North Eastern Regional Power Committee

Agenda
For
93rd OCC & 17th PCC Joint Sub-Committee Meeting

Time of meeting : 10:00 Hrs.

Date of meeting : 21st January, 2014 (Tuesday)

Venue : Hotel Sun View, G.S. Road, Guwahati.

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 92nd MEETING OF OPERATION SUB-COMMITTEE OF NERPC.

The minutes of 92nd meeting of Operation Sub-committee held on 6th December, 2013 at Guwahati were circulated vide letter No. NERPC/SE (O)/OCC/2013/6613-6635 dated 19th December, 2013.

CONFIRMATION OF MINUTES OF 16th MEETING OF PROTECTION SUB-COMMITTEE OF NERPC.

The minutes of 16th meeting of Protection Sub-committee held on 6th December, 2013 at Guwahati were circulated vide letter No. NERPC/SE (O)/PCC/2013/6636-6658 dated 31st December, 2013.

No observations or comments were received from the constituents. The Sub-committee may confirm minutes of 92nd OCCM & 16th PCCM of NERPC.

ITEMS FOR DISCUSSION

B. OPERATIONAL PERFORMANCE AND GRID DISCIPLINE DURING DEC, 2013

As per the data made available by NERLDC, the grid performance parameters for December, 2013 are given below:

NER PERFORMANCE DURING DECEMBER, 2013

	Energy Met (MU)			Energy Reqr. (MU)		
States	**Dec-13**	**Nov-13**	**% inc(+)/dec(-)**	**Dec-13**	**Nov-13**	**% inc(+)/dec(-)**
Ar. Pradesh	49	**41.83**	17	51.791	**44.93**	15
Assam	557	**563.83**	-1	591.314	**580.29**	2
Manipur	47	**43.54**	8	50.446	**46.46**	9
Meghalaya	147	**136.82**	7	168.186	**156.87**	7
Mizoram	42	**37.77**	11	43.022	**39.25**	10
Nagaland	48	**42.78**	12	50.36	**44.49**	13
Tripura	101	**99.58**	1	105.696	**104.35**	1
Region	**990**	**966.15**	2	**1060.815**	**1016.64**	4

	Demand Met (MW)			Demand in (MW)		
States	**Dec-13**	**Nov-13**	**% inc(+)/dec(-)**	**Dec-13**	**Nov-13**	**% inc(+)/dec(-)**
Ar. Pradesh	124	120	3	125	120	4
Assam	1065	1155	-8	1153	1169	-1
Manipur	129	123	5	130	124	5
Meghalaya	313	298	5	312	300	4
Mizoram	79	65	22	80	66	21
Nagaland	104	96	8	105	96	9
Tripura	191	207	-8	194	208	-7
Region	**1890**	**1966**	-4	**2009**	**2046**	-2

REGIONAL GENERATION & INTER-REGIONAL EXCHANGE IN MU

Month---->	**Dec-13**	**Nov-13**
Total Generation in NER (Gross)	729.890	763.05
Total Central Sector Generation (Gross)	441.697	471.97
Total State Sector Generation (Gross)	288.193	291.08
Inter-Regional Energy Exchange		
(a) NER-ER	14.83	12.37
(b) ER-NER	283.76	225.99
© Net Import	268.92	213.62

AVERAGE FREQUENCY (Hz)

Month---->	**Dec-13**	**Nov-13**
	% of Time	% of Time
Below 49.7 Hz	1.91	1.17
Between 49.7 to 50.2 Hz	89.5	91.23
Above 50.2 Hz	8.6	7.6
Average	50.02	50.02
Maximum	50.69	50.51
Minimum	49.33	49.48

From the above table, it is seen that energy demand met and peak met of the region have decreased respectively. The import from ER has also increased considerably.

C.1 Synchronization of Pallatana Module -I

During the 92nd OCC meeting, the representative of OTPC informed that ONGC has already carried out 4th round of pigging, Performance Heater Test is under progress and the same will be completed soon. He also intimated that cyclone separator will be installed by 15th December, 2013. For installation of cyclone separator, shut down of machine for 4-5 days is normally required. However, he mentioned that without waiting for installation of cyclone separator, the Unit#1 will be synchronized on 10-12-2013 and PPA test including other trial run operations would be carried out so that CoD can be achieved within 31st December, 2013. He requested all the constituents to extend their support during PPA test.

All the constituents agreed to extend their support to OTPC and this lean hydro season is very much suitable for achieving the maximum generation required for trial operation / PPA tests. The committee requested OTPC to co-ordinate with NERLDC for ensuring smooth operation of the grid during PPA tests and to intimate NERLDC about the schedule of tests / trial operation at least one week in advance.

The Sub-committee also reviewed the status of Pallatana & Transmission lines. The status as informed by OTPC and POWERGRID is as follows:

SN	Items	Present status
1	Trial operation of Unit -I of OTPC at Palatana	December, 2013
2	Trial operation of Unit -II of OTPC at Palatana	June, 2014
3	400KV D/C Silchar - Melriat line	June, 2014
4	400KV D/C Silchar - Imphal line	June, 2014
5	220KV D/C Mariani (New) - Mokokchung	March, 2014
6	400KV D/C Byrnihat-Bongaigaon line	March, 2014 (Byrnihat-Ajara section likely to be completed by January 2014)
7	400kV Balipara – Bongaigaon D/C line # 3 & 4 with FSC	March, 2014

1. As per Clause 1 (12) of CERC Tariff Regulations 2009-14, Pallatana U-I (363.3 MW) demonstrated the Maximum Continuous Rating (MCR) or the Installed Capacity through a successful trial run on 3rd January, 2013.

2. Out of 363.3 MW Installed Capacity of U-I, 49 MW is merchant quantum and balance 314.3 MW is contracted with NER states which is the contracted capacity.

3. As per provision of clause 6.2 of the PPA between OTPC and buyers of North Eastern States, the performance test (PPA test) of 363.3 MW block-I of Pallatana GBCC project continuous operation of 72 consecutive hours at or above 95% of contracted capacity) was conducted from 1200 hrs of 26.12.2013 upto 1800 hrs of 30.12.2013. During this period generation was maintained between 303 MW to 320 MW.

4. In line with these, OTPC declared commercial operation of U-I w.e.f. 0000 hrs of 04.01.2014
5. As per (3) above, tested capacity was more than 100% contracted capacity.
6. In day ahead scheduling, available capacity for the constituents are declared accordingly.

Committee may like to discuss and review the current status of progress:

SN	Items	Present status
1	CoD of Unit -I of OTPC at Palatana	
2	Trial operation of Unit -II of OTPC at Palatana	
3	400KV D/C Silchar - Melriat line	
4	400KV D/C Silchar - Imphal line	
5	220KV D/C Mariani (New) - Mokokchung	
6	400KV D/C Byrnihat-Bongaigaon line	
7	400kV Balipara – Bongaigaon D/C line # 3 & 4 with FSC	

C.2 Independent third party audit of protection system:

During 92nd OCC meeting, Member Secretary I/C requested all constituent states of the region to take up the issue with their respective Power Ministry for approaching the Ministry of Power, Govt. of India so that fund is made available from NLCPR-Central at the earliest and the schemes is implemented early for smooth operation of the grid for the benefit of the region as well as for the country.

As decided in 14th TCC meeting, project proposal amounting to Rs. 815.00 crores viz. “Rectification of various deficiencies including renovation and modernization of protection system in existing substations and generating stations of 132kV and above class”, prepared by NERPC, on behalf of the region, has been submitted by Chairman NERPC & Hon’ble Power Minister, Govt. of Tripura to Ministry of Power (Govt. of India) and Ministry of DoNER vide letter dated 10.01.2014 requesting to look into the matter and to take necessary step for getting the project sanctioned under NLCPR (Central).

The constituent states are requested to take up the matter with their respective Power Ministry so that funding for execution of above work is made available from NLCPR-Central to the constituent states of the region at the earliest.

C.3 Details of Installations and self-certification (by STUs and CTUs) in respect of operationalisation of Under Frequency Relays (UFRs) in NER systems and additional requirement of UFR and df/dt relays:

During 14th TCC meeting, the quantum of UFR based load shedding has been approved by the Committee as decided in the 88th & 13th PCC meeting as given below:

SN	Stages	Frequency (in Hz)	State-wise Load Shedding	Total Load shedding (in MW)
1	Stage-I	49.2	Arunachal = 5 MW Assam = 55 MW Manipur = 5 MW Meghalaya = 15 MW Mizoram = 5 MW Nagaland = 5 MW Tripura = 10 MW	100
2	Stage-II	49.0	Arunachal = 5 MW Assam = 55 MW Manipur = 5 MW Meghalaya = 15 MW Mizoram = 5 MW Nagaland = 5 MW Tripura = 10 MW	100
3	Stage-III	48.8	Arunachal = 5 MW Assam = 55 MW Manipur = 5 MW Meghalaya = 15 MW Mizoram = 5 MW Nagaland = 5 MW Tripura = 10 MW	100
4	Stage-IV	48.6	Arunachal = 5 MW Assam = 55 MW Manipur = 5 MW Meghalaya = 15 MW Mizoram = 5 MW Nagaland = 5 MW Tripura = 10 MW	100
			Total load shedding	**400**

During 92nd OCC meeting, the Committee reviewed the list of feeders identified for UFR based load shedding by the constituent states of the region. In the meeting the representative of Nagaland also submitted the list of feeders identified for UFR based load shedding. Assam was requested to ensure that feeders / loads considered under four staged (49.2 Hz, 49.0 Hz, 48.80Hz, 48.60Hz) UFR based load shedding should not form part of proposed islanded pocket. Assam, Meghalaya & Nagaland informed that the implementation of UFR based load shedding for 1st & 2nd Stage would be completed by January, 2014 and Mizoram by February, 2014. The status pertaining to Ar. Pradesh, Manipur & Tripura could not be updated since no representative was present. All constituent states of the region, except Ar. Pradesh and Manipur, have identified the feeders for UFR based load shedding. The details of UFR based load shedding is given at **Annexure – C.3 (i).**

The Sub-committee may now like to know about the status of implementation of UFRs based load shedding (Assam, Meghalaya, Mizoram, Tripura and Nagaland) and discuss about the identification of the feeders, the quantum of UFR based load shedding at different stages and implementation plan of Ar. Pradesh and Manipur.

C.4 Lines under long outages

The status for restoration of following lines as reviewed in the 92nd OCC meeting is given below:

a) 220kV BTPS – Agia line (one ckt) – [Since Nov'97]: Material has already been procured and the target for completion of work is January, 2014.

b) 132kV Mariani – Mokokchung line - [Since Apr'02]

EE, DoP, Nagaland informed that 60 strings of insulators have been replaced and rest of the work is likely to be completed by **December, 2013 and charging of line is expected in January 2014.**

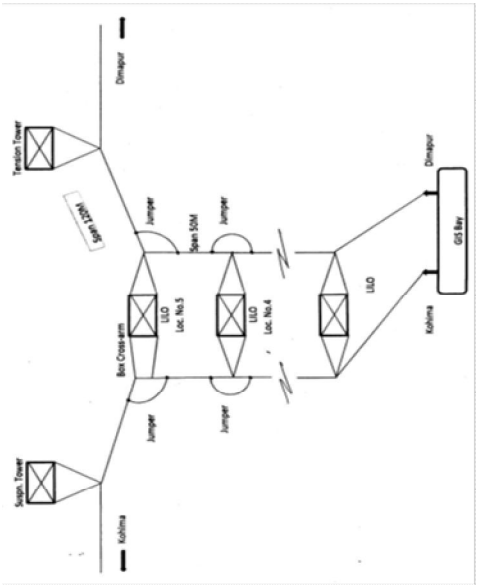
c) 39km of 132kV Rengpang – Jiribam line – [Since Oct'02]

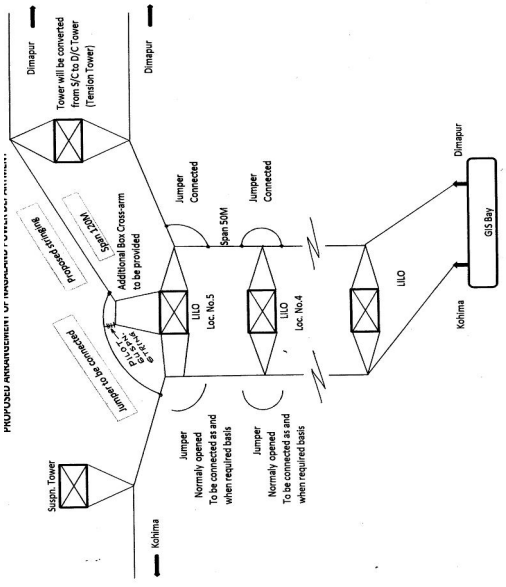
The EE, DoP, Manipur informed that the line was charged for one week, but due to road cutting by BRTF, the minimum ground clearance was hampered and the line has been kept out of service. The status could not be updated since no representative from Manipur was present.

d) LILO of 132 kV Dimapur (Nagaland) – Kohima (Nagaland) line at 220/132 kV Dimapur (PGCIL) Substation- [Since Aug'11]:

The representative of Nagaland informed that work for upgrading the existing 3x20 MVA by 2x100 MVA is in progress. Also he informed that some minor modification in one of the tower is required for completion of LILO and Dept. of Power had already engaged a firm for designing the same and the drawing was submitted to POWERGRID for examination.

