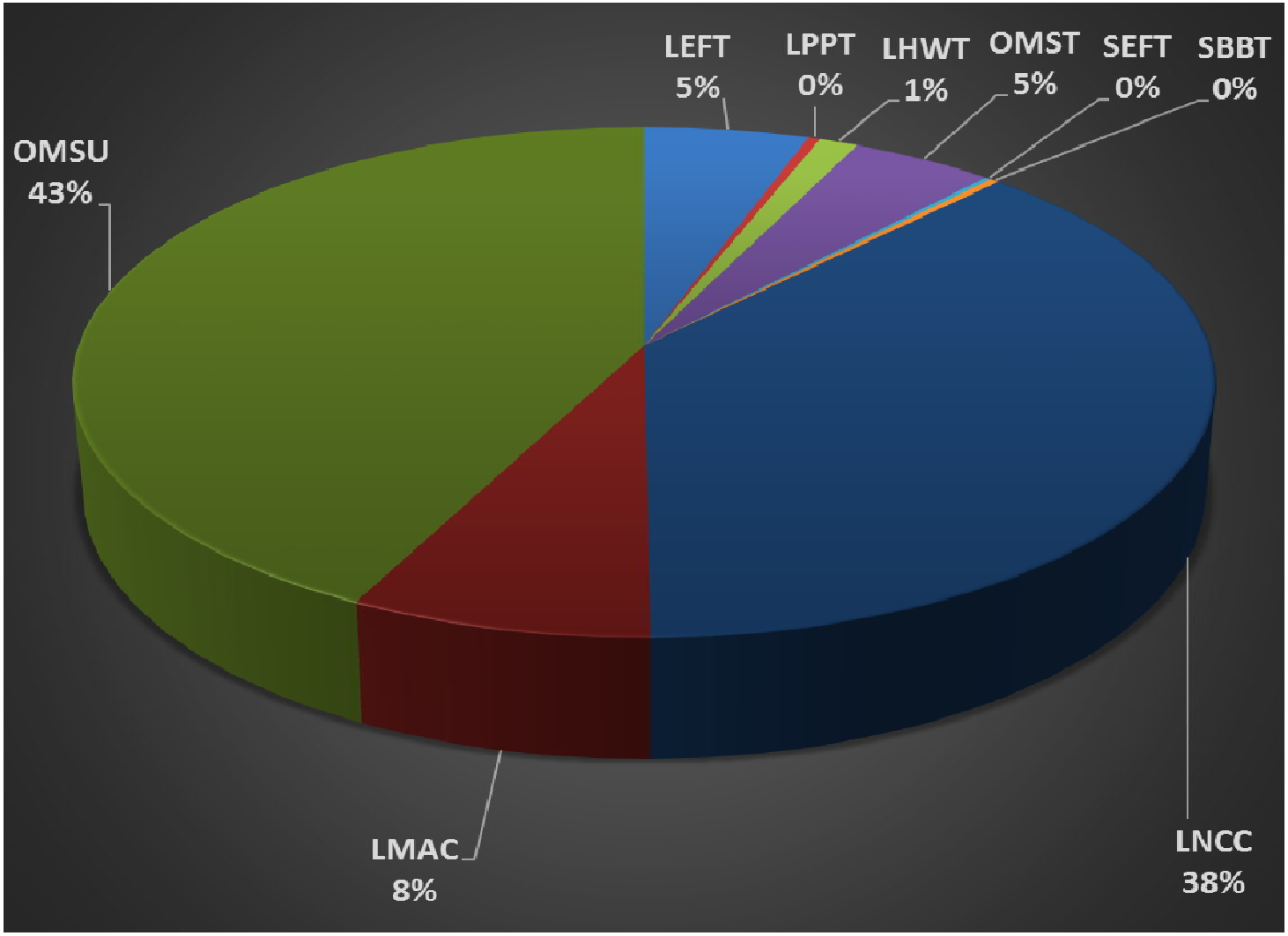
06	Loc. 460 at Laxminagar, Near Churaibari	5,93,650.00	
07	Loc. 461 at Laxminagar, Near Churaibari	5,49,581.00	
08	Loc. 467 at Churaibari	21,71,616.00	
	Total:	**Rs. 70,76,779.00**	

