

# North Eastern Regional Power Committee

## Agenda For

### 161<sup>st</sup> OCC Sub-Committee Meeting

Time of meeting : 10:00 Hrs.

Date of meeting : 22<sup>nd</sup> October, 2019 (Tuesday)

Venue : "Hotel Nandan", Guwahati.

#### A. CONFIRMATION OF MINUTES

#### CONFIRMATION OF MINUTES OF 160<sup>th</sup> MEETING OF OPERATION SUB-COMMITTEE OF NERPC.

The minutes of 160<sup>th</sup> meeting of Operation Sub-committee held on 4<sup>th</sup> September, 2019 at Guwahati were circulated vide letter No. NERPC/SE (O)/OCC/2016/4556-4591 dated 17<sup>th</sup> September, 2019.

*The Sub-committee may confirm the minutes of 160<sup>th</sup> OCCM of NERPC as no comments/observations were received from the constituents.*

#### ACTION TAKEN -ITEMS

#### B.1. ACTION TAKEN:

#### 1. IMPLEMENTATION OF PROJECTS FUNDED FROM PSDF:

The status as informed in 160<sup>th</sup> OCC:

State	R&U scheme	ADMS	Capacitor Installation	SAMAST **	Line Differential Protection
Ar. Pradesh	TPA still not signed. Package-I NOA issued Finance dept concurrence not given. P-II tender to be opened on 22.09.19. thereafter P-III tender will be done. Station-wise status to be updated *	Bid document handed over. TPA, A/C opening & Contract agreement by Sep'19.	-	Yet to be approved by TESG.	-
Nagaland	Submitted	Contract agreement completed. TPA, A/C opening & by Sep'19.	-	Yet to be approved by TESG.	Lines identified. Under DPR preparation stage.
Mizoram	Could not be updated due to absence of representative	Contract agreement signed. TPA, A/C opening & by Sep'19.	To reply to TESG queries.	Yet to be approved by TESG.	Lines not yet identified. To be taken up in Sub-group.

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Manipur	Could not be updated due to absence of representative	Contract agreement signed. TPA, A/C opening & by Sep'19.	To reply to TESG queries.	Yet to be approved by TESG.	Lines identified. LDP for 132kV Imphal-Imphal and 132kV Jiribm-Jiribam proposed. Meghalaya DPR to be shared.
Tripura	Station-wise status to be updated *	Contract agreement signed. TPA, A/C opening & by Sep'19.	Study to be carried out in consultation with NERLDC.	Yet to be approved by TESG.	Lines not yet identified. To be taken up in Sub-group.
Assam	Submitted	TPA, A/C opening & Contract agreement by Sep'19.	-	Appraisal Committee approved.	Lines identified. Under DPR preparation stage.
Meghalaya	MePTCL Station-wise status updated MePGCL - Station-wise status to be updated *	Contract agreement signed, A/C opened. TPA, by Sep'19.	-	Appraisal Committee approved.	Tendering in progress

Meghalaya has submitted the station-wise status. The other state utilities are requested to furnish status in similar format, station-wise as per format by first week of every month on regular basis to Member Convener, PSDF Project Monitoring Group (AGM, NLDC, POSOCO) with a copy to NPC & NERPC. The LOAs of R&M Scheme are to be furnished to NERLDC/NERPC regularly. As per deliberation in the previous meetings all the utilities were requested to submit station-wise status of R&U schemes.

***States may please intimate the latest status.***

**2. Long Outage of Important Grid Elements:**

Name of the Element	Name of Utility	Status as informed in 160 <sup>th</sup> OCC	Latest status
63MVAR Reactor at Byrnihat to replace with 80MVAR Reactor	MePTCL	DPR submitted to NLDC/NPC.	

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132kV Dimapur - Imphal (out since 25.07.18)	NERTS	Referred to TCC/RPC	
220kV Sonabil-Samaguri-I	AEGCL	NIT by Sep'19	
132kV Srikona- Panchgram(out since 14.01.2019)	AEGCL	To be updated	
63MVAR L/R for 400kV Palatana-Silchar Ckt-I (out since Apr'19)	OTPC	By Oct'19	

**Utilities may please intimate the latest status.**

**3. Follow up of recommendations of PCC/Sub-group:**

SN	Name of element	Actions to be taken	Concerned Utilities	Status as informed in the 160 <sup>th</sup> OCC Meeting	Latest status
1	132 kV AGTCCPP - Agartala D/C	Installation of Line Differential in 132 kV AGTCCPP - 79 Tilla D/C & Review of impedance setting of both ends as a temporary measure.	NERTS/ NEEPCO	LDR procurement : Bids opened and is under evaluation Impedance measurement:= Test kit is in use at Misa S/S and shall be spared after 10.09.19	
2	132kV AGTCCPP- Kumarghat	GPS to be procured and time synchronization of relay to be done	NEEPCO	Dec'19	
3	132kV PKBari- Kumarghat	Installation of Line differential relay	NERTS	LDR procurement Bids opened and is under evaluation	

**Utilities may please intimate the latest status.**

**4. Furnishing of various data for reliable operation of grid:**

Sl.No.	Data reg.	Target deadline	Latest status
1	Furnishing Technical and Commercial data for computation of PoC Charges and Losses for January to March'20 (Q4 of 2019-20)	15.10.2019	

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2	Furnishing details regarding GT Tap Positions of ISGS and other generators. Required for studies related to reactive power capability testing	15.10.2019	Kopili HEP, BgTPP, Palatana GBPP submitted.
3	Furnishing Nodewise half hourly data monthly Required for studies pertaining to Real Time Market	By 10 <sup>th</sup> of the month	

***NERLDC may please intimate the latest status.***

**B.2. OPERATIONAL PERFORMANCE AND GRID DISCIPLINE DURING SEPTEMBER, 2019**

As per the data made available by NERLDC, the grid performance parameters for September, 2019 are given below:

**NER PERFORMANCE DURING SEPTEMBER, 2019**

States	Energy Met (MU)		w.r.t. Aug,19 % inc (+) /dec (-)	Energy Reqr. (MU)		w.r.t. Aug,19 % inc (+) /dec (-)	% surplus (+) /shortfall (-) of energy In Sep,19
	Sep-19	Aug-19		Sep-19	Aug-19		
Ar. Pradesh	57.65	67.2	-14.21	57.96	67.63	-14.30	-0.53
Assam	956.16	1070.59	-10.69	1050.84	1118.49	-6.05	-9.01
Manipur	72.92	74.6	-2.25	73.33	75.06	-2.30	-0.56
Meghalaya	164.64	166.61	-1.18	164.64	166.61	-1.18	0.00
Mizoram	67.38	64.75	4.06	67.74	65.21	3.88	-0.53
Nagaland	66.29	72.86	-9.02	66.64	73.55	-9.39	-0.53
Tripura	141.11	153.79	-8.25	141.94	160.21	-11.40	-0.58
<b>Region</b>	<b>1526.15</b>	<b>1670.4</b>	<b>-8.64</b>	<b>1623.09</b>	<b>1726.76</b>	<b>-6.00</b>	<b>-5.97</b>

States	Demand Met (MW)		w.r.t. July,19 % inc (+) /dec (-)	Demand in (MW)		w.r.t. July,19 % inc (+) /dec (-)	% surplus (+) /shortfall (-) of demand In Aug,19
	Sep-19	Aug-19		Sep-19	Aug-19		
Ar. Pradesh	152	152	0.00	152	155	-1.94	0.00
Assam	1900	1956	-2.86	1980	2051	-3.46	-4.04
Manipur	182	184	-1.09	190	207	-8.21	-4.21
Meghalaya	336	333	0.90	336	333	0.90	0.00
Mizoram	91	91	0.00	91	91	0.00	0.00

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Nagaland	156	169	-7.69	176	192	-8.33	-11.36
Tripura	298	300	-0.67	303	300	1.00	-1.65
<b>Region</b>	<b>3070</b>	<b>3023</b>	<b>1.55</b>	<b>3183</b>	<b>3095</b>	<b>2.84</b>	<b>-3.55</b>

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

**AVERAGE FREQUENCY (Hz)**

Month---->	Sep-19	Aug-19	Month---->	Sep-19	Sep-19
Total Generation in NER (Gross)	1651.289	1744.980		% of Time	% of Time
Total Central Sector Generation (Gross)	1233.651	1388.350	Below 49.9 Hz	4.57	7.28
Total State Sector Generation (Gross)	417.638	356.630	Between 49.9 to 50.05 Hz	75.25	72.67
<b>Inter-Regional Energy Exchange</b>			Above 50.05 Hz	20.18	20.05
(a) NER-ER	19.39	14.09	Average	50.01	50.00
(b) ER-NER	<b>429.01</b>	<b>528.17</b>	Maximum	50.27	50.32
(c) NER-NR	<b>412.35</b>	<b>467.61</b>	Minimum	49.85	49.5
(d) NR-NER	<b>0.00</b>	<b>0.00</b>			
© Net Import	-2.73	46.47			

**C. ITEMS- STATUS REVIEW**

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

During 160th OCC meeting, the status as informed by different beneficiaries is as follows:

SN	Items	Status as given in 158 <sup>th</sup> OCC Meeting		Status as given in 159 <sup>th</sup> OCC Meeting	
		Timeline for completion	Furnishing of detail parameters	Timeline for completion	Furnishing of detail parameters
<b>a. New elements</b>					
1	400/220kV, 315 MVA ICT-1 of NTPC at Bongaigaon	By 15.09.19	Already submitted		
2	Kameng HEP of NEEPCO two units (2 x 150 MW)  Next two units (2x150 MW)	Nov'19 or Dec'19	CEA clearance available		
3	132kV Monarchak – Surjamaninagar D/C of TSECL	By Dec'19, tower erected 128/145 foundation completed 145/152. stringing 15.5 km completed.	To be submitted to NERLDC.		

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4	220/132 kV, 160MVA ICT-II at Balipara	30.09.19	To be submitted to NERLDC.		
5	220/132 kV, 1x160 MVA ICT with GIS Bay at Kopili	Idle charging of ICT by 15.09.19  Power Flow by 30.09.19	To be submitted to NERLDC.		
6	Dedicated 33kV feeder at Khliehriat Substation from Lumshnong.	A date will be fixed NERPC, MeECL and NERTS will visit	Not applicable.		
7	Replacement of 315 MVA ICT-II with 500 MVA ICT at Misa (PG)	400/220 kV 500 MVA ICT- III put into service on 27.08.19	To be submitted to NERLDC.		
8	220kV Balipara- Sonabil-2	Estimate under process	To be submitted to NERLDC.		
9	Bay at Agia S/S for 132kV Agia- Nangalbibra Ckt#II by AEGCL	LOA issued on 27.06.19. By Sep'19	To be submitted to NERLDC.		
10	80MVAR B/R at RHEP by NEEPCO	NEEPCO requested for revision of 1st NERSCT MoM. FE 40Cr approx.	-		
<b>b. Elements under breakdown/upgradation</b>					
11	Up-gradation of 132 kV Lumshnong- Panchgram line	TESG queries submitted	Not applicable.		
12	PLCC Panels at Loktak end of Loktak - Ningthoukhong 132 kV feeder and Loktak - Rengpang 132 kV feeder	Aug'19.	Not applicable.		

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13	Upgradation of 132 kV Bus Bar at Umiam Stg- III to ACSR Zebra	DPR submitted. Other upgradation works to be included in DPR	Not applicable		
14	220/132 kV 30 MVA ICT at Mokokchung	March' 2021	To be submitted to NERLDC		
15	Upgradation of 132kV Yurembam-Karong by MSPCL	WIP. By Aug'19	-		
16	Upgradation of 132kV Lekhi-Chimpu and Lekhi bus by DoP Ar. Pradesh	Mar'2020	-		
17	Upgradation of CT at Lekhi for 132kV Lekhi-Chimpu by DoP Ar. Pradesh	Mar'2020	-		
18	Installation of LDP for 132kV AGTCCPP-Agartala D/C & 132kV PKBari-Kumarghat by NERTS	LDR procurement Bids opened and is under evaluation	-		
19	Procurement of GPS at AGTCCPP & time synchronization for 132kV AGTCCPP-Kumarghat by NEEPCO	Dec'19	-		
20	Diversion of 132kV Bawktlang-Shihmui	Status: OBD on 18.09.19 By Nov'19	-		

**Concerned constituents may kindly intimate the status.**

**C.2. Update on Real Time Energy Assessment for Effective Grid Management:**

Data availability is given below:

Name of the state /utility	Data Availability(in%)	Issues	Status as updated in the 161 <sup>st</sup> OCCM
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DoP Ar. Pradesh	Not updated	-	
Assam	62%	-	
Manipur	80%	(i)Frequent hang of TARA device, resumes reporting upon reboot. (ii) Yurembam end of 132kv of Imphal(PG)-2 fdr, corresponding to SEM NP-8374-A not reporting. (iii) Jiribam 132/133kv ICT(manipur consumption), corresponding to SEM NP-8501-A not reporting	
Meghalaya	0% detailed report to be submitted	after TARA devices are connected the SEMs they hang.	
Mizoram	50%	Luangmual end of 132kV Aizawl(PG) not reporting; Kolasib end of 132kV Badarpur(PG) not reporting	
Nagaland	37.5%	Non-reporting: (i)Kohima end of 132kV Dimapur(PG)-2 (ii)Sanis end of 132kV DHEP (iii)Mokokchung end of Mokokchung(PG)-1 (iv) Mokokchung end of Mokokchung(PG)-2 (v) Mokokchung end of DHEP FDR	
Tripura	12.5%. Network available 24x7. Device fault suspected.	-	

***CDAC/SLDCs may please intimate the latest status.***

**C.3. Ensuring proper functioning of Under Frequency Relays(UFR) & df/dt Relays:**

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

Deliberations in the previous meetings:-

- Inspection for Mawphlang completed.

