ANNEXURE-I

LIST OF PARTICIPANTS IN 28th TCC MEETING			
SN	**ORGANISATION**	**NAME (S/SHRI)**	**DESIGNATION**
1		Sh. Bibhu Bhuyan	TCC Chairman/Managing Director,APGCL
2		Sh. Akshay Talukdar	CGM (PP&I),APGCL
3		Md. Zakir	CGM (GEN),APGCL
4		Sh. Arup Kr. Kalita,	CGM (O&M), LAR, AEGCL
5		Sh. Jagadish Baishya	CGM (Commercial), APDCL
6		Sh. Soobhan Saikia,	CGM(O&M), UAR, AEGCL
7		Sh. Suresh Kaimal	CGM (F&A),APGCL
8		Sh. Saurav Saikia	CGM (H&C),APGCL
9		Sh. Abhijit Saha	DGM,APGCL
10		Sh. Rati Kanta Dey	DGM,APGCL
11		Sh. Longsing Bey	GM, KLHEP,APGCL
12		Smti. Aklantika Saikia	DGM (Regulalory),APGCL
13	**ASSAM**	Sh. Hari Narayan Hazarika	DGM (NRE),APGCL
14		Sh. Bigstone Hanse	DGM,APGCL
15		Sh. Debasish Choudhury,	DGM(O), SLDC
16		Sh. Indrajit Tahbildar	DGM (Commercial),APDCL
17		Sh. Amar Chetri	AGM,APGCL
18		Sh. Nabajit Phukan	AGM/ OSD to theMD,APGCL
19		Sh. Pankaj Bikash Sarmah	AGM,APGCL
20		Ms. Tarali Deka,	AGM(T), AEGCL
21		Sh. Nillutpal Baruah,	AGM (SO), SLDC
22		Sh. Parag Jyoti Kalita	AGM(TRC), APDCL
23		Miss Sisrikhya Dutta	DM (TRC),APDCL
24		Ms. Dipmoni Nath,	AM(T), AEGCL
25		Sh. Biswajit Borgohain	
26		Sh. Ginko Lingi	CE (Power), CEZ & SNO-RDSS.
27		Sh. T. K. Tara	CE (Power), TP&MZ.
28		Sh. Nangkong Perme	SE (E), SO&PSC, Head of SLDC: Arunachal Pradesh.
29	**AR. PRADESH**	Sh. Doyum Taipodi	SE (E), Arunachal Pradesh Electrical Circle-I, Naharlagun
30		Sh. Jumjar Gibi	SE (E), Arunachal Pradesh Electrical Circle-III, Miao
31		Sh. Ojing Jerang	EE (E), SLDC
32		Sh. Geyi Yinyo	JE (E), SLDC, Arunachal Pradesh
33		Sh. Rajesh Sharma	JE (E), Commercial Zone, Itanagar.
34		Sh. S. Priyananda Singh	Executive Director (Technical), MSPCL
35	**MANIPUR**	Sh. H. Manimukta Singh	General Manager (Substation), MSPCL
36		Dr. Sarangthem Sanajaoba Singh	Deputy General Manager (400 kv SSD), MSPCL
37		Sh. A.F.G. Momin,	Director Distribution,MePDCL
38		Sh. Mukesh Swer,	Chief Engineer (Projects), MePDCL
39		Sh. M. Patlong,	Chief Engineer (Distribution), EZ,MePDCL
40		Sh. H.F Shangpliang	Chief Engineer (Generation), MePGCL
41		Sh. B. Wankhar,	Addl Chief Engineer (Projects), MePDCL
42		Sh. B.Saibon	Additional Chief Enginneer (Generation), MePGCL
43		Sh. B. Nikhla,	SE (Projects), O/o Director (Dist),MePDCL
44		Sh. J. L. Kharmih,	SE, RBDC, MePDCL, Umiam.,MePDCL
45	**MEGHALAYA**	Sh. M.F.Mawlieh,	SE (EM),MePDCL
46		Sh. T.Gidon	Superintending Engineer (SLDC), MePTCL
47		Sh, K Lyngwa	Superintending Engineer (T&T),MePTCL
48		Sh. D J Lyngdoh	Superintending Engineer, MePTCL
49		Sh. B Narry	Superintending Engineer (T&T), MePTCL
50		Sh. W.Khyriem	Superintending Engineer, GC-I, MePGCL
51		Sh. M K War	Executive Engineer, MePTCL
52		Sh. M R Marak	Executive Engineer,MePTCL
53		Sh. B.Das	Executive Engineer, Generation II, MePGCL
54		Er. Laltlanthanga	Chief Engineer (RE)
55	**MIZORAM**	Er. Lalhminghlua	Superintending Engineer (COM)
56		Er. H.Lalruatkima	Superintending Engineer (SLDC)
57		Er. Abenthung Ngullie	S.E & Head SLDC
58	**NAGALAND**	Er. S.I. Asangba Tikhir	E.E, Transmission Divison Dimapur
59		Er. Namheu Khate	E.E, Transmission Divison Kohima
60		Sh. Biswajit Basu	Managing Director, TSECL
61	**TRIPURA**	Sh. Debabrata Paul	Sr.Manager, TSECL
62		Sh. Anil Debbarma	DGM SLDC, TSECL
63		Sh. Nirupam Guha	AGM Transmission TPTL

64	**CEA**	Shri Hemant Jain	Member (GO&D), CEA
65	**NERLDC**	Sh. Amaresh Mallick	Executive Director
66		Sh. Sugandh Prasad Barnwal	Chief General Manager (SL)
67		Sh. B.B. Bhoi	Deputy General Manager (MO)
68		Sh. G.Praveen Naik	Chief Manager (HR)
69		Sh. Sunil Singha	Manager (SO)
70	**POWERGRID**	Sh. M.S.Dutt,	CGM
71		Sh. Pradeep Kumar	CGM(i/c), CTDS
72		Sh. S.I.Singh	CGM, NERPSIP
73		Sh. Hemendra Agarwal	CGM, Projects
74		Dhanurjay Nikhandia	Sr. GM,CC-AM
75		Beni Madhav	DGM, CC-AM
76		Mohan Kishor	DGM, GA&C, CC
77		Sh. Ashish Agarwal,	Sr. DGM, CTDS
78		Sh. Raktim Konwar	Manager, NERPSIP
79		Sh. Abhilash	Asst. Manager, NERPSIP
80		Sh. Ashim Kr. Paul,	DGM, POWERGRID
81		Sh. Binod Debberma,	Chief Manager
82		Sh. Kamlesh Baishya,	Asst. Manager
83	**CTUIL**	Sh. Shiv K Gupta	Sr. DGM
84		Sh. Hari Babu Vakda	Chief Manager (Commercial)
85	**NETC**	Sh. Navin Kumar Poddar	In-charge (O&M), NETC
86	**NEEPCO**	Smt. Debjani Dey	ED (Commercial)
87		Sh. Bijit Goswami	ED (O & M)
88		Sh. Bivash Sen	CGM (O & M)
89		Sh. Ripunjoy Bhuyan	CGM(Commercial)
90	**NTPC**	Sh. Saurav Lalhal	Sr. Manager (Commercial)
91		Sh. Girish Chandra Mohapatra	ADDL. GENERAL MANAGER, Commercial, ER-II Region
92		Sh. Samir Haloi	DY. GENERAL MANAGER, Commercial, ER-II Region
93	**NHPC**	Sh. Vijay Kumar	DGM (O&M)
94	**OTPC**	Sh. Prabhat Chandra,	AGM (O&M),
95		Sh. Amit Dabas,	Head-Commercial
96		Sh. Dinesh Laha,	Lead-Commercial
97	**PWC**	Sh. Dyutiman Choudhury	Director
98		Sh. SK Rajim	Associate Director
99		Sh. Jintu Boruah	Manager
100	**NERPC**	Sh. K.B.Jagtap	Member Secretary
101		Sh. Alikpanth De	Dy.Director
102		Sh. Dinesh Singh	Asst. Director
103		Sh. Vikash Shankar	Asst. Director

LIST OF PARTICIPANTS IN 28th NERPC MEETING

1. Shri Prasanta Phukan, Hon'ble Power Minister, Govt of Assam & Chairman of NERPC

2. Shri A.T.Mondal, Hon'ble Power Minster, Govt. of Meghalaya

SN	ORGANISATION	NAME (S/SHRI)	DESIGNATION
3	ASSAM	Sh.Bibhu Bhuyan	TCC Chairman/Managing Director
4		Sh. Akshay Talukdar	CGM (PP&I)
5		Md. Zakir	CGM (GEN)
6		Sh. Suresh Kaimal	CGM (F&A)
7		Sh. Saurav Saikia	CGM (H&C)
8		Sh. Arup Kr. Kalita,	CGM (O&M), LAR, AEGCL
9		Sh. Soobhan Saikia,	CGM(O&M), UAR, AEGCL
10		Sh.. Jagadish Baishya	CGM (Commercial)
11		Sh. Abhijit Saha	DGM
12		Sh. Rati Kanta Dey	DGM
13		Smti. Aklantika Saikia	DGM (Regulalory)
14		Sh. Hari Narayan Hazarika	DGM (NRE)
15		Sh. Bigstone Hanse	DGM
16		Sh. Indrajit Tahbildar	DGM (Commercial)
17		Sh. Debasish Choudhury,	DGM(O), SLDC
18		Sh. Longsing Bey	GM, KLHEP
19		Sh. Nabajit Phukan	AGM/ OSD to theMD
20		Sh. Pankaj Bikash Sarmah	AGM
21		Sh. Amar Chetri	AGM
22		Ms. Tarali Deka,	AGM(T), AEGCL
23		Sh. Nillutpal Baruah,	AGM (SO), SLDC
24		Sh.. Parag Jyoti Kalita	AGM(TRC)
25		Miss Sisrikhya Dutta	DM (TRC)
26		Sh.Biswajit Borgohain	
27		Ms. Dipmoni Nath,	AM(T), AEGCL
28	AR. PRADESH	Sh. Ginko Lingi	CE (Power), CEZ & SNO-RDSS.
29		Sh. T. K. Tara	CE (Power), TP&MZ.
30		Sh. Nangkong Perme	SE (E), SO&PSC, Head of SLDC: Arunachal Pradesh.
31		Sh. Doyum Taipodi	SE (E), Arunachal Pradesh Electrical Circle-I, Naharlagun
32		Sh. Jumjar Gibi	SE (E), Arunachal Pradesh Electrical Circle-III, Miao
33		Sh. Ojing Jerang	EE (E), SLDC
34		Sh. Geyi Yinyo	JE (E), SLDC, Arunachal Pradesh
35		Sh. Rajesh Sharma	JE (E), Commercial Zone, Itanagar.
36	MANIPUR	Sh. S. Priyananda Singh	Executive Director (Technical), MSPCL
37		Sh. H. Manimukta Singh	General Manager (Substation), MSPCL
38		Dr. Sarangthem Sanajaoba Singh	Deputy General Manager (400 kv SSD), MSPCL
39	MEGHALAYA	Sh. A.F.G. Momin,	Director Distribution,MePDCL
40		Sh. Mukesh Swer,	Chief Engineer (Projects), MePDCL
41		Sh. M. Patlong,	Chief Engineer (Distribution), EZ,MePDCL
42		Sh. H.F Shangpliang	Chief Engineer (Generation), MePGCL
43		Sh. B. Wankhar,	Addl Chief Engineer (Projects), MePDCL
44		Sh. B.Saibon	Additional Chief Enginneer (Generation), MePGCL
45		Sh. B. Nikhla,	SE (Projects), O/o Director (Dist),MePDCL
46		Sh. J. L. Kharmih,	SE, RBDC, MePDCL, Umiam.,MePDCL
47		Sh. M.F.Mawlieh,	SE (EM),MePDCL
48		Sh. T.Gidon	Superintending Engineer (SLDC), MePTCL
49		Sh, K Lyngwa	Superintending Engineer (T&T),MePTCL
50		Sh. D J Lyngdoh	Superintending Engineer, MePTCL
51		Sh. B Narry	Superintending Engineer (T&T), MePTCL
52		Sh. W.Khyriem	Superintending Engineer, GC-I, MePGCL
53		Sh. M K War	Executive Engineer, MePTCL
54		Sh. M R Marak	Executive Engineer,MePTCL
55		Sh. B.Das	Executive Engineer, Generation II, MePGCL
56	MIZORAM	Er. Laltlanthanga	Chief Engineer (RE)
57		Er. Lalhminghlua	Superintending Engineer (COM)
58		Er. H.Lalruatkima	Superintending Engineer (SLDC)
59	NAGALAND	Sh. Asangla Imti	Secretary Power
60		Sh. Labosang	Addl. C.E Distribution
61		Sh,. Lithrichum	Addl. C.E Transmission & Generation
62		Er. Abenthung Ngullie	S.E & Head SLDC
63		Er. S.I. Asangba Tikhir	E.E, Transmission Divison Dimapur
64		Er. Namheu Khate	E.E, Transmission Divison Kohima
65	TRIPURA	Sh. Biswajit Basu	Managing Director, TSECL
66		Sh. Debabrata Paul	Sr.Manager, TSECL
67		Sh. Anil Debbarma	DGM SLDC, TSECL
68		Sh. Nirupam Guha	AGM Transmission TPTL

69	**CEA**	Sh.Hemant Jain	Member (GO&D)
70	**NERLDC**	Sh. Amaresh Mallick	Executive Director
71		Sh. Sugandh Prasad Barnwal	Chief General Manager (SL)
72		Sh. B.B. Bhoi	Deputy General Manager (MO)
73		Sh. G.Praveen Naik	Chief Manager (HR)
74		Sh. Sunil Singha	Manager (SO)
75	**POWERGRID**	Sh. Rajesh Gupta	ED, NERTS
76		Sh. M.S.Dutt,	CGM
77		Sh. Pradeep Kumar	CGM(i/c), CTDS
78		Sh. S.I.Singh	CGM, NERPSIP
79		Sh. Hemendra Agarwal	CGM, Projects
80		Dhanurjay Nikhandia	Sr. GM,CC-AM
81		Beni Madhav	DGM, CC-AM
82		Mohan Kishor	DGM, GA&C, CC
83		Sh. Ashish Agarwal,	Sr. DGM, CTDS
84		Sh. Raktim Konwar	Manager, NERPSIP
85		Sh. Abhilash	Asst. Manager, NERPSIP
86		Sh. Ashim Kr. Paul,	DGM, POWERGRID
87		Sh. Binod Debberma,	Chief Manager
88		Sh. Kamlesh Baishya,	Asst. Manager
89	**CTUIL**	Smt Manju Gupta	DY. COO
90		Sh. Shiv K Gupta	Sr. DGM
91		Sh. Hari Babu Vakda	Chief Manager (Commercial)
92	**NETC**	Sh. Navin Kumar Poddar	I/c (O&M)
93	**NEEPCO**	Smti Debjani Dey	ED (Comml.)
94		Sh. Bijit Kr. Goswami	ED (O&M)
95		Sh. Ripunjoy Bhuyan	CGM (Comml.)
96		Sh. Bivash Sen	CGM (O&M)
97	**NTPC**	Shri Saurav Lalhal	Sr. Manager (Commercial)
98		Shri Girish Chandra Mohapatra	AGM, Commercial, ER-II Region
99		Shri Samir Haloi	DGM, Commercial, ER-II Region
100	**NHPC**	Sh. Vijay Kumar	DGM (O&M)
101	**OTPC**	Sh. Sanil C. Namboodiripad	MD (OTPC & NETC)
102		Sh. Prabhat Chandra,	AGM (O&M),
103		Sh. Amit Dabas,	Head-Commercial
104		Sh. Dinesh Laha,	Lead-Commercial
105	**Sterlite - I**	Sh. Mahesh Bhagat	Manager O&M
106	**NERPC**	Sh. K.B.Jagtap	Member Secretary
107		Sh. Alikpanth De	Dy.Director
108		Sh. Dinesh Singh	Asst. Director
109		Sh. Vikash Shankar	Asst. Director

Annexure-III

অসম চৰকাৰ

सत्यमेव जयते

GOVERNMENT OF ASSAM

Speech of

SHRI. PRASANTA PHUKAN

HON'BLE POWER MINISTER, GOVT. OF ASSAM & CHAIRMAN, NERPC

ON THE OCCASION OF THE 28TH MEETING OF THE

N.E. REGIONAL POWER COMMITTEE

AT HOTEL RADISSON BLU, GUWAHATI

ON 21st February 2025

Honourable Colleague Ministers from North-Eastern States, Esteemed Officers of the Central and State Governments, Representatives from Central and State Power Utilities and Distinguished Guests.

A warm welcome to the 28th North Eastern Regional Power Committee meeting. It is a privilege to address this esteemed gathering as we convene in Guwahati to deliberate on critical matters concerning the power sector in the North Eastern Region. I extend my sincere appreciation to all the participating states, government agencies, and power utilities for their unwavering efforts in overcoming challenges and jointly contributing to the development of the power sector in the region.

Assam has a total installed capacity of 2037 MW, of which 34% is from renewable energy sources including hydro and solar. Thermal power stations constitute nearly 70% of total installed capacity of the state. Assam is highly reliable on gas-based power generation also owing to 31% of total installed capacity against 6% share of gas-based capacity at All India level. Present RE installation of the state stands at around 690.5 MW including rooftop, on grid/off grid solar and hydro energy sources and 335 MW of large-scale solar projects are under execution.

The state of Assam has witnessed exponential hike in power demand in recent years. The peak demand of the state has touched 2684 MW in 2024 and annual growth of 6-7% in power demand is expected to take place in coming years. As per 20th EPS report by CEA, Assam will have around 20,285 MU energy requirement by the year 2030-31. Govt. of Assam is promoting renewable energy on a larger scale in line with national agenda and has targeted for around 5.719 GW of renewable energy addition by 2030. We need to develop robust transmission and distribution network to meet future demand. Programmes for reduction of AT&C losses like “Revamped Distribution Sector Scheme - A Reforms based and Results linked Scheme” etc. are under implementation by the Government.

Before we move forward, I would like to reflect on the key deliberations and resolutions from the 27th TCC and NERPC meetings held on 7th-8th November 2024. We discussed the upgradation of SCADA-EMS systems, recognizing it as a crucial step towards modernizing grid operations, with an emphasis on expedited implementation to address cyber vulnerabilities and outdated infrastructure. The implementation of Remote Access System and Automatic Fault Analysis System was also highlighted as an essential measure for enhancing grid security and reliability, requiring immediate prioritization.

Another key area of discussion was enhancing transmission and distribution networks. Critical transmission corridors, including the 132kV Rangia-Montanga international line and the 220kV Mariani-Samaguri circuit, were identified for urgent upgrades to prevent overloading and ensure grid resilience. Technical upgradation of Karbi Langpi Hydro Electric Project with Digital Governing System, Control System (SCADA), Excitation System and Micro-Processor based Protection Systems is another important project to consider for Safe, Optimal and Reliable Operation of the plant. Additionally, the need for capacity building in emerging technologies was emphasized, with a proposal for skill development programs to enhance expertise in smart grid technology, renewable energy integration, and market-based power transactions.

To address the growing role of renewable energy, it was agreed to establish a sub-committee dedicated to resolving challenges faced by RE developers and ensuring compliance with regulations. Discussions also underscored the importance of financial sustainability and the effective utilization of PSDF, highlighting the need for clearing outstanding dues to CPSUs, rationalizing electricity tariffs, and expediting approval for projects under the PSDF framework.

As we convene today for the 28th NERPC meeting, our focus must remain on ensuring the long-term stability and growth of the power sector in NER. One of the key areas is the expansion of renewable energy infrastructure,

particularly reviewing the integration of renewable energy from NER into the national grid. The development of small hydro power (SHP) projects is another vital area, as we explore strategies to harness NER's hydro potential and advocate for additional funding support from MNRE.

I would like to highlight the proposal of 25 MW/100 MWh Battery Energy Storage System at Namrup Thermal Power Station from APGCL, this project shall be of immense benefit to the grid and can be used in emergency response systems for grid stability, ramp rate control and during black starts to provide quick energy at a good response rate.

With this forum, I urge Arunachal Pradesh to allow Assam (through APGCL) to develop one or two hydro projects like 225 MW Talong Londa Hydro Power Project.

Also, few small issues have held up 55 MW Kulsi HEP. I urge Hon'ble Power Minister of Meghalaya to resolve the issue for greater benefit of NE region in energy safeguard.

I am also aware that the interstate power corridor is neglected to make all 7 states a single power region for each other benefits.

Strengthening grid reliability is also on our agenda, with further deliberations on SCADA-EMS, RAS, and AFAS implementation and assessing the progress of key transmission projects to enhance grid resilience. We must also evaluate the financial health of state utilities, ensuring timely payments, discussing cost-effective solutions for power procurement, and working towards financial reforms and tariff rationalization. Enhancing communication and cybersecurity measures remains a priority, with a focus on strengthening the region’s power infrastructure and bolstering cybersecurity frameworks.

The North Eastern Region stands at a pivotal juncture in its energy transition. Through collaborative efforts, strategic investments, and robust policy frameworks, we can ensure sustainable power development across the

region. I look forward to insightful discussions and actionable outcomes from this meeting.

Thank you!