Transmission Line Surge Arrester – An Alternative to arrest Frequent Tripping of 132kV Lines in NER during Monsoon

Presentation By:
P. Kanungo, POWERGRID, NERTS

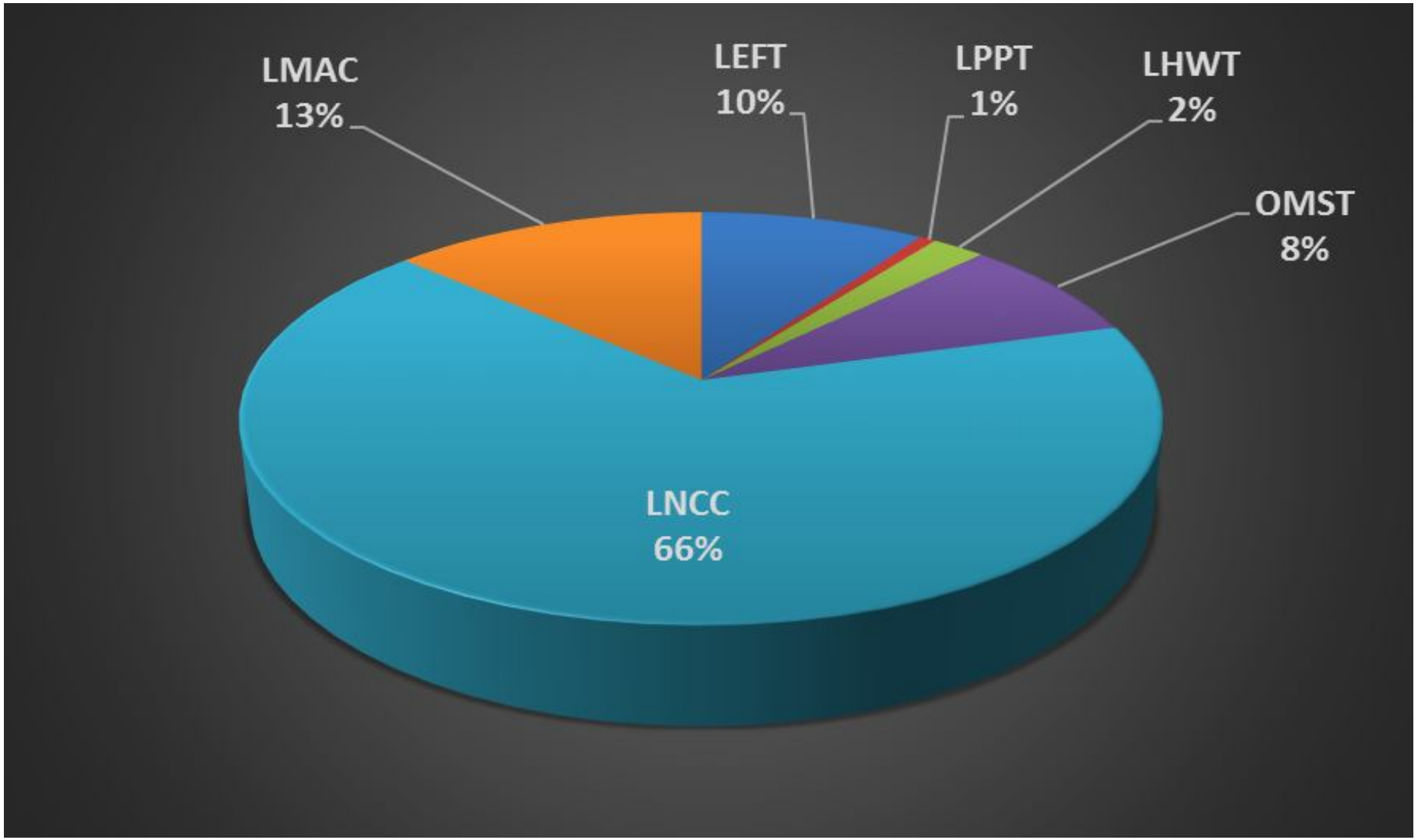
Tripping Break-Up (Oct'14 – Sep'16)