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- Inspection for Sankardevnagar, Rangia and Rowta under Assam was completed in April'2019.
- UFR Inspection and Testing for TSECL Stations as well as UFRs under Islanding Scheme No.2 carried out in June'19.

In 160th OCCM, DGM, SLDC, TSECL informed the following status:

UFR details	Status as informed in the 160th OCCM.
For all existing UFR except SMNagar	By Oct'19
UFR at SMNagar	By Sep'19
Additional UFR under Islanding Scheme-II	Status to be updated

- In 160th OCCM it was decided that UFR Inspection for Nagaland would be completed by Sep'19.

***NERPC/TSECL may please inform the status.***

#### **C.4. Extended C Band VSAT for power system communications in NER:**

In 160th OCCM, the forum requested NERLDC to obtain the exact cost of the Pilot project so that the same may be approved by TCC/RPC.

***NERLDC may please intimate the status.***

#### **C.5. DIMAPUR\_PG telemetry out since Feb'18.**

In 159th OCCM NERTS informed that LOA was placed on 06.05.2019. The target for completion is Nov'19.

***NERTS may please update the latest status.***

#### **C.6 Update on PDMS:**

As per deliberation in the previous meeting(s) the following status/decisions:-

- SAT for Assam system completed. Data collection for Meghalaya, Tripura & Mizoram completed.
- Network to be finalised based on the feedback of Operational load flow given by NERLDC
- Data collection to be completed for Arunachal Pradesh and Nagaland.
- Prospective Go Live by Nov'19.

***NERPC/PRDC may please update the status.***

#### **C.7 Non-availability/ Non-functioning of synchronization facility at numerous stations**

As per deliberations in the previous meetings the following is the status for synchronization facility at stations of different utilities:

- AEGCL – In 160<sup>th</sup> OCCM, it was decided that a meeting would be convened amongst NERTS, AEGCL, NERLDC and NERPC in Sep'19 for detailed discussion on the necessity of the trolleys.

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- DoP Ar. Pradesh –Lekhi S/S no Sync check relay is available while for Chimpu relay is available. The procurement for trolley/synchroscope is being initiated and exact date for implementation would be intimated later on. But, they will have Synchronization facility latest by Oct 2019.

***AEGCL/DoP Ar. Pradesh may please update the status.***

**C.8 Phase shift errors in PMU:**

The following status was updated by NERTS/AEGCL in the 160<sup>th</sup> OCCM:

- Bongaigaon - Completed except for New Siliguri-2 feeder.
- Misa - 220 kV Side Completed.
- Dimapur, Mariani, Silchar, Salakati - yet to be started, possible completion by 30.09.19.
- Samaguri sub-station under upgradation under PSDF. Re-connection to the PMU will be done after completion of upgradation work.

***NERTS/AEGCL may please update the status.***

**C. 9 Tentative schedule for Black Start & Restoration Procedure Mock exercise in NER during the year 2019**

Status/decisions as per previous meetings:

- LOKTAK After commissioning of 132kV Bus-A
- RHEP to be done in lean season
- DOYANG could not be completed due to synchronization problem in 132kV DHEP-Dimapur-I
- AGBPP – Segregation of aux supply of the STGs from the emergency service board and provisions would be made for black start exercise.

***NEEPCO/NHPC/NERLDC may please intimate the status.***

**C. 10 DVAR and PSS at AGTCCPP:**

In 160<sup>th</sup> OCCM DGM, NEEPCO informed that the GTG-IV is still under S/D due to load coupler problem. M/s ABB visited Plant and did some partial work of DVAR of the Unit. They will again visit in the month of Sept'19 and accordingly NERLDC/NERPC will be informed. NERLDC requested NEEPCO to intimate the action plan for installation of DAVR/PSS in the other units at AGTCCPP.

***NEEPCO may please intimate the status.***

**C. 11 Bus Configuration issues for various sub-stations:**

Status as on 156<sup>th</sup> OCC Meeting:

- 132kV Transfer Bus at Loktak HEP - CEA clearance obtained. Manpower engaged in Unit-III restoration. To be completed by Oct'19

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- 400kV Bus A at RHEP - (i) NEEPCO to procure new 400kV CB for Bus Coupler Bay including mandatory spares.  
(ii) NEEPCO to check /ensure the healthiness of all the elements required to take Bus-A into service. Followings bay equipments to be checked:
  - Two sets of Center Break Isolator(Bus Coupler)
  - Four sets of Pantograph isolators
  - One Set CT(Bus Coupler)
  - One set CVT(Bus-A)
 In 160<sup>th</sup> OCCM shutdown was requested by NEEPCO. OCCM gave in-principle of the shutdown on 22.09.19 & 23.09.19 tentatively. However, exact date would be based on in-flow conditions and consent of DoP Ar. Pradesh in real time.
- 132kV Bus Coupler at Pavoi - Bus coupler is in operation. The protection system is yet to be confirmed by Assam

**NEEPCO/NHPC/AEGCL may please inform the status.**

**C.12 Distance Relay Settings Revision at Deothang/Motonga in Bhutan:**

After the reversion to original configuration on 27.09.19 the following may please be updated:

- Final reading at Deothang and Initial Reading at Motonga.
- FR/IR at Rangia.
- Proper relay settings at Motonga and Deothang.
- The revision of the reach settings at Rangia.

**NERPC/NERTS may please intimate the latest status.**

**C. 13 Status of recommendations reg GD-Vs on 03<sup>rd</sup> & 20<sup>th</sup> April,2019:**

Recommendations	Status as informed in the 160 <sup>th</sup> OCCM	Latest status
Identification of weak joints for 400kV Palatana-Silchar D/C ( Scope NERTS)	Sample already sent to NTH.	
Study for reactive compensation in Tripura System(scope of TSECL)	NERPC to write to CMD, TSECL for forthwith submission of data.	
Identification of feeders for additional UFR based load shedding under Islanding Scheme-II( Scope of TSECL)	Status of procurement, installation to be submitted.	
Standalone EL for integration of relay at AGTCPP by Oct'19(Scope of NEEPCO)	Under Process. Delayed tender at least 1+6 months. From date of LOA to be monitored	
All stations to confirm DR downloading facility and it's healthiness at respective stations. A consolidated	<b>NEEPCO</b> except Doyang HEP all other Stations have the DR downloading facility. In	

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<p>undertaking by the respective utility in this regard is to be submitted prior to each OCCM.</p>	<p>case of DHEP, order placed to M/s ABB, for all the machines, lines, bus etc. Retrofitting shall be done from Dec'19 to April'20. After completion of the same regular uploading of DR/EL in the tripping portal shall be done.</p> <p>Khandong- Kop-II bay of NERTS, DR downloading not explained to NEEPCO. Kopili end under renovation Khandong end - DR downloading to be explained in sub-group</p>	
<p>NHPC to procure standalone EL for Loktak HEP</p>	<p>Under process exact date of LOA to be confirmed</p>	
<p>Revised SPS-3 scheme offer sought from GE by NERTS</p>	<p>GE intimated approximate cost to be about Rs 1 Crore. Detailed break up to be submitted yet. Generation reduction would be decided with OTPC</p>	
<p>Line defects in 400kV Silchar - Azara &amp; 400kV Silchar-Byrnihat T/L to be attended(Scope of NETC)</p>	<p>Defects attended by availing the shut down as proposed. AR successfully operated on 02.09.19** 400kV TLA to be installed</p>	
<p>Impedance measurement for 400kV Paltana-Silchar D/C, 400kV Silchar-Azara, 400kV Silchar - Byrnihat</p>	<p>The Impedance Measuring Kit is on use at Misa S/S now. Shall be diverted to Agartala by 10.09.19</p>	
<p>Line parameters to be matched at Silchar, Azara and Byrnihat.</p>	<p>To be done on or after 10.09.19</p>	
<p>NERTS and AEGCL to jointly visit Azara and check exact cause for delay in appearance of voltage input to relay when charged via Tie Breaker</p>	<p>Joint visit done. But the problem of delayed appearance of voltage while charging through Tie CB could not be identified.</p> <p>However, the problem of non operation of Auto Reclosure has been attended.</p>	

**Concerned utilities may please update the status.**

**C.14 Tripping of all units of BgTPP:**

On 23/05/2019 Units I, II, III of BgTPP tripped at 03:06 hrs, 03:37 hrs, 03:56 hrs respectively. In 158<sup>th</sup> OCCM NTPC gave a detailed presentation on tripping of the three units on 23.05.2019. The suggested recommendations by NTPC are as follows:

Sl. No.	Recommendation	Status as informed in the 159 <sup>th</sup> OCCM	Status as informed in the 160 <sup>th</sup> OCCM
1	Unit -1 unit bus incomer breaker to restored at the earliest	Aug'19	By Sep'19
2	Providing alternate cooling water source to compressors		Unit-1 overhead tank connection made, when unit-2 will go under s/d then connection would be completed. S/D planned Apr'2020

***NTPC may please intimate the status.***

**C.15 Transformer Tap Optimization Study:**

NERLDC has conducted Transformer Tap Optimization studies considering High Hydro Scenario in North Eastern Region. Suggested taps position of important transformers in NER for maintaining bus voltages within permissible limit as well as to minimize system losses was circulated in the 158<sup>th</sup> OCCM.

In 160<sup>th</sup> OCCM AEGCL informed that the comments would be sent by 06.09.2019.

***NERLDC may please intimate the status.***

**C.16 Better weather forecasting for power sector by IMD:**

Decisions/deliberations in the previous meetings:

- IMD to conduct survey for each of the individual utilities.
- Nodal officers for all the utilities nominated in the 159<sup>th</sup> OCCM.
- Utilities(except NERTS) to furnish the list of substations where AWS can be installed.

***NERLDC may please intimate the status.***

**C.17 Erroneous SCADA data i.r.o. AEGCL**

In 160<sup>th</sup> OCCM AEGCL informed that administrative approval has been received. ECI would be given LOA by this week. At least 3 months would be required for supply and installation. NERLDC requested SLDC Assam to submit the hourly voltage data block-wise for calculation of VDI for the period w.e.f Apr'19 to Jul'19 for onward transmission to CERC.

***AEGCL may please intimate the status.***

**C.18 Requirement of model data for simulation of power system stability and dynamics**

NLDC vide letter dated 27<sup>th</sup> Aug 2019 to NPC and RPCs highlighted the requirement of inclusion of new formats in addition to the existing formats by CTU and STU/SLDCs for collection of data pertaining to dynamic parameters of new generators and other equipment. In case of already connected plants, SLDC/STU may issue the necessary instruction to the concerned generator with modified template and request them to furnish the information latest by Dec 2019.

In 160<sup>th</sup> OCCM, CGM, NERLDC stated for new elements being commissioned the data may be submitted to NERLDC and for old generators the available data is also to be submitted

***NERLDC may please intimate the status.***

**C.19 3-phase Auto-reclosure for 400kV Silchar-Azara & 400kV Silchar - Byrnihat:**

NERPC informed that in view of repeated 2-ph/3-ph tripping of 400kV Silchar-Azara & 400kV Silchar-Byrnihat due to back flashover, the 3-ph AR is imperative to be implemented. Sr.GM(SO-II), NERLDC opined that in case of simultaneous tripping of both of these lines, chances of successful 3-ph AR would be remote due to islanding of the Southern grid from NER grid(different frequency). After detailed deliberation it was decided that in order to increase the reliability of the system, 1-ph & 3-ph AR would be implemented for both the 400kV Silchar-Azara and 400kV Silchar-Byrnihat. Forum requested NERLDC to give suggestion regarding which end check sync and dead sync to be implemented. NERPC informed that this would be further referred to CTU & CEA for concurrence.

***NERLDC/NERPC may please intimate the status.***

**C.20 Special Protection Scheme at RHEP**

Discussion in the subgroup meeting of NERPC held on 07.08.19 as follows:

NERPC informed that as per decision in the 158<sup>th</sup> OCCM a team visited RHEP on 05.08.19 and suggested the following SPS:

(i)With tripping of one ICT, one unit of RHEP is to be tripped.

(ii)SPS to be taken into service when all 3 units of RHEP are generating.

NEEPCO requested that tripping of one unit of Pare HEP to be included in the SPS when both units at Pare are generating.

The matter was referred to OCC for approval.

The 160<sup>th</sup> OCC forum agreed in principle and requested NEEPCO to implement the SPS.

***NEEPCO may please intimate the status.***

**C.21 Frequent trippings in Arunachal Pradesh system:**

Sr.GM(SO-I), NERLDC informed that in the months of June-July'19 frequent trippings were observed in the 132kV RHEP-Ziro-Daporizo-....corridor and lines connected to Lekhi. He requested the intervention of the forum for proper analysis of the same. Director, NERPC stated that participation of DoP Ar.Pradesh in the Sub-group meeting on Protection and PCC is extremely lacklustre. He requested DoP Ar.Pradesh to ensure adequate participation from concerned transmission division in all the meetings.

SE(SO&PSC), DoP Ar. Pradesh stated that there is no cohesiveness in data collection since engineers are scattered and onsite training is required. It was decided that after

Agenda for 161<sup>st</sup> OCC Meeting to be held on 22<sup>nd</sup> October, 2019

15th August, 2019 scheduling of training is to be done, then DoP Ar. Pradesh to send personnel to Nirjuli(PowerGRID) for practical hands-on training. The following officers were nominated for the training:

->Moli Kamki, AE, DoP Ar.Pradesh

->Hibu Bama, EE, DoP Ar.Pradesh

->Duyo Richo, AE, DoP Ar.Pradesh

***NERTS/DoP Ar.Pradesh may please intimate the status.***

**C.22 Status of CT upgradation:**

The status of CT upgradation as per the mentioned table as per 156<sup>th</sup> OCC Meeting is to be reviewed.

