सत्यमेव जयते

भारत सरकार

Government of India

विद्युत् मंत्रालय

Ministry of Power

पूर्वी क्षेत्रीय विद्युत् समिति

Eastern Regional Power Committee

सं /**NO. ERPC/TCC&ERPC COMMITTEE/2024/** 1082 दिनांक/**DATE: 26.09.2024**

सेवा में/To,

सूची के अनुसार./ As per list

विषय 5 सितंबर 2024 (गुरुवार) को गोवा में भौतिक रूप से आयोजित 52वीं टीसीसी बैठक का कार्यवृत्त

Sub: Minutes of 52nd TCC Meeting held on 5th September 2024 (Thursday) physically at Goa - reg.

महोदय/ महोदया,
Sir/Madam,

कृपया 05.09.2024 (गुरुवार) को गोवा में भौतिक रूप से आयोजित 52वीं TCC बैठक के संलग्न कार्यवृत्त को अपनी जानकारी और आवश्यक कार्रवाई के लिए प्राप्त करें। यह ईआरपीसी वेबसाइट (**www.erpc.gov.in**)पर भी उपलब्ध है। ईआरपीसी के निर्णय के अनुसार गो-ग्रीन पहल के रूप में बैठक के कार्यवृत्त की हार्ड प्रतियों का वितरण बंद कर दिया गया है।

Please find enclosed minutes of 52nd TCC Meeting held on 05.09.2024 (Thursday) physically at Goa for your kind information and necessary action. The same is also available at ERPC website (**www.erpc.gov.in**). As per decision of ERPC, distribution of hard copies of the minutes of the meeting has been discontinued as Go-Green initiative.

संलग्न : उपरोक्त
Encl: As above

भवदीय / Yours faithfully

एन. एस. मंडल
26.9.2024

(एन. एस. मंडल) / **(N. S. Mondal)**
(सदस्य सचिव) / **(Member Secretary)**

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ERPC Members

1. Chairperson, ERPC & Principal Chief Engineer-cum-Secretary, Energy & Power Department, Govt. of Sikkim, Kazi Road, Gangtok – 737101, Sikkim.
2. Member (GO&D), Central Electricity Authority, Sewa Bhawan, R.K. Puram, New Delhi-110066.
3. Chairman, GRIDCO Ltd., Janpath, Bhubaneshwar-751022.
4. Chairman-cum-Managing Director, Odisha Power Transmission Corporation Ltd., Janpath, Bhubaneswar- 751022.
5. Chairman-cum-Managing Director, OHPC Ltd., Orissa State Police Housing & Welfare Corporation Bldg. Vanivihar, Janpath, Bhubaneswar- 751022.
6. Managing Director, OPGC Ltd., Zone-A, 7th Floor, Fortune Towers, Chandrasekharpur, Bhubaneswar-751023.
7. Chairman-cum-Managing Director, Jharkhand Urja Vikas Nigam Limited, Engineering Building, HEC, Dhurwa, Ranchi-834004.
8. Chairman-cum-Managing Director, Jharkhand Urja Utpadan Nigam Limited, Engineering Building, HEC, Dhurwa, Ranchi-834004.
9. Managing Director, Jharkhand Urja Sancharan Nigam Limited, Engineering Building, HEC, Dhurwa, Ranchi-834004.
10. Managing Director, Jharkhand Bijli Vitaran Nigam Limited, Engineering Building, HEC, Dhurwa, Ranchi- 834004.
11. Managing Director, Tenughat Vidyut Nigam Ltd., Hinoo, Doranda, Ranchi – 834002
12. Chairman-cum- Managing Director, Bihar State Power Holding Company Ltd., Vidyut Bhavan, Bailey Road, Patna-800001.
13. Managing Director, Bihar State Power Transmission Company Limited, Vidyut Bhavan, Bailey Road, Patna- 800001.
14. Managing Director, South Bihar Power Distribution Company Limited, Vidyut Bhavan, Bailey Road, Patna- 800001.
15. Chairman & Managing Director, West Bengal State Electricity Distribution Company Ltd., Vidyut Bhavan, 7th Floor, Block-DJ, Sector-II, Bidhannagar, Kolkata-700091.
16. Managing Director, West Bengal State Electricity Transmission Company Ltd., Vidyut Bhavan, 8th Floor, Block- DJ, Sector-II, Bidhannagar, Kolkata-700091.
17. Chairman & Managing Director, West Bengal Power Development Corporation Ltd., Bidyut Unnayan Bhavan, 3/C, Block LA, Sector-III, Bidhannagar, Kolkata-700098.
18. Member (Finance), Damodar Valley Corporation, DVC Towers, VIP Road, Kolkata -700054.
19. Director (Commercial), NTPC Ltd., Core-7, SCOPE Complex, Lodhi Road, New Delhi -110003.
20. Director (Technical), NHPC Ltd., NHPC Office Complex, Sector-33, Faridabad, Haryana-121003.
21. Director (Operations), Power Grid Corporation of India Ltd., Saudamini, Plot No. 2, Sector-29, Gurgaon-122001.
22. Executive Director, ERLDC, GRID-INDIA, 14 Golf Club Road, Tollygunge, Kolkata – 700033.
23. Executive Director, NLDC, GRID-INDIA, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi-110016
24. COO, CTUIL, Saudamini, 1st Floor, Plot-1, Sector-29, Gurgaon-122001
25. Director (C&O), PTC India Ltd., 2nd floor, NBCC Tower,15 Bhikaji Cama Place, New Delhi- 110066.
26. Managing Director, Tata Power Trading Company Limited, B12/13, 2nd Floor, Shatabdi Bhavan, Sector-4, Noida-201301, Uttar Pradesh.
27. Chief Executive Officer, NTPC Vidyut Vyapar Nigam Limited, SCOPE Complex, Core-3, 7th Floor, Lodhi Road, New Delhi-110003.
28. Managing Director (Generation), CESC Ltd., CESC House, 1 Chowringhee Square, Kolkata- 700001.
29. Chief Executive Officer, Maithon Power Ltd., Village-Dambhui, P.O. Barbindia, Dist.-Dhanbad, Jharkhand- 828205.
30. V.P (Plant Head), GMR Kamalanga Energy Ltd., AT/PO-Kamalanga, PS-Kantabania, Via- Meramundali, Dist.- Dhenkanal, Odisha-759121.
31. Chief Executive Officer, Jindal India Thermal Power Limited, Plot No-12, Sector-B1, Local Shopping Complex, Vasant Kunj, New Delhi-110070.
32. Managing Director, Sikkim Urja Limited, 2nd Floor, Vijaya Building, 17 Barakhamba Road, New Delhi- 110001.
33. CEO, BRBCL, Nabinagar, Dist- Aurangabad, Bihar-824303.
34. CEO, DMTCL Ltd., 504 & 505, Off CST Road, Kalina, Santacruz(E), Mumbai-400098

TCC Members

1. Chairperson, TCC & Principal Chief Engineer-II, Energy & Power Dept., Govt. of Sikkim, Kazi Road, Gangtok-737101.
2. Chief Engineer (GM), CEA, Sewa Bhawan, R.K. Puram, New Delhi-110066.
3. Managing Director, GRIDCO Ltd., Janpath, Bhubaneswar-751022.
4. Director (Operation), Odisha Power Transmission Corporation Ltd., Janpath, Bhubaneswar - 751022.
5. Director (Operation), Orissa Power Generation Corporation Ltd, Zone-A, 7th floor, Fortune Towers, Chandrasekharpur, Bhubaneswar-751023.
6. Director (Operation), Orissa Hydro Power Corporation Ltd, Orissa State Police Housing & Welfare Corporation Building, Vanivihar Chowk, Janpath, Bhubaneswar-751022.
7. Executive Director (Tech),, Jharkhand Urja Utpadan Nigam Limited, Engineering Building, HEC, Dhurwa, Ranchi-834004.
8. Director (Project), Jharkhand Urja Sancharan Nigam Limited, Engineering Building, HEC, Dhurwa, Ranchi- 834004.
9. Chief Engineer (S&D-JBVNL), Jharkhand Urja Vikas Nigam Limited, Engineering Building, HEC, Dhurwa, Ranchi-834004.
10. Chief Engineer (S&D), Jharkhand Bijli Vitaran Nigam Limited, Engineering Building, HEC, Dhurwa, Ranchi-834004.
11. General Manager, Tenughat TPS, Lalpania, Dist- Bokaro, Jharkhand-829149.
12. Director (Tech.), Bihar State Power Generation Company Limited, Vidyut Bhavan, Bailey Road, Patna-800001.
13. Chief Engineer (Commercial), Bihar State Power Holding Company Ltd., Vidyut Bhavan, Bailey Road, Patna-800001.
14. Director (Project), North Bihar Power Distribution Company Limited, Vidyut Bhavan, Bailey Road, Patna-800001.
15. Director (Operations), West Bengal State Electricity Transmission Company Ltd., Vidyut Bhavan, 8th Floor, Block-DJ, Sector-II, Bidhannagar, Kolkata-700091.
16. Director (R&T), West Bengal State Electricity Distribution Company Ltd., Vidyut Bhavan, 7th Floor, Block- DJ, Sector-II, Bidhannagar, Kolkata-700091.
17. Director (O&M), WBPDCL, Bidyut Unnayan Bhavan, 3C, Block-LA, Sector-III, Bidhannagar, Kolkata- 700098.
18. Executive Director (Commercial), Damodar Valley Corporation, DVC Tower, VIP Road, Kolkata-700054.
19. Regional Executive Director (ER-I), NTPC Ltd., 2nd floor, Lok Nayak Jai Prakash Bhawan, Dak Bunglow Chowk, Patna-800001.
20. Regional Executive Director (ER-II), NTPC Ltd., 3rd Floor, OLIC Building, Plot No.N-17/2, Nayapalli, Bhubaneswar-751012.
21. Executive Director (O&M), NHPC Ltd., NHPC Office Complex, Sector-33, Faridabad-121003, Haryana.
22. Executive Director (ER-I), Power Grid Corporation of India Ltd, Board Colony, Shastri Nagar, Patna- 800023.
23. Executive Director (ER-II), Power Grid Corporation of India Ltd, CF-17, Action Area-I, Newtown, Rajarhat, Near Axis Mall, Kolkata-700091.
24. Executive Director (Odisha Project), Power Grid Corporation of India Ltd, Plot No-4, Unit 41, Niladri Vihar, Chandrasekharpur, Bhubaneswar, Odisha-751021.
25. Executive Director, ERLDC, GRID-INDIA, 14 Golf Club Road, Kolkata –700 033.
26. Executive Director, National Load Dispatch Center, GRID-INDIA, B-9 Qutab Institutional Area, Katwaria Sarai,New Delhi-110016.
27. Dy COO, CTUIL, Saudamini, 1st Floor, Plot-1, Sector-29, Gurgaon-122001
28. Executive Director (Marketing), PTC India Ltd., NBCC Tower, 15 Bhikaji Cama Place, New Delhi-110066.
29. Head (Marketing), Tata Power Trading Company Limited, B-12/13, 2nd Floor, Shatabdi Bhavan, Sector-4, Noida-201301, Uttar Pradesh.
30. Chief General Manager, NTPC Vidyut Vyapar Nigam Limited, SCOPE Complex, Core-3, 7th Floor, Lodhi Road, New Delhi-110003.
31. Sr. Vice President (System Operation), CESC Ltd, CESC House, 1 Chowringhee Square, Kolkata-700001.
32. Station Head & General Manager (O&M), Maithon Power Ltd., Village-Dambhui, P.O. Barbindia, Dist.- Dhanbad, Jharkhand-828205.
33. GM (Head-Electrical), GMR Kamalanga Energy Ltd., AT/PO-Kamalanga, PS-Kantabania, Via-Meramundali, Dist.-Dhenkanal, Odisha-759121.
34. Chief Operating Officer, Jindal India Thermal Power Limited, Plot No-12, Sector-B1, Local Shopping Complex, Vasant Kunj, New Delhi-110070.
35. Managing Director, Sikkim Urja Limited, 2nd Floor, Vijaya Building, 17 Barakhamba Road, New Delhi- 110001.
36. CEO, BRBCL, Nabinagar, Dist- Aurangabad, Bihar-824303.
37. Chief Operating Officer, 504 & 505, Off CST Road, Kalina, Santacruz(E), Mumbai-400098

Non-Member Participants

1. Managing Director, Haldia Energy Limited, Haldia, West Bengal-721658
2. Director, JSW Energy (Utkal) Ltd, Sahajbahal, Jharsguda, Odisha-768211
3. Managing Director, Adhunik Power & Natural Resources Ltd., Lansdowne Towers, 5th Floor, 2/1A Sarat Bose Road, Kolkata-700020.
4. Managing Director, DANS Energy Pvt Ltd, DLF Cyber City, Phase-II, GURGAON – 122 002
5. Director, Shiga Energy Pvt. Ltd., 5th Floor, DLF Building No. 8, Tower-C, DLF Cyber City, Phase-II, Gurgaon – 122002
6. CEO, Sneha Kinetic Power Projects Pvt.Ltd. #31 -A, Behind SNOD building, Deorali, Gangtok, Sikkim-737102
7. CEO, Rongnichu HEP, MBPCL, Sikkim-737102.
8. Senior Vice President, Sikkim Power Transmission Limited, B2/1A, Safdarjung Enclave, Africa Avenue, New Delhi-110066
9. CEO, IndiGrid Limited, Mumbai-400079
10. CEO, Cross Boarder Power Transmission Limited, 3rd Floor, Niryat Bhawan, New Delhi-110057
11. CEO, Alipurdar Transmission Limited, 101, Part-III, G.I.D.C Estate, Gandhinagar, Gujrat-382028
12. CEO, SJVN Thermal Pvt Ltd, 169. Pataliputra Colony, Patna-800013
13. MD, Tata Steel UISL, Jamshedpur, Jharkhand-831001
14. Managing Director, India Power Corp. Ltd., Kolkata.

GOVERNMENT OF INDIA

MINISTRY OF POWER

Eastern Regional Power Committee

MINUTES

OF

52nd TCC MEETING

Date of Meeting: 05.09.2024

Time: 10:00 Hrs

Goa

Contents

Eastern Regional Power Committee, Kolkata

MINUTES OF 52nd TCC MEETING

Date: 05th September ,2024(Thursday) at 10:00 Hrs **Goa**

- **In Chair: Shri Sonam Rinchen Bhutia, Principal Chief Engineer, Power Dept, Govt of Sikkim**
- **Host:** NTPC Ltd.

- *Meeting was convened physically at Goa.*
- *List of participants is attached at **Annexure-A.***

***RED, NTPC** welcomed all esteemed members of TCC and other participants to the 52nd TCC meeting. He highlighted major achievements of NTPC in recent years and also highlighted the CSR activities being undertaken by them. He expressed his gratitude for giving them the opportunity to host the 52nd TCC & ERPC Meeting. He wished all the delegates a pleasant stay and fruitful deliberations in the meeting.*

1. PART-A

1.1. Confirmation of Minutes of 51st TCC Meeting held on 11th January 2024 virtually through MS TEAMS online platform

The minutes of 51st ERPC meeting held on 11.01.2024 virtually on MS TEAMS online platform was circulated vide letter no. ERPC/ TCC & ERPC COMMITTEE/2024/1497 dated 25.01.2024.

Members may confirm the minutes of 51st TCC meeting.

Deliberation in the 52nd TCC meeting

Members confirmed the Minutes of 51st TCC meeting.

2. PART-B: ITEMS FOR DISCUSSION

2.1 Flexible operation of Coal based Thermal Power Plants

- As per gazette notification dated 30.01.2023 issued by CEA regarding flexible operation of coal fired thermal generating units, ramp rate of 2% between 55-70% along with a ramp rate of 3% above 70% was mandated within one year of notification of the regulations i.e by Jan 2024.
- The SOP for operating at 55% load with recommendation for necessary training of the plant operators, was also circulated.
- Relevant communication in this regard was also passed on to State Electricity regulatory Commissions as well as principal secretaries of concerned states outlining measures for execution of CEA regulations.

- As per above mentioned regulations, coal based thermal generating units, whose implementation shall be as per phasing plan specified by CEA. Implementation plan for unit operation at 40% minimum load in phased manner (pilot+4 phases) (attached at **Annexure 2.1**) This phased implementation has been notified, with specific targets and timelines for compliance.

❖ **Regarding 55% Minimum Technical Load (MTL)**

Thermal GENCOs may share details w.r.t the following:

a) Whether the target of achieving 55% Technical Minimum Load (MTL) has been met & if not, the reasons for the same & tentative date for achieving the same.

b) Whether the specified ramp rates outlined in the regulations i.e., 3% for 100-70% load & 2% for 70-55% load have been adhered to, if not, the reasons & tentative date for achieving the same.

c) How many operators have been trained in your organisation? (May treat this matter as Most Urgent)

❖ **Regarding 40% Minimum Technical Load (MTL) & status of units under pilot phase (May,2023-March,2024).**

Phase	**Sector**	**Organization**	**Name of Project**	**Unit No.**	**Capacity (MW)**	**Region**
Pilot	Central	DVC	MEJIA TPS	8	500	ER
Pilot	State	WBPDCL	SAGARDIGHI TPS	3	500	ER

In addition to the above, one unit of MPL has already demonstrated part load operation upto 40 %.

Thermal GENCOs may share details w.r.t the following:

❖ Whether the target of achieving 40% Technical Minimum Load (TML) has been met and if not, the reasons for the same and tentative date for achieving.

❖ Whether the specified ramp rates outlined in the regulations, i.e., **3% for 100-70% load, 2% for 70%-55% load, 1% for 40%-55%** have been adhered to. If not, the reasons for behind and tentative date for achieving the target.

- In 218th OCC it was opined that flexible operation of Coal based thermal power plants holds paramount significance for reliable and secure grid Operation, especially during solar hours amid high variability of RE generation. Thus, timely adherence to the regulations issued by CEA is essential for smooth energy transition.
- OCC recommended all the Generating utilities to ensure technical capability to operate at 55% MTDL in compliance to CEA regulations.
- In absence of OPGC representative, SLDC Odisha was advised to update on operation upto 55% MTDL i.r.o remaining 210 MW units of OPGC in next OCC.
- OCC directed all the respective generating stations to adhere to the CEA timeline w.r.t phase-wise implementation (phasing plan enclosed) flexible operation in their respective units.
- **OCC advised DVC and WBPDCL to take up with BHEL for expediting technical feasibility of sustained operation at 40% MTDL.**
- OCC also referred the matter to TCC for further deliberation.

Thermal GENCOs may update. TCC may discuss.

Deliberation in the 52nd TCC meeting

❖ *MS, ERPC briefly highlighted the need of Flexible operation of Thermal Power Plants in order to accommodate the increased penetration of variable and intermittent RE power into the Grid mainly during the Solar Hours for stable & secure Grid Operation.*
❖ *Keeping this in view, it has become imperative for all the Thermal Generators to ensure required Flexibilization with desired ramp rates as per gazette notification dated 30.01.2023 issued by CEA.*

A. 55% Minimum Technical Limit (MTL):

❖ *WBPDCL updated that all the thermal generating units are technically capable to operate at 55% MTDL ,but in absence of appropriate compensation regulations of WBERC, generating units are not inclined to operate at 55% MTL or below.*
❖ *On behalf of DPL, he informed that all the units of DPL TPS are capable of operating at the desired MTL(55%).*
❖ *ED, ERLDC apprised that they have already highlighted the matter to WBERC & WBERC has inter alia informed that appropriate regulation to incentivize generators shall be looked into.*
❖ *NTPC, DVC & CESC representatives submitted that all their thermal generating units are technically capable of operating at 55% MTDL on sustained basis.*
❖ *OPGC updated that all Units are technically capable to operate at 55% MTL.*
❖ *Chief Engineer, GM Division,CEA suggested that the thermal units shall mandatorily comply the flexibilization in their operation with required ramp rates as per CEA/MOP directives.*

TCC Decision:

❖ *TCC opined that it would not be prudent to compromise with secure and stable grid operation for commercial aspects. It was further observed that in view of rapid RE capacity addition, flexible operation of existing thermal units is extremely crucial.*
❖ *Joint Secretar(Thermal), MoP vide DO letter dated 28th Aug 2024 addressed to principal Secretary(Energy/Power) of all states/UTs suggested all states to take up with respective SERCs to introduce enabling provisions for thermal flexibility of intra-state generating units. TCC advised concerned members of state utilities to take up the matter with their SERCs for issuance of necessary provisions/regulations to facilitate flexibility in intra-state thermal generating stations.*

B. 40% Minimum Technical Load (MTL):

WBPDCL updated that Sagardighi unit#3 trial run was already done at 40% MTL for a short duration of time & the exact response in continuous operation with specified ramp rates is yet to be ascertained.
❖ *He further submitted that the unit#3 will be fully capable of operating at 40% MTL at desired ramp rate as per CEA Guidelines by November 2024 after some fine tuning of Governor system by M/S BHEL .*
❖ *DVC updated that the detail report on successful trial operation at 40% MTL of Mejia Unit#8 highlighting the issues faced during trial run, is already shared with CEA & ERPC. However,they are waiting for feedback from M/S BHEL & the same will be updated in the next OCC.*
❖ *OPGC submitted that their 660MW units are technically capable to operate at 40-45% MTL. However, in 210MW units having tube mill boilers, part load operation at 40-45% is not feasible without oil support.*
❖ *GMR also informed that their units are technically capable to operate at 45% MTL without oil*

support.

Phase-1 Implementation Programme by CEA (July 2024-June 2026)

❖ *Under the Phase-1 Implementation Programme by CEA, three units has been identified in respect of ER.*
❖ *DVC updated that part load operation at 40% MTL in the Bokaro TPS `A` Extension unit#1 (500 MW) will be implemented within the stipulated timeline (Nov 2024).*
❖ *Raghunathpur TPS unit#2 (600 MW) is a Chinese make Unit & due to non-availability of support from OEM, the issue has been highlighted to CEA.*
❖ *IBEUL updated that they will achieve the implementation of 40% MTL in unit#1 (350 MW) within stipulated time frame (December 2024).*

TCC Decision:

❖ *TCC advised the Generators selected under pilot phase as well as phase-1 to expedite their execution process & complete all the required modification within the stipulated timeframe given by CEA.*
❖ *TCC advised DVC and WBPDCL to take up with BHEL for expediting technical feasibility of sustained operation at 40% MTL.*
❖ *TCC opined for regular follow-up of status in OCC.*

2.2 Commercial Issues related to MTDL at 55 % of Intra-state Generators

- Flexibility of conventional generating stations is required for reliable grid operation with increased penetration of RE. In compliance to the above, CEA (Flexible Operation of coal based Thermal Generating Units) Regulations, 2023 were notified on 25th January 2023. According to this regulation, all thermal generators should achieve 55% technical minimum within one year from notification of this regulation and should attain 40% technical minimum as per CEA phasing plan notified on 15th Dec 2023.
- During the 218th OCC held on 23.08.2024, DVC, Bihar and WB (Except Kolaghat TPS and DPL unit #8) has confirmed capability of running all the units at 55% of MCR. However, during the sustained high frequency on August 3rd and 4th, 2024, it was observed that most of the state generators were running above 55% of MCR. From the discussions, it emerged that scheduling of such generators were not done by SLDCs due to specific compensation mechanism from SERC for part load operation for operating intra-state generators in TM level.
- Further, it was observed that TRAS down margin also not available due to less participation of Intra-state generators in TRAS market.
- If these state generators are not reduced to 55% TM and instead, units ISGS are decommitted, it would result in a severe power shortage during non-solar hours. In view of the above, following need to be addressed:

1. Ensure scheduling of state generators by SLDC at 55% of MCR in compliance of CEA regulation.

2. Participation of Intra-state generators in TRAS market.

215th OCC Decision:

- OCC directed WBPDCL to support the grid at the time of need by backing down of generation. WBPDCL was also suggested to approach WBERC with the above-mentioned issues.

- OCC referred the matter to TCC for further deliberation.

ERLDC may explain. TCC may deliberate.

Deliberation in the 52nd TCC meeting

ED, ERLDC highlighted operational difficulty faced by System operators to regulate the frequency within the stipulated IEGC Band mainly during non-solar hours because of large Penetration of RE power in the Grid.

❖ *Referring to the sustained high frequency event that occurred on August 3rd and 4th, 2024, He underscored the importance of Scheduling of Intrastate Generators by SLDCs at 55% MTL, to avert any such frequency escalation in the future as most of Intrastate Generators were running above 65% during this period.*

TCC Decision:

- *TCC opined that operational requirements for Grid Stability & Security shall not be compromised for Commercial aspects of Generators.*
- *It was decided that as per DO letter issued by JS(Thermal), MoP on 28th Aug 2024 addressed to Principal Secretary(Energy/Power) of each States/UTs that the States shall take up 55% MTL Flexible Operation of Thermal Units with Respective SERC & make it mandatory to participate in maintaining Grid Stability as well as Security during any Grid disturbance event.*
- *TCC directed all States to approach respective SERC for specific compensation mechanism for part load operation to support Grid at the time of need & subsequent participation of Intra*-state generators *in TRAS Market.*

2.3 Implementation of AGC in Intra-state generating units

- AGC has been successfully operationalized at most ISGS plants across India (71 plants), with a combined installed capacity of approx. 69 GW. Although as per the extant regulations the connected plants typically offer +/- 5% of their MCR under SRAS, however, the dispatchable margin provided through AGC and Secondary Reserve Ancillary Services (SRAS) remains insufficient for maintaining frequency within the IEGC band. It has been observed that the actual reserves available to system operator are in the range of +/- 1000-1500 MW. With the growing RE penetration, wide frequency excursions in the hourly boundary are being experienced posing significant challenges for system operators in maintaining optimal grid frequency.
- Considering the growing need for flexibility, it is crucial to enhance the secondary reserves available for dispatch through AGC under SRAS. Hence to strengthen frequency control and stability, expanding the ambit of AGC to intra-state generating stations is need of the hour.
- To address this need, initiatives are underway to encourage greater participation from intra-state generators in the SRAS scheme. Feasibility studies have been conducted, and stakeholder consultations have been held with DVC, West Bengal, and Bihar to explore viable solutions and address concerns.
- Present status of Intra-state AGC integration process is as follows:

SLDC/State	Generator name	Unit Capacity (MW)	Status
Bihar	Barauni unit # 8 & 9	2x250	Pending discussion between NTPC Barauni, SLDC Bihar and its DISCOM for mutually agreeing to Mechanism for recovery of one-time cost of AGC implementation and Mechanism for Sharing of gains which is to be fixed bilaterally.
DVC	Mejia-B, DSTPS and Koderma	(2x500) (2x500) (2x500)	Final procurement order was awarded to Siemens on **7th August 2024** with timeline of completion of **4 months.**
West Bengal	Units of WBPDCL	-	**AGC implementation getting delayed due to contractual issues and implementation mechanism b/w WBPDCL and WB SLDC.** M/s WBPDCL refers to WBSERC for implementing the AGC server at WBSLDC after which plants will be connected to SLDC one by one.

TCC may deliberate.

Deliberation in the 52nd TCC meeting

❖ *DVC apprised that final procurement order was awarded to Siemens on 7th August 2024 for all identified six Units & it is expected that within 4 months AGC implementation will be completed.*

❖ *NTPC representative informed that NOC for implementing AGC in its Barauni unit # 8 & 9 is yet to be received from SLDC, Bihar & also discussion is pending between NTPC Barauni, SLDC Bihar and its DISCOM for mutually agreeing to cost recovery and gain sharing mechanism.*

❖ *RED, NTPC mentioned that since the need for AGC Implementation in its Barauni unit # 8 & 9 is principally agreed & for this, a formal clearance from Bihar is required. They will resolve the issue by joint meeting.*

❖ *ED, ERLDC requested SLDC, Odisha to organize a meeting with OPGC to formulate a methodology so that OPGC units can be integrated with AGC.*

❖ *SLDC, Odisha submitted that attempt has been made by OPGC but OEM has not yet responded.*

❖ *OPGC suggested to have a special meeting with M/S BHEL & SLDC, Odisha to finalize the modalities of Implementation of AGC & will update the status within one month.*

❖ *CE, WB SLDC submitted that another meeting shall be convened with WBPDCL to resolve contractual issues and decide next course of action.*

TCC Decision:

- *TCC appreciated efforts of DVC in initiating AGC implementation process*
- *SLDC Bihar and Bihar DISCOMs were advised to resolve the pending issues with NTPC bilaterally for AGC implementation at the earliest.*
- *SLDC Odisha was advised to organize meeting with OPGC and ERLDC to resolve AGC implementation in OPGC units.*
- *WB SLDC was advised to resolve issues with WBPDCL bilaterally for expediting AGC implementation.*
- *TCC advised all the concerned utilities to expedite the execution process & complete the AGC Implementation as early as possible.*
- *Status of AGC implementation to be updated regularly in OCC meetings.*

2.4 Operational Difficulties faced by DVC Generators in Complying to the FGMO Logic as per IEGC, 2023 and Delay in implementation of Incentive to Generators for providing PFR: DVC

- Referring to the provisions laid down under Cl. 10 on 'Primary Control' in the CERC (IEGC) Regulations, 2023, the generating Stations and units thereof needs to operate under Free Governor mode of Operation with an inherent deadband of +/- 0.03 Hz. The deadband is to be set with respect to the reference frequency of 50.000 Hz and not with respect to the tracking/ current frequency – clarified in the detailed Operating Procedure of NLDC. The scan rate of frequency input to the governor needs to be kept at minimum possible also.
- The above criteria deviate significantly from that of the earlier requirements for Governor Response, as per the IEGC, 2010 Regulations wherein a concept of "Ripple Filter" of +/- 0.03 Hz introduced, and it was supposed to be measured w.r.t. the tracking/ current frequency and not against a fixed refence frequency. The purpose was to ignore the small changes in frequency in order to prevent governor hunting.
- It is agreed that the national grid frequency has stabilized over the years with reduction in Frequency Variation Index. However, it may also be appreciated that as on date the deviation is not being maintained strictly within +/- 0.03 Hz w.r.t. the Reference Frequency, (within 49.97Hz to 50.03 Hz) for most of the time in a day. Even, the 15-min avg. block frequency is found to remain ~38% of the time outside +/- 0.03 Hz Band on avg. in a day with a max. daily fig. of 52% (*derived considering the frequency data of June'24). For a finer time-resolution, the above figures expected to be even large and frequent and hence the FGMO logic remains activated for a significant period of time in a day.
- Even outside the band, the back-and-forth movement of frequency within a short span of time, accounts for frequent reversal of FGMO influence and thus results in hunting of Turbine Control Valve and machine parameters. A sample illustration of DSTPS U#2 is being shown in below table showing frequent change in FGMO correction input and its effect on various plant parameters.

Parameters	15:54:30	16:01:30	16:05:00	16:08:30
Actual load	426	413	416	420
Load SP	420	420	420	420
Drum Pressure	172.96	186.81	188.26	180.09
MS pressure	158.20	176.65	173.34	165.0
MS Pr. Set Point	161.64	163.19	161.11	161.11
Coal flow	244	222	225	226

FGMO correction	7.7MW	-17.3	-12	00
Drum Level	-7	-75	-92	-167
MS temp.	547	528	491	497
HPBP Opening	0	0	25%	0

- The situation even gets worsened when the Load setpoint (SP) variation, on account of revised despatch instruction of SLDC, is in opposite direction of FGMO output. For example, say the case when Load SP has been increased at higher Frequency excursion outside the +/-0.03 Hz band. Under such case, the additional fuel-flow due to increase in Load SP will cause MS pressure increase after a boiler dead time of 3-4 mints. However, at the same time the Turbine control valves will get closing command due to FGMO effect, resulting an increase in Main Steam Pressure. The Deviation of Main Steam pressure (ΔP) sometimes exceeds the Main steam Pressure set-point of 12 Kg/cm2 for this dual effect causing opening of HP Bypass valve in auto. Which in terms causes significant instability in drum level control and SH temperature control.