SPEECH OF SHRI A. T. MONDAL, HON'BLE POWER MINISTER, GOVT. OF MEGHALAYA ON THE OCCASION OF THE 28TH NERPC MEETING

1. Hon'ble Chairperson NERPC and my dear Colleague Ministers from other North-Eastern States, officials of Central Government and State Governments, officials from other Central and State Power Utilities, distinguished Guests, special invitees, ladies and gentlemen.

2. At the outset, I convey my sincere gratitude to the Chairperson, NERPC and the Honourable Power Minister of Assam, Shri Prasanta Phukan, for having invited me to this 28th North East Regional Power Committee (NERPC) meeting here in Guwahati. I also thank PTC India Ltd. for their gracious hospitality in hosting this meeting. I would also like to express my appreciation to NERPC for their continuous efforts and contributions towards the Power sector in the region for the overall welfare of the people.

3. I am happy to inform this August House that the entire energy generation of the State is clean and green. As on date, there are 9 (nine) operational hydro power stations with a total Installed Capacity of 367.50 MW, generating about 1200 MU of green energy annually.

4. Government of Meghalaya has been taking various steps towards harnessing the hydro potential for the state. The Riangdo Small Hydro Project, which was earlier conceptualized for 3 MW, has been re-engineered to revise the capacity to 6 MW. Further, the Detailed Project Report of 210 MW Myntdu Leshka Project Stage II is on the final stage, and the approval of CEA is expected by March 2025.

5. Further, there are three hydro projects with a cumulative capacity of around 320 MW, for which the DPRs have been received from some private players, and the allotment process for the same is under progress and is expected to be completed very soon. In addition to the above, the State Power Generating Corporation has also completed DPRs of 12 (twelve) Small Hydro Projects, totaling 61.70 MW.

6. Respected Chairperson, the Meghalaya Government is always looking forward to improving the reliability of transmission of power within and outside the state and managing grid discipline. To improve efficiency and reliability, modern technology must be introduced, and further investments must be made to replace old/obsolete infrastructure. Taking this opportunity, I would like to mention certain proposals here:

    a) Upgradation Activities of SCADA-EMS systems.
    b) Work of Supply & Installation of AMR Compatible ISTS Interface Energy Meters along with AMR (Automatic Meter Reading) System.
    c) Replacement of two lines with OPGW for backup NERLDC connectivity. However, clarification from POWERGRID is required regarding ownership of the link, subsequent to break-even point of capital investment, since out of these two lines, one line is being maintained by both AEGCL and MePTCL.
    d) CEA has, in its Report on Transmission System Requirement of North Eastern States and Sikkim by the year 2031-32, approved the proposals of Meghalaya. However, considering the acute financial constraints faced by Meghalaya, I request the forum to pursue the matter for assistance in funding for priority projects for different time frames, which will also include long-pending proposals for urgent re-conductoring of intra-state and inter-state transmission lines. The matter for financial support for select transmission projects under PM-DevINE/DoNER or any other Central Sector schemes may be expedited.
    e) Setting up of the on-premises Security Operation System to ensure cyber security.
    f) Enhancing transmission reliability, for which MePTCL has submitted PSDF funding proposals for reconductoring transmission lines with HTLS conductor, installation of Transmission Line Surge Arrestors in select transmission lines, implementation of Reliable Communication & Data Acquisition at 132 kV substations, and Renovation & Upgradation of Protection and Control System Phase-II.

7. I am thankful to NERPC that the proposals pertaining to Renovation, Re-conductoring, and Re-engineering of two lines submitted by MePDCL have been approved in the 27th NERPC meeting. The DPR's preparation is in process and will be submitted to NERPC very shortly.

8. Further, regarding the downstream connectivity of the 33 kV substations being constructed under the NERSIP scheme, as per NERPC's directive in the last meeting, MePDCL has already submitted the proposal for downstream elements to CEA in August 2024 for funding consideration under RDSS. The revised cost estimate stands at Rs. 33.98 Crore, which has been included as a status agenda item in the 28th TCC & 28th NERPC meeting.

9. The forum is requested to pursue with CEA for early consideration of funding for the smooth evacuation of power to the end-user. I will be very happy and thankful to NERPC if our proposal is pursued vigorously with CEA for funding at the earliest.

10. The PM-DevINE scheme launched by GOI under the Ministry of DoNER is a boon for infrastructure development in the NER. However, to enhance its effectiveness for the power sector, there should be a defined allocation of funds specifically for power infrastructure, ensuring impactful benefits in terms of reliable transmission networks not covered under any other scheme.

11. MePDCL has submitted five proposals covering 5 new 33 kV lines and 5 new substations, with a transformation capacity of 70 MVA and an expenditure of Rs. 286 Crore, seeking funding under the PM-DevINE scheme. Additionally, MePDCL is finalizing DPRs for the establishment of three more 33 kV lines with three new substations of 15 MVA capacity.

12. In compliance with the Electricity Amendment Rule 2022, Resource Adequacy studies have been carried out for Meghalaya based on CEA, NERLDC, and NERPC data. However, there are observations in the final Resource Adequacy Plan regarding energy consumption projections, distribution losses, and allocated generation capacity at the beginning of the study period, which are being taken up with CEA.

13. Before I conclude, I extend my heartfelt greetings to all participants. I am confident that informed decisions will be arrived at in this NERPC meeting, and I look forward to strong support from NERPC in the leadership of our current Chairperson.

Thank you
Jai Hind

ADDRESS OF SH. K.B. JAGTAP, IES (CPES)
MEMBER SECRETARY, NERPC
28TH NERPC MEETING OF
NORTH EASTERN REGIONAL POWER COMMITTEE
21st February , 2025 at Radisson Blue, GUWAHATI

……

Hon'ble Power Minister Govt. of Assam & Chairman, NERPC , Shri Prashant Phukan Ji, Hon'ble Power Minister Government of Meghalaya Shri Abu Taher Mondal Ji, Hon'ble Power Minister Government of Manipur, Shri Bishwaji Singh Ji, Hon'ble MLA Cum Advisor (Power), Govt. of Arunachal Pradesh Pradesh, Shri Jikke Tako ji, MD, APGCL and Chairman TCC, Shri Bibhu Bhuyan Ji, Member(Go&D) Central electricity Authority Shri Hemant Jain ji.

Principal Secretaries/Commissioners/ Secretaries of NER States Power Departments, Chief Engineers from Central Electricity Authority, Managing Director of State utilities, Senior officers from NER State Utilities, Central Utilities/Organizations, Special Invitees, ladies and gentlemen.

1. On behalf of NERPC, I extend a very warm welcome to each one of you to the 28th NER Power Committee Meeting. I hope you have a pleasant stay here. It gives me great pleasure in appreciating the efforts and task taken by Dr. Manoj Kumar Jhawar, CMD (Additional Charge), PTC, Shri Harish Saran ji, Director(Marketing), PTC and his team for making excellent

arrangement for the meeting and also for taking good care all our delegates.

I am happy to inform that we are able to hold RPCs meeting at regular interval due to blessings of our Chairman NERPC and Hon'ble power Minister Assam and Ministers of other NER state.

2. In the last 27th NERPC meeting which was held on 8th November at this place, many important decisions were taken for progress and strengthening of NER Power Sector specially request for release of PSDF fund (which was withhold for one year) to support NER State for upgradation of old transmission line through reconductoring and laying OPGW communication fiber as special case,in NER and I am happy to inform that Monitoring committee, MoP has already agreed to release fund for NER as special case for NER projects falling under PSDF guideline subject to submission of updated DPR with revised cost (if any). This has happened only with support from Member (Go&D), Sir, who has supported NER case rigorously in PSDF committee forum.

3. NER State also requested the funding for Intrastate Transmission lines which are considered by Central Electricity Authority in Transmission planning NER 2034-time frame. We are requesting PSDF committee, kindly consider this under PSDF or any other special scheme such as NERPSIP/Comprehensive phase-II. This will help the NER state to transmit and evacuate power from large hydro projects which are in pipeline. A resolution in this regard already sent

to Hon'ble Union Power Minister through Chairman NERPC and HPM Assam.

4. As you aware that CEA and CERC, are now more concentrating on keeping Resource adequacy to cater the growing demand of consumer NER and also to keep the reserves, Secondary and tertiary (SRAS and TRAS) in order to keep the reliable and quality power supply. In this regard CERC will be taking meeting on 24.02.2025 with NER SLDCs and DISCOMs. All SLDCs head and DISCOM head are requested to be present in this meeting as it involves financial implication on all SLDCs and DISCOM as they are mandated to keep the reserve (secondary as well tertiary reserve) in order to maintain the grid parameter. In order to reduce the burden of keeing the reserve capacity , We need to do proper forecasting of demand, both on long and shorter terms and reduce overdraw from grid .

5. The Ministry of Power, GOI has issued Workforce Adequacy Guidelines for Load Despatch Centres (LDCs) to ensure smooth operation and capacity building at SLDCs. We need to ensure minimum number of skilled manpower at our SLDCs to ensure smooth and reliable power supply to our consumers. For Assam SLDCs being medium SLDCs needs minimum skilled manpower workforce of 103 and other emerging SLDCs (such as Meghalaya, Manipur, Mizoram , Nagaland , Arunachal and Tripura- need 62 skilled manpower) . This includes manpower for System operation, Market operation, Logistics, REMC, Cyber security and support function (HR and Finances) at each SLDCs. At present, these SLDCs are manned by only 20 to 30% Manpower. So SLDCs are dire need of essential skilled

manpower. So it is requested that as per GOI guideline requisite skilled manpower to be recruited to run the SLDCs smoothly.

6. North east State also focusing and gearing up for strengthening of SLDCs by installing Security Operation Centre (SOC) at SLDCs to defense against the Cyber Threat. Government of India is fully (100%) funding the Security Operation Centre (with 2 Year AMC) along with one year finance for O&M expenses through outsourcing employee. However, we are requesting PSDF committee, kindly AMC should be at least 5 years, so as the SOC shall run with support of AMC.

Now I would like draw our collective attention in NER :

1. First accelerate the pace of development of huge Hydropower potential of NER to become the hydro hub of India by considering the community concerns.

2. **Strengthening Transmission and Distribution Networks**: Investments in transmission infrastructure must continue to keep pace with the growing demand. We must also focus on reducing AT&C (Aggregate Technical and Commercial) losses and improving the financial viability of DISCOMs.

3. **NER also need to Promote other Renewable Energy** such as Solar, BESS, Pumped Hydro storage and Hydrogen Projects

4. **Empowering Communities**: Access to reliable and affordable electricity is a cornerstone of socio-economic development. We must ensure that our efforts translate into tangible benefits for the people of the North Eastern Region, empowering them to lead better lives.

I hope that in today's meeting also, many important decisions will be taken for the interest of the nation and the N.E. Region in particular.

On behalf of NERPC, I once again extend my heartiest greetings to all the participants and look forward to meaningful deliberation.

Thank you very much for hearing patiently.

*****

Action taken report of 27th TCC/NERPC by NERPC Secretariat

Annexure-1.3

Sl No	ISSUES	TCC/NERPC MEETING	MEETING DELIBERATION	Action taken/to be taken
1	**Upgradation Activities of SCADA-EMS systems at Regional/State level in North-Eastern Region**	**27th TCC/NERPC**	**Resolution regarding construction of backup SLDC(Civil part) amounting to rs 65 Crore has to be sent to MoP**	Resolution sent in January'2025
2	**Implementation of Remote Access System (RAS) and Automatic Fault Analysis System (AFAS)**	**27th TCC/NERPC**	**Email /letter to be sent to Powergrid to provide technical specifications to aid NER states in making the DPR**	Technical Specifications received from Powergrid. NERPC to circulate the same to states in order to facilitate them to make DPRs
3	**High loading in 132 kV Rangia - Montanga international line**	**27th TCC/NERPC**	**Letter to be sent to PTC & Powergrid with copy to CEA, NLDC, CTU**	Letter sent to Member PS on 26.12.2024 and to CE, PSPA-2, CEA on 31.01.2025
4	**Establishment of redundant fibre path between NERLDC, Shillong, Khelieriat and NEHU for reliability of power system communication link till NERLDC**	**27th TCC/NERPC**	**Email/Letter to PCD Div, CEA to expedite finalizing the OPGW Sharing guidleines**	1. Draft guidelines issued by CEA 2. Guidelines likely to be issued by March'25
5	**Connectivity of NERLDC Guwahati with Sarusajai and Umiam bypassing Kahilipara for its redundancy**	**27th TCC/NERPC**	**Email/Letter to PCD Div, CEA to expedite finalizing the OPGW Sharing guidleines**	1. Draft guidelines issued by CEA 2. Guidelines likely to be issued by March'25
6	**Funding of proposals for strengthening of Intra State Transmission System of Meghalaya approved by CEA and CTU up To 2032 timeframe**	**27th TCC/NERPC**	**Resolution regarding strengthening of Intra State Transmission System to be sent to MoP**	Resolution sent in January'2025
7	**Setting up of Guest House/Transit Camp at Guwahati for NERPC Members**	**27th TCC/NERPC**	**SIte inspection to be done in the month of December. Letter to CEA for allocating 5000sqft area of NPTI for constructing backup office of NERPC at Guwahati**	A committee has been formed for site selection. Committee to submit report to MS, NERPC by February'2025
8	**VOIP Communication system for Grid-Operation for all Five Regions NR, NER, SR, WR, ER as PAN India**	**27th TCC/NERPC**	**Special Meeting to be convened to finalize BoQ**	Meeting held on 22.11.2024.

9	**Capacity building for NER constituents on emerging technologies of Power Sector to be funded through PSDF or any other funds**	**27th TCC/NERPC**	**Proposal to be sent to PSDF Secretariat**	Revised estimate sought from PTC via mail dated 30.01.2025. Then the revised DPR to be sent to PSDF Sceretariat
10	**Procurement of 2 nos. of UPS and 2 nos. of battery bank for PDMS server of NERPC**	**27th TCC/NERPC**	**2 Nos UPS and 2 Nos Battery banks to be procured**	Installed in the 1st week of February'2025
11	**Realignment/Alteration of existing 33kV Power supply to NERPC/PGCIL/NERLDC**	**27th TCC/NERPC**	**Letter to be isued to MePDCL**	Work in progress.
12	**Proposal for procurement of new office vehicle for NERPC**	**27th TCC/NERPC**	**White Color, Innova(Hybrid) to be procured**	In progress. Quotation to be taken from vendor in February'2025.
13	**Roster for TCC/NERPC Meeting**	**27th TCC/NERPC**	**PTC to convene 27th TCC & 27th NERPC meetings tentatively in the 2nd week of March'2025**	28th TCC & NERPC Meetings are scheduled on 20.02.2025 and 21.02.2025
14	**Re-Engineering of existing 33KV Line on 33 KV Lattice Structures/Towers from Umiam-Umtru Stage-III Power Station, Kyrdemkulai to Stage-IV Concrete Gravity Dam up to Umiam-Umtru Stage-IV Power Station, Nongkhyllem**	**27th TCC/NERPC**	**Resolution regarding strengthening of Intra State generating stations to be sent to MoP**	Resolution sent in January'2025
15	**Re-Engineering of existing 33 kV Line with 33 kV Lattice Structures/ Towers from Myntdu Leshka Stage-I Power Station to Myntdu Leshka Dam.**	**27th TCC/NERPC**	**Resolution regarding strengthening of Intra State generating stations to be sent to MoP**	Resolution sent in January'2025
16	**Formation and Activities of the Regional Disaster Management Group (RDMG) for Power Sector in NER**	**27th TCC/NERPC**	**Physical meeting to be convened at Guwahti in coordination with CEA**	Letter sent to CEA on 14.01.2025
17	**Agenda on Resource Adequacy- IRP Div, CEA**	**27th TCC/NERPC**	**Workshop with Discoms to be organized**	Letter sent to CEA on 14.01.2025
18	**Formation of Sub group of RE generators and discussion their challenges at RPC level**	**27th TCC/NERPC**	**Letter to GENCOs, STUs, SLDCs for nomination for RE group.**	Letter sent to utilities on 22.01.2025
19	**AMC of SAMAST Project**	**27th TCC/NERPC**	**To be taken up in next NETEst Meeting**	Discussed in 30th NETEsT on 24.01.2025

Annexure-2.4

सं. 22-1306/4/2022-ओ एम [E-262577]
भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power

F-Wing, 2nd Floor, Nirman Bhawan
New Delhi, the 30th October, 2024

To,

1. Principal Secretary/Secretary (Energy) of State Governments/UTs.
2. CMD, Grid-India, New Delhi

Subject: Workforce Adequacy Guidelines for Load Despatch Centres and Guidelines for deputation of Workforce from SLDCs to Grid-India for fixed terms-reg.

Sir/Madam,

A copy each of the 'Workforce Adequacy Guidelines for Load Despatch Centres' and **'Guidelines for deputation of Workforce from SLDCs to Grid-India'** approved by the Hon'ble Minister of Power is forwarded herewith for information and compliance.

2. The Workforce Adequacy Guidelines for Load Despatch Centres will serve as a benchmark for enhancing the Load Despatch Centres by ensuring they are equipped with sufficient skilled human resources. The Guidelines for Deputation of Workforce from State Load Despatch Centres (SLDCs) to Grid-India focus on fostering collaboration and knowledge-sharing among various LDCs. These guidelines facilitate the exchange of personnel, thereby promoting functional cohesion and building a robust talent pool of Power System Operators.

3. By adhering to these guidelines, LDCs can enhance their operational capacity, ensure efficient management of the grid and ultimately contribute to the stability and reliability of the electricity supply across the nation. Compliance with these guidelines is essential for achieving the goal of a well-equipped and skilled workforce in the power sector.

Encl: As Above

Yours faithfully
30/10/24
(Parveen Dudeja)
Director (OM)
Email:parveen.dudeja@nic.in

Copy to : Chairperson, CEA

Copy for information to: PS to Hon. MoP /Sr. PPS to Secretary (Power)/ Sr. PPS to AS(SN)/ PPS to JS(OM)

Copy to: Incharge, NIC, Ministry of Power for uploading the guidelines on the website of Ministry of Power under 'New Notices' with heading "**Workforce Adequacy Guidelines for Load Despatch Centres and Guidelines for deputation of Workforce from SLDCs to Grid-India for fixed terms**".

Workforce Adequacy Guidelines for Load Despatch Centres

July 2024

Table of Contents

Introduction

The Electricity Act 2003 designates the Load Despatch Centres (LDCs) as apex bodies to ensure integrated, secure, reliable, economic, and efficient operation of power system under their jurisdiction. The LDCs would play an important role in facilitating the energy transition towards a sustainable and decarbonised electricity grid. Human Capital is the most important Asset in in any organizational setup. Human Resource adequacy has a direct effect on performance and efficiency of all functions and activities. Since LDCs carry out mission critical activities on a 24X7 basis, the availability of adequate human resources in the Load Despatch Centres play a very critical role for reliable and efficient power supply. These guidelines have been formulated to provide a benchmark for strengthening the State Load Despatch Centres by ensuring adequacy of skilled human resources.

The Committee on 'Manpower, Certification, and Incentives for System Operation and Ring-fencing Load Despatch Centres' 2008, estimated a total requirement of 60-70 persons in each Load Despatch Centre. However, it has been more than 14 years since the report was published and the landscape of Indian Power Sector has undergone major transformations since then.

The report on 'Capacity Building of Indian Load Despatchers'(CABIL) endorsed by the Forum of Regulators in 2018 elaborated the manifold expansion in the roles and responsibilities of the load despatch centres in India. The load despatch centres were placed in three groups viz Group-A (Large LDCs), Medium LDCs and Emerging LDCs. The total number of executives (including Supervisors, excluding staff for Sub-LDCs, Physical Security and REMC) in Group-A (Large LDCs) recommended in the report was in the range of 100 – 150 nos. The report further recommends additional 25 personnel for Renewable Energy Management Centres (REMCs).

Categorization of Load Despatch Centres

Considering the diversity of power system profile of different states in terms of their peak demand met, energy consumption and installed capacity of Renewable Energy Sources, all SLDCs have been categorised. Their Human Capital requirements are different as well. The thirty-five SLDCs have been grouped into three categories – Large SLDCs, Medium SLDCs, Emerging SLDCs. NLDC and RLDCs have been considered in the category of large LDCs for the purpose of estimating workforce requirement.

Table 1- Categorisation of SLDCs

S. No.	Large SLDCs	Medium SLDCs	Emerging SLDCs
1	Andhra Pradesh	Assam	Arunachal Pradesh
2	Gujarat	Bihar	Chandigarh
3	Haryana	Chhattisgarh	Dadra and Nagar Haveli /Daman & Diu
4	Karnataka	Damodar Valley Corporation	Goa
5	Maharashtra	Delhi	Manipur
6	Madhya Pradesh	Himachal Pradesh	Meghalaya
7	Punjab	Jammu & Kashmir and Ladakh	Mizoram
8	Rajasthan	Jharkhand	Nagaland
9	Tamil Nadu	Kerala	Puducherry
10	Telangana	Odisha	Sikkim
11	Uttar Pradesh	Uttarakhand	Tripura
12	West Bengal		Andaman & Nicobar*
13			Lakshadweep**

* As of now, LDC functions of A& N are being managed by the Energy Management Centre (EMC) at Port Blair. Considering the power system profiles such as Peak Demand Met, Energy Consumption and Installed Capacity of Renewable Energy Sources, A&N can be categorize under Emerging LDC.