Name of the line	CT Ratio at either end (current)		CT Ratio at either end (required)		No. of CTs required		status as per 156 <sup>th</sup> OCCM
	Stn A	Stn B	Stn A	Stn B	Stn A	Stn B	
132 kV Jiribam-Aizwal	400 /1	400 /1	600/1	600/1	3 by PGCIL	4 by PGCIL	Jul'19
132 kV Jiribam-Haflong	400 /1	400 /1	600/1	600/1	3 by PGCIL	4 by PGCIL	Jul'19
132 kV Khandong-Umrangso-Haflong	300 /1	400 /1	600/1	600/1	3 at Khandong by NEEPCO, 3 at Umrangso by AEGCL	3 at Umrangso by AEGCL, 3 at Haflong by PGCIL	AEGCL- Arranged from other station not procured
132 kV D/C Doyang - Dimapur	300 /1	600 /1	600/1	600/1	3 by PGCIL & 6 by NEEPCO		PGCIL July'19 NEEPCO By Mar'20
132 kV Khandong - Khliehriat- I	300 /1	300 /1	600/1	600/1	3 by NEEPCO	3 by PGCIL	PGCIL done NEEPCO By Mar'20
132 kV Khandong - Kopili I & II	300 /1	300 /1	600/1	600/1			PGCIL done NEEPCO By Mar'20
132 kV Dimapur-Dimapur	600 /1	120 0/1	600/1	600/1		3 by DoP Nagaland	PGCIL-completed, DoP Nagaland-Jul'19

***Utilities may please intimate the status.***

**C. 23 Metering Status Review:**

Agenda Description	Status as per 160 <sup>th</sup> OCCM	Latest status
<p>Distribution of 70 Laptops</p>	<p>In 160th OCC Meeting, Assam informed that 3 laptops for Srikona, Dullavchera and Hailakandi will be received from Badarpur(PG) after rectification of software issues.</p> <p>Also Meghalaya requested NERTS to despatch the laptop from Misa to Shillong so that Meghalaya can take from NERTS,Shillong.</p> <p>Software for self installation will be mailed by NERTS to all the concerned within few days as informed by NERTS</p>	
<p>Correction of Meter error:</p> <p><i>(i) Erratic reading:</i> Ningthoukhong end, Kohima end , Panchgram end</p> <p><i>(ii) Sign Change:</i> Dimapur I &amp; II state end, Deothang end, Silicon Factory end, Mokokchung end, Kopili end (check meter).</p>	<p>Not yet corrected.</p>	
<p>SEMs to be Procured</p>	<p>In 160th OCC Meeting,NERTS informed that the procurement will be completed by Oct'19</p>	

***NERLDC/NERTS/All STUs may please intimate the status.***

**D. I T E M S FOR DISCUSSION**

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

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

Plants	Reservoirs level in meter	MU content	Present DC (in MU)	No of days as per current generation
Khandong + Kopili stg II			<b>1.44</b>	
Kopili			<b>4.608</b>	
Doyang			<b>0.2049</b>	
Loktak			<b>0.2265</b>	

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

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

**D.2 Outage Planning Transmission elements**

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

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

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

***The sub-Committee may kindly discuss and approve the transmission line outages proposed by Constituents for 01<sup>st</sup> November,2019 to 30<sup>th</sup> November,2019 which is available in the website of NERPC.***

**D.3 Estimated Transmission Availability Certificate (TAC) for the month of August,2019 – September,2019:**

Agenda for 161<sup>st</sup> OCC Meeting to be held on 22<sup>nd</sup> October, 2019

NETC and POWERGRID have submitted the outage data for the month of August, 2019 – September, 2019. So the attributability of outage of the said elements may please be finalized.

***Members may please discuss.***

#### **D.4 Assessment of TTC, TRM & ATC by SLDC on respective Inter-State Transmission Corridor**

NERLDC has assessed the state control area wise, state subsystem wise and group of control-area wise TTCs for NER Grid. The study results will be presented during the meeting. SLDCs are requested to check and validate the TTC of their control areas as computed by NERLDC.

***Members may please discuss.***

#### **D.5 RGMO performance analysis of events**

Decisions in the previous meetings:

- NERLDC to scan PMU records for any event prior to 11:55hrs on 05.02.2019 resulting in droop of frequency by more than 0.03 Hz.
- BgTPP Unit #II mechanical problem in Turbine to be rectified.
- BgTPP DAS data to be submitted for event dated 05.06.19.
- For event dated 21.08.2019 DAS data to be submitted by Kopili HEP, Khandong HEP and Palatana GBPP.
- Reasons for non-sustenance of positive generation of Unit –II & III at BgTPP to be furnished.

***Members may please discuss.***

#### **D. 6 Reactive power capability/injection of generating stations:**

Decisions/deliberations in the previous meetings:

- Recommendations during the reactive capability testing for Palatana to be implemented.
- Testing for BgTPP would be done in the 3<sup>rd</sup> week of Sep'19

***Members may please discuss.***

#### **D.7 Accurate Load forecasting by SLDCs as per IEGC c1.5.3 for better system operation**

RMSE for load forecast of actual data in comparison to that forecasted by the states for the month of July'19 is as follows:

<b>% Error with Actual Data (Forecasted by States)</b>							
<b>Day</b>	<b>Arunachal Pradesh</b>	<b>Assam</b>	<b>Manipur</b>	<b>Meghalaya</b>	<b>Mizoram</b>	<b>Nagaland</b>	<b>Tripura</b>
<b>Median</b>	23	15	9	11	34	11	15

Forum decided that load forecast error will be monitored in OCC Meeting till the RMSE comes below 5%

In 160<sup>th</sup> OCCM CGM, NERLDC informed that POSOCO in association with IIT, Guwahati is developing methodology to forecast at the regional level. He requested all SLDCs to be proactive for the same.

***Members may please discuss.***

**D.8 Continuous shutdown of 220 kV Bus Coupler & 4 x 33 MAV 22/132kV ICT-1 along with associated bays w.e.f 06/09/2019 and shifting of 01 set of 220 kV Bus PT w.e.f 02/09/2019.**

Under the NERSS VIII, SS01 package , the 220/132 kV Dimapur substation is being upgraded from AIS to GIS including replacement of existing 4x33.33 MVA, 220/132 kV single phase unit transformer by 1 x 160 MVA, 220/132 kV 3-phase unit and addition of 1 No 1x160 MVA, 220/132 kV 3-phase transformer.

The existing 220/132 kV Dimapur substation is a conventional AIS substation having 220 kV bays with double main cum transfer scheme and 132 kV bays with single main and transfer bus schemes. Under the NERSS VIII project, all the existing 220 kV and 132 kV AIS bays shall be changed to GIS bays (Double main bus scheme) in the same existing switchyard by creating space for 220 kV GIS building , 132 kV GIS building and outer Gas Insulated Bushings **after dismantling the existing tower/ beams/ equipment's along with structures. During this upgradation period, both the 220 kV & 132 kV bays shall be operated on single bus system and only 220 / 132kV 100 MVA ICT 2 shall remain in service. "**

As per the proposed up-gradation and dismantling, only 220 KV Bus-A (towards the Transmission line side) will be in service. For construction of 200kV GIS Building and 132kV GIS building following assets at Dimapur substations shall be required to be dismantled.

- (1) 220/132 kV 4 X 33MVA ICT-1
- (2) 200kV ICT - 1 BAY
- (3) 132kV ICT - 1 BAY
- (4) 200kV BUS B
- (5) 200kV BUS COUPLER BAY

The substation layout diagram is attached for further reference.

The existing 220 kV PTs of Bus 1 & 2 are installed where the 220 kV GIS building is proposed to be constructed. As such 1 set of the bus PT is to be shifted to a convenient location towards ICT-2 area.

After shifting of the PT to the new location, dismantling works of the bus coupler bay and ICT-1 bays including the 4x33.33 MVA 1-Phase transformer will commence.

Once the above shutdown is approved, the shutdown shall continue till erection, testing and commissioning of the new GIS system which is February 2021 as per the approved L2 schedule.

Considering the above, It is proposed for Shutdown below mentioned assets under new construction activity related outage:

- b. Continuous Shutdown of BUS A w.e.f 02.09.2019 to 05.09.2019 for shifting of 1 set of 220 kV Bus PT as above.
- c. Continuous Shutdown of the 220kV/132kV 4x 33 MVA ICT - 1, 220 kV Bus coupler and ICT-1 bays (Bay No.203 & 204)w.e.f 06/09/19 till erection, testing and commissioning of the new GIS system.

In 160th OCCM, NERLDC informed that during the period of shutdown, power restriction in Nagaland might be required in peak hours and hence concurrence of Nagaland will be necessary to approve the shutdown.

Further, NERLDC informed that as per system studies there will be severe low voltage problem in case of outage of other ICT in service at Dimapur. NERLDC opined that this shutdown would be allowed after restoration of the 132 kV Dimapur – Imphal line. NERTS requested NERLDC to check whether the low voltage issue could be avoided by changing the tap position of the ICTs in Nagaland Power System.

Director, NERPC requested NERLDC to conduct a detailed study so that the matter may be discussed in detail in the next OCCM in presence of officers from DoP Nagaland.

***Members may please discuss.***

**D.9 Outage of lines and ICT at RHEP for replacement of breakers:**

All hydraulic CBs at RHEP are to be replaced due to non-availability of spares. Considering the urgency of the work, NEEPCO has already given the order and materials are deemed to be delivered shortly. He requested for the views of the forum keeping in view the power supply condition to Arunachal Pradesh. SE(SO&PSC), DoP Ar. Pradesh stated that 132kV RHEP-Ziro line is the life line for the state and it is not possible to grant shutdown of the line. After detailed deliberation it was decided that NEEPCO would be requested to explore the option of keeping at least one 400/132kV ICT in service and 132kV RHEP-Ziro in service (by means of Transfer Bus and Bus Coupler) at all times.

***Members may please discuss.***

**D.10 Monitoring of Critical Elements affecting the reliability of and security of the Grid**

Critical Elements which affect NER/ER TTC/ATC Values and Cause major Grid Disturbance		
SI No	Name of Element	No of tripping during Sep' 19
1	400 kV Bongaigaon - Byrnihat S/C	Count will be presented during the meeting
2	400 kV Bongaigaon - Azara S/C	
3	400 kV Silchar - Azara S/C	
4	400 kV Silchar - Byrnihat S/C	
5	400 kV Palatana - Silchar D/C	
6	400/132 kV, 125 MVA ICT I and II at Palatana	
7	132 kV Palatana - Surajmaninagar S/C	
8	400 kV Balipara - Misa D/C	
9	400/220 kV 1x315 MVA and 1 x 500 MVA ICTs at Misa	
10	132 kV Imphal - Dimapur S/C	
11	132 Khandong - Kopili D/C	

***NERLDC may please deliberate.***

#### **D.11 Intra State Lines being kept open**

Important intrastate lines are being kept open, compromising the reliability of the NER grid. Some of the lines kept open are as follows:

- a. 132kV Rangia- Rowta
- b. 132kV Rangia-Siphajhar
- c. 132kV Sarusajai-Umtru 1, 2
- d. 132kV Kahilipara-Umtru 1, 2

The matter was deliberated in 159<sup>th</sup> OCC Meeting. Action plan to mitigate the issues leading to opening the above mentioned lines is to be discussed so that these lines may be kept in service round the clock.

In 160<sup>th</sup> OCCM SLDC, AEGCL informed that the 132kV Rangia - Rowta and 132kV Rangia-Siphajhar is being kept open due to system constraints. NERPC informed that for items c & d above issue will be resolved after LILO at Killing. NERLDC requested for joint study along with Assam for a & b above.

***Members may please discuss***

#### **AGENDA ITEMS FROM AEGCL**

#### **D.12 Bay for 2<sup>nd</sup> circuit of 220kV Sonabil- Balipara line at Balipara**

Proposal of Bay for 2<sup>nd</sup> circuit of 220kV Sonabil- Balipara line at Balipara that needs to be constructed at the earliest to enhance the stability and security of North Bank of Brahmaputra. AEGCL desires to take up the work on installation of the missing elements for the same at Balipara GSS.

***AEGCL may please deliberate.***

#### **AGENDA ITEMS FROM NERLDC:**

#### **D.13 Reactivation of SPS -1**

The SPS-1 associated with tripping of generation of both Modules of Palatana CCGT (2 x 363.3 MW) is deactivated at present. The same needs to be activated to Avoid Violation of ATC of NER-ER Corridor. Details of the SPS are attached as **Annexure D.13** for reference.

***NERLDC may please deliberate.***

#### **D.14 Implementation of revised SPS-3 scheme**

As per the Minutes of 20<sup>th</sup> TCC & 20<sup>th</sup> NER Power Committee Meetings held at Guwahati on 12<sup>th</sup> Sept., 2019 (Agenda No. D 20), the said SPS is to be discussed again in OCC and it is to be put up in the 21<sup>st</sup> TCC/RPC Meeting.

***NERLDC may please deliberate.***

#### **D.15 Submission of Disturbance recorder (DR):**

As per the Minutes of 20<sup>th</sup> TCC & 20<sup>th</sup> NER Power Committee Meetings held at Guwahati on 12<sup>th</sup> Sept., 2019, the states of Arunachal Pradesh, Nagaland and Mizoram, who have not started giving the DR data till date, shall start sending DR data since September, 2019. However, no DR data has been received from these states in September, 2019.

***NERLDC may please deliberate.***

**D.16 Delay in availing of shutdown:**

The approved shutdown is being availed after much delay from the approved shutdown time. This mostly leads to delay in restoration of shutdown and leads to grid security and reliability issues. The shutdown will not be allowed to be availed beyond delay of a certain time. This delay time may be discussed by the forum.

***NERLDC may please deliberate.***

**D.17 Frequent blackouts at Kolasib:**

Subsequent to visit of the protection expert team to Kolasib, Tural and Badarpur as scheduled on 13th and 14th Sep'2019, Total 3 Nos of blackouts has been observed at Kolasib Bus till date as per details below. These frequent incidences cause, inter alia, huge commercial loss to Mizoram as well as to NEEPCO in addition to compromising onGrid security. Details attached as **Annexure D.17**.