Meanwhile, POWERGRID has informed that the issue of LILO of 132 kV Dimapur (Nagaland) – Kohima (Nagaland) Line at 220/132 kV Dimapur (PGCIL) Substation is pending since August, 2011. DoP, Nagaland has communicated POWERGRID for rearrangement of original LILO as below which will change the configuration of Original Missing Link Project:





Further, EE, DoP, Nagaland informed that the above modification will enhance the reliability of the power supply to Kohima. Further, he stated that the present arrangement of power supply to Kohima via the GIS substation of POWERGRID will continue and the modification will provide an alternate connection to Kohima. Moreover, the cost of modification will be borne by DoP, Nagaland. He requested POWERGRID to give their consent at the earliest**.**

DGM, POWERGRID stated that they have to take up the matter with their corporate office at Gurgaon for approval of proposed modification (i.e. incorporation of additional Box Cross Arm at Tower Location No. 5). Further, he enquired from Nagaland that till the time the proposed arrangement is implemented, whether the connectivity with Kohima substation will be through LILO arrangement at PGCIL's Dimapur GIS substation or will be connected directly with Kohima substation bypassing the GIS substation.

EE, DoP, Nagaland informed that the connectivity to Kohima till the implementation of the scheme will be fed directly bypassing POWERGRID S/S. The committee suggested DoP, Nagaland to utilize the LILO arrangement with GIS for connectivity to Kohima.

The Sub-committee agreed with the modified proposal of Nagaland and requested POWERGRID to take up matter for early approval of their competent authority. POWERGRID agreed.

POWERGRID may kindly intimate the current status.

C.5 SPS Scheme for Pallatana:

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

Case 1: Tripping of generating unit of OTPC at Palatana

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

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

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

The scheme for all the four cases will be as follows:

Case 1: When Palatana unit trips:

i) When generator at Palatana trips a signal will be generated from trip relay of the unit.

ii) This signal should trip the CB of 132 kV Silchar – Srikona D/C & 132 kV Silchar – Panchgram lines at Silchar.

iii) Subsequent to tripping of 132 kV Silchar – Panchgram line, the CB at Badarpur of 132 kV Badarpur – Panchgram line should be tripped.

iv) After these trippings an instant load of 80 MW will be relieved during off-peak hours & 130 MW will be relieved during peak hours which will prevent the system from cascade tripping

v) Then manual demand disconnection/management should be imposed.

Case 2: When 400 kV Palatana-Silchar (D/C) lines trip

i) When both the ckts of 400 kV Palatana – Silchar lines trips, a signal will be generated from trip relays at Silchar

ii) This signal should trip the CBs at Silchar end of 132 kV Silchar – Srikona D/C & 132 kV Silchar – Panchgram lines.

iii) Subsequent to tripping of 132 kV Silchar – Panchgram line, the CB at Badarpur end of 132 kV Badarpur – Panchgram line should be tripped.

iv) After these trippings an instant load of 80 MW will be relieved during off-peak hours & 130 MW will be relieved during peak hours which will prevent the system from cascade tripping

v) Then manual demand disconnection/management should be imposed.

Case 3: 400 kV Silchar – Byrnihat line trips (with generation at Pallatana)

i) When 400 kV Byrnihat – Silchar lines trip, signal will be generated from trip relays at Silchar

ii) This signal should trip CB of GTG/STG of Generating Unit at Palatana. But unit may run in Full Speed No Load (FSNL) condition.

iii) An instant relief of load of 230/130 MW will prevent the system from cascade tripping.

iv) Then manual demand disconnection/management should be imposed.

Case 4: <u>When 400 kV Silchar – Byrnihat line trip(without generation at Pallatana)</u>

i) When 400 KV Byrnihat – Silchar line trips, a signal will be generated from trip relays at Silchar.

ii) This signal should trip the CB of 132 kV Silchar – Srikona D/C & 132 kV Silchar – Panchgram lines at Silchar.

iii) Subsequent to tripping of 132 kV Silchar – Panchgram line, a signal will be generated from trip relay of 132 KV Silchar – Panchgram line. This signal should trip the CB at Badarpur of 132 kV Badarpur – Panchgram line.

iv) After these trippings an **instant loadrelief** of around **95 MW in Peak Hours** which will prevent the system from cascade tripping

v) Then manual demand disconnection/management may be imposed, if necessary.

The status of implementation of SPS reviewed by sub-committee during 92nd OCC meeting was as follows:

Case I: OTPC stated that necessary action at their end would be completed by 7.12.2013 and the scheme will be made operational.

Case 2-3: OTPC stated that for the remaining cases, BHEL has already circulated internally about the SPS schemes proposed to be implemented to BHEL & OTPC and their observations if any has to be given by 15.01.2014. After that the exact status will be made available.

Case – 4: Has already been implemented by POWERGRID.

POWERGRID had confirmed that the work associated with all four (4) SPS have already been completed at their end.

The Sub-committee had requested OTPC to go ahead with the implementation of the scheme as suggested in consultation with BHEL without further delay and in case any problem arises, the same will be reviewed again and modified as per system requirement.

In various OCC meetings and other forums NERLDC has requested OTPC to implement the SPS cases related to Palatana. Presently, Palatana is generating around 350 MW round the clock. ~~So~~ Without the SPS in place the 132 kV Pocket always remains in venerable condition. So it is requested to implement the SPS as soon as possible to avoid security threat to the system due to high generation. It was observed that SPS1 was not operated after tripping of STG1 of Palatana at 1426 Hr on 31.12.13.

OTPC/NERLDC may intimate the current status of implementation of SPS.

C.6 Implementation of Islanding Scheme in NER:

During the 87th OCC meeting, the committee had decided the following islanding scheme and associated frequencies levels for creation of islands in NER:

SN	Islanding Scheme	Lines required to be opened	UFR Location	Implemen Agency
1	**ISLAND AT 48.80 Hz:** Island comprising of generating units of AGBPP (Gas), NTPS (Gas) & LTPS (Gas) and loads of Upper Assam system &Deomali area (Ar. Pradesh) **[Total Generation: 380-400MW and load: 200MW (off peak)-300MW (peak)]**	220 kV New Mariani (PG) – AGBPP	UFR-1 [At New Mariani (PG)]	**PGCIL**
		220 kV New Mariani (PG) – Misa		
		220 kV Mariani – Misa	UFR-2 [At Mariani, Samaguri of AEGCL]	**AEGCL**
		220 kV Mariani – Samaguri		
		132 kV Mokukchung – Mariani		
		132 kV Dimapur (PG) – Bokajan	UFR-3 [At Dimapur (PG)]	**PGCIL**
2	**ISLAND AT 48.20 Hz:** Island comprising of generating units of AGTPP (Gas), generating units at Baramura (Gas), Rokhia (Gas) &Gumati (Hydro) and loads of Tripura system &Dullavcherra area (Assam) **[Total Generation: 150-160MW and load: 110MW (off-peak)-150MW (peak)]**	132 kV Palatana – Udaipur	UFR-1 [At Palatana]	**OTPC**
		132 kV Palatana – Surjamani Nagar		
		132 kV Silchar – Dullavcherra	UFR-2 [At Silchar]	**PGCIL**
		132 kV AGTPP – Kumarghat	UFR-3 [At Kumarghat]	**PGCIL**
		132 kV P K Bari – Kumarghat		
3	**ISLAND AT 47.90 Hz:** Isolation of NER from NEW grid at ER-NER boundary with rest of the generation and load of NER	To be decided after system study		

The deliberation in the 1st meeting of the subgroup on the Islanding Scheme which was held on 29.11.2013 at SLDC, Kahilipara was as follows:

1. NERLDC gave brief presentation on system studies carried out in connection with 1st and 2nd islanding schemes. NERLDC informed that in case of 1st islanding scheme, in general the generation (in the proposed islanded pocket) will be more (of the order of 100-150MW) than the connected load depending on peak/off-peak and summer/winter/monsoon condition. Similarly in case of 2nd islanding scheme the generation (in the proposed islanded pocket) will be more (of the order of 30 - 50MW) than the connected load under off-peak condition and less (of the order of 20 - 25MW) than the connected load under

peak condition. The gap between expected generation and load will vary and hence proper load generation balance would be required for survival of islanded pocket.

2. It was decided to focus on implementation of 1st Islanding scheme comprising of generating units of AGBPP (Gas), NTPS (Gas) & LTPS (Gas) and associated load of Upper Assam System, Deomali Area of Arunachal Pradesh.

3. The representatives of NEEPCO, AEGCL & Tripura were requested to send the machine data to IIT, Guwahati & NERLDC by 1st week of December 2013. In case relevant information is not available with the generating companies, standard values may be assumed for the studies.

4. Professor Tripathy of IIT, Guwahati was requested to carry out relevant system studies associated with the proposed islanding schemes based on the relevant machine data provided by LTPS, NTPS, AGPPP, AGTTP, and Tripura. Simulation should be carried out by opening unit (s) of AGBPP / NTPS / LTPS to see the behavior of the system. NERLDC will also carry out similar exercise in consultation with Prof. Tripathy and the result of study will be discussed in OCC/PCC meetings.

5. Feeders / loads considered under four staged (49.2 Hz, 49.0 Hz, 48.80Hz, 48.60Hz) UFR based load shedding /any manual shedding should not form part of proposed islanded pocket.

6. During discussion it was brought to notice that machines at Namrup, Lakwa and AGBPP are quite old, unit sizes are also quite different and of different make. Moreover, being gas based machines, reduction in generation by way of reducing fuel/gas input may not practically feasible and hence de-synchronization / isolation of generating unit (s) one after the other, operating with own house load, will be done to balance load and generation. It was decided that the de-synchronization / isolation of generating unit (s) of AGBPP will be followed by units of Namrup and Lakwa as per requirement to achieve required load and generation balance.

7. UFR may also be installed in feeders / loads for automatic load shedding.

8. Programmable Logic Controller (PLC), UFR and df/dt relays etc. may be required at generating stations and substations for automatic balancing of load and generation.

9. The scheme will be formulated by NEEPCO and PGCIL in association with NERLDC and the target date of implementation of 1st Islanding Scheme proposed at 48.8Hz is January 2014.

10. The Committee also decided that the 2nd Islanding Scheme proposed at 48.2Hz will be implemented soon in similar line after implementation of 1st islanding scheme.

11. In general, the house was of the opinion that proposed 3rd islanding scheme (the isolation of NER from ER at 47.9Hz) should not be considered for the time being as most of the time NER is importing power from ER except during high hydro season. The isolation of NER from ER could be detrimental for NER Grid and NER grid may not survive after isolation.

During 92nd OCC meeting, the Sub-committee decided to have the meeting of representative (s) of Assam, NEEPCO, POWERGRID, NERLDC & NERPC at Shillong during December 2013 to discuss about the implementation plan so that the first Islanding scheme proposed at 48.8 HZ will be implemented by January 2014.

The meeting of sub-group was held on 19.12.2013 at Shillong and requested POWERGRID to co-ordinate in completion of implementation of first Islanding Scheme.

During the meeting following decisions were taken:

1. For 1st islanding Scheme at 48.8 Hz [comprising of AGBPP, NTPS & LTPS and associated loads], UFRs, inbuilt feature of numerical relays, will be activated at New Mariani (PG) & Dimapur (PG) substations by POWERGRID (for opening of two 220kV lines and one 132kV line) and at Mariani and Samaguri substations by AEGCL (for opening of two 220kV lines and one 132kV line).

2. Similarly for 2nd islanding Scheme at 48.2 Hz [comprising of AGTPP, Baramura, Rokhia & Gumati and associated loads], UFRs, inbuilt feature of numerical relays, will be activated at Silchar & Kumarghat substations by POWERGRID (for opening of four 132kV lines) and at Palatana substation by OTPC (for opening of two 132kV lines).

3. Two UFRs (one as back up) need to be activated at above locations.

4. The time delay for operation of UFRs at all these locations will be 5 secs.

5. Based on operational experience, it is expected that after formation of island, the frequency in the islanded pocket is likely to rise suddenly as expected generation will be more than load in the pocket. Hence, it was decided to use UFRs at AGBPP of NEEPCO for de-synchronization / isolation of one GT and one ST from each of two modules, which are in operation, leading to reduction of generation of about 80-90 MW [i.e each module will contribute to reduction of about 40-45MW (GT:30MW+ST:15MW)]. Accordingly UFRs, inbuilt feature of numerical relays, will be also activated at AGBPP of NEEPCO. In addition to above AGBPP has to develop logic to identify the Units, which are in service / operation so that these modules are de-synchronized/ isolated from the system in order to achieve the load and generation balance.

6. After reduction in generation at AGBPP by de-synchronization of two GTs and two STs from two modules, if further reduction in generation is required, then generation reduction of about 20 -30 MW would be carried out at NTPS / LTPS or both.

7. Automatic Governor Control of each module of AGBPP shall also be activated.

8. In case the load is more than generation in islanded pocket of 1st Islanding scheme, UFRS (inbuilt feature of numerical relays) are to be activated at Mariani, Tinsukia substations by AEGCL for disconnection of radial load by opening of 132kV Mariani-Golahat line (at 48.7Hz), 132kV Tinsukia – Ledo S/C line (at 48.6Hz), 132kV Tinsukia – Rupai S/C line (at 48.5Hz). UFRs are to be set at three different frequencies as indicated above without any time delay for operation.

9. In next stage, automated scheme would be devised to achieve the load and generation balance. For implementation of such scheme, inputs from SCADA, Programmable Logic Controller (PLC), df/dt and additional UFR etc. may be required at generating stations and substations.

In the meantime POWERGRID has informed vide email dated 11.01.2014 that POWERGRID's scope of works for implementation of **Islanding scheme in NER** (i.e. Island-1 at 48.80Hz with 5 Sec delay and Island-2 at 48.50 Hz with 5 Sec delay) has been completed through activation of Under Frequency protection (inbuilt to different DPRs) for tripping of specific lines and detail is enclosed at **Annexure-C.6.**

The Committee may like to know the status of implementation of scheme as per discussion held at NERLDC on 19-12-2013 and discuss about the bottleneck in the process of implementation.