** Managed by Electricity Department, Lakshadweep

The functions discharged by LDCs can be broadly classified into following categories - System Operation (SO), Market Operation (MO), Logistics, and

Support services. The System Operation function covers operational planning (including assessments, studies, crew management), real-time operation (including scheduling, forecasting, outage planning and reporting) and post despatch analysis (including reporting, MIS, feedback and analytics). The market operation function covers open access administration, day ahead market, real-time market, energy accounting and settlement activities, regulatory functions etc. Logistics covers decision support, Information technology. Cyber Security has emerged as an important function and requires dedicated specialized personnel. Support Services include human resource management, contract services, finance and account, establishment, administration are support services.

There are thirteen Renewable Energy Management Centre (REMC) in India which include the REMCs in Rajasthan, Gujarat, Madhya Pradesh, Maharashtra, Telangana, Tamil Nadu, Karnataka and Andhra Pradesh which are collocated with SLDCs. The REMCs are also envisaged for UT Ladakh and 3 more locations (under discussion stage). The REMC takes care of the forecasting, scheduling and real-time monitoring renewable energy resources. REMCs at all regions require dedicated, specialized employees.

Imperatives

In the past decade, due to rapid developments / interventions in the sector, through reforms, policy initiatives, changing corporate landscape and LDCs' own evolving roles in the Power Sector, several imperatives have emerged. Additional HR will be required to meet challenges related to exponential increase in electrical energy demand, growth in the economy and changes in technology, regulations, market design, administration and management of the power system. These imperatives will impact functions and require additional resources including Human Resources. Some of these are enumerated below:

1. Grid management has transitioned from supervisory role to sophisticated controls & faster Electricity Market administration such as Automatic Generation Control, System Integrity Protection Systems, Real Time

Market, Advance metering Architecture/Smart Grid. There is now an increased thrust on optimization – Economic Dispatch, Energy Optimization, Asset Optimization and Demand Optimization.

2. In addition to the round-the-clock System Operation, the Load Despatch Centres are expected to contribute in Market Operation, research & analysis, support / advocacy in regulatory affairs, Data dissemination (system data acquisition, Communication, IT systems) and other establishment services to carry out the various functions with suitably skilled workforce.

3. There have been dynamic changes in the electricity consumption patterns, in addition to this, System Operation is facing another major challenge of integration of Renewable resources, such as Solar & wind, in line with India's commitment to Climate change & NDC targets. This brings in new challenges in respect of its variability, intermittency and technological aspects associated with Power electronic devices. Further, constraints in terms of flexibility of conventional resources also contribute towards these challenges.

4. LDCs have undertaken several new work domains to improve reliability, security and economy, these include:- Load forecasting, RE forecasting, fuel security assessment, production cost optimization studies, generation outage planning, transmission outage planning, assessment of Transfer Capability, Reactive Power studies, Short circuit and transient stability studies, small signal stability studies, Electromagnetic transient studies, Mock black start drills, Activation of back up control centre, preparations for special events like festivals, natural calamities like cyclone, floods etc. and documentation of procedures (operating, restoration).

5. With advent of new players such as distributed generation, storage, electric vehicles, aggregators etc., there is a need for renewed thrust in areas such as Market Design, Open Access Administration, Day Ahead

Market, Real Time Market, Ancillary Services Market, Metering, Accounting, Settlement & Pool Accounts, Tax reconciliation & LDC fees and charges etc. With introduction of ancillary services, forecasting scheduling & deviation settlement regulations for RES, demand for market-based instruments (balancing & flexibility services viz. AGC, fast response tertiary regulation, ramping, load following etc.) is likely to arise on a significant scale. Hence, adequate personnel will be required to meet these challenges and carry out these evolving activities.

6. On technology front, focus areas essential for building and strengthening of technical infrastructure in LDCs are Engineering of new SCADA/EMS upgrades, Synchro-phasor technologies, Real time Applications, Off-line applications, Big Data Analytics tools, Website development, upgrading and maintaining Cyber security, etc.

7. Cyber Security is a new emerging area, where keeping updated, timely assessment of threats and facilitating collaboration on devising policies and strategies to strengthen Cyber Security efforts across Power Systems is important

8. Furthermore, for efficient running of the LDCs HR functions, Finance functions, Planning, Vigilance, etc. deployment of matching additional HR Resources would be a necessity.

9. There should be a sufficient number of power system operators to ensure that the grid can be operated safely and efficiently at all times, and that operators are not overworked. There is a need for some type of rotation of staff for scheduling, continuity of service and stress reduction of the power system operators, hence, a minimum tenure and reserve shift are important.

Figure 1- Emerging Areas for LDCs

Methodology adopted for working out HR Requirement

1. Based on existing functions and envisaged future functions, an organigram was prepared for LDCs.

2. Comprehensive list of existing and anticipated activities based on present area of operations and anticipated requirements was prepared.

3. Working out FTE (Full Time Equivalent) requirement for each activity- This was done based on daily time-required estimate for completion of each activity. FTEs have been estimated in particular function in increments of 0.25.

4. While estimating FTE Requirement, degree of automation and outsourcing which is present and/ or anticipated is also accounted for. Certain activities such as housekeeping, security etc. are envisaged to

be outsourced completely, with only supervisory function remaining with the LDCs.

5. In critical functions such as Real-Time System operation, it is essential to plan for contingencies and build reserves, a requirement underscored by COVID-19 Pandemic. Hence, in a major change of approach, a reserve shift has been considered, making it 5 shifts in total for Real –Time Grid Management.

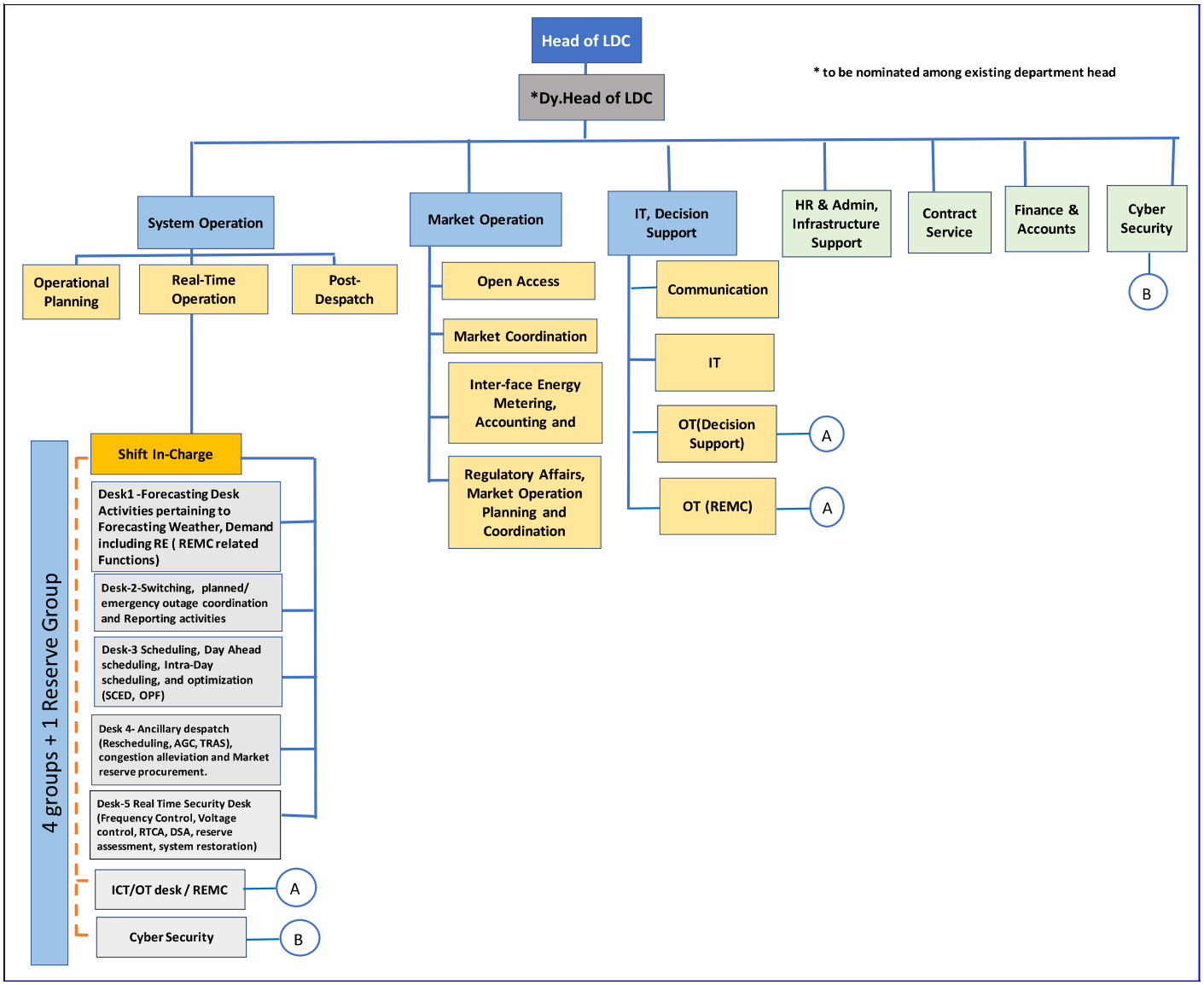
6. The number of activities performed in Large, Medium and emerging LDCs remain more or less the same, the volume and extent of the activities being carried out differs based on the size of the LDC, hence, the number of personnel differs at each LDC. There are certain statutory activities which will remain the same irrespective of the size of the LDCs and therefore, a minimum number of workforce allocation will be required at each LDC.

DEPARTMENT CATEGORISATION - NLDC, RLDCs & SLDCs

FTEs allocation has been done to these 7 Functions: i. System Operation,ii. Market Operation iii. Logistics iv. Cyber Security v. Contract Services vi. Finance and Accounts vii HR, Admin & Infrastructure Services. These numbers do not include workmen or staff requirement for non-core functions such as general upkeep of the premises, security, assistants etc. and do not include workmen, these requirements are different for every LDCs based on their local. Regional requirement and ongoing legacy.

Further, it is not envisaged that these numbers are achieved immediately, as culture and socialisation of employees is important it is important that there is a gradual scaling or workforce at every LDCs.

Figure 2- Typical Organogram for an LDC



1. System Operation

System Operation in each LDCs has been organized under three divisions- i. Operational Planning or Pre-Despatch; ii. Real-Time Operation- to be operated in Shifts, with respective Shift-In charges and with one offline In-charge, iii. Post-Despatch

a. Functions, roles and responsibilities of **Operational Planning** are as follows:-

i. Primary Frequency Response Testing
ii. Primary/secondary/tertiary reserve capacity assessment
iii. Validation of standards conformity test reports submitted by RE developers through in-house simulations
iv. Enforcement and Compliance of various standards and regulations under RE
v. Network model validation for simulation studies
vi. Fuel adequacy assessment
vii. Protection coordination, resilience coordination
viii. Enhanced coordination with stakeholders for system reliability for high impact low probability events (Lights off, cyclone, Solar Eclipse etc.
ix. Increasing number of Power System Elements- especially Renewables, EVs, Solar Roof-top
x. Studies such as Steady State Studies, Dynamic Studies, Optimisation Studies. Forecasting, Fuel Security Assessment and Generation & Network Outage Planning.
xi. Disaster Management Coordination
xii. Transnational Coordination, resilience coordination Mock black-start drills, contingency plans, Preparation for Special Events
xiii. Augmentation in Back-Up control centre operations- As a part of the initiatives to enhance resiliency of control centre operations, back-up control centres and disaster recovery systems are being implemented in some of the LDCs. Dedicated HR is required for satisfactory operation of these centres to enable them to cater for emergency situations.
xiv. Resource Crew Management, documentation

Some of the key additional functions also include Carrying out data intensive research consultation / collaboration with other grid operators, multilateral agencies, academia and other statutory bodies in India. Strengthening capabilities in system simulation, optimization, forecasting, model validation, data management, situational awareness, synchrophasor applications, dynamic security assessment and other decision support technologies, harmonization of operating procedure.

b. Functions, roles and responsibilities of **Real-Time Grid Operation** are as follows :

Real-Time operation is at the heart of any LDC. Therefore, adequate deployment of trained and certified personnel is required. Each control room must operate in five shift groups with 3-8 Nos. per shift. There would be total 5 shift groups. The fifth group is recommended to factor leave reserves and training needs of real-time operations personnel. This is in line with the international best practices. COVID-19 Pandemic has underscored the importance of Reserve Shifts. This fifth reserve group will ensure continuity of operation even in cases where entire groups have been quarantined Thus, the HR budget for real-time operations takes into account round-the clock operations, entitled leaves, public holidays, festivals, business travel, training, special assignments etc. making a total of 15 – 40 Nos. overall for control room shift operation.

These functions in each shift group have been segregated into desks, each desk will perform specific duties. Shifts will be headed by Shift In-charges, with an overall in-charge in offline (General Shift), to oversee and coordinate. The Desks are as follows:-

i. Desk 1- Forecasting Desk – Activities pertaining to Forecasting Weather, Demand including RE (REMC related Functions)

ii. Desk-2-Switching, planned/emergency outage coordination and Reporting activities

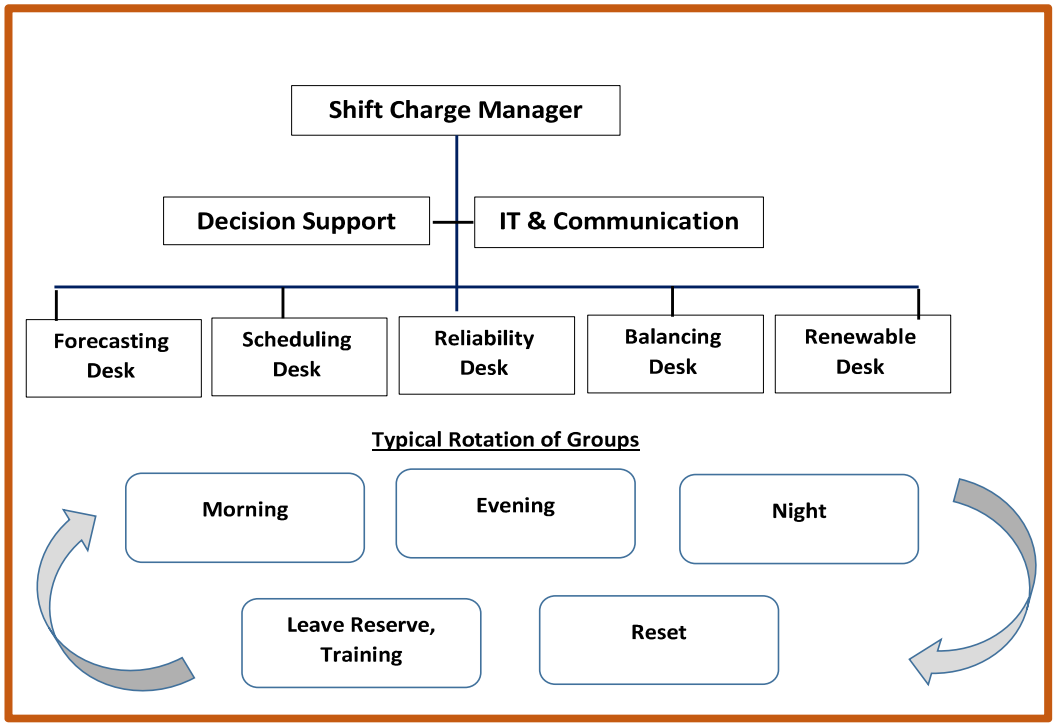
iii. Desk-3 Scheduling- Day Ahead scheduling, Intra-Day scheduling, and optimization (SCED, OPF)- for activities and functions pertaining to Security Constrained Economic Despatch and Optimal Power Flow.

iv. Desk 4- Ancillary despatch (Rescheduling, AGC, TRAS), congestion alleviation and market reserve procurement. This require dedicated persons in real-

time for reserve assessment, reserve procurement from DAM/RTM and despatch and coordination with the ancillary service providers.

v. Desk-5 Real Time Security Desk (Frequency Control, Voltage control, RTCA, DSA, reserve assessment, system restoration).

Figure 3- Organogram of Real-time shift operation



c. Functions, roles and responsibilities of **Post Despatch** are as follows: -

i. System performance assessment.
ii. MIS and Reporting, Grid standards, code compliance monitoring and reporting.
iii. Low Frequency Oscillation Display and Analysis Evaluating Primary Response- Inertia and frequency response Ramp performance assessment AGC response assessment Network availability verification Grid incident/ disturbance analysis, reporting and documentation.
iv. Operation feedback compilation.
v. Simulation of events and learning, Data analytics and research.

2. Market Operation

Market Operation function is an evolving Dynamic Function, which is changing due to various regulatory initiatives and reforms. Market Operation has been organized under 4 divisions - Open Access, Market Coordination, Inter-face Energy Metering, Accounting and Settlement, Regulatory Affairs. Functions and activities related to Electricity markets are limited in medium and emerging LDCs, hence, comparatively the staffing requirements are lower in these LDCs. Functions, roles and responsibilities which have been added to Market Operation include: -

a. **Open Access Administration**:

i. Administration of Electricity Market through National Open Access Registry (NOAR) Short term open access - bilateral / e-bidding Open Access Short term open access - collective / DAM, RTM, billing, collection, disbursement, reconciliation
ii. Day Ahead Market, proposed GDAM, MBED, Market coupling
iii. Real Time Market
iv. Accounting and settlement of Secondary/Tertiary Reserve and Ancillary Services
v. Ancillary Services Market
vi. forecasting scheduling & deviation settlement regulations for RES
vii. Market based instruments (balancing & flexibility services viz. AGC, fast response tertiary regulation, ramping, load following etc.)
viii. DSM Amendment Regulations

b. Market Coordination:

i. Grid Access- User registration, fees and charge sharing

ii. Market Participants Coordination, allocations, Energy contracts, losses, regulation of power supply, Day Ahead Ancillary Requirement
iii. Finalisation of inter-change schedule

c. Inter-face Energy Metering, Accounting and Settlement:

i. Energy meter placement and integration, FTC clearance
ii. Meter data collection, AMR
iii. Energy meter data validation including with SCADA
iv. Energy meter data processing
v. Energy accounting (active & reactive) including trans-national accounting, Congestion Account
vi. Congestion, Ancillary (SRAS, TRAS...) account
vii. SCED account
viii. Transmission charge computation
ix. Pool account operation including reconciliation (Finance Executive)
x. Transnational exchanges Settlement and Reconciliation

d. Regulatory Affairs, Market Operation Planning and Coordination

i. Market analytics,
ii. Market design feedback
iii. Audit / Stakeholder coordination
iv. Physical Grid access administration-Connectivity, long/medium term access
v. Power purchase agreement, database
vi. Regulatory compliance verification coordination, first time charging coordination, Performance test, COD verification
vii. Filing petitions and replies
viii. Coordination with legal, regulatory institutions, law firms

3. Logistics

Logistics functions have been organised in 4 divisions which are:- i. Operation Technology; ii. Renewable Energy Management Centres; iii. Information Technology; iv. Communication.

Real-Time SCADA/ IT Support Desk - With automation of the scheduling process and introduction of ancillary despatch, AGC control system, dynamic security assessment, the real-time supervision of the communication and the information technology systems has become critical. This desk would oversee the decision support systems and the data and speech communication in real-time.

b. Functions, roles and responsibilities of **Operation Technology Logistics** are as follows**:**

i. Engineering of upgrades of SCADA/ EMS, R&M, Integration of PMU and RTU,
ii. Development & Maintenance-SCADA database, SCADA Display, ICCP,
iii. Synchro-Phasor Technologies- Database and display development & maintenance
iv. Real-Time Software Application - SCED, AGC, RRAS, State Estimation
v. Decision Support-State Estimation, EMS, Dynamic security assessment, Optimal Power Flow
vi. Dispatcher training simulator maintenance
vii. Local and remote back up control centre (incl REMC) maintenance
viii. Power Supply System - UPS/DG Set, Control Room Air Conditioning
ix. AMC coordination, certification, verification
x. Support for real-time ICT/OT desk / REMC Support

c. Functions, roles and responsibilities of **Information Technology - Logistics** are as follows:

Advanced digitization and automation requirements without compromising cyber security and hygiene. Effective redundancy and disaster recovery mechanism which is seamless and wide-spread. The thrust would be towards timely execution of the Technology roadmap that has been evolved through a wide consultation.

i. IT systems infrastructure, networking, hardware engineering design and maintenance
ii. -JanIT systems- Application software maintenance
iii. Information access control and security (Implementation of CISO,
iv. CERT-GO Advisories)
v. Information interface (Internal, external)
vi. Database administration and maintenance
vii. Application software design and development
viii. Data analytic system
ix. Disaster recovery system
x. Data lake, warehouse and mining

d. Functions, roles and responsibilities of **Communication Logistics** are as follows**:**

i. Voice communication (Internal and external, recording)
ii. Data communication - (PLCC, Leased line, Optic fibre, GPRS, VSAT, Satellite), Wi-Fi
iii. Remote Conferencing and Meeting Facilities- Audio-Visual
iv. Communication Network Availability Verification

4. **Renewable Energy Management Centres(REMCs)**

The REMCs in the southern, western, northern region and the national REMC in New Delhi began operations in February 2020 are being managed by GRID - INDIA. They require dedicated human resource for maintaining the IT systems, overseeing the operations, and other related IT, OT and forecasting aspects.