***NERLDC may please deliberate.***

**D.18 Automatic Generation Control(AGC) in Indian Grid:**

Hon'ble Central Electricity Regulatory Commission (CERC) has stipulated the implementation of AGC in Indian Grid. CERC order and AGC requirements are attached as **Annexure D.18**.

***NERLDC may please deliberate.***

**D.19 Frequent high loading of 220 kV BTPS-Salakati line:**

It has been observed several times that the loading of each 220 kV BTPS- Salakati line had gone beyond thermal limit of 203 MW. In order to reduce the loading of this D/C and for better reliability of the grid, it is requested to reconduct 220 kV BTPS- Salakati line with HTLS and commission 400/220 kV, 315 MVA ICT-1 at BgTPP at the earliest. In the 160th OCC meeting, the target date for commissioning of ICT-1 at BgTPP was given as 15th Sep'2019.

***NERLDC may please deliberate.***

**D.20 Installation of FACTS devices at Biswanath-Chariali:**

After commissioning of +/- 800 kV HVDC Biswanath Chariali – Agra Pole-1 in December 2015 and Pole 2 in September 2016, the duration of high voltage at 400 kV Bongaigaon, 400 kV Balipara, 400 kV Biswanath Chariali, 400 kV Ranganadi and 400 kV Misa nodes have increased. The low fault level at these 400 kV Buses of NER also result in voltage spikes with each switching of filter banks at 400 kV Biswanath Chariali (PG) substation.

High voltage observed in 400 kV nodes of NER grid (Balipara, Biswanath Chariali & Ranganadi) for 18 minutes w.e.f 23:55 Hrs on 22.02.19 while increasing power order of HVDC Biswanath Chariali – Agra from 500 MW to 700 MW after de-blocking of Pole-1. Unwanted switching of filter bank at Biswanath Charali before the desired power flow in HVDC poles was the reason of sudden rise in voltage.

High voltage was also observed in major 400 kV nodes (phase voltage of 295 kV at Balipara, 303 kV at Biswanath Chariali & 299 kV at Ranganadi) while tripping of HVDC Biswanath Chariali –Alipurduar - Agra Pole-1 on 29th Aug'18 which resulted in Grid Disturbance in Arunachal Pradesh Power System and Ranganadi and Pare Power Stations.

The matter needs resolution, as this poses a threat to security of NER power system as also may force operation of HVDC Biswanath Chariali - Agra link at much lower capacity than rated. There have also been instances of tripping of 400 kV lines on overvoltage, which have resulted in near-miss incidents in NER power system.

It was observed from system studies that the planned reactive compensation till now may not be sufficient to keep all 400 kV lines in NER Grid in service during off-peak hours. Hence installation of FACTS devices like STATCOM/SVC at Biswanath Chariali is necessary to resolve the issue.

***NERLDC may please deliberate.***

**D.21 Non-Reporting of PMU data under URTDSM Project:**

PMUs at Agia (AS), Samaguri (AS), Tinsukia (As), Salakati (AS), Kopili (NO), Dimapur (PG) and Misa (PG) are not reporting/reporting partially. The concerned utilities are requested to take appropriate actions.

***NERLDC may please deliberate.***

**Metering Agenda**

**D.22 High SEM Time Drift:**

Time drift in SEMs may result in computational errors in Regional energy accounts & Weekly Loss. All constituents in whose premises the meters are installed are required to take corrective action for time correction whenever meter time drift > 1minute and submit weekly compliance report of the same to NERLDC.

The compliance report of many locations as detailed in **Annexure D.22.a**, are not received by NERLDC and **Annexure D.22.b** provides location details of Drift correction action not being done / weekly SEM data not sent.

***NERLDC may please deliberate.***

**Any other item:**

**Date and Venue of next OCC**

It is proposed to hold the 162<sup>nd</sup> OCC meeting of NERPC on second week of November, 2019. The date & exact venue will be intimated in due course.

\*\*\*\*\*

## ***SPS Schemes of NER***

**Table -1: System Protection Scheme (SPS) No. 1 Information Sheet**

### SPS No.1 in NER

Item	Information Explanation
Reporting Party	POWERGRID, OTPC, AEGCL, MePTCL and TSECL
Scheme's Name	SPS associated with tripping of generation of both Modules of Palatana CCGT (2 x 363.3 MW)
Classification	SPS related to Minimization of ATC Violation of NER-ER Corridor
Reference No.	<b>SPS/NER/ATC/01</b>
Operating Procedure	<b>Refer to Chapter 12, Point No 12.1 of Operating Procedure of NER</b>
Design Objectives	To Avoid Violation of ATC of NER-ER Corridor
Operation	Load Disconnection
Modelling	<p><b><u>Pre-condition:</u></b>  <b>Following lines should be kept in open conditions</b></p> <ul style="list-style-type: none"> <li>➤ 132 kV Khliehriat – Lumshnong S/C</li> <li>➤ 132 kV Pailapool – Jiribam line at Jiribam end</li> <li>➤ 132 kV P K Bari – Dharmangar S/C will be kept open</li> </ul> <p><b><u>Scheme</u></b></p> <ol style="list-style-type: none"> <li>i. When both Modules of Palatana CCGT trips, a signal (SPS-I) will be generated from trip relay of the Modules and will be sent to Silchar.</li> <li>ii. After receiving SPS signal from Palatana at Silchar, a signal should trip the Circuit Breakers of 132 kV Silchar – Srikona D/C and Circuit Breakers of 132 kV Silchar – Hailakadi D/C. Also, a signal from Silchar should be sent to Badarpur.</li> <li>iii. After receiving signal from Silchar at Badarpur End, the signal should trip the Circuit Breakers of 132 kV Badarpur – Panchgram line at Badarpur.</li> <li>iv. Then manual demand management / disconnection should be imposed, if necessary.</li> </ol>
Original In-Service Year	<b>14.09.2013</b>
Recent Assessment Group	OTPC, NERPC Secretariat, NERLDC & NERTS
Recent Assessment Date	<b>10.05.2018</b>

### Frequent Black out at Kolasib Bus

Subsequent to visit of the protection expert team to Kolasib, Tural and Badarpur as scheduled on 13th and 14th Sep'2019, Total 3 Nos of blackouts has been observed at Kolasib Bus till date as per details below.

These frequent incidences cause, inter alia, huge commercial loss to Mizoram as well as to NEEPCO in addition to compromising on Grid security.

SL. No	Date	Time (Hrs.)	Description of the incident:	Load affected	Generation affected	Remarks
1	16.09.19	10:44	132 kV Badarpur - Kolasib (Badarpur: Bph, Z3, 177.5 KM; Kolasib : No Tripping) & 132 kV Aizawl - Kolasib (Aizawl : Bph, Z3, 128 KM ; Kolasib : No Tripping) TL tripped along with Tural generation resulting in blackout of 132 kV Kolasib S/S.	6 MW ( Kolasib Area)	57 MW (Tural)	
2	20.09.19	04:02	132 kV Badarpur - Kolasib (Badarpur: R-N, Z-3, 183.3 KM; Kolasib : No Tripping) & 132 kV Aizawl - Kolasib (Aizawl : R-N, Z-3, 135.7 KM ; Kolasib : No Tripping) TL tripped along with Tural generation resulting in blackout of 132 kV Kolasib S/S.	4 MW (Kolasib Area)	31 MW (Tural )	
3	28.09.19	00:31	132 kV Badarpur - Kolasib (Badarpur: R-N, Z-2, 100.7 KM; Kolasib : E/F) & 132 kV Aizawl - Kolasib (Aizawl : Back-up E/F ; Kolasib : No Tripping) T/L tripped resulting in blackout of 132 kV Kolasib S/S.	1MW (Kolasib Area)	0 MW	Prior to the incident , Blackout at Tural Bus along with 132 kV Badarpur -Kolasib ( Badarpur: R-ph, Z-2, 98.38 km, Kolashib E/F) at 23:56 Hrs of 27.09.19 . Tural generation was 30MW before blackout.



नई दिल्ली  
NEW DELHI

याचिका संख्या. /Petition No.: 319/RC/2018

कोरम/Coram:

श्री पी. के. पुजारी, अध्यक्ष/Shri P. K. Pujari, Chairperson  
डॉ. एम. के. अय्यर, सदस्य/ Dr. M.K. Iyer, Member  
श्री आई. एस. झा, सदस्य/ Sh. I.S. Jha, Member

आदेश दिनांक /Date of Order: 28<sup>th</sup> of August, 2019

**IN THE MATTER OF**

Automatic Generation Control (AGC) implementation in India

**AND**

**IN THE MATTER OF**

National Load Despatch Centre  
Power System Operation Corporation Ltd.  
(A Government of India Enterprise) B-9,  
Qutab Institutional Area, Katwaria Sarai  
New Delhi-110016

...Petitioner

**VERSUS**

1. NTPC Limited,  
Plot No A-8A,  
Sector-24, Noida,  
Uttar Pradesh, India- 201301
2. NHPC Limited,  
N.H.P.C Office Complex,  
Sector-33, Faridabad – 121003, Haryana

3. Central Transmission Utility,  
Saudamini, Plot No. 2,  
Sector-29, Gurgaon-122 001 (Haryana)
4. SJVN, Shakti Sadan,  
SJVN Corporate Office Complex, Shanan-171006
5. THDC INDIA LIMITED, Corporate Office,  
Rishikesh, Pragatipuram, By Pass Road,  
Rishikesh – 249201, Uttrakhand
6. Aravali Power Company Private Ltd.,  
Indira Gandhi Super Thermal Power Station (IGSTPS),  
Jharli, District Jhajjar, Haryana-124141
7. N T E C L Vallur Thermal Power Project,  
P.O.: Vellivoyal Chavadi,  
Ponneri Taluk, Tiruvallur Dist, Chennai- 600 103
8. NLC India Limited,  
Block - 1, Neyveli - 607 801,  
Cuddalore District, Tamilnadu
9. NTPC-SAIL Power Company Limited –  
Corporate Centre, 4th Floor, Nbcc Tower,  
15 Bhikaiji Cama Place, New Delhi, Delhi – 110066
10. Coastal Gujarat Power Ltd,  
Tata Power Co. Ltd., Backbay Rec Station,  
148, Lt. Gen. J.Bhonsle Marg,  
Nariman Point, Mumbai 400 021
11. Sasan Power Limited,  
Reliance Centre, Near Prabhat Colony,  
Off Western Express Highway,  
Santacruz East, Mumbai – 400055, Mumbai
12. Ratnagiri Gas and Power Pvt. Ltd.,  
Registered Office, NTPC Bhawan,  
Core-7, SCOPE Complex,  
7, Institutional Area, Lodi Road,  
New Delhi-110003, India
13. North Eastern Electric Power Corporation Ltd,  
Brookland Compound, Lower New Colony,  
Shillong-793003, Meghalaya, India.

14. ONGC Tripura Power Company Ltd.  
6th Floor, A Wing, IFCI Towers, 61,  
Nehru Place, New Delhi – 110019

15. Bharatiya Rail Bijlee Company Ltd.  
Nabinagar, Khera Police Station  
Dist.-Aurangabad, Bihar-824303

**Northern Region**

16. Delhi Transco Limited,  
33kV, Sub Station Building,  
Minto Road, New Delhi -110002.

17. Haryana Vidyut Prasaran Nigam Limited,  
XEN/LD & PC, SLDC Complex,  
Sewah Panipat -132103.

18. Himachal Pradesh State Electricity Board,  
HP Load Despatch Society,  
SLDC complex, Totu,  
Shimla -171011.

19. Jammu & Kashmir Power Development Department,  
SLDC Building,  
220 kV Grid Station Narwal,  
Jammu -180007.

20. Punjab State Transmission Corporation Limited,  
Ablowal, Patiala, SLDC Building,  
Near 220KV Grid Substation,  
PSTCL, Ablowal,  
Patiala -147001

21. Rajasthan Rajya Vidyut Prasaran Nigam Limited,  
State Load Despatch Centre,  
Rajasthan Rajya Vidyut Prasaran Nigam Limited,  
Ajmer Road, Heerapura,  
Jaipur -302024

22. Uttar Pradesh Power Transmission Corporation Limited,  
Power System, 5th Floor,  
Shakti Bhawan, 14 Ashok Marg,  
Lucknow -226001

23. Power Transmission Corporation of Uttarakhand Limited,  
400 KV Substation,  
Veerbhadra, Rishikesh -249202

24. General Manager,  
Singrauli Super Thermal Power Station,  
Shakti Nagar, UP-231222
25. General Manager,  
Singrauli Solar PV Power Project,  
Shakti Nagar, UP-231222
26. General Manager,  
Singrauli Small Hydro Power Project,  
Shakti Nagar, UP-231222
27. General Manager,  
Rihand Super Thermal Power Station-I,  
Rihand Nagar, UP-231223
28. General Manager,  
Rihand Super Thermal Power Station-II,  
Rihand Nagar, UP-231223
29. General Manager,  
Rihand Super Thermal Power Station-III,  
NTPC Rihand, Dist-Sonbhadra,  
UP - 231223
30. General Manager,  
Dadri, National Capital Power Project,  
Dadri Dhaulana Road,  
Distt. Gautam Buddh Nagar,  
UP-201008
31. General Manager,  
Dadri – Stage - II,  
National Capital Power Project,  
Dadri Dhaulana Road,  
Distt. Gautam Buddh Nagar,  
UP-201008
32. General Manager,  
Firoz Gandhi Unchahar Thermal Power Project-I,  
Unchahar, Distt. Rai bareilly,  
UP
33. General Manager,  
Firoz Gandhi Unchahar Thermal Power Project-II,  
Unchahar, Distt. Raibareilly,  
UP