C.8 Installation of Harmonic Filters:

During 91st OCC meeting, SE (E), DoP, Ar. Pradesh informed that installation of harmonic filters will be completed by November 2013.

Since no representative from DoP, Ar. Pradesh was present during 92nd OCC meeting; the status could not be updated.

The Committee may like to review the status.

C.9 Frequent Tripping Of 33kV System of DOP, AP at Nirjuli and Ziro:

The status of tripping of 33kV Feeders at Nirjuli and Ziro Sub Station, as informed by POWERGRID, is as below:

(a) Tripping 33kV Feeders at Ziro

SN	Feeder	Jan'10 – Jun'13		Tripping in Aug'13	
		Nos.	Nos. / Month	Nos.	Nos. / Month
1	Kurung- Kamey	766	18.23	19	19
2	Old Ziro Feeder	440	10.47	3	3
3	Kimin Feeder	1208	28.76	61	61

(b) Tripping 33kV Feeders at Nirjuli

SN	Feeder	Jan'10 – Jun'13		Tripping in Aug,13	
		Nos.	Nos. / Month	Nos.	Nos. / Month
1	AP – 1	262	6.23	7	7
2	AP – 2	590	14.07	17	17
3	AP – 4	82	1.95	2	2

In OCC/PCC/TCC forum, the committee has expressed concern for frequent tripping in 33kV system of Ar. Pradesh. POWERGRID informed that such repeated tripping resulted in failure of transformers at Ziro & Nirjuli substation. The 5MVA, 132/33kV (Y-Phase) ICT of 132kV Ziro Sub Station failed on 10.09.2013 causing complete power supply disruption at Ziro. The supply was restored at Ziro on 15.09.2013 by replacing the failed unit with available spare unit. This has commercial impact on the constituents of the region. The representative of Assam re-iterated that on request of Ar. Pradesh all constituents had agreed to include augmentation of transformation capacity at above substations as the regional project although Ar. Pradesh was the exclusive beneficiary. Hence committee desired that Ar. Pradesh should look into the matter seriously to reduce the frequent tripping in 33kV system so that unwarranted failure of transformers is not repeated.

The details of failure of transformers and status of tripping of 33kV Feeders at Nirjuli and Ziro Sub Station, as informed by POWERGRID, was discussed in detail in 91st OCC/15th PCC meeting. Similarly the frequent tripping at Deomali substation of NEEPCO due to fault in 33KV side of Ar. Pradesh was also discussed in above meetings. Subcommittee also reiterated that if tripping is not reduced failure of major equipments cannot be prevented.

CE, DoP, Ar. Pradesh had assured the forum that all efforts will be made to improve the situation and had also informed that he would organize a separate meeting with officials of POWERGRID, NEEPCO and NERPC to discuss and resolve the issue.

Since no representative from DoP, Ar. Pradesh was present during 92nd OCC meeting; the status could not be updated.

The Committee may like to review the status. POWERGRID may intimate about the outcome of the meeting.

C.10 T- Connection of Lekhi & Bhalukpong sub-Station

During 91st OCC meeting, SE (E) DoP, Ar. Pradesh informed that the LILO at Lekhi will be completed by December, 2013 as stated earlier and the LILO works (tower structure & control room etc.) at Bhalukpong is under progress and the same will be completed by March, 2014.

DGM, POWERGRID informed that a section of the existing 132 KV S/C Nirjuli – Dikrong line [Section covering location No. 1 to 23 including location 134 (common tower for NDTL & GITL)] near Doimukh area is required to be diverted/shifted on account of construction of a new Railway Line. POWERGRID has been given a time schedule of two years (i.e. up to May, 2015) by the District Administration to complete the diversion work. Preliminary works towards this realignment have already been taken up by POWERGRID. During diversion/shifting, the LILO is to be disconnected from its existing position (in between the location No. 10 & 11).

CE, DoP, AP informed that he would organize a separate meeting with officials of POWERGRID and NERPC to discuss and resolve the issue.

The Committee may like to review the current status. POWERGRID may intimate about the outcome of the meeting.

C.15 Bay Owner Details of Inter-State Transmission Lines:

NERLDC requested all the constituents to provide the Owner detail of Bays at both ends of all Inter-State Transmission Lines at the earliest for ensuring proper co-ordination among all concerned.

During 92nd OCC meeting, the Sub-committee requested all the constituents to provide the information to NERLDC at the earliest for better operation of the grid.

All the constituents agreed to provide the above information at the earliest.

NERLDC may kindly intimate the current status.

C.17 Power Atlas for NER and States of NER:

The Power Atlas of NER and States of NER in pdf format and in AutoCAD format was circulated to all SLDCs of NER for checking before finalization. You are requested to kindly suggest modifications, if any. The Power Atlas is to be finalized after incorporating your comments before 31st December, 2013.

The Power Maps may be used at SLDC level for better visualization.

During 92nd OCC meeting, DGM, NERLDC requested all the constituents to go through the SLDs forwarded by them and give their observations/modifications at the earliest. He also requested the constituents to nominate the Nodal Officer for the same.

The name of nodal officers as decided by the Sub-committee is as follows:

Ar. Pradesh	: Sh. Tarik Mize, EE, SLDC (09774007853)
Assam	: Sh. B.C. Bordoloi, DGM, SLDC (09435045675)
Manipur	: Sh Birjit Singh, SE (09436065214)
Meghalaya	: Sh. F.E. Kharshiing, SE, SLDC (09863066960)
Mizoram	: Sh. Lalrema, SE, SLDC (09436140353)
Nagaland	: Sh. A. Jakhalu, EE, SLDC (09436002696)
Tripura	: Sh. B. Debbarma, DGM, SLDC (09436450501)

Constituents may kindly intimate the current status.

C.19 Formation of Study Group:

In the 91st OCC meeting, MS I/C informed that P&E Dept, Govt. of Mizoram has already formed a System Study Group and requested other State constituents to follow the same. He stressed upon the importance of the study group. The objective of formation of study group is to develop the capability of each state to carry out various studies relating to their own transmission network as well as for regional network independently for different contingencies so that corrective measures can be taken accordingly. The soft copy of relevant files including SLD for the existing network of each state (compatible to PSSE software) was also handed over to the participants during the first meeting of system study group of NER, organized on 20.08.2013 at NERLDC, Shillong so that system studies for different conditions can be carried out by them independently. NERLDC has also agreed to provide all kind of support to State constituents for system studies. Constituents are also requested to study their network for reactive power management. Member Secretary I/C informed that Prof. P. Tripathi, IIT, Guwahati has been included as the member of the study group of NER to assist the constituents in various system studies relating to NER region as well as constituent states. Faculty from NITs of respective states may also be included in their system study group.

During 92nd OCC meeting, the Sub-committee had requested all the other constituents to form their own study group at the earliest for their benefit. NERLDC may intimate about the expected date of training programme (intermediate level training programme) on PSSE software.

The Committee may like to discuss the present status.

C.20 Monthly MU requirement & availability of each state of NER as per format:

The following figures of state wise MU requirement and availability for Jan14, Feb14 & Mar14 taken from LGBR 2013-14 of NERPC. State wise MU requirement and availability for these months are to be checked. As LGBR 2014-15 not yet finalized, State wise MU requirement and availability for Apr14 & May14 are to be provided at the earliest by the respective constituents

Requirement:

Name of State	Jan14	Feb14	Mar14	Apr14	May14
Ar. Pradesh	51.60	49.31	43.81		
Assam	574.81	478.68	538.87		
Manipur	58.29	44.99	45.06		
Meghalaya	185.86	165.68	168.29		
Mizoram	37.05	32.44	38.08		
Nagaland	53.83	44.08	46.74		
Tripura	112.21	84.84	103.83		
NER	**1073.64**	**900.02**	**984.67**		

Availability:

Name of State	Jan14	Feb14	Mar14	Apr14	May14
Ar. Pradesh	31.22	27.83	33.17		
Assam	389.88	353.85	389.73		
Manipur	46.97	42.79	48.00		
Meghalaya	122.77	107.65	112.41		
Mizoram	40.33	37.53	40.98		
Nagaland	35.31	32.20	35.54		
Tripura	96.91	87.85	97.09		
NER	**763.38**	**689.71**	**756.92**		

- These data required for preparation of various reports.

These data required for system study, daily report, computation of TTC-ATC and preparation of reports for various meetings of Ministries, CEA, Constituents etc.

Constituents may kindly furnish the data to NERLDC.

D. NEW ITEMS

D.1 Operational Statistics for the month of December, 2013

The different proforma for Operational Statistics required for every month are given in Annexure below:

(i)– Schedule Vs Actual Generation & Requirement.

(ii)– Peak Demand: Schedule Vs Actual.

(iii)– Integrated Operation of the system.

(iv)– Details of DC, schedules and injections from Central sector stations, drawal schedules and entitlements of constituents.

(v) –Details of major reservoirs in NER.

Committee may like to discuss the present status.

D.2 State-wise anticipated peak demand/requirement, shortage for January - May, 2014.

The sub-Committee may review the anticipated peak demand/energy requirement and finalize the same for the months of January - May, 2014.

S.N.	State	Peak Demand (MW) Jan' 14	Peak Demand (MW) Feb' 14	Peak Demand (MW) Mar' 14	Peak Demand (MW) Apr' 14	Peak Demand (MW) May' 14
1	Ar. Pradesh	120	95	95		
2	Assam	1300	800	800		
3	Manipur	120	105	105		
4	Meghalaya	280	230	230		
5	Mizoram	75	55	55		
6	Nagaland	100	80	80		
7	Tripura	230	155	155		
	Region	2245	1520	1520		

The sub-Committee may review the anticipated peak availability and finalize the same for the months of January - May, 2014.

S.No.	State	Peak Availability (MW) Jan' 14	Peak Availability (MW) Feb' 14	Peak Availability (MW) Mar' 14	Peak Availability (MW) Apr' 14	Peak Availability (MW) May' 14
1	Ar. Pradesh	100	100	100		
2	Assam	830	830	830		
3	Manipur	110	110	110		
4	Meghalaya	240	240	240		
5	Mizoram	60	60	60		
6	Nagaland	85	85	85		
7	Tripura	160	160	160		
	Region	1585	1585	1585		

D.3 Generation Planning (ongoing and planned outages)

NEEPCO/NHPC/OTPC may kindly intimate the availability for hydro stations:

Khandong – MU
Kopilli – MU
Ranganadi - MU
Doyang – MU
Loktak – MU
Pallatana - MU

Hydro generation planning for lean hydro period - With the onset of winter season, reservoir levels in all the hydro stations have started depleting. Hence proper planning is required to utilize the available water for entire lean hydro period, say upto April, 2014.

The Committee may discuss and approve the proposed shutdown by Generating Stations.

D.4 (A) Outage Planning Transmission elements

***The sub-Committee may kindly discuss and approve the transmission line outages proposed by Constituents for January - March, 2014 as enclosed at* Annexure- D.4 (i)**.

D.4 (B) Line outages Planned vs. Implemented:

The planned outages approved by the OCC Sub-committee has to be complied by the executing agency and in case the same is not availed or deferred, the same has to be intimated with reasons why the shutdown could not be availed so that proper planning can be made by NERLDC/NERPC. The same will be monitored henceforth.

The sub-Committee may kindly discuss.

D.5 (A) Power Cut/Restrictions on Industries:

a) All industries are allowed to run their units on all days of week & if they want to avail staggered holiday, then they will have to stagger on notified day only & cannot avail as per their choice.

b) All industries are required to keep their recess timings staggered.

Name of State	Details	Quantum of power cut (MW)	Restriction Timing		Total Energy cut (MUs/day)
			From	To	
	(a) Power restrictions (evening peak hour) on non continuous process HT/LT Industries (b) Load shedding				
	(c) Other information 1. Weekly off 2. Staggering of power supply				

The Sub-Committee may like to discuss.

D.5 (B) Power supply to Agricultural Sector:

Name of State	Details	From Date	To Date	Supply Hours per day		
				Max (hrs)	Min (hrs)	Average (hrs)
	3-phase supply (DLF)					
	3-phase supply (Irrigation)					

The Sub-Committee may like to discuss.

D.6 SEM at 132 KV Nangalbibra - Agia

Meghalaya informed that the Inter-State meters installed by CTU at 132 KV Nangalbibra – Agia feeder was not working since commissioning. Further, the DCD was becoming defective since 25.11.2013**.**

The Sub-Committee may like to discuss.

D.7 SEM at 400 KV Byrnihat – Silchar line:

Meghalaya informed that meter installed at 400 KV Byrnihat S/S was defective since charging of the line. Energy Accounting for Meghalaya was based from the meter installed at 400 KV Silchar S/S.

The Sub-Committee may like to discuss.

D.8.1 TGBPP at Monarchak (101MW):

It has been observed that gas pipeline of Monarchak power station is lying uncovered/uncared at different locations for which commissioning of project may be disrupted. Earlier the same problem was being faced by Pallatana GBPP.

The Sub-Committee may like to discuss.

D.8.2 Deviation Settlement issued by CERC:

B. TSECL stated that it is necessary to implement requisition based drawal schedule in the region as it is being implemented through the country.

C. TSECL stated that withdrawal losses & injection losses are directly deducted from the schedule of Pallatana. Quantum of losses is not reflected in the revision.

D. TSECL stated that Regulation on deviation settlement issued by CERC on 06.01.2014 has adverse impact on NER states.

NERLDC also informed that these regulations shall come into force w.e.f. 17.2.2014. The charges for the Deviations for all the time-blocks shall be payable for over drawal by the buyer and under-injection by the seller and receivable for under-drawal by the buyer and over-injection by the seller and shall be worked out on the average Frequency of a time-block at the rates specified in this regulation.