Category	Nos.
LEFT	55
LPPT	4
LHWT	13
OMST	48
SEFT	2
SBBT	3
LNCC	388
LMAC	77
OMSU	439
TOTAL	1029



Around 90% Tripping are on account of Lightning (LNCC), Miscreants (LMAC) & Downstream Fault (OMSU) beyond control of POWERGRID

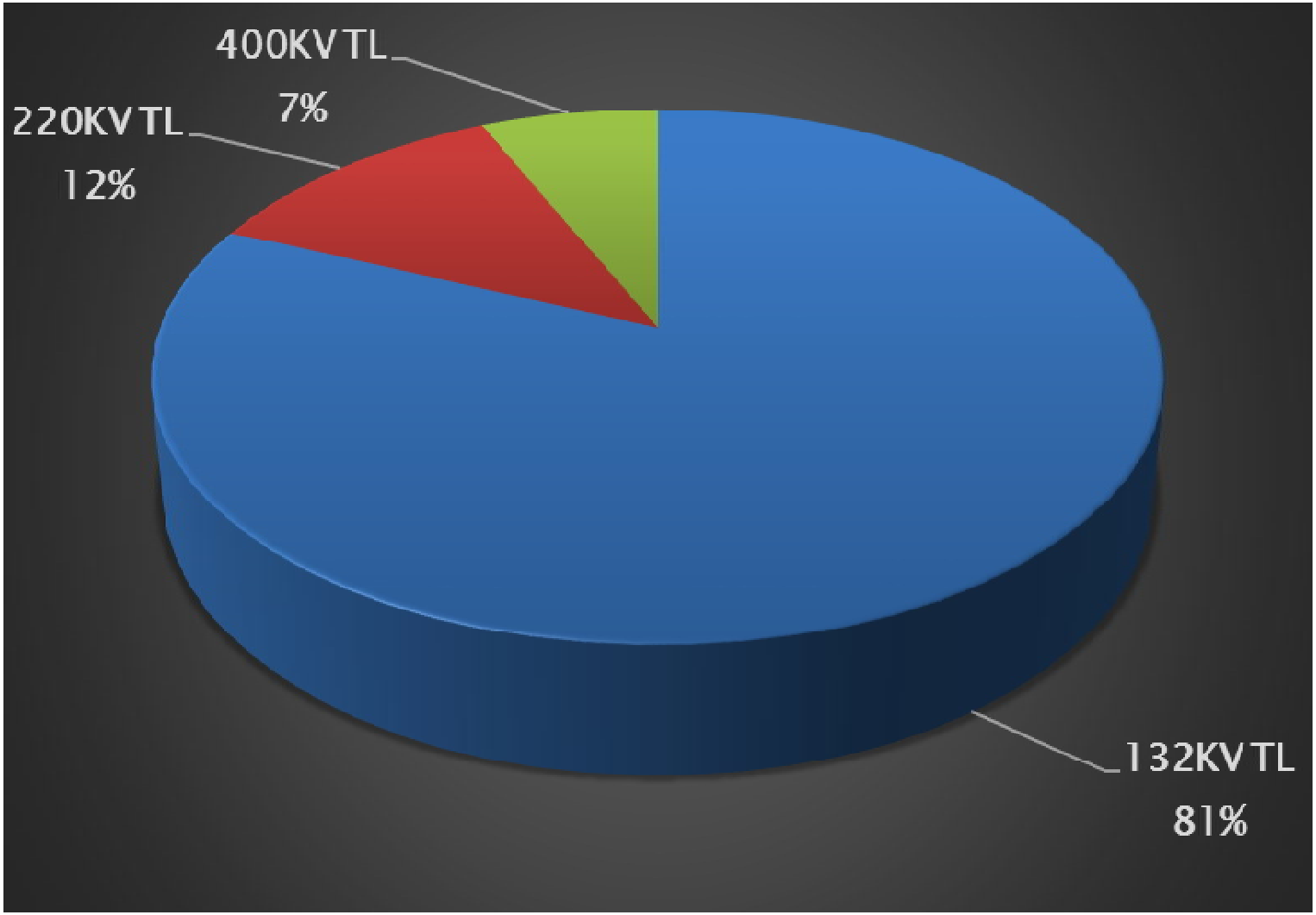
Impact of Lightening



LEFT	LPPT	LHWT	OMST	LNCC	LMAC	TOTAL
55	4	13	48	388	77	585

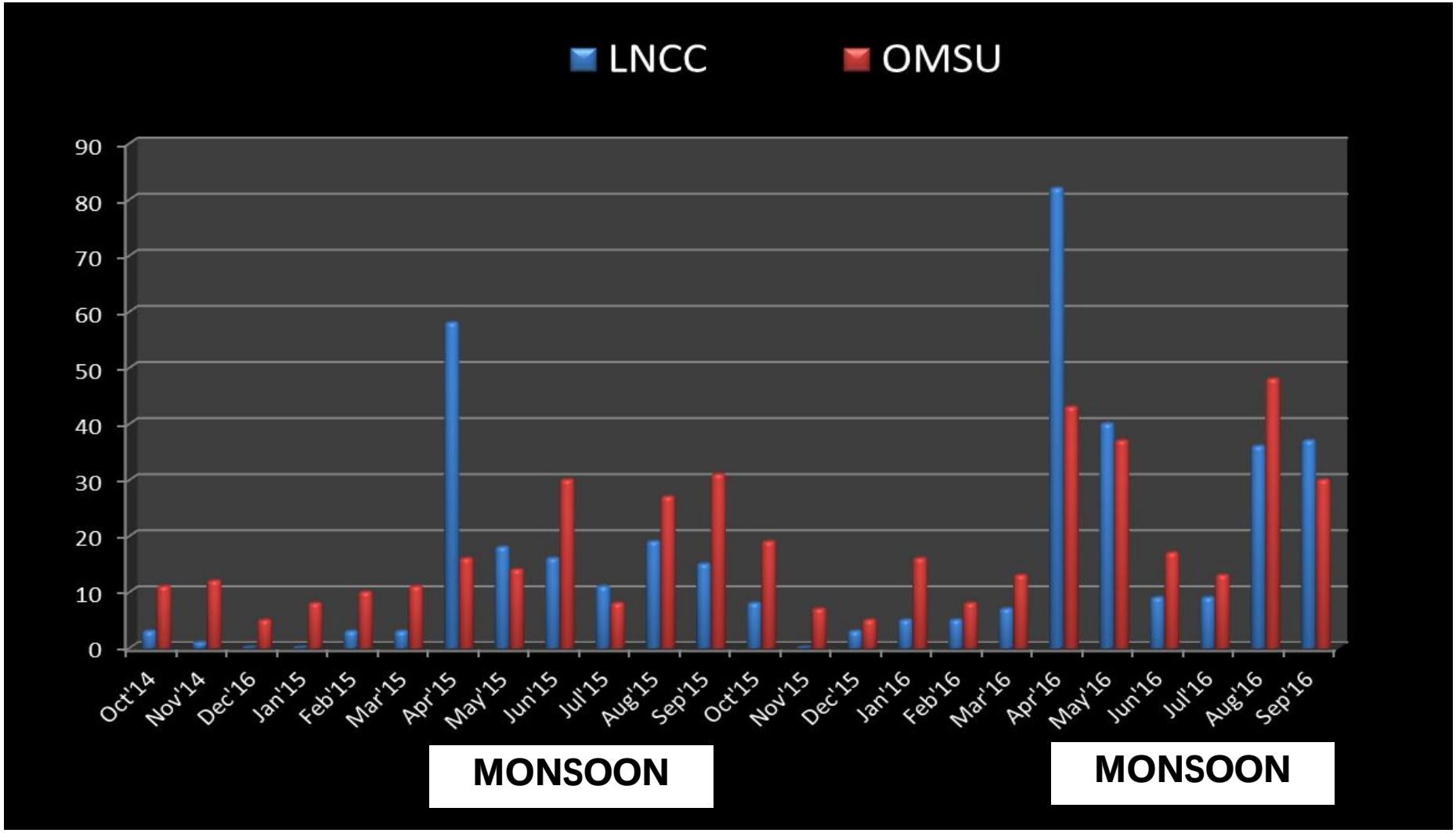
No. of LNCC Tripping Voltage-Wise/100Km/Year