34. General Manager,  
Firoz Gandhi Unchahar Thermal Power Project-III,  
Unchahar, Distt. Raibareilly,  
UP
35. General Manager,  
Firoz Gandhi Unchahar Thermal Power Project-IV,  
P.O. Unchahar, Dist. : Raibareilly (U.P.) Pin-229406
36. General Manager,  
Firoz Gandhi Unchahar Solar PV Power Project,  
Unchahar, Distt. Raibareilly, UP
37. General Manager,  
Dadri Gas Power Project,  
Dhaulana Road, Distt.  
Gautam Buddh Nagar,  
UP-201008
38. General Manager,  
Dadri Solar PV Power Project,  
Dhaulana Road, Distt.  
Gautam Buddh Nagar,  
UP-201008
39. General Manager,  
Auraiya Gas Power Project( Gas Fired, RLNG Fired, Liquid Fired),  
Dibiyapur, Distt Etawah,  
UP-206244
40. General Manager,  
Anta Gas Power Project (Gas Fired, RLNG Fired, Liquid Fired),  
Distt. Baran,  
Rajasthan-325209
41. General Manager, Koldam HPP, NTPC,  
Post- Barman, Dist- Bilaspur,  
Himachal Pradesh 174013
42. Station Director,  
Narora Atomic Power Station,  
Narora, Distt. Bulandshahar,  
UP-202389
43. Station Director,  
Rajasthan Atomic Power Station-B,  
Anu Shakti Vihar, Kota,  
Rajasthan-323303

44. Station Director,  
Rajasthan Atomic Power Station-C, (RAPS-5&6)  
PO-Anushakti, Kota,  
Rajasthan-323304
45. General Manager,  
Bairasiul Hydro Electric Project,  
NHPC Ltd., Surangini,  
Distt. Chamba, HP-176317
46. General Manager,  
Salal Hydro Electric Project,  
NHPC Ltd,  
Jyotipuram, Distt. Udhampur,  
J&K-182312
47. General Manager,  
Tanakpur Hydro Electric Project,  
NHPC Ltd.,  
Banbassa, Distt. Champawa,  
Uttarakhand-262310
48. General Manager,  
Chamera-I Hydro Electric Project,  
NHPC Ltd.,  
Khairi, Distt.  
Chamba, HP-176310
49. General Manager,  
Uri Hydro Electric Project,  
NHPC Ltd.,  
Mohra, Distt. Baramulla,  
J&K-193122
50. General Manager,  
Chamera-II Hydro Electric Project,  
NHPC Ltd.,  
Karian, Distt. Chamba,  
HP-176310
51. General Manager,  
Chamera-III Hydro Electric Project,  
NHPC Ltd., Dharwala, Distt.- Chamba,  
HP-176311
52. General Manager,  
Dhauliganga Hydro Electric Project,  
NHPC Ltd., Tapovan, Dharchula, Pithoragarh,  
Uttarakhand-262545

53. General Manager,  
Dulhasti Hydro Electric Project,  
NHPC Ltd.,  
Chenab Nagar, Distt. Kishtwar,  
J&K-182206
54. General Manager,  
Uri 2 Hydro Electric Project, NHPC Ltd.,  
Nowpora, Distt. Baramulla, J&K-193123
55. General Manager,  
Parbati HE Project Stage-III Behali,  
P.O- Larji Kullu 175122 Himachal Pradesh
56. Chief Engineer,  
Sewa-II Power Station,  
NHPC Ltd. Mashke, post Bag no-2,  
P.O-Khari, Dist: Kathua, Jammu and Kashmir -176325
57. The Chief Engineer (Electrical),  
Kishanganga HEP,  
Office cum Residential colony, Kralpora,  
Distt: Bandipora, Jammu and Kashmir-193502
58. Chief Engineer (Elect.),  
Parbati-II HEP, Electrical & Mechanical complex,  
Sainj, Distt. Kullu, Himachal Pradesh -175134
59. General Manager,  
Napha Jhakhri HEP,  
Satluj Jal Vidyut Nigam Ltd. Power Project,  
Jhakri, Rampur, Distt. Shimla, HP-172201
60. General Manager,  
Rampur HEP,  
Satluj Jal Vidyut Nigam Ltd. Power Project,  
Jhakri, Rampur, Distt. Shimla, HP-172201
61. General Manager,  
Tehri Hydro Development Corporation Ltd.,  
Pragatipuram, Rishikesh,  
Uttarakhand-249201
62. General Manager,  
Koteshwar HEP, THDCIL, Koteshwerpuram,  
Post Office- Pokhari Tehri Garwal, Uttarakhand - 249146

63. Director (Power Regulation),  
Bhakra Power House, SLDC Complex,  
66 KV Substation, Industrial Area Phase-I,  
Madhya Marg, BBMB Chandigarh
64. General Manager, ADHPL,  
Village- Prini, PO -Jagat Sukh,  
Tehsil - Manali, Distt- Kullu (H.P) India.
65. General Manager,  
Indra Gandhi Super Thermal Power Project,  
PO -Jharli, Tahsil Matanhail, Dist – Jhajjar, (Haryana)-124125
66. General Manager,  
Karcham Wangtoo HEP,  
Himachal Baspa Power Company Limited,  
Sholtu Colony, PO- Tapti, Dist-Kinnaur, -172104 (HP)
67. Director,  
Malana - II Everest Power Pvt. Ltd,  
Hall-A/ First Floor Plot No-143-144,  
Udyog Vihar, Phase -4, Gurgaon, Haryana 122015
68. Company Secretary,  
Shree Cement Thermal Power Project Bangurnagar,  
Beawar , Dist Ajmer, Rajasthan -305901
69. Company Secretary,  
Greenco Budhil HPS Ltd,  
Plot No. 1367 Road No- 45,  
Jubilee Hills, Hyderabad- 500033
70. Project General Manager,  
Himachal Sorang Power Limited, D-7,  
Lane-I, Sector-I, New Shimla, Shimla, H.P.-171009.
71. General Manager,  
Sainj HEP, HPPCL, Larji,  
Distric - Kullu, Himachal Pradesh, 175122

### **Western Region**

72. MSLDC,  
Airoli, Navi Mumbai, Airoli,  
Thane - Belapur Road, Navi Mumbai-400708.
73. State Load Despatch Centre,  
MPPTCL, Jabalpur,  
O/o Chief Engineer (SLDC), MPPTCL, Nayagaon, Jabalpur

74. SLDC Gotri Vadodara,  
Gujarat, 132kV Gotri s/s compound,  
Opposite Kalpvruk Complex,  
Gotri Road,  
Vadodara
75. Chhattisgarh State Load Despatch Centre,  
C.E(LD), State Load Despatch Centre,  
CSPTCL, Daganiya-HQ,  
Raipur, Chhattisgarh
76. General Manager, Korba STPS STG (I& II),  
National Thermal Power Corporation,  
P.O. Vikas Bhavan, Jamnipali,  
Korba(Distt.),  
Chhattisgarh- 495 450.
77. General Manager,  
Korba STPS STG (III),  
National Thermal Power Corporation,  
P.O. Vikas Bhavan, Jamnipali,  
Korba(Dist),  
Chhattisgarh- 495 450.
78. General Manager,  
STAGE-I, Vindhyachal STPS,  
National Thermal Power Corporation of India Ltd,  
P.O Vindhyanagar, Sidhi(Dist),  
Madhya Pradesh – 486 885
79. General Manager,  
STAGE-II, Vindhyachal STPS,  
National Thermal Power Corporation of India Ltd,  
P.O Vindhyanagar, Sidhi(Dist),  
Madhya Pradesh – 486 885
80. General Manager,  
STAGE-III, Vindhyachal STPS,  
National Thermal Power Corporation of India Ltd,  
P.O Vindhyanagar, Sidhi(Dist),  
Madhya Pradesh – 486 885
81. General Manager,  
STAGE-IV, Vindhyachal STPS,  
National Thermal Power Corporation of India Ltd,  
P.O Vindhyanagar, Sidhi(Distt.),  
Madhya Pradesh – 486 885

82. General Manager,  
Kawas Gas Power Project,  
National Thermal Power Corporation of India Ltd,  
P.O. Aditya Nagar,  
Surat- 394 516
83. General Manager,  
Gandhar Gas Power Project,  
National Thermal Power Corporation of India Ltd,  
P.O. NTPC Township, Bharuch(Distt.),  
Gujarat- 392 215
84. General Manager,  
SIPAT TPS Stg-I,  
National Thermal Power Corporation of India Ltd,  
SIPAT, Chhattisgarh.
85. General Manager,  
SIPAT TPS Stg-II,  
National Thermal Power Corporation of India Ltd,  
SIPAT, Chhattisgarh.
86. General Manager,  
Mouda STPP,  
NTPC Ltd,  
Mouda Ramtek Road,  
P.O.Mouda, Nagpur (Dist),  
Maharashtra
87. General Manager ,  
2 X 135 MW Kasaipali Thermal Power Project,  
ACB (India) Ltd.  
District - Korba  
Chhattisgarh Chakabura 495445
88. General Manager,  
Bharat Aluminium Co. Ltd,  
Captive Power plant-II,  
BALCO Nagar Chhattisgarh, Korba 495 684
89. Executive Director,  
Costal Gujarat Power Ltd,  
Tunda Vandh Road, Tunda Village, Mundra,  
Gujarat Kutch 370435
90. Executive Director,  
DB Power,  
Village - Baradarha, Post - Kanwali,  
Dist - Janjgir, Champa, Chhattisgarh Baradarha 495695

91. Executive Director,  
Jindal Power Ltd. Stg-I,  
OP Jindal STPP, PO-Tamnar,  
Gjarghoda Tehsil,  
Chhattisgarh District - Raigarh, 496107
92. Executive Director,  
Jindal Power Ltd. Stg-II,  
OP Jindal STPP,  
PO-Tamnar,  
Gjarghoda Tehsil,  
Chhattisgarh District - Raigarh, 496107
93. Executive Director,  
Plot No Z-9,  
Dahej SEZ Area (Eastern side),  
Dahej, Taluka-Vagra, Gujarat Dist-Bharuch, 392130
94. Executive Director,  
EMCO Power Ltd,  
Plot No B-1, Mohabala MIDC Growth Center  
Post Tehsil - Warora, Dist Chandrapur-Maharashtra 442907
95. Executive Director,  
ESSAR POWER MP LTD.  
Village Bandhora,  
Post Karsualal, Tehsil Mada,  
Distt. Singrauli, Madhya Pradesh-486886
96. General Manager,  
GMR CHHATTISGARH ENERGY LTD  
Skip House, 25/1, Museum Road  
Karnataka Bangalore 560025
97. Managing Director,  
Jaypee Nigri Super Thermal Power Project,  
Nigri District, Madhya Pradesh  
Singrauli 486668
98. Executive Director,  
DCPP, OP Jindal STPP,  
PO-Tamnar, Gjarghoda Tehsil,  
Chhattisgarh District - Raigarh, 496107
99. Station Director,  
Nuclear Power Corporation of India ltd,  
Kakrapara Atomic Power Station,  
PO - via Vyara, Gujarat Dist - Surat 395651

100. Station Director,  
Tarapur Atomic Power Station 1&2,  
Nuclear Power Corporation of India Ltd,  
P.O. TAPP, Thane(Dist),  
Maharashtra- 401 504
101. Station Director,  
Tarapur Atomic Power Station 3&4,  
Nuclear Power Corporation of India Ltd,  
P.O. TAPP, Thane (Distt.),  
Maharashtra- 401 504
102. Managing Director,  
Korba West Power Co. Ltd.,  
Village – Chhote Bhandar,  
P.O. - Bade Bhnadar,  
Tehsil - Pussore,  
District - Raigarh,  
Chhattisgarh Raigarh 496100
103. Managing Director,  
KSK Mahanadhi,  
8-2-293/82/A/431/A, Road No 22 Jubilee Hills  
Andhra Pradesh Hyderabad 500033
104. General Manager,  
LANCO Power Ltd,  
Plot No - 397, Phase -III, Udyog Vihar, Haryana  
Gurgaon 122016
105. General Manager,  
NTPC-SAIL Power Company Private Ltd,  
Puranena Village, Chhattisgarh Dist - Durg,  
Bhilai 490021
106. General Manager,  
Ratnagiri Gas & Power Pvt Ltd,  
2nd Floor, Block-2, IGL Complex,  
Sector-126, Expressway, Uttar Pradesh  
Noida 201304
107. Managing Director,  
Sasan Power Ltd,  
DAKC, I Block, 2nd Floor, North Wing,  
Thane Belapur Road, Koparkhairana Maharashtra  
New Mumbai 400710

108. Managing Director,  
Vandana Vidyut Bhavan,  
M. G. Road  
Chhattisgarh Raipur 492001
109. Managing Director,  
RAPP Transmission Company Limited,  
Mira Corporate Suites,  
1&2 Ishwar Nagar,  
Okhla crossing,  
Mathura road,  
New Delhi, 110065
110. General Manager,  
LARA,  
National Thermal Power Corporation of India Ltd,  
Chappora, PO-Pussora,  
Raigarh, Chhattisgarh.
111. General Manager,  
Solapur,  
National Thermal Power Corporation of India Ltd,  
Western Region HQ,  
Samruddhi Venture Park,  
2<sup>nd</sup> Floor, MIDC Marol,  
Andheri East, Mumbai,  
Maharashtra.