Committee may like to discuss on the issue.

D.9 Issuance of CERC (Indian Electricity Grid Code) (Second Amendment) Regulations, 2014:

These Regulations shall come into force with effect from 17.2.2014. Frequency band changed to 49.90-50.05 Hz.

Committee may like to discuss on the issue.

D.10 Evacuation of TGBPP at Monarchak & Pallatana Power (Two Modules):

After commissioning of Module II of Palatana & Monarchak power station, it is required to evacuate 704 MW from Palatana & 98 MW from Monarchak. System Study was conducted for peak and off peak scenarios of Jun14 with these machines & 400 kV Silchar – Imphal D/C (Charged at 132 kV) lines. It is observed that a maximum of around 410 MW during off peak and 590 MW during peak can be evacuated from Palatana & Monarchak plants with present network & 400 kV Silchar – Imphal D/C (Charged at 132 kV) (Limitation : High loading of 220 kV Misa-Byrnihat I & II – 160 MW on each circuit). These Studies were conducted without taking N-1 criteria of 400 kV Byrnihat-Silchar, 220 kV Misa-Byrnihat D/C & 220 kV Misa-Samaguri D/C lines. Hence it is very important that 400 kV line from Silchar to Bongaigaon is commissioned at the earliest.

The Sub-Committee may like to discuss.

D.11 Operation Co-ordination with Manipur:

The issue of operation co-ordination & empowerment of Shift in-charges of SLDCs was raised by NERLDC in earlier occasions also. It has been observed that shift personnel of Manipur are on several occasions asking NERLDC to contact their higher officials for effecting any real time requirement of the grid, like reduction of drawal. This is resulting in delay in effecting corrective actions for system security.

Manipur is requested to empower their shift personnel to take real time decision.

D.12 Synchronization Problem:

Recently on few occasions rough/hard synchronizations have been taken place during synchronization of separated systems. It is a very serious issue and hence all concerned are requested to please maintain the synchronizing facilities in good conditions and also to train the operation personnel in this regard to avoid such occurrences in future.

The Sub-Committee may like to discuss.

D.13 Furnishing of Technical & Commercial Data for computation of PoC Charges & Losses for April – June, 2014:

Designated ISTS Customers (DICs) are requested to submit the data for New Transmission Assets, Yearly Transmission Charges (YTC), Forecast Injection and Withdrawal and Node-wise Injection/Withdrawal data as per Format I, Format II & Format III (Formats are available in http://posoco.in/transmission_pricing/formats) to the Implementing Agency (NLDC, POSOCO) along with copy to NERLDC for computation of PoC Charges and Losses for Apr14-Jun14 at the earliest. Soft copy of these filled up formats are also to be sent to the Implementing Agency (NLDC, POSOCO) along with copy to NERLDC at the earliest. Letter for submission of these data as per formats was e-mailed to all DICs on 10.01.14.

The Sub-Committee may like to discuss.

D.14 LGBR for 2014 - 2015:

The LGBR for 2014 -15 for NE Region is required to be finalized. All the constituents are requested to submit the data for preparation of LGBR at the earliest as per the proforma given at **Annexure – D.14.** The formats include the outage planning for Generating units as well as important transmission elements in state and central sector.

Meanwhile NERPC has prepared the draft LGBR regarding the demand and availability in MWs & MUs for 2014-2015.

Constituents may kindly check the draft LGBR prepared and also requested to submit the above data in the format furnished by NERPC at the earliest.

NERLDC also mentioned that as per IEGC, Load Generation Balance Report (LGBR) for Peak as well as Off-Peak scenarios and the Annual Outage Plan for all elements as per list of Important Elements for the following financial year required to be finalised by 31st December of each year.

These reports/plan are valuable inputs to the operation of Power System as well as calculation of Transfer Capability, and hence need to be finalized at the earliest.

All power utilities are requested to furnish these information/data at the earliest so that NERPC can prepare the LGBR and outage planning[both generator and transmission line elements].

Constituents are requested to kindly submit the above data in the format furnished by NERPC at the earliest.

D.15 Estimated Transmission Availability Certificate (TAC) for the month of December, 2013.

The Estimated Transmission System Availability for the month of December, 2013, furnished by PGCIL, is **99.9820%.** The detail outage data for calculation of TransmissionSystem Availabilityfurnished by PGCIL, is at **Annexure D.15.** NER constituents are requested to kindly communicate their views and observations, if any, by 27th January, 2014 so that Final TAC for the month of December, 2013 may be finalized by NERPC Secretariat.

The Sub-Committee may like to discuss.

D.16 Major grid disturbances in the previous month (December, 2013)

As intimated by NERLDC, there was no major grid disturbance during the month of December, 2013 pertaining to NER.

Members may kindly note.

D.17 Grid strengthening for safe and secure operation of NER grid:

Capacity of the following elements required to be enhanced/added for safe and secure operation of NER Grid :-

a. Transformation Capacity of 400/220 kV Bongaiagon S/S to be enhanced as there is only one ICT at 400/220 kV Bongaiagon S/S. N-1 criteria is not fulfilling. Moreover, load of downstream area of this sub-station increased due to load growth & shifting of load of Nangalbibra area to this area. At 1743 Hr on 19.12.13, Lower Assam, Capital Load of Assam, Nangalbibra Load of Meghalaya, Langpi Generation (Part of NER Grid), Birpara Load (Part of ER Grid) & East Bhutan Load, West Bhutan Load along with Chukha System was collapsed due to tripping of 400/220 kV, 315 MVA ICT at Bongaigaon on overloading (450 MW).

b. Transformation Capacity of 400/220 kV Balipara S/S to be enhanced as there is only one ICT at 400/220 kV Balipara S/S. N-1 criteria is not fulfilling. Moreover, load of downstream area of this sub-station increased due to load growth.

c. Transformation Capacity of 220/132 kV Kopili PS to be enhanced as there is only one ICT at 220/132 kV Kopili PS. N-1 criteria is not fulfilling.

d. 220 kV BTPS(NTPC)-BTPS(AEGCL) D/C lines are required for enhancement of transfer capability of this corridor. It was observed that loading of 220 kV Salakati-BTPS D/C is more than 140 MW in each circuit during certain period of peak hour. Under this condition, power supply to Dhaligaon area & Capital area (Assam) & Nangalbibra area (Meghalaya) may be disrupted in case of tripping of any line of Salakati-BTPS lines.

e. 400 kV Bongaigaon-Byrnihat, 400 kV Bongaigaon-Kukurmara, 400 kV Kukurmara-Silchar lines and Kukurmara S/S to be commissioned at the earliest for safe & secure operation of Southern Part of NER Grid. Southern Part of NER Grid may become vulnerable in case of tripping of 400 kV Silchar-Byrnihat line or 220 kV Misa-Byrnihat D/C lines.

f. 220 kV BTPS(NTPC)-Rangia D/C, 220/132 kV, 2x100 MVA ICT at Rangia, LILO of 132 kV Rangia – Sishugram at Kamakhya, LILO of 132 kV Rangia – Kahilipara at Kamakhya, 400/220 kV, 315 MVA at Kukurmara, 220/132 kV, 2x50 ICTs at Kukurmara, 132 Kukurmara-Azara line to be commissioned at the earliest so that loading problem of 220 kV Misa-Samaguri D/C can be solved. It was observed that loading of 220 kV Misa-Samaguri D/C is more than 130 MW in each circuit during certain period of peak hour. Under this condition, power supply to Dhaligaon area & Capital area (Assam) & Nangalbibra area (Meghalaya) may be disrupted in case of tripping of any line of Misa-Samaguri lines.

g. 400 kV Silchar-Imphal D/C (Charged at 132 kV) line needs to be commissioned at the earliest for safe & secure operation of Southern Part of NER Grid. It was observed that 132 kV Loktak-Ningthoukhong overloaded during certain period of peak hours.

h. More in feed points need to be planned and implemented for improving reliability and security of NER Grid. At present NER Grid is connected to rest of NEW Grid through only one in feed point i.e. Bongaigaon-Salakati Sub-Station. As per Master Plan of HEPs in Arunachal Pradesh of CEA, there will be +/- 800 kV HVDC Sub-Station at Rowta, LILO of 400 kV Balipara – Bongaigaon I & II and LILO of 400 kV Balipara – Bongaigaon III & IV at Rowta. AC part of +/- 800 kV Rowta HVDC S/S along with these LILOs may be programmed for early completion. In addition of these activities, 400 kV Rowta – Bongaigaon III & IV may be LILO at Alipurduar for creating one more than in feed point of NER.

The Sub-Committee may like to discuss.

D.18 <u>Grid connectivity to Tawang areas of Ar. Pradesh:</u>

It has been brought to notice that power supply position in Tawang area is very erratic and most of the time the area is without power supply. Moreover, Tawang, being a very important place as far as country's defense establishment is concerned, is not connected with the NER grid. At present the small /mini/micro hydro generating stations in and around Tawang is feeding the area at 33kV level. Entire stretch from Bomdila – Dirang - Sela Pass-Tawang - Bomula (China border) is occupied predominately by National army. Considering the importance of Tawang as it is situated close to International border, 132 kV D/C link from existing Khupi / Kimi Sub-station to Tawang via Bomdila / Dirang may be desirable so that reliable power supply can be extended to these areas and beyond.

During 92nd OCC, the Sub-committee discussed the matter in detailed about the importance of extending reliable power supply to Tawang considering the strategic importance of Tawang as far country's defense establishment is concerned. In absence of the representative of Ar. Pradesh, the action plan of Ar. Pradesh for extending reliable power supply to Tawang could not be known. The forum is of the opinion that as the line has to pass through difficult terrain, dense forest and high altitude snow bound areas, the design/construction of such line would be very difficult for state utility and 132 kV D/C link from existing Khupi / Kimi Sub-station to Tawang via Bomdila / Dirang and associated substations may be treated as regional project. However, the view of Ar. Pradesh in this regard would be required.

The Committee may like to discuss the matter and Ar. Pradesh may express their view in this regard.

D.19 Any other item:

D.19.1 General Network Access (GNA) vis-à-vis existing Approach

The concept General Network Access (GNA) vis-à-vis the existing approach was discussed in the joint Standing Committee Meeting of North Eastern Region and Eastern Region for Power System Planning held at Guwahati on 03-01-2014. Members of NER wanted further discussion on the concept of GNA.

The Committee may like to discuss the matter

D.19.2 Proposal agreed by Members in the joint Standing Committee Meeting of North Eastern Region and Eastern Region for Power System Planning held at Guwahati on 03-01-2014

1. Additional 1x315 MVA, 400/220 kV transformer at Bongaigaon Sub-Station:

The present transformation capacity at Bongaigaon (PG) 400/220 kV sub-station is 315 MVA which comprises of 4 no. single phase units of 105 MVA. Assam draws power over Bongaigaon(PG)-Salakati(PG)-BPTS-Agia 220 kV D/C line due to which the loading on the ICT becomes very critical and is expected to increase further with the growing demand. Further, tripping of the ICT restricts the import capability of NER on ER-NER transmission links which becomes very critical during low hydro condition. The addition of 2nd ICT at Bongaigaon was agreed in 90th OCC meeting of NER constituents at Guwahati held on 04-10-2013.

POWERGRID stated that as per norm, the addition of 2nd ICT at Bongaigaon need to be associated with 2 no of 220kV bays which would be helpful for Assam and Meghalaya to draw additional power. At present, Bongaigaon transformer is extended through 500m long line to Salakati substation, however there is no 220kV

bay arrangement at Bongaigaon substation. The Salakati substation also does not have space for future 220kV line bays. Accordingly, the 2nd ICT at Bongaigaon need to be associated with new 220kV bus arrangement at Bongaigaon which would accommodate 220 kV bays for existing ICT and the proposed ICT, 220kV D/c Bongaigaon- Salakati line as well as 2 nos. of 220kV line bays for additional 220kV lines for drawal of power by Assam / Meghalaya. This 220kV bus arrangement would be carried out on GIS in view of space constraint. For accommodation of 220kV line bay at desired location of Salakati substation, necessary re-arrangement / shifting of existing 220kV bays also need to be carried out. For 220kV Bongaigaon-Salakati D/c line, fibre optic based protection shall be provided in view of severe ROW problem. Further, in order to have 2nd reliable auxiliary power supply, 1 No of 1 MVA, 33/0.44 kV Transformer is also to be installed in the tertiary of new proposed ICT, which was also agreed in 91st OCC meeting by NER Constituents held on 15.11.2013.

Therefore, in order to improve reliability, it has been agreed to install second 1x315 MVA 400/220 kV (3 phase) transformer along with 220kV GIS bus arrangement (Double main) accommodating 2 bays for existing and the proposed ICT, 2 bays for 220kV D/c lines to Salakati and 2 bays for 220kV additional line at Bongaigaon (PG) and necessary re-arrangement / shifting of bays at Salakati substation for accommodating 220kV line bay.

The members have concurred to the above proposal to be implemented by POWERGRID under regulated tariff mechanism.

2. Replacement of existing 60MVA 220/132kV ICT by 1x160 MVA 220/132 kV ICT at Kopili HEP of NEEPCO.

Initially 60 MVA (4 no. 1 phase units of 20 MVA) 220/132kV transformer at Kopili sub-station of NEEPCO which was later augmented by 1x160 MVA three phase transformer by POWERGRID. At present, the 60 MVA transformer at Kopili is not in operation. The 220/132 kV transformer at Kopili and 132 kV Kopili-Khandong 2xS/C lines are important links for power supply to South Assam, Mizoram, Tripura and Manipur. In the event of outage of this 1x160 MVA transformer, the power supply to South Assam, Manipur and Mizoram gets severely affected.