132KV TL	8.00
220KV TL	1.20
400KV TL	0.70



More than 80% Tripping due to Lightening is in 132kV Lines

Down Stream Vs. LNCC Tripping



Down Stream Faults in State System is also mostly due to Lightening

Need of the Hour for NER

Arrest Tripping of 132kV Lines during Lightning in NER by:

- **Installation of TLSA.**
- **Improvement of Tower Earthing.**
- **Implementation of Auto Reclose Scheme**

TLSA Movie

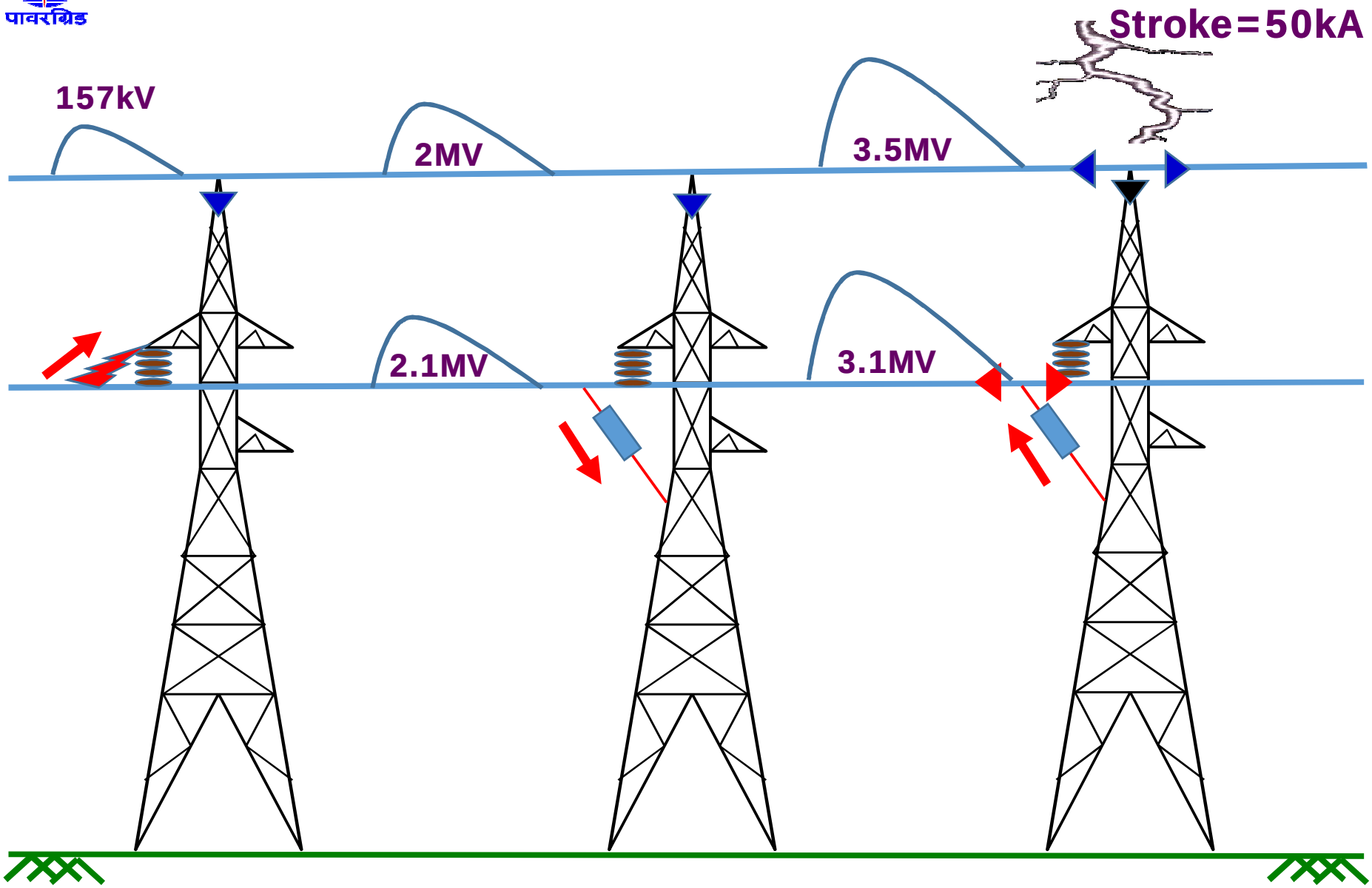
TLSA Location for High Tower Footing Resistance