**Eastern Region**

112. State Load Despatch Center,  
GRIDCO Colony  
PO-Mancheswar Railway Colony,  
BBSR Bhubaneswar -751070
113. State Load Despatch Center,  
Jharkhand State Electricity Board (JSEB)  
Kushai Colony, Doranda,  
Ranchi-834002
114. SLDC-BSEB,  
Patna, Bihar State Electricity Board,  
Vidyut Bhawan, Jawaharlal Nehru Marg,  
Patna-800021
115. SLDC-W.Bengal,  
P.O. Danesh Seikh Lane,  
Andul Road  
Howrah – 711109

116. Damodar Valley Corporation,  
DVC Tower,  
VIP Road, Kolkata,  
WB 700054
117. Energy and Power Deptt.,  
Govt. of Sikkim  
Kazi Road,  
Gangtok 737 201
118. General Manager,  
Farakka Super Thermal Power Plant-I&II,  
NTPC Ltd.,  
Farakka, WB 742236
119. General Manager,  
Farakka Super Thermal Power Plant-III,  
NTPC Ltd.,  
Farakka, WB 742236
120. General Manager,  
Kahalgaon Super Thermal Power Plant-I NTPC Ltd,  
Bhagalpur Bihar 813214
121. General Manager,  
Kahalgaon Super Thermal Power Plant-II NTPC Ltd,  
Bhagalpur Bihar 813214
122. Executive Director,  
Talcher Super Thermal Power Stn-I NTPC Ltd,  
Nayapalli, Odisha 751012
123. Addl. General Manager,  
National Thermal Power Corporation Limited,  
BARH Thermal Power Station, Patna, Bihar 803213
124. GM(O&M),  
Kanti Bijlee Utpadan Nigam Limited  
Muzaffarpur Thermal Power Station Bihar Muzaffarpur 843130.
125. The General Manager(O&M),  
Bharatiya Rail Bijlee Company Ltd.  
Nabinagar,Khera Police Station Dist.-Aurangabad, Bihar-824303
126. General Manager (O&M),  
Darlipali Super Thermal Power Project NTPC Ltd.  
Odisha Darlipali,Sundergarh 770072.(upcoming)

127. Chairman, Damodar Valley Corporation  
DVC Tower, VIP Road West Bengal Kolkata 700054  
(Not an ISGS but have many generating units)
128. Chief Engineer (Elect),  
Teesta V HEP,  
NHPC,  
Singtam, East Sikkim 737134
129. Chief Engineer,  
Rangit Hydro Electric Project NHPC,  
P.O. Rangit Nagar  
South Sikkim 737111
130. CEO,  
Maithon Power Limited  
MA-5 Gogna Colony,  
P.O: Maithon, Dhanbad,  
Jharkhand 828027
131. DGM (Electrical), Adhunik Power & Natural Resource Limited  
Village: Padampur, PS: Kandra Tata-Seraikela Road,  
Jharkhand 832105
132. GM (Power Sales & Regulatory),  
GMR Kamalanga Energy Ltd,  
Plot No.-29, Satyanagar,  
Bhubaneswar, Odissa-751007
133. Head Power & Sales,  
Jindal India Thermal Power Ltd.,  
Plot No.12,Local Shopping Complex,  
Sector-B1,Vasant Kunj, New Delhi- 110070
134. Advisor(Power),  
Ind-Barath Energy Utkal Ltd ,  
Sahajbahal, PO CgarpaliBarpali,  
Dist - Jharsuguda, Odisha , Pin – 768211
135. GM(C & RA),  
Odisha Power Generation Corporation Ltd.,  
Zone-A, 7th Floor, Fortuna Towers,  
Chandrashekharpur, Odisha Bhubaneswar 751023. (Upcoming)
136. Sr.Vice President(O&M),  
Teesta Urja Ltd.(Teesta -III HEP)  
Vijaya Building, 2nd Floor, 17 Barakhamba Road  
New Delhi New Delhi 110001

137. Asst. General Manager ,  
DANS ENERGY PVT. LTD.  
5th Floor, DLF Building No. 8,  
Tower C, DLF Cyber City, Phase – II,  
Gurgaon- 122002, Haryana
138. Chairman,  
GATI Infrastructure Ltd,  
268, UdyogVihar,  
Phase-IV, Gurgaon,  
Haryana 122001
139. President –Technical,  
Shiga Energy Private Ltd.  
5th Floor, DLF Building No.8,  
Tower C, Phase-II, Haryana Gurgaon 122002
140. VP (Commercial),  
Sneha Kinetic Power Project Private Ltd  
1366, Road no. 45, Jubilee Hills  
Telangana Hyderabad 500033

**Southern Region**

141. Andhra Pradesh State Load Dispatch Centre,  
Room No. 611, 6th Floor, A Block APTRANSCO,  
Vidyut Soudha, Khairatabad
142. State Load Despatch Centre,  
KPTCL, 28, Race course Cross Road,  
Bangalore -560009
143. State Load Despatch Centre, Kalamassery,  
Executive Engineer O/o Chief Engineer, (Transmission),  
System Operation, Kalamassery-683503
144. System Control Centre,  
Electricity Department, Puducherry,  
137, Nethaji Subhash Chandra Bose Salai,  
Electricity Department-605001
145. TANTRANSCO, SLDC, MLDC  
Block, 144 Anna Salai, Chennai-600002
146. Telangana SLDC, Chief Engineer,  
Room No 611 A Block,  
SLDC of the State of Telangana (TSSLDC),  
TSTRANSCO, Vidyut Soudha,  
Khairtabad, Hyderabad-500082

147. General Manager,  
National Thermal Power Corporation Ltd.,  
SR Headquarters II & V Floors,  
MCH Complex,  
R.P. Road, Secunderabad-500 003,
148. General Manager,  
National Thermal Power Corporation Ltd.,  
SR Headquarters II & V Floors,  
MCH Complex,  
R.P.Road, Secunderabad-500 003,
149. General Manager,  
Neyveli Lignite Corporation Ltd.,  
Corporate Office, Block-01,  
P.O. Neyveli, PIN: 607 801,  
Cuddalore Distt., Tamil Nadu State.
150. The Deputy General Manager,  
Neyveli Lignite Corporation Ltd.,  
Corporate Office, Block-01,  
P.O. Neyveli, PIN: 607 801,  
Cuddalore Dist., Tamil Nadu State.
151. The Deputy General Manager,  
Neyveli Lignite Corporation Ltd.,  
Corporate Office, Block-01,  
P.O.Neyveli, PIN: 607 801,  
Cuddalore Dist., Tamil Nadu State.
152. The Deputy General Manager,  
Neyveli Lignite Corporation Ltd.,  
Corporate Office, Block-01,  
P.O.Neyveli, PIN: 607 801,  
Cuddalore Dist., Tamil Nadu State.
153. The Station Director,  
Madras Atomic Power Station,  
Nuclear Power Corpn. Of India Ltd.,  
Kalpakkam – 603 102, Tamil Nadu State
154. The Deputy General Manager,  
Kaiga Generating Station,  
Nuclear Power Corpn. of India Ltd.,  
P.O.Kaiga, Via Karwar,  
Karnataka - 581400 , Karnataka State.

155. The Station Director,  
Kudankulam Nuclear Power Project, Unit -1  
Nuclear Power Corporation of India Ltd.,  
P.O. Kudankulam, Radhapuram Taluk Tirunelveli District,  
Tamil Nadu - 627 106
156. The Station Director,  
Kudankulam Nuclear Power Project, Unit -2  
Nuclear Power Corporation of India Ltd.,  
P.O. Kudankulam, Radhapuram Taluk Tirunelveli District,  
Tamil Nadu - 627 106
157. The Chief Operating Officer,  
LANCO- Kondapalli Power Ltd., Stage-II  
Plot No.4, Software Units Layout,  
Hitech City, Madhapur,  
Hyderabad-500 081. Andhra Pradesh State
158. The Chief Operating Officer,  
LANCO- Kondapalli Power Ltd., Stage-III  
Plot No.4, Software Units Layout,  
Hitech City, Madhapur,  
Hyderabad-500 081. Andhra Pradesh State
159. General Manager (O&M),  
NTPC Tamilnadu Energy Company Ltd.,  
Vallur Thermal Power Project,  
Vellivoyalchavadi P.O.,  
Ponneri Taluk, Tiruvallur Dist.,  
Chennai – 600103, Tamil Nadu State.
160. Sr. Vice President,  
Meenakshi Energy Pvt. Ltd.,  
Meenakshi, Plot No: 119,  
Road No: 10, Jubilee Hills,  
Hyderabad-500 033.
161. The Chief Executive Officer,  
NLC Tamil nadu Limited,  
2\*500, MW JV Thermal Power Project,  
Harbour Estate,  
Tuticorin, PIN: 628004, Tamil Nadu State.
162. Thermal Power Tech Corporation India Limited,  
SPSR Nellore, 6-3-1090,  
A-Block, 5<sup>th</sup> Floor, TSR Towers,  
Raj Bhavan Road, Somajiguda,  
Hyderabad, 5000082.

163. Sr. Vice President,  
Meenakshi Energy Pvt. Ltd.,  
Meenakshi, Plot No: 119,  
Road No: 10, Jubilee Hills,  
Hyderabad-500 033.
164. The General Manager (Projects),  
Simhapuri Energy Pvt. Ltd.,  
Madhucon Greenlands, 6-3-866/2,  
3rd Floor, Begumpet,  
Hyderabad-500016.
165. Managing Director,  
Coastal Energen Pvt. Ltd,  
7th Floor, Buhari Towers,  
4 ,Moores Road,  
Chennai, PIN: 600006, Tamil Nadu State
166. The Chief Commercial Officer (CCO)  
SEMBCORP Energy India Ltd.,  
6-3-1090, A-Block, 5th Floor,  
T.S.R Towers, Raj Bhavan Road,  
Somajiguda, Hyderabad 500082, Telangana
167. Senior General Manager,  
IL & FS Tamilnadu Power Company limited,  
C. Pudhupettai post,  
Parangipettai (via), Chidambaram(tk.),  
Cuddalore-608502, Tamil Nadu.
168. General Manager,  
Sembcorp Gayatri Power Ltd.,  
TP Gudur Mandal,  
Nellore-524344, Andhra Pradesh.

**North Eastern Region**

169. State Load Despatch Centre,  
Agartala, 79 Tilla, Kunjaban, Agartala,  
Tripura (West)
170. Department of Power,  
Government of Nagaland, SLDC Nagaland,  
Electricity Colony,  
Full Nagarjan Dimapur, Nagaland
171. Mizoram State Load Despatch Centre,  
Tuikhuahtlang, Aizawl -796001

172. State Load Despatch Centre,  
Assam, SLDC, AEGCL,  
Near 132kv Grid Sub Station,  
Kahilipara, Guwahati
173. General Manager,  
Doyang HEP, NEEPCO,  
Wokha, Nagaland
174. General Manager,  
Ranganadi HEP, NEEPCO,  
P.O. Ranganadi Proj. Dist. Subansiri,  
Ar. Pradesh-791121
175. General Manager,  
AGBPP, NEEPCO,  
Kathalguri, Tinsukia, Assam
176. General Manager,  
AGTPP, NEEPCO,  
Ramchandranagar, Agartala, Tripura
177. General Manager,  
KHANDONG HEP, NEEPCO,  
Umrangsoo, N.C.Hills, Assam
178. General Manager,  
KOPI LI HEP, NEEPCO,  
Umrangsoo, N.C.Hills, Assam
179. General Manager,  
KOPI LI-2 HEP, NEEPCO,  
Umrangsoo, N.C.Hills, Assam
180. Chief Engineer,  
NHPC  
Loktak HEP Leimatak-795124, Manipur
181. Ranganadi HEP (NEEPCO)  
Ranganadi HEP, NEEPCO Ltd.,  
Yazali, Dist. Lower Subansiri,  
Andhra Pradesh-791119
182. Managing Director,  
ONGC Tripura Power Company Ltd,  
6th Floor, A Wing, IFCI Tower-61,  
Nehru Place, New Delhi, 110019

183. General Manager,  
Bongaigaon TPP, NTPC Ltd.,  
P.O.-Salakati, Kokrajhar Dist.  
Assam-783369
184. Kameng HEP (NEEPCO),  
EMG, Kameng HEP, NEEPCO, Kimi,  
P.O.- Bhalukpong, Post Box-2, West Kameng  
Dist., Arunachal Pradesh, PIN – 790114
185. Pare HEP (NEEPCO),  
Pare HEP, NEEPCO Ltd, Sopo,  
P.O- Doimukh, Dist- Papumpare,  
Arunachal Pradesh, PIN – 791112
186. State Load Despatch Centre,  
Agartala, 79 tilla, Kunjaban,  
Agartala, Tripura (West)
187. Department of Power,  
Government of Nagalnd,  
SLDC Nagaland, Electricity Colony,  
Full Nagarjan Dimapur, Nagaland.
188. Mizoram State Load Despatch Centre,  
Tuikhuahtlang, Aizawl -796001
189. State Load Despatch Centre,  
Assam, SLDC, AEGCL,  
Near 132kv Grid Sub Station,  
Kahilipara, Guwahati

**...Respondents**

190. Member Secretary,  
Northern Regional Power Committee  
18-A, Shaheed Jeet Singh Sasanwal Marg,  
Katwaria Sarai,  
New Delhi-110 016
191. Member Secretary,  
Southern Regional Power Committee  
29, Race Course Cross Road,  
Bangalore-560 009.
192. Member Secretary,  
Eastern Regional Power Committee  
14, Golf Club Road,  
Kolkata-700 033

193. Member Secretary,  
Western Regional Power Committee  
F-3, MIDC Area,  
Andheri (East),  
Mumbai-400 093
194. Member Secretary,  
North Eastern Regional Power Committee  
NERPC Complex,  
Dong Parmaw,  
Lapalang,  
Shillong-6
195. Chief Engineer (Grid Management),  
Central Electricity Authority Sewa Bhawan,  
R.K.Puram,  
New Delhi-110 022.
196. Chief Engineer  
(National Power Committee),  
Central Electricity Authority,  
18-A, Shaheed Jeet Singh Sasanwal Marg,  
Katwaria Sarai, New Delhi-110 016

**...Proforma Respondents**

**Parties Present:** Shri S.R. Narasimhan, NLDC  
Shri N. Nallarasana, NLDC  
Shri Phanisankar Chilakuri, NLDC

### **ORDER**

The Petitioner, National Load Dispatch Centre (NLDC) is the system operator at the national level and has made the following prayers:

- a) Direct all ISGS stations whose tariff is regulated / determined by CERC to install equipment as per the requirement mentioned in the Petition at the unit control rooms for transferring the required data for AGC by 30th June 2019.*
- b) Direct all ISGS stations whose tariff is regulated / determined by CERC to ensure communication from nearest wide band node to the RTU in the unit control room by 30th June 2019.*
- c) Direct Central Transmission Utility (CTU) to ensure communication availability*

*from NLDC/RLDCs to nearest wide band node/switchyard for the generating stations in a redundant and alternate path ensuring route diversity and dual communication by 30th June 2019.*

- d) Decide the mark up price for secondary regulation service through AGC.*
- e) Allow NLDC/RLDCs to test, tune and operate the AGC system for providing the signals to the power plants as and when they comply with the directions above.*
- f) Allow any variation in the generation during testing phase to be settled under DSM.*
- g) Allow NLDC/RLDCs to put all the Phase-I plants under continuous operation on AGC before 31st December 2019.*
- h) Direct Phase-II plants in the detailed modus operandi to provide infrastructure at RTU/internal communication.*
- i) Road map for implementation of AGC at RLDCs in future may be accepted.*
- j) Pass any other orders as this Commission may deem fit and proper under the given facts and circumstances.*

## **SUBMISSIONS OF THE PETITIONER**

2. The Petitioner has submitted that vide Order dated 13.10.2015 in petition no 11/SM/2015, the Commission gave the roadmap for ‘Operationalization of Generation Reserves in the Country’. The Order mandated that each region should maintain primary, secondary and tertiary reserves. The objective of the Order was to introduce ‘Spinning Reserves’ in the country, which is one of the important components for ensuring grid security, quality and reliability by achieving adequacy of supply and maintaining load-generation balance. All generating stations that are regional entities were directed to ‘must plan’ operationalization of Automatic Generation Control (AGC) along with reliable telemetry and communication by 01.04.2017. The Commission noted that this would entail a one-time expense for the generators to install requisite software and firmware, which could be compensated for and that the communication infrastructure must be planned by the Central Transmission Utility (CTU) and developed in parallel, in a cost-effective manner.