Therefore, in order to improve the reliability, second 1x160 MVA 220/132 transformer was proposed at Kopili by replacement of the existing 60MVA 220/132kV ICT. The above proposal was agreed in 90th OCC meeting of NER constituents at Guwahati on 04-10-2013.

POWERGRID stated that the 220/132kV 2nd ICT at Kopili need to be associated with upgradation of 132kV bus scheme at Kopili from single bus to double main scheme for complete 132kV switchyard and the same need to carried out on GIS due to space constraint. At 220kV side, the bay equipments of existing 60 MVA ICT need to be replaced. Further, for 220kV double bus bar switching scheme, new bus bar protection along with LBB to be provided for the complete substation.

Members concurred the proposal of replacement of existing 60MVA, 220/132kV ICTs by 1x160 MVA 220/132 kV ICT at Kopili HEP of NEEPCO by POWERGRID along with upgradation/replacement of complete 132kV bus scheme including switchgear etc with GIS and 220kV bay equipments (AIS) & protection scheme under regulated tariff mechanism.

3. Replacement of existing 2x50MVA, 220/132kV ICTs by 2x160MVA, 220/132kV ICT at 400/220/132KV Balipara Substation of POWERGRID.

At present there are 2 no. of 50 MVA, 220/132kV ICTs installed at Balipara substation of POWERGRID, one owned by NEEPCO and the other by AEGCL. These ICTs are very important for supply of power to both Assam and Arunachal Pradesh. It has been observed that in most of the cases both the ICTs are fully loaded and tripping of one ICT often results in tripping of the other ICT. Tripping of these ICTs due to overload or due to maintenance results severe shortfall of power to both Arunachal and Assam.

Therefore, the proposal of replacement of existing 2x50MVA, 220/132kV ICTs by 2x160MVA, 220/132kV ICTs along with replacement of 132 kV equipments (with suitable capacity) at 400/220/132KV Balipara Substation by POWERGRID under regulated tariff mechanism has been agreed by members.

4. System strengthening Scheme in NER-II (NERSS-II)

The following works were agreed by NER constituents as “System strengthening Scheme in NER-II” in the meeting to review the inter-state works of Comprehensive Scheme for Strengthening of Transmission System in NER & Sikkim held at Guwahati on 30-10-2012 :

i) 2nd 400/220 kV, 315 MVA transformer at Balipara (PG)

ii) LILO of 2nd ckt. of Silchar - Bongaigaon 400 kV D/c line at Byrnihat (MeECL)

iii) Silchar - Misa 400kV D/c line (Quad) line

iv) NER PP (Biswanath Chariyalli) – Itanagar (Ar. Pradesh) 132 kV D/C line (Zebra conductor).

v) Replacement of existing 132/33kV, 2x10MVA ICT at Nirjuli by 2x50MVA ICT

vi) Ranganadi HEP-Nirjuli (PG) 132kV D/c line with one ckt. LILOed at Itanagar S/s (Ar. Pradesh) or routed via Itanagar.

vii) Imphal (PG) – New Kohima (Nagaland) 400kV D/c line (to be initially operated at 132kV)

The Empowered Committee on transmission in its 31st Meeting on February 18, 2013 at CERC, New Delhi had suggested CTU to obtain firm commitment from MeECL, Department of Power (DoP) Arunachal Pradesh, NEEPCO and DoP Nagaland for the availability of space for the bays for the termination of the above lines.

Subsequently, MeECL has intimated that there is no space at Byrnihat for termination of LILO of 2nd ckt. of Silchar - Bongaigaon 400 kV D/c line at Byrnihat (MeECL). Department of Power (DoP) Arunachal Pradesh confirmed that at Itanagar (Ar. Pradesh), there is space for 2 no. 132 kV line bays only. In view of above the scheme was modified and revised System strengthening Scheme in NER-II is given below:

i) 2nd 400/220 kV, 315 MVA transformer at Balipara (PG)

ii) Silchar - Misa 400kV D/c line (Quad) line

iii) NER PP (Biswanath Chariyalli) – Itanagar (Ar. Pradesh) 132 kV D/C line (Zebra conductor).

iv) Replacement of existing 132/33kV, 2x10MVA ICT at Nirjuli by 2x50MVA ICT

v) Ranganadi HEP-Nirjuli (PG) 132kV D/c line

vi) Imphal (PG) – New Kohima (Nagaland) 400kV D/c line (to be initially operated at 132kV)

The i) and iv) elements of the modified scheme would be implemented by POWERGRID under regulated tariff mechanism and remaining elements would be implemented through TBCB. In addition, POWERGRID would provide

a) 2 no. of 132kV line bays each at Biswanath Chariyalli (PGCIL), Nirjuli (PGCIL) and Imphal (PGCIL)

b) 2 no. of 400kV line bays each at Silchar (PGCIL) and Misa (PGCIL)

c) 1x80MVAR bus reactor at Misa

d) 1x80 MVAR switchable line reactors at Misa end on each circuit of the Silchar–Misa 400kV D/c line

e) 2 no. of 132kV line bays at Itanagar S/s of DoP, Arunachal Pradesh

f) 2 no. of 132 kV line bays (GIS) at Ranganadi Switchyard of NEEPCO

g) 2 no. of 132kV line bays at its New Kohima S/s of DoP, Nagaland

Bays at Silchar and Misa substations shall be equipped with GIS due to space constraint.

Members have agreed to the above proposal

The Committee may note above proposals.

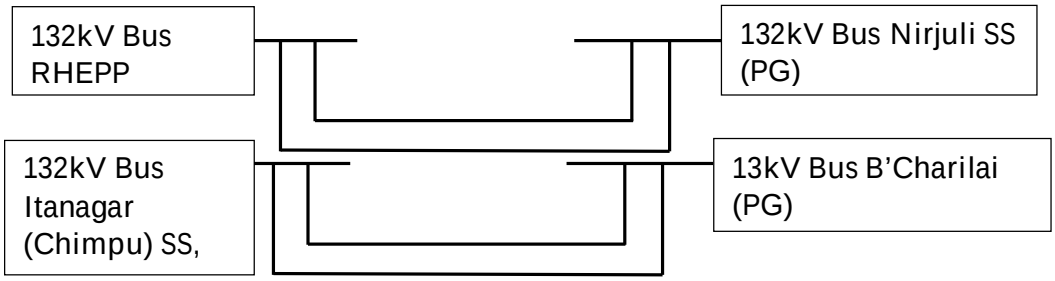
D.20 Re-arrangement of proposed 132 KV D/C Ranganadi – Nirjuli T/L and 132 KV D/C Itanagar (Chimpu) to B'Chariali under NER SSS – II Scheme

In recently concluded joint Standing Committee Meeting of North Eastern Region and Eastern Region for Power System Planning held at Guwahati, following transmission lines have been agreed by the members:

i) NER PP (Biswanath Chariyalli) – Itanagar (Ar. Pradesh) 132 kV D/C line (Zebra conductor).

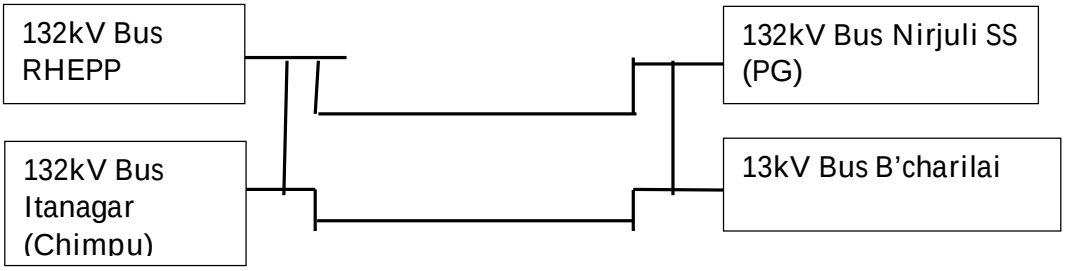
ii) Ranganadi HEP-Nirjuli (PG) 132kV D/c line

Thus present scheme drawing is as follows:



To have better connectivity & reliability between above four substations (Biswanath Chariyalli, Itanagar, Ranganadi & Nirjuli) it is proposed to carry out minor modification by in one of the circuits of above two D/C lines without increasing the number of bays at any of these substations so that a ring is formed between Biswanath Chariyalli – Nirjuli - Ranganadi – Itanagar. In the process Itanagar will be connected to both substations at Biswanath Chariyalli and Ranganadi (instead of only one substation at Biswanath Chariyalli). Similarly & Nirjuli will be connected to both substations at Biswanath Chariyalli and Ranganadi (instead of only one substation at Ranganadi).

According the modified scheme would be as follows:



The Committee may like to **discuss the proposal.**

D.21 Workshop / Seminar on emerging issues funded from Reactive Pool Account

It is proposed to arrange workshop / seminars on emerging issues for the benefit of NER constituents. The funds will be made available from Reactive Pool Account after approval by NERPC board. NERPC / NERLDC may organise such workshop / seminars at different places in NER.

The Committee may like to discuss on the proposal and amount to be kept for this purpose.

D.22 Standardization of Protection Scheme for Generating stations in NER:

During 13th PCC meeting, the Sub-committee had also suggested that Generator protection Philosophy including protection for Generator Transformer (GT), Unit Auxiliary Transformer (UAT), Station Auxiliary Transformer (SAT), Excitation Transformers should also be prepared and requested all the Central sector and State sector Generating companies in NER (NEEPCO, NHPC, NTPC & OTPC; Assam, Meghalaya, Tripura) to furnish their practices at the earliest so that Draft can be prepared for discussion in the next PCC meeting. ***All Central sector and State Sector generating companies agreed to furnish the information.***

During 16th PCC meeting, the following Protection Philosophy for Generator [Hydro / Thermal (Coal / Gas based) Generator], Generator Transformer (GT), Unit Auxiliary Transformer (UAT), Station Auxiliary Transformer (SAT) / Station Supply Transformer (SST), Excitation Transformer pertaining to NER was circulated to constituents of NER:

A: GENERATOR PROTECTION

SN	Protection	Purpose of Protection and Setting
1	Generator Differential Protection (87G1 &87G2)	Generator Differential Protection is provided for internal short circuit fault in generator. Trip
2	95% Stator Earth Fault Protection (64G1) for Unit size less than 100MW	Stator Earth Fault protection is provided for stator phase to earth fault. This protection is limited to approximately 95% of the stator winding. Trip Time delay: 0.3 to 0.5 Secs.
3	100% Stator Earth Fault Protection (64G2) for Unit size 100MW & above	Stator Earth Fault protection is provided for stator phase to earth fault. This protection covers the whole stator winding and the generator neutral. Trip Time delay: 2.0 Secs.

4	Negative Phase Sequence Protection(46G)	Negative Phase Sequence (NPS) protection current can appear due to unbalanced single phase loads or transmission line unsymmetrical faults. This protection safeguards the generator rotor against overheating. The relay should be set to the NPS capability of the generator. Time delay for Alarm at 50% of continuous withstands capability of the machine: 3 sec.
5	Low forward Power (for thermal machines) / Reverse Power Protection (for hydro machines) (32G / 37G) [To be duplicated for large generators]	Low forward Power (for thermal machines) / Reverse Power Protection (for hydro machines) is provided to prevent motor mode of operation. Trip
6	Loss of field Excitation Protection (40G) [To be duplicated for Unit size of 500MW and above]	Loss of Excitation protection is provided to prevent synchronous generator to act as an induction generator. Trip
7	Over Voltage Protection (59G)	Over Voltage provides protection against over voltage on the terminals of the generator, which can damage the insulation. Stage # I: V_{S1}= 1.15 x V_n & T_{S1}= 10 Sec. [**5 Sec. (NTPC)]** Stage # II: V_{S2}= 1.3 x V_n & T_{S2}= 0.5 sec. [**100 ms. (NTPC)]**
8	Generator Over Load Protection (for Hydro machines) (51G)	Generator Over load protection is provided as an additional check of the stator winding temperature. Alarm Time delay: 2.5 to 25 Sec.
9	Generator Over Fluxing Protection (99G) [To be duplicated for Unit size of 500MW and above]	Generator Over Fluxing Protection provides protection against operation at flux densities which may cause accumulative damage to the core. Trip with time delay
10	Generator Under frequency Protection (81G)	Generator Under Fluxing Protection prevents generator from operating for long time at reduced frequency. Alarm Time delay: 2 Sec. Trip

11	Dead machine protection / Accidental back energisation (27G/50G) [Generally recommended for Units of size of 100MW and above]	Dead machine Protection provides protection against inadvertent energisation of generator while at stand still or on turning gear. The generator and rotor may get damaged beyond repair under this condition. Trip
12	Generator Pole slip protection / Out of step protection (98G) [Generally recommended for thermal Units of size of 100MW and above. For hydro machines, utilities can decide the Unit size depending upon machine parameters]	Generator pole slip / out of step detects all pole slips leading to an increase in rotor angular position beyond the generator transient stability limits protection provides protection against inadvertent energisation of generator while at stand still or on turning gear. The generator and rotor may get damaged beyond repair under this condition. Trip
13	Back up impedance protection- 3pole (21G) **Or (This should be treated as separated item – NEEPCO)** Over Current / Under Voltage Protection (51G / 27G)	Backup impedance Protection operates for phase faults. Trip
14	Rotor Earth fault protection (64F1, 64F2)	Rotor Earth fault is provides protection against ground fault of field winding and field short circuit. Alarm (First Rotor Earth fault), Time delay: 1 Sec. Trip (Second Rotor Earth fault), Time delay: 5 Sec. But it is recommended that the machine is taken out of service at the earliest opportunity after the occurrence of first earth fault. **Rotor O/L & O/C protection trip (NTPC)**
15	Generator winding and bearing temperature protection (49G)	Generator winding and bearing temperature protection prevents generator winding / bearing from high temperature operation. Alarm **Trip in place of winding warm gas temp high (NTPC)** The temperature settings shall be as per manufacturer's recommendations.