Functions, roles and responsibilities of **Renewable Energy Management Centre**s are as follows**:**

i. RES Integration
ii. REMC database/ Display development, maintenance, Support for Real-time REMC Desk
iii. Forecast Service Provider, Weather Service Provider coordination in REMC
iv. Availability and Performance Verification

5. **Cyber Security**

Cyber Security is a major focus area in view of changing Information Technology Landscape globally. A real-time 24X7 desk to coordinate activities and functions pertaining to Cyber Security in LDCs. RLDCs and NLDC are under the same corporate structure, a few cyber security functions have been centralised at GRID-INDIA, at the corporate level.

Functions, roles and responsibilities of **Cyber Security** are as follows**:**

i. Roles and responsibilities of CISO, Alternate CISO, and various requirement to coordinate with the statutory bodies and monitoring and ensuring cyber security initiatives and compliances within the LDC
ii. Coordination and enactment of cyber security controls and compliances.

i. SOC function - works related to 24 x 7 monitoring at Security operation Centre (if established at the organizational level) and

analysis of the events thereof, . With future growth and possibility of establishment of NOC (Network Operation Centre), SOC at unit level etc. the requirement may also increase.

ii. CISO, CERT GO related coordination with stakeholders, CERT-In, NCIIPC

iii. ISMS compliance

iv. Real-time Cyber security monitoring

6. Support Functions– Contract Services, Finance and Human Resources

For efficient running of the LDCs the support functions like HR/ Admin, Finance, Planning, Vigilance, Contract service, Legal etc. play a very important role. The Work place policies keep up with necessary protective measures and implementation and provide solutions to issues between team members, avoiding risk for the company and its employees. The financial information are required to operate effectively and efficiently, keeping the overall guidelines and direction.

Functions, roles and responsibilities of **Support Functions** are as follows:

Finance & Accounts : Revenue Accounting & Reconciliation, Pool Accounts & STOA - Accounting & Reconciliation, Third party payment (CAPEX/REPAX/Opex, Admin exp.) - Accounting, Payments, MIS, Maintenance of BG, Establishment - (Salary & Employee Claims, Loans and Advances) - Payments to employees viz Salary, TA, Medical, Contingent claims, Lease payments, Tax calculation, Issuance of Form 16, Filing of quarterly and annual TDS returns, Payment to retired Employees claims, Financial Concurrence and Committee works, Banking , Payment to employees & Third party on daily basis, Bank Reconciliation, Liaoning with bank, Taxation - Deposit of monthly tax, Filing of Quarterly & Annual return, TDS reconciliation, Coordination with Income Tax Deptt. GST Returns & Compliance, internal, statutory and CAG audits etc.

HR/HRD & Admin : Performance Appraisal & Coordinating Promotion, HRD, HR Operation, Social Security and Compliances including IMS/ DPE/ MoP/ CERC etc., Recruitment, HR Operation, Social Security and Compliances including IMS/ DPE/ MoP/ CERC etc., House Keeping, Despatch, Reception & Visitor Management; Welfare, AMS, Sports, Other agencies; Ergonomics & ambience - Furniture, Lighting, Acoustics, horticulture, Public Address System etc.

Contract Service: Quotation collection, tender preparation, GeM portal, Bid processing, opening, Placing of LoA/PO, Contract closing.

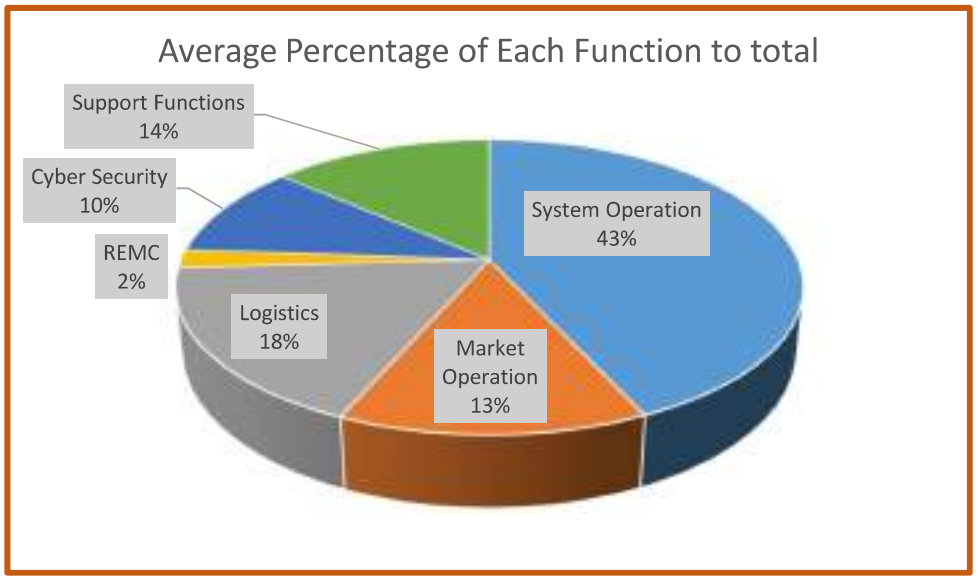
7. Summary of Function-wise Allocation of FTEs in LDCs are follows:-

Table 2- Function-wise Workforce allocation

LDCs - Workforce Staffing Norms						
SN	**Function**	**NLDC**	**RLDC**	**Large SLDC**	**Medium SLDC**	**Emerging SLDC**
System Operation						
1	System Operation - Operational Planning	18	18	18	16	9
2	Real Time Grid Operation (For SO only)	31	31	31	26	18
3	Post-Despatch	10	10	10	10	4
Sub -Total (SO)		**59**	**59**	**59**	**52**	**31**
Market Operation						
4	Open Access Administration	5	4	4	1	1
5	Market Coordination	4	4	4	3	1
6	Inter-face Energy Metering, Accounting and Settlement	10	8	8	4	1

7	Regulatory Affairs, Market Operation Planning and Coordination	7	5	5	1	1
Subtotal - MO		**26**	**21**	**21**	**9**	**4**
Logistics						
8	Logistics _Operation technology	15	14	14	8	3
9	IT Logistics	9	9	9	6	3
10	Communication Logistics	4	4	4	2	2
Subtotal - Logistics		**28**	**27**	**27**	**16**	**8**
REMC						
11	REMC Logistics	3	3	3	2	1
Cyber Security						
12	**Cyber Security**	**17**	**8**	**14**	**13**	**10**
Support Functions						
13	Contract Services	3	3	3	2	2
14	Finance and Accounts	9	9	9	5	3
15	HR & Admin	8	8	8	4	3
Subtotal -Support Functions		**20**	**20**	**20**	**11**	**8**
Grand-Total		**153**	**138**	**144**	**103**	**62**

Figure 4- Average percentage of each function



Level-Wise Requirement

In order to facilitate decision making and empower control rooms and functions to take decisions independently without any time lag and waiting for approval for all actions, it is imperative that appropriate senior level persons are deployed at every level.

Table 3- Level-wise Requirement at each LDC

Level	Percentage of total Workforce in LDCs
Top Management	1 %
Senior Management (experience of 20 years & above)	9 %
Middle Management (Experience of 15 -20 Years)	20 %
Working Executives (experience of below 15 Years)	70 %

a. Top Management:

Head of LDC- All LDCs are required to be headed by senior level executive, as they are required to interact with external stake-holder and give inputs. Hence, experienced and senior person is required who is able to communicate with all institutions such as SERCs, STUs & SLDCs and interact with head of institutions, at the level of Secretary of State Energy dept., CMD / Directors of other Power Utilities etc.

b. Senior Management:

i. They typically serve as Heads of functions (based on their seniority. Further, it is essential to keep succession planning in mind and these

senior executives shall take the roles of Head of LDCs / future Directors of similar institutions.

ii. Represent LDCs at various forums and multi-lateral agencies. They are responsible for motivating their teams, leading and coordinating efforts, and have to undertake assignments.

c. Middle Management Level

Will head each shift group and divisions, within functions in LDCs including function like HR, Finance etc. It is essential that he/she is given responsibility to ensure that there is independent real-time decision making. They are empowered to take complex actions and decisions. Thus, there is decentralization of authority and responsibility.

d. Working Level

These are working and learning levels and these employees progress through the hierarchy to take more responsibilities.

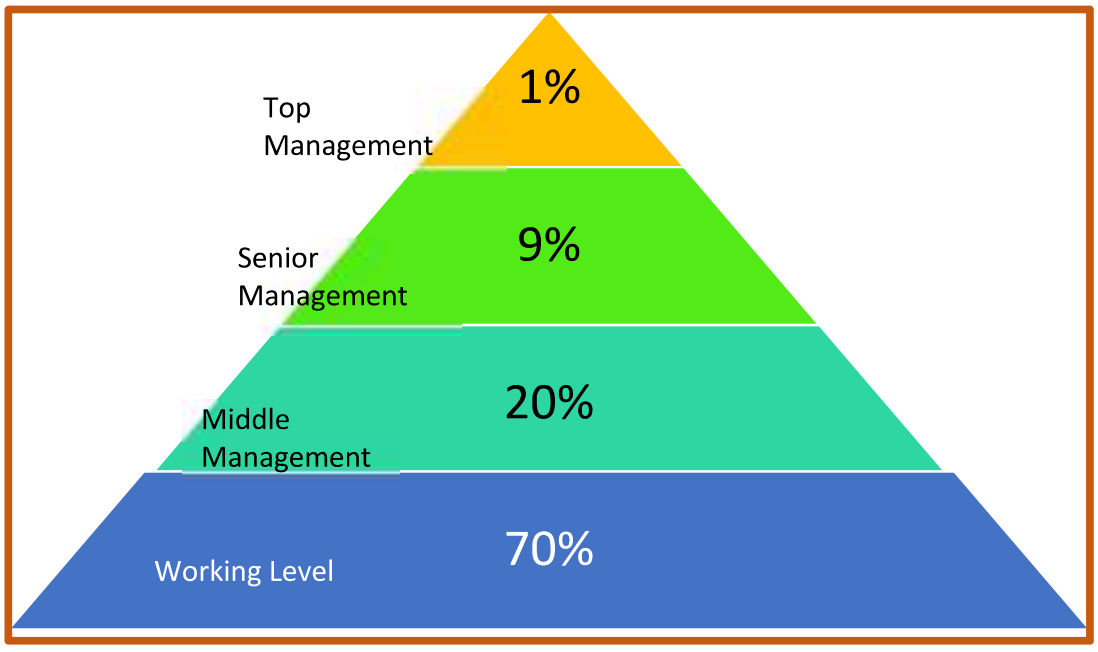


Figure 5- Level-wise distribution of Workforce

Creating Skilled and Motivated Workforce at LDCs

i. Training of System Operators

System operators need to be up-to-date with the evolving technology, policies, rules, standards, regulations, procedures and best practices. Therefore, capacity building through training and refresher programme has been implemented through National Power Training Institute (NPTI) for Load Despatchers. It is categorized into 3 levels - Basic Level, Specialist Level and Management Level. Basic Level System Operation programme is the foundation course required for all System Operators and can also be attended by those posted in other functional areas in LDCs. Basic Level Course on Cyber Security is required for those posted in IT & OT functions. The specialist courses on topics such as Reliability, Regulatory Framework in Power Sector, and Advanced course on Cyber Security are available for experienced specialist professionals employed in these respective fields in LDCs. The payment of Tuition fee for these courses is exempt for employees of SLDCs. Detailed list of Training Courses for LDC personnel is given at **Annexure-I.**

In addition to this, LDC personnel should also be encouraged to pursue online training and certification available at several national and international academic institutes and offered by Massive Online Open Courses (mooc) platforms such as LinkedIn Learning, Edx, Coursera etc. Learning has evolved from structured learning programs to individualised learning journeys where the content, pace, and assessment of the learning are tailored to the individual learner's needs and preferences. This approach allows learners to set their own learning goals. The learning journey must align to employees' career advancement as well as bridge the gaps between the present skills, knowledge and behaviours to what is required to meet future challenges and promote the mantra of 'Learning on the go'. Forum of Load Despatchers (FOLD) can also evolve its own e-learning platform, to cater to unique requirements of system operators.

ii. Certification of System Operators & Fixed Retainer-Ship Incentives

Presently, National Power Training Institute (NPTI) has been entrusted as Nodal Agency for Training & Certification of System Operators and various certification exams for Basic and Advance Level are being conducted by NPTI. List of training/certification programs is given at Annexure-I. As per Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2022, Ref No. CEA-PS-16/1/2021-CEI Division, dated 8th June 2023, "***no personnel shall be engaged as Load Despatcher without certification***". For details guidelines regarding mandatory Training & Certification of Basic and Advance Level refer Central Electricity Authority's *"**Statutory Guidelines for Training and Certification of Load Despatchers & Recognition of Training Institutes' January 2024".***

The Load Despatchers who acquire the certificate of basic level and of advance level in their respective area of specialization shall be allowed a fixed retainer-ship amount during the validity of such certificate period in line with the Central Electricity Authority's "**Statutory Guidelines for Training and Certification of Load Despatchers & Recognition of Training Institutes' January 2024.**

iii. Short term exposure Programme for System Operators

Power system operators should have the necessary education and training to perform their duties, and should be regularly updated on new technologies and industry developments, there should be concerted efforts to increase collaboration and communication among System Operators from LDCs. A Short-Term Exposure Programme has been envisaged to provide opportunity the system operators to learn from each other and to propagate best-practices. Rotation of System Operators would also enhance cohesive working and coordination in operations. The programme will include 2-10 days' duration rotational assignments to other LDCs. The officials from one LDC will be rotated to other LDCs in System Operation, Market Operation and Logistics functions. Detailed modalities of the Short-Term Exposure Programme are given **as Annexure- II.**

iv. Tenure of Posting in SLDCs

Reliable and safe operation of power systems is critical to the country. Tacit knowledge gained through practical experience is essential for handling minute to minute challenges and for training new entrants. Therefore, a minimum posting for a period of three years is recommended for any official posted in SLDC. Any person posted in an LDC shall be provided training and must acquire relevant basic level certificate within six months of being posted in the LDC.

v. Creating a Progressive Culture

LDCs play a critical role in ensuring the reliability and efficiency of the electric power grid. Organizational culture, the values, beliefs, and practices that shape how an organization functions.

There have been immense transformations in the power sector resulting into an increase in the scope, volume and complexities of all the functions. LDC's external business environment has always been fast-evolving, requiring continuous knowledge upgradation and inherently challenging. The years ahead will bring additional challenges, both anticipated and uncertain. LDC's success in meeting them will depend largely on an engaged, highly skilled and motivated workforce.

In order to build competence and ensure that LDCs are able to deliver high levels of performance, due importance must be given to developing a progressive culture and creating an ecosystem that values employees and empowers them.

A strong organizational culture can help establish trust with stakeholders, by promoting transparency and consistency, LDCs can demonstrate its commitment to fair and impartial decision-making internally and externally.

When employees feel that they are valued and respected, they are more likely to be committed to the organization and motivated to perform at their best.

A positive organizational culture can improve communication and collaboration among employees, which can help ensure that the grid is operated in a safe and efficient manner. It can help in building teamwork and trust among employees, resulting in better coordination and better outcomes.

An LDC's culture plays an important role in encouraging innovation, improving communication, attracting and retaining talents and maintaining safety and compliance. A strong, positive culture can help the LDCs operate more effectively and efficiently, and ultimately better serve the nation.

LDCs must create and provide opportunities to their employees for continuous professional development, employees must be given exposure and networking opportunities to interact and network. LDCs must participate in national and international for a such as FOLD, NPSC etc. Mentorship must be provided to the new joinees in the organization in order to assimilate and socialize them to the culture. Reward and recognition mechanisms must be designed to recognize high performance individuals, motivate and reward them.

Behavioral Training on topics such as communication skills, leadership skills and skill based training on topics such as Data Analysis. It is important to develop strong values and ethics in the organization to develop high performance culture which empowers every employee.

Apart from Training and Certification, clearly defined procedures and protocols for handling different types of situations help create clearly defined goals for System Operators and enables them to do carry out their functions effectively. Established performance parameters for organisations, departments and individuals such as Key Performance

Indicators (KPIs), Annual Appraisal for System Operators help peomote accountability and excellence. These create a positive work environment, where everyone is aware of their goals, roles and responsibilities and is responsible for outcomes.

Tools and processes must be established to ensure that there is communication and collaboration among all System Operators, especially among different shift groups, off-line studies, post-despatch functions. Special measures such as peer-to-peer learning sessions mjust be organised to ensure this.

Conclusion

Given the strategic and unique nature of LDC's operations, it is important to ensure sufficient bench strength for diverse functional areas and adequate talent pool for leadership roles at senior and top management. Optimal deployment of human resources is imperative for employee satisfaction and motivation across functions, regions and levels. Deployment of additional HR coupled with their capacity building as detailed above, is vital to effectively carry out the statutory/corporate roles and responsibilities at present and in the future to the satisfaction of all its stakeholders.

List of Tables

List of Figures

List of Abbreviations

1. LDCs- Load Despatch Centres
2. VUCA- Volatile Uncertain Complex and Ambiguous
3. REMC- Renewable Energy Management Centre
4. FTE- Full Time Equivalent
5. ESCerts- Energy Saving Certificates
6. RPO- Renewable Purchase Obligation
7. HPO- Hydro Purchase Obligation
8. REC- Renewable Energy Certificate
9. PAT- Perform Achieve Trade
10. CISF- Central Industrial Security Force
11. PSDF- Power System Development Fund
12. CERC- Central Electricity Regulatory Commission
13. CEA- Central Electricity Authority
14. MoP- Ministry of Power
15. CERT-GO- Computer Emergency Response Team Grid Operator
16. IMS- Integrated Management System
17. IT- Information Technology
18. OT- Operational Technology
19. NOAR- National Open Access Registry
20. SCED- Security Constrained Economic Despatch
21. AGC- Automatic Generation Control
22. EV- Electric Vehicles
23. DAM- Day Ahead Market
24. RTM- Real Time Market
25. STATCOM- Static Synchronous Compensator
26. SVC- Static Var Compensator
27. HVDC- High Voltage Direct Current
28. UFR- Under Frequency Relays
29. ROCOF- Rate of Change of Frequency
30. SPS- Special Protection Schemes
31. RPC- Regional Power Committee
32. FOLD- Forum of Load Despatchers
33. MIS- Management Information System
34. STOA- Short Term Open Access
35. SCADA- Supervisory Control and Data Acquisition
36. ICT- Information Communication Technology
37. PMU-Phasor Measurement Unit
38. RTU-Remote Terminal Unit
39. EMS- Energy Management System
40. UPS- Uninterruptible Power Supply
41. DG- Diesel Generator
42. CISO- Chief Information Security Officer
43. PLCC-Power Line carrier Communication
44. GPRS- General Packet Radio Service
45. VSAT-Very Small Aperture Terminal
46. ISMS- Information Security Management System

References

1. Report of Committee on 'Manpower, Certification, and Incentives for System Operation and Ring-fencing Load Despatch Centres
https://forumofld.in/wp-content/uploads/2020/09/Pradhan_Committee_Report.pdf

2. Report on 'Capacity Building of Indian Load Despatchers'(CABIL)-
http://www.forumofregulators.gov.in/data/reports/for%20report%20cabil.pdf

3. GRID - INDIA Vision 2030 document

4. Report on the Grid Disturbance on 30th July 2012 and 31st July 2012
https://cercind.gov.in/2012/orders/Final_Report_Grid_Disturbance.pdf

5. Ministry of Power order dated 18th March 2021, regarding establishing CERT-GO to be housed at GRID - INDIA

Annexure – I: Training and Certification Program for capacity building

1. System Operator Training Programmes

SN	Name of the Training Program	Level
1	Basic Level Programme on Power System Operation	Basic
2	Power Market	Specialist
3	Regulatory Framework in Power Sector	Specialist
4	Power System Logistics	Specialist
5	Power System Reliability	Specialist
6	RE source and Grid Integration	Specialist
7	Familiarization on Despatcher Training - Simulator	-
Cyber Security (Training cum Certification)		
8	Training and Certification Program on Cyber Security	Basic
9	Training and Certification Program on Cyber Security	Intermediate
10	Training and Certification Program on Cyber Security	Advance

2. System Operator Certification

SN	Name of the Certification	Level
1	Basic Level Power System Operation Certification	Basic
2	Advance Level Power System Reliability Certification	Specialist
3	Advance Level Regulatory Framework in Power Sector Certification	Specialist
4	Advance Level Market Operation	Specialist
5	Adance Level Power System Logistics Certification	Specialist

Annexure – II: Short Term Exposure Program

A Short-Term Exposure Programme to facilitate rotation of System Operators, to enhance cohesion and exposure among System Operators in LDCs is being implemented for all State Load Despatch Centres, Regional Load Despatch Centres and National Load Depatch Centre. The objective of this programme is to propagate best-practices, facilitate peer-to-peer learning from each other and propagate best-practices through hands on exposure of real time working of other LDCs This will be beneficial for new and emerging SLDCs, where resource adequacy concerns for multi-tasking executives have been expressed. The planned exposure programme comprises of rotation of LDC officials to other LDCs for a duration of Two to Ten Days.