3. The Commission directed the Petitioner to upload the detailed modus operandi on ‘Operationalization of Spinning Reserves’ on NLDC website and seek comments from the

stakeholders by 11.08.2017 and file the comments received from stakeholders within two weeks thereafter. Accordingly, the report was also uploaded on the NLDC website.

4. The Petitioner has submitted that the detailed implementation plan was also discussed in the National Power Committee (NPC) meeting held at Indore on 08.09.2017. An agenda on 'secondary frequency control' was sent to NPC for discussion in the respective Regional Power Committees (RPC). The Expert Group constituted (in May 2017) by the Commission to review and suggest measures for bringing power system operation closer to National Reference Frequency, recommended that the frequency control continuum as given in their report may be adopted and included as part of the Grid Code (hereinafter referred to as 'IEGC') through an amendment to Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010. Further, it was recommended that AGC must be implemented throughout the country at the earliest in line with the Commission's recommendation of treating a region as a balancing area and that the Performance Metrics for AGC payments may be introduced once sufficient experience is gained through the pilot project (carried out at Dadri generating station of NTPC). AGC at the intra-State level, particularly for large states, was to be implemented in line with directions by the Appropriate Commission(s).

5. The Petitioner has submitted that the Commission in its order dated 06.12.2017 in Petition No. 79/RC/2017 approved the Commissioning of the AGC Pilot Project between NLDC and NTPC Dadri Stage-II and various developments in the AGC Pilot were acknowledged by the Commission. Vide the above order, the Commission also directed that similar pilot projects may be replicated by NLDC, in at least one other regional grid of the country. Dadri Stage-II was successfully taken under remote as a part of AGC pilot project from NLDC from 1225 Hrs. of 04.01.2018 and is under continuous operation. Further, data is being submitted by NLDC to NRPC in the agreed format on a weekly basis.

6. The Petitioner has submitted that Karnataka Power Transmission Corporation Limited (KPTCL) together with (United States Agency for International Development (USAID) has proposed AGC pilot project on Varahi and Sharavathi Hydro Power Plants. On 10.02.2018, SRLDC, USAID and NLDC visited NP Kunta solar park in Andhra Pradesh for understanding the feasibility of AGC implementation. USAID agreed to take the AGC implementation at NP Kunta Solar power project under 'Greening the Grid' (GtG)-RISE

project. The matter was also discussed in the 33<sup>rd</sup> meeting of SRPC held on 17.02.2018 at Puducherry. A workshop was organised by USAID and NLDC on 15.05.2018 at Andhra Pradesh SLDC, Vijayawada to explain the basic architecture of the AGC project and the proposed project at NP Kunta to stakeholders.

7. On 18.05.2018, Letter of Award was issued by NTPC Simhadri to M/S Siemens for the supply, testing and commissioning of software and hardware and implementation of the AGC pilot project at NTPC-Simhadri. AGC on Barh (Eastern Region), Bongaigaon (North Eastern Region) and Mauda (Western Region) are power plants of NTPC under contracting phase of implementation.

8. The Petitioner has submitted that it has started up-gradation of SCADA from October 2017. AGC set up is envisaged to be capable of sending and receiving AGC signals to all Regional Entity generating stations to start with for the first time in India. The RLDCs' SCADA/EMS system was recently upgraded before AGC was notified through the Commission's Order. Hence, considering a region as a balancing area, AGC is being implemented through NLDC, which is a unique experiment as five (5) AGCs are being operated from a single control center at NLDC. Further, as a next step, discussion could start on the roadmap to progressively shift AGC control to RLDCs over the next 3-5 years. At the intra-regional level, discussion at RPC level is on for introducing AGC at least in the few intra-State generators in RE-rich States.

9. The Petitioner has submitted that the CERC (Communication System for inter-State transmission of electricity) Regulations, 2017 has provided detailed roles and responsibilities of various organizations with respect to communication. NLDC was given the responsibility for preparation and issuance of guidelines with the approval of the Commission on the interfacing requirements in respect of terminal equipment, RTUs, SCADA, PMUs, Automatic Generation Control (AGC), Automatic Meter Reading (AMR), Advanced Metering Infrastructure (AMI), etc. and for data communication to the respective control centres. The Generic Technical Specifications for AGC connecting equipment that has to be procured by the power plants were prepared by the Petitioner based on the experience of the AGC pilot project (at Dadri) for full scale implementation of AGC. Generating stations have to install AGC connecting equipment at the unit control rooms for transferring the required set of data for AGC.

10. The Petitioner has submitted that Regional Secondary Reserves quantum, mandated by the Commission are given as below:

Secondary Reserves quantum needed in MW (Region wise)	
NR	800
ER	660
WR	800
SR	1000
NER	363
Total	3623

11. The Petitioner has suggested that the detailed implementation plan pan-India for AGC implementation is proposed in the following manner:

Phase-I

(a) Inter-State Generating Stations (ISGS) generators, whose tariff is regulated/ adopted by the Commission, are proposed to be made capable of participating in 'Secondary Control' since the tariff for these generators is already available and there are fewer communication issues. This is also because in case of these generating stations, Ancillary Services/ AGC Pilot Project Framework is available for settlement (without the refund of fixed charges as mentioned in the Half Yearly Feedback on Ancillary Services and CERC Order on AGC Pilot Project) and, therefore, its implementation is expected to be dispute free. However, limiting AGC implementation to only these generating stations may not be sufficient to ensure availability of the full quantum of reserves as mandated by the Commission.

Phase-II

(b) All Regional Entity generating stations scheduled by RLDCs (over and above the Phase-I power stations mentioned above) can be made capable of participating in secondary control. However, Declared Capability (DC) at present is not taken from these generating stations by RLDCs. Some Independent Power Producers (IPP) have part Power Purchase Agreements with discoms/ traders while part capacity is untied, and power is sold under merchant contracts. Tariff for these generators has to be

decided and agreed upon *a priori* for secondary control participation of these generators. DC and Schedule have to be obtained from these generators similar to Central Sector generating stations for reserve estimation. Many of these regional entity generating stations operate in the day-ahead energy market and the day-ahead prices may have a significant role in respect of these generating stations as far as availability to the grid at any instant is concerned. Low prices in the Day-Ahead Market (DAM) on a sustained basis may lead to many of these units remaining off the grid. The following, inter-alia, may be the requirements for the Regional entity generating stations equipped under Secondary Control:

- The generating stations shall bear the cost of secondary control hardware at the generating station end including the cost of the fibre optic cable from the generating station control room to the nearest communication node.
- Share DC and Schedule like ISGS generators on day ahead basis and subsequent revisions with RLDCs.
- Payment for energy and incentive will be as decided by the Commission.
- The generating stations shall have working control systems for turbine, boiler and governor. Governor response plots/ graphs of past incidents have to be submitted to concerned RLDC.
- Existing wide band communication node to be established within a radius below 30-40 km from the plant to communicate with the nearest RLDC. Distance need not be a binding limitation and the connectivity of the generating station with the communication node can be seen on case to case basis based on merit.

12. The Petitioner has submitted that Primary, secondary and tertiary generation reserves are required for frequency control and ensuring reliable operation of the grid, particularly under high Renewable Energy (RE) penetration. Primary control provision has been existing in the IEGC but its enforcement has been an issue that has been highlighted before the Commission. Secondary control had been absent in the system so far while tertiary frequency control was introduced only in April 2016 through the Central Electricity Regulatory Commission (Reserves Regulation Ancillary Services) Regulations, 2016 (or for short, RRAS Regulations). Through Order dated 16<sup>th</sup> July 2018 in Petition No. 07/SM/2018, Fast Response Ancillary Services or FRAS was ordered by the Commission for central sector hydro stations and is under implementation phase.

13. The Petitioner has submitted that the following issues become important when one looks at the entire continuum of frequency control:

- i. Ensuring accurate load forecasting and Renewable Energy (RE) forecasting: This is the first step towards reliability as generating units need to get committed based on the forecasts. Starting from Discom level, the forecasts need to be aggregated for the State at SLDCs level, at RLDCs for the regional level and at NLDC for the All-India level.
- ii. Evaluating Area Control Error (ACE) of each control area: Bias may be taken as equal to Frequency Response Characteristics (FRC) of the State in past ten events. For ACE, high quality measurement of line flows and frequency at 10 seconds or better periodicity at LDCs is a must. Further, seamless transfer of schedule data from off-line systems to SCADA must be ensured. RLDCs are already bringing forth the non-availability of real time data in the RPC forums and this needs to be addressed promptly.
- iii. Primary Response: The SLDCs must also monitor the primary response from the generating units within the State and report to the respective SERCs as directed by CERC vide its order dated 31<sup>st</sup> July 2017 in Petition No. 84/MP/2015.
- iv. Measurements: For AGC, high quality measurements are needed for inter-regional tie lines and generating stations under AGC. As stated above, periodic monitoring of the data quality needs to be done at the RPC forums and chronic problems of non-availability of data are addressed promptly so that real time operation is smooth.
- v. Fiber Optic Communication: Fiber optic communication from Regional Entity generating station to nearest CTU node and from there on to RLDCs/ NLDC is a must and it could be closely monitored through the RPC forums. This is required irrespective of whether we have a regulated system of secondary reserves procurement or a market based one.
- vi. Participation: ACE is allocated to the generating stations under AGC based on the selected participation factor mode in the AGC software. The participation of each generating station will be calculated by the AGC software based on the weightage assigned to different attributes of the plant and the grid. Spinning reserve availability, ramp rate and variable cost of the generating station are the important attributes that are typically considered. In case of inter-/ intra-regional transmission constraints during

outages, certain plants may not be able to participate in AGC till normalization of transmission system.

14. The Petitioner has submitted that ‘Spinning Reserves’ viz. DC on bar minus schedules available in real time in ISGS is currently used for rescheduling/ tertiary reserves by States, tertiary frequency control through Reserves Regulation Ancillary Services and now being envisaged for secondary control through AGC. It is also available for primary control though the IEGC clearly specifies that the schedules should not exceed capacity on bar less Normative Auxiliary Consumption. This ensures that even if the power plant is fully scheduled, the overload capacity and margins in auxiliary consumption is able to provide primary response.

15. The Petitioner has submitted that after the forecast of load and RE generation, the scheduling of conventional generation resources by the States assumes importance. Here, apart from scheduling, the States also need to indicate the amount of hot spinning reserves it is holding. The reserves could be held either within the State or at the ISGS where the State has a share but it should be replenished whenever there is a contingency such as a generating unit tripping within the State. Unless such a mechanism is in place, the secondary control would not work as all the reserves would get depleted quickly. DC on bar less the schedules equals the hot spinning reserves. It was observed that hot spinning reserve gets depleted daily during the morning and evening peak hours when States requisition their full entitlement. Under this situation, the State utilities ought to have reserves elsewhere within the State.

16. The Petitioner has submitted that on 06.09.2018, the Commission has issued a discussion paper on ‘*Redesigning Ancillary Services Mechanism in India*’ and comments were invited from stakeholders. The Petitioner is of the view that the physical infrastructure in terms of communication and suitable hardware/ software at the power plants is sine qua non for secondary control through AGC irrespective of whether the same is regulated or market-based. The only variable is the quantum of secondary reserves required on day to day basis.

### **PROCEEDINGS DURING HEARING**

17. The Petition was admitted on 25.10.2018. During the hearing on 31.1.2019, the

Petitioner submitted that the present petition has been filed for implementation of AGC in India.

18. The Petitioner further submitted that the Commission in its Order dated 06.12.2017 in Petition No. 79/RC/2017 approved the commissioning of AGC pilot project between NLDC and NTPC Dadri Stage-II and the Commission also directed that similar pilot projects may be replicated by NLDC, in at least one other regional grid of the country. Accordingly, one plant in each region has been identified and AGC has also been commissioned in Simhadri and Mauda generating station.