16	Generator Circuit Breaker Failure Protection(50ZGCB) [To be provided Generators provided with Generator Circuit Breaker (GCB)]	Generator Circuit Breaker Failure operated in case of failure of GCB. Trip
17	Condition Monitoring of Hydro-Turbine generator	Online condition monitoring system shall be provided for monitoring of radial & axial vibration, phasor diagram, air gap and Partial Discharge.
18	Process Control	Process Control is to be provided for sequential operation.
19	Disturbance Recorder (DR), Event Logger (EL) and Fault locator (FL)	To be provided as a standard practice. DR, EL & FL, being inbuilt feature in Numerical Relays, such features should also be used.
20	Time Synchronizing Equipment (TSE)	To be provided as a standard practice.
21	Overall Differential Protection (87OA) for Generator and Generator Transformer	Overall Differential Protection is provided for internal short circuit fault in generator and Generator transformer **& Unit Transformer (NTPC).** Trip
	Grouping of Protection	The Protection of Generator could be divided into two groups (Group-A & Group-B) and each group should be connected to separate DC source. Both Group-A & Group-B protection shall give trip impulse to circuit breaker of Generator bay. The Group-A should include Generator Differential protection (87G), back up Back up impedance protection- 3pole (21G) **[Or** Over Current / Under Voltage Protection (51G / 27G)], overload protection (51G), 100% stator earth fault protection(64G2), Rotor Earth fault protection (64F1/64F2), Low forward Power / Reverse power protection (32G / 37G), and Over voltage protection (59G). The Group-B should include Overall differential protection (87OA), 95% stator earth fault (64G1) protection, loss of excitation protection(40G), pole slip protection (98G), under frequency protection (81G) and over fluxing protection (99G).

(B) Bus bar and LBB Protection

SN	Protection	Setting
1	LBB protection and bus bar protection	Bus bar & LBB protection to be provided at 400kV, 220kV, 132kV/66kV level for Generating stations. LBB current should be in pick up condition always **picking up more than 20%. (NTPC)** LBB Time delay = 200ms.

A: Protection for Generator Transformer (GT)

SN	Protection	Purpose of Protection and Setting
1	Generator Transformer Differential protection (87GT)	Differential Relay is provided for Internal Fault in Transformer Trip
2	Restricted Earth Fault (REF) protection (64GT)	REF to be provided for Internal Earth Fault in Transformer **No REF for 500MW unit, only 87 HV protection in place of REF- (NTPC)**
3	Generator Transformer back up IDMT O/C protection of HV winding (51GT)	Back up protection to be provided for Internal and external Fault. **Trip No O/C protection for GT – (NTPC).**
4	Generator Transformer back up Earth Fault protection of LV winding (51NGT)	Back up protection to be provided for Internal and external Fault. Trip
5	Over Fluxing (OF) protection (99GT)	Over Flux Relay be provided for protection from Over Fluxing (V/f)=1.1 for alarm & (V/f)=1.4 for tripping
6	HV winding cum overhang differential protection (87HV / 87 NT)	HV winding cum overhang differential protection is a unit type protection which operates for earth faults on the generator transformer HV side and also covers a large portion of the HV winding and the HV terminals upto the HV current transformers. **Alarm & Trip contacts both hooked up for TRIP – (NTPC).**

6	Buchholz protection	Buchholz Relay to be provided for detection of incipient internal fault in Transformer Tripping for both stages (The contacts for both stages shall be paralleled so that tripping command goes to CB(s) in both stages.) However, the existing practice of two stage tripping may be reviewed by utilities.
7	Winding Temperature Indicator (WTI)	WTI to be provided for preventing the transformer winding from High Temperature Operation. Cooling, Alarm **Trip with time delay – (NTPC)** The temperature settings shall be as per manufacturer's recommendations.
8	Oil Temperature Indicator (OTI)	OTI to be provided for preventing the transformer oil from High Temperature Operation. Alarm **Trip with time delay – (NTPC)** The temperature settings shall be as per manufacturer's recommendations.
9	Pressure Relief Device (PRD)	PRD to be provided for protection of transformer tank from blasting due to development of high internal pressure during heavy internal fault Trip
10	Magnetic Oil Gauge (MOG)	MOG to be provided for Low oil level Alarm. Alarm
11	Surge Arresters	Gapless Surge Arresters shall be provided on both primary and secondary sides of transformers.
	Grouping of Protection	The Protection of Generator Transformer could be divided into two groups (Group-A & Group-B) and each group should be connected to separate DC source. Both Group-A & Group-B protection shall give trip impulse to circuit breaker of Generator bay. The Group-A should include Transformer Differential protection (87GT) and back up Earth Fault protection of LV winding (51NGT). The Group-B should include REF protection (64GT), back up IDMT O/C protection of HV winding (51GT) and HV winding cum overhang differential protection (87HV / 87 NT).

(D) Protection for Unit Auxiliary Transformer (UAT) and Station Auxiliary Transformer (SAT)

SN	Protection	Purpose of Protection and Setting
1	Differential protection (87T)	Differential Relay to be provided for Internal Fault in Transformer Trip
2	Restricted Earth Fault (REF) protection(64)	REF to be provided for Internal Earth Fault in Transformer Trip
3	Back up IDMT O/C protection of HV winding (51)	Back up protection to be provided for Internal and external Fault. Trip
4	Back up Earth Fault protection of LV winding (51N)	Back up protection to be provided for Internal and external Fault. Trip
5	Buchholz protection	Buchholz Relay to be provided for detection of incipient internal fault in Transformer Tripping for both stages (The contacts for both stages shall be paralleled so that tripping command goes to CB(s) in both stages.) However, the existing practice of two stage tripping may be reviewed by utilities.
6	Winding Temperature Indicator (WTI)	WTI to be provided for preventing the transformer winding from High Temperature Operation. Cooling, Alarm **Trip with time delay – (NTPC)** The temperature settings shall be as per manufacturer's recommendations.
7	Oil Temperature Indicator (OTI)	OTI to be provided for preventing the transformer oil from High Temperature Operation. Alarm **Trip with time delay – (NTPC)** The temperature settings shall be as per manufacturer's recommendations.
8	Pressure Relief Device (PRD)	PRD to be provided for protection of transformer tank from blasting due to development of high internal pressure during heavy internal fault Trip

9	Magnetic Oil Gauge (MOG)	MOG to be provided for Low oil level Alarm. Alarm
10	Surge Arresters	Gapless Surge Arresters shall be provided on both primary and secondary sides of transformers, located outdoors with overhead connection.
	Grouping of Protection	The Protection of Unit Auxiliary Transformer (UAT) could be divided into two groups (Group-A & Group-B) and each group should be connected to separate DC source. Both Group-A & Group-B protection shall give trip impulse to circuit breaker of Generator bay. The Group-A should include Transformer Differential protection (87T) and back up Earth Fault protection of LV winding (51N). The Group-B should include REF protection (64GT) and back up IDMT O/C protection of HV winding (51).

(E) <u>Protection for Excitation Transformer</u>

SN	Protection	Purpose of Protection and Setting
1	Restricted Earth Fault (REF) protection (64)	REF to be provided for Internal Earth Fault in Transformer Trip. **No REF, Short Circuit Protection provided for excitation transformer – (NTPC).**
2	Instantaneous and IDMT O/C protection of HV winding (51)	Back up protection to be provided for Internal and external Fault. Trip
3	Winding Temperature Indicator (WTI)	WTI to be provided for preventing the transformer winding from High Temperature Operation. Cooling, Alarm Trip The temperature settings shall be as per manufacturer's recommendations.

During 16th PCC, the Sub-committee had requested all the constituents to go through the above protection philosophy and give their observations/comments so that the same can be discussed further and finalized. Suggestions received from NTPC has been incorporated and highlighted in bold letters.

The Sub-committee may like to discuss.

D.23 T- Connection at various points in NER Grid:

Some of the lines in NER are being tapped (i.e. operating with T-connections) to feed radial loads. ***To ensure more reliability and security of these lines, LILO of these lines need to be done at those locations.***

In 16th PCC meeting, the status as informed by Assam and Nagaland in the meeting is given below:

i. 220 kV Samaguri – Sarusajai I (Jawharnagar) - **Completed**
ii. 220 kV Sarusajai – Langpi I (Star CemenT)
iii. 132 kV Balipara – Depota (Ghoramara)
iv. 132 kV Samaguri – Depota (Pavoi)
v. 132 kV Srikona – Panchgram – **Dec'13**

To be reviewed by Assam

vi. 66 kV Dimapur – Bokajan (Singrijan, Power House & Dairy Farm) – **Representative of Nagaland** stated that they will refer to the case higher Authority.

Assam/Nagaland may kindly intimate the current status.

D.24 Installation of 2nd Distance Protection Relay (DPR) for 220KV and above System

The status of installation of 2nd DPR in respect of following lines as given in 12th PCC is as follows:

SN	Station	Line	Utility	Status
1	Samaguri SS	220 KV Balipara	AEGCL	**Nov, 2013**
2	BTPS SS	220 KV Salakati # I	AEGCL	Oct, 2013
3	BTPS SS	220 KV Salakati # II	AEGCL	Oct, 2013

During the 11th PCC meeting, the committee advised Assam to install Main –II (Distance protection) at Tinsukia end of Kathalguri-Tinsukia 220kV D/c line.

During 12th PCC meeting Assam had informed that they intend to install the relays, handed over by POWERGRID, at Samaguri Sub Station (for 220kV Balipara – Samaguri line) and Tinsukia Sub Station (for 220kV Kathalguri – Tinsukia line).

During 16th PCC meeting, sub-committee had requested Assam to inform the status of implementation of 2nd DPR at Samaguri substation for 220kV Balipara – Samaguri line and action plan for installation of Line Differential relays for BTPS – Salakati 220kV lines in next PCC meeting.

The Assam may inform the status of implementation of 2nd DPR at Samaguri substation for 220kV Balipara – Samaguri line and action plan for installation of Line Differential relays for BTPS – Salakati 220kV lines.

D.25 400 KV Bus Arrangement at Ranganadi:

It has been observed that 400 KV Bus at Ranganadi is operated in single bus mode and it is connected at Bus-B. As per information from Ranganadi, reason for keeping in single bus is due to failure of one of the Bus CT.

As per CEA's Technical Standard for Construction of Electrical Plants and Electric Lines Regulations, it is suggested that at 400kV level, layout of Air Insulated Substation shall be either one or half breaker scheme or double main and transfer bus scheme depending on the importance of the station.

Considering the importance of Ranganadi station, it is requested that bus arrangement at 400kV may be corrected at the earliest and both buses at 400kV should be available in service all the time and feeders/ICTs distributed at each bus accordingly.

During 16th PCC meeting, DGM, NERLDC requested NEEPCO to restore the bus coupler bay at the earliest for enhancing reliability of the system with two buses. NEEPCO agreed to that.

NEEPCO may inform the current status.

D.26 Replacement of 220 KV Current Transformers (3-core) with suitable 5 core Current Transformer by NEEPCO:

Replacement of 220kV, 3-Core Current Transformers with suitable 5(five) core Current Transformer by NEEPCO for incorporation of 220kV Bus Bar Protection at Kopili station. During last standing committee meeting Dtd.03.01.14, it has been decided to replace existing 60MVA ICT-1(20x3) by new 160MVA ICT by POWERGRID along with installation of 220KV Bus bar protection for 220kV Bus scheme at Kopili HEP, NEEPCO. However, to make Bus Bar protection operational, NEEPCO has to change all 220KV CT of all 200kV bays (except ICT-1/2 bay) connected to 220kV bus at Kopili HEP, NEEPCO.

NEEPCO is requested to take necessary action in this regard.

E. NEW ITEMS

E.1 Major Grid Disturbances during December, 2013:

There was no grid disturbance during the month of December, 2013.

For kind information only.

E.2 Major Events in North-Eastern Regional Grid during the period December, 2013

A. Tripping of 220 kV Misa-Byrnihat lines:

220 kV Misa-Byrnihat I & II lines tripped at 1423 Hr on 31.12.13 & 1320 Hr on 02.01.14. 220 kV Misa-Byrnihat I line tripped at 0551 Hr on 05.01.14, 0613 Hr on 06.01.14, 0016 Hr on 09.01.14 & 0247 Hr on 09.01.14.

Tripping of 220 kV Misa – Byrnihat I & II lines **at 1423 Hr on 31.12.13** led to overloading of 132 kV Badarpur - Khliehriat, 132 kV Jiribam - Haflong and 132 kV Imphal - Dimapur lines which tripped on O/C. This caused isolation of Southern part of NER Grid from rest of NER Grid. Frequency of this islanded system shot up to 51.40 Hz causing tripping of STG 1 of Palatana.
Load Loss: 10 MW & Generation Loss: 174 MW

Tripping of 220 kV Misa – Byrnihat I & II lines **at 1320 Hr on 02.01.143** led to overloading of 132 kV Badarpur – Khliehriat line. 20 MW generation of AGTPP reduced to reduce loading of 132 kV Badarpur - Khliehriat line & for safe, secure & reliable operation of Southern Part of NER Grid.

Due to tripping of 220 kV Misa – Byrnihat I line at **0016 Hr on 09.01.14** & **0247 Hr on 09.01.14,** 50 MW generation of Palatana reduced for safe, secure & reliable operation of Southern Part of NER Grid.