- Such type of incidents is appearing roughly 3-4 times daily in each of the unit, resulting unstable operation of the units and increase chances of unit tripping on Drum Pressure fluctuation. Further, such stressed operation of various equipment/ components due to fluctuating FGMO commands on persistent basis, may account for significant damage in long run.

- Earlier, there was no specific incentive allowed to generators for providing Primary Frequency Response. However, as per maximum response limit of FRC i.e. upto 105%, generators were allowed to declare their DC upto 105%. In that way, generators were benefitted in terms of excess DC, if %availability falls short of 85% on annual basis. However, the same has been restricted in the CERC (IEGC) Regulations, 2023 by way of limiting DC upto 100%.

- The provision of performance linked incentive to the generators, ceiling upto 10% of annual Capacity Charge of the station, is still not implemented due to delay in finalisation of the detailed procedure of NLDC.

- Under such scenario, the plants are deprived of any financial benefit in spite of providing grid support through Primary Response.

- **In 218th OCC Meeting**, DVC was advised to coordinate with NTPC and ERLDC for pin-pointing the exact cause behind instability of units on comparing with NTPC units where FGMO operation is successful.
- OCC advised ERLDC to take up the matter with NLDC & expedite the process of finalizing the procedure of incentivizing Generators for supporting grid through Primary Frequency Response.

- OCC referred the matter to TCC for further deliberation.

DVC may update. TCC may deliberate.

Deliberation in the 52nd TCC meeting

DVC representative submitted the following points:

- *Operational constraints faced by their generating units due to frequent reversal of FGMO logic.*
- *There was no specific incentive allowed to generators for providing Primary Frequency Response in the current regulations and the plants are deprived of financial benefit despite providing grid support through Primary Response.*

After detailed deliberation, TCC suggested DVC may take up the issue with CEA and referred the matter to ERPC for further deliberation.

2.5 Incorporation of some essential features in new WBES: WB SLDC

Provision for viewing MTDL values of all the generating stations catering power to the state of West Bengal is a mandatory requirement in the context of merit order despatch. The matter has commercial implications on the intra-state Discoms and need to be resolved at the earliest.

Requirement of providing facility for viewing consolidated scheduling dashboard with details like date, time, name of affecting utility was pointed out in the last OCC. The required provision is yet to be implemented.

Providing API of contract details related to GNA/TGNA with parameters such as approval date, approved period, approved quantum etc. for seamless integration with other applications like SAMAST. The issue needs to be resolved at the earliest.

During several discussions with ERLDC implementation team, it was suggested that a new API may be developed and shared in which only the current revision number to be provided. This API should have a different rate limit from the existing API.

As new WBES has been integrated with SAMAST scheduling module, it is requested to intimate SLDC, WB before deploying any relevant modifications/update in new WBES.

As per deliberation in the **218th OCC** meeting

- ERLDC stated that following requirements as desired by WB SLDC have been implemented:
  - Schedule data visibility of all India entities through user credential-controlled access.
  - Contract Rate has been made Non mandatory field.
  - DC and Schedules of all generating stations in which West Bengal has share allocation.
  - Partially Fulfilled: Making nomenclature in NOAR and WBES same as CEA (OPM division)- all utilities of WBES and NOAR synched with NOAR ID.
  - **Following requirements as sought by WB SLDC, are yet to be completed:**
  - MTDL values to be made available for all generators together in Reports section
  - GNA Contract details like contract quantum, approved period etc to be provided in API
  - Report to view block wise quantum excl loss for all transactions together to be prepared
  - Date and time stamp in all report downloaded shall be provided.
- Intra-state DISCOM wise login needs further deliberation as across pan India, only one Login id is shared by all state entities & all are operating smoothly without any such issues mentioned above. Also, the WBES system may get slowed down with provision of multiple access by many intra-state entities.
- Implementation of Dynamic IP based API access will not be possible because of cyber security threats.

OCC advised ERLDC to incorporate the necessary requirements in New WBES to the best feasible extent.

OCC also instructed ERLDC to strictly follow a standard nomenclature of all generation stations as followed by OPM division of CEA in order to eliminate mismatch in nomenclature in new WBES.

ERLDC may update. TCC may discuss.

Deliberation in the 52nd TCC meeting

WB SLDC submitted that most of requirements as sought by them is already incorporated in New-WBES portal by ERLDC.

❖ *They also requested ERLDC to intimate in advance before deploying any changes in New WBES portal.*

❖ *WBSEDCL highlighted following features that needs to be incorporated in WBES:*

- *In New WBES only a single DISCOM login is allocated to West Bengal which is shared by CESC, IPCL, and WBSEDCL & if there are multiple logins attempt with incorrect passwords by any user then portal gets locked. It adversely affects the activities of other users. So requested NLDC via this forum for providing additional login-id to Discoms, those are having ISTS share.*
- *Provision for viewing MTDL values of all the generating stations catering power to the state of West Bengal in the context of merit order dispatch.*
- *In the new WBES system, both Full Schedule and Net Schedule have become numerically identical and are displayed at the State periphery, considering CTU loss. This change has deviated from the conventional distinction between Net and Full Schedules.To facilitate ease of Energy Accounting at each bus, the convention of Net and Full Schedules may be reinstated to its original format, as in the old WBES system. This would enable separate viewing and downloading of Net Schedule and Full Schedule, maintaining the distinction between Regional and State peripheries.*

❖ *The Representative of ERLDC Submitted the following:*

- *Provision of viewing MTDL shall be made available within a week & provided in the form of a report.*
- *The issue of Multiple login credential for intrastate Discom shall be taken up with NLDC.*

❖ *In 218th OCC Meeting, ERLDC was advised to follow standard nomenclature of all generation stations as followed by OPM Division of CEA in order to eliminate mismatch in nomenclature in new WBES. However, ERLDC underscored that there are lots of instances in which OPM Division uses a single Nomenclature for different stages of same thermal station, thereby increasing the ambiguity.*

❖ *CE, GM Division, CEA took serious note of the issue & opined that all other RLDCs may list out such type of differences in nomenclature or may compare their data with database of NLDC. Accordingly, CEA will hold a joint meeting with all RPCs & RLDCs for necessary corrections in the specific nomenclature to bring clarity & share the same with all utilities across pan India for future usage.*

TCC Decision:

❖ *CE, CEA (GM Division) agreed to hold a joint meeting with all RPCs & RLDCs to incorporate necessary correction in the nomenclature wherever is required & communicate the same with all utilities so that universal nomenclature can be followed across pan India for all purposes including New-WBES, DSM accounting by RPCs etc.*

❖ *ERLDC to incorporate the necessary requirements of the stakeholders in New WBES to the best*

feasible extent.

2.6 Spare Reactor procurement under Eastern Regional Pool as per CEA norms – Powergrid ER-II.

- Spare Reactor proposal was forwarded from POWERGRID in **202nd OCC** and further referred to special meeting convened on 05.02.2024 for feasibility study.
- Based upon outcome of the special meeting, the subject agenda put up in 29th CMETS (By ERLDC), where in CTU provides its views for operational aspects/planning perspective only.

In **29th CMETS-ER**:

- After detailed deliberations, all stakeholders agreed that some candidate reactors can be kept identified for use as spare or for replacement of failed reactor. As and when need arises, based on merit of the case and considering all techno- economic issues, use of reactors as spare or for replacement can be decided.
- In view of above, POWERGRID was requested to finalize the spare reactor quantity, such that necessary procurement could be finalized.
- Original list of spare Reactors proposed were as follows:-

STATE	VOLTAGE	SIZE	STORAGE PLACE
WEST BENGAL	400 KV	125 MVAR	DURGAPUR SS
		80 MVAR	BINAGURI SS
		63 MVAR	BINAGURI SS
SIKKIM	400 KV	80 MVAR	RANGPO SS
	220 KV	31.5 MVAR	NEW MELLI SS
BIHAR	400 KV	125 MVAR	BIHARSARIFF SS
		80 MVAR	PATNA SS
		63 MVAR	MUZAFFARPUR SS
JHARKHAND	400 KV	125 MVAR	NEW RANCHI SS
		80 MVAR	RANCHI SS
ODHISSA	400 KV	63 MVAR	ROURKELLA SS

- After detailed deliberation in 217th OCC, OCC consented to the proposal of reactor spares as follows:

STATE	VOLTAGE	SIZE	STORAGE PLACE
WEST BENGAL	400 KV	125 MVAR	DURGAPUR SS
		80 MVAR	BINAGURI SS
SIKKIM	220 KV	31.5 MVAR	NEW MELLI SS

JHARKHAND	400 KV	125 MVAR	NEW RANCHI SS
ODHISSA	400 KV	63 MVAR	ROURKELLA SS

- OCC advised Powergrid ER-II to submit revised cost estimate as per revised spares requirement as given above in the upcoming CCM.

In **51st CCM:**

- Representative of Powergrid submitted that the tentative rates mentioned against each reactor have taken by considering the average rate of several LOA placed across India by Powergrid. The transportation rate for New Melli S/s has been considered on a slightly higher side.
- Also, the rates for 31.5 MVAR reactor have been considered on a pro-rata basis as the production of these reactors are not very common. Cost approval may be accorded for the time being as the actual cost would be detailed during the tendering process.
  The Commercial Committee agreed with the estimated cost **Rs. 55.67 Crores** (details provided at **Annexure 2.6**) and referred for concurrence of 52nd TCC & ERPC.

POWERGRID ER-II may explain. TCC may concur.

TCC agreed with the proposal of procurement of spare reactor under ER pool with the estimated cost Rs. 55.67 Crores (exclusive of GST) and referred to ERPC for approval.

Deliberation in the 52nd TCC meeting

TCC Decision

TCC agreed with the proposal of procurement of spare reactor under ER pool with the estimated cost Rs. 55.67 Crores (exclusive of GST) and referred to ERPC for approval.

2.7 Upgradation of AMR system Network into Layer-3 in Eastern Region (Addition to Scope for AMR Phase-5)- Powergrid ER-II.

Synopsis:

- AMR system implementation in Eastern Region was started from year 2013 onwards. At the beginning, data communication from Sub Station DCUs and ERLDC data center was via GPRS/SIM card-based communication. In the year 2018, as per regulation of CEA/CERC on cyber security, the AMR system communication gradually started migrating in LAN/Intranet based communication channel. We had been provided a LAN port at Sub Stations, where the DCU was physically connected. From the Sub Station to ERLDC, LAN based connection was already present using which SEM data was communication in AMR system. In 2022, 100% AMR system was migrated into LAN/Intranet based setup.
- While the LAN ports were assigned for AMR data communication during the implementation phase, it was observed that the proper network design and logical segregation was missing. Only one VLAN setup was created for the entire AMR, due to which all the AMR DCUs was assigned IP address from a single IP Subnet. In this setup, if any unprecedent issue occurs at any of the locations, the entire AMR network will be choked. Also, in the AMR VLAN, if any other non-AMR devices (like Switch, Router etc.) are getting connected at any of the Sub Stations and that device is using same IP address of AMR VLAN, a data packet loop is getting created resulting entire AMR VLAN out of service. Additionally, due to lack of proper Network Management System (NMS), finding the exact location of these devices are also not being done.

Proposed Solution:

As stated above, the entire AMR network is operating in a single VLAN and in the Layer2. So, any control mechanism of unprecedent scenarios is not feasible. To implement a proper network of AMR, the existing AMR network needs to be upgraded in Layer3. The detailed solution is described below.

Upgradation of AMR Network in Layer3:

•In existing AMR of Eastern Region, there are total 05 states (WB, SIKKIM, ODISHA, BIHAR & JHARKHAND) along with 3 Central Sectors (PGCIL, NTPC, DVC & IPPs).

•For each of the zones, the AMR data should be dropped in a single location/node. Example: In WEST BENGAL state, we have total 22 number of AMR DCUs. So, it is requested that all these DCU communication should be dropped in a single station SDH (may be WB SLDC). PGCIL/ULDC/SLDC has to ensure the same.

•From the state wise/sector wise AMR data dropping location, the data traffic of these AMR DCUs will be connected with ERLDC using point to point connection (not another hopping/data dropping point). PGCIL/ULDC/SLDC has to ensure the same.

•A new Layer3 Device (Router) will be installed at the zone station. This router will be placed in between the SDH ports of that station. So, eventually the router will be connected with the AMR DCUs and the ERLDC channel.

•At ERLDC central Data Centre, a centralized Router device will be installed. This will be connected with all the station level Router & the existing AMR network at ERLDC.

•Like one state (WB) as mentioned above, new Router will be installed at each zones/state levels for different sectors. (in this proposal we have considered 08 numbers i.e 05 states and 3 Central Sectors).

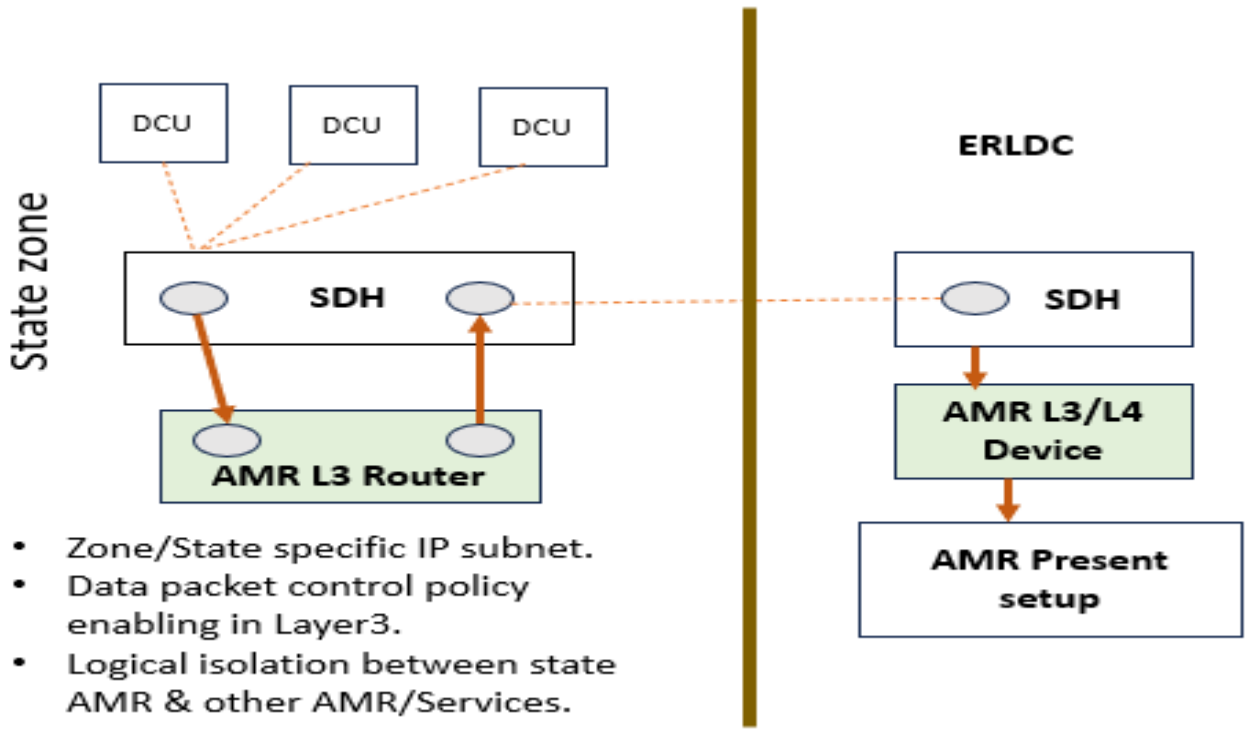
•All the zones will be assigned new IP address from different subnet of Ips, that means the DCU IP address will be different for different zones. This will significantly reduce the chances of occurring any IP loop in the Network.

•All these different routers (installed at different zones) will have network level security. That means if any unprecedent situation occurs at any zone(s), that issue will be blocked at the router installed for this zone. This will not be transmitted to the central AMR zone thus the other AMR zones will be working without any disruption.

•Monitoring of the zone level routers will be done Centrally from ERLDC.

The matter was discussed in 15th TeST Committee Meeting. The TeST committee advised POWERGRID, ERLDC & WBSETCL to jointly implement the interim measure proposed by POWERGRID till approval of the permanent solution proposed by TCS team.
All utilities agreed to the proposal of M/S TCS as a long term solution. Accordingly,TeST committee advised Powergrid to put up a detailed scheme on logical segmentation of AMR network along with cost estimate in next TeST meeting.

Proposed design diagram for upgrading AMR Network in Layer3



Scope of Work:

As per the solution proposed in above section, following will be the scope of work for us.

- Procurement of hardware.
- Installation of hardware at respective locations. New AMR router will be installed at Rack (Rack space must be provided by the respective zone station) and physically connected with the SDH ports.
- Configuration of the hardware as per network design and requirements.
- Re-Configuration of AMR DCUs, as per upgraded network design setup & new IP addresses.
- Testing of the entire AMR system with upgraded network design.
- AMR DCUs will be migrated to new network setup zone wise. (Means one zone will be migrated and testing will be done. Once one zone data communication is successful, the next zone will be migrated).
- During the AMC phase, dedicated network team will be sitting at ERLDC Data Centre for monitoring of the system. (Adequate sitting arrangement at Data Centre has to be provided).
- AMC support window will be 5 working days/9hrs per day for a week.

Exclusions/ To be provided by Client:

- PGCIL/respective utility has to ensure that AMR data communication for their stations must be dropped at a single station.
- From station to ERLDC, point to point connectivity must be provided.
- Dedicated RJ45 ports (02nos) to be provided at each SDH for each locations/zone.

- PGCIL/Other utility has to ensure that the IP subnet being used for AMR Network, that will be logically separated from any other network that the state/zone using presently or may be using in future. (We will share the IP subnet details with PGCIL beforehand).
- Each Zone/Utility has to be ensured that no Layer2 protocol in their existing Network shall have access to AMR Network or vice e versa.
- At each station, the respective utility has to provide a Rack space for installation of the new Router of AMR. Also, dual channel power supply has to be provided.
- Each station/utility has to ensure that the physical distance between the SDH & the place where new AMR router will be installed, shall not be more than 80mtr.
- At ERLDC, one dedicated SDH port (RJ45) with minimum 100MBPS bandwidth has to be provided this new AMR network.

Project Timeline (tentative):

As per the proposed solution mentioned above, below is the estimated timeline of the project scope.

Procurement of Hardware	Installation & Configuration of the hardware	Testing and Go-Live	AMC Support
03 months (M1 to M3)	02 months (M4 to M5)	01 month (M6)	36 months (M7 to M42)

Project Commercial Details:

Supply of Hardware:

Item Description	Make & Model	Quantity	Unit Price	Total Price
Router- for each zone	Cisco Catalyst 8200L	08	198930	2111171
Router- for central ERLDC	Cisco Catalyst 8200L	01	198930	198930
Total Cost of Hardware (without Taxes)				**23,10,101**

Services:

Installation, Configuration, Testing & Go-Live (without Taxes)	**46,86,162**
03 years comprehensive AMC Support (without Taxes)	**92,36,593**

Total Cost (without Taxes): INR **1,62,32,855 /-**

POWERGRID ER-II may explain. TCC may concur.

Deliberation in the 52nd TCC meeting

TCC Decision

TCC agreed on the technical requirement of the proposal for upgradation of AMR system network into Layer-3.

- *TCC concurred the estimated cost of Rs.46.86 Lakh (without Taxes) for Installation, Configuration, Testing & Go-Live, however for estimated AMC cost component, Powergrid was advised to negotiate with the concerned vendor and intimate the negotiated value in OCC.*
- *TCC referred the issue to ERPC for further discussion and approval.*

2.8 URTDSM Phase-I: Cyber Security & Performance issues in URTDSM system POWERGRID

A. **Obsolescence of Windows Server 2012 Operating System: Windows 2012 R2 Operating system, whose support from windows is expired on 10th October-2023:**

1. M/s GE informed that Win OS (Servers) upgrade is not feasible under current circumstances owing to following reasons: (Copy of letter from GE attached at **Annexure-2.8.1**

a. GE WAMS application Roadmap is heading for GridOS WAMS.

b. Associated applications of 3rd party tools will get impacted.

2. In view of above, a system upgrade on existing infra is not feasible in current set-up. As an alternate and secure arrangement, POWERGRID proposes the following methods to ensure the security of existing WAMS system until Phase-II systems are in place:

a. URTDSM WAMS System being maintained air-gapped with perimeter protection at Firewall level and available updated Anti-virus patches for system robustness and security.

b. Additionally, at HIPS level, option for Virtual patching to take care of the obsolete Windows Server OS is explored by POWERGRID. Virtual patching protects operating systems and third-party applications from known vulnerabilities and protects legacy systems and end-of-life software that no longer receive updates, ensuring ongoing security and helping organizations meet compliance requirements.

c. POWERGRID discussed with the OEM of Antivirus, M/s TrendMicro and obtained budgetary estimation. The OEM quoted approximately Rs. 1.5 Crores for all 500+ Servers installed in URTDSM System pan India (for 3 years license support).

POWERGRID proposes to procure this virtual patching solution through the AMC contractor M/s GE on Cost sharing basis to address the obsolescence of the Windows Server OS.

B. PMU Data Streaming through Firewall:

1. A new requirement for PMU data streaming through Firewall in existing URTDSM system, is raised by multiple SLDCs and RLDC. This requirement was not included in the scope of services Annual maintenance contract being provided by M/s GE T&D India Ltd. Hence, it is proposed to use the existing internal firewalls (by configuring separate VLAN for PMU data streaming) and addition of two new switches. Accordingly, a commercial offer was obtained from M/s for Supply of new LAN switches and configuration of Internal Firewalls for PMU data streaming. The cost per each RLDC/SLDC is **Rs. 15.35 Lakhs excluding GST**. (Copy of the offer from GE is attached at **Annexure-2.8.2**).

POWERGRID proposes to procure this solution from M/s GE on Cost sharing basis.

C. Retention of logs up to 6 months:

1. A new requirement for retention of system logs for up to 6 months in the existing URTDSM system was requested by multiple SLDCs and RLDC. This is also a new requirement, which is not covered under the scope of existing AMC contract.

2. Hence, POWERGRID obtained a techno-commercial offer from M/s GE for procuring additional 6TB storage at each RLDC/SLDC at a cost of **Rs. 19.35 Lakhs (excluding GST)**. (Copy of the offer from GE is attached at **Annexure-2.8.**3).

POWERGRID proposes to procure this solution from M/s GE on Cost sharing basis.

Upon concurrence of RPC for cost sharing of these additional scope (Sl. No. 1,2 & 3 above), POWERGRID shall initiate the process for award of the above three solutions for execution by M/s GE.

POWERGRID may explain. TCC may deliberate/concur.

Deliberation in the 52nd TCC meeting

TCC Decision

TCC in principally agreed on the proposal of PowerGrid for cyber security and performance related update in URTDSM-I referred ERPC for approval.

2.9 Allocation of firm power w.r.t. Parbati-II hydroelectric project (800 MW) and Dibang multi-purpose project (2880 MW) of NHPC Ltd: ERPC Secretariat

IRP division of CEA vide mail dated 16.08.2024 forwarded the communication from MoP regarding Allocation of firm power w.r.t. Parbati-II hydroelectric project (800 MW) and Dibang multi-purpose project (2880 MW) of NHPC Ltd.

It was requested by CEA that the consent from states of the region for willingness to take power from Parbati-II hydroelectric project (800 MW) and Dibang multi-purpose project (2880 MW) of NHPC Ltd shall be taken and communicated to IRP Division at the earliest so that proposed allocation can be furnished to MoP. It is also requested that no willingness of states of respective region may also be communicated to this office. The detail communication is enclosed at **Annexure-2.9**.

States/DISCOMs may update. TCC may deliberate.

Deliberation in the 52nd TCC meeting

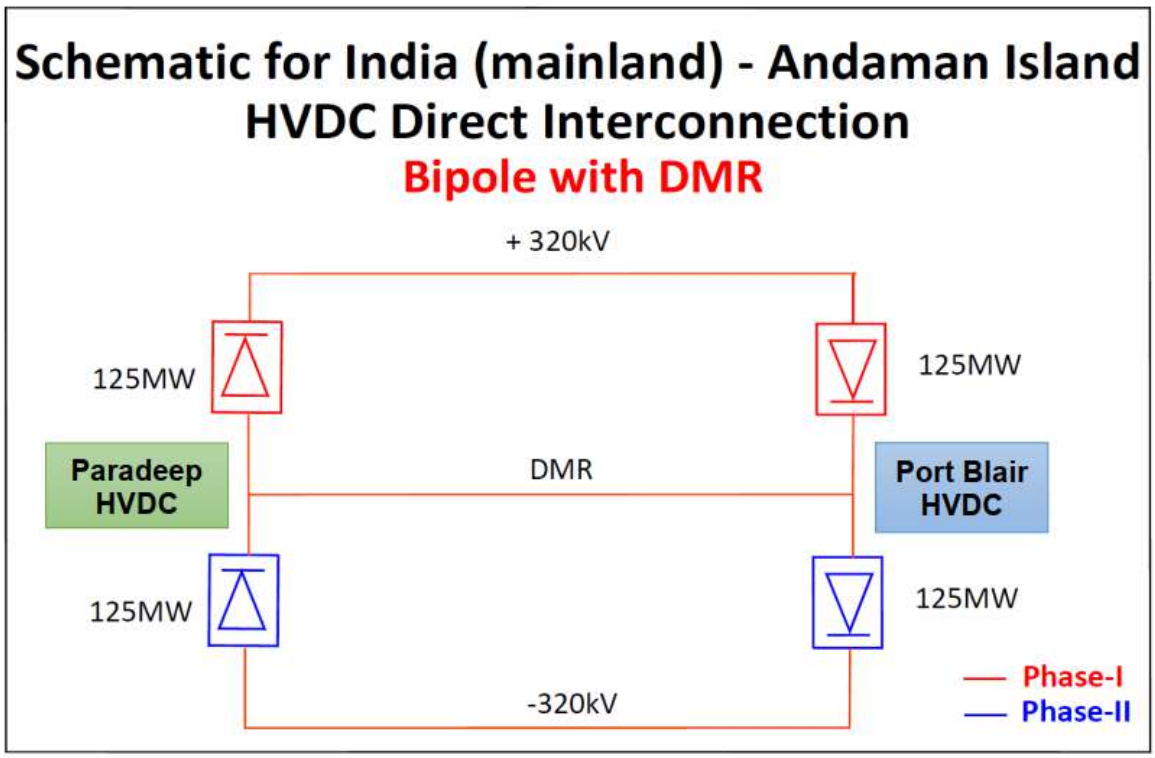
- *DVC submitted the following:*
  - *In order to meet the growing demand in the valley Area, MoP has directed DVC to set up three brown field thermal projects & also considering the firm power Generation growth in the region, Support from Hydro Electric power plant is required mainly during Monsoon period as thermal generation is heavily affected by non-availability of Coal.*
  - *To meet the RPO (Hydro power obligation), Allocation of firm power from the above-mentioned upcoming Hydroelectric power projects by NHPC is required.*
  - *They have also submitted the requisition to MoP & CEA for Dibang, Teesta-VI, Rangit-IV, Kiru & Parbati-II during 2023.*

- *WBSEDCL submitted that they are interested in buying 200MW for long term & 400 MW for medium term from Parbati-II.*

TCC Decision

TCC advised all beneficiary states of ER to timely submit the requisition to CEA (IRP division) for availing power from Parbati-II hydro project, Dibang multi-purpose project and also other hydro projects.

2.10 Establishment of Paradeep-Andaman HVDC Interconnection as ISTS-CTU



Estimated Cost: 15,950 Cr

Impact on the ATC in %: 4.856 %

In 51st TCC meeting, Representative of CTU briefly highlighted salient features of the scheme. He further apprised the forum that Hon'ble Minister of Power emphasized the need for a clean and reliable power supply in the Andaman & Nicobar Islands and suggested connecting the same with mainland (India). Discussions were held on this matter during meetings chaired by the Chairperson, CEA on 7th June and 14th August'2023. It was decided during these meetings to explore the possibility of using a deep-sea cable HVDC link for connecting the Andaman & Nicobar Islands to the National Grid.

1. CTU further mentioned that the modalities regarding the cost sharing of the project are yet to be finalized.
2. Representative of Power Dept, Andaman & Nicobar reported that the current power supply in the islands primarily relies on diesel generators and solar energy. The majority of the power generation is from diesel generators. She also informed the participants about the Renewable Energy (RE) plan approved by the Ministry of Power (MoP) and asserted that the plan would be shared with ERPC. It was also mentioned that the instant plan is a backup one for more reliable power supply to the islands.
3. Representative of West Bengal expressed two concerns: firstly, they requested clarification on whether cost recovery for the project would be treated as a regional project or a national one, similar to the Agra – BNC project. Secondly, he stated that since the project would not

contribute to their system (WB system), they would not be willing to share any financial burden for the project.

4. Representative of Odisha expressed doubts about the technical viability of the project and suggested that a large-scale solar project with battery backup or transportation of Green Hydrogen from mainland could be an ideal solution.

5. Jharkhand proposed that a separate meeting should be conducted to discuss all the cost modalities related to the project.

6. DVC suggested holding a separate meeting to ensure clarity on cost recovery for the project.

After detailed deliberation, TCC:

1. Advised CTU to share pre-feasibility study report of the project.

2. Advised CTU to share the details of how the cost estimation for the proposed project was determined.

3. Advised Power Dept, A&N to share the RE Plan as approved by MoP to ERPC.

7. Was of the view that as all the ER utilities showed apprehension regarding the modalities of cost sharing, clarification on cost recovery methodology is required.

TCC referred the agenda to 51st ERPC meeting for information.

Deliberation in 51st ERPC Meeting:

1. CTU was directed to come up with a concrete plan that includes the exploration of other alternative energy solutions with cost ~ benefit comparison.

2. The matter will be discussed in subsequent TCC and ERPC meetings to evaluate the scheme further and incorporate any new findings or suggestions.

CTU vide letter dated 09.05.2024 has submitted a brief on power supply position in Andaman & Nicobar Islands & Paradeep-Andaman HVDC Connection. The same is enclosed at **Annexure 2.10.**

TCC may discuss.

Deliberation in the 52nd TCC meeting

- *As per communication received from CTU vide letter dated 09.05.2024:*
  - *To supply clean power to Andaman island from various energy sources, a detailed study has been carried out by CEA in consultation with various stakeholders including Andaman & Nicobar Island(ANI) authorities,CTU,NTPC,SECI etc.*
  - *The present cost of supply of power from diesel generation in ANI comes out to be more than Rs 40/per unit & GOI is providing huge subsidies to reduce the cost of electricity in ANI.*
  - *Further there is no adequate RE potential & also there is scarcity of land for development of RE.*
  - *Accordingly, HVDC interconnection of ANI with main land through undersea cable has been planned to supply clean & reliable power towards greening the island initiatives.*
  - *Considering the future power requirements of Nicobar Islands, Paradeep-Andaman HVDC Interconnection as ISTS would be established with 500MW HVDC cable with 250 MW terminal in 1st phase at Andaman Island & balance 250 MW terminal would be installed at Nicobar Island in future.*
- *CTU updated:*

The issue has been discussed at NCT forum wherein CTU has been directed to carry out cost benefit analysis. The same is under discussion with CEA/NCT and the mode of implementation shall be

decided by MOP on recommendation of NCT.