- **A stretch of a 132kV Transmission line consisting of 10 Tower having Tower footing resistance as below:**

TOWERS	1	2	3	4	5	6	7	8	9	10
OHM	25	35	20	205	250	100	155	30	35	25

- **Adding arresters to all three phases on towers at locations 4,5,6, and 7 where resistance is highest would reduce the lightning flashovers.**
- **To achieve acceptable performance, TLSA should also be placed on towers 3 and 8, which are the first structures on each side of the ridge that have low footing resistance.**

TLSA Location for High Tower Footing Resistance



Tower-3: 17 Ω

Tower-4: 170 Ω

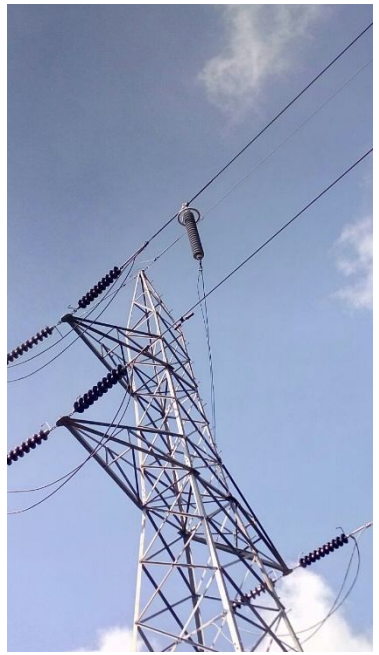
Tower-5: 200 Ω

TLSA - Summary

- **TLSA are to be placed in locations having high tower footing resistance. There will be flash over where tower footing resistance is low if TLSA are not provided at location immediately after the location having high tower footing resistance.**
- **Therefore TLSAs are to be placed at locations having high Tower Footing Resistance as well as at location having permissible tower footing resistance immediately after the high tower footing resistance tower.**

Action Taken by POWERGRID, NERTS

- **Installation of TLSA in 132kV Khliehriat - Khandong Circuit # 1 132kV Khliehriat - Khandong Circuit # 1 as per EPRI Guidelines.**
- **Limited installation of TLSA in Towers having high impedance for 132kV Badarpur-Khliehriat Line and 132kV Aizawal-Kumarghat Line.**
- **Performance of above lines during monsoon will be compared.**



Action Plan for NER

- **Installation of TLSA in all 132kV Transmission Lines of POWERGRID under PoC Mechanism.**
- **Installation of TLSA and Improvement of Tower Footing Resistance of 132kV Lines of States under PSDF.**

Thank You