B. Disturbance in Manipur System:

At 1830 Hr on 11.12.13, 132 kV Dimapur-Imphal, 132 kV Loktak-Imphal & 132 kV Loktak-Ningthoukhong lines tripped. Due to tripping of these elements, 45 MW generation of Loktak reduced for safe, secure & reliable operation of Southern Part of NER Grid.

At 1158 Hr on 02.01.14, 132 kV Dimapur-Imphal, 132 kV Loktak-Imphal & 132 kV Loktak-Ningthoukhong lines tripped. Due to tripping of these elements, power supply to Manipur (except Jiribam & Rengpang load) disrupted.
Load Loss: 69 MW

At 1446 Hr on 12.01.14, 132 kV Loktak-Imphal & 132 kV Loktak-Ningthoukhong lines tripped. Due to tripping of these elements, there was 20 MW loss of generation in Loktak.

C. Disturbance in part of Tripura System:

At 1136 Hr on 14.12.13, 132 kV R C Nagar-Agartala I & II, 132 kV Agartala-Rokhia I, 132 kV Agartala-Dhalabil and 66 kV Udaipur-Gumti lines tripped. Due to tripping of these elements, there was **48 MW loss of generation & 12 MW loss of load**.

D. Disturbance in Capital Area(Assam) & Lower Assam Area and Nangalbibra Area (Meghalaya):

Lower Assam Area, Capital Area (Assam) & Nangalbibra Area (Meghalaya), Langpi Generation (Part of NER Grid), Birpara Load (Part of ER Grid), East Bhutan Load, West Bhutan Load, Chukha System was connected with rest of NEW Grid through 220 kV Birpara - Binaguri I & II, 220 kV Samaguri - Sarusajai I & II & 400/220 kV, 315 MVA ICT at Bongaigaon as 400/220 kV (200 MVA ICT at Malbase was not in service).

Before the incident, NER Grid was importing around 460 MW through 400 kV Bongaigaon – Binaguri D/C lines and 42 MW through 400 kV Salakati – Birpara D/C lines. **At 17:40:30 Hrs on 19.12.13**, 220 kV Birpara – Binaguri I tripped on DP, Z-I, B-E, 46.85 km, 58.56% from Birpara while power flow was 144 MW from Binaguri. This resulted in overloading of 220 kV Birpara – Binaguri II (222 MW power flow from Binaguri), which subsequently tripped at 17:43 Hrs. As a result, entire power flow shifted through 400 kV Binaguri – Bongaigaon D/C (794 MW) line causing overloading of the 400/220 kV 315 MVA ICT at Bongaigaon, which tripped on HV side Over Current Protection (450 MW loading) 67R at 17:43:40 Hrs. At 17:43:50 Hrs, 220 kV Balipara – Samaguri Line tripped at Samaguri (164 MW flow from Balipara) on over current. At 17:43:53.629 Hrs, the 220 kV Misa – Samaguri II tripped at Misa on Over Current (165 MW from Misa) Protection 67B. At 17:43:53.832 Hrs, 220 kV Misa – Samaguri I tripped at Misa on Over Current (165 MW from Misa) Protection 67B. This resulted in tripping of 220 kV D/C Samaguri – Sarusajai line at Samaguri on overloading. Tripping of all these elements resulted in blackout of power of above system. There was, however, no tripping of 220 kV Samaguri – Mariani S/C line.

Load Loss: 358 MW & Generation Loss: 40 MW

E. Disturbance in Mizoram System:

At 0923 Hr on 24.12.13, 132 kV Kumarghat-Aizwal, 132 kV Jiribam-Aizwal & 132 kV Kolasib-Aizwal lines tripped. Due to tripping of these elements, power supply to Mizoram (except Kolasib Load) disrupted.

Load Loss: 36 MW

F. Disturbance in Capital Area (Assam):

At 1105 Hr on 11.01.14, 220 kV Sarusajai-Samaguri I & II lines tripped. At 1110 Hr on 11.01.14, 220 kV Sarusajai-Agia & Sarusajai-Boko lines tripped. Due to tripping of these elements, power supply to Capital Area (Assam) disrupted.
Load Loss: 200 MW

G. Disturbance in Nagaland System:

At 0908 Hr on 25.12.13, 132 kV Dimapur - Dimapur line tripped. Due to tripping of this element, power supply to Nagaland (except Mokokchung load) disrupted.
Load Loss: 53 MW

H. Islanding Schemes of NER:

The matter on finalization of implementation of Islanding Schemes of NER was discussed at the meeting on 29.11.13 at SLDC, Kahilipara & 20.12.13 at NERLDC.

It is suggested that machine data for conducting Inertial Load Flow Study, Governor Response Power Flow Study and Dynamic Study to understand the dynamic behavior of the island may kindly be provided at the earliest to expedite the process of implementation of discussed Islanding Schemes.

H : Machine Inertia Constant in p.u. on Machine Base (including turbine inertia)
R : Governor Permanent Droop in p.u.
D : Turbine Damping Factor/Co-efficient in p.u. on Machine Base
Pmax : Maximum Generator Active Power Output (in MW)
Pmin : Minimum Generator Reactive Power Output (in MW)

If these data are not readily available then respective utilities may collect these data from the manufacturers of the machines. In case of non-availability of these data, on-site testing of generators may be taken up.

Though gas based units are exempted from operation in Free Governor Mode of Operation, machines of the islanded control areas are to be kept in Free Governor Mode (FGMO) considering the importance of Governor Response to control frequency in the island.

I. Major Events in North-Eastern Regional Grid

List of multiple tripping of elements and tripping of important elements in North-Eastern Regional Grid during the period w.e.f. 02nd December, 2013 to 12th January, 2014 is enclosed herewith at **Annexure - I.**

J. New SPS

At 1426 Hr on 31.12.13, Southern Part of NER Grid was separated from rest of NER Grid due to tripping 220 kV Misa-Byrnihat D/C lines. SPS5 for Palatana (with Generation from Palatana) is required in case of tripping of 220 kV Misa-Byrnihat D/C lines (both circuits).

Members may please deliberate.

Date and Venue of next OCC

It is proposed to hold the 94th OCC meeting of NERPC on second week of February, 2014. As per roaster, Mizoram will be the host for 94th OCC meeting. The exact venue will be intimated in due course.

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Period from 02/12/13 to 12/01/14

Sl. No.	Name of Transmission Element/Generator Tripped	Owner / Utility	Date of Event	Time of Event	Effect (Loss of Generation/ Load in MW)
A. Multiple / Repeated tripping					
1	132 kV Badarpur - Silchar II	POWERGRID	10-12-2013	2310 2333	-
	132 kV Silchar - Panchgram	POWERGRID		2310 2333	
2	132 kV Agartala - RC Nagar I	POWERGRID	14-12-2013	1136	Load Loss: 12 Generation Loss: 48
	132 kV Agartala - RC Nagar II				
	132 kV Agartala - Rokhia I	TSECL			
	132 kV Agartala - Dhalabil				
3	400/220 kV, 315 MVA ICT at Bongaigaon	POWERGRID	19-12-2013	1743	Load Loss: 358 Generation Loss: 40
	220 kV Sarusajai - Samaguri I	AEGCL			
	220 kV Sarusajai - Samaguri II				
	220 kV Misa - Samaguri I				
	220 kV Misa - Samaguri II				
	220 kV Balipara - Samaguri S/C				
4	132 kV Aizawl - Kumarghat S/C	POWERGRID	24-12-2013	0923	Load Loss: 36
	132kV Aizawl - Jiribam S/C				
	132 kV Aizawl - Kolasib S/C				
5	220 kV Misa - Brynihat I	MePTCL	31-12-2013	1423	Load Loss: 10 Generation Loss: 174
	220 kV Misa - Brynihat II				
	132 kV Badarpur - Khliehriat	POWERGRID		1426	
	132 kV Haflong - Jiribam				
	132kV Dimapur - Imphal	POWERGRID			

6	132kV Dimapur - Imphal	POWERGRID	02-01-2014	1158	Load Loss: 69 (Manipur)
	132kV Loktak - Imphal				
	132kV Loktak - Ningthoukhong	Manipur			
7	220 kV Misa - Brynihat I	MePTCL	09-01-2014	0016	Generation Loss: 50 (Palatana)
				0247	Generation Loss: 50 (Palatana)
8	220 kV Sarusajai - Samaguri I	AEGCL	11-01-2014	1105	Load Loss: 200 (in Assam)
	220 kV Sarusajai - Samaguri II				
	220 kV Sarusajai - Agia			1110	
	220 kV Sarusajai - Boko				
9	132 kV Loktak - Imphal	POWERGRID	12-01-2014	1446	Generation Loss: 20 (Loktak)
	132 kV Loktak - Ningthoukhong	Manipur			

B. Bus Fault

1	Aizawl (PG)	POWERGRID	24-12-2013	0923	Load Loss: 36

C. Sub-Station Blackout

1	Aizawl (PG)	POWERGRID	24-12-2013	0923	Load Loss: 36

D. Unit tripping

1	Kopilli U#2	NEEPCO	08-12-2013	1925	Generation Loss: 33
2	AGTPP U#3	NEEPCO	26-12-2013	0543	Generation Loss: 22
3	AGTPP U#1	NEEPCO	22-12-2013	0753	-
4	AGTPP U#3	NEEPCO	30-12-2013	0035	Generation Loss: 13
5	Palatana STG#1	OTPC	31-12-2013	1426	Generation Loss: 114
	Palatana GTG#1			1509	Generation Loss: 206
6	Khandong U#2	NEEPCO	02-01-2014	2120	Generation Loss: 19
7	AGBPP U#2	NEEPCO	09-01-2014	1815	Generation Loss: 32
	AGBPP U#7				Generation Loss: 7
8	Loktak U#3	NHPC	10-01-2014	0753	Generation Loss: 35

E. Tripping of critical element					
1	132kV Khandong - Halflong	POWERGRID	05-12-2013	1154	
2	132kV Jiribam - Jiribam (S)	Manipur	05-12-2013	1450	Generation Loss: 3
3	220kV Samaguri - Balipara	AEGCL	05-12-2013	1702	
4	132kV Imphal - Ninthoukong	Manipur	09-12-2013	1232	Generation Loss: 10
5	400kV Balipara - Ranganadi I	POWERGRID	10-12-2013	0833	-
6	400kV Balipara - Ranganadi I	POWERGRID	11-12-2013	1448	-
7	132kV Loktak - Ninthoukong	Manipur	11-12-2013	1830	Generation Loss: 45 Load Loss: 20
8	400 kV Silchar - Palatana I	NETC	17-12-2013	1034	-
9	220 kV BTPS - Agia S/C	AEGCL	20-12-2013	0600	-
10	132kV Loktak - Ninthoukong	Manipur	21-12-2013	0545	-
11	220 kV BTPS - Agia S/C	AEGCL	24-12-2013	2022	-
12	132kV Dimapur - Dimapur S/C	POWERGRID	25-12-2013	0908	Load Loss: 53
13	132kV Dimapur - Imphal	POWERGRID	30-12-2013	1131	-
14	220kV Misa - Brynihat I 220kV Misa - Brynihat II	MePTCL	02-01-2014	1320	Generation Loss: 20 (AGTPP-manually)
15	220kV Misa - Brynihat I	MePTCL	05-01-2014	0551	-
16	220 kV Misa - Brynihat I	MePTCL	06-01-2014	0613	-

Annexure - C. 3 (ii)

SN	Name of State	Total Quantum of Load Shedding required	Location where URF installed (Feeder's Name)	Stage	Load in each feeder	Quantum of Load shedding (MW) implemented	Additional quantum of load shedding required
1	Ar. Pradesh	**20**	**At Satyam Ispat** (11 KV Banderdewa - Satyam Ispat)	Stage - I (49.2 Hz)		**3.5**	**1.5**
			To be identified	Stage - II (49.0 Hz)		**0**	**5**
			To be identified	Stage - III (48.8 Hz)		**0**	**5**
			To be identified	Stage - IV (48.6 Hz)		**0**	**5**
2	Assam	**220**	**At Gauripur** (132 KV Dhaligoan - Gossaigoan - Gauripur)	**Stage - I (49.2 HZ)**	16	**54.5**	**0**
			At Sipajhar (132 KV Depota - Rowta - Sipajhar)		10		
			At Dhemaji (132 KV Gohpur - Nalkata - Dhemaji)		11		
			At Majuli (132 KV Nalkata - Majuli)		2.5		
			At Baghjap (132 KV Kahilipara - Chandrapur - Baghjap)		15		
			At Diphu (132 KV Samaguri - Sankardev - Diphu)	**Stage - II (49.0 Hz)**	11	**61**	**0**
			At Gohpur (132 KV Samaguri - B. Chariali - Gohpur)		8		
			At Rupai (132 KV Tinsukia - Rupai + AP Load)		17		
			At Jogighopa (132 KV Dhaligoan - Jogighopa)		7		
			At Sankardevnagar (132 KV Samaguri - Sankardevnagar)		18		

SN	Name of State	Total Quantum of Load Shedding required	Location where URF installed (Feeder's Name)	Stage	Load in each feeder	Quantum of Load shedding (MW) implemented	Additional quantum of load shedding required
2	Assam		**At Gossaigoan** (132 KV Dhaligoan - Gossaigoan)	**Stage - III (48.8 Hz)**	7	**59**	**0**
			At Rowta (132 KV Depota - Rowta)		18		
			At Chandrapur (132 KV Kahilipara - Chandrapur)		12		
			At Nalkata (132 KV Gohpur - Nalkata)		11		
			At Bokakhat (132 KV Jorhat - Bokakhat)		11		
			At Sishugram (132 KV Sarusajai - Sishugram)	**Stage - IV (48.6 Hz)**	45	**57**	**0**
			At Ledo (132 KV Tinsukia - Ledo)		12		
3	Manipur	**20**	**At Yurembam** (33 KV Yurembam - Leimakhong)	**Stage - I (49.2 Hz)**		**3**	**2**
			To be identified	**Stage - II (49.0Hz)**		**0**	**5**
			To be identified	**Stage - II (48.8Hz)**		**0**	**5**
			To be identified	**Stage - II (48.6Hz)**		**0**	**5**
SN	**Name of State**	**Total Quantum of Load Shedding required**	**Location where URF installed (Feeder's Name)**	**Stage**	**Load in each feeder**	**Quantum of Load shedding (MW) implemented**	**Additional quantum of load shedding required**