1. Modalities
    a. Rotational assignments will be done on reciprocity basis. Generally, the ratio of requirement and number of persons to be rotated will endeavoured to be kept as 1:1, however, in certain cases especially for emerging LDCs this can be relaxed.
    b. All LDCs will analyse their own requirement, work out number of officers they wish to post to other LDCs for exposure, clearly specifying periods of assignments in both cases. Each LDC can prepare an **Annual Rotation Plan** for – (i) officials they wish to rotate to other LDCs and (ii) officials they can host in their LDC, keeping in mind their Human Resource Adequacy.
    c. The host organization may design specific programme including a few class-room sessions to facilitate the learning delivery in share with the visiting organization beforehand.
    d. In order to leverage familiarity and already established sense of comfort, initially the rotation will be within the same region.
    e. The Rotation will be in the areas of System Operation, Market Operation, Logistics and REMC Functions.

f. Any short-term assignment will be for a minimum period of 2 working days but not exceeding 10 working days in total.

2. Eligibility:-
    a. All LDC officials working in System Operation, Market Operation, Logistics and REMC functions will be eligible to be rotated to other LDCs.
    b. LDC officials should have minimum 1 year or regular service in an LDC before they can be considered for the exposure programme.

3. Execution
    a. LDCs can send their Annual Rotation Plan to the Forum of Load Despatchers (FOLD) Secretariat at the beginning of the Financial year.
    b. FOLD secretariat will compile requirements and assist in devising a Region-wise rotational plan on round-robin basis so that Human Resource adequacy is maintained at all Load Despatch Centres.
    c. This programme is focused on increasing capacity building of SLDCs, therefore, the focus must be on giving exposure to SLDC officials. However, to kickstart the programme, RLDCs and NLDC will start by posting their officers out to SLDCs and host officers from other LDCs in their region. FOLD Secretariat will coordinate the liasoning with LDCs, if require. Travel arrangement including accommodation & logistics will be done by respective LDCs.

4. TA/DA including accommodation expenses will be borne by the parent organization as per their rules. Host organization will not be obligated to provide any facility to the visiting officer.

Annexure to Short Term Exposure Programme:- Requirement Detail Format

Name of the LDC _____

Total number of Job Roles identified for officers from other LDCs_____

Details of the roles identified for officers from other LDCs

Sl. No.	Department	Area of the task/ project	Proposed Assignment Details (To which the officer from LDCs will be deputed)	Proposed Period of the Assignment (Start Date & End Date)

GUIDELINES FOR DEPUTATION OF WORKFORCE FROM STATE LOAD DESPATCH CENTRES TO GRID-INDIA FOR FIXED TERMS

Table of Contents

A. Objective

1. Load Despatch Centres (LDCs) play a very important role in secure and reliable operation of the Grid. Grid Management has become challenging and complex. With such a vast size of the Grid, LDCs play an important role in facilitating the energy transition towards a sustainable and decarbonised electricity grid. Human Capital is the most important Asset in any organizational setup. Human Resource adequacy has a direct effect on performance and efficiency of all functions and activities. Since LDCs carry out mission critical activities on a 24X7 basis, the availability of trained human resources in the Load Despatch Centres is critical for reliable and efficient power supply. These guidelines have been formulated to strengthen the Load Despatch Centres by facilitating mobility of trained skilled human resources and thus, bolstering cooperation and cohesion.

2. To achieve these aims of improving cooperation across Load Despatch Centre (LDCs) and introducing cohesion in functions and propagating best-practices, a focused effort to enhance Human resource inter-change within LDCs is required. For this, Load Despatchers from SLDCs must be given adequate exposure and opportunities for career growth and learning. There should be regular exchange of Human Resources amongst the LDCs, especially SLDCs and Grid-India to facilitate better coordination, camaraderie and create a nation-wide Power System Operator talent pool.

3. In addition to the training and experience that load dispatchers receive during the recruitment process at the State Load Despatch Centre (SLDC), it is imperative to provide them with comprehensive exposure and prospects for career advancement and learning. Fostering a consistent exchange learning program between SLDCs and Grid-India thus becomes crucial. To support the developmental journey of SLDCs and enhance their learning experiences, Guidelines for Deputation of Workforce from SLDCs to GRID-INDIA for fixed terms have been drafted. Through this initiative, System Operators from SLDCs will get the chance to undergo training and hands-on work exposure at GRID-INDIA for a specified duration on fixed-terms deputation basis.

B. Methodology

1. A scheme has been formulated to provide an opportunity to eligible System Operators from State Load Despatch Centres (SLDCs) for exposure of working in Load Despatch Centres at Regional or National Level. The deputed officer will be given adequate training, work exposure etc. in Grid-India. The pay and perks of the officer during the period of deputation to GRID-INDIA will be as per applicable DPE guidelines.

2. Invitation for deputation from SLDCs will be sent annually by RLDCs and NLDC. Total workforce in Grid-India, which will be on deputation from SLDCs would be capped at 10% of the eligible technical executive strength in respective RLDCs/NLDC. Though, to start with this number may be kept as 1 % of the total eligible technical executive strength at a particular RLDC and may gradually be increased upto 10 % of the eligible technical executives of the RLDCs as the programme progresses. The officer on deputation from SLDCs will be given comprehensive exposure in the areas of System Operators, Market Operation and Logistics.

3. In order to ensure that there is uniformity across RLDCs and NLDC, the invitation to SLDCs for **deputation at RLDCs and NLDC will be for posts equivalent to the levels of E3 to E6 in Grid-India.**

4. The details Job description and responsibilities are given at Annexure.

5. The scheme is proposed to be rolled out by 2025, when mandatory certification of System Operators comes in to affect.

6. The System Operators from SLDCs will apply to Grid-India based on the annual vacancies released by RLDCs/NLDC. They will be shortlisted against the Job Description and thereafter selected through interview and other screening mechanisms, introduced as deemed fit.

7. **Duration of Deputation-** This exposure will be for a period of six months to three year on deputation basis.

8. **Mode of Deputation:** Through notification floated by RLDCs and NLDC, inviting applications for willingness from SLDCs executives. Since the approach is to fill the gap in terms of staffing numbers, skill sets and to enhance mobility for strengthening the LDCs, the vacancies may be operated Region-wise (WR, NR, ER, SR & NER).

9. **Mode of selection:** The selection will be done on merit basis (criteria for drawing the merit will be decided based on relevant factors) for the sanctioned vacancies for each region. The candidate meeting the criteria in the annexed job description will be further interviewed and assessed for suitability as required.

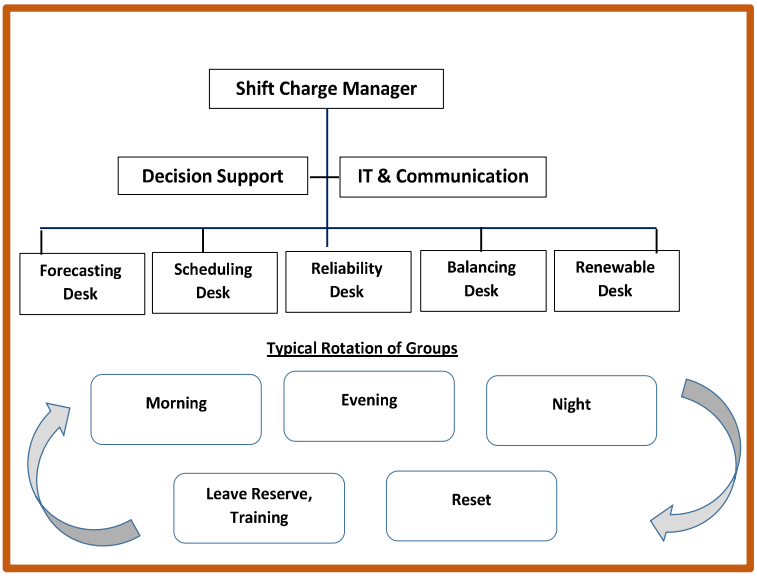
10. Consent of concerned SLDC will be obtained by the applicant at the time of forwarding of application.

C. Functional Domains Identified for Deputation

1. **System Operation**

The System Operation (SO) function covers operational planning (including assessments, studies, crew management), real-time operation (including scheduling, forecasting, outage planning and reporting) and post despatch analysis (including reporting, MIS, feedback, and analytics) and all operational functions pertaining to REMC etc.

Figure 1- Organogram of Real-time shift operation



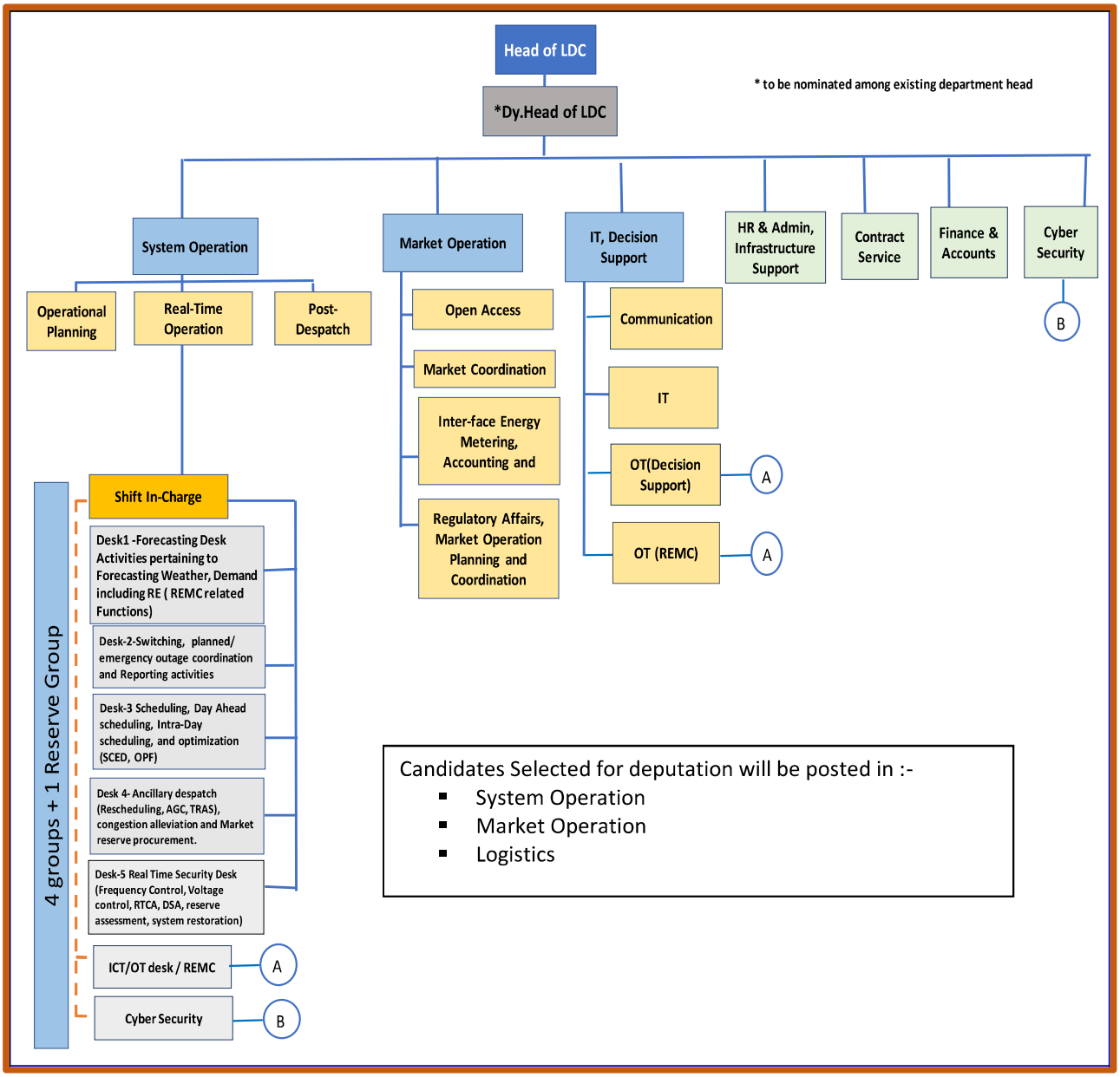
2. Market Operation

The Market Operation (MO) function covers open access administration, day ahead market, real-time market, energy accounting and settlement activities, regulatory functions etc. Market Operation function is an evolving Dynamic Function, which is changing due to various regulatory initiatives and reforms. Market Operation has been organized under 4 divisions - Open Access, Market Coordination, Inter-face Energy Metering, Accounting and Settlement, Regulatory Affairs.

3. Logistics

Logistics functions is essential to maintain situational awareness and support decision making in real-time. Technology plays an increasingly important role in Grid Management and will continue to increase in scope and importance. Logistics has e been organised in 4 divisions which are:- i. Operation Technology; ii. Renewable Energy Management Centres; iii. Information Technology; iv. Communication.

Figure 2- Organogram of Typical LDC


Head of LDC
*Dy.Head of LDC
* to be nominated among existing department head
System Operation
Market Operation
IT, Decision Support
HR & Admin, Infrastructure Support
Contract Service
Finance & Accounts
Cyber Security
Operational Planning
Real-Time Operation
Post-Despatch
Open Access
Market Coordination
Inter-face Energy Metering, Accounting and
Regulatory Affairs, Market Operation Planning and Coordination
Communication
IT
OT(Decision Support)
OT (REMC)
A
B
4 groups + 1 Reserve Group
Shift In-Charge
Desk1 -Forecasting Desk Activities pertaining to Forecasting Weather, Demand including RE (REMC related Functions)
Desk-2-Switching, planned/ emergency outage coordination and Reporting activities
Desk-3 Scheduling, Day Ahead scheduling, Intra-Day scheduling, and optimization (SCED, OPF)
Desk 4- Ancillary despatch (Rescheduling, AGC, TRAS), congestion alleviation and Market reserve procurement.
Desk-5 Real Time Security Desk (Frequency Control, Voltage control, RTCA, DSA, reserve assessment, system restoration)
ICT/OT desk / REMC
Cyber Security
Candidates Selected for deputation will be posted in :-
System Operation
Market Operation
Logistics

D. Annexure: Job Description and Responsibilities

1. Responsibilities

The System Operator plays a crucial role in the operation and management of a power system. The primary responsibility is to ensure the reliable and secure operation of the electrical grid. They continuously monitor the system's parameters, including voltage, frequency, and line flows, and take appropriate actions to balance electricity supply and demand. The selected System Operators will be posted in the following areas of the Load Despatch centres - SO, MO and Logistics. He/she is responsible for the efficient operation and management of a power system, and for achieving the corporate objectives.

2. Eligibility

- **Age & Experience:** Upper age limit (in years) and minimum no. of years of experience as on date of Notification

Level	*Upper Age Limit (in years)	Minimum no. of Years of Post Qualification Experience (excluding trainee period) as system Operators in SLDC (in years)
E3	32	3
E4	35	6
E5	38	9
E6	41	12

* Age relaxation as per govt.norms

- **Qualification:**

I. Graduate in Electrical /Computer Engineering/ IT/Electronics & Communication (Full time).
II. Valid certification as per Power System Operator Training and Certification framework conducted by NPTI (presently).

- **Experience:**

The applicant should have worked three to twelve years (depending on the position notified) as System Operator (excluding training period) in SLDCs in executive cadre as on the date of notification.

- **Pay Scale:** The pay of the officer on deputation will be as per DPE guidelines.

.

E. Terms used:

LDCs	- Load Despatch Centres
RLDCs	- Regional Load Despatch Centres
SLDCs	- State Load Despatch Centres
ER	- Eastern Region
NER	- North-Eastern Region
NR	- Northern Region
SR	- Southern Region
WR	- Western Region
SO	- System Operation
MO	- Market Operation
REMC	- Renewable Energy Management Centres
RES	- Renewable Energy Source
OT	- Operation Technology

F. Table of Figures

Annexure-2.7

Loc no. 18 of 132KV Jiribam-Loktak

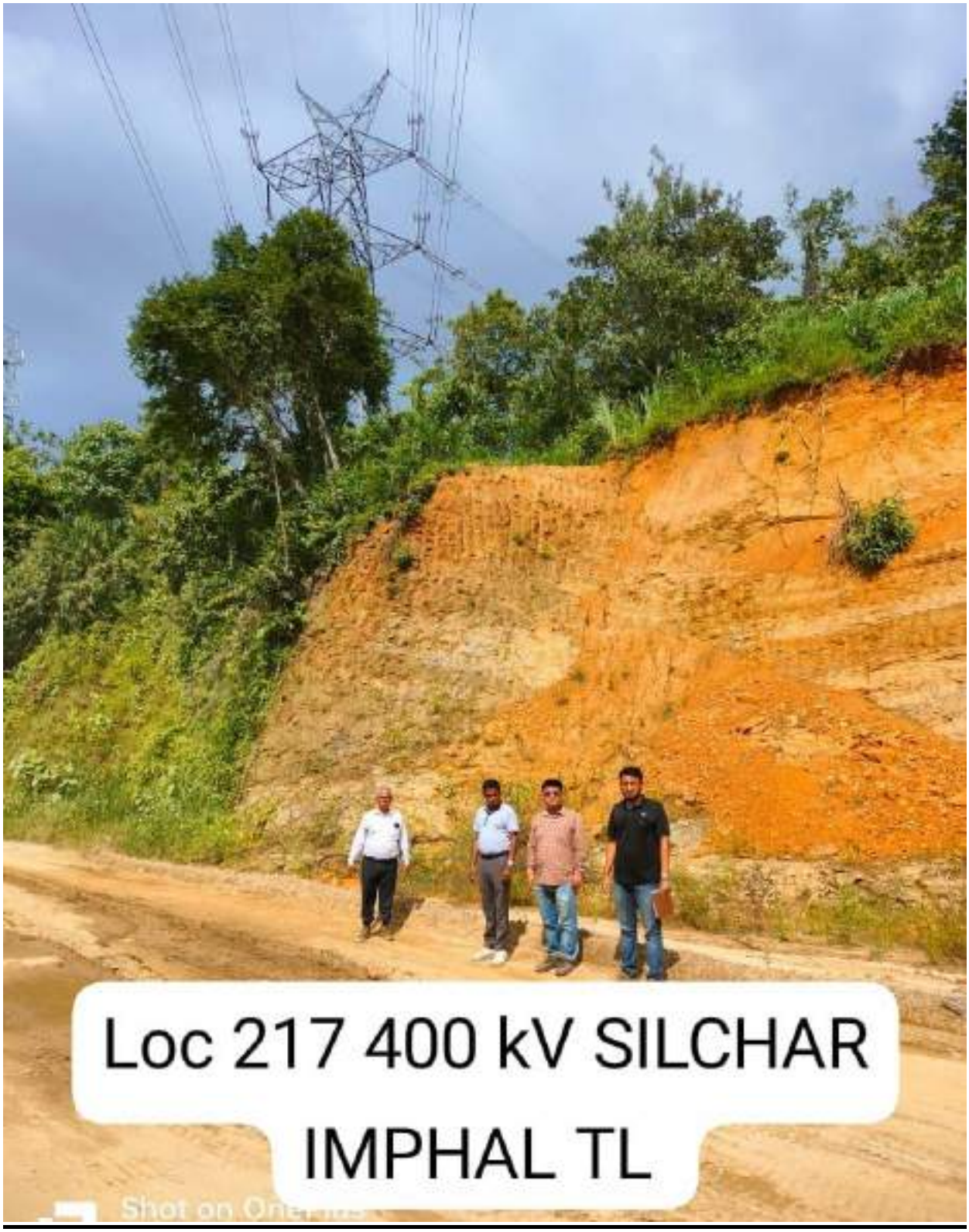
Loc No. 52 of 132KV Jiribam-Loktak

Loc No. 129 of 132KV Jiribam-Loktak

Loc No. 130 of 132KV Jiribam-Loktak

Loc 201 400 kV SILCHAR

LOC NO 336 OF 400KV D/C SILCHAR-IMPHAL LINE


Loc 217 400 kV SILCHAR
IMPHAL TL

Annexure-3.6

ONGC TRIPURA POWER COMPANY LIMITED
ओएनजीसी त्रिपुरा पावर कम्पनी लिमिटेड

Blending Proposal

Gas Blending at OTPC Palatana Station for Maximizing Availability for Beneficiaries

Gas Supply Position in India

Plant	Installed Capacity (MW)	Domestic Gas Allocated (MMSCMD)	Gas Supplied (MMSCMD)	RLNG Imported (MMSCMD)	RLNG Used (MMSCMD)	% Gas/RLNG Supplied
Central Sector North Region	2344	9.08	0	2	0.7	6.3
Central Sector Western Region	3280	17.41	0	1.75	0.58	3
Central Sector NE Region	1253	5.30	5.1	0	0	96
State Sector North Region	2704	8.74	2.53	0.8	0.75	35
State Sector Western Region	2850	7.85	1.14	0.5	0	14
State Sector South Region	661	3.30	1.46	0	0	45
State Sector NE Region	466	2.46	1.96	0	0	80
Total	13558	54.14	12.19	5.05	2.03	24

- CEA Gas Supply Data for FY 22-23

Gas Generation NE Vs Rest of India

FY 23-24	Installed Capacity (MW)	Gas Based Capacity (MW)	% of Gas Capacity
All India	417668	24824	6 %
NE Region (Central Sector)	3472.6	1152.6	33.19 %

- Source MoP Website and REA by NERPC
- As compared to Rest of India, NE Region is significantly dependent on Gas based generation
- NE Region has the highest Gas Supply in India to both Central and State Sector projects
- NE Region is the only area in India where gas stations are operating at good PLFs

Gas Station Performance FY 23-24

Region	Monitored Capacity (MW)	Target (Mus)	Actual Generation (Mus)	PLF %
Northern	5995	9035	7266	13.88
Western	10806	8380	12155	12.81
Southern	6482	4050	2145	3.77
Eastern	80	0	0	0
North Eastern	1665	10535	9728	66.52
All India	**25028**	**32000**	**31295**	**14.26**

- Source CEA Report on Energy Generation Programme and PLF of Gas Stations
- NE Region with lowest monitored gas capacity is providing highest PLF for Gas Stations
- Palatana FY 23-24 generation – 4575 MUS (Gross), 4383 Mus (Net Export)
- Nearly 50% the total gas MUs generation (including state generation) in NE comes from Palatana

Palatana Performance

FY	PAF %	PLF %
14-15	77.29	77.52
15-16	56.03	54.58
16-17	66.76	65.17
17-18	66.05	62.8
18-19	74.69	73.28
19-20	62.66	60.58
20-21	81.45	79.52
21-22	64.9	64.19
22-23	77.58	77.03
23-24	70.95	70.78
24-25	59.73	59.15
Average	68.76	67.54

- Apart from Gas reservoir issues in FY 15-16, Palatana has been operating successfully
- PAF and PLF of Palatana have been very close signifying high demand of Palatana Power by beneficiaries
- Depressed gas supply in FY 24-25
- Fuel supplier exploring supply from new gas wells but future remains uncertain
- OTPC has been exploring alternative gas options
- Palatana cash flows severely strained and need to look for alternative gas supply options to stay operational and solvent
- Gas Supply offer received from GAIL

Offer from GAIL

- GAIL has offered upto 0.3 MMSCMD alternative fuel gas to OTPC via Indhradhanush Gas Grid Ltd (IGGL) network/GAIL Network/ONGC Network.
- Alternative gas shall be at a price determined as per MoPNG-PPAC (Petroleum Planning and Analysis Cell) notification for new domestic gas pricing dated 7th April 2023.
- As per the notification, gas from new wells or well interventions in nomination fields shall be at a premium of 20% on APM prices plus taxes and duties.
- The allocation shall be for 3-5 years with suitable take or pay obligations
- The monthly gas prices under the policy shall be determined and published dynamically by PPAC each month. (sample enclosed)
- Landed price for additional 0.3 MMSCMD of gas from GAIL to OTPC under the policy is expected to be USD 12/MMBTU (including marketing margin, Tripura VAT and Road Cess).