19. The Petitioner requested the Commission to direct ISGS to install the equipment in power plants for accepting signals from NLDC. After hearing, the Commission directed the Petitioner to furnish the Minutes of Meeting held with RPCs wherein RPCs have given their consent to the AGC pilot project. The Commission further directed the Petitioner to submit the feedback report on the operation of AGC at NTPC Dadri Stage-II along with the summary of findings of this pilot project.

20. The Petitioner has complied with the directions and submitted the minutes of the special meetings on AGC pilot project which were held with all RPCs. The Petitioner has also submitted the feedback report before the Commission on 15<sup>th</sup> February 2019, highlighting the learning from the pilot project. Several learning including those on the implementation aspects, communication protocols, generator regulation and load following capabilities, metering, monitoring, visualisation, accounting etc. were gathered via pilot project and explained in the feedback report. The Pilot projects have also provided capacity building in the field of AGC which will be useful during implementation of secondary control on a large scale.

### **ANALYSIS & DECISION**

21. We have heard the Learned Counsels for the Petitioner and have carefully perused the records.

22. The Commission is of the view that the most important responsibility of the Power System operators is to maintain reliability of the Power System by maintenance of Load -

Generation balance. For a large complex grid such as the Indian grid, primary, secondary and tertiary frequency controls are must-have tools to ensure reliability. With the objective of ensuring grid security, quality and reliability, the Commission vide Order dated 13.10.2015 in Petition no 11/SM/2015 had laid down a roadmap for '*Operationalization of Generation Reserves in the Country*'. It was envisaged that apart from the primary reserve at the national level, secondary reserve should be maintained by each region and tertiary reserve by each State. All the generating stations that are regional entities were directed to plan to operationalize AGC along with reliable telemetry and communication by 01.04.2017. The NLDC was directed to submit a detailed procedure to operationalize reserves in the country vide Order dated 13.10.2015.

23. The Commission notes that an 'outline procedure' was submitted by NLDC vide letter dated 15.12.2015 in which it was proposed to take up a pilot project with one of the NTPC plants in a region based on which further activities could be taken up. On 05.02.2016, NLDC was advised to submit the draft detailed procedure and implementation plan for operationalization of Reserves within three months of implementation of Ancillary Services Regulations. After various brainstorming sessions and meetings, NLDC submitted the detailed procedure on Operationalization of Spinning Reserves on 14.07.2017 and recommended that secondary control should be added as an Ancillary Service.

24. The Commission observes that the 'National Electricity Policy' also mandates that adequate reserves may be maintained to ensure secure grid operation. The Commission is of the view that collective efforts of the stakeholders in implementation of the AGC are a step forward and will go a long way in development of the secondary reserves in the country leading to stable frequency operation and grid security and reliability.

25. The Commission observes that the feedback on implementation of AGC submitted by NLDC highlights the need for enhancing adequacy of reserves in the country. It has been stated that valuable experience has been gained in terms of implementation aspects, communication protocols, generator regulation and load following capabilities, cyber security etc. which is useful during implementation of secondary control on a large scale. The Petitioner has submitted that from the interactions with national and international experts on power systems and experience with Ancillary Services till date, the general understanding was that different solutions as a package like load and Renewable Energy (RE) generation

forecast, proper portfolio management by the States, primary response from the generators, secondary control in the form of AGC, Ancillary Service products in different timeframes etc. are needed for stable frequency operation of the power system. No unique solution existed. NLDC report emphasised that a bad or no forecast of load/ RE generation and poor portfolio management by the State utilities would lead to heavy deviations from schedule and grid indiscipline exhausting all reserves in the system and making the system insecure. AGC effectiveness would have to be seen in this overall context. It was further highlighted in the feedback report that deployment of two-three plants under AGC with 200 MW-300 MW reserve might not be sufficient for a grid size like that of India. The Commission observes that the Expert Group on 'National Reference Frequency' in its report submitted to the Commission in November 2017 recommended that AGC must be implemented throughout the country at the earliest and Performance Metrics for such AGC payments may be introduced once sufficient experience is gained through the pilot project.

26. The Petitioner has suggested that implementation of AGC be undertaken in Phases. Under Phase-I, ISGS generators, whose tariff is regulated/ adopted by the Commission, are proposed to be made capable of participating in 'Secondary Control'. Dadri Stage-II NTPC in Northern Region was the first AGC pilot project of the country which was approved by the Commission vide Order in Petition No.79/RC/2017 on 06.12.2017 and is in continuous operation from 1225 Hrs. of 04.01.2018. The Commission also directed that similar pilot projects may be replicated by NLDC, in at least one other regional grid of the country. Accordingly, four more AGC pilot projects have been/are being implemented viz. Simhadri Stage-II in Southern Region, Mauda Stage-II in Western Region, Barh Stage-II in Eastern Region and Bongaigaon in North-Eastern Region.

27. The Commission observes that there is one-time expense involved for the generators to install requisite software and firmware. The Commission has been informed that the implementation cost i.e. placing of order for the equipment and integration cost of the four AGC pilot projects which have been commissioned viz. Dadri Stage-II NTPC in Northern Region Simhadri Stage-II in Southern Region, Mauda Stage-II in Western Region and Barh Stage-II in Eastern Region, is in the range of Rs. 30.00 lakhs to Rs. 50 lakhs per generating station. The Commission accepts the Petitioner's proposition that the cost of such equipment at generating stations for AGC implementation is not significant and ideally all ISGS stations should be AGC enabled. The Commission notes that majority of the thermal stations

regulated by the Commission have station capacity of 200 MW and above and the AGC support is mainly expected from these facilities apart from the hydro generating stations other than Run-of-River projects. It will therefore be prudent, also from the point of view of cost effectiveness to ensure that the thermal generating stations with installed capacity of 200 MW and above and all hydro stations with capacity exceeding 25 MW necessarily have the capability to provide AGC support. Further, the Commission is of the view that with due regard to the nature of the Run-of-River Hydro projects it may not be advisable to mandate such plants to provide AGC support, as this might lead to spillage/ under-utilization of water, which should be avoided. Accordingly, the Commission directs all thermal Inter State Generating Stations (ISGS) that are regional entities with installed capacity of 200 MW and above and all hydro stations with capacity exceeding 25 MW excluding the Run-of-River Hydro Projects irrespective of size of the generating station and whose tariff is determined or adopted by the Commission, to install the required software and firmware for implementation of AGC at the unit control rooms for transferring the required set of data for AGC. These regional entity generators may approach the Commission under relevant regulations and provisions of PPA for compensation of this one-time cost. The Commission also directs the Central Transmission Utility and the NLDC to commission the required communication system in parallel.

28. Once the aforesaid generating stations are AGC enabled, NLDC/ RLDCs shall be allowed to test, tune and operate the AGC system for providing the signals to the power plants. With this decision to make the ISGS stations AGC compliant, the Commission is of the view that any other pilot beyond the five pilots already initiated by NLDC, may not be needed.

29. As regards compensation for AGC support and deviation charges, it is clarified that the framework in this regard as stipulated in the Commission's Order in Petition no. 79/RC/2017 dated 06.12.2017 shall apply to the five pilot projects as also to other ISGS as and when they are AGC enabled. This arrangement shall remain in place till further Orders or till relevant regulations inter-alia on compensation for AGC services are framed by the Commission.

30. The Commission has noted the suggestions of the Petitioner for covering under Phase-II, other regional entity generators (other than those whose tariff is determined or adopted by

the Commission). The Commission is of the view that decision on this issue cannot be taken in the present petition. It needs wider consideration.

31. The Commission observes that NLDC in its report on implementation of RRAS, has recommended moving towards market-based procurement of ancillary service for a more robust design. The relevant excerpt is reproduced below:

*“Once the scope of present implementation of ancillary services is enlarged from the regulated generation stations at inter-state level to include state-level generators also, a critical mass would be achieved. Moreover as more and more generators start participating in regulation services, closer monitoring of the performance of generating stations would also be needed. The implementation would also be more robust by design and subsequently, based on the experience gained, market based procurement of ancillary services could also be thought of.”*

32. The Commission is of the view that the experience gained under RRAS underlines the need for a calibrated approach to transform the extant administered Ancillary Services mechanism to a market-based mechanism with the objective of increasing the ambit of potential providers of such services at efficient costs and enhanced reliability of the grid. The Staff Paper on *‘Redesigning Ancillary Services Mechanism in India’* issued by staff of the Commission on 06.09.2018 has highlighted that the physical infrastructure in terms of communication and suitable hardware/ software at the power plants is sine qua non for secondary control through AGC irrespective of the fact whether the same is regulated or market-based. The only variable is the quantum of secondary reserves required on day to day basis.

33. The Commission observes that given the changes in technology, generation mix and increasing decentralized generation, and locational ancillary requirements, long term bilateral contracts for ancillary support should be avoided. Same resource can provide multiple flexibility services. For example, a generator that can provide fast tertiary response can also provide slow tertiary response. An arrangement which bundles multiple flexibility services has some advantages – by allowing such generators to utilize their capabilities to serve various system requirements thereby reducing the cost of providing individual services. Accordingly, the Commission directs the staff of the Commission to initiate a comprehensive review of Ancillary services framework based on these principles, and present to the Commission for suitable decision.

## **SUMMARY**

34. In the interest of reliable and safe grid operation, the Commission directs that all the ISGS stations whose tariff is determined or adopted by CERC shall be AGC-enabled and the ancillary services including secondary control through AGC be implemented as per the following direction:

- i. All thermal ISGS stations with installed capacity of 200 MW and above and all hydro stations having capacity exceeding 25 MW excluding the Run-of-River Hydro Projects irrespective of size of the generating station and whose tariff is determined or adopted by CERC are directed to install equipment at the unit control rooms for transferring the required data for AGC as per the requirement to be notified by NLDC. NLDC shall notify the said requirements within one month of this order.*
- ii. All such ISGS stations whose tariff is determined or adopted by CERC shall have communication from the nearest wide band node to the RTU in the unit control room.*
- iii. The Central Transmission Utility (CTU) is directed to have communication availability from NLDC/ RLDCs to the nearest wide band node/ switchyard for the generating stations in a redundant and alternate path ensuring route diversity and dual communication.*
- iv. The NLDC is also directed to commission the required communication infrastructure.*
- v. The expenditure as a result of compliance of the above directions may be claimed as per relevant regulations or provisions of the PPA.*
- vi. The NLDC is directed to monitor implementation of the above directions so that all the ISGS stations whose tariff is determined or adopted by CERC are AGC-enabled within six months of this order.*
- vii. The framework regarding compensation for AGC support and deviation charges as stipulated in the Commission's Order in Petition no. 79/RC/2017 dated 06.12.2017 shall apply to the five pilot projects as also to other ISGS as and when they are AGC enabled. This arrangement shall remain in place till the relevant regulations inter alia on compensation for AGC services are framed by the Commission.*
- viii. NLDC/RLDCs are allowed to operate the AGC system for enabling the signals to the power plants at the earliest.*

*ix. All new thermal ISGS stations with installed capacity of 200 MW and above and hydro stations having capacity exceeding 25 MW excluding the Run-of-River Hydro Projects irrespective of size of the generating station and whose tariff is determined or adopted by CERC shall mandatorily have the capability to provide AGC support.*

35. With the above directions, Petition No. 319/RC/2018 stands disposed of.

Sd/-

आई. एस. झा  
सदस्य

Sd/-

डॉ एम. के. अय्यर  
सदस्य

Sd/-

पी. के. पुजारी  
अध्यक्ष

### **TIME DRIFT REPORT STATUS**

<b>SL.NO</b>	<b>PGCIL</b>	<b>STATUS</b>
1	BNC (PG)	REPORT NOT RECEIVED/ACTION NONE
2	BADARPUR (PG)	REPORT NOT RECEIVED/ACTION NONE
3	Silchar(PG)	REPORT NOT RECEIVED/ACTION NONE
4	MARIANI (PG)	REPORT NOT RECEIVED/ACTION NONE
5	HAFLONG (PG)	REPORT NOT RECEIVED/ACTION NONE
6	Mokokchang(PG)	REPORT NOT RECEIVED/ACTION NONE
7	RANGIA (PG)	REPORT NOT RECEIVED/ACTION NONE
8	Aizawl(pg)	REPORT NOT RECEIVED/ACTION NONE
9	SALAKATI(PG)	REPORT NOT RECEIVED/ACTION NONE
10	BONGAGIGAON(pg)	REPORT NOT RECEIVED/ACTION NONE
11	DIMAPUR(pg)	REPORT NOT RECEIVED/ACTION NONE
12	Khliehriat(Pg)	REPORT NOT RECEIVED/ACTION NONE
	<b>ASSAM</b>	
13	DULLAVCHERRA	REPORT NOT RECEIVED
14	<b>NAGALAND(S)</b>	REPORT NOT RECEIVED
15	<b>MIZORAM(S)</b>	REPORT NOT RECEIVED
	<b>TRIPURA</b>	
16	SM NAGAR	REPORT NOT RECEIVED
17	79 TILLA	IRREGULAR
	<b>ARUNACHAL PRADESH</b>	
18	CHIMPU	REPORT NOT RECEIVED
	<b>GENERATION</b>	
19	AGBPP	REPORT NOT RECEIVED
20	DOYANG	REPORT NOT RECEIVED
21	PALATANA	IRREGULAR

### **Time Drift Corrective Action Not taken**

Sl. NO.	ENTITY	LOCATION	TIME DRIFT STATUS (MIN)	STATUS
1	ASSAM	AZARA-BONG	-04:08	Meter replaced due to high time drift but due to inaction drift >4
2	ASSAM	AZARA-SIL	-04:33	Meter replaced due to high time drift but due to inaction drift >4
3	ASSAM	DULLAVCHERRA	+02:20	No action taken

### **Locations not sending weekly SEM data**

Sl. No.	LOCATION NOT REPORTING	STATUS
1	UDAIPUR	DATA NOT SENT
2	SONABIL	DATA NOT SENT