4	Meghalaya	**60**	**At Nangalbibra** (33 KV Mendipathar - Nangalbibra)	**Stage - I** **(49.2 Hz)**	6.5	**15**	**0**
			At Rongkhon (33 KV Garobadha I - Rongkhon)		8.5		
			At Mawphlang (132/33 KV, 20 MVA Transformer)	**Stage - II** **(49.0 Hz)**		**15**	**0**
			At Khliehriat (132/33 KV, 20 MVA Transformer)	**Stage - III** **(48.8 Hz)**	12	**15**	**0**
			At Nongstoin (33 KV Nongstoin - Mairang)		3		
			At Mawlai (33 KV Mawlai - Nongthymmai)	**Stage - IV** **(48.6 Hz)**	7.5	**15**	**0**
			At NEHU (33 KV NEHU - Happy Valley)		7.5		
5	Mizoram	**20**	**At** 132 KV Khawiva (33 KV Khawiva - Sazaikawn)	**Stage - I** **(49.2 Hz)**	2.38	**5.09**	**0**
			At Bukpui (33 KV Bukpui - Chhingchhip)		2.71		
			At Zuangtui (6.3 MVA, 33/11 KV Transformer - I)	**Stage - II** **(49.0 Hz)**	5.31	**5.31**	**0**
			At Zuangtui (6.3 MVA, 33/11 KV Transformer - II)	**Stage - III** **(48.8 Hz)**	4	**5.1**	**0**
			At Tlangnuam (33 KV Tlangnuam - Aibawk)		1.1		
			At Chawnpui (6.3 MVA, 33/11 KV Transformer - I)	**Stage - III** **(48.6 Hz)**	3	**5.2**	**0**
			At Zuangtui (11 KV Zuangtui - Chaltlang)		2.2		

SN	Name of State	Total Quantum	Location where URF installed (Feeder's	Stage	Load in each	Quantum of Load	Additional
6	Nagaland	**20**	**At Mokokchung** (66 KV Mokokchung - Tuli)	**Stage - I** **(49.2 Hz)**		**6**	**0**
			At Dimapur (33 KV Dimapur - AP -I)	**Stage - II** **(49.0 Hz)**		**4.5**	**0**
			At Kohima (132 KV Kohima - Wokha)	**Stage - III** **(48.8 Hz)**		**5**	**0**
			At Dimapur (33 KV Dimapur - Refferal Hospital)	**Stage - IV** **(48.6 Hz)**		**4.5**	**0**
7	Tripura	**40**	**At Badharghat** (33 KV Badarghat - Bishalghar)	**Stage - I** **(49.2 Hz)**	8.5	**11**	**0**
			At Badharghat (33 KV Badarghat - Takarjala)		2.5		
			At 66 KV Rabindra Nagar (33 KV Rabindra Nagar - Melaghar)	**Stage - II** **(49.0 Hz)**	6.5	**10**	**0**
			At 66 KV Rabindra Nagar (33 KV Rabindra Nagar - Kathalia)		3.5		
			At 79 Tilla (33 KV, 79 Tilla - Mohanpur)	**Stage - III** **(48.8 Hz)**	7.5	**14.5**	**0**
			At 79 Tilla (33 KV, 79 Tilla - Durjoy Nagar)		7		
			At 79 Tilla (33 KV, 79 Tilla - College Tilla)	**Stage - IV** **(48.6 Hz)**		**12.5**	**0**

Note: **The inbuilt UFR of existing Numerical Relay at identified locations (at 132 KV level) of Assam, Meghalaya & Tripura can be used for above purpose. Existing UFR can also be shifted to new locations, wherever required.**

In respect of Ar. Pradesh, Manipur, Mizoram & Nagaland: Setting of existing UFR needs to be changed in case they use the same

Feeder. (i.e. 48.8 Hz to be set to 49.2 Hz for Stage - I), (48.5 to be set to 49.0 Hz for Stage - II) & (48.2 Hz to 48.8 Hz for Stage - III) Feeder is to be identified at the earliest for remaining quantum of load shedding of other stages of 48.8 Hz & 48.6 Hz.

STATUS OF UFR IMPLEMENTATION IN NER

Stage	Load shed Required	Implemented	To be Implemented
Stage - I (49.2 Hz)	100 MW	98.09	1.91
Stage - II (49.0 Hz)	100 MW	95.8	4.19
Stage - III (48.8 Hz)	100 MW	98.6	1.4
Stage - IV (48.6 Hz)	100 MW	94.2	5.8
TOTAL	400 MW	386.69	13.3

APPROVED SHUTDOWN OF ELEMENTS FOR THE PERIOD 22.01.2014 TO 15.03.2014

1. Transmission Lines

SL. No.	Name of Transmission Line	Date & Time	Purpose	Areas/Feeders affected
TRANSMISSION LINES				
1	220KV Misa-Mariani(new)	21.01.14 to 22.01.14(7:00 to 15:00 Hrs)	For facilitating shifting ofvulnerable loc.585, 586 & 587 on Pile foundation.	220KV Misa-Mariani(new)
		01.02.14 to 10.02.14(Cont. SD)		
2	220KV Misa-Mariani	11.02.14 to 25.02.14(Cont. SD)		220KV Misa-Mariani
3	132KV Khandong-Khliehriat-II	25.02.14 to 01.03.14(7:00 to 15:00 Hrs)	For providing additional jumpers along the line for enhanced loadability of the line(as per decision of OCC)	132KV Khandong-Khliehriat-II
4	132KV Khandong-Khliehriat-I	02.03.14 to 06.03.14(7:00 to 15:00 Hrs)		132KV Khandong-Khliehriat-I
5	220KV Balipara-Samaguri line	15.02.14 to 18.02.14(7:00 to 15:00 Hrs)	For shifting of conductors from existing line to ERS in connection with diversion work of line section loc.13-16 & loc.22 to 25 for Railway gauge conversion.	220KV Balipara-Samaguri line
6	220KV BTPS-Agia(AEGCL)	23.01.14(7:00 to 15:00 Hrs)	For facilitating stringing of OPGW in the line	220KV BTPS-Agia(AEGCL)
7	220KV Misa-Samaguri-I	24.01.14(7:00 to 15:00 Hrs)	Replacement of Isolator hanger assembly. Isolators are more than 25 yrs old.	220KV Misa-Samaguri-I
8	220KV Misa-Samaguri-II	25.01.14(7:00 to 15:00 Hrs)		220KV Misa-Samaguri-II
9	132 KV Loktak-Imphal-II	22.01.14 to 24.01.14(Cont. SD)	Installation of addl. Tower in between span 113-114 for enhanced ground clearance.	132 KV Loktak-Imphal-II
2. SUBSTATIONS				
SN	**Name of Substation**		**Purpose**	
1	**400KV Misa S/s**			
i	400KV Balipara#2 -Main Bay	8/2/2014 (7:00 to 15: 00 Hrs)	Annual Maintance program	Line shall remain in service through Tie bay
ii	400 KV ICT-1 MAIN BAY	9/2/2014 (7:00 to 15:00 Hrs)	Annual Maintance program	ICT-I shall remain in service through Tie bay
iii	220 KV Bus coupler bay	20/2/2014 9:00(7:00 to 15:00 Hrs)	Annual Maintance program	All feeders shall remain in service
iv	400KV Balipara#1 -Main Bay	21/2/2014 9:00(7:00 to 15:00 Hrs)	Annual Maintance program	Line shall remain in service through Tie bay
v	400 / 220 KV,315MVA ICT#2	5/2/2014 (7:00 to 15:00 Hrs)	Annual Maintance program	400 / 220 KV,315MVA ICT#2
vi	400KV ICT#2 Main Bay	27/2/2014 (7:00 to 15:00 Hrs)	Annual Maintance program	ICT-2 shall remain in service through Tie bay
vii	400KV ICT#2 Tie Bay	28/2/2014 (7:0 to 15:00 Hrs)	Annual Maintance program	ICT-2 shall remain in service through Main bay
2	**400KV Balipara S/s**			
i	400KV, 80MVAR Bus Reactor-II	27.01.14(7:00 Hrs to 15:00 Hrs)	Repacement of existing 390KV Las with 336KV Las in view of change in design parameters	400KV, 80MVAR Bus Reactor-
ii	400/220KV,315MVA ICT	29.01.14(7:00 to 15:00 Hrs)	Annual Maintance program	400/220KV,315MVA ICT

IMPLEMENTATION OF ISLANDING SCHEME IN NER

(A) ISLAND-1: AT 48.80 Hz, Delay 5 Secs:

SN	Lines required to be opened	Scheme Details	Responsibility
1	220 kV New Mariani (PG) – AGBPP	**Mariani (PG) SS:** UFR of 220 kV Kathalguri feeder (Main-1 & 2) to be activated at 48.80 Hz with 5 sec delay to initiate 3-Ph Trip with DT send to other end.	POWERGRID, Misa.
		Kathalguri (NEEPCO) PH: UFR of 220 kV New Mariani feeder (Main-1 & 2) to be activated at 48.80 Hz with 5 sec delay to initiate 3-Ph Trip with DT send to other end.	NEEPCO
2	220 kV New Mariani (PG) – Misa	**Mariani (PG) SS:** UFR of 220 kV Misa feeder (Main-1 & 2) to be activated at 48.80 Hz with 5 sec delay to initiate 3-Ph Trip with DT send to other end.	POWERGRID, Misa.
		Misa (PG) SS: UFR of 220 kV New Mariani feeder (Main-1 & 2) to be activated at 48.80 Hz with 5 sec delay to initiate 3-Ph Trip with DT send to other end.	
3	220 kV Mariani – Misa	**Mariani (AEGCL) SS:** UFR of 220 kV Misa feeder (Main-1 & 2) to be activated at 48.80 Hz with 5 sec delay to initiate 3-Ph Trip with DT send to other end.	POWERGRID, Misa.
		Misa (PG) SS: UFR of 220 kV old Mariani feeder (Main-1 & 2) to be activated at 48.80 Hz with 5 sec delay to initiate 3-Ph Trip with DT send to other end.	
4	132 kV Dimapur (PG) – Bokajan	**Dimapur (PG) SS**: New DPR for 132 kV Bokajan feeder will be installed before 10.01.2014 and UFR to be activated at 48.80 Hz with 5 sec delay to initiate 3-Ph Trip.	POWERGRID, Dimapur
5	Isolation of 2 Nos of Gas Turbine Generator from 2/3 different modules.	**Kathalguri (NEEPCO) PH**: UFR of Deomali & Tinsukia feeder to be activated at 48.80 Hz with 5 sec delay and Trip out puts to be paralleled for extension of 3-Ph Trip to 2 Nos of Gas Turbines Generators from 2/3 different modules.	NEEPCO & POWERGRID, Misa.

IMPLEMENTATION OF ISLANDING SCHEME IN NER

(B) ISLAND-2 AT 48.50 Hz with 5 Sec delay

SN	Lines required to be opened	Scheme Details	Responsibility
1	132 kV Palatana – Udaipur	**Pallatana (OTPC) PH:** UFR of 132 kV Udaipur to be activated at 48.50 Hz with 5 sec delay to initiate 3-Ph Trip.	OTPC & POWERGRID, Silchar.
		Udaipur (TSECL) SS: UFR of 132 kV Pallatana feeder to be activated at 48.50 Hz with 5 sec delay to initiate 3-Ph Trip.	TSECL & POWERGRID, Silchar.
2	132 kV Palatana – Surjamani Nagar	**Pallatana (OTPC) PH:** UFR of 132 kV Surajmani Nagar to be activated at 48.50 Hz with 5 sec delay to initiate 3-Ph Trip.	OTPC & POWERGRID, Silchar.
		Surajmani Nagar (TSECL) SS: UFR of 132 kV Pallatana feeder to be activated at 48.50 Hz with 5 sec delay to initiate 3-Ph Trip.	POWERGRID, Silchar.
3	132 kV Silchar – Dullavcherra	**Silchar (PG) SS:** UFR of 132 kV Dullavcharra to be activated at 48.50 Hz with 5 sec delay to initiate 3-Ph Trip.	POWERGRID, Silchar.
		Dullavcherra (AEGCL) SS: UFR of 132 kV Silchar feeder to be activated at 48.50 Hz with 5 sec delay to initiate 3-Ph Trip.	AEGCL
4	132 kV AGTPP – Kumarghat	**AGTPP (NEEPCO) PH:** UFR of 132 kV Kumarghat to be activated at 48.50 Hz with 5 sec delay to initiate 3-Ph Trip.	NEEPCO & POWERGRID, Silchar.
		Kumarghat (PG) SS: UFR of 132 kV AGTPP feeder to be activated at 48.50 Hz with 5 sec delay to initiate 3-Ph Trip.	POWERGRID, Kumarghat.
5	132 kV P K Bari – Kumarghat	**Kumarghat (PG) SS**: UFR of 132 kV P K Bari feeder to be activated at 48.50 Hz with 5 sec delay to initiate 3-Ph Trip.	POWERGRID, Kumarghat.