Effect on Palatana Tariff

- The existing fuel supplier has indicated a gas supply of 2.18 - 2.38 MMSCMD from existing wells.
- Based on existing gas supplies upto 2.38 MMSCMD and GAIL's offer of 0.3 MMSCMD additional gas at USD 12/MMBTU, the blending of gas at Palatana at various combinations shall effect the power tariff as below:

Gas from Existing Arrangement (MMSCMD)	PAF with existing gas	Alternate Gas Arrangement (MMSCMD)	Blending Ratio	PAF After blending	Blended Cost ECR (Rs/Unit)	Existing FC (Rs/Unit)	Total Blended Tariff (Rs/Unit)
2.38	68 %	0.15	6.30 %	72 %	2.46	1.28	3.74
2.38	68 %	0.30	12.61 %	80 %	2.63	1.28	3.91
2.38	68 %	0.50	21.01 %	85 %	2.98	1.28	4.26

Effect on Palatana Tariff

Gas from Existing Arrangement (MMSCMD)	PAF with existing gas	Alternate Gas Arrangement (MMSCMD)	Blending Ratio	PAF After blending	Blended Cost ECR (Rs/Unit)	Existing FC (Rs/Unit)	Total Blended Tariff (Rs/Unit)
2.18	62 %	0.15	6.88 %	66 %	2.49	1.28	3.77
2.18	62 %	0.30	13.76 %	72 %	2.78	1.28	4.06
2.18	62 %	0.50	22.94 %	80 %	3.01	1.28	4.29

- Palatana Tariff shall stay within a range Rs 3.74 per unit (blending of 0.15 MMSCMD) to Rs 4.29 per unit (blending of 0.5 MMSCMD) depending on alternate gas blending.
- Palatana tariff shall still be very competitive to other thermal (coal and gas) stations in NE region.

Tariff Comparision

- Despite blending of gas at a high price, Palatana tariff shall continue to remain very attractive and cheapest of the thermal station in NE region. Even below the APPC of beneficiary states.

- A tariff comparision with other comparable projects in NE region is depicted below:

Project	Fixed Cost (Rs/Unit)	ECR (Rs/Unit)	Total Tariff (Rs/Unit)
Bongaigaon Thermal	2.40	3.43	5.83
Assam Gas Based Power Plant (Kathalguri)	2.65	4.60	7.25
Agartala Gas Based Power Station	2.18	4.39	6.57
Rokhia GTPS	0.67	5.90	6.57
Baramura GTPS	1.26	5.90	7.16
Average Power Purchase Cost of NE States	-	-	Above 4.5 – 5
Palatana (after blending 0.5 MMSCMD additional gas)	1.28	2.98	4.26
Palatana (after blending 0.3 MMSCMD additional gas)	1.28	2.63	3.91

Palatana Current Tariff

Year	Amount (Rs Cr)	Energy (MUs)	Rate Monthly (Rs./kWh)
Apr-2024	96.17	282.06	3.41
May-2024	103.64	285.37	3.63
Jun-2024	92.45	271.55	3.40
Jul-2024	82.57	244.04	3.38
Aug-2024	88.37	270.98	3.26
Sep-2024	99.10	278.21	3.56
Oct-2024	104.82	308.68	3.40
Nov-2024	108.27	310.06	3.49
Dec-2024	109.51	324.98	3.37
FY-2024-2025	884.89	2,575.93	3.44

ONGC Tripura Power Company Ltd.

- Palatana Normative Tariff
  - ECR – Rs 2.105 per unit
  - FC – 1.28 per unit
  - Total – Rs 3.30 per unit
- Palatana Actual Landed Tariff
  - Varies for each state
  - Rs 3.44 per unit average
- Variation due to
  - Scheduled Energy
  - Spread of AFC over schedule
  - Plant parameters

Blended Tariff Impact

- Though GAIL has offered 0.3 MMSCMD, we are seeking approval for upto 0.5 MMSCMD
  - To avoid repetitive approvals

- Blended Tariff at 0.3 MMSCMD blending shall be:
  - Around Rs 3.91 per unit at blending of 2.38 MMSCMD + 0.3 MMSCMD
  - Present Palatana landed tariff Rs 3.44 per unit
  - Increase of around **45-55 paisa per unit**

- Blended Tariff at 0.5 MMSCMD blending shall be:
  - Around Rs 4.26 per unit at blending of 2.38 MMSCMD + 0.5 MMSCMD
  - Present Palatana landed tariff Rs 3.44 per unit
  - Increase of around **75-85 paisa per unit**

- Actual blended tariff expected to be better than above estimates
  - Better SHR
  - Low AUX
  - Temperature parameters

Market Scenario

FY	IEX MCP At Regional Periphery (Rs/Unit)	Landed Price for NE state (Rs/Unit)	Bilateral Market Prices (CERC Market Report) (Rs/Unit)
22-23	6.06	6.31	5.21
23-24	5.17	5.42	7.56
24-25	4.46	5	6.7
Palatana Blended Tariff (0.5 MSMCMD)	4.26	4.26	4.26
Palatana Blended Tariff (0.3 MMSCMD)	3.91	3.91	3.91

- Palatana blended tariff shall still be cheaper than the prevailing market prices
- Also cheaper than APPC of most NE states

MUs Impact

State	Allocation (%)	Allocation (MW)	Before Blending	After Blending		Increase in Mus per month (with 2.38 + 0.3)	Increase in Mus per month (with 2.38 + 0.5)
			MUS per month at 68% PAF (with 2.38 MMSCMD Gas)	MUs per month at 80% PAF (with 2.38 + 0.3 MMSCMD blended gas)	MUs per month at 85% PAF (with 2.38 + 0.5 MMSCMD blended gas)		
Assam	33.058	240	117.60	138.35	147.00	20.75	29.40
Tripura	26.997	196	96.04	112.99	120.05	16.95	24.01
Meghalaya	10.882	79	38.71	45.54	48.39	6.83	9.68
Manipur	7.162	52	25.48	29.97	31.85	4.50	6.37
Mizoram	5.785	42	20.58	24.21	25.72	3.63	5.14
Arunachal Pradesh	3.03	22	10.78	12.68	13.47	1.90	2.69
Nagaland	7.162	52	25.48	29.97	31.85	4.50	6.37
Total	94.076	684	334.67	393.73	418.34	59.06	83.67

Financial Impact

State	Increase in Mus per month @2.68 (with 2.38 + 0.3)	Increase in Mus per month @2.88 (with 2.38 + 0.5)	Increase in Tariff per month @2.68 (Rs Crores)	Increase in Tariff per month @2.88 (Rs Crores)
Assam	20.75	29.40	7.48	13.19
Tripura	16.95	24.01	6.11	10.78
Meghalaya	6.83	9.68	2.46	4.34
Manipur	4.50	6.37	1.62	2.86
Mizoram	3.63	5.14	1.31	2.31
Arunachal Pradesh	1.90	2.69	0.69	1.21
Nagaland	4.50	6.37	1.62	2.86
Total	59.06	83.67	21.28	37.55

Proposal

- Being a single plant company, it is essential for OTPC to arrange for alternate gas to stay operational.
- In view of this the forum is requested kindly to:
  - Allow Palatana to source upto 0.5 MMSCMD of alternative fuel gas for blending with existing fuel supplies and to operate Palatana at a good PAF for the benefit of the beneficiary states.
  - Allow sourcing this 0.5 MMSCMD of additional gas at a price as notified by MoPNG/PPAC as per its latest guidelines for a period of 3 years.
  - Allow sourcing this gas for at least a period of 3 years from signing of GSPA
- Your kind support is solicited to keep operating Palatana station successfully and maintaining the solvency of OTPC.

Thank You

Annexure-3.8

Outlook

Re: Fw:

From nasim mallick <nasim.mallick@stltech.in>
Date Thu 2/6/2025 5:57 PM
To Kaushal Suman {कौशल सुमन} <k.suman@powergrid.in>
Cc Tanay Jaiswal {तनय जायसवाल} <tanay@powergrid.in>; Rahul Kumar Shakya {राहुल कुमार शाक्य} <rshakya@powergrid.in>; Naga Pavan Kalyan Kumar {नागा पवन कल्याण कुमार} <Pavan.naga@powergrid.in>; Mandyam Dinesh Sai {} <dineshsai@powergrid.in>; Shiv Kumar Gupta {एस.के. गुप्ता} <shivkumar@powergrid.in>; H S Kaushal {एच.एस. कौशल} <hsk@powergrid.in>

Dear sir,

It is P K Bari (state) node which is Fibcom SDH

BR//
Nasim Mallick

On Thu, Feb 6, 2025 at 5:41 PM Kaushal Suman {कौशल सुमन} <k.suman@powergrid.in> wrote:

> Sir
>
> Kindly confirm whether the details provided in trailing mails are for P K Bari (State) or P K Bari(ISTS).
>
> Regards

From: Tanay Jaiswal {तनय जायसवाल} <tanay@powergrid.in>
Sent: Thursday, February 6, 2025 4:10 PM
To: Kaushal Suman {कौशल सुमन} <k.suman@powergrid.in>
Cc: Rahul Kumar Shakya {राहुल कुमार शाक्य} <rshakya@powergrid.in>; Naga Pavan Kalyan Kumar {नागा पवन कल्याण कुमार} <Pavan.naga@powergrid.in>; Mandyam Dinesh Sai {} <dineshsai@powergrid.in>
Subject: Fw: Fw:

Dear Sir,

This is for info pls.

सादर धन्यवाद / Thanks & Regards,

Tanay Jaiswal Engineer Trainee (UNMS & Metering)
Central Transmission Utility of India Ltd.
(A wholly owned subsidiary of POWERGRID)
5th - 10th Floor, Ircon International Tower-1,
Sector-32, Gurugram, Haryana - 122003
Mobile: +91-8176876372

From: nasim mallick <nasim.mallick@stltech.in>
Sent: Thursday, February 6, 2025 3:52 PM
To: Tanay Jaiswal {तनय जायसवाल} <tanay@powergrid.in>
Subject: Re: Fw:

> You don't often get email from nasim.mallick@stltech.in. Learn why this is important

Dear sir, plz find the attached snaps

On Thu, Feb 6, 2025 at 3:29 PM nasim mallick <nasim.mallick@stltech.in> wrote:

> Dear sir,
>
> Plz find the details

Port Availability (STM-16)				
Location	**OEM**	**Card Name**	**Available Port**	**Remark**
Silchar	Fibcom	simx16m_8-1-11	4 Nos	STM-16 sfp required
		simx16m_8-1-13	4 Nos	STM-16 sfp required
		sim16-1-24	8 Nos	STM-16 sfp required
	Comtel	XS A:XIO16_4	2 Nos	STM-16 sfp required
		XS B:XIO16_4	2 Nos	STM-16 sfp required
		TS5:SMS16	1 No	STM-16 sfp required
		TS6:SMS16	1 no	STM-16 sfp required
PK bari	Fibcom	simx16m_8-1-11	2,7	sfp available in the mentioned port
		simx16m_8-1-13	7,8	sfp available in the mentioned port

Silchar to NERLDC (Shillong) STM-16 Continuous Path	
Location	**OEM**
Silchar	Fibcom
badarpur	Fibcom
Khliehriat	Fibcom
Shillong	Fibcom
Shillong_25	Fibcom
Shillong_new_35	Fibcom

PK_Bari to NERLDC (Shillong) STM-16 Continuous Path	
Location	**OEM**
PK_Bari	Fibcom
RC_Nagar	Fibcom
Kumarghat	Fibcom
badarpur	Fibcom
Khliehriat	Fibcom
Shillong	Fibcom
Shillong_25	Fibcom
Shillong_new_35	Fibcom

On Thu, Feb 6, 2025 at 11:34 AM Tanay Jaiswal {तनय जायसवाल} <tanay@powergrid.in> wrote:

Dear Sh Nasim,

As discussed, Pls follow the trailing mail and provide the necessary information and Screenshot for the same may be shared.

सादर धन्यवाद / Thanks & Regards,

Tanay Jaiswal Engineer Trainee (UNMS & Metering)
Central Transmission Utility of India Ltd.
(A wholly owned subsidiary of POWERGRID)
5th - 10th Floor, Ircon International Tower-1,
Sector-32, Gurugram, Haryana - 122003
Mobile: +91-8176876372

From: Mandyam Dinesh Sai {} <dineshsai@powergrid.in>
Sent: Thursday, February 6, 2025 11:26 AM
To: Tanay Jaiswal {तनय जायसवाल} <tanay@powergrid.in>; Naga Pavan Kalyan Kumar {नागा पवन कल्याण कुमार} <Pavan.naga@powergrid.in>
Subject:

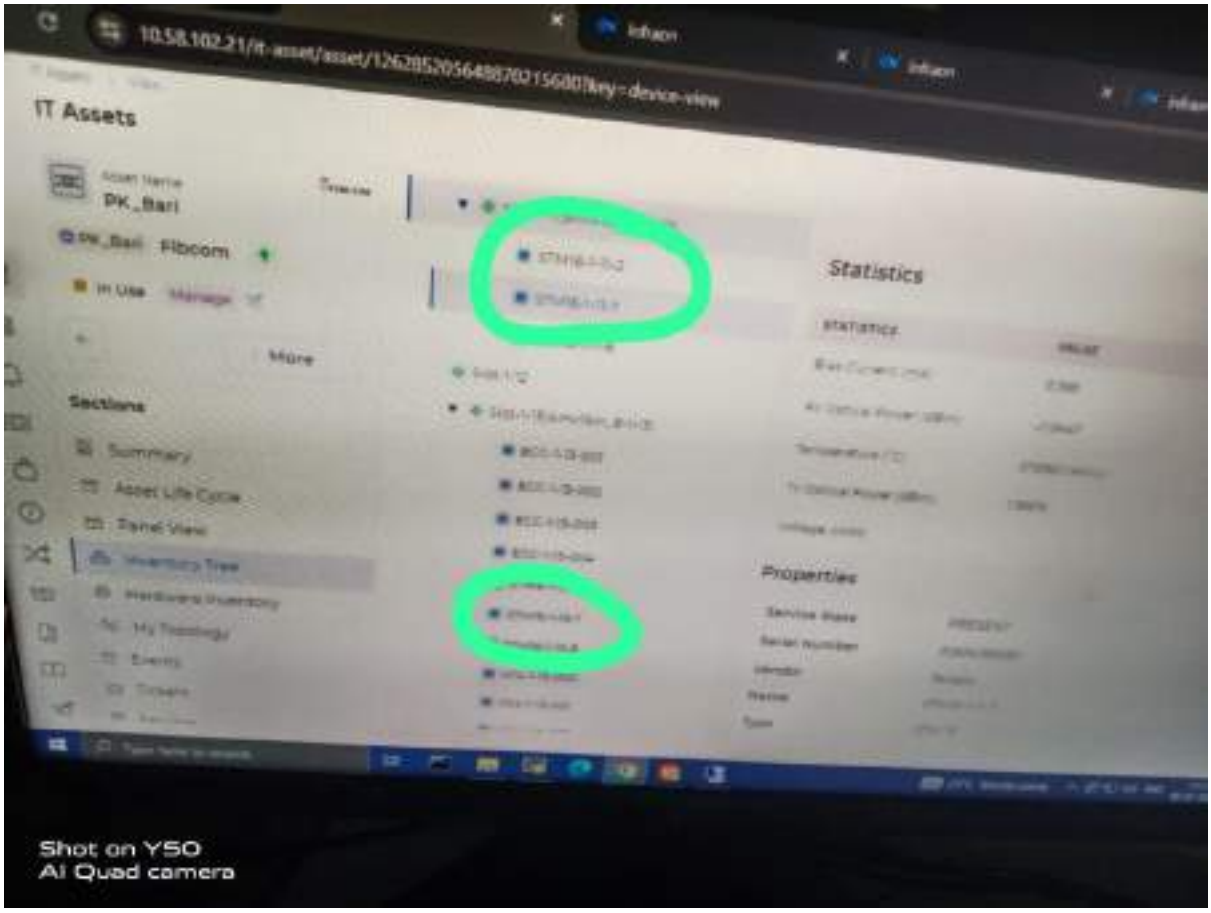
Dear sir

OPGW (STM-16) is planned between **silchar** to **pkbari (state)** through hallaikandi dhullavchera dharmanagar

Following inputs are required for the same :

1. **STM-16** Port availability at **PK bari and silchar** for all available port.
2. All the nodes **(STM-16)** between **PK BARI and NERLDC(shillong)** for continuous path of STM-16 Connectivity
3. All the nodes **(STM-16)** between **SILCHAR and NERLDC(shillong)** for continuous path of STM-16 Connectivity

दावात्याग : यह ईमेल पावरग्रिड के दावात्याग नियम व शर्तों द्वारा शासित है जिसे http://apps.powergrid.in/Disclaimer.htm पर देखा जा सकता है। Disclaimer: This e-mail is governed by the Disclaimer Terms & Conditions of POWERGRID which may be viewed at http://apps.powergrid.in/Disclaimer.htm


IT Assets
PK_Bari
Statistics
Properties
Shot on Y50
AI Quad camera

i) Transformer:

MVA Rating of Transformers	Voltage Rating	Total Installed unit in POWERGRID	Installed State	Spare Required as per CERC report	Available Spare (As per RPC Approved)	Qty Proposed for procurement	Location/State of spare requirement
3Ø-315MVA	400/132/33kV	1 No-**Silchar**	**Assam, Silchar**	1	0	1	**Assam, Silchar**
3Ø-160MVA	220/132kV	06 Nos **02-Balipara** **02- Dimapur** **02- Kopili**	**Assam-Balipara** **Nagaland-Dimapur** **Assam-Balipara**	2	**1(Assam- Balipara)**	1	**Nagaland , Dimapur**
3Ø-100MVA	220/132kV	02 Nos **01 No-Dimapur** **01 No- Salakati**	**Nagaland-Dimapur** **Assam-Salakati**	2	**1(Nagaland- Dimapur)**	1	**Assam, Salakati**
3Ø-50MVA	132/33kV	04 Nos **02- Imphal** **02- Nirjuli**	**Manipur- Imphal** **Arunachal Pradesh**	2	**1 (Arunachal Pradesh - Nirjuli)**	1	**Manipur, Imphal**
	TOTAL:					**4**	
	Tentative Cost						**43.94 Cr**

ii) Reactors:

MVAr Rating of Reactors	Voltage Rating	Total Installed unit in POWERGRID	Installed State	Spare Required as per CERC report	Available Spare (As per RPC Approved)	Qty Proposed for procurement	Location/State of spare requirement
3Ø-125MVAR#	420kV	06 Nos 01-Silchar 01-Imphal 01 – Balipara 01 – BNG 02- Mariani	Assam-Silchar **Manipur-Imphal** Assam-Balipara Assam-Bongaigaon Assam-Mariani	2	**1(Assam-Silchar)**	1	**Manipur, Imphal**
3Ø-63MVAR*	420 kV	**22 Nos** 06- Balipara 06-Bongaigaon 04-Silchar 02- Imphal 04- BNC	Assam-Balipara Assam- Bongaigaon Assam-Silchar **Manipur- Imphal** Assam- BNC	2	**1(Assam-Balipara)**	1	**Manipur, Imphal**
3Ø-50MVAR*	420 kV	**9 Nos** 02- Balipara 04- Bongaigaon 02- Silchar 01-Misa	Assam- Balipara Assam-Bongaigaon Assam-Silchar **Assam-Misa**	1	0	1 *** proposed to be replaced with 63 MVAr**	**Assam-Misa**
3Ø-31.5MVAR	245kV	01-Mokukchung	**Nagaland-Mokukchung**	1	0	1	**Nagaland,Mokukchung**
3Ø-20MVAR	245kV	01-Mariani	**Assam-Mariani**	1	0	1	**Assam, Mariani**
3Ø-20MVAR	132kV	3		3	0	3	**Manipur- Imphal**

		01 No- Imphal 01 No- Aizwal 01 No- Kumarghat	Manipur-Imphal Mizoram-Aizwal Tripura-Kumarghat				**Mizoram- Aizwal Tripura-Kumarghat**
	TOTAL:					**8**	
	Tentative Cost						**50.0 Cr**

- Quantity considered for both 125MVAR & 80MVAR reactors in Manipur. In case of failure of existing 80MVAR reactor, replacement can be done with 125MVAR.