2.11 Connectivity of upcoming units of Koderma and Raghunathpur TPS Phase-II - DVC

- Ministry of Power has given target towards setting-up 1600 MW (2x800 MW) and 1320 MW (2X660 MW) Thermal Power Plant at **Koderma** and **Raghunathpur** respectively. Both the projects are required to be set-up within the timeline as set by MOP and both the locations have got adequate infrastructure within the switchyard for evacuation of power for existing units as well as upcoming units.
- To summarize, existing 400 KV switchyard for RTPS Phase-1 and KTPS Phase-1 were conceived considering the power evacuation for both Phase-1 and proposed Phase-2 in both the plants. The matter can well be validated taking reference from the MOM of the Standing Committee Meeting on Power System Planning in Eastern Region held at Puri on 05-05-2007.
- The relevant points are reproduced below:-

Ref Point 4.4 : "*Member (PS), CEA clarified that considering right of way constraints and forest area the transmission scheme of Kodarma and Bokaro Extn had been planned considering possible extension by DVC at their Kodarma TPS at a future date. To a query from Member (PS), CEA Chief Engineer, DVC confirmed that they had no proposal for future expansion at Bokaro but expansion at Kodarma was not ruled out and could be contemplated at a future date.*"

Ref Point No 4.4: "*Chief Engineer, DVC also enquired that with Raghunathpur-Ranchi 400 kV line with quad conductor, whether the system would be adequate to evacuate additional power from Stage-II without any further evacuation network. Chief Engineer (SP&PA) stated that with new generation capacity planned the flow pattern may undergo change and it would be appropriate to examine it again at the time when Raghunathpur Stage-II was firmed up*".

- From the above deliberation, it is clear that the switchyard along with outgoing lines at both Koderma and Raghunathpur were conceived considering the provision of future expansion at both the project locations at a suitable time in future.
- Moreover, as on date there is enough margin available for evacuation of power from both the Project locations which is evident from the load flow study (PSSE base case).
- Now, construction of Direct Transmission Line (DTL) from Phase-II units to nearest ISTS Substation without utilizing the available margin in existing infrastructure will underutilize the existing asset and will be burden to end consumers.
- Both the projects are in advance stage to meet the timeline. Hence, any delay in power evacuation process will create national loss.

❖ With the above deliberations and future discussion on GNA connectivity for Phase-II of Koderma and Raghunathpur, the following is proposed to be discussed-

(1) The existing outgoing transmission line may be reoriented, so that additional line (DTL) may not be required to be constructed for KTPS Ph-II against DVC's application for connectivity.

(2) The existing RTPS (DVC)- Ranchi (PG) line be terminated to Phase-II, so that additional line (DTL) may not be required to be constructed for RTPS Ph-II against DVC's application for connectivity.

DVC may explain. TCC may discuss.

Deliberation in the 52nd TCC meeting

DVC apprised:

➢ *Construction of Direct Transmission Line (DTL) separately from KTPS & RTPS Phase-II units to nearest ISTS Substation without utilizing the available margin in existing infrastructure will underutilize the existing asset and will be burden to end consumers for remaining period of lines. Moreover, both the projects may remain stranded as construction of DTL will remain to be uncertain considering ROW challenges and Forest clearance issues at both the locations. Stranded project will incur loss to DVC at the same time will hamper the capacity addition target of India as well as fail to meet the commitment of beneficiary Discom who has agreed to take power from the project.*

➢ *The loading of existing lines is well below SIL, having adequate margin available for power evacuation which is evident from the load flow study (PSSE base case).*
➢ *Further, In the CMETS -ER minutes of 6th consultation meeting for transmission scheme held on 29-04-2022, the load flow was discussed, and it was decided to have a joint study meeting between DVC and CTUIL. Subsequently, the joint study meeting was held on 13th & 14th June 2023 at CTUIL office in Gurugram where evacuation from KTPS Ph-II and RTPS PH-II were discussed in detail and it was decided that power from new generation units at both the locations can be evacuated using existing ISTS and ICTs.*
➢ *PPA and LOA of the upcoming projects is already in advance stage. The projects need to be completed as per MOP directed timeline which is feasible by utilizing the existing transmission network.*

***TCC Decision*:**

After detailed deliberation,

➢ *TCC opined that existing transmission infrastructure needs to be optimally utilized before taking decision on additional transmission lines, if required.*
➢ *Further DVC was advised to submit fresh connectivity application for Raghunathpur TPP to CTU for further study and consideration in CMETS-ER.*

❖ *The matter was referred to ERPC for deliberation.*

2.12 Scheme for deployment of SDH equipment and amplifier at Alipurduar S/s of Eastern Region: CTU

MD, PHPA-II requested CEA to provide necessary communication to the concerned Authority so as to enable purchase and commissioning of OPGW based communication, control and protection system of transmission lines connecting Alipurduar substation and Bhutan, vide their letter reference no. PHPA- IUMD/CEA/2023/206 dated 04.12.2023.
CEA after deliberation with all stakeholders has directed POWERGRID to provide necessary equipments at Alipurduar end vide its file ref no. CEA-PS-12- 17(15)/1/2018-PSPA-II Division dtd. 14.03.2024.

CTU vide letter dated 06.06.2024 has sought ERPC views on the proposed scheme so that the same may be put up in NCT for necessary approval.

Objective / Justification of the scheme

a)OPGW has been installed on Alipurduar- Jigmeling and Punatsagnchhu-II/ Punatsagnchhu-I - Alipurduar 400 kV lines.

b) SDH technology-based Fiber Optic Terminal Equipment (FOTE) is deployed in Indian Grid including Alipurduar substation, as it provides a highly reliable and synchronized communication infrastructure. However, Bhutan is implementing MPLS-TP in their whole system including at Punatsangchhu-II for data and teleprotection.

c) There will be issue in protection and data communication between SDH at one end i.e Alipurduar, India and MPLS-TP at other end i.e. Punatsangchhu-II, Bhutan.

d) Considering the necessary capabilities to ensure the accurate coordination of devices between India and Bhutan as well as to cater to cybersecurity issue of the Indian Grid, the proposed scheme for Alipurdwar S/s end needs to be implemented.

Further at the Alipurduar end, communication between the existing SDH equipment and the newly proposed equipment will occur over the El Interface. This will provide a layer of isolation between interfacing node at landing location and ISTS Communication Network.

Scope of the scheme (Estimated cost: Rs. 65,00000/- (Sixty-Five lacs) only)

- Deployment of FOTE (SDH Equipment) and amplifier solutions at Alipurduar S/s end for OPGW based communication and Teleprotection for 400kV lines from PHEP-II, PHEP-I and Jigmeling of Bhutan to Alipurduar, India:
- a)1 set of STM-4 SDH equipment along with panel supporting minimum five directions with MSP (Multiplex Section Protection 1+1) & equipped with E1 and Ethernet interfaces.
- b)6 sets of 175 km Amplifiers solutions: 2 directed towards Punatsangchhu-II(PHEP-II), 2 directed towards Punatsangchhu-I(PHEP-I) and 2 directed towards Jigmeling.
- POWERGRID to coordinate with Bhutan ends while procuring the equipment to avoid any non-compatibility issues.

- The 225 km solution proposed under the scheme shall work with STM-4 equipment freed on upgradation to STM-16.
- The STM-4 equipment freed on upgradation to STM-16 will be compatible with Bhutan end as suggested by CEA."

Cost estimate for the proposed scheme as shared by PowerGrid attached at **Annexure B.2.12.**

As per Deliberation in the **216th OCC** meeting

OCC advised PowerGrid to explore the following options:

- Utilization of the the STM-4 equipment freed on upgradation to STM-16 under the "Scheme on requirement of Additional FOTE at ISTS nodes in ER" for reliable communication with Bhutan from Alipurduar S/S.
- The existing SDH equipment (STM-4) (as per specifications of the scheme)may be upgraded at Alipurduar S/S to improve necessary redundancy in addition to the existing PLCC line as an interim measure in view of the synchronization of PHEP-II by Mid-August. In this regard cybersecurity issues must be duly addressed by deployment of additional firewall or other suitable measures.

❖ OCC advised Powergrid to update the status along with revised cost estimate in next CCM meeting.

As per deliberation in the **51st CCM**:

◆ Representative of Powergrid submitted that the revised cost estimate after consideration of the STM-4 equipment freed under the congestion scheme as per the decision taken in the 216th

OCC Committee is around Rs. 60.29 lakhs as against the initial estimated cost of Rs. 65 lakhs (in case of new STM equipment).

- Representative of Powergrid highlighted that as there is not much of difference in the total cost in case STM-4 equipment freed under congestion scheme is used and keeping in view the importance of the scheme as being an international connectivity, initial cost estimate of Rs. 65 lakhs considering new equipment may be considered. The same would ensure enhanced life of the equipment and the scheme may be implemented without waiting for completion of the congestion scheme.
- Representative of CTU was also of the view that the scheme may be implemented by procurement of new equipment.
- Representative of Bhutan raised their concern about timely implementation of the scheme as the commissioning of PHEP would be done by September 2024. Also, BPSO has already taken up the implementation work of SDH at Bhutan end.
- Upon enquiring about the timelines for procurement of new equipment, it was informed that 6 months would be required after receipt of NCT approval.
- 51st Commercial Committee were of the view that installation of new equipment would ensure better reliability therefore agreed for the proposal of procurement of new equipment for implementation of above scheme with an **estimated cost of Rs. 65 lakhs.**

The matter was referred for concurrence of 52nd TCC & ERPC.

CTU and POWERGRID may update. TCC may concur.

Deliberation in the 52nd TCC meeting

TCC agreed with the scheme of deployment of SDH & Amplifies at Alipurduar S/s with new equipment with the cost estimate of Rs. 65 lakhs (inclusive of taxes) and referred it to ERPC for approval.

2.13 Revised connectivity for redundant path of Teesta-III- CTU

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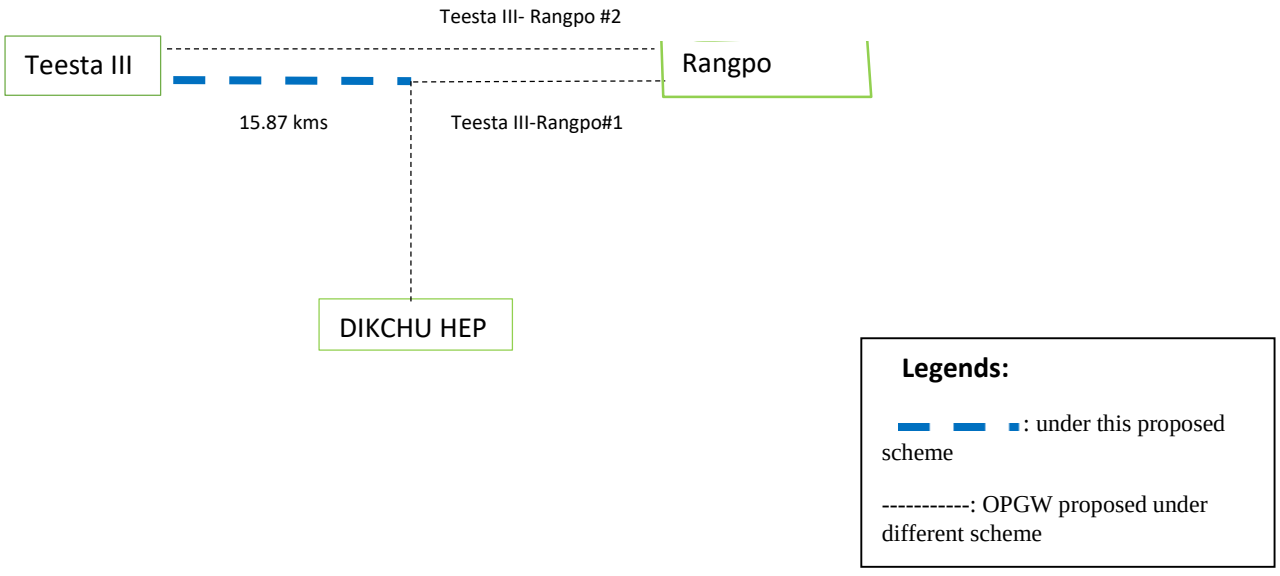
S. No.	Items	Details
1.	Scope of the scheme	Laying of OPGW with required terminal equipments from Teesta III to LILO point(15.87km) to establish 400kV Teesta III-Rangpo#1link.Presently Teesta III-Rangpo#1line is LILOed at Dikchu HEP.
2.	Objective / Justification	In the 51st ERPC meeting held on 12.01.2024, ERPC gave the decision as follows: i. The scheme for the revised connectivity of the redundant path of Teesta-III is accorded for in principle approval. ii. CTU was directed to provide a cost estimate for the revised scheme in the next CCM Meeting of ERPC. Accordingly, cost estimate is proposed in ERPC CCM meeting.
3.	Estimated Cost	Rs. 1,12,36,000/- (approx.) (One crore Twelve Lakhs Thirty-Six Thousand only)

4.	Implementation time frame	18 months from date of allocation.
5.	Implementation mode and agency	Line Ownership of the proposed section for OPGW laying in the instant scheme is with TPTL. To be implemented by POWERGRID in RTM mode.
6.	Deliberations	The scheme was revised and OPGW laying is proposed on Teesta III to LILO point for Dikchu HEP (15.87 km) on Teesta III-Rangpo ckt 1. The revised scheme was deliberated in 51st ERPC meeting held on 12.01.2024. In the 51st ERPC meeting held on 12.01.2024, ERPC gave the decision as follows: i. The scheme for the revised connectivity of the redundant path of Teesta-III is accorded for in principle approval. ii. CTU was directed to provide a cost estimate for the revised scheme in the next CCM Meeting of ERPC. As directed in 51st ERPC meeting, the revised scheme with cost estimate is being put up for CCM committee of ERPC for review. This scheme after CCM committee review shall be put up to NCT for approval.

- The revised diagram for the scheme is as below:

Schematic diagram of FO connectivity of Teesta III



In the **51st CCM**:

- Representative of CTU submitted that in-principle approval for the scheme has already been accorded in the 51st ERPC meeting. The cost estimate of Rs. 1,12,36,000/- (approx.) (One crore Twelve Lakhs Thirty-Six Thousand only) submitted by Powergrid is also in order.

The 51st Commercial Committee agreed with the proposed cost estimate and referred for concurrence of 52nd TCC & ERPC.

TCC may concur.

Deliberation in the 52nd TCC meeting

TCC Decision

TCC agreed in-principally for redundant OPGW connectivity of Teesta-III with cost estimate of Rs. Rs. 1,12,36,000/- (One crore Twelve Lakhs Thirty-Six Thousand only).

- *CTU was advised to explore possibility of implementing the redundant communication link by utilizing the existing Fiber optics. The matter may be discussed in next TeST meeting of ER.*
- *TCC referred it to ERPC for discussion and approval.*

2.14 VOIP Communication system for Grid-Operation of all Five Regions: NR, NER, SR, WR, ER on PAN India basis –CTU

- Hot Line Speech Communication System (VOIP based PABX system) was implemented in 2016 by POWERGRID in all five regions after grid disturbance in 2012 where grid operators faced problem of fast communication due to unavailability of dedicated speech communication **PAN India** between NLDC, RLDCs, SLDCs, important state and ISTS substations and generators. The said PABX was implemented by M/s Orange through Alcatel Lucent as OEM. The lead region for the existing VoIP system is Northern Region of POWERGRID. After execution of the project cost of the same booked under regional communication schemes. As per CERC tariff regulations useful life of system is 15 years.
- In the 67th NRPC meeting dtd. 30.06.2023, POWERGRID representative stated that the scheme executed by M/s ORANGE was with a provision of AMC of 7 years as part of the contract and the same is expiring in July' 2023 for most of the sites.
- AMC of the same was extended and approved in the 67th NRPC for further 2 years upto July'25 with financial implication and shall be booked under ULDC O&M charges as per the CERC norms. After July'25 there is no support shall be extended by Alcatel (OEM). POWERGRID stated they are not able to maintain the system beyond that AMC expiration. MS-NRPC advised CTU to plan upgradation/ new system in view of expiration of AMC in July'25.
- Grid-India in 23rd NRPC- TeST meeting (held on dtd. 21.09.2023) stated that VOIP system is utmost requirement of Grid-Operation and shall be planned by CTU in advance as there is no support of OEM after July'25.
- During 24th TeST Meeting of NRPC held on 09.02.24, it was agreed in Forum that Hot Line exchange should be considered as part of communication system and CTU shall take up scheme in all RPCs for approval and then in the NCT.

- In this regards CTU discussed the requirements with utilities & various VOIP system suppliers/OEMs and acquired inputs from the utilities in the various meetings of CPM, COM/ TeST/SCADA of all five regions (reference are given in the scheme). For the utilities those have provided inputs we have considered the same in the cost estimate purpose. Further a combined CPM (Communication planning meeting) of all five region was also held on 12.06.2024 to obtain uniformity of features and functions of the VoIP system among all regions. After incorporating the comments of all utilities MoM is issued same is attached at **Annexure-2.14.1**.
- It is proposed that being a Nationwide PAN India project, the total cost of five regions including NLDC and international Exchange (Cross border links) VoIP system shall be put up in all five regions for RPC/s review followed by NCT approval as single Scheme and package PAN India Basis for seamless integration.
- Tentative Region-wise cost breakup of the scheme is given below:

Cost Breakup Between Regions and Central Sector and State Sector

Region	Central Sector (ISTS) (in Crs.)	State Sector (in Crs.)	Total (in Crs.)
NR	₹18.54	₹15.92	₹ 34.46
SR	₹15.3	₹ 12.68	₹ 27.98
WR	₹14.61	₹ 11.74	₹ 26.35
ER	₹12.32	₹ 7.44	**₹ 19.76**
NER	₹16.91	₹5.45	₹ 22.36
National Portion (NLDC Ex, International exchange and Cyber audit)	₹ 6.55	₹ 0	₹ 6.55

Grand Total: ₹ 137.46 Cr. (excluding GST/TAXES)

➢ **Modalities of Cost sharing:**

❖ There are three types of cost involved, Regional Central Sector, National Central Sector, State Sector. The sharing of cost shall be done as per following mechanism between constituents:

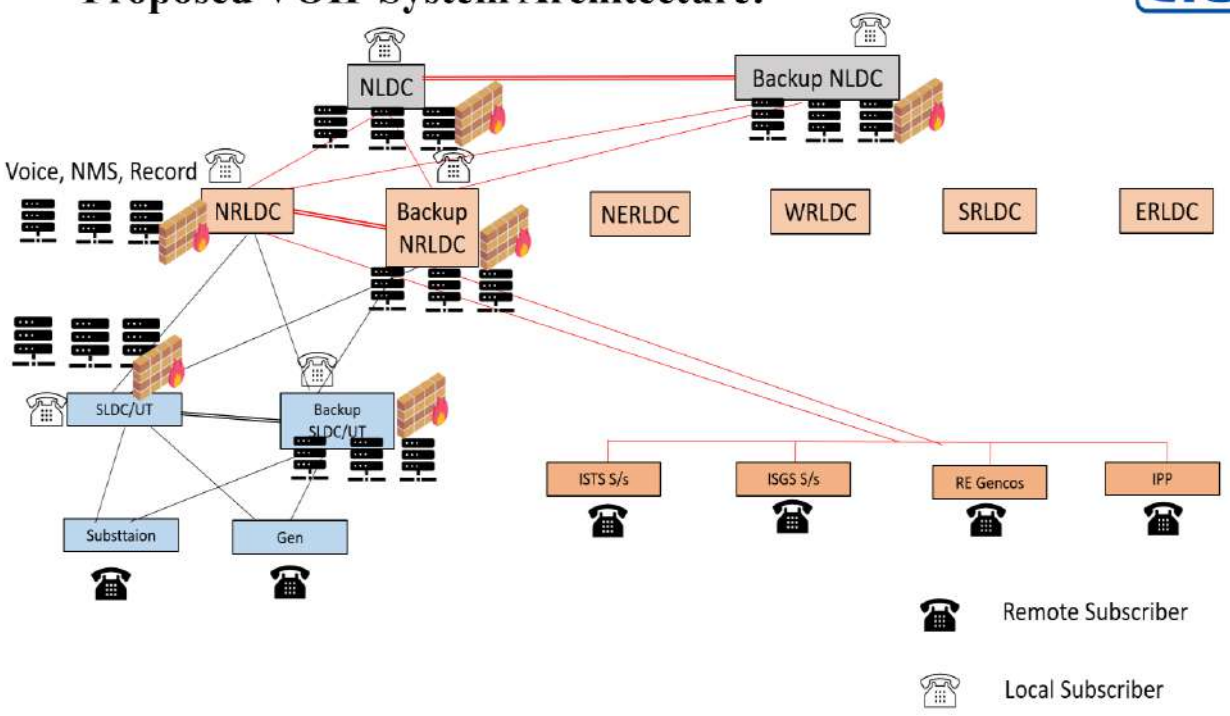
(i) **Regional Central Sector Cost** to be shared by respective region DICs as per CERC (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020 under Regional Component.

(ii) **National Central Sector Cost** to be shared by all regional DICs as per CERC (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020 under National Component.

(iii) **State Sector Cost** shall be shared by respective state/s for their portion as per CERC (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020.

(iv) **AMC for State Sector** shall be shared by respective states for their portion as per CERC (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020.

Proposed VOIP System Architecture:



S. No	Present VOIP Exchange	Proposed VOIP system
1	Exchange based system	Server based system
2	Star based architecture and no redundancy between exchanges (SLDC/RLDC/NLDC)	Multiple level of Redundancy kept. At phone level two channels are proposed for main and backup exchanges of SLDCs and RLDCs. For State sector four level Hardware redundancy has been considered as e.g. Main SLDC/ Back Up SLDC/ Main RLDC/ Backup RLDC For Central sector four level Hardware redundancy has been considered as e.g. Main RLDC/ Back Up RLDC/ Main NLDC/ Backup NLDC
3	Proprietary License based system	SIP based open source licenses

4	The IP Phones connected at NLDC, RLDC and SLDC are proprietary IP Phones of Alcatel	IP Phones shall not be proprietary in nature.
5	No PoE Switches	POE switch with dual redundancy considered
6	NA	Firewall are considered for cyber security
7	NA	Cyber Security Audit is considered
8	NA	Provision of video phones at Control Centre for higher officials
9	NA	Sufficient numbers of licenses considered to cater future RE/ ISTS/ ISGS/ IPP and STU substations locations.
10	Recording done at one location	Recording at each Control Centre shall be done locally and later at regular intervals transferred to a backup server for storage and archival

Details of proposed scheme is given at **Annexure-2.14.2.**

Estimated Cost implication towards Eastern Region is around Rs 19.76 Cr. excluding GST/taxes.

Deliberation in the 52nd TCC meeting

After detailed deliberation, TCC

- *agreed in-principle to the technical requirement of VOIP communication system.*
- *advised CTU to furnish the cost breakup of Eastern region in next TeST Committee Meeting after incorporating requirements of all ER utilities.*
- *referred the issue to ERPC for further deliberation.*

2.15 Requirement of additional FOTE at various ISTS nodes in ER due to exhaustion of existing capacity-CTU

S. No.	Items	Details
1.	Scope of the scheme	Requirement of additional FOTE for upgradation of capacity(bandwidth) at various Eastern region stations due to exhaustion of existing capacity at these stations is as follows: a)Thirteen(13) numbers of FOTE STM-64 along with amplifiers as required as per **Appendix I**.

		b) Dismantling of 4 nos. of STM-16 equipment freed after conversion of STM-16 equipment to STM-64 equipment and their transportation, installation, configuration, commissioning, and integration of the same equipment at STM-4 location for the upgradation of capacity of these stations as per **Appendix I.**
2.	Depiction of the scheme on FO Map	NA
3.	Objective / Justification	• In Eastern region, the communication network has STM-16 link capacity at most of the places, however at few links/nodes have STM-4 or lesser capacity. It has been observed that for the few links /nodes, the capacity has been utilised for more than 75 percent. The detail of such nodes/links was intimated by POWERGRID which are having congestion in terms of traffic/bandwidth so that planning for capacity enhancement of the node/link may be done. • **4th Communication Planning meeting (CPM) deliberation**: CEA suggested that the upgradation of capacity may be taken up considering change of technology to MPLS. CTUIL welcomed the suggestion and stated that the MPLS implementation shall take longer time in view of committee report and subsequent approvals. In view of this, out of the above links provided by POWERGRID only links with congestion of approximately 90% and above & few other important stations shall be taken up on priority for upgradation. • Accordingly, the list of nodes in ER with capacity utilisation of approximately 90% and above & few other important stations is enclosed as Appendix-I. • As per list, capacity upgradation of four numbers of STM-4 FOTE(Fiber Optic Terminal Equipment) to STM-16 FOTE and thirteen nos. of STM-16 FOTE to STM-64 FOTE is required.
4	Estimated Cost	**Rs. 9.78 crores (approx.) (Nine crores & Seventy Eight lakhs only)**
5.	Implementation time frame	12 months from date of allocation.
6.	Implementation mode	To be implemented by POWERGRID in RTM mode.

7.	Deliberations	The proposed scheme was deliberated in the 3rd and 4th Communication Planning meeting (CPM) of CTUIL held on 26.12.2022 & 27.07.2023 respectively. POWERGRID informed that for existing FOTE capacity cannot be upgraded by upgradation of cards and new FOTE are required at all these locations. i)51st ERPC approved the conversion of 13 nos. STM 16 FOTE to STM 64 FOTE. ii) Advised POWERGRID to explore the feasibility of reusing the surplus STM16 equipment (13 units post STM16 to STM64 conversion) for the conversion of STM4 to STM16 and update the same in the next TeST Meeting of ERPC. POWERGRID informed vide email dtd. 21.02.2024 that they will utilize four no. of STM16 equipment freed from STM16 to STM64 upgradation as mentioned above for capacity upgradation of four no of STM-4. Also, estimated cost for dismantling of STM-16 equipment from existing location and transportation, installation, configuration, integration & commissioning of the same equipment to STM-4 location is Rs 4 lakhs per site. Further, POWERGRID requested in 5th CPM of ER that the time frame for implementation which has been taken as six months in the scheme may be changed to twelve months .Further, scheme involve dismantling of existing equipment and transportation to new location which shall also take considerable time in implementation. POWERGRID also suggested that nine(9) no. STM-16 FOTE left spare after conversion/upgradation of STM-4 and STM-16 FOTEs may be used for O&M purpose and meeting directions for any new upcoming stations. Accordingly, scope of the scheme is modified as follows: i) Conversion of 13 nos. STM-16 FOTE to STM-64 FOTE as per enclosed Appendix I. ii)The conversion of STM-4 FOTE to STM-16 FOTE by utilizing four nos. FOTEs freed from upgradation of STM-16 FOTE to STM-64 FOTE. iii)Cost Estimate: Rs. 9.78 crores (approx.) (Nine crores & Seventy Eight lakhs only); Implementation time frame: 12 months from date of allocation This revised scheme post ERPC review shall be put up to NCT for approval.

Appendix-I

Sr No.	Node Name(with approx 90% capacity exhausted)	Upgradation/replacement required	Detail of ard/Equipment required for upgradation	Estimated Cost
1	Kasba	STM 16 to STM 64	Existing Equipment Cannot be upgraded. New STM 64 SDH Equipment Required	74 Lakhs
2	ERLDC	STM 16 to STM 64		74 Lakhs
3	Jeerat	STM 16 to STM 64		74 Lakhs
4	Subhashgram	STM 16 to STM 64		74 Lakhs
5	Farakka	STM 16 to STM 64		74 Lakhs
6	Kahalgaon	STM 16 to STM 64		74 Lakhs
7	Saharsa	STM 16 to STM 64		74 Lakhs
8	Binaguri	STM 16 to STM 64		74 Lakhs
9	Purnea	STM 16 to STM 64		74 Lakhs
10	Kishenganj	STM 16 to STM 64		74 Lakhs
11	Sasaram	STM 16 to STM 64		74 Lakhs
12	AB380 Repeater	STM 16 to STM 64		74 Lakhs
13	Allahabad	STM 16 to STM 64		74 Lakhs
Total Cost for conversion of 13 nos. of STM16 equipment to STM64:A				**9.62 Cr**
14	Gaya	STM 4 to STM 16	Upgradation to be done by utilizing four no of STM16 equipment freed in above list after upgradation to STM64.	4 Lakhs
15	Essar Chandwa	STM 4 to STM 16		4 Lakhs
16	Darbhanga(KPTL)	STM 4 to STM 16		4 Lakhs
17	Arrah	STM 4 to STM 16		4 Lakhs
Total Cost for conversion of 04 nos. of STM4 equipment to STM 16: B				**16 Lakhs**
Total Cost for conversion of 13 nos. of STM16 to STM 64 and 04 nos. of STM4 equipment to STM 16: A+B				**9.78 Cr**

❖ **14th TeST decision:**

- TeST committee accepted the proposal of CTU and POWERGRID ER-II for optimal utilization of remaining 9 nos. of STM-16 after conversion of STM-16 to STM-64 as well as from STM-4 to STM-16 with **cost estimate of Rs. 9.78 crores (approx.)** (Nine crores & Seventy Eight lakhs only)
- Powergrid was requested to execute the work within 9 months from approval of competent authority.
- TeST committee further referred the "revised scheme on additional FOTE requirement at ISTS nodes of ER" to TCC/ERPC meeting for concurrence.

CTU may explain. TCC may concur.

Deliberation in the 52nd TCC meeting

TCC agreed on the proposal of requirement of additional FOTE at various nodes of ER with the estimated cost of Rs. Rs. 9.78 crores (approx.) (Rupees Nine crores & Seventy-Eight lakhs only) and referred it to ERPC for approval.

2.16 Establishment of State-of-the-Art National Unified Network Management System (N-UNMS) in main & backup configuration integrating all the Regional UNMS- for ISTS Communication System - CTU

Background:

- In line with CERC, CEA Regulations and RPC approvals, the Regional UNMS scheme integrating ISTS communication system along with State sector network, is being deployed in each region.
- Now, all five (5) Regional UNMS servers shall be integrated in the next layer to the National UNMS server integrating all the regional ones; in main & backup configuration.
- This will facilitate centralized reporting/collection of PAN India communication Network of ISTS as well as State level system including cross border links at National Level. The scope & technical aspect of the National UNMS scheme shall be broadly in line with Technical Specification of Regional UNMS while including features for National aspects, as per the deliberations held in all RPC/NCT forums.

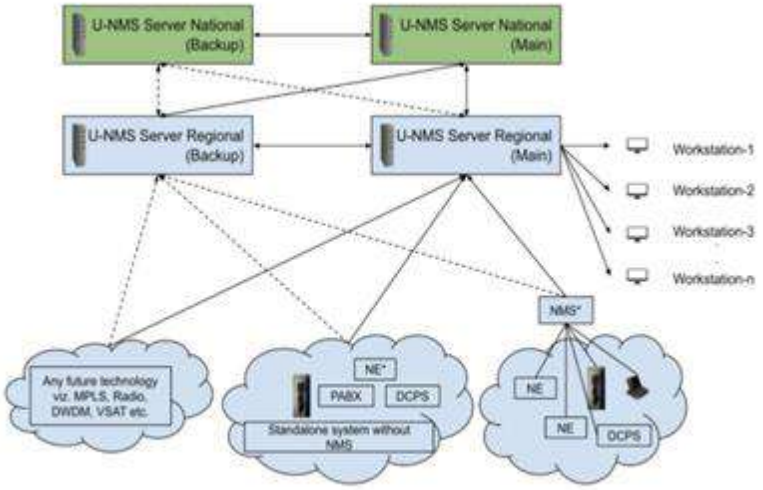
Summary of relevant approvals in various forums:

- The scheme for National UNMS was deliberated in all RPC forums earlier during deliberation of respective Regional UNMS projects.
- Further, the National UNMS scheme was also deliberated in the 14th NPC meeting held on 03.02.2024 in Bangalore.
- It is to be noted that the agenda of N-UNMS has already been approved in NRPC, WRPC and SRPC.

❖

Sl. No.	Items	Details
1.	Name of Scheme	Establishment of State-of- the-Art National Unified Network Management System (N-UNMS) in main & backup configuration integrating all the regional UNMSs.
2.	Scope of the scheme	● Supply and Installation of Main & Backup National-UNMS system hardware and software along with associated items at respective UNMS Centres. The new system shall be deployed in such a way that the operation of the existing systems should not be disturbed. ● Supply and Installation of hardware & software for workstation, network switches, firewall & IDPS, Printer, Furniture etc. ● Integration of existing Regional UNMS (In Main & Backup config) with Main and Back up N-UNMS System. One channel of each Regional UNMS to Main and Back up UNMS

		centre shall be used for redundancy of respective UNMS Centres. ● Development of complete Database, displays and reports either from scratch or by extracting existing database, displays and reports, also for creating integrated national communication system overview and inter regional system details for the modules. ● Supply of all FCAPS features with advance planning tool. ● Import and Adaption of database & displays made for Regional UNMS system including import of historical data stored in existing servers for integration in new system also for creating national dashboard and inter regional system dashboards for the required system details. ● Auxiliary Power Supply System Comprising of UPS with Battery set along with all necessary distribution board. ● Integration & Testing with any new UNMS coming up during implementation and AMC period of this Project. ● Supply of Spares identified under AMC along with main items to meet the contingency during installation period and during AMC period. ● All cabling, wiring, and interconnections to the items being supplied and to be integrated including power supply. ● The project scope shall include customization of its database, such as configuration of database, scan period and all other database parameters required to integrate existing system successfully. ● Additional Hardware, software and services necessary to ensure compatibility with existing equipment. ● Auditing of Cyber Security implementation by CERT-In listed Auditors during AMC & ensuring its compliance. ● Training of personnel and Users of the System. ● Comprehensive Maintenance of the supplied system for seven (7) years including one (1) year defect liability period as per specification, including integration with future UNMS (if any), Database configurations, Maintaining Spare inventory etc. ● Integration with third party Applications: The N-UNMS Systems being supplied shall have provision to exchange data with the existing and or to be purchased third party applications of in standard formats like ODBC, OPC & XML etc.

		● GI/Aluminium cable trays/trace ways with covers shall be supplied in the project for laying cables so that cable can be protected from rodents. These cable trays/trace ways shall be screwed/ fixed on the floor. ● The system shall have remote console along with connectivity and shall be under AMC for; CEA- PCD & NPC Division, NLDC- Grid India, CTUIL, GA&C- POWERGRID. Additionally, UNMS control room in CTUIL shall be equipped with a 85 Inch TV/Monitor.
3.	Architecture	 **Proposed U-NMS Topology for Data Flow (Typical)**
4.	Objective/ Justification	☐ In line with CERC, CEA Regulations and RPC approvals, the Regional UNMS scheme integrating ISTS communication system along with State sector network, is being deployed in each region. Now, all five (5) Regional UNMS servers shall be integrated in the next layer to the National UNMs server integrating all the regional ones; in main & backup configuration. This will facilitate centralized reporting/collection of PAN India communication Network of ISTS as well as Intra State level system including cross border links at National Level. The scope & technical aspect of the National UNMS scheme shall be broadly in line with Technical Specification of Regional UNMS while including features for National aspects, as per the deliberations held in all RPC/NCT forums. ☐ The proposed National UNMS (N-UNMS) System shall provide the multi-tiered solution for Network Management System Functions with modules such as Network Resource/Discovery/Inventory, configuration management, Planning, Fault/Alarm Management, Performance Management, Trouble Ticket with application security, reporting, simulation, Artificial Intelligence & Analytics etc. and common dashboards also for integrated national network and for inter-regional systems including cross border.

		☐ The N-UNMS shall also provide a Pan India visualization of power system communication network. This shall facilitate Centralized Supervision and Quick Fault detection and restoration for ISTS Communications systems for National, Inter-Regional and Cross-Border communication system and the network. The N-UNMS shall additionally have advanced planning tool having features for Long, Medium & Short-Term Planning for preparing planning projections for ISTS Communication System (for National/ Regional/ State) for 2 years, 5 years and 10 years. ☐ The proposal of N-UNMS was deliberated in all the RPCs during approval of respective Regional UNMS scheme and the in-principle technical approval has been given by the forum. The relevant extract of 15th NCT meeting is also attached as **Annexure-2.16.**
5.	Estimated Cost	**Rs. 101* Crores.** (approx.) and **19.07 Crores.** AMC charges for 7 years. The cost of national UNMS shall be **recovered on POC basis.** *Cost has been derived from awarded package of regional UNMS Scheme
6.	Implementation timeframe	**24 Months** from date of project allocation based on NCT approval.
7.	Implementation Mode	Through **RTM** to **POWERGRID**
8.	Location of National UNMS	Main UNMS at **NLDC**, Katwaria Sarai, and Backup UNMS at **ERLDC**, Kolkata

CTU may explain. TCC may deliberate.

Deliberation in the 52nd TCC meeting

TCC Decision

After detailed deliberations,

- *TCC in principally agreed to the need of National UNMS project.*
- *TCC advised CTU to furnish the cost breakup of the National NMS project having detailed scope along with cost implication for Eastern region.*
- *The matter was referred to ERPC for further deliberation.*

2.17 SOP regarding Procurement and Installation of ISTS Interface Energy Meter (IEM):- CTU

- As per CEA metering regulations, 2006 and its amendments thereafter, all interface meters installed at the points of interconnection with Inter-State Transmission System (ISTS) for the purpose of electricity accounting and billing shall be owned by CTU. As per IEGC, 2023, CTU shall be responsible for procurement and installation of Interface Energy Meters and responsible for replacement of faulty meters.

- In line with the above and to maintain uniformity as PAN India, a draft **'SOP regarding Procurement & Installation of ISTS Interface Energy Meter (IEM)'** was prepared by CTUIL which was floated on CTUIL website on 02.05.2024 for comments/feedback from various stakeholders. Same was also shared with all RLDCs and Member Secretary of all RPCs vide e-mail dated 15.05.2024.
- Comments were received from BBMB, SRLDC, SRPC, SLDC JSEB, Ranchi and POWERGRID which were suitably incorporated in the final SOP.
- The final draft SOP was attached at **Annexure-2.17**

The draft SOP was submitted for information and adoption by ERPC.

Deliberation in the 52nd TCC meeting

MS, ERPC enquired whether comments of all the concerned stakeholders has been incorporated in the SOP.

TCC referred to ERPC.

2.18 Supply & Installation of AMR Compatible ISTS Interface Energy Meters along with AMR (Automatic Meter Reading) System under the scheme "5 min Interface Energy Meter along with AMR system"-For all five regions as PAN India level: CTU

S. No.	Items	Details
1.	Name of Scheme	Supply and installation of AMR compatible 5 min Interface Energy Meter along with AMR Systems- For all five regions NER, ER, NR, WR & SR.as PAN India.
2.	Scope of the scheme	Supply of AMR compatible 5 min Interface Energy Meters for all ISTS metering points of All five regions, Installation of new AMR compatible IEMs by replacing existing meters in case of existing points and for newly added metering points. (Replacement work & New Installation work) Supply and installation of AMR systems in dual LAN configuration at central location along with DCU, Ethernet Switch and other accessories at substation end and AMR software along with servers, consoles, historian software, database, printer, firewall, furniture, etc. at RLDC end to receive 5 min load profile data in auto mode. Provision of streaming online instantaneous MW data at a user configurable rate (minimum 1 min) via AMR system for viewing purpose. AMC includes Operations & Maintenance work (including data processing & report generation from AMR) for complete AMR system for 7 years. Online Data storage of Raw Data & processed data for three years. The complete scope of IEM & AMR scheme shall be broadly in line with the Technical Specification (Section 1 & 2 of Part

		1) circulated by NPC Division, CEA vide letter dtd. 6th July 2022. ***Note: MDP system which is also part of the above TS mentioned shall be implemented by respective RLDC and would match the timeline schedule with IEM & AMR project.***
3.	Conceptual Architecture of AMR connectivity of ISTS Meters	**Appendix-I**
4.	Objective/ Justification	• For Indian Power system, commercial settlements of energy generation and consumption are being computed through Availability Based Tariff (ABT) and Deviation Settlement Mechanism (DSM) which are in vogue for energy accounting. Availability Based Tariff was implemented in India in 2002/2003 considering the settlement period as 15-min. • Government of India (GoI) has set a Renewable Energy (RE) target of 500 GW by 2030. In the last few years approximately since a decade, the need for implementing 5-minute meters along with AMR system for regional energy accounting and settlement at the Inter State level has been discussed and deliberated in various apex level forums & Committees. • A PAN India pilot project on 5-minute metering was implemented as per the directive from Hon'ble CERC in 2018. A report on the pilot project covering implementation aspects, challenges and suggested way forward has been submitted by POSOCO for perusal of the Hon'ble Commission • This issue was discussed in OCC/TCC/RPC meetings at regional level and it was discussed to replace the existing SEMs (15-min Block) with AMR compatible Interface Energy Meters (5-min Block) and implementation of Automated Meter Reading (AMR) and Meter Data Processing (MDP) system for efficient and faster accounting. Moreover, there is a need expressed by States to get streaming online instantaneous MW data at a user configurable rate (minimum 1 min) at SLDCs via AMR system for viewing purpose to manage their drawl. • A Joint Committee (JC) comprising the members from each RPC, CEA, CTU/PGCIL & POSOCO has been prepared Technical Specifications (TS) of the "5/15 Minute Interface Energy Meters (IEMs) with Automatic Meter Reading (AMR) and Meter Data

		Processing (MDP)" for interstate transmission system at PAN India basis. NPC Division, CEA vide letter dated 6th July 2022 had circulated the final copy of the TS. • This Technical specification includes: • All the procured IEMs shall be configured as 5 min time block. These meters shall record and send 5 min block data to regional AMR system for necessary computation to convert 5 min Time Block data to 15 min Time block data (in line with regulations). • Provision of 1 min instantaneous MW power flow data from IEMs to SLDC, for viewing purpose only. • CTUIL sent a letter dtd. 27.06.2023 to CERC stating that nodal agency for AMR system implementation may be identified. CTUIL also informed NPC division, CEA vide letter dtd. 24.07. that JC TS calls for 5 min Time block recording by ISTS IEMs whereas as per CEA metering regulation it is 15 min time block. • In this regard, Grid-India NLDC specified to NPC, CEA that 5-minute time block could be considered for procurement of new ISTS IEM, AMR & MDP. Subsequently NPC CEA, coordinated a joint meeting amongst the stakeholders comprising of CERC, Grid India (NLDC, RLDCs) & CTUIL, chaired by CEA Regulatory division dated 18th August'23 to check the feasibility for amendment of the CEA metering regulation in line with the ongoing developments and requirements of 5 min time block recording in IEMs. • In view of the above-mentioned system requirement of 5 min Time Block, while also complying the present regulations for 15 min time block for Scheduling, Accounting, Metering & Settlement; JC TS is being adopted for the above-mentioned project proposal.
5.	Deliberations in RPCs	The PAN India scheme was discussed in all the RPCs and the status is as below: **50th SRPC:** In-principle approval accorded. **49th WRPC:** In-principle approval accorded with a request to CTU to seek PSDF funding which may be available in the next financial year. **74th NRPC:** Approval accorded.

		26th NERPC: In-principal approval accorded with a request to CTU to seek PSDF funding for the same for NER as special case.
6.	Estimated DPR Cost	**Rs. 444.87 Cr.** excluding AMC & **Rs 152.62 Cr.** for 7 yr AMC *Costing to be updated considering latest no. of meters and locations at the time of tendering.
7.	Implementation timeframe	Approx. 24 months from gazette Notification.
8.	Implementation Mode	To be deliberated

Earlier 90% of the project cost was allocated for PSDF grant. But grant for the FY 24-25 is not available as per MoP order. **Accordingly, the modality of funding is also to be deliberated.**

TCC may discuss.

Deliberation in the 52nd TCC meeting

TCC Decision

- *TCC in principally consented to the requirement of 5 min IEMs with AMR, however the exact requirement of meters needs to be worked out on consultation at ER OCC meeting.*
- *TCC opined:*

- *CTU needs to re-examine the requirement of meters in Eastern region in view of compliance of the existing meters with 5 min data recording to latest technical specifications and also furnish the cost breakup of each metering point along with AMR.*
- *Since AMR is already operational in ER, final cost may be arrived at by considering only those locations where AMR is yet to be implemented.*

- *TCC referred to ERPC for further deliberation.*

2.19 Reliable power supply of Tenughat: TVNL

TVNL is the only power generating company of Govt. of Jharkhand. It has two units each having capacity of 210 MW, situated at Lalpania in the District of Bokaro. Presently, TTPS is connected with the following transmission lines:

1. TTPS- Patratu (PVUNL) Single Circuit line :400 KV
2. TTPS-GovindpurCircuit - I : 220 KV.
3. TTPS-GovindpurCircuit -2 : 220 KV.
4. TTPS-Biharsharif Single Circuit :220 KV

TTPS- Patratu (PVUNL) 400 KV single circuit line was reconfigured and charged on dated 16.08.2023 at 400 KV level for startup power to PVUNL. Now TTPS is left with only three lines viz

TTPS-Govindpur Double Circuit 220 KV and TTPS-Biharsharif 220 KV single circuit line for its power evacuation. Five (05) events of TPF (Total Power Failure) have occurred since 16.08.2023. This has caused significant generation loss to TVNL.

TVNL has requested to keep this line at 400 KV level for power evacuation from TVNL units not only for start-up power of PUVNL but to remain in service even after commissioning of PUVNL units.

TVNL may explain. TCC may guide.

Deliberation in the 52nd TCC meeting

TCC Decision

TCC advised TVNL to highlight the issue in lower forum of ERPC as well as in CMETS Meeting for detailed deliberation.

2.20 Implementation of Bus Bar protection at 220 KV Substations.

During discussion and analysis of various grid disturbances in PCC meeting, it was observed that in many of the events where bus fault had occurred, the fault clearing time exceeded the allowed time due to non-availability of busbar protection at the concerned substations. Further, non-availability of busbar protection leads to total power failure at the substation causing huge load loss to the nearby serving areas. Thus, affecting the reliability & security of the grid.

The issue of busbar protection at 220 kV Biharsharif S/s was highlighted in 132nd PCC Meeting held on 27.02.2024 wherein it was observed that no progress has been made for commissioning of the busbar protection since the last discussion in 46th TCC Meeting held in Aug-22. PCC advised to raise the issue in next TCC/ERPC meeting.

The issue of busbar protection at 220 kV Ramchandrapur S/s, 220 kV Tenughat S/s was also highlighted in many of the PCC Meetings but no progress has been made in order to make them functional.

BSPTCL: 220 kV Biharsharif S/s

JUSNL: 220 kV Ramchandrapur S/s, 220 kV Chaibasa S/s

TVNL: 220 kV Tenughat S/s (electromechanical relay)

Concerned Utilities may update.

Deliberation in the 52nd TCC meeting

- *JUSNL updated that Bus bar Protection at 220 kV Ramchandrapur S/s & 220 kV Chaibasa S/s shall be implemented by December-2024.*
- *BSPTCL submitted that they are constructing new control room at 220 kV Biharsharif S/s which shall be completed by end of 2024.During shifting of the equipment from Old S/S to New S/S, bus bar Protection shall be implemented.*

TCC Decision

TCC directed all concerned utility to expedite the implementation of busbar protection for the mentioned substations for compliance.

2.21 Frequent disturbances at 220/132 kV Rengali (OPTCL) S/S

As per discussion held in **136th PCC** Meeting, following critical issues are found at Rengali S/s

- Non-availability of bus bar protection at 220/132 kV Rengali S/s.
- Non- availability of differential protection for 220 kV Rengali-Rengali (PG) d/c (500 meter long).
- Keeping all elements at only one 220 kV bus at Rengali and non-availability of other bus for long time despite having Double Main and Transfer Bus Scheme.

- Healthiness of protection system and operational flexibility is very important for reliability of Rengali S/s which is getting deeply affected by aforesaid issues. During any bus fault, entire Rengali S/ s becomes dead with delayed fault clearance due to non-availability of bus bar protection.
- 220 kV Rengali-Rengali (PG) D/C which is a tie line has tripped multiple times in recent times for external faults. Since it is a short line of only 500 metres length, differential protection is to be provided for this d/c line as per ERPC protection philosophy for improving reliability. Further, keeping all elements at one bus results in tripping of all of them during the bus fault which can be avoided by shifting some of elements to another bus.
- OPTCL is requested to take necessary actions to rectify these issues as earliest as possible in order to improve reliability of Rengali S/s.

OPTCL may update. TCC may guide.

Deliberation in the 52nd TCC meeting

OPTCL updated that Differential protection scheme shall be implemented in 220 kV Rengali-Rengali (PG) D/C December-2024.

TCC Decision

TCC advised OPTCL to take necessary measure to improve the overall protection system at 220 kV Rengali S/s and expedite the work for implementation of Differential protection as well as busbar protection system as suggested by PCC of ERPC.

2.22 Third party protection audit for critical substations

- As per IEGC 2023 Clause 15.2, “All users shall also conduct third party protection audit of each sub-station at 220 kV and above (132 kV and above in NER) once in five years or earlier as advised by the respective RPC.”
- Further, IEGC 2023 Clause 15.3 states that “After analysis of any event, each RPC shall identify a list of substations / and generating stations where third-party protection audit is required to be carried out and accordingly advise the respective users to complete third party audit within three months.”
- In 138th PCC Meeting, ERPC secretariat informed that as per SOP for Third Party Protection Audit finalized by NPC, Third Party Protection Audit shall be carried out by the third party

designated agencies in line with the IEGC Regulations 2023 or by the audit teams constituted by RPCs with the members from other states (at least two) who opt for the RPC coordinated third party protection audit.

- PCC advised all utilities to submit plan for third party protection audit of their substations within a month to ERPC along with their choice to carry out protection audit either through ERPC coordinated third party protection audit or by third party designated agencies.
- Member Secretary, ERPC informed that after receiving audit plan from all utilities, ERPC will communicate to concerned utilities the substations for which protection audit can be done through the audit team of ERPC.
- He further proposed that ERPC Secretariat would identify critical substations in consultation with ERLDC for which the protection audit will be carried out by ERPC along with the members from ERLDC & other utilities with help of third-party agencies (to be hired by ERPC).
- PCC agreed with the proposal made by Member Secretary, ERPC.
- It is proposed that for FY 2024-25, third party protection audit of around 7 nos. is proposed to be carried out by ERPC for which **Rs 30-35 lakh** will be required for expenses involved in hiring third party agency, expenses in boarding, lodging and travel etc.

TCC may deliberate.

Deliberation in the 52nd TCC meeting

TCC Decision

- *TCC agreed with the proposal of outsourcing services through an agency to assist in carrying out third party protection audit of critical substations of ER and its monitoring of implementation with an estimated cost of Rs. 35 lakhs and referred it to ERPC for approval. The substations facing frequent protection related issues shall be chosen on priority basis.*

- *TCC opined that ERPC Secretariat may closely monitor the implementation of recommendations of protection audit.*

2.23 Review of Automatic Under Frequency Load Shedding (AUFLS) scheme in Eastern Region

A Task Force was constituted by NPC vide letter dated 25.08.2023 on Implementation of AUFLS and df/dt scheme under the chairmanship of Member Secretary, SRPC and comprising members from NPC, RPCs and Grid-India.

- The Task force after convening meeting on 11.09.2023 submitted its report to NPC in 14th NPC meeting on 05.02.2024, wherein certain recommendations were made.
- Accordingly, as per decision of 214th OCC meeting, a special meeting was convened on **10.07.2024** to deliberate on successful implementation of Automatic Under Frequency Load Shedding (AUFLS) in Eastern region wherein following course of action was delineated to all constituent ER states.
- **Action points:**

☐ All SLDCs were instructed to shift the load quantum from Stages –III & IV to stage-I & II respectively as an interim measure till new feeders for additional load relief gets identified by individual state DISCOMs.
This must be implemented at the earliest with necessary changes in frequency settings of the existing UFRs and the same shall be reviewed in upcoming OCC meeting.

- ☐ All SLDCs were advised to share the identified feeders list for revised load relief quantum within a month. The status shall be reviewed in monthly OCC meetings.
- ☐ Curtailment of critical loads should be avoided. However , in stage-III and stage-IV, as it operates only in severe threat to grid stability, industrial loads may also be considered. Accordingly DVC and IPCL (having dominant industrial consumers) were urged to identify industrial feeders for load relief in stage-III and stage-IV.
- ☐ All SLDCs were urged to expedite and ensure SCADA visibility of existing as well as newly identified feeders under AUFLS for effective supervision of load relief quantum.

Constituent	Stage-1	Stage-2	Stage-3	Stage-4	Revised Total	Previous Total	Change (MW)
Bihar	315	379	442	442	**1577**	**1568**	**+9**
Jharkhand	87	105	122	122	**437**	**435**	**+2**
DVC	172	207	241	241	**861**	**897**	**-36**
Odisha	306	367	428	428	**1530**	**1521**	**+9**
West Bengal	497	597	696	696	**2486**	**2472**	**+14**
Sikkim	5	6	7	7	**25**	**25**	**0**
Total	**1383**	**1660**	**1937**	**1937**	**6916**	**6918**	**-2**

Constituent wise	Annual Consumption	Consumption factor	Demand met	Peak demand factor	Demand contribution
Bihar	40952	0.220	7578	0.236	0.228
Jharkhand	12391	0.067	1923	0.060	0.063
DVC	26214	0.141	3476	0.108	0.125
Odisha	41142	0.221	7104	0.221	0.221
West Bengal	65009	0.349	11868	0.370	0.359
Sikkim	526	0.003	137	0.004	0.004
Total Consumption	**186234**	1.000	**32086**	1.000	1.000

As per deliberation in the **218th OCC** meeting

- ❖ CESC updated that they have added new feeders to implement the AUFLS & list of feeders' data will be soon shared to SLDC, WB.
- ❖ SLDC, WB updated:
- Shifting the load quantum from Stages –III & IV to stage-I & II will be carried out within 15 days. However, for implementing AUFLS in stage III & IV, new feeders are yet to be identified.
- Relevant inputs have been received from WBSEDCL but the same is awaited from IPCL.In this regard, IPCL was directed by OCC to share action plan of load shifting to stages-I&II of AUFLS with WB SLDC at the earliest.
- ❖ DVC apprised that load shifting from Stages –III & IV to stage-I & II has already been completed & Feeder identification is going on to implement AUFLS in Stage III & IV.
- ❖ SLDC, Odisha submitted:

Communication is already sent to DISCOM highlighting the need of identification of feeder to implement AUFLS but they have not received any feedback yet.

OCC Decision

❖ *OCC raised serious concern on delay in load shifting to stages-I & II of AUFLS and advised SLDC, Odisha to expedite the discussion with DISCOM to identify the feeder list and shifting of load at the earliest. In this regard SLDC Odisha agreed to update the status within a week after conducting bilateral discussion with concerned DISCOM.*

❖ *OCC further opined that SLDCs who have successfully implemented AUFLS in stage I & II by shifting load quantum from stage III & IV, should explore the identification of new feeders to incorporate AUFLS in stage III & IV. The list of newly identified feeders may be shared with ERPC Secretariat for information.*

❖ *OCC also advised SLDCs to ensure periodic testing of UFR to ascertain their healthiness and submit report to ERPC/ERLDC.*

The agenda was also discussed **in 15th TeST** Meeting of Eastern region and following decisions has been taken:

- *All SLDCs were further directed to ensure SCADA data availability from newly identified UFR feeders at ERLDC level (to reach the respective desired designed MW level).*
- *In case of non-availability of SCADA data, anticipated timelines for making availability of SCADA data must be communicated for all applicable UFR feeders.*
- *All SLDCs were urged to keep display of UFR feeder data available at their end to ensure smooth monitoring and reliable telemetry as mandated in IEGC 2023.*

TCC may discuss.

Deliberation in the 52nd TCC meeting

❖ *SLDC, Odisha was directed to take up the matter with DISCOM to identify the feeder list and shifting of load at the earliest to implement AUFLS.*

❖ *Director, SLDC Odisha agreed to coordinate with concerned DISCOM and update in next OCC.*

TCC Decision

TCC advised all SLDCs:

- *To expedite the process of implementation of AUFLS in stage I & II by shifting load quantum from prevailing stage III & IV by October-2024 and shall explore the identification of new feeders to incorporate AUFLS in proposed stage III & IV and share the list of newly identified feeders with ERPC Secretariat by October-2024.*

- *To ensure SCADA data mapping from newly identified UFR feeders at ERLDC level & in case of non-availability of SCADA data, anticipated timelines for making availability of SCADA data must be communicated for all applicable UFR feeders.*

2.24 Provision of construction power supply for FGD and New Nabinagar 3 X 800 MW project from existing commercialized units of Nabinagar (3 X 660 MW): -NTPC.

Details of requirement:

- The construction power will be required for upcoming Stage-II (3X800MW) and ongoing FGB project. As all the units of NSTPS are commercialised and operational, the provision for construction power shall be made from existing units of NSTPS by incorporating power drawn for construction activities in to Metering system.

- Considering above, kindly approve drawl of construction power from existing units by providing appropriate meters by SBPDCL and ERLDC.
- Accordingly metering logic may be incorporated for the same.

❖ As per deliberation in the **215th OCC** meeting:

NTPC ER-I submitted:

- Around 3 MW power for installation of FGD and construction of propose New Nabinagar (3 X 800 MW) project was proposed to be drawn from the existing 11 kV switchgear feeding the station load.
- Lack of reliable power supply from Bihar DISCOM (SBPDCL) for construction of proposed New Nabinagar (3 X 800 MW) project was highlighted.
- Installation of a SEM meter at the site location was proposed to account for internal power consumption by NTPC in construction of the new project. Payment for this power drawn may be made to Bihar DISCOM based on the reading of meter installed by DISCOM.
- Placing underground 11 kV cables in place of overhead lines from Bihar DISCOM to improve safety aspect in power plant premises was pointed out.
- The project shall take minimum 4 years for completion.

➢ SBPDCL confirmed that reliable power supply can be catered to NTPC Nabinagar plant from DISCOM end.

OCC decision:

- OCC affirmed of ensuring reliable power supply to NTPC Nabinagar and necessary coordination in this regard needs to be done mutually between SBPDCL and NTPC.
- OCC opined that laying of underground 11 kV cables may be explored in place of overhead lines within plant premises to mitigate safety concern.
- OCC observed that the proposal of drawal of construction power for the purpose of FGD installation and subsequent commissioning of 3*800 MW units from the existing station load may be in contravention with certain regulatory provisions.
- OCC opined that since SBPDCL has ensured to provide reliable power supply, NTPC may take up with SBPDCL. SBPDCL was requested to extend all possible co-operation to NTPC for reliable supply of construction power for installation of FGD and subsequent construction of proposed 3*800MW units at NPGC.

❖ In **51st CCM**

- Representative of SLDC Bihar advised NTPC to submit an application to the Superintending Engineer of the DISCOM (Aurangabad) for the drawl of power.
- Representatives of Bihar and NTPC mutually agreed to finalize the modalities for drawl of construction power and place the detailed schematic plan in the upcoming 52nd TCC meeting.

CCM decision:

The Committee advised NTPC to explore the possibilities regarding detailed modalities for drawl of construction power from the existing 11 kV switchgear of station for FGD and New Nabinagar (3 X 800 MW) project and to place before 52nd TCC for consideration.

NTPC may update. TCC may deliberate.

Deliberation in the 52nd TCC meeting

NTPC updated that matter has already been taken up with Bihar& Bihar has agreed with the proposal for drawl of construction power from the existing 11 kV switchgear for FGD and New Nabinagar (3 X 800 MW) project. Accordingly, SBPDCL will install meter for billing purposes.

TCC Decision

TCC advised both NTPC & SBPDCL to settle the issues bilaterally and shall submit the final metering arrangement at Nabingar to ERPC/ERLDC.

2.25 DSM revision of Barh Stage#1 & North Karanpura station- NTPC

(i) North Karanpura:

Events details on 18.04.2024:

- 4.24 hr. (Block-18): Unit tripped in Electrical fault.
- Immediately informed to ERLDC over phone
- 04.53 hr. (Block-20): Email sent to ERLDC mentioning tripping time, revised DC (618.75 MW) and estimated restoration time.
- 05.04 hr. (Block-21): Site checked the system and found DC has not updated by ERLDC. Thus, requested ERLDC over phone not to revise the DC to 618.75 MW and Revised DC is being informed shortly after considering exact APC for both units.
- 05.18 hr. (Block -22): E-mail sent to revise DC 590 MW.
- 5.50 hr. (Block-24): ERLDC updated DC effective from 29th block. i.e. 7 blocks after last communication.

NTPC submission:

Trip event communicated to ERLDC over phone immediately after Trip. Tripping was due to electrical fault. It took some time for estimation of restoration time and within 30 min, email communication was sent. However, due to some communication misunderstanding, DC was not revised by ERLDC for Blocks - 26, 27, 28 i.e. DC was revised w.e.f. Block-29.

Due to this NTPC incurred huge DSM loss of Rs 44.5 lakh.

In view of above it is requested to consider either of following.

1. Revise DC and SG w.e.f. Block-26

2. Consider DSM rate as ECR for Block-26,27,28.

Similarly for the incident on 01.04.2024 at Barh Stage-I, NTPC requested for DSM calculation @ECR.

In 51st CCM, Member Secretary, ERPC, apprised the forum that the DSM calculation of Barh stage-2 for 01.04.2024 and North Karanpura on 18.04.2024 ***may be considered*** *@* ***ECR*** *as the station was under forced outage during the period and the financial implication would impact only the ER pool rather than any of the beneficiaries.*

51st Commercial Committee referred the issue to 52nd TCC for further deliberation.

NTPC may update. TCC may discuss.

Deliberation in the 52nd TCC meeting

TCC agreed with the decision of CCM and opined that DSM calculation for the mentioned blocks of Barh stage-2 on 01.04.2024 and North Karanpura on 18.04.2024 shall be calculated @ ECR as the station was under forced outage during the period.

❖ *TCC advised ERPC secretariat to revise the DSM account accordingly.*

2.26 NOC requirement for MTPS (Kanti)-II installed Capacity – NTPC

- In the recent past it was observed that Bihar has scheduled the power under T-GNA up to 100 MW. The present GNA allotted quantum of 126 MW is insufficient to offer the Kanti-2 one block ramp quantum of 54.5 MW due to power scheduled under T-GNA by Bihar. Further the clause 18.1(g) of the GNA Regulations, which provides as follows:
- "(g) The Central generating stations which are connected to the grid and have not been granted Long term Access under the Connectivity Regulations, 2009 but whose power is allocated by the Ministry of Power, shall be deemed to have been granted GNA equal to the installed capacity of such generating station(s).".
- And as per clause no. 07 of CERC order Removal of Difficulties (Fourth Order) dated 07.10.2023: "the generating station should obtain a "No Objection Certificate" from the host state. Accordingly, the STU may provide a NOC, for scheduling the power of more than 126 MW outside the state".
- As per LPSC Amended Rule and to offer the un-requisition power up to the full station capacity in the power market for less schedule requisition and unit shut down cases, NOC for offering the MTPS (Kanti)-II full station Capacity of 354.9 MW in the power market is required from Bihar STU.

NTPC may explain. Bihar STU may respond.

Deliberation in the 52nd TCC meeting

TCC advised NTPC & Bihar STU to settle the dispute bilaterally and in case the issue gets unresolved, the matter may be highlighted in the OCC Meeting of ERPC.

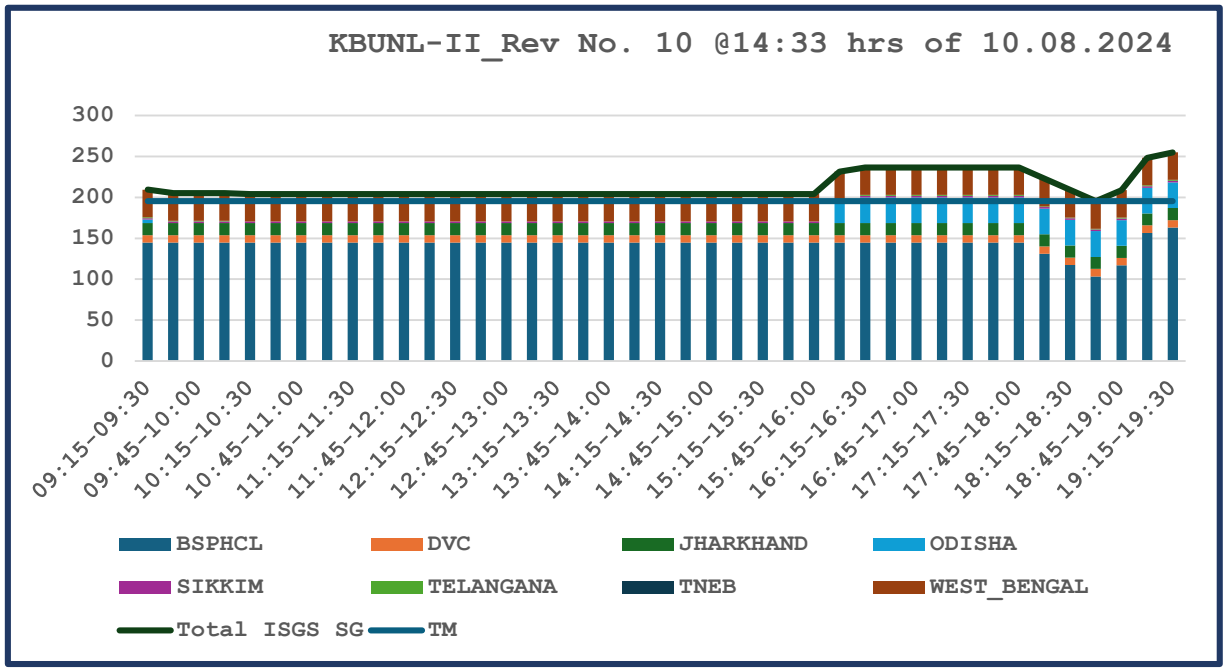
2.27 Reduction in requisition by beneficiaries on D-Day leading to SG below Technical Minimum (195.19 MW) i.r.o MTPS-II-NTPC

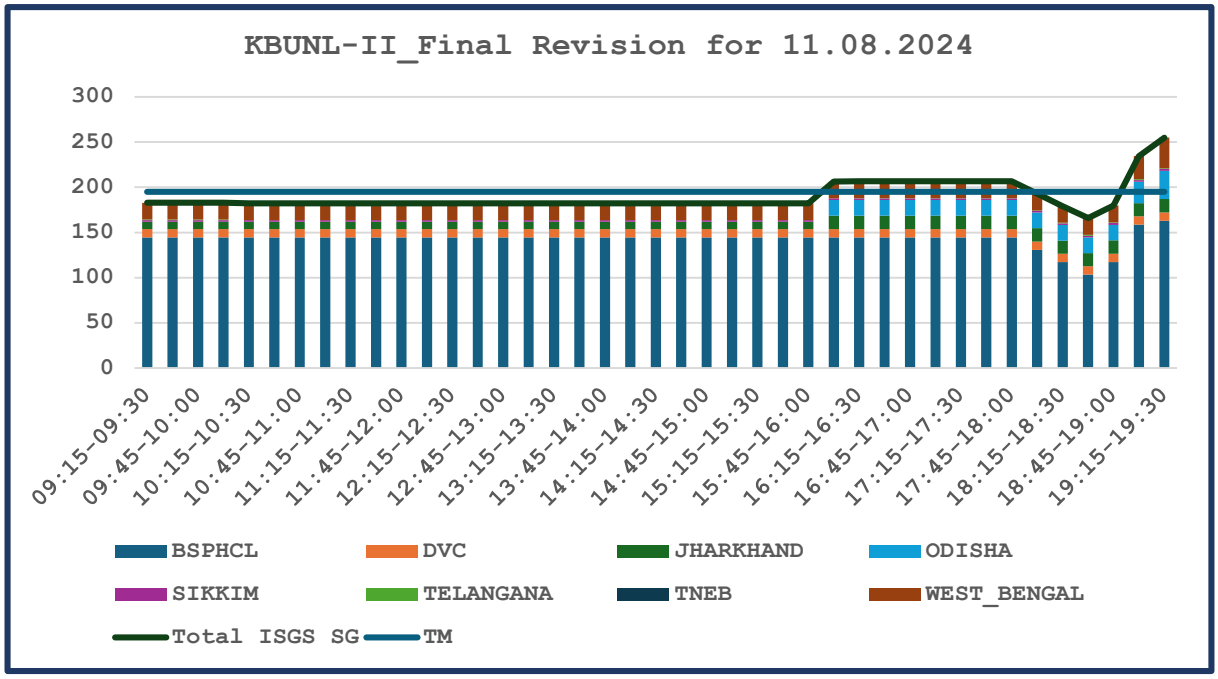
- CERC's order 18 /SM/2023 dtd_18.12.2023 in the matter of removal of difficulties (Second Order) in giving effect to certain provisions of Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023, restricts the beneficiaries to revise the schedule below Technical Minimum post 14:30 hours on D-1 day.
- Many beneficiaries are continuing to revise schedule after the stipulated time and below technical minimum. The same has been brought into consideration to all the concerned by the generators. It is contrary to applicable clauses of IEGC-2023.
- Few beneficiaries have been reducing their requisitions on D day i.e, after 1430 hrs of D-1 day, such that the total ISGS schedule (sum of requisitions) for the station gets reduced below its

minimum turndown level (195.19 MW), which is contrary to the provision of clause No. 4(b) Section 46 of Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023 stated below-

- *"Beneficiaries of such stations, whose units are likely to be scheduled below minimum turndown level for some or all-time blocks of the D-day, shall be permitted to revise their requisitions from such stations by 1430 Hrs of D-1 day, in order* ***to enable such units to be on bar.*** *The revised requisition from the said generating stations, once confirmed by the beneficiaries by 1430 Hrs of D-1 day, shall be final and binding after 1430 Hrs of D-1 day and* ***further reduction in drawal schedule shall not be allowed from such stations except in cases when the generating stations remain above minimum turn-down level."*** *(emphasis supplied).*
- Detailed Cases of 11.08.2024 (Block no.s 38-64, 73-76) & 15.08.2024 (Block no.s 47- 48, 54-57, 59-60) have been attached herewith (Copy of mail communication dt. 16.08.2024 including Excel sheet are attache
- d). In both these cases, schedule was above min. turndown level at 14:30 Hrs of D-1 day and same was revised to below min turndown level (195.19 MW) during D-day i.e, after the publication of SCUC eligibility for the respective days. As a result, the station was forced to run at the level below technical minimum without any opportunity for applying for SCUC support on D-1 day. Schedule to be restricted upto Minimum Turndown level of the Generating station when schedule above min. turn down level at 14:30 hrs of D-1 day.

➢ Attachments: 1. Mail dt. 16.08.2024 (**Annex-B.2.**
2. Excel sheet showing cases of 11.08.2024 & 15.08.2024 (**Annex-B.2.**





NTPC may explain. TCC may deliberate.

Deliberation in the 52nd TCC meeting

- *NTPC representative highlighted the issue of schedule reduction by beneficiaries on D-day i.e. after 1430 hrs of D-1 day, leading to the final schedule comes down to minimum turndown level which is contract to the provision of clause 4(b) of section 46 of CERC IEGC 2023.*
- *Representative of WBSEDCL pointed out that the said clause of IEGC 2023 is applicable only for the generators selected under SCUC.*

TCC Decision:

TCC acknowledges the problem faced by NTPC and opined that the issue being regulatory in nature, NTPC may approach CERC in this regard.

2.28 Sale of URS power in RTM / DAM in case beneficiary wants the power in exigency T-GNA: NTPC

The beneficiary requests that the quantum of power requisitioned in the exigency T-GNA not be sold from the station. However, according to the LPSC rules, bidding of URS power must be conducted in the power market. More clarity is needed whether the generating company cannot offer the T-GNA quantum in power market.

NTPC may explain. TCC may deliberate.

Deliberation in the 52nd TCC meeting

ED, ERLDC stated that the issue has already been discussed in the meeting taken by Chairperson, CEA on 30.07.2024 wherein it was clarified that the distribution companies have no authority to block the offer of generating company in the exchanges as per the provision of LPS rules. TCC advised that NTPC may take decision at their end for such type of requests received from beneficiaries.

2.29 Publication of merit order by DISCOMs on their Website.

To bring more efficiency and transparency in the system, the merit order, which is used for scheduling process, may be made available to all concerned by publishing it on website on respective SLDCs. Additionally, viewing right to access the final schedule by the DISCOMs/SLDCs (with respect to state generating stations) to be extended to ISGS generator also.

The issue was discussed in 51st CCM wherein the forum referred the issue to 52nd TCC for deliberation.

NTPC may elaborate. TCC may discuss.

Deliberation in the 52nd TCC meeting

NTPC requested to drop the agenda from discussion which was agreed by TCC.

2.30 Non-Consideration of Renewable Power scheduled in G-DAM for computation of waiver of Transmission charges: GRIDCO

As per the provisions of the CERC Sharing Regulations, 2023, waiver has been allowed on the CTU Transmission charges for scheduling power under GNA, GNA-RE, T-GNA and T-GNA-RE from Renewable Energy sources ((i)REGS or RHGS based on wind or solar sources or (ii) ESS charged with energy sourced from REGS or RHGS or (iii) generation based on hydro power sources). The detailed methodology for calculating waiver is specified in the Sharing regulations, 2023. On verification, it was found that the implementing Agency (NLDC) has been computing the waiver percentage of Odisha without considering the Renewable Power scheduled to State under G-DAM. Renewable energy scheduled under long term contract is only being considered towards computation of waiver percentage. It is to mention that nothing has been explicitly or implicitly mentioned in the Sharing Regulation towards non-consideration of RE power through G-DAM while calculating transmission waiver percentage.

The issue was discussed in 51st CCM wherein Representative of GRIDCO highlighted the issue and submitted that NLDC is only considering the RE power under long term contracts for the calculation of waiver percentage for transmission charges.

ERLDC highlighted that there are few categories of sellers who are eligible to participate in GDAM but not eligible for waiver of Transmission charges. As GDAM is a collective transaction, it is not possible to differentiate that which quantum of the power procured by a state through GDAM is eligible for the said waiver and which quantum is not eligible for the waiver.

GRIDCO representative requested that the matter may be clarified at RPC forum.

The 51st Commercial Committee opined that ERPC Secretariat may take up with CERC in this regard however opinion of TCC/ERPC may be obtained on this issue.

GRIDCO may explain. TCC may discuss.

Deliberation in the 52nd TCC meeting

TCC acknowledged the issue raised by GRIDCO and advised ERPC Secretariat to highlight the issue before CERC.

2.31 Scheduling of power by GRIDCO from IBEUL (Unit #1): JSWEL.

As per PPA dated 04.01.2011 and MoU dated 24.11.2023, GRIDCO has right to purchase 12% of power sent out from the JSWEL power project (Unit#1 339.6 MW). Relevant extract of the PPA & MoU clauses are reproduced below:

PPA dated 04.01.2011

2.2. Entitlement of Power to GR/OCO:

2.2.1

GRIDCO shall at all times have the right on behalf of Government of Odisha to receive from the Station 14 (Fourteen) percent of the power sent out from the thermal power station (s) if Coal B/ock(s) is allocated with the State of Odisha. Otherwise, ***GRIDCO shall receive 12 (Twelve) percent of the power sent out from*** *the thermal power station(s). /BEUL shall duly incorporate a term in the agreements with other beneficiaries for sale of electricity or capacity pertaining to the Station, confirming the above rights of GR/OCO.*

MoU dated 24.11.2023:

1 Sharing of Power:

ii A nominated agency(s) authorised by the State Government shall have the ***right to purchase 12%ofpower sent out from*** *the Thermal Power Plant at Variable Cost /Energy Charge Rate (ECR) from the IPP who have been allocated coal blocks within the State. .*

Despite of repeated request vide letters and emails, State Load Despatch Centre (SLDC), Odisha is continuing to punch schedule considering 12% of the Unit#1 capacity i.e. 38.205 MW instead of 12% of the power sent out from the Unit#1 which is being also accepted by ERLDC.

The issue was deliberated in 51st CCM in which Commercial Committee was of the view that the issue being legal and bilateral in nature, is beyond the scope of this Committee and may be resolved by the concerned parties mutually.

JSWEL vide letter dated 22.08.2024 submitted that even after various communications and discussions with GRIDCO, the issue is still persisting till date. On account of wrong submission of schedule by Odisha SLDC, excess power is being drawn by GRIDCO against their entitlement. They requested that the issue may be discussed in TCC/ERPC Meeting.

TCC may discuss.

Deliberation in the 52nd TCC meeting

Representative from IBEUL briefed forum about the issue and stated that IBEUL is submitting its block wise declared capacity for 'D' day as per provisions of IEGC 2023 to GRIDCO, Odisha SLDC and in WBES portal on 'D-1' day.

- *However, SLDC Odisha is not revising the schedule on real time basis and punching a constant schedule of 38.205 MW i.e. 12% of the net installed capacity of IBEUL Unit#1. This is impacting IBEUL as it is facing DSM penalty on account of excess energy drawn by GRIDCO.*

TCC Decision:

After detailed deliberation, the followings were agreed upon:

- *IBEUL to submit its block wise declared capacity considering GRIDCO's entitlement as per the applicable provisions of Clause 49 (1) (Procedure for Scheduling and Dispatch for Inter-State Transaction) of the IEGC 2023.*

- *SLDC Odisha to consider the scheduled generation of IBEUL from WBES software in real time and revise the schedule as per the Clause 49 (4) (Procedure for Scheduling and Dispatch for Interstate Transaction) of the IEGC 2023.*

- *GRIDCO agreed that SLDC, Odisha should consider real time scheduled generation of IBEUL for scheduling GRIDCO's entitlement.*

- *The matter was referred to ERPC for information.*

2.32 ROW Issues related to OPGW Installation in 132kV Rangpo - Chuzachen line: - Powergrid

- Power Grid had been entrusted with establishing Fiber Optic network (OPGW) over 132 kV Rangpo - Chuzachen TL of EPDS, Sikkim under Eastern Region Fibre Optic Expansion Project (Additional Requirement) for smooth communication of Chuzachen HEP power generating station to Regional Load Dispatch Centre (ERLDC) at Kolkata. The ownership of said transmission line belongs to Energy & Power Dept., Govt of Sikkim.
- After completing 19.327 km OPGW installation, work was again stopped in Padamchay village due to public complaint over induction problem faced between tower no. 35 and 36 of 132 kV Rangpo-Chuzachen TL due to very ground low clearance issue. Matter was taken up in 49th ERPC meeting where in Energy & Power Department, Govt. Of Sikkim was requested to resolve the issue.
- Further, POWERGRID had also requested intervention by Senior authority of Energy & Power Department, Govt. Of Sikkim vide letter dated 27th June 2023 to urgently resolve the issue. Matter was again highlighted in 51st TCC Meeting, wherein TCC advised ERPC secretariat to take up with Sikkim authorities separately.
- However, resolution of RoW is pending till date. Since project is heavily delayed and delay reasons are not attributable to POWERGRID, forum may guide regarding short closure and modalities of recovery of investment made by POWERGRID in the mentioned link till date.

POWERGRID may update. TCC may deliberate.

Deliberation in the 52nd TCC meeting

- *Sikkim representative submitted that ROW issue has resurfaced again in some villages as Villagers demanded extra Tower in that region due to very low ground clearance issue causing severe Induction effect.*
- *Chairperson, TCC and PCE, Energy and power dept, Govt of Sikkim further informed that Govt of Sikkim has approved the construction of tower in the recent budget session & tower erection shall start by end of this year.*

TCC Decision

TCC advised Sikkim to expedite the Tower construction activity. Powergrid was advised not to short close the project.

2.33 Upgradation of SCADA/EMS system at ERLDC and SLDCs under ULDC Phase III-ERLDC

- Upgradation of SCADA/EMS System under ULDC Phase III was taken up by POWERGRID. As informed by POWERGRID, NIT for the same was floated on 18th July 2023. OBD-1 was opened on 1st Nov 2023 and OBD-II was on 15 May and 27 May 2024. The package has been approved by the committee of award (COA, POWERGRID) on 26th July 2024 and letter of recommendation forwarded vide **2nd Aug 2024**. Further, placement of award for new SCADA/EMS system for ERLDC is expected shortly with competition schedule of **18 months.**

As per **15th TeST** deliberation:

- POWERGRID was advised by the TeST forum to expedite the process so that upgradation of SCADA/EMS system under ULDC Phase III can be executed as per timeline.
- TeST committee requested all the SLDC & POWERGRID for enhancement of manpower in SCADA/ EMS works and proposed to take up this agenda in next TCC/ERPC meeting.

POWERGRID may update the status.

Deliberation in the 52nd TCC meeting

TCC Decision

- *TCC requested all the utilities to extend the maximum possible support to upgrade of SCADA/EMS system at ERLDC and SLDCs under ULDC Phase III.*
- *TCC advised Powergrid to update the progress status in the TeST Meeting.*

2.34 Update on establishment of 400/132kV, 2x315MVA New Laxmikantpur substation of WBSETCL - ERPC Secretariat

- ☐ Establishment of New Laxmikantpur 400/132kV, 2x315MVA GIS substation through LILO of both circuits of Haldia (CESC) - Subhasgram (POWERGRID) 400KV D/c line at New Laxmikantpur was agreed for implementation under intra-state scheme by WBSETCL in the 2nd meeting of erstwhile ERSCT held on 05-07-2019.
- ☐ WBSETCL vide letter dated 20-05-2022 had submitted the proposal of establishment of New Laxmikantpur S/s through LILO of one circuit of under construction Jeerat New (PMJTL) Subhasgram (POWERGRID) 400KV D/C (Quad) line and LILO of one circuit of existing Haldia (CESC) - Subhasgram (POWERGRID) 400KV D/C line, in view of anticipated more reliability and stronger source at Jeerat New 765kV.

As per deliberation in the **50th TCC** Meeting:

- TCC agreed with the proposal of connectivity of proposed New Laxmikantapur substation through LILO of one circuit of Jeerat New -Subhashgram 400kV D/C (Quad) to be implemented as intrastate system. WBSETCL agreed to comply with connectivity as well as grid standard regulations of CEA and to ensure proper communication and protection systems for the LILO portion of the line.
- The issue was referred to ERPC for concurrence so that the same may be referred to NCT for approval.

As per deliberation in the **50th ERPC** Meeting:

- ERPC endorsed the views of TCC and agreed for the proposed LILO of 400 kV New Jeerat-Subhasgram S/C line at New 400/132 kV New Laxmikantpur Substation of West Bengal.
- WBSETCL was advised to ensure installation of OPGW in LILO portion of line and installation of necessary communication equipment at their end in coordination with ISTS licensee.

WBSETCL may update.

Deliberation in the 52nd TCC meeting

❖ *WBSETCL updated:*
Land has been identified for new substation and currently land valuation report is under progress by concerned District Administration.

TCC Decision
TCC advised WBSETCL to update to ERPC of any progress made in the Land Acquisition process.

2.35 Status update on restoration of Teesta III Hydro-electric Project(SUL), Teesta –V HEP(NHPC) and Dikchu HEP- ERPC Secretariat

- 1200 MW Teesta III Hydro-electric Project, on the intervening night of 03.10.2023 and morning of 04.10.2023, had encountered a natural disaster in upstream catchment area of the dam. It was reported that a cloudburst in upstream of dam region has led to sudden increase in discharge of Teesta river.
- This had also subsequently resulted in considerable damage to Teesta –V HEP(NHPC) and Dikchu HEP located in downstream.
- Present status of revamping works at Teesta –III HEP, Teesta-V HEP(NHPC) and Dikchu HEP along with tentative timeline for revival of service may please be intimated.

As per deliberation in **212th OCC:**
SUL representative apprised of ongoing restoration works in powerhouse of damaged Teesta-III project, which is expected to be completed by September 2025 . It was further informed:
- Assessment of damage caused, which is under progress, shall be completed by the end of February 2024.
- Silt removal works completed around generating transformer and station transformers.
- DPR preparation for reconstruction of the washed away dam is under progress, which shall be submitted to Central Water Commission(CWC) and Central Electricity Authority (CEA) by the end of 2024 for approval.
- Generation is expected to revive by middle of 2028.

NHPC representative apprised:
- Restoration of Teesta-V project is planned through five packages, out of which two packages i.e civil and hydro-mechanical jobs have already been awarded and work execution has commenced at the site.
- Silt removal , boulder removal and other associated cleaning works in different parts of the plant are in progress.
- Generation is expected to revive by 31.03.2025 after restoration of all units.
- Two towers among three collapsed transmission towers have already been restored by Powergrid while foundation works of dead end tower is under progress.
- Tower restoration at Teesta-V end shall be completed by November 2024.

It was also updated that Teesta-VI plant, which is presently under construction, is expected to be commissioned by 27.12.2024.

Dikchu representative apprised:

- Major cleaning works, i.e dewatering and silt removal from major components has been completed by December 2023.
- One of the turbine-generator sets has been dismantled and the other generator is under restoration by cleaning and heating processes.
- Some auxiliary components in plant need replacement owing to damage caused by silt deposition along with prolonged submergence in water.
- Generation is expected to restart from September 2024 after synchronization of both the units.
- No considerable damage caused to associated transmission system except submergence of the GIS, which is presently under restoration.

OCC decision:

- OCC advised Teesta-III (SUL), Teesta –V(NHPC) and Dikchu HEP to regularly update ERPC regarding status and progress in restoration works at respective plants.
- OCC also emphasized significance of restoration of associated transmission systems of respective hydro-projects in tandem with revamping of generating units.

SUL, NHPC and Dikchu HEP may update. Members may discuss.

Deliberation in the 52nd TCC meeting

❖ *NHPC intimated:*

Restoration work is going on in war footing basis at Teesta-V but significant damage has been caused to the GIS substation in recent landslide, thus the revival process shall be delayed. Tentative restoration by March 2025.

❖ *SPTL representative on behalf of SUL submitted:*

➢ *Most of the muck has been removed & two DPRs pertaining to restoration activity have been placed before CEA. Part-I of the DPR submitted on 05.04.2024 and Part-II on 24.06. 2024, which are under consideration of CEA.*

➢ *Restoration activities planned in Part-I and Part-II are likely to be tentatively completed by Jun 2025 & April 2028 respectively.*

TCC Decision

TCC advised NHPC,SUL & DIKCHU to expedite the restoration work & share the progress with RPC Secretariat on regular basis.

2.36 Erosion of Riverbank of Teesta River in Mingley Village near Tower no. 91 of 400 kV Teesta III – Kishanganj D/C transmission Line - SPTL

Background:

- The tower no. 91 of the 400 kV Teesta III-Kishanganj D/C line is located in Mingley Village, Namchi District, Sikkim near the Teesta River. The tower is a “DD” type tower with +0 m extension. . The foundation type of the tower is of Dry Fissured Rock type. The riverbank at Mingley Village near the tower was not affected before the flash flood event as the river flow was along the opposite bank since year 2010.
- The Flash Flood of October 2023 had eroded a large portion of the riverbank. Also, due to flash flood huge amount of riverbed material was deposited on the opposite river bank and the river course was shifted to bank near the tower. The riverbank is now getting scoured continuously. The total height of slope is 40m approximately from the riverbed level.

- The riverbank was further scoured during the heavy rainfall since in June 2024 due to high flow of Teesta River. The surrounding area and houses in the village are under threat in future in case of any slope failure. The distance between the tower foundation and affected river bank is 25m.

Main issue:

- The 400 kV Teesta-III – Kishanganj transmission line is important ISTS line for evacuation of power from hydro power generation complex in Sikkim. It is crucial that the line is kept in healthy condition.
- SPTL is continuously monitoring the situation for any further changes. SPTL is planning to take up temporary protection measures (construction of Gabion walls, Rope Gabions etc.) near the tower area.
- **STPL has requested that the matter may be deliberated in TCC/ERPC so that necessary measures can be taken up to safeguard the tower and surrounding area.**

Photographs of the tower and the eroded slope / riverbank are attached as **Annexure-2.36.**

SPTL may update. TCC may discuss.

Deliberation in the 52nd TCC meeting

TCC Decision

- *TCC advised SPTL to either relocate the position of tower or construct some embankment around the Tower area so that breakdown of Tower no. 91 of 400 kV Teesta III – Kishanganj D/C transmission line due to erosion of river bank can be avoided.*
- *TCC chairperson and PCE, Energy and Power Dept., Govt of Sikkim assured to provide all types of administrative support to SPTL in this regard.*

2.37 Status of upcoming Thermal Generation Projects: ERPC Secretariat

- Enhancing thermal capacity is imperative due to escalating load demands. As we approach the summer season, ensuring preparedness is of utmost importance. Possessing adequate capacity during peak load periods is crucial for effective grid management. There are several forthcoming thermal projects within the region, with a few Thermal Power Plants (TPPs) awaiting their CODs such as North Karanpura, Barh, Patratu, IBEUL (Unit #02) and SJVN.
- It is necessary for these thermal power plants to strategize for their timely completion and integration into the grid, ensuring the region's readiness for the upcoming demand surge.
- COD of Unit #02(660 MW) of North Karanpura TPP was completed on 20.03.2024. Status of Unit#03(660 MW) may please be confirmed by NTPC.

Generating unit	**Update as per 214th OCC meeting**	**Update as per 215th OCC meeting**	**Update as per 218th OCC meeting**	**Source of Fuel/Mode of coal transportation**
North Karanpura TPP U#3(660 MW)	to be commissioned by **December 2024**.	to be commissioned by **December 2024**.	Unit#3 COD will be tentatively by March,2025.	Status of implementation of fuel transportation system to be updated.

Barh stage-I U#3 (660 MW)	to be commissioned by **April 2025.**	to be commissioned by **April 2025.**		Status of implementation of fuel transportation system to be updated.
Patratu	-	COD expected in Q4 of FY 2024-25.	Patratu generating unit is planned to be synchronized by Dec,2024 & it's COD shalll be tentatively done by Q4 of FY 2024-25.	Status of development of captive coal mine and fuel transportation system to be updated.
Buxar TPP(SJVN)	Synchronization of Unit#1 is targeted in **September, 2024** and Unit#2 in December**, 2024**	SJVN representative was not present in the meeting.		Status of implementation of fuel transportation system to be updated.

218th OCC Decision:

OCC advised NTPC to expedite the process of COD for the above-mentioned generating Units.

All concerned Thermal GENCOs may update.

Deliberation in the 52nd TCC meeting

NTPC updated that

- *Barh stage-I U#3 (660 MW) will be declared commercial tentatively by Q4 of 2024-25.*
- *North Karanpura TPP unit#3 COD will be tentatively by Q4 of 2024-25.*
- *Patratu COD expected in Q4 of FY 2024-25.*
- *There is no such problem in getting coal in the above-mentioned Generating stations & railway connectivity is being established for coal supply to Patratu TPS from CCL.*

BSPTCL on behalf of SJVN submitted:
Because of ongoing land acquisition problem, it is expected that Unit#1 and Unit#2 is likely to be synchronized by December, 2024 & April 2025 respectively.

TCC Decision

- *TCC advised NTPC to take necessary action to develop the allotted Captive coal mines as it will significantly reduce the per unit generation cost so that consumers can get cheaper power.*
- *For North Karanpura, the implementation of dedicated conveyor system may be expedited.*
- *TCC advised SJVN to expedite the commissioning activities so that power from these units can be made available before onset of next summer.*

2.38 Update on Patna Islanding scheme

It was decided that Patna islanding scheme will be formed with Units of NPGCL along with loads of Pana city.

NTPC may update the present status.

Deliberation in the 52nd TCC meeting

TCC referred the matter to lower forum of ERPC for discussion.

2.39 Reduction in the capacity of proposed 500MVA ICT (to be installed in place of 3x105 MVA ICT at Jeypore S/S under ADD-CAP 2019-24 block) to 315 MVA ICT

- Replacement with upgradation of 400/220kV, 3x105 MVA BHEL make ICT-1 with 500MVA ICT under the JTTS ADD-CAP 2019-24 block was approved in the 45th ERPC meeting. Subsequently LOA have been issued to M/s Toshiba dtd. 17.03.2023 for manufacture and supply of the new ICT.
- M/s Toshiba has informed vide their mail dtd: 08/03/2024 that they carried out route survey of six different routes for transportation, but no feasible route has been identified by the transporter for the smooth transportation of 500MVA ICT to Jeypore S/S. However, they mentioned that transportation of 315 MVA ICT is partially feasible. Site. Copy of mail communication and route survey reports are attached herewith for reference (**Annex B.2.2**).
- Meanwhile, it is pertinent here to mention that another spare 315 MVA ICT is under transit from M/s Toshiba factory, Hyderabad to Rourkela S/S.
- In view of above difficulties in transportation and as the proposed ICT at Jeypore S/S is to be commissioned under ADD-CAP 2019-24 block, the only possibility is to install a 315 MVA ICT in place of earlier approved 500MVA ICT at Jeypore S/S. This can be done by interchanging the procured 500MVA ICT for Jeypore & 315 MVA ICT for Rourkela SS.
- Therefore, it is requested to accord approval for reduction of capacity of 500MVA ICT to 315MVA ICT at Jeypore S/S for commissioning under ADD-CAP 2019-24 block.

As per deliberation in the **217th OCC** meeting:

- The Representative of Powergrid Odisha apprised the forum:
  - Non-feasibility of transportation of 500MVA ICT which was supposed to be installed in place of 3*105MVA ICT at Jeypore S/S. Several constraints were highlighted in the detailed route survey carried out in six different routes.
  - On the other hand, transportation of 315 MVA ICT was found feasible as per the route survey.
  - Accordingly, 315 MVA ICT has been transported to Jeypore S/S. **Now the ICT is ready for commissioning after completion of necessary foundation works by end of August 2024**.

OCC Decision:

- OCC took serious view on transportation of the said 315 MVA ICT by PowerGrid Odisha without prior consent of OCC Forum & advised Powergrid to refrain from such practices in future.
  ERLDC may issue FTC as and when requested by Powergrid Odisha.
- OCC referred the matter to TCC for information.

The modification in capacity of ICT from 500 MVA to 315 MVA is put before TCC for post-facto approval.

POWERGRID ODISHA may update. TCC may approve.

Deliberation in the 52nd TCC meeting

TCC Decision:

- *In view of practical difficulties in transportation, TCC agreed to the modification in capacity of Jeypore ICT from earlier approved capacity of 500 MVA to 315 MVA.*
- *TCC referred to ERPC for post-facto approval.*

2.40 Update on Restriction of Talcher-Kolar HVDC Bi-pole

On 20th April'24, ERLDC received one mail from HVDC Talcher stating the requirement of replacement of the R-phase converter transformer necessitating restriction of the power order of HVDC Talcher bi-pole to 1500MW till the replacement. It was also informed that the spare Converter Transformer of HVDC Kolar is being diverted from HVDC Kolar to HVDC Talcher and is expected to reach HVDC Talcher by 31st May 2024.

Since April'24, either pole of HVDC blocked 5 times out of which, in 4 times the other pole went to ground return mode instead of metallic return mode resulting in overloading of 400kV Talcher-Meeramundali D/C and generation backdown was done either manually or through operation of SPS.

Further, while availing the planned shutdown of Pole-2 on 28.04.2024, the other pole didn't go to metallic return mode as the automatic changeover sequence failed and remained in Ground return mode for around 15 minutes.

As per deliberation in **218th OCC:**

❖ PowerGrid Odisha apprised :

- The Converter Transformer has reached at Durg, Chhattisgarh after traversing 1480kms & yet to cover 580km to reach at the Talcher HVDC SS.
- 4 Railway crossing & one underpass (Bridge) that comes on the way where they may face some problem while transporting the consignment from Durg, Chhattisgarh.
- Considering all constraints hindering transportation, by end of September 2024, the converter Transformer will reach the site & thereafter 15 more days will be needed to complete the commissioning activities.

OCC Decision:

OCC advised PowerGrid Odisha to expedite the transportation of Converter Transformer so that Talcher-Kolar HVDC system can be restored at the earliest.

PowerGrid Odisha may update the present status of the Converter Transformer.
TCC may discuss.

Deliberation in the 52nd TCC meeting

The Representative of Powergrid updated that the converter transformer is likely to reach at site by the end of September 2024 & commissioning of the said transformer shall be completed by 25th October 2024.

2.41 Recovery of Outstanding Dues from Government of Sikkim– WBSEDCL.

- Background and Context:

- The Energy and Power Department of the Government of Sikkim has an agreement with WBSEDCL for the purchase of power at a tariff based on the generation cost of the Rammam Hydel project operated by WBSEDCL.
- In line with this arrangement, the Government of Sikkim has been drawing power from WBSEDCL on a regular basis but has been reluctant to settle the bills since 2017.
- Additionally, WBSEDCL previously purchased power from the Government of Sikkim on a consumer basis until June 2023. The volume of power purchased by WBSEDCL was significantly less compared to the amount of power sold to the Government of Sikkim.
- After accounting for adjustments related to purchases and sales, as well as surprise payments made by Sikkim for November and December 2021(amounting to Rs. 1.087Crs), the current outstanding dues as on 31.07.2024 from the Government of Sikkim amount to approximately Rs. 94.90 Crores. This figure includes a Late Payment Surcharge (LPSC) of Rs. 42.02 Crores.

The issue of the outstanding dues was raised in 42nd Commercial Committee Meeting & in 43rd TCC & ERPC Meetings however, the matter remains unresolved till date.

Till date WBSEDCL has made several attempts to resolve this issue of outstanding but has found no satisfactory remedy. **WBSEDCL reached out to PFC** also for assistance in resolving this outstanding issue, however, **PFC i**ndicated that they are unable to help, citing limitations in the **PRAPTI** portal. In view of the prolonged nature of this issue and the substantial outstanding amount, WBSEDCL is placing the following proposal for consideration of the forum.

1. Intervention of this platform towards prompt realisation of outstanding dues of WBSEDCL from Sikkim and if necessary, take up the issue with higher authorities such as CEA and MOP, to facilitate prompt payment of the outstanding dues to WBSEDCL.

2. Initiative of this platform to address the issue of realisation of outstanding dues of DISCOMs' from other state/ discom/ generator (as applicable) utilize the **PRAPTI** portal through intervention of MOP (if necessary), ensuring a more comprehensive and inclusive portal.

WBSEDCL may explain. Sikkim may respond.

Deliberation in 52nd TCC meeting

- *WBSEDCL intimated about the huge outstanding dues from Sikkim and requested Sikkim for early clearance of the pending dues.*
- *Further he submitted that provision may be incorporated in PRAPTI portal of MoP for realization of outstanding dues of DISCOMs' from another state/ discom/ generator (as applicable).*

TCC Decision:

- *TCC opined that the matter of provision in PRAPTI portal needs to be taken up at appropriate level.*
- *TCC referred the issue to ERPC for discussion.*

2.42 Default details of constituents pertaining to Deviation, Reactive, Fees and Charges, Opening of LC and Interest due to delayed payment of deviation charges- ERLDC

A. Default details of constituents pertaining to Deviation, Reactive, Fees and Charges.

The details of major defaulters as on 21.08.2024 considering the ERPC bills dated 13/08/24 (Wk-29/07/24 to 04/08/24) for DSM charges, Reactive charges and RLDC Fee and charges are tabulated below-

Jharkhand:

	JBVNL
DSM (in Cr)	₹ 124.33 Cr /-
Reactive	Nil
Fee & Charges	Nil
LC for DSM	No Valid LC available
Due date of expiry of LC	NA
Reconciliation of Statements of	**DSM:** Pending from Q2 of FY 2020-21
	Reactive: Pending from Q1 of FY 2019-20
	FnC: Pending from Q1 of FY 2021-22

Bihar:

	Bihar
DSM (in Cr)	₹ 153.01 Cr /-
Reactive	Nil
Fee & Charges	Nil
LC for DSM	No Valid LC available
Due date of expiry of LC	NA
Reconciliation of Statements of	**DSM:** Pending from Q1 of FY 2023-24
	Reactive: Pending from Q1 of FY 2023-24
	FnC: Pending from Q1 of FY 2023-24

Sikkim:

	Sikkim
DSM (in Cr)	**₹ 29.91 Cr /-**
Reactive	**Nil**
Fee & Charges	**5.9 Lakhs/-**
LC for DSM	**No Valid LC available**
Due date of expiry of LC	**NA**
Reconciliation of Statements of	**DSM: Pending from Q2 of FY 2019-20** **Reactive: Pending from Q1 of FY 2019-20**

	FnC: Pending from Q1 of FY 2021-22

Entity	Outstanding as on 04.01.24 (as per 51st TCC)	Amount Receivable by Pool after 04.01.24 till 21.08.24	Amount Received by pool after 04.01.24 till 21.08.24	Present outstanding as on 21.08.24
Bihar	29.42	197.59	74	153.01
Jharkhand	54.54	128.3	58.51	124.33
Sikkim	22.95	8.46	1.5	29.91

The Table below presents information regarding the rise in outstanding amounts pertaining to DSM, following the 51st TCC, which was held on 11.01.24, below:

Further, the details of other pool members are enclosed as **Annexure 2.42.1 and Annexure 2.42.2.**

CCM advised all the constituents to clear the outstanding dues at the earliest.

B. Opening of LC by ER Constituents for DSM Payments.

As per regulation 10.2 of **CERC(DSM) Regulations 2022**:

Quote

Any regional entity which at any time during the previous financial year fails to make payment of charges for deviation within the time specified in these regulations, shall be required to open a Letter of Credit (LC) equal to 110% of their average payable weekly liability for deviations in the previous financial year in favour of the concerned Regional Load Despatch Centre within a fortnight from the start of the current financial year.

Unquote

The details of LC amount required to be opened, as per ERLDC letter dated 29/04/2024 (and reminder dated 26/06/2024), for default in FY 2023-24 by ER constituents is given in table below:

Sl No	ER Constituents	LC Amount (110% of Average weekly Deviation Charge liability) in ₹	Remarks
1	BSPTCL	₹ 3,70,50,927	No Valid LC
2	JUVNL	₹ 2,65,67,573	No Valid LC
3	DVC	₹ 2,03,05,615	No Valid LC
4	Sikkim	₹ 55,16,800	No Valid LC
5	NTPC	₹ 8,14,71,412	No Valid LC
6	CHUZACHEN	₹ 3,91,733	No Valid LC
7	GMR	₹ 5,27,184	No Valid LC

8	NVVN-Nepal	₹ 1,96,45,399	No Valid LC
9	BRBCL	₹ 17,88,965	No Valid LC
10	ECR	₹ 7,40,236	No Valid LC
11	IBEUL	₹ 27,67,148	No Valid LC
12	Tashiding	₹ 42,887	No Valid LC

Further, the details of other pool members are enclosed as Annexure-2.42.3.

Concerned Utilities may update.

Deliberation in the 52nd TCC meeting

The matter was referred to ERPC for deliberation.

3. PART-C: ITEMS FOR INFORMATION

3.1. Installation of 5th 400/220 KV 315 MVA ICT in place of existing old 50 MVAR (3x16.6 MVAR single phase units) ISTS Reactor at 400 kV Jeerat S/s of WBSETCL

•At present the total installed capacity of 400/220 KV ICTs at Jeerat 400 KV SS of WBSETCL is 4X315 MVA. The defective 4th 315 MVA ICT which was out of system for over 2 years has been replaced with a Regional pool spare 315 MVA ICT & put into service on 14th April-2024.

•Peak demand of Jeerat 400 KV SS in 2023-24 was 971 MVA (Jun-2023) i.e. more than full load capacity of the ICTs in service at that time i.e. 3X315 MVA.

•After recommissioning of the 4th ICT, it is evident from the load flow studies that the load shared by Jeerat SS with 4 nos of ICTs will increase considerably as compared to earlier load sharing with 3 nos of ICTs. The anticipated load during 2024-25 will increase further & may approach the full load capacity of all the four ICTs thus violating (N-1) criterion.

•So to cater the load growth at Jeerat 400 KV SS at 400/220 KV level maintaining (N-1) condition, augmentation of 400/220 KV ICT capacity from 4X315 MVA to 5X315 MVA is necessary at an early date.

•Clear space for construction of 220 KV bay for 5th ICT is available at Jeerat SS but there is no space for construction of new 400 KV bay & installation of 5th ICT.

•Due to space constraint, it is hereby proposed to use the 400 KV bay & equipment space of existing 50 MVAR (3X16.6 MVAR single phase units) Bus reactor which is at present operating with another 3-Ph 50 MVAR reactor in group control, both of which were installed under ISTS scheme a long time ago.

•Feasibility for keeping the 3-Ph 50 MVAR reactor in service by alternative arrangement is being explored by WBSETCL. WBSETCL is also considering the possibility for installation of a 3-Ph 125 MVAR Bus Reactor in place of the age old 50 MVAR 3-Ph Reactor depending on VAR compensation requirement as per system study.

•Considering the above facts proposal for installation of 5th ICT at Jeerat 400 KV SS was placed in the 29th CMETS-ER on 27.03.2024 Region for consideration and approval. It was decided that since the existing ISTS bus reactors (50MVAr (3x16.67MVAr single phase units) & 50MVAr 3-Ph) are to be disconnected and the vacated ISTS bay and space is to be used for installation of 5th ICT.

- As per deliberation in **217th OCC**:

❖ West Bengal STU intimated:

➢ A joint site inspection was carried out on 28th June 2024` & one location has been identified for shifting 50 MVAR Bus reactor.

- Shifting of Bus reactor involves construction of new 400 KV Bus-coupler bay & the freed 400 KV bus reactor Bay shall be deployed for commissioning of the new 315 MVA 400/220 kV ICT. However, the commercial aspects are not yet sorted.

❖ PowerGrid ER-II submitted:

- Due space constraints only feasible option is to replace the old reactors by a single 125 MVAR reactor it's final commissioning will take around 3-4 months.
- Two existing 50 MVAR reactors to be de-capped and 125 MVAR reactor shall be installed in its place as ISTS asset under RTM.
- When the subject reactor shall be taken out of service while commissioning the new 315 MVA ICT, deemed availability shall be required from RPC for claiming O&M charges.

ERLDC suggested to have the new Bus coupler ready before dismantling of existing one.

TCC may note.

Deliberation in the 52nd TCC meeting

TCC noted.

3.2. Difficulty in Transportation of Spare ICT at Rangpo SS and subsequent finalization of revised destination thereof: POWERGRID ER-II

- 44th ERPC approved procurement of Spare **105 MVA** 400/220/33 KV ICT (1-Ph) for Rangpo SS. Based Upon approval, POWERGRID carried out necessary procurement process and awarded the subject job to M/s Transformer & Rectifiers Ltd, Vadodara.
- As per scope of Contract M/s Transformer & Rectifiers Ltd. Has to manufacture and transport the said **105 MVA** 1-Ph ICT to Rangpo SS. But due to present heavy downpour at Sikkim and North Bengal has cut off road communication between West Bengal & Sikkim (NH 10). Furthermore, onset of monsoon season has worsened the situation. The vehicular movement on NH-10 was impacted last month due to adverse weather events. As of now, the vehicle movement on the National Highway has been stopped for an indefinite period as restoration work is underway following the landslide triggered by incessant rain.
- Going by above it is very much evident that at present condition, subject Transformer cannot be transported to Rangpo SS. Moreover, if clearance not given at this instant, M/S. T&R will not take final assembling/manufacturing of the Transformer and it will be delayed inordinately. Accordingly, from POWERGRID side, to mature the contract and honor the decision taken in **44th ERPC** meeting, it is proposed to accommodate the Transformer at Binaguri SS at this instant.

As per deliberation in the **217th OCC** meeting:

❖ Powergrid ER-II informed about the difficulty in transportation of 105 MVA Spare ICT(1-phase) to Rangpo S/S as the road connectivity between Sikkim and North Bengal (NH-10) has been cut off due to damage caused by heavy rain.

❖ Keeping in view of the prevailing conditions in Sikkim & consequent uncertainties over reaching of the ICT at Rangpo SS, it was requested to transport the ICT from Vadodara to 400 kV Binaguri S/S(PG) on interim basis.

❖ 400 kV Binaguri S/S being situated nearer to 400 kV Rangpo S/S, transportation of the ICT will be easier once the road connectivity between Sikkim & North Bengal (NH-10) is re-established.

OCC decision:

Considering the connectivity between West Bengal & Sikkim being adversely affected by heavy rainfall, OCC consented to the proposal of PowerGrid ER-II i.r.o transportation of 1-ph 105MVA

ICT to its 400 kV Binaguri S/S as an interim measure.

Deliberation in the 52nd TCC meeting

TCC noted.

3.3. Approval for re-conductoring in 220kV Lines (more than 35 years in service) commissioned under CTS- Powergrid ER-II.

The transmission network build under CTS scheme was commissioned in mid of 1980's

In most of the these lines, the conductor damage from VD, MSCJ and repair sleeve, jumper, dead ends etc. have been noticed at several places. The damage might be occurring due to ageing of the conductors & earth-wire due to natural wear & tear. Also, conductor and earth wire getting snapped during seasonal temperature changes. Some snaps of sections of lines where breakage has been reported are enclosed.

All the lines are more than 35 years in service so have completed useful life as per CERC regulation. Considering the increase in conductor & earth-wire snapping incidents, the issue was taken up during 209th OCC Meeting. Upon detail discussion during the 209th OCC Meeting, OCC forum advised POWERGRID to submit a detailed survey report along with health assessment report of conductor installed in old 220kV Lines commissioned under CTS.

During 210th OCC Meeting, OCC forum technically agreed to the above proposal.

In 50th CCM meeting, Representative of ERPC highlighted the seriousness of re-conductoring & earth-wire replacement of 220kV Lines commissioned under Chukha Transmission System in view of the continuous increase in flow of power through these lines. Injection from Phunatsangchhu is also likely to be started shortly. Considering the facts reliability of the said lines of CTS is very important.

Representative of Powergrid submitted that the cost mentioned above is tentative and the final cost would be approved in CCM forum before further submission to CERC under ADDCAP 2024-2029 block.

Upon enquiring about the timelines for completion of project, representative of Powergrid submitted that nearly 24 months would be required from the date of approval and till commissioning of the lines.

CCM approved the re-conductoring work with HTLS conductor & Earth-wire replacement in above mentioned 9(Nine) lines 470.73 KM route length with approx. cost of Rs. 281 Crores and further advised Powergrid to carry out the healthiness checkup work of tower members along with the re-conductoring work.

The above agenda was discussed in a special meeting convened by CEA under chairmanship of Member(PS) on 27.08.2024 wherein the followings were decided:

(i)*CTUIL to bring an agenda in the NCT meeting for reconductoring of following transmission lines as new ISTS strengthening project after deliberation in appropriate forum based on cost estimate.*

a. Alipurduar (POWERGRID) – Falakata (WBSETCL) 220 kV D/c line (ISTS portion)

b. Falakata (WBSETCL) – Birpara (POWERGRID) 220 kV D/c line (ISTS portion)

c. Birpara (POWERGRID) – Binaguri (POWERGRID) 220 kV D/c line

d. Binaguri (POWERGRID) – Siliguri (POWERGRID) 220 kV D/c line

e. Siliguri (POWERGRID) – Kishanganj (POWERGRID) 220 kV D/c line

f. Kishanganj (POWERGRID) – Dalkhola (POWERGRID) 220 kV D/c line

g. Dalkhola (POWERGRID) – Gazole (WBSETCL) 220 kV D/c line (ISTS portion)

h. Malda (POWERGRID) – Gazole (WBSETCL) 220 kV D/c line (ISTS portion)

(ii). Detailed proposal for reconductoring of following cross border lines shall be submitted by CTUIL to Designated Authority, CEA for further taking up with Bhutan.

a. Birpara (POWERGRID) – Chukha HEP (Bhutan) 220 kV D/c line

b. Birpara (POWERGRID) – Malbase (Bhutan) 220 kV S/c line

(iii). Reconductoring of intra-state LILO portion of Birpara (POWERGRID) – Alipurduar (POWERGRID) 220 kV D/c line at Falakata (WBSETCL) and Dalkhola – Malda 220 kV D/c line at Gazol (WBSETCL) shall be carried out by WBSETCL matching with HTLS conductor of the main ISTS line.

TCC may note.

Deliberation in the 52nd TCC meeting

TCC noted.

3.4. Protection Philosophy of Eastern Region

Clause 13 of IEGC_2023 stipulates that RPC shall develop the protection protocol and revise the same after review from time to time, in consultation with the stakeholders in the concerned region.

Accordingly, in 129th PCC it was decided that the protection philosophy of ER will be reviewed. The draft revised philosophy was prepared by ERPC Secretariat and was circulated among all the stakeholders for comment/observations.

Subsequently a special meeting was convened on 26.06.2024 to finalize the philosophy. Based on the discussions held in the meeting, the protection philosophy was finalized and was put up in 137th PCC meeting for information and complaince. The revised protection philosophy is enclosed at **Annexure 3.4.**

TCC may note.

Deliberation in the 52nd TCC meeting

TCC noted.

3.5. Prospects of existing 132 kV D/C PTPS-DVC Patratu Tie Line 5C&6C:DVC

- This has reference to the subject matter regarding the status of the existing 132 kV D/C PTPS-DVC Patratu Tie Line 5C&6C, as outlined in DVC's correspondence with JUSNL on 28.06.24, and the deliberations during the meeting held on 31.07.2024. The operation of these circuits, which are controlled by ERLDC, is crucially supported by ERPC's administrative oversight to ensure smooth load flow.
- In light of this, below are the key points for consideration, further deliberation and resolution.:

- The 132 kV JUSNL PTPS-DVC Tie Circuits 5C/6C (84, 85) were commissioned in 1972 to address the emergent power requirements of both organizations (DVC & JUSNL) during exigencies. Historically, these lines have been utilized for bidirectional power transmission, ensuring steady supply as needed.
- The Patratu and North karnpura DVC substations are directly connected to the Ramgarh Substation in a radial configuration. The Patratu-PTPS Tie Lines #85 (5C) & #84 (6C) play a critical role in maintaining grid connectivity and providing an alternative power source for the Patratu Substation. This connectivity is vital for esteemed consumers such as CCL, Railways, NTPC Mines, JSPL, etc., who rely heavily on these networks for their power needs. The availability of these Tie Circuits significantly enhances system stability in the region, thereby improving the overall grid profile.
- With the ongoing construction of 3x800 MW Super Critical Thermal Units at PTPS, Patratu, under the joint venture of NTPC and PVUNL, the existing switchyard is planned to be relocated to the newly constructed PGCIL Katia Substation for power evacuation. Given the importance of the 132 kV D/C PTPS-DVC Patratu Transmission Line 5C&6C, DVC expresses concern regarding the final connectivity at the JUSNL end. It is imperative that JUSNL develops a concrete plan for the construction of bays for the termination of the Patratu-PTPS Tie Lines #85 (5C) & #84 (6C) at the Katia Substation, following the establishment of the powerhouse at Patratu.
- As per the Minutes of the Meeting dated 31.07.2024, JUSNL has agreed in principle to divert the DVC Line to the newly under-construction 220/132/33 kV GSS within the premises of the 400/220 kV GSS Katia Patratu. JUSNL needs to conduct a technical feasibility study regarding the construction of the diversion of the Transmission Line and the establishment of 2 Nos. 132 kV bays at the newly under-construction GSS Katia Patratu.

- In 218th OCC Meeting, consent was accorded for the proposal of DVC for termination of 132 kV D/C PTPS-DVC Patratu Tie Line 5C&6C at the Katia substation.
- OCC also referred the matter to TCC for information.

TCC may note.

Deliberation in the 52nd TCC meeting

TCC noted.

3.6. Laying of OPGW in DVC Sector:

Sl. No.	Name of Link	Voltage Level	Approx. length (km)
1.	CTPS - RTPS via CTPS-Kalyaneswari LILO	220kV	82
2.	RTPS - Kalyaneswari via CTPS-Kalyaneswari LILO	220kV	83
3.	BTPS B -Jamshedpur	220kV	155
4.	Dhanbad - Patherdih	132kV	35
		Total Length	355

Upon approval in the 47th ERPC meeting held on 25.11.2022 and subsequent consent letter of DVC dated 5.1.2023, PGCIL was assigned for laying of OPGW in above-mentioned lines.

Due to delay in finalisation of Contract by PGCIL and subsequent approval from CEA for Renovation & Augmentation of DVC's T&D System, DVC decided to lay OPGW on above-mentioned lines by itself. DVC had withdrawn its consent from PGCIL through letter dated 04.03.2024.

As per Deliberation in **14th TeST** meeting:

- TeST Committee agreed to the proposal for OPGW laying on the above mentioned four lines by DVC itself instead of PGCIL.
- TeST Committee also referred the agenda to upcoming TCC/ERPC meeting for information.

TCC may note.

Deliberation in the 52nd TCC meeting

TCC noted.

3.7. Fees and charges of ERLDC

The reconciliation statements of FnC payments by registered users of ERLDC have been sent up to the period of Q1 of FY 2024-25. The same is also available at FnC portal https://fc.posoco.in/FnCWeb/#/landing. Many of the users are yet to sign the reconciliation statement. The constituents were requested to verify /check the same & comment (if any) to ERLDC at the earliest.

The status of reconciliation is enclosed in **Annexure 3.7.**

Deliberation in the 52nd TCC meeting

TCC noted.

3.8. Statements of Pool accounts:

The reconciliation statements of DSM, Reactive, TRAS and SRAS charges are being issued by ERLDC on quarterly basis and statements are being sent to the respective constituents and also being uploaded at ERLDC website at https://erldc.in/market-operation/. The status of reconciliation as on 21.08.2024 is enclosed in **Annexure 3.8.**

Constituents are requested to take necessary action for the signing of pending reconciliation statements.

Deliberation in the 52nd TCC meeting

TCC requested all the constituents to take necessary action for the signing of pending reconciliation statements.

3.9. For TGNA payments made to CTU:

The reconciliation statements of TGNA payments of Q-1 for FY 24-25 has been sent to CTU on 30.07.2024 and also uploaded the same at ERLDC website at https://erldc.in/open-access/reconciliation-sldc-stu/.The constituent was requested to verify /check the same & comment (if any) to ERLDC at the earliest.

The status of reconciliation is enclosed in **Annexure 3.9**.

Deliberation in the 52nd TCC meeting

TCC noted.

3.10. For Payments made to TGNA Applicants

The reconciliation statements of TGNA payments for the period of Q-1 for FY 24-25 have been sent to the GRIDCO, JBVNL, WBSEDCL, APPCPL, DALMIA CEMENT (BHARAT) LIMITED (RCW) , HPX, IEXL, IPCL, NALCO(OD), KEIPL, PXIL, ITC Limited Corporate Office Kolkata, BSPHCL, AEL, NVVN, PTC, PCW, MKPL, TSFAP Joda, ULTSLDCD47, UCL Cuttack and TPTCL on dated 30.07.2024 and also uploaded the same at ERLDC website at https://erldc.in/open-access/reconciliation-applicant/.The constituents were requested to verify /check the same & comment (if any) to ERLDC at the earliest.

The status of reconciliation is enclosed in **Annexure 3.9.**

Deliberation in the 52nd TCC meeting

TCC noted.

3.11. Challenges faced in LAN Integration for various locations/New SEMs under AMR Phase-5: POWERGRID ER-II

AMR Phase-5 LOA (ER2/NT/W-MISC/DOM/E00/24/03816/1000022907/I-4329/P-4156/9801) was placed on 14th Mar 2024. It has scope of integration of new 320 number of SEMs with the AMR system. This covers both existing locations where AMR system is already present and new locations where AMR will be installed for the first time.

As per the Cyber Security Guideline measure & regulation of CEA, the entire AMR system communication must be LAN based. For the AMR Phase5 scope, it is planned to complete the entire installation by 31-Aug-2024. The work has already been started and ongoing.

In the existing sites, LAN ports were already enabled. In few of these existing locations, new LAN ports were required and those have been enabled by PGCIL.

The list of existing locations/Substations are as follows:

Sl. No	State	Substation	Sl. No	State	Substation	Sl. No	State	Substation
1	BIHAR	BANKA	12	BIHAR	KAHALGAON (NTPC)	23	ODISHA	SUNDERGARH
2	BIHAR	CHANDAUTI	13	BIHAR	KHAGAUL	24	ODISHA	DSTPP
3	BIHAR	KISHANGANJ	14	BIHAR	SONNAGAR	25	SIKKIM	RANGPO
4	BIHAR	MOTIHARI	15	JHARKHAND	RANCHI	26	WB	FARAKKA(NTPC)
5	BIHAR	MUZAFFARPUR	16	JHARKHAND	RANCHI NEW	27	WB	RAJARHAT
6	BIHAR	PUSAULI	17	JHARKHAND	MAITHON	28	WB	SAGARDIGHI
7	BIHAR	SAHARSHA	18	ODISHA	ANGUL	29	WB	BINAGURI
8	BIHAR	SITAMARHI	19	ODISHA	BARIPADA	30	WB	MEJIA
9	BIHAR	BARH(NTPC)	20	ODISHA	GMR	31	WB	SUBHASGRAM

10	BIHAR	BIHARSHARIF	21	ODISHA	JEYPORE			
11	BIHAR	DARBHANGA	22	ODISHA	RENGALI			

However, at the new locations, opening of new LAN ports are required for data communication. PGCIL has already communicated to ERLDC/ERPC for opening of LAN ports vide email (email dated: **13th May 2024** and **24th June 2024**). ERLDC has forwarded the email to the respective utilities/stations.

Till date, following are the locations where LAN ports are still not enabled for AMR Data Communication:

Sl. No	State	Substation Name	Utility	Sl. No	State	Substation Name	Utility
1	BIHAR	NABINAGAR (BRBCL)	BRBCL	12	ODISHA	RENGALI	GRIDCO
2	BIHAR	BARSOI	BSPHCL	13	ODISHA	BALIMELA	GRIDCO
3	BIHAR	NPGC(NTPC)	NTPC	14	ODISHA	KEONJHAR	GRIDCO
4	BIHAR	MTPS STG-II (NTPC)	NTPC	15	ODISHA	DULANGA CMP	NTPC
5	BIHAR	DUMRAON NEW	BSPHCL	16	SIKKIM	TASHIDING	IPP
6	BIHAR	NAUBATPUR	BGCL	17	SIKKIM	RONGNICHU	MBPCL
7	BIHAR	DURGAWATI	DFCCIL	18	SIKKIM	GYALSHING	Sikkim E&PD
8	JHARKHAND	DHANBAD	NKTL	19	SIKKIM	SAGBARI	Sikkim E&PD
9	JHARKHAND	NORTH KARANPURA	NTPC	20	SIKKIM	SAMARDANG	TCL
10	JHARKHAND	GOELKERA	JSEB	21	WB	KLC BANTALA	WBSETCL
11	ODISHA	BHOGRAI	GRIDCO	22	WB	KOLAGHAT	WBSETCL

Without having an active LAN port at stations, the AMR data communications will not get established with ERLDC.

So, it is requested to all utilities to enable the LAN ports and share the details with PGCIL

OCC Decision:

- OCC advised all the utilities to enable the LAN ports and share the details with PGCIL since the communication framework of entire AMR system must be LAN based as per the CEA Cybersecurity guidelines.
- OCC also suggested PowerGrid to form a working group, consisting of all concerned utilities for seamless co-ordination i.r.o integration of AMRs with LAN.

TCC may note.

Deliberation in the 52nd TCC meeting

TCC noted.

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Annex-A

Attendance

Organization	Name of guest	Designation	Contact No.	Email ID	(TCC) 05.09.2024	(ERPC) 06.09.2024
Adani	Sh. Abhishek Kukreja	Lead -O&M	6359956492	abhishek.kukreja@adani.com		
Adani	Sh. Nihar Raj	Sr. Vice President and He	9724334162	nihar.raj@adani.com		
BERC	Sh. A K Sinha	Member (Technical)	9955055886			
Bhutan	Sh. Chophel	Chief Manager				
Bhutan	Sh. Padam Chamlagai	Chief Engineer	99/0138916	cetojmd@dhpa2.gov.bt		
Bhutan	Sh. Samten	Senior Engineer				
BSPHCL	Sh. Murtaza Helal	Chief Engineer (PMC)	7763813834	murtaza.helal@gmail.com		
BSPHCL	Sh. Nadeem Ahmad	ESE(PMC)	7763814046	nade 786@gmail.com	05.09.24	06.09.24
BSPHCL	Sh. Sanjay Kumar	ESE-Cum-OSD to CMD	7763813824	skumarsbpdcl@gmail.com		
BSPTCL	Sh. A.K Singh	Director (Operations)	9264477220	alg.lalfanic@gmail.in		
BSPTCL	Sh. Ratan Kumar	Chief Engineer (Project I)	7763817701			
CEA	Sh B. LEE LYNGKHOI	Chief Engineer GM Division				
CEA	Sh Hemant Jain	Member (GO&D)	9818301995			

Attendance

Organization	Name of guest	Designation	Contact No.	Email ID	(TCC) 05.09.2024	(ERPC) 06.09.2024
CEA	Sh Vikram SIngh	Chief Engineer	9868893051	VIKRAMSINGH-CEA@GOV.IN		
CESC Limited	Sh. Brajesh Singh	Managing Director (Gene	9099995744	brajesh. singh@rpsg.in		
CESC Limited	Sh. Koushik Banerjee	General Manager (Systen	9831003281	koushik. banerjee@rpsg.in	5/9/24.	6/9/24.
CESC Limited	Sh. Sandip Pal	Sr. Vice President (Syste	9831054651	sandip.pal@rpsg.in		
CTUIL,Gurgaon	Ms.Sangeeta	Chief Manager	9560850202	jama.sangita@powergrid.in		
CTUIL,Gurgaon	Sh H.S Kaushal	Sr.GM(commn)	9599291535	hsk@powergrid.in		
CTUIL,Gurgaon	Sh. Atul Agarwal	CGM	9910378059	atul_ag@powergrid.in		
Damodar Valley C	Sh . Arup Sarkar	Member-Finance, DVC	9425294115	memberfinance@dvc.gov.in		
Damodar Valley C	Sh. Debiprasad Puitandi	Chief General Manager, S	9434745905	debiprasad.puitandi@dvc.gov.in		
Damodar Valley C	Sh. S Suresh Kumar, IAS	Chairman, DVC	9449596083	chairman@dvc.gov.in		
Damodar Valley C	Sh. Samit Mandal	General Manager, Coml.	7980933540	samit.mandal@dvc.gov.in		
Damodar Valley C	Sh. Sanjiv Srivastava	Executive Director(Coml.)	9433727107	sanjiv.shrivastava@dvc.gov.in		
DANS Energy Pvt	Sh. Abhilash Gour	Manager	9561258986	abhilash.gour@dansenergy.com		

Attendance

Organization	Name of guest	Designation	Contact No.	Email ID	(TCC) 05.09.2024	(ERPC) 06.09.2024
DANS Energy Pvt	Sh. Vimal Saxena	Vice President	9811988482	vimal.saxena@dansenergy.com		
DMTCL	Sh. Krishnajith M U	AVP		krishnajith.mu@energy-sel.com		
DMTCL	Sh. Vanraj Dodia	AVP	96662540731	vanrajsinh.dodia@energy-sel.com		
ER-II, NTPC Ltd.	Sh. S.K.Pradhan	AGM (Commercial)	9437049168	skpradhan02@ntpc.co.in		
ERLDC	Mrs. Kritika Debnath	Asst Manager (SO)	9402102354	kritika@grid-india.in		
ERLDC	Sh. Gaurav Verma	Chief Manager (SO)		gauravverma@grid-india.in		
ERLDC	Sh. Rajib Sutradhar	ED				
ERLDC	Sh. Rishav Kumar	Asst Manager(SCADA)		rishav@grid-india.in		
ERLDC	Sh. Shyamal Konar	Sr. GM (SO)	8697621130	skonar_s@grid-india.in		
ERLDC	Sh. Sourav Mondal	Chief Manager (MO)	9402102354	souravmondal@grid-india.in		
ERPC	Sh. A Basu	Executive Engineer	7070939184	abasu.nitsilchar@gmail.com	05/09/24	06/09/24
ERPC	Sh. A Chatterjee	Assistant Director	9831054494	agriva.cea@gov.in	05/09/24	
ERPC	Sh. A Das	Deputy Director	9681214774	anup.das@nic.in	5.9.24	6.9.24

Attendance

Organization	Name of guest	Designation	Contact No.	Email ID	(TCC) 05.09.2024	(ERPC) 06.09.2024
ERPC	Sh. D Khuntia	Assistant Director	7683889161	dilip.khuntia@gov.in		06/09/2024
ERPC	Sh. N. S. Mondal	Member Secretary	9958389967			
ERPC	Sh. P. P. jena	Deputy Director	9776198991	ppjena.erpc@gov.in		
ERPC	Sh. S R Swain	Assistant Director	9337791451	Saswat.ranjan@gov.in		
ERPC	Sh. S. Kejriwal	Suptd. Engineer	9831919509	Shyam.kejriwal@gov.in		
GMR Kamalanga	Sh. Pradeep Kumar Mohanty	GM	7894450332	pradeep.mohanty@gmrgroup.in		
Greenko Group	Sh. Pratul Gupta	DGM (Comm)	99104 08668	pratul.g@greenkogroup.com		
GRIDCO	Mrs. Susmita Mohanty	DGM (Electrical)	9437231456	ell.emohanty@gridco.co.in		
GRIDCO	Sh Srikanta Sahoo	CFO	8596037104	Srikanta.gridco@gmail.com		
GRIDCO	Sh. Umakanta Sahoo	Director T&BD	9348909857	dir.trading@gridco.co.in		
India Grid Trust (I	Sh. Vivek Karthikeyan	AGM - Regulatory Operat	8966903034	vivek.karthikeyan1@indigrid.com		
JBVNL	Sh. Satyajeet Ghosh	GM (IA&FM-cum-P&FM)	8210972284			
JBVNL	Sh. Saurav Kumar Sinha	Director(Commercial)	9431118207			

Attendance

Organization	Name of guest	Designation	Contact No.	Email ID	(TCC) 05.09.2024	(ERPC) 06.09.2024
JITPL	Sh. Sanjay Mittal	Director Powersales	9811314080	sanjay_mittal@jindalgroup.com		
JITPL	Sh. Shubhnag Nandan	Head Powersales & Regu	8102699777	head.powersales@jindalgroup.com		
JITPL	Sh. Vijay Bhaskar Reddy	CEO	9701008282	vijayabhaskar.d@jindalgroup.com		
JSW Energy	Sh. Arpit Tandon	DGM - Regulatory & Pow	9099038536	arpit.tandon@jsw.in		
JSW Energy	Sh. Jyotiprakash Panda	Senior Vice President - R	9449849739	jyotiprakash.panda@jsw.in		
JUSNL & SLDC	Sh. A. K. Bhartiyam	GM (Engineering)	7033991202	gmengineering.jusnl@gmail.com		
JUSNL & SLDC	Sh. Arun Kumar	GM (SLDC)	7070816390	sldcranchi@gmail.com		
JUSNL & SLDC	Sh. M.K. Karmali	Director (Project)	8987581081	dir.p.jusnl@gmail.com		
JUSNL & SLDC	Sh. Mukesh Kumar Singh	GM (Transmission)	9430153891	gmtzone5hzb@gmail.com		
JUSNL & SLDC	Sh. Praween Kumar	GM (C&M, NWBP)	8987421011	praween.jseb@gmail.com		
JUUNL	Sh. Kumud Ranjan Sinha	GM (Technical)	8210263836	cegenjuunl@gmail.com		
JUUNL	Sh. Rakesh Pandey	Senior Manager (Technic	9110183517	cegenjuunl@gmail.com		
JUVNL	Sh. Kumar Sambhav	Estate Officer	7903702681	eo.juvnl@gmail.com		

Attendance

Organization	Name of guest	Designation	Contact No.	Email ID	(TCC) 05.09.2024	(ERPC) 06.09.2024
JUVNL	Sh. Rakesh Kumar Lakhotiya	DGM (F&A)	7209663666	ddojuvnl@gmail.com		
Maithon Power Ltd	Sh. Sudip Dash	Head, Commercial	9204652869	sudipdash@tatapower.com		
NHPC	Sh. S K Mishra	GM (O&M)	9910103478	swandamishra@nhpc.nic.in		
NHPC	Sh. Jagannath Pani	SM (O&M)	8800021271	jagannathpani@nhpc.nic.in		
NRPC	Sh. V.K. Singh	Member Secretary	9810177609	msnrpc@nic.in		
NTPC Ltd	Sh. Rahul Anand	DGM(O)	9425823430	rahulanand@ntpc.co.in		
NTPC Ltd	Sh. Shankar Sharan	GM(Commercial)	9650990818	shankarsaran@ntpc.co.in		
NTPC Ltd	Sh. Sudip Nag	RED(ER-I)			D	
NVVN	Ms. Renu Narang	CEO	9650991965	ceonvvn@ntpc.co.in		
NVVN	Sh. Arvind Patle	AGM (Commercial)	9425178284	arvindpatle@ntpc.co.in		
Odisha Power Tra	Sh. B B Mehta	Director (Operation)	9438907008	dir.operation@optcl.co.in	D	
Odisha Power Tra	Sh. Chitta Ranjan Mishra	GM (Elect.)	9438907305	ele.crmishra@optcl.co.in		
Odisha Power Tra	Sh. Santosh Kumar Das	DGM (Elect.)	9438907316	ele.santoshdas@optcl.co.in		

Attendance

Organization	Name of guest	Designation	Contact No.	Email ID	(TCC) 05.09.2024	(ERPC) 06.09.2024
OERC	Sh. S K MOHAPATRA	Hon'ble Member, OERC			(51) Issued	
OHPCL	Sh. Amiya Kumar Mohanty	Sr. General Manager	7328840019	akm_678@yahoo.co.in		
OHPCL	Sh. Dillip Kumar Swain	General Manager	7328840348	dillipkumarswain56@gmail.com		
OPGC	Sh. Manasa Ranjan	MD	9777296075	manas.rout@opgc.co.in		
POWERGRID	Dr. Sunita Chohan	CGM(GA&C)	9873549019	chohan@powergrid.in		
POWERGRID	Sh. A Barat	Executive Director, ER-II	9434735952	abarat@powergrid.in		
POWERGRID	Sh. Arvind Kumar Pandey	Chief GM (AM)	7042396703	arvind.pandey@powergrid.in		
POWERGRID	Sh. Partha Gosh	DGM (AM), ER-II	9434748263	partha.ghosh@powergrid.in		
PTC India Limited	Sh. Bikram Singh Guram	Executive Vice President	9810626742	bikramsingh@ptcindia.com		
PTC India Limited	Sh. Manoj Kumar Jhawar	CMD (Addl. Charge)	8319959092	manoj.jhawar@ptcindia.com		
SBPDCL	Sh. Irshad Akhtar	Electrical Executive Engir	7763814050	irsh35new@gmail.com		
SBPDCL	Sh. Purushottam Prasad	Chief Engineer(Commerc	7763814744	cecom.sbpdcl22@gmail.com		
Sikkim	SH. ASHISH LAMICHANEY	DIVISIONAL ENGINEER	9615878284	a.lamichaney@gmail.com		

Attendance

Organization	Name of guest	Designation	Contact No.	Email ID	(TCC) 05.09.2024	(ERPC) 06.09.2024
Sikkim	SH. NAMGYAL TASHI, SLDC	SUPERINTENDING ENG	7797672743			
Sikkim	SH. SONAM RINCHEN BHUT	PRINCIPAL CHIEF ENGI	9679784844			
Sikkim	SH. T.T. LEPCHA.	PCE CUM SECRETARY	99330 98887			
Sikkim Power Tra	Sh. Y K DIXIT	Director	9811309921	ykd@sikkimurjalimited.in		
Sikkim Urja Limite	Sh. Prabhat Kumar	Chief General Manager P	9431241313	pk@sikkimurjalimited.in		
Sikkim Urja Limite	Sh. Rupesh Sood	Chief General Manager F	9810145341	rs@sikkimurjalimited.in		
SLDC, Bihar	Sh. Arvind Kumar	ESE (SLDC)	7763817777			
SLDC, Odisha	Sh. Subhas Chandra Dash	Sr.General Manager	9438907966	ele.scdash@optcl.co.in		
Tenughat Vidyut N	Sh. Anil Kumar Sharma	MD, TVNL	9031051155	aksttps@gmail.com		
Tenughat Vidyut N	Sh. Ashish Kumar Sharma	ESE, TTPS	9031049922	ashishtvnl@gmail.com		
WBPDCL	Sh. Kausik Datta	Executive Director(OS)	8336903895	kdatta@wbpdcl.co.in		
WBPDCL	Sh. Manoj Podder	AGM(OS)	8336904077	mpodder@wbpdcl.co.in		
WBSEDCL	Sh. Jibanlal Mallick	Superintending Engineer/	9007606419	jibanlal@gmail.com		

Attendance

Organization	Name of guest	Designation	Contact No.	Email ID	(TCC) 05.09.2024	(ERPC) 06.09.2024
WBSEDCL	Sh. Preetam Banerjee	Additional Chief Engineer	7003871189	preetam.banerjee@wbsedcl.in		
WBSEDCL	Sh. Santanu Roy	Superintending Engineer/	9733256232	santanu.roy@wbsedcl.in	Santanu Roy	Santanu Roy
WBSETCL	Sh. Debashis Chaki	C.E., CPD	9434910019	cpd.wbsetcl@gmail.com		
WBSETCL	Sh. Sabyasachi Roy	Director(Operations)	9432316727	sabya_60@yahoo.com		
WBSETCL	Sh. Shouvik Banerjee	A.C.E., SLDC	9434910379	sldcshutdown@gmail.com	5/9/24	6/9/24
WBSETCL	Smt. Rita Chakraborty	C.E., SLDC	9434910030	ce.wbsldc@gmail.com	5/9/24	6/9/24
WRPC	Sh Deepak Kumar	Member Secretary	9999231466	deepak.cea@gmail.com		
NTPC	Manish Jain	Mgr. ER-I	9650993493	MANISHJAIN02@ntpc.co.in		
~~NTPC~~	Rahul Anand	DGM OS ER-I	9425832[illegible]	rahulanand@ntpc.co.in		

Attendance

Organization	Name of guest	Designation	Contact No.	Email ID	(TCC) 05.09.2024	(ERPC) 06.09.2024

PHASE 1 (JULY, 2024 - JUNE, 2026)

YEAR	MONTH	PHASE	SECTOR	ORGANISATION	NAME OF PROJECT	UNIT NO.	CAPACITY (MW)	DATE OF COMMISSIONING	PIT HEAD	REGION
2024	November	Phase 1	Central	DVC	BOKARO TPS 'A' EXP	1	500	3/22/2016	N	ER
2024	December	Phase 1	Private	IBPIL	UTKAL TPP (IND BARATH)	1	350	2/25/2016	N	ER
2025	January	Phase 1	Central	DVC	RAGHUNATHPUR TPP	2	600	1/18/2016	N	ER

PHASE 2 (JULY, 2026 - JUNE, 2028)

YEAR	MONTH	PHASE	SECTOR	ORGANISATION	NAME OF PROJECT	UNIT NO.	CAPACITY (MW)	DATE OF COMMISSIONING	PIT HEAD	REGION
2026	July	Phase 2	Central	NTPC	NORTH KARANPURA STPP	1	660	1/18/2023	N	ER
2026	July	Phase 2	Private	ADHUNIK	MAHADEV PRASAD STPP	2	270	3/29/2013	N	ER
2026	August	Phase 2	Central	NPGCL	NABINAGAR STPP	3	660	3/6/2022	N	ER
2026	August	Phase 2	Central	NTPC	MUZAFFARPUR TPS	4	195	3/24/2016	N	ER
2026	August	Phase 2	Private	GMR ENERGY	KAMALANGA TPS	1	350	3/29/2013	N	ER
2026	November	Phase 2	Central	NTPC	NABI NAGAR TPP	4	250	11/10/2021	N	ER
2026	November	Phase 2	Central	DVC	KODARMA TPP	2	500	2/15/2013	N	ER
2026	December	Phase 2	Central	NTPC	BARH 1	1	660	10/30/2021	N	ER
2026	December	Phase 2	Central	NTPC	MUZAFFARPUR TPS	3	195	3/31/2015	N	ER
2026	December	Phase 2	Private	ADHUNIK	MAHADEV PRASAD STPP	1	270	11/19/2012	N	ER
2027	January	Phase 2	Central	NTPC	NEW NABI NAGAR TPP	2	660	3/31/2021	N	ER
2027	January	Phase 2	Central	NTPC	BARH II	5	660	3/4/2015	N	ER
2027	January	Phase 2	Private	MPL	MAITHON RB TPP	2	525	3/31/2012	N	ER
2027	February	Phase 2	Central	NTPC	NEW NABI NAGAR TPP	1	660	7/12/2019	N	ER
2027	February	Phase 2	Private	HEL	HALDIA TPP	2	300	2/16/2015	N	ER
2027	February	Phase 2	Central	DVC	DURGAPUR STEEL TPS	2	500	3/23/2012	N	ER
2027	March	Phase 2	Private	JITPL	DERANG TPP	2	600	1/24/2015	N	ER
2027	July	Phase 2	Private	HEL	HALDIA TPP	1	300	1/14/2015	N	ER
2027	July	Phase 2	State	WBPDC	SAGARDIGHI TPS	4	500	12/15/2016	N	ER
2027	August	Phase 2	Central	NTPC	NABI NAGAR TPP	3	250	2/26/2019	N	ER
2027	August	Phase 2	Central	DVC	RAGHUNATHPUR TPP	1	600	8/24/2014	N	ER
2027	November	Phase 2	Central	NTPC	BARAUNI TPS	9	250	3/31/2018	N	ER
2027	November	Phase 2	Private	JITPL	DERANG TPP	1	600	4/10/2014	N	ER
2027	December	Phase 2	Central	NTPC	BARAUNI TPS	8	250	8/11/2018	N	ER
2027	December	Phase 2	State	DPL	D.P.L TPS	8	250	3/31/2014	N	ER
2027	December	Phase 2	Central	NTPC	NABI NAGAR TPP	1	250	3/20/2016	N	ER
2028	January	Phase 2	Private	HMEL	HIRANMAYE TPP	2	150	12/31/2017	N	ER
2028	January	Phase 2	Private	GMR ENERGY	KAMALANGA TPS	3	350	3/21/2014	N	ER
2028	February	Phase 2	Private	HMEL	HIRANMAYE TPP	1	150	6/7/2017	N	ER
2028	February	Phase 2	Central	NTPC	BARH II	4	660	11/20/2013	N	ER
2028	March	Phase 2	Central	NTPC	NABI NAGAR TPP	2	250	4/3/2017	N	ER
2028	March	Phase 2	Private	GMR ENERGY	KAMALANGA TPS	2	350	9/28/2013	N	ER

PHASE 3 (JULY, 2028 - DECEMBER, 2029)

YEAR	MONTH	PHASE	SECTOR	ORGANISATION	NAME OF PROJECT	UNIT NO.	CAPACITY (MW)	DATE OF COMMISSIONING	PIT HEAD	REGION
2028	July	Phase 3	Central	NTPC	DARLIPALI STPS	2	800	7/21/2021	Y	ER
2028	July	Phase 3	State	WBPDC	BAKRESWAR TPS	5	210	12/24/2007	N	ER
2028	August	Phase 3	Central	NTPC	DARLIPALI STPS	1	800	12/30/2019	Y	ER
2028	August	Phase 3	State	WBPDC	SAGARDIGHI TPS	2	300	12/21/2007	N	ER
2028	November	Phase 3	Central	DVC	DURGAPUR STEEL TPS	1	500	7/29/2011	N	ER
2028	November	Phase 3	State	DPL	D.P.L TPS	7	300	11/24/2007	N	ER
2028	December	Phase 3	Central	DVC	KODARMA TPP	1	500	7/20/2011	N	ER

2028	December	Phase 3	State	WBPDC	SANTALDIH TPS	5	250	11/7/2007	N	ER
2029	January	Phase 3	Private	MPL	MAITHON RB TPP	1	525	30-06-2011	N	ER
2029	January	Phase 3	Central	DVC	MEJIA TPS	4	210	10/12/2004	N	ER
2029	Februry	Phase 3	State	WBPDC	SANTALDIH TPS	6	250	29-06-2011	N	ER
2029	Februry	Phase 3	Private	TATA PCL	JOJOBERA TPS	3	120	2/1/2002	N	ER
2029	March	Phase 3	Private	SEL	STERLITE TPP	2	600	29-12-2010	N	ER
2029	March	Phase 3	State	WBPDC	BAKRESWAR TPS	4	210	21-03-2001	N	ER
2029	July	Phase 3	Private	SEL	STERLITE TPP	1	600	14-10-2010	N	ER
2029	July	Phase 3	Private	TATA PCL	JOJOBERA TPS	2	120	2/1/2001	N	ER
2029	August	Phase 3	Central	DVC	MEJIA TPS	7	500	30-09-2010	N	ER
2029	November	Phase 3	State	OPGC	IB VALLEY TPS	4	660	7/2/2019	Y	ER
2029	November	Phase 3	Private	CESC	BUDGE BUDGE TPS	3	250	29-09-2009	N	ER
2029	December	Phase 3	State	OPGC	IB VALLEY TPS	3	660	7/2/2019	Y	ER
2029	December	Phase 3	State	WBPDC	SAGARDIGHI TPS	1	300	20-07-2008	N	ER

PHASE 4 (JAN, 2030 - DECEMBER, 2030)

YEAR	MONTH	PHASE	SECTOR	ORGANISATION	NAME OF PROJECT	UNIT NO.	CAPACITY (MW)	DATE OF COMMISSIONING	PIT HEAD	Age as on 31.12.2029
2030	January	Phase 4	Central	NTPC	FARAKKA STPS	6	500	3/7/2011	Y	18.8
2030	January	Phase 4	Central	NTPC	TALCHER STPS	3	500	21-02-2003	Y	26.9
2030	January	Phase 4	State	OPGC	IB VALLEY TPS	1	210	6/2/1994	Y	35.6
2030	January	Phase 4	State	WBPDC	KOLAGHAT TPS	6	210	17-03-1991	N	38.8
2030	January	Phase 4	Central	NTPC	BARAUNI TPS	6	105	5/1/1983	N	46.7
2030	February	Phase 4	Central	NTPC	KAHALGAON TPS	7	500	31-07-2009	Y	20.4
2030	February	Phase 4	Private	CESC	BUDGE BUDGE TPS	2	250	3/6/1999	N	30.8
2030	February	Phase 4	State	TVNL	TENUGHAT TPS	1	210	14-04-1994	N	35.7
2030	February	Phase 4	Central	NTPC	FARAKKA STPS	3	200	8/6/1987	Y	42.4
2030	March	Phase 4	Central	NTPC	KAHALGAON TPS	6	500	16-03-2008	Y	21.8
2030	March	Phase 4	Private	CESC	BUDGE BUDGE TPS	1	250	16-09-1997	N	32.3
2030	March	Phase 4	Central	NTPC	KAHALGAON TPS	2	210	17-03-1994	Y	35.8
2030	March	Phase 4	Central	NTPC	FARAKKA STPS	2	200	24-12-1986	Y	43
2030	July	Phase 4	Central	NTPC	KAHALGAON TPS	5	500	31-03-2007	Y	22.8
2030	July	Phase 4	State	TVNL	TENUGHAT TPS	2	210	10/10/1996	N	33.2
2030	July	Phase 4	Central	NTPC	FARAKKA STPS	5	500	16-02-1994	Y	35.9
2030	July	Phase 4	Central	NTPC	FARAKKA STPS	1	200	1/1/1986	Y	44
2030	August	Phase 4	Central	NTPC	TALCHER STPS	6	500	2/6/2005	Y	24.9
2030	August	Phase 4	Central	NTPC	KAHALGAON TPS	4	210	18-03-1996	Y	33.8
2030	August	Phase 4	State	WBPDC	KOLAGHAT TPS	5	210	28-12-1993	N	36
2030	August	Phase 4	State	WBPDC	KOLAGHAT TPS	3	210	16-12-1985	N	44.1
2030	November	Phase 4	Central	NTPC	TALCHER STPS	5	500	13-05-2004	Y	25.7
2030	November	Phase 4	State	OPGC	IB VALLEY TPS	2	210	22-10-1995	Y	34.2
2030	November	Phase 4	Central	NTPC	FARAKKA STPS	4	500	25-09-1992	Y	37.3
2030	November	Phase 4	Central	NTPC	BARAUNI TPS	7	105	31-03-1985	N	44.8
2030	December	Phase 4	Central	NTPC	TALCHER STPS	4	500	25-10-2003	Y	26.2
2030	December	Phase 4	Central	NTPC	KAHALGAON TPS	3	210	24-03-1995	Y	34.8
2030	December	Phase 4	Central	NTPC	KAHALGAON TPS	1	210	31-03-1992	Y	37.8
2030	December	Phase 4	State	WBPDC	KOLAGHAT TPS	4	210	24-01-1984	N	46

BOQ FOR PROCUREMENT OF REGIONAL RECATOR SPARES EASTERN REGION **Annexure- 2.6**

SL No.	Activity Description	Substation	Item Description	Unit	Qty	Unit Price as per march2024 SOR (Excl. GST)	GST @ 18%	Unit Price as per march2024 SOR (Excl. GST)	Freight/Insuranace/Loading/Unloading @ 4% ON SUPPLY	TOTAL Price
1	420KV, 3 Ph , 125 MVAR Reactor	**DURGAPUR/ NEW RANCHI**	420KV , 3Ph , 125 MVAR Reactor without Insulating Oil	EA	2	92190713	18%	108785041.3	3687628.52	224945339.7
2	420KV, 3 Ph , 125 MVAR Reactor		Insulating Oil for 3Ph , 125 MVAR Reactor	LOT	2	8000000	18%	9440000	320000	19520000
3	420KV, 3 Ph , 125 MVAR Reactor		Online Dissolved Gas & Moisture Analyser	EA	2	2084518	18%	2459731.24	83380.72	5086223.92
4	420KV, 3 Ph , 125 MVAR Reactor		Online Insulating Oil Drying System (Cartridge type)	EA	2	836500	18%	987070	33460	2041060
5	420KV, 3 Ph , 125 MVAR Reactor		SPARE FOUNDATION	EA	2	3500000	18%	4130000		8260000
									TOTAL	**259852623.6**
1	420KV,3 Ph , 80 MVAR Reactor	**BINAGURI**	420KV , 3Ph , 80 MVAR Reactor without Insulating Oil	EA	1	75048982	18%	88557798.76	3001959.28	91559758.04
2	420KV,3 Ph , 80 MVAR Reactor		Insulating Oil for 3Ph , 80 MVAR Reactor	LOT	1	6000000	18%	7080000	240000	7320000
3	420KV,3 Ph , 80 MVAR Reactor		Online Dissolved Gas & Moisture Analyser	EA	1	2084518	18%	2459731.24	83380.72	2543111.96
4	420KV,3 Ph , 80 MVAR Reactor		Online Insulating Oil Drying System (Cartridge type)	EA	1	836500	18%	987070	33460	1020530
5	420KV,3 Ph , 80 MVAR Reactor		SPARE FOUNDATION	EA	1	3000000	18%	3540000		3540000
									TOTAL	**105983400**
1	420KV,3 Ph , 63 MVAR Reactor	**ROURKELA**	420KV , 3Ph , 63 MVAR Reactor without Insulating Oil	EA	1	67043335	18%	79111135.3	2681733.4	81792868.7
2	420KV,3 Ph , 63 MVAR Reactor		Insulating Oil for 3Ph , 63 MVAR Reactor	LOT	1	5500000	18%	6490000	220000	6710000
3	420KV,3 Ph , 63 MVAR Reactor		Online Dissolved Gas & Moisture Analyser	EA	1	2084518	18%	2459731.24	83380.72	2543111.96
4	420KV,3 Ph , 63 MVAR Reactor		Online Insulating Oil Drying System (Cartridge type)	EA	1	836500	18%	987070	33460	1020530
5	420KV,3 Ph , 63 MVAR Reactor		SPARE FOUNDATION	EA	1	2700000	18%	3186000		3186000
									TOTAL	**95252510.66**

SL No.	Activity Description	Substation	Item Description	Unit	Qty	Unit Price as per march2024 SOR (Excl. GST)	GST @ 18%	Unit Price as per march2024 SOR (Excl. GST)	Freight/Insuranace/Loading/Unloading @ 4% ON SUPPLY	TOTAL Price
1	220KV,3 Ph ,31.5 MVAR Reactor	NEW MELLI	220KV , 3Ph , 31.5MVAR Reactor without Insulating Oil	EA	1	64796879	18%	76460317.22	6479687.9	82940005.12
2	220KV,3 Ph , 31.5 MVAR Reactor		Insulating Oil for 3Ph , 31.5 MVAR Reactor	LOT	1	5200000	18%	6136000	520000	6656000
3	220KV,3 Ph , 31.5 MVAR Reactor		Online Dissolved Gas & Moisture Analyser	EA	1	2084518	18%	2459731.24	208451.8	2668183.04
4	220KV,3 Ph , 31.5 MVAR Reactor		Online Insulating Oil Drying System (Cartridge type)	EA	1	836500	18%	987070	83650	1070720
5	220KV,3 Ph , 31.5 MVAR Reactor		SPARE FOUNDATION	EA	1	2000000	18%	2360000		2360000
									TOTAL	**95694908.16**
									Grand Total	**556783442.5**

GE VERNOVA

GE T&D India Limited

Plot No. A-225, Sector-83
Noida-201305, Uttar Pradesh

T +91 120 636 6700
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gevernova.com

03rd Jul '24
Ref. No. GE/URTDSM/AMC/209A

To,
Sr. General Manager,
Power Grid Corporation of India Limited
Gurgaon (Haryana) – 122001

Kind Attn: Mr. A. K Singh

Sub: Obsolescence of Windows Server Operating System of URTDSM System
Ref:

1. C: GAC: URTDSMPh1: Cyber security dated 28.06.2024
2. GE e-mail dated Apr 02nd, 2024 and March 27th, 2024 (subject: URTDSM: OS upgrade viz-a-viz ULDC)

Dear Sir,

This refers to discussions and communication received related to Windows Server OS under URTDSM system.

We would like to convey that any sort of upgrade & related testing is outside the ambit of existing contract.

Further, we reiterate that Win OS (Servers) upgrade is not feasible under current circumstances owing to following reasons:

- GE WAMS application Roadmap is heading for GridOS WAMS.
- Associated applications of 3rd party tools will get impacted.

In view of above, a system upgrade on existing infra is not feasible in current set-up. Moreover, URTDSM WAMS System is air-gapped with perimeter protection and available updated Anti-virus patches for system robustness and security.

We hope to have addressed your concerns on the subject matter.

Sincerely yours
For GE T&D India Ltd.

Vivek Aggarwal
M&S Lead: India Region

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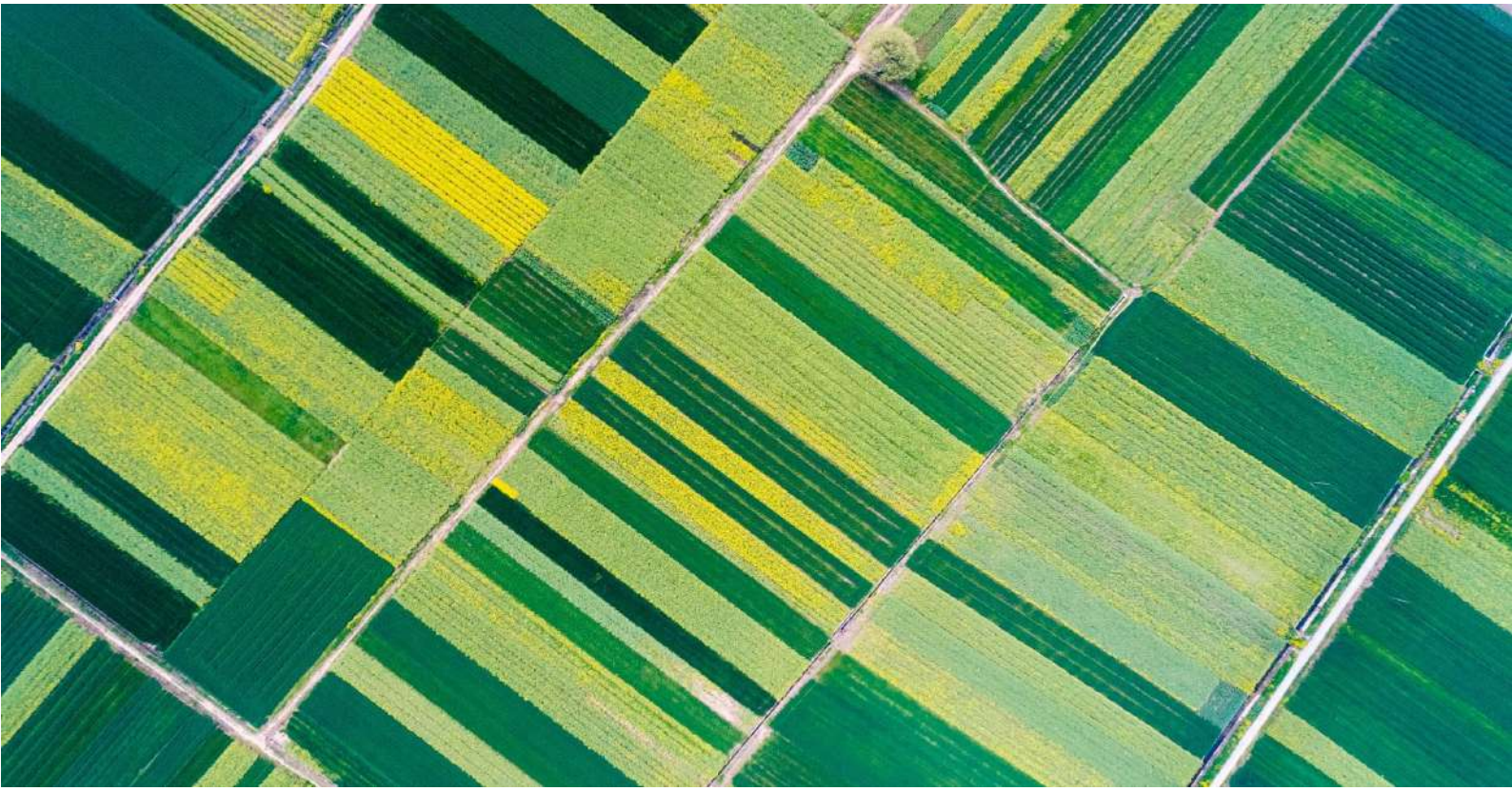


Power Grid Corporation of India Limited

Offer for supply of Switch & Firewall Configuration

Techno Commercial Offer

Validity: Forty-Five (45) Days

July 30th, 2024

GE Document – GE/OP24POWIN0000548924/V3

Configuration Management: Documentation

Document and Revision Level	Publication Date
GE/OP24POWIN0000548924/V3	July 30th, 2024

Revision History

Date	Revision	Revision Details
Feb 09, 2024	V0	Initial publication
May 01st, 2024	V1	Initial publication
June 26th,2024	V2	Initial publication
July 30th. 2024	V3	Initial publication

Contents

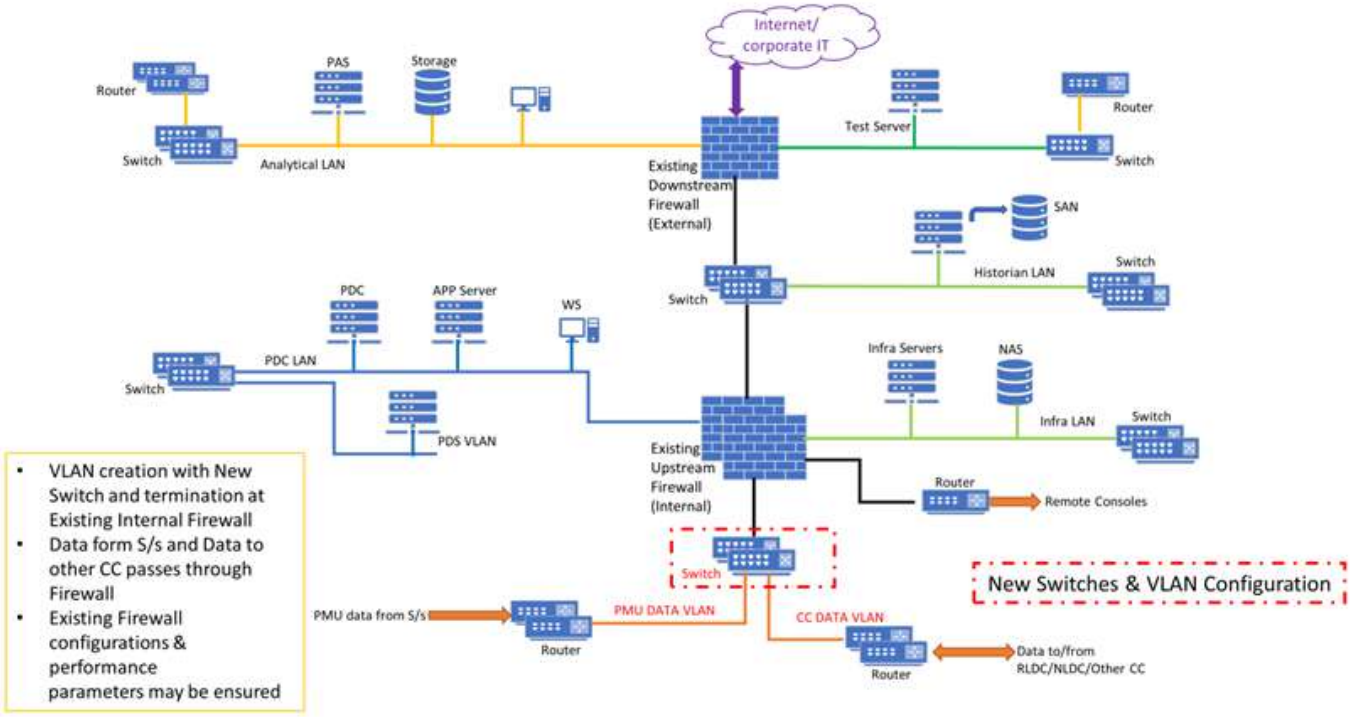
Figures

No Table or figure entries found

Tables

No Table or figure entries found

1 Proposed Architecture



The PMU data is proposed to be routed through existing internal firewalls in the existing URTDSM system.

The scope includes the supply of new LAN switches and the configuration of existing firewalls to allow reasonable streaming of PMU data.

2 Price Schedule- Per RLDC

Sl. no.	Description	Proposed Make	Qty	Unit Price (INR)	Total Price (INR) excl. GST
1	24 Port LAN Switch (L3)-1G CU ports	HP/DELL/ CISCO/JUNIPER	2 nos.	575,000	1,150,000
	Total supply price excluding GST (in INR)				**1,150,000**
	Total services price excluding GST (in INR)				**3,85,000**

Price Schedule- Per SLDC

Sl. no.	Description	Proposed Make	Qty	Unit Price (INR)	Total Price (INR) excl. GST
1	24 Port LAN Switch (L3)-1G CU ports	HP/DELL/ CISCO/JUNIPER	2 nos.	575,000	1,150,000
	Total supply price excluding GST (in INR)				**1,150,000**
	Total services price excluding GST (in INR)				**3,85,000**

Note: Rates for internal firewall configuration are included under the service section of each control center.

Special Terms & Conditions

1) Taxes shall be Extra at Actuals at the time of ordering.
2) Offer to be read in conjunction with attached EM-104
3) Validity – 45 days from offer date
4) Currency of Quotation: Indian Rupees (INR)
5) Payment Term: 100% advance of the contract value with PO
6) INCOTERMS: Ex-Works, Noida
7) Delivery Lead time – 3 -4 months from receipt of advance in GED's bank account or PO date whichever is later.

All sort of statutory variation including change, addition, deletion, abolition, repeal or reclassification due to change in Law and/ or directive or interpretation of authorized agency, shall be exclusively to the owner/purchaser's account.

Appendix A: Standard Terms & Conditions

EM-104

GE T&D India Limited
A-225, Sector-83
Noida – 201 305
Uttar Pradesh, India

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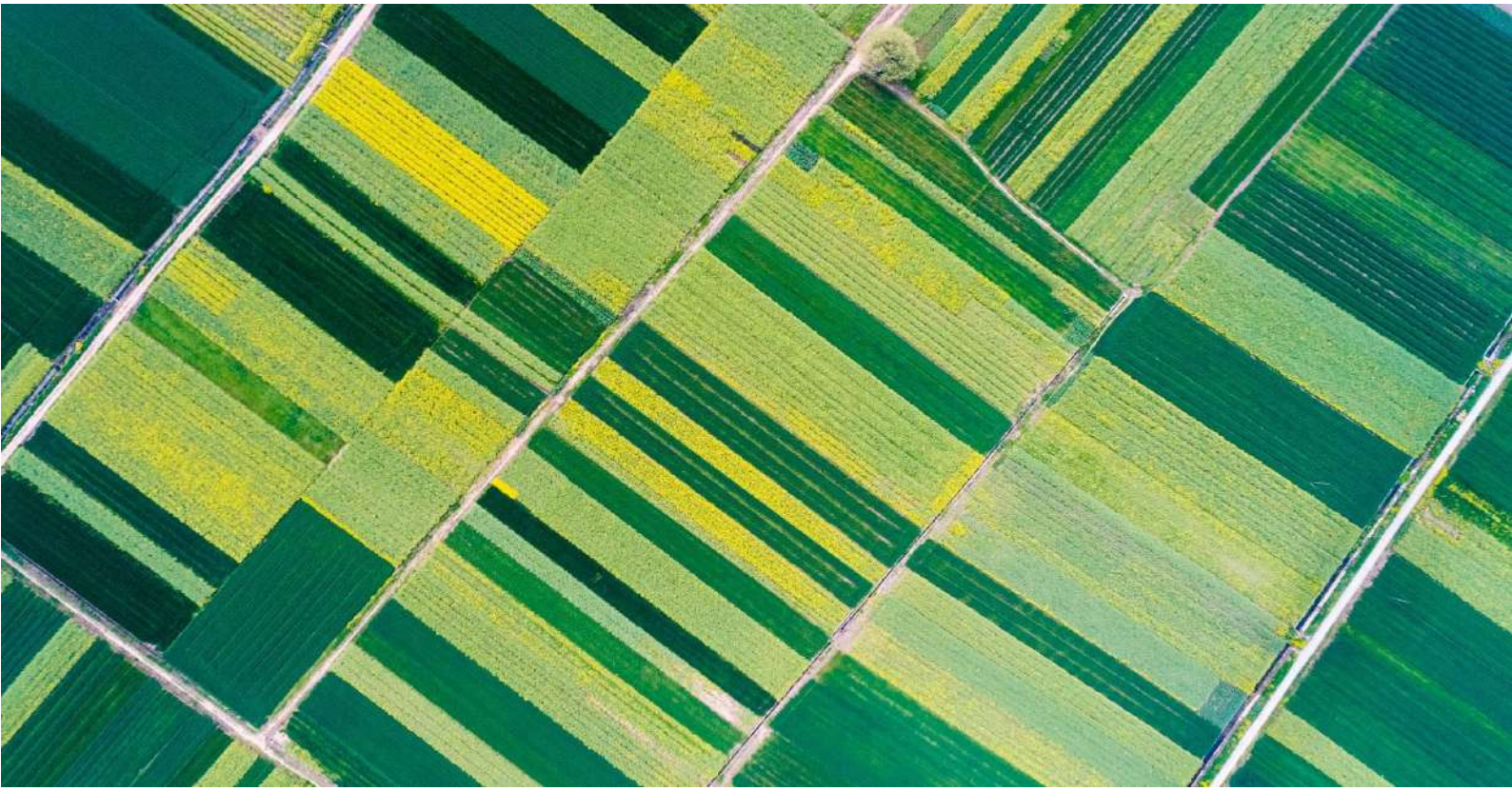

Power Grid Corporation of India Limited Offer of Additional Storage for Log Retention Techno Commercial Offer

Validity: Forty-Five (45) Days

July 30th, 2024

GE Document – GE/OP24POWIN0000548924/V3

Configuration Management: Documentation

Document and Revision Level	Publication Date
GE/OP24POWIN0000548924/V3	July 30th, 2024

Revision History

Date	Revision	Revision Details
Feb 09, 2024	V0	Initial publication
May 01st, 2024	V1	Initial publication
June 26th,2024	V2	Initial publication
July 30th, 2024	V3	Initial publication

Contents

Figures

No Table or figure entries found

Tables

No Table or figure entries found

1 Price Schedule- Per RLDC

Sl. no.	Description	Proposed Make	Qty	Unit Price (INR)	Total Price (INR) excl. GST
1	Storage- 6TB- Dual Controller, 10K SAS Drive, 4X1G CU port (6 Months data storage capacity)	HP/DELL/LENOVO/NETAPP	1 no.	1,160,000	1,160,000
	Total supply price excluding GST (in INR)				**1,160,000**
	Total service price excluding GST (in INR)				**7,75,000**

Price Schedule- Per SLDC

Sl. no.	Description	Proposed Make	Qty	Unit Price (INR)	Total Price (INR) excl. GST
1	Storage- 6TB- Dual Controller, 10K SAS Drive, 4X1G CU port (6 Months data storage capacity)	HP/DELL/LENOVO/NETAPP	1 no.	1,160,000	1,160,000
	Total SUPPLY Price excluding GST (in INR)				**1,160,000**
	Total SERVICES Price excluding GST (in INR)				**7,75,000**

Special Terms & Conditions

1. Taxes shall be Extra at Actuals at the time of ordering
2. Offer to be read in conjunction with attached EM-104
3. Validity – 45 days from offer date
4. Currency of Quotation: Indian Rupees (INR)
5. Payment Term: 100% advance of the contract value with PO
6. INCOTERMS: Ex-Works, Noida
7. Delivery Lead time – 3 -4 months from receipt of advance in GED's bank account or PO date whichever is later.

All sort of statutory variation including change, addition, deletion, abolition, repeal or reclassification due to change in Law and/ or directive or interpretation of authorized agency, shall be exclusively to the owner/purchaser's account.

Appendix A: Standard Terms & Conditions

EM-104

GE T&D India Limited
A-225, Sector-83
Noida – 201 305
Uttar Pradesh, India

Annexure-B2.9

No. 11/29/2023-NHPC

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power

New Delhi, the 12th of August 2024

To,
The Chairperson,
Central Electricity Authority,
Sewa Bhawan, R.K. Puram
New Delhi

Sub: Allocation of firm power w.r.t. Parbati-II hydroelectric project (800 MW) and Dibang multi-purpose project (2880 MW) of NHPC Ltd.

Sir,

I am directed to forward herewith a copy of NHPC Ltd.'s letter No. NH/Comml./MOP/Allocation/2024/885 dated 06.05.2024 which is self-explanatory. The shares of various states/utilities according to their entitlement fromParbati-II hydroelectric project (800 MW) and Dibang Multi-Purpose project (2880 MW) is required to be finalized as per the revised guidelines issued by this Ministry on 31.07.2024 for allocation of power from the central hydro power generating stations.

2. NHPC Ltd. vide letter dated 09.08.2024 (copy attached) has also indicated the updated status of consent received/PPA signed from various DISCOM/States for procurement of power from above projects. As such, CEA is requested to examine the case w.r.t. Parbati-II (800 MW) and Dibang (2880 MW) projects and furnish the proposed allocation to this Ministry at the earliest.

Encl.: As above

Yours faithfully,

Deputy Director
Tel No. 23324357

Copy to:
1. CMD, NHPC Ltd., Sector-33, Faridabad, Haryana

एनएचपीसी लिमिटेड
(भारत सरकार का उद्यम)
NHPC Limited
(A Govt. of India Enterprise)

एनएच/वाणिज्यिक/एमओपी/आवंटन/2023/ 1023 दिनांक 09.08.2024

अवर सचिव,
एनएचपीसी डेस्क,
ऊर्जा मंत्रालय, भारत सरकार,
श्रम शक्ति भवन,
रफी मार्ग, नई दिल्ली-110001

विषय: एनएचपीसी लिमिटेड, उसके जेवी/अनुषंगियों की आगामी जलविद्युत परियोजनाओं से राज्यों को बिजली का आवंटन।

महोदय,

कृपया आगामी एनएचपीसी जलविद्युत परियोजनाओं के लिए प्राप्त सहमति और हस्ताक्षरित पीपीए की नवीनतम स्थिति संलग्न है ।

इसके अलावा , हाल ही में प्राप्त, यूटी चंडीगढ़ की सहमति संलग्न है और अन्य डिस्कॉम/राज्यों की सहमति पहले ही एमओपी, भारत सरकार के साथ साझा की गई है।

धन्यवाद,

सादर,

09/08/24

(ओंकार यादव)
महाप्रबंधक(वाणिज्यिक)
Email: nhpc-pt@nhpc.nic.in

ANNEXURE A

DETAILS OF UPCOMING HYDRO PROJECTS

DESCRIPTION	TEESTA-VI	RANGIT-IV	RATLE	PAKALDUL	KWAR	KIRU	PARBATI-II	DIBANG	TOTAL
PROJECT OWNERSHIP	LTHPL	JPCL	RHPCL	CVPPPL	CVPPPL	CVPPPL	NHPC	NHPC	
INSTALLED CAPACITY (MW)	500	120	850	1000	540	624	800	2880	7314
FREE POWER(12%)+ LADF(1%) -MW	65	16	111	130	70	81	104	374	391
STATUS OF PROJECT	Under Construction	Under Construction	Under Construction	Under Construction	Under Construction	Under Construction	Under Construction	Under Construction	
EXPECTED COMMISSIONING	Dec'27	May-25	Nov'26	SEP'26	NOV'26	Sep'26	Dec'24	Feb'32	
DISCOM/STATES	CONSENT (MW) RECEIVED FROM								
NORTHERN REGION									
JKPCL, J&K			560.5	480	170.2	81	PPA SIGNED		INCLUDING FREE POWER
HPSEBL, HP							PPA SIGNED		
HPPC, HARYANA	100	100	250	250	200	624	PPA SIGNED	400	
PSPCL, PUNJAB	65	20	75		100	100	PPA SIGNED		
DTL, DELHI							PPA SIGNED		
NDMC,DELHI	50	50	50						
BRPL, DELHI	50	50	50	11	50	100			
BYPL, DELHI	50			7		50			
TATA POWER									
UPPCL, UTTAR PRADESH				In Principal consent		624	PPA SIGNED	In Principal consent	
UPCL, UTTRAKHAND							PPA SIGNED		
RUVNL, RAJASTHAN			In Principal consent				PPA SIGNED		
UT CHANDIGARH			20				PPA SIGNED		

NHPC LIMITED
एनएचपीसी N·H·P·C
FARIDABAD

ANNEXURE A

DETAILS OF UPCOMING HYDRO PROJECTS

DESCRIPTION	TEESTA-VI	RANGIT-IV	RATLE	PAKALDUL	KWAR	KIRU	PARBATI-II	DIBANG	TOTAL
PROJECT OWNERSHIP	LTHPL	JPCL	RHPCL	CVPPPL	CVPPPL	CVPPPL	NHPC	NHPC	
EASTERN REGION									
BSHPCL , BIHAR	100		100			300		2000	
GRIDCO, ORISSA	100		100			100			
WBSEDCL, WEST BENGAL	100		100						
DVC	200		100			150		500	
WESTERN REGION									
GUVNL, GUJARAT	429	103	377	443	240	543		500	
CSPDCL, CHHATTISGARH	300		300	250	100	250	200	250	
MPPMCL, MADHYA PRADESH	400	120	500						
MSEDCL, MAHARASTHRA			213	100	54	109		288	
SOUTHERN REGION									
ANDHRA PRADESH	87	20.88	75	88	48				
PCKL, KARNATAKA	In Principal consent			In Principal consent	In Principal consent	In Principal consent		In Principal consent	

NHPC LIMITED
एनएचपीसी
N·H·P·C
FARIDABAD

ANNEXURE B

DETAILS OF UPCOMING HYDRO PROJECTS

DESCRIPTION	TEESTA-VI	RANGIT-IV	RATLE	PAKALDUL	KWAR	KIRU	PARBATI-II	DIBANG	TOTAL
PROJECT OWNERSHIP	LTHPL	JPCL	RHPCL	CVPPPL	CVPPPL	CVPPPL	NHPC	NHPC	
INSTALLED CAPACITY (MW)	500	120	850	1000	540	624	800	2880	7314
EXPECTED COMMISSIONING	Dec'27	May-25	Nov'26	SEP'26	NOV'26	Sep'26	Dec'24	Feb'32	
DISCOM/STATES	STATUS OF PPA WITH DISCOM /STATES								
NORTHERN REGION									
JKPCL, J&K			PPA SIGNED	PPA SIGNED	PPA SIGNED	PPA SIGNED	PPA SIGNED		INCLUDING FREE POWER
HPSEBL, HP	-	-	-	-	-	-	PPA SIGNED	-	
HPPC, HARYANA	PPA APPROVED	PPA APPROVED	PPA APPROVED	PPA APPROVED	PPA APPROVED	PPA APPROVED	PPA SIGNED	PPA APPROVED	
PSPCL, PUNJAB	PPA UNDER APPROVAL	PPA UNDER APPROVAL	PPA UNDER APPROVAL	-	PPA UNDER APPROVAL	PPA UNDER APPROVAL	PPA SIGNED	-	
DTL, DELHI	-	-	-	-	-	-	PPA SIGNED	-	
NDMC,DELHI	PPA UNDER APPROVAL	PPA UNDER APPROVAL	PPA UNDER APPROVAL	-	-	-	-	-	
BRPL, DELHI	PPA UNDER APPROVAL	PPA UNDER APPROVAL	PPA UNDER APPROVAL						
BYPL, DELHI	PPA UNDER APPROVAL								
TATA POWER	-	-	-	-	-	-	-	-	
UPPCL, UTTAR PRADESH	-	-	-	PPA UNDER APPROVAL	-	PPA SIGNED	PPA SIGNED	PPA SIGNED	
UPCL, UTTRAKHAND	-	-	-	-	-	-	PPA SIGNED	-	
RUVNL, RAJASTHAN	-	-	PPA SIGNED	-	-	-	PPA SIGNED	-	
UT CHANDIGARH	-	-	PPA UNDER APPROVAL	-	-	-	PPA SIGNED	-	

NHPC LIMITED
एन एच पी सी
N·H·P·C
FARIDABAD

3

ANNEXURE B

DETAILS OF UPCOMING HYDRO PROJECTS

DESCRIPTION	TEESTA-VI	RANGIT-IV	RATLE	PAKALDUL	KWAR	KIRU	PARBATI-II	DIBANG	TOTAL
PROJECT OWNERSHIP	LTHPL	JPCL	RHPCL	CVPPPL	CVPPPL	CVPPPL	NHPC	NHPC	
EASTERN REGION									
BSHPCL , BIHAR	PPA UNDER APPROVAL		PPA UNDER APPROVAL			PPA UNDER APPROVAL		PPA UNDER APPROVAL	
GRIDCO, ORISSA	PPA UNDER APPROVAL		PPA UNDER APPROVAL			PPA UNDER APPROVAL			
WBSEDCL, WEST BENGAL	PPA UNDER APPROVAL		PPA UNDER APPROVAL						
DVC	PPA UNDER APPROVAL		PPA UNDER APPROVAL			PPA UNDER APPROVAL		PPA UNDER APPROVAL	
WESTERN REGION									
GUVNL, GUJARAT	PPA SIGNED	PPA SIGNED	PPA SIGNED	PPA SIGNED	PPA SIGNED	PPA SIGNED		PPA SIGNED	
CSPDCL, CHHATTISGARH	PPA SIGNED		PPA SIGNED	PPA SIGNED	PPA SIGNED	PPA SIGNED	PPA SIGNED	PPA SIGNED	
MPPMCL, MADHYA PRADESH	PPA SIGNED	PPA SIGNED	PPA SIGNED						
MSEDCL, MAHARASTHRA			PPA UNDER APPROVAL	PPA UNDER APPROVAL	PPA UNDER APPROVAL	PPA UNDER APPROVAL		PPA UNDER APPROVAL	
SOUTHERN REGION									
ANDHRA PRADESH	PPA UNDER APPROVAL	PPA UNDER APPROVAL	PPA UNDER APPROVAL	PPA UNDER APPROVAL	PPA UNDER APPROVAL				
PCKL, KARNATAKA	PPA UNDER APPROVAL			PPA UNDER APPROVAL	PPA UNDER APPROVAL	PPA UNDER APPROVAL		PPA UNDER APPROVAL	

NHPC LIMITED
एन एच पी सी
N·H·P·C
FARIDABAD

From

PC-cum-Executive Engineer,
Electy. 'OP' Divn. No.2,
UT Chandigarh

To

The General Manager (Comml.)
NHPC office Complex Sector-33
Faridabad-121003 Haryana

Memo No.: PC/EE/OP2/APC/JP-4A/2024-25/ 113450 1
Dated: 25/07/24

Subject: **Consent for procurement of power from upcoming hydro projects developed by NHPC and through its JVs.**

Reference: - Your Office Letter No. NH/Comml./New Projects/2022/609 dated 02.06.22

In this regard, it is intimated that the Worthy Secretary Engineering UT Chandigarh has accorded approval to give consent for purchase of 20 MW power from Rattle Hydro power plant from upcoming project developed by NHPC and through its JVs.

This is for your kind information and taking further necessary action please.

DA/~~AA~~

30/07/24

GSM(T)

PC-cum-Executive Engineer,
Electy. 'OP' Divn. No.2,
UT Chandigarh

सेंट्रल ट्रांसमिशन यूटिलिटी ऑफ इंडिया लिमिटेड
(पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड के स्वामित्व में)
(भारत सरकार का उद्यम)
CENTRAL TRANSMISSION UTILITY OF INDIA LTD.
(A wholly owned subsidiary of Power Grid Corporation of India Limited)
(A Government of India Enterprise)

Ref: CTU/E/00/ERPC

Date: 09-05-2024

Member Secretary
Eastern Regional Power Committee (ERPC)
14, Golf Club Road, Tollygunge
Kolkata-700033

Annexure-B2.10

Subject: Paradeep – Andaman HVDC Interconnection – reg.

Dear Sir,

This is with reference to the deliberation on "Paradeep – Andaman HVDC Interconnection" in the 51st TCC/ERPC meeting held on 11th and 12th Jan 2024 wherein the following was decided.

1. CTU was directed to come up with a concrete plan that includes the exploration of other alternative energy solutions with cost - benefit comparison.

2. The matter will be discussed in subsequent TCC and ERPC meetings to evaluate the scheme further and incorporate any new findings or suggestions.

In this regard, it is to mention that the analysis in regard to supply of clean power to Andaman islands from various energy solutions has already been carried out by CEA in consultation with various stakeholders including Andaman & Nicobar Island (ANI) authorities, CTU, NTPC, SECI etc. The present cost of supply of power from diesel generation in ANI comes out to be more than ₹40/per unit, and Govt. of India is providing huge subsidies to reduce the cost of electricity in ANI. Further, there isn't adequate RE potential and also there is scarcity of land for development of RE. Accordingly, HVDC interconnection of Andamand islands with main land through undersea cable has been planned to supply clean and reliable power towards greening the island initiative. This is also reduce the dependency on diesel generators to large extent.

Considering the future power requirement of Nicobar islands, this interconnection would be established with 500MW HVDC cable with 250MW terminal in first phase at Andaman islands and balance 250MW terminal would be installed at Nicobar islands in future. A brief write-up on power supply situation in ANI, exploration of other alternative energy solutions including cost-benefit analysis and planned HVDC interconnection is given at **Annexure-I**. As per the directions of NCT / CEA, DPR of the said HVDC interconnection is presently under preparation by POWERGRID.

Thanking you.

Yours faithfully,

राजेश कुमार
09/05/2024

(Rajesh Kumar)
Senior General Manager (TP-III & CP)

Copy to:

1. **Chairperson** Central Electricity Authority Sewa Bhawan, R.K.Puram New Delhi-110066	2. **Director (Transmission)** Ministry of Power Shram Shakti Bhawan, Rafi Marg New Delhi - 110001

A brief on Power supply situation in Andaman and Nicobar Islands (ANI) and Paradeep – Andaman HVDC interconnection (through undersea cable)

A. Background

The Andaman and Nicobar Islands (ANI) are a group of islands at the south-eastern edge of the Bay of Bengal, located roughly 1000km east of the Indian mainland. The archipelago consists of about 572 islands, with only 37 of them inhabited.

The power generation capacity of the islands is primarily based on diesel generators, with some small-scale renewable energy sources such as solar and wind power. The islands are located far from the mainland, which makes it difficult to transport fuel and other resources needed for power generation. Due to the remote location of the islands and the limited availability of resources, the islands are not connected to the National Grid. This increases the cost of electricity generation and makes the islands more vulnerable to supply disruptions.

While there are some small-scale renewable energy projects in the islands, such as solar and wind power, the adoption of renewable energy sources is limited due to the high cost of installation and limited availability of resources. The heavy reliance on diesel generators for power generation has a significant environmental impact, contributing to air pollution and greenhouse gas emissions. The use of renewable energy sources and cleaner technologies can help to mitigate these concerns. There isn't adequate RE potential and also there is scarcity of land for development of RE.

B. Present Power Supply Scenario

Port Blair experiences its peak demand of around 40 MW during the evening hours (6 pm to 10 pm). During this time, the solar power is not available and the whole demand is met through running captive as well as hired DG plants. However, the generation is generally short by 5-6 MW to the total demand. So, there is often roaster load shedding in Port Blair besides the fault tripping during peak hours. During solar hours, the peak demand is around 30 MW which is met by DG plants in conjunction with the Solar Power plants. Solar plants have sufficient capacity to meet the demand during the solar hours, however, due to sudden variations in solar radiations owing to typical weather of Port Blair, and inability of DGs to ramp up and ramp down their output causes demand – supply mismatch leading to sudden frequency variations and thereby the failure of the Grid. As per CEA regulations (Technical standards for connectivity to the Grid), the solar plants shall be capable of operating in the frequency range of 47.5 to 52.5 Hz and shall be able to deliver the rated output. However, it has been observed that during most of the faults, high frequency occurs in the system causing tripping of solar plants and overall grid failure. It was observed during the field visits that the grid was operating in the frequency band of 50-52 Hz for most of the time. With the emergence of any feeder fault resulting in loss of load the frequency quickly shoots up above 52 Hz leaving no room for corrective action through manual intervention. Upon grid failure, the system restoration takes about 25-30min. Such repeated Grid failures are not healthy for power system equipment, and it also causes larger public inconveniences.

C. Greening the Islands initiative of Govt. of India

A review meeting on the power scenario of ANI was held under the chairmanship of Honourable Minister of Power & NRE on 25-05-2023. Honourable minister advised to explore the off shore and near shore wind opportunities along with solar and battery energy storage sources to meet the demand of island. It was also decided in the meeting to gradually phase out the existing old diesel generators in view of Government of India's ambition of achieving Greening the Grid (GTG) and greening the islands of ANI.

Thereafter a review meeting was held under the chairmanship of Chairperson, CEA on 07-06-2023. In the meeting it was decided that due to various issues such as import of fuel, transportation, regasification and storage of gas, the LNG project is not viable in the near future. Inter alia following key areas/projects were identified for improvement of power supply situation in ANI:

(a) Feasibility study for off-shore wind project

(b) Installation of roof-top solar panels on Govt. buildings

(c) Assess feasibility of energy storage systems

(d) Strengthening of internal transmission & distribution system of ANI

(e) HVDC interconnection of ANI with mainland through undersea cable

D. Alternatives for improving power supply situation in ANI

In the 51st TCC/ERPC meetings, CTU was directed to come up with a concrete plan that includes the exploration of other alternative energy solutions with cost - benefit comparison. In this regard, it is to mention that various alternatives were explored for facilitating improvement of power supply situation in ANI. The brief on the same is as under:

(a) Capacity augmentation of Diesel Generations (DGs)

The present cost of supply of power from diesel generation in ANI comes out to be more than ₹40/kWh, and Govt. of India is providing high subsidies to reduce the cost of electricity in ANI and make it affordable for public.

DGs release greenhouse gases, which degrades the sensitive environment of the ANI. Continuing use