* - Quantity considered for both 50MVAR & 63MVAR reactors. In case of failure of existing 50MVAR reactor, replacement can be done with 63MVAR.

01 In view of the above, it is requested for approval for procurement of cold spare transformers & reactors of various ratings as per CERC committee recommendation as mentioned above. The Tariff for the investment made is to be shared by constituents as per the provisions of CERC Regulation.

Annexure -5.8

Responsibility of Users as per IEGC			
Sr. No.	**Clause**	**Description**	**Responsibility**
1	5.2.(i)	Demand Forecasting:	DISCOM
2	5.3.a.(i)	Assess the existing generation resources and identify the additional generation resource requirement to meet the estimated demand	STU
3	5.3.a.(ii)	Prepare generation resource procurement plan.	DISCOM
4	5.4.a	Transmission resource adequacy assessment	CTU
5	5.4.b	Transmission resource adequacy assessment	STU
6	7 (1)	All Users connected to or seeking connection to the grid shall comply with all the applicable regulations as enacted or amended from time to time,	Transmission Utility/Generator/DISCOM
7	8.2	Preparation a detailed procedure covering modalities for first time energization and integration of new or modified power system element and submit for approval of the Commission.	NLDC
8	9(1)	In case of users seeking connectivity to the ISTS under GNA Regulations, Connectivity Agreement shall be signed between such users and CTU. In case of multiple transmission licensees connected at same station, the Site Responsibility Schedule including the responsibility for operation & protection coordination and data sharing among the licensees, shall be specified in the Connectivity Agreement.	Transmission Utility/Generator/DISCOM
9	11 (1) 11(2)	Reliable speech and data communication systems shall be provided to facilitate necessary communication, data exchange, supervision and control of the grid by the NLDC, RLDC and SLDC in accordance with the CERC (Communication System for Inter State Transmission of Electricity) Regulations, 2017 and the CEA Technical Standards for Communication.	Transmission Utility/Generator/DISCOM
10	13 (1) & 13(2)	All users connected to the integrated grid shall provide and maintain effective protection system having reliability, selectivity, speed and sensitivity to isolate faulty section and protect element(s) as per the CEA Technical Standards for Construction, the CEA Technical Standards for Connectivity, the CEA (Grid Standards) Regulations, 2010, the CEA Technical Standards for Communication and any other applicable CEA Standards specified from time to time. Back-up protection system shall be provided to protect an element in the event of failure of the primary protection system.	Transmission Utility/Generator/DISCOM
11	13.3	develop the protection protocol and revise the same, after review from time to time, in consultation with the stakeholders in the concerned region, and in doing so shall be guided by the principle that minimum electrical protection functions for equipment connected with the grid shall be provided as per CEA Standards	RPC
12	14.1	review of the protection settings, assess the requirement of revisions in protection settings and revise protection settings in consultation with the stakeholders of the respective region, from time to time and at least once in a year.	RPC
13	14(2)	All users connected to the grid shall: (a) furnish the protection settings implemented for each element to respective RPC in a format as prescribed by the concerned RPC; (b) obtain approval of the concerned RPC for (i) any revision in settings, and (ii) implementation of new protection system; (c) intimate to the concerned RPC about the changes implemented in protection system or protection settings within a fortnight of such changes; (d) ensure correct and appropriate settings of protection as specified by the concerned RPC. (e) ensure proper coordinated protection settings	Transmission Utility/Generator/DISCOM

14	14.3.a, 14.3.b	maintain a centralized database and update the same on periodic basis in respect of their respective region containing details of relay settings for grid elements connected to 220 kV and above (132 kV and above in NER). carry out detailed system studies, once a year, for protection settings and advise modifications / changes, if any, to the CTU and to all users and STUs of their respective regions.	RPC
15	15(1), 15(2), 15(4), 15(5), 15(6) and 15(7)	Protection Audit (Internal & Third Party) and deficiency rectification. Submission to RPC, RLDC or SLDC as the case may be. Annual audit plan by 31st Oct. Protection Indices every month	Transmission Utility/Generator/DISCOM
16	16.2	perform regular load flow and dynamic studies and mock testing for reviewing SPS parameters & functions, at least once in a year.	RLDC or NLDC, as the case may be, in consultation with the concerned RPC(s)
17	16(3) & 16(4)	The users and SLDCs shall report about the operation of SPS immediately and detailed report shall be submitted within three days of operation to the concerned RPC and RLDC in the format specified by the respective RPCs. The performance of SPS shall be assessed as per the protection performance indices	Transmission Utility/Generator/DISCOM
18	17(1)	All users shall keep the recording instruments (disturbance recorder and event logger) in proper working condition.	Transmission Utility/Generator/DISCOM
19	19(6) & 19(7)	Start-up power shall not be used by the generating station for construction activities; The onus of proving that the interchange of infirm power from the unit(s) of the generating station is for the purpose of pre-commissioning activities, testing and commissioning, shall rest with the generating station, and the concerned RLDC shall seek such information on each occasion of the interchange of power before COD. For this, the generating station shall furnish to the concerned RLDC relevant details, such as those relating to the specific commissioning activity, testing, and full load testing, its duration and the intended period of interchange. The generating station shall submit a tentative plan for the quantum and time of injection of infirm power on day ahead basis to the respective RLDC.	Generator
20	20 (1)	The details of the generation station shall be furnished by each regional entity generating station to the concerned RLDC, RPC and the beneficiaries of the generating station, wherever identified, prior to notice of	Generator
21	21(1)	The generating company proposing its generating station or a unit thereof for trial run or repeat of trial run shall give a notice of not less than seven (7) days to the concerned RLDC. Repeat trial run is to take place within forty eight (48) hours of the failed trial run, fresh notice shall not be	Generator
22	21(2)	The transmission licensee proposing its transmission system or an element thereof for trial run shall give a notice of not less than seven days to the concerned RLDC, CTU, distribution licensees of the region and the	Transmission Utility
23	22(1), 22(2), 22(3)	TRIAL RUN OF GENERATING UNIT	Generator
24	23	TRIAL RUN OF INTER-STATE TRANSMISSION SYSTEM	Transmission Utility
25	24(1) and 24(2)	DOCUMENTS AND TESTS PRIOR TO DECLARATION OF COMMERCIAL OPERATION	
26	24(3)	Documents and Tests Required for Thermal (coal/lignite) Generating Stations:	Thermal Generator
27	24(4)	Documents and Tests Required for Hydro Generating Stations including Pumped Storage Hydro Generating Station:	Hydro Generator
28	24(5)	Documents and Test Required for Gas Turbine based Generating Stations	Gas Generator

29	24(6)	Documents and Tests Required for the Generating Stations based on wind and solar resources	Wind and Solar Generator
30	24(7)	Documents and Tests Required for Energy Storage Systems	Energy Storage
31	24(8)	Documents and Tests Required for HVDC Transmission System or SVC or STATCOM	Transmission Utility
32	26	DECLARATION BY GENERATING COMPANY AND TRANSMISSION LICENSEE regarding meeting CEA regulations, standards. Installation of main plant and auxiliary system, emergency supply, etc.	Transmission Utility/Generator
33	27	DECLARATION OF COMMERCIAL OPERATION (DOCO) AND COMMERCIAL OPERATION DATE (COD)	
34	28(7)	Every generating station, and transmission substation of 110 kV and above shall have a control room manned by qualified operating personnel round the clock. Alternatively, the same may be operated round the clock from a remotely located control room, subject to the condition that such remote operation does not result in a delay in the execution of any switching instructions and information flow: Provided that a transmission licensee owning a transmission line but not owning the connected substation, shall have a coordination centre functioning round the clock, manned by qualified personnel for operational coordination with the concerned load despatch centres and equipped to carry out the operations as directed by concerned load despatch centres	Transmission Utility/Generator
35	28(8)	ESS and Bulk Consumers, which are regional entities shall have coordination centres functioning round the clock and manned by qualified personnel for operational coordination with the concerned load despatch	ESS and Bulk Consumers
36	29(4)	Except in an emergency, or when it becomes necessary to prevent imminent damage to critical equipment, no user shall suddenly reduce its generating unit output by more than 100 (one hundred) MW without prior permission of the respective RLDC.	Generator
37	29(5)	Except in an emergency, or when it becomes necessary to prevent imminent damage to critical equipment, no user shall cause a sudden variation in its load by more than 100 (one hundred) MW without the prior permission of the respective RLDC.	Generator
38	29(6)	All generating units shall have their automatic voltage regulators (AVRs), Power System Stabilizers (PSSs), voltage (reactive power) controllers (Power Plant Controller) and any other requirements in operation, as per the CEA Technical Standards for Connectivity. If a generating unit with a capacity higher than 100 (hundred) MW is required to be operated without its AVR or voltage controller in service, the generating station shall immediately inform the concerned RLDC of the reasons thereof and the likely duration of such operation and obtain its permission.	Generator
39	29(7), 29(8)	The tuning of AVR, PSS, Voltage Controllers (PPC) including for low and high voltage ride through capability of wind and solar generators or any other requirement as per CEA Technical Standards for Connectivity shall be carried out by the respective generating station:– at least once every five (5) years;– based on operational feedback provided by the RLDC after analysis of a grid event or disturbance; and– in case of major network changes or fault level changes near the generating station as reported by NLDC or RLDC(s), as the case may be. – in case of a major change in the excitation system of the generating station.Power System Stabilizers (PSSs), AVRs of generating units and reactive power controllers shall be properly tuned by the generating station as per the plan and the procedure prepared by the concerned RPC.	Generator
40	29(12)	All distribution licensees, STUs and bulk consumers shall provide automatic under-frequency relays (UFR) and df/dt relays for load shedding in their respective systems to arrest frequency decline that could result in grid failure as per the plan given by the RPCs from time to time.	Distribution licensees

41	29(18)	All defence mechanisms shall always be in operation and any exception shall be immediately intimated by the concerned user to the concerned RLDC and SLDCs along with the reasons and the likely duration of such exception. The concerned user shall also obtain permission from the concerned RLDC or SLDC, as applicable.	User/RLDC/SLDC
42	30(3)	All users shall adhere to their schedule of injection or drawl, as the case may be, and take such action as required under these regulations and as directed by NLDC or respective RLDCs or respective SLDCs so that the grid frequency is maintained and remains within the allowable band	Generator/SLDCs
43	30(10)(d), 30(10)(g), 30(10)(h), 30(10)(i), 30(10)(j), 30(10)(k), 30(10)(l), 30(10)(m)	Primary control/ Governor action The generating stations and units thereof shall have electronically controlled governing systems or frequency controllers in accordance with the CEA Technical Standards for Connectivity and are mandated to provide PRAS. The generating stations and units thereof with governors shall be under Free Governor Mode of Operation. Drop settings -3 to 6 % (for thermal generating units and WS Seller) or 0-10% (for hydro generating units) Primary response as per Table-4	Generator
44	30(10)(n)	Each control area shall assess its frequency response characteristics and share the assessment with the concerned RLDC along with high resolution data of at least 1 (one) second for regional entity generating stations and energy storage systems and 10 (ten) seconds for the state control area	Generator/SLDCs
45	30(11)(j)	The SRAS Providers shall start responding to SRAS signals within thirty (30) secondsof receipt of the signal and shall be capable of providing the entire SRAS capacityobligation within fifteen (15) minutes and sustaining it at least for the next thirty (30)minutes.	Generator
46	30(11)(w)	All thermal generating stations having a capacity of more than 200 MW and hydro generating stations having a capacity of more than 25 MW shall make arrangements to enable automatic operation of the plant from the appropriate load despatch centre by integrating the controls and telemetering features of their system into the automatic generation control in accordance with the CEA Technical Standards for Construction and the CEA Technical Standards for Connectivity. The communication system shall be established in accordance with the CEA Communication Regulations.	Thermal Generator
47	30(12)(j) 30(12)(l)	Tertiary reserves to be provided by the TRAS provider shall be capable of providing TRAS within fifteen (15) minutes of despatch instructions from RLDC or SLDC, as the case may be, and shall be capable of sustaining the service for at least the next 60 minutes. The modalities for information exchange and timelines in respect of tertiary reserves shall be as per detailed procedure prepared by NLDC	Generator
48	30(11)(x)	All renewable energy generating stations and ESS shall be equipped with the facility to control active power injection in accordance with the CEA Connectivity Standards and the communication system shall be established in accordance with the CEA Technical Standards for Communication.	Renewable Engery
49	31(2)(f) 31(2)(h)	The entities such as bulk consumers or distribution licensees that are directly connected to ISTS shall estimate and furnish such a demand estimate to the concerned RLDC	Bulk consumers or distribution licensees
50	32(2)(d) 32(3)(f)	Protection relay related outages, auto–re-closure outages and SPS testing outages shall be planned on a monthly basis with the prior permission of the concerned RPC, which shall consult the concerned RLDC & NLDC. All users, CTU and STUs, licensees shall follow the annual outage plan. If any deviation is required, the same shall be allowed only with the prior permission of the concerned RPC, which shall consult the concerned RLDC and NLDC	All users, CTU and STUs, licensees

51	32(3)(g)	Each user shall obtain the final clearance from NLDC or the concerned RLDC, prior to the planned outage of any grid element. The clearance shall also be obtained from SLDC for a grid element of the State Control areas.	Transmission Utility/Generator/DISCOM
52	34(3)	Detailed procedures for restoration post partial and total blackout of each user system within a region shall be prepared by the concerned user in coordination with the concerned SLDC, RLDC or NLDC, as the case may be. The concerned user shall review the procedure every year and update the same. The user shall carry out a mock trial run of the procedure for different sub-systems including black-start of generating units along with grid forming capability of inverter based generating station and VSC based HVDC black-start support at least once a year under intimation to the concerned SLDC and RLDC. Diesel generator sets and other standalone auxiliary supply source to be used for black start shall be tested on a weekly basis and the user shall send the test reports to the concerned SLDC, RLDC and NLDC on a quarterly basis.	SLDC/RLDC/NLDC
53	34(4)	Simulation studies shall be carried out by each user in coordination with RLDC for preparing, reviewing and updating the restoration procedures considering the following: (a) Black start capability of the generator; (b) Ability of black start generator to build cranking path and sustain island; (c) Impact of block load switching in or out; (d) Line/transformer charging; (e) Reduced fault levels; (f) Protection settings under restoration condition.	Generator with RLDC
54	34(5)	The thermal and nuclear generating stations shall prepare themselves for house load operation as per design. The concerned user and SLDC shall report the performance of house load operation of a generating station in the event where such operation was required	thermal and nuclear generating stations
55	35(5)(b)	Any planned operation activity in the ISTS system [such as generating unit synchronization or de-synchronization, transmission element opening or closing (including breakers), protection system outage, SPS outage and testing etc.] shall be done by taking operational code from RLDC or NLDC, as the case may be. The operational code shall have validity period of sixty (60) minutes from the time of issue. In case such operation activity does not take place within the validity period of the code, the entity shall obtain a fresh operational code from RLDC or NLDC, as the case may be.	Transmission Utility
56	37(2)	Post Despatch Analysis: Event Reporting	
57	38(2)	Daily and monthly reports covering the performance of the regional grid shall be prepared by each RLDC based on the inputs received from SLDCs and users. Data submission for preparation of reports (Generation MUs, drawl, etc.)	RLDC/SLDC
58	39(1), 39(2), 39(3)	REACTIVE POWER MANAGEMENT	
59	39(8)	Reactive power facility shall be in operation at all times and shall not be taken outwithout the permission of the concerned RLDC or SLDC	RLDC/SLDC

60	40(1) and 40(2)	PERIODIC TESTING There shall be periodic tests, as required under clause (3) of this Regulation, carried out on power system elements for ascertaining the correctness of mathematical models used for simulation studies as well as ensuring desired performance during an event in the system (a) The owner of the power system element shall be responsible for carrying out tests as specified in these regulations and for submitting reports to NLDC,RLDCs, CEA and CTU for all elements and to STUs and SLDCs for intra-State elements. (b) All equipment owners shall submit a testing plan for the next year to the concerned RPC by 31st October to ensure proper coordination during testing as per the schedule. In case of any change in the schedule, the owners shall inform the concerned RPC in advance. (c) The tests shall be performed once every five (5) years or whenever major retrofitting is done. If any adverse performance is observed during any grid event, then the tests shall be carried out even earlier, if so advised by SLDC or RLDC or NLDC or RPC, as the case may be. (d) The owners of the power system elements shall implement the recommendations, if any, suggested in the test reports in consultation with NLDC, RLDC, CEA, RPC and CTU.	Transmission Utility/Generator
61	40(3)	Testing requirements	
62	45(2)	The regional entity generating stations and the entities participating in Ancillary Services must be capable of receiving the load set point signals from the RLDCs or the NLDC as per CEA Technical Standards for Connectivity, or in terms of Ancillary Service Regulations, as applicable.	Generating stations
63	45(5)(a)	Requirement for Commencement of Scheduling: (a) The following documents shall be submitted to the respective RLDC by the seller or the buyer, as the case may be, before commencement of the scheduling of transactions under GNA or T-GNA, as the case may be:	Seller or buyer
64	45(6)	Adherence to Schedule: Each regional entity shall regulate its generation or demand or both, as the case may be, so as to adhere to the schedule of net injection into or net drawl from the inter-State transmission system	Regional entity (SLDCs and Generator)
65	45(8)(a), 45(8)(b)	Declaration of Declared Capacity by Regional entity generating stations	
66	45(9)(a)	Ramping Rate to be Declared for Scheduling.(i) Coal or lignite fired plants shall declare a ramp up or ramp down rate of notless than 1% of ex-bus capacity corresponding to MCR on bar per minute;(ii) Gas power plants shall declare a ramp up or ramp down rate of not less than3% of ex-bus capacity corresponding to MCR on bar per minute;(iii) Hydro power plants shall declare a ramp up or ramp down rate of not less than10% of ex-bus capacity corresponding to MCR on bar per minute;(iv) Renewable Energy generating stations shall declare a ramp up or ramp downrate as per CEA Connectivity Standards.	Generator

67	45(11)(d), 45(11)(e), 45(11)(f)	Scheduling of WS seller and ESS by QCA: (d) QCA registered with the concerned RLDC shall, on behalf of wind, solar or renewable hybrid generating stations or Energy Storage System shall: (i) Coordinate and facilitate scheduling of power with the concerned RLDC; and; (ii) Undertake commercial settlement of deviations with the concerned RLDC in accordance with the DSM Regulations. (iii) Submit a copy of the consent to the concerned RLDC certifying that QCA shall undertake all operational and commercial responsibilities on behalf of generating stations as per the CERC Regulations. (e) The concerned wind, solar or renewable hybrid generating stations including energy storage systems shall indemnify the RLDC for any act of commission or omission on the part of QCA including compliance with the Grid Code and settlement of its financial liability in the pooled account. (f) Contract between the generating stations and QCA shall invariably contain provisions for internal dispute resolution, and any disputes arising between the generating stations and QCA shall be settled in accordance with the said mechanism	QCA
68	45(12)	Minimum turndown level for regional entity thermal generating stations:	Generator
69	45(15)	For meeting its power requirements during non-generation hours, whether before or after COD, a generating station, including renewable energy generating station, shall enter into a valid contract with a seller or distribution licensee or through power exchange: Provided that where the generating station including a renewable energy generating station is unable to enter into a contract for the drawl of power during non-generation hours, it may draw power from ISTS on payment of deviation charges as per the DSM Regulations.	Generator
70	46(4)(i), 46(5) ©	SCUC46(4(i)All the generating stations identified under SCUC shall be available on bar, and inthe event of such stations or units thereof being on Unit Shut Down (USD), the timeto start a unit under different conditions such as HOT, WARM and COLD andminimum time for which it shall be brought on bar, shall be as specified in theDetailed Procedure to be prepared by NLDC and approved the Commission. 46(5)(c) All regional entity generating stations shall declare DC for 'D' day within 2 hours ofannouncement by NLDC, for consideration under three day ahead SCUC.	Generator
71	47(2), 49(10)	In case a generating station, or unit thereof, opts to go under unit shut down (USD) or in the event of forced outage, the generating company owning such generating station or unit thereof shall fulfil its obligation to supply electricity to its beneficiaries who had made requisition from the said generating station prior to it going under USD, In the event of forced outage of a generating station or unit thereof, the generating company owning the generating station or unit thereof shall fulfil its supply obligation to the beneficiaries which made requisition from such generating station or unit thereof,	Generator
72	47(3)	In case of emergency conditions, for reasons of grid security, a generating station or unit thereof, which is under USD may be directed by NLDC to come on bar, and in such event the generating station or unit thereof shall come on bar under hot, warm and cold conditions as per the time period to be specified in the detailed procedure under subclause (i) of clause (4) of Regulation 46 of these regulations.	Generator and NLDC
73	48	SCHEDULING FROM ALTERNATE SOURCE OF POWER BY A GENERATING STATION (1) A generating station may supply power from alternate source in case of (i) USD in terms of clause (1) of Regulation 47 of these regulations or (ii) forced outage of unit(s) or (iii) a generating station other than REGS replacing its scheduled generation by power supplied from REGS irrespective of whether such identified sources are located within or outside the premises of the generating station or at a different location.	Generator

74	49	PROCEDURE FOR SCHEDULING AND DESPATCH FOR INTER-STATE TRANSACTIONS	
75	49(12)	Energy Metering and Accounting: operation and periodic calibration of IEM shall be done by the respective entity.The installation, operation, calibration and maintenance of Interface EnergyMeters (IEMs) with automatic remote meter reading (AMR) facility shall be inaccordance with the CEA Metering Regulations 2006.(c) The installation, operation, and maintenance of additional communication links, ifany, required for the purpose of AMR facility shall be in accordance with CEACommunications Regulations.(d) Access to such metering data to the concerned RLDC and SLDC(s) shall be inaccordance with the CEA Metering Regulations 2006.(e) Entities in whose premises the IEMs are installed shall be responsible for (i)monitoring the healthiness of the CT and PT inputs to the meters, (ii) takingweekly meter readings for the seven day period ending on the preceding Sunday2400 hrs and transmitting them to the RLDC by Tuesday noon, in case suchreadings have not been transmitted through automatic remote meter reading(AMR) facility (iii) monitoring and ensuring that the time drift of IEM is within thelimits as specified in CEA Metering Regulations 2006 and (iv) promptly intimatingthe changes in CT and PT ratio to RLDC.	Transmission Utility/Generator/DISCOM
76	49(13)	Inspection of Records: The operational logs and records of the regional entity generating stations and inter-State transmission licensees shall be available for inspection and review by the RLDCs and RPCs.	RLDC/RPC
77	51	CYBER SECURITY AUDIT All users, NLDC, RLDCs, SLDCs, CTU and STUs, power exchanges, QCAs, SNAs, shall conduct Cyber Security Audit as per the guidelines mentioned in the CEA (Cyber Security in Power Sector) Guidelines, 2021 and any other guidelines issued by an appropriate Authority.	All users, NLDC, RLDCs, SLDCs, CTU and STUs, power exchanges, QCAs, SNAs

Annexure-6.5

Pic 1: Year 2018 [530 Mtrs from Loc no 125]

Pic 2: Year 2024 [175 Mtrs from Loc no 175]

Annexure-6.6


Loc no. 74
Path or polygon
Click points on the map to draw a path or poly
Length
1,001.16 m
Save to project
Loc no 75
3D
100%
Data attribution
400 m
Camera: 2,841 m


Layers
3D

Annexure-6.7

ENERGY ACCESS EXPLORER

A PLANNING AND PRIORITIZATION TOOL

WRI INDIA

FEBRURAY 2025

Masfick Hazarika & Abdul Khalid

WRI India

1 SUSTAINABLE CITIES
Developing and scaling solutions for smart urban growth

2 CLIMATE, ECONOMICS, FINANCE
Advancing transformative solutions for climate change mitigation and adaptation

3 **ENERGY**
Powering the growth of sustainable, affordable and reliable energy for all

4 FOOD, LAND & WATER
Accelerating India's transition towards a land-based restoration economy for sustainable and resilient food and land use systems

5 CLIMATE RESILIENCE
Helping Governments, Civil Society, and the Private Sector to Develop Adaptation Solutions

ENERGY PROGRAM

Clean Energy Supply

Scale clean, renewable energy supply and investment in resilient energy infrastructure

Decarbonized Energy Consumption

Leverage demand to reduce fossil fuel consumption in buildings, transport and industry

Energy Access for Equitable Development

Deliver affordable, reliable clean energy to institutions and businesses for health, livelihood and economic development

Energy Minerals, Land and Circularity

Assess the competition for land/ minerals, and build the circular energy economy

2023 GEO SDG AWARDS

DPG

Energy Access Explorer

Online
Open-Source
Interactive
Geospatial platform

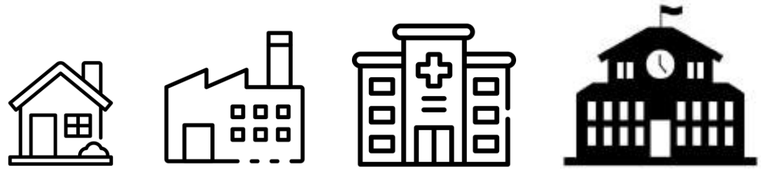
CAPABILITIES OF ENERGY ACCESS EXPLORER

DATA REPOSITORY

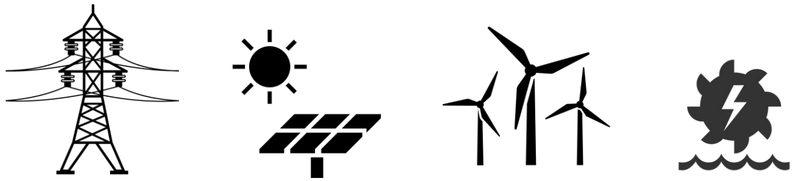
TRACK CHANGES

MULTI-CRITERIA ANALYSIS

TYPES OF DATASETS ON THE PLATFORM



------- **DEMAND**



------- **SUPPLY**

------- **VULNERABILITY**

------- **INFRASTRUCTURE**

SUPPLY DATASETS

DATA LAYERS	SOURCE
Distribution Transformers	APDCL
Distribution Substations 33/11kV	APDCL
Rooftop Solar Plants (kW)	APDCL
Large Scale Solar Projects (MW)	APDCL
Powerplant – Gas	ASDMA – GIS Portal
Powerplant – Hydro	Resource Watch
Transmission Lines	Open Street Maps
Solar Farm Sites	Transition Zero – Solar Asset Mapper
Wind Speed	Global Wind Atlas
Global Horizontal Irradiation	Global Solar Atlas
Bioenegy Potential	Jaivoorja - Bhuvan

VULNERABILITY & CLIMATE DATASETS

DATA LAYERS	SOURCE
Landslide Susceptibility	Bhukosh – Geological Survey of India
Historical Seismic Activity	National Center of Seismology
Flood Vulnerability Index (1998-2015)	Bhuvan – NRSC
Average Daily Precipitation 2023	Google Earth Engine – CHIRPS
Average Day Land Surface Temperature 2023	Google Earth Engine – CHIRPS
Average Night Land Surface Temperature 2023	Google Earth Engine – CHIRPS

DATA | ANALYSIS

DISTRIBUTION TRANSFORMERS
Capaity: 250 kVA
Distribution Transformers: 0 km
District Boundaries: Kamrup Metro
longitude 91.76975
latitude 26.16408
Points of interest
Nemcare Hospital

LEGEND:
Distribution Transformers

- 16 kVA
- 63 kVA
- 250 kVA
- 25 kVA
- 100 kVA
- 200 kVA
- 500 kVA
- 150 kVA
- 10 kVA
- 2500 kVA
- 630 kVA
- 315 kVA
- 1000 kVA
- 160 kVA
- 750 kVA
- 2000 kVA

REPORT
Save Analysis | Share Analysis

SUPPLY INDEX
Current and/or potential

Area share: 97,660 km²
Population share: 4,52,62,397 people

Low | Medium | High

Energy Access Potential (not enough datasets)
Demand Index (not enough datasets)
Supply Index
Assistance Need Index (not enough datasets)

Raster Analysis

Supply Index

Feedback

Help | Disclaimer

Clear all datasets | Clear filters

Large Scale Solar Projects (MW)

0 km 500

Rooftop Solar Plant Sites (kW)

0 km 500

District Boundaries

DATA | ANALYSIS

ROOFTOP SOLAR PLANT SITES (KW)

Name:	MANAGER, ROSEKANDY T.E.
District:	CACHAR
RTS Capacity installed (kW):	540
Metering Initiation Date:	2020-06-14
Rooftop Solar Plant Sites (kW):	2 km
Large Scale Solar Projects (MW):	40 km
District Boundaries:	Cachar
longitude	92.69751
latitude	24.69371

REPORT

Save Analysis | Share Analysis

SUPPLY INDEX

Current and/or potential

Area share: 97,624 km²

Population share: 4,52,30,460 people

Low | Medium | High

Energy Access Potential (not enough datasets)

Demand Index (not enough datasets)

Supply Index

Assistance Need Index (not enough datasets)

Raster Analysis

Supply Index

Help | Disclaimer

Feedback

Clear all datasets | Clear filters

Powerplant - Gas
0 — proximity in km — 500

Powerplant - Hydro
0 — proximity in km — 500

Transmission lines
0 — proximity in km — 700

District Boundaries

DATA | ANALYSIS

POWERPLANT - HYDRO

name:	KARBI LANGPI
capacity (MW):	100
year:	2007
Powerplant - Hydro:	2 km (proximity to)
Powerplant - Gas:	150 km (proximity to)
Transmission lines:	12 km (proximity to)
District Boundaries:	Karbi Anglong
longitude	92.50821
latitude	25.95805

REPORT

Save Analysis | Share Analysis

SUPPLY INDEX

Current and/or potential

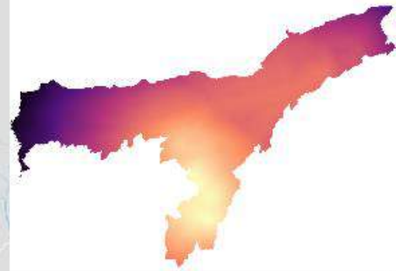
Area share: 97,624 km²
Population share: 4,52,30,460 people

Low — Medium — High

Energy Access Potential (not enough datasets)
Demand Index (not enough datasets)
Supply Index
Assistance Need Index (not enough datasets)

Raster Analysis

Supply Index



Help | Disclaimer

Feedback

Clear all datasets | Clear filters

Distribution Substations 33/11kV

0 — proximity in km — 700

District Boundaries

DATA | ANALYSIS

DISTRIBUTION SUBSTATIONS 33/11KV

Name:	33/11kV Hamren S/S
Distribution Substations 33/11kV:	2 km (proximity to)
District Boundaries:	Karbi Anglong
longitude	92.57032
latitude	25.85478

REPORT

Save Analysis | Share Analysis

DEMAND INDEX

Current and/or potential

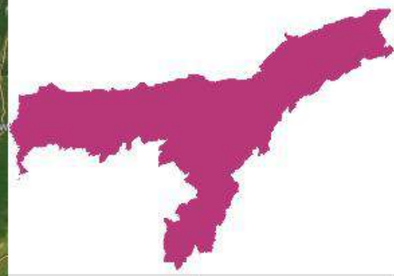
Area share: 97,624 km²

Population share: 4,52,30,460 people

Low — Medium — High

Raster Analysis

Demand Index



Help | Disclaimer

Feedback

DATA | ANALYSIS

DISTRIBUTION SUBSTATIONS 33/11KV

Name:	33/11kV Nagaon Gomafulbari S/S
Distribution Substations 33/11kV:	1 km (proximity to)
District Boundaries:	Barpeta
longitude	91.10856
latitude	26.30180

REPORT

Save Analysis | Share Analysis

SUPPLY INDEX

Current and/or potential

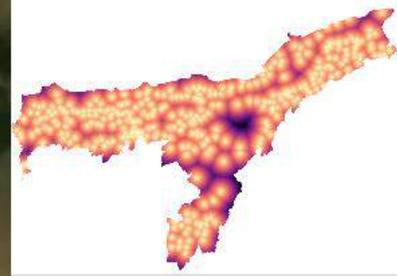
Area share: 97,624 km²

Population share: 4,52,30,460 people

- Energy Access Potential (not enough datasets)
- Demand Index (not enough datasets)
- Supply Index
- Assistance Need Index (not enough datasets)

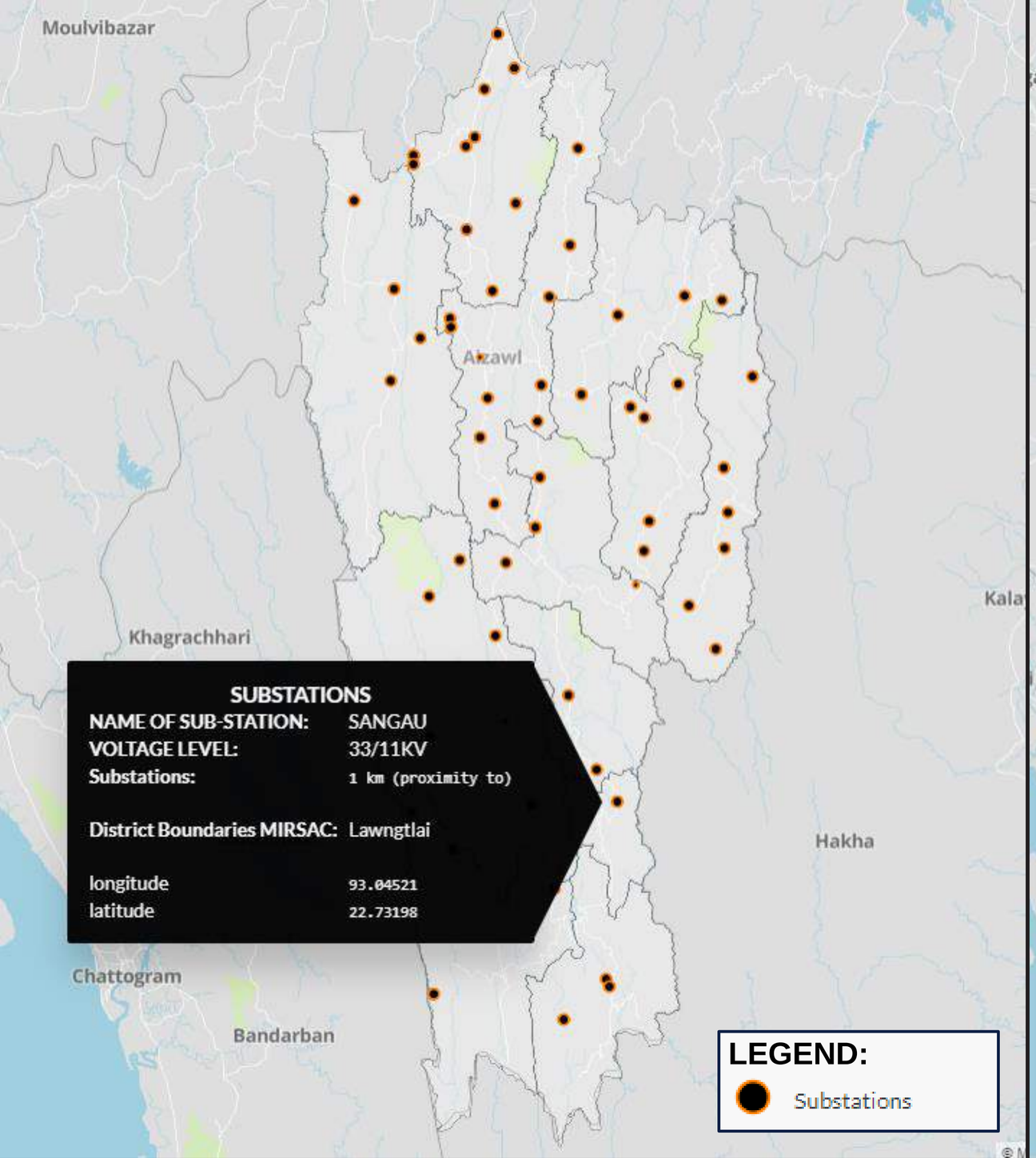
Raster Analysis

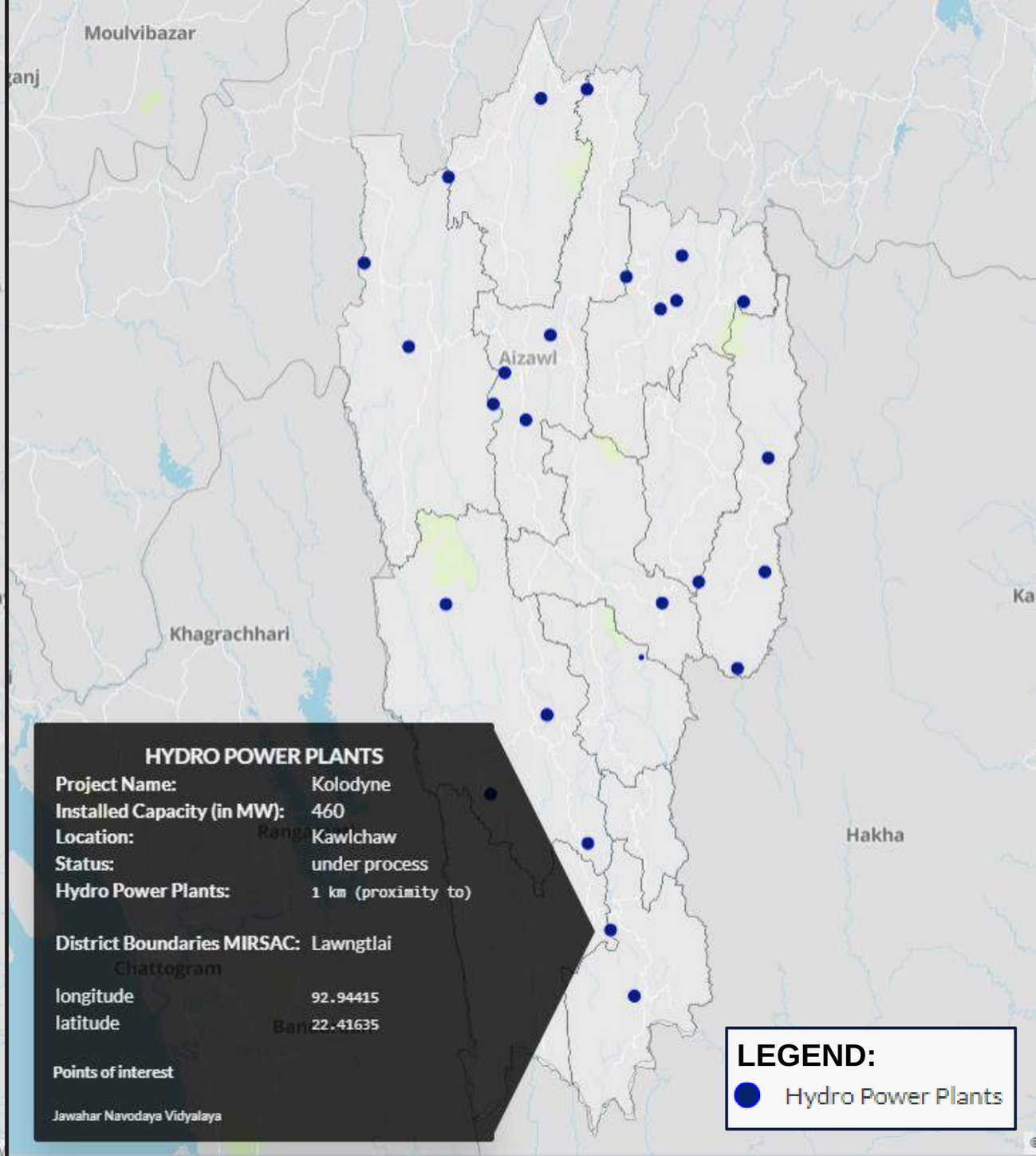
Supply Index



Help | Disclaimer

Feedback


Moulvibazar
Aizawl
Khagrachhari
Hakha
Chattogram
Bandarban
SUBSTATIONS
NAME OF SUB-STATION: SANGAU
VOLTAGE LEVEL: 33/11KV
Substations: 1 km (proximity to)
District Boundaries MIRSAC: Lawngtlai
longitude 93.04521
latitude 22.73198
LEGEND:
Substations


Moulvibazar
Aizawl
Khagrachhari
Hakha
HYDRO POWER PLANTS
Project Name: Kolodyne
Installed Capacity (in MW): 460
Location: Kawlchaw
Status: under process
Hydro Power Plants: 1 km (proximity to)
District Boundaries MIRSAC: Lawngtlai
longitude 92.94415
latitude 22.41635
Points of interest
Jawahar Navodaya Vidyalaya
LEGEND:
Hydro Power Plants

Thank You.

Scan the QR code below to visit our website and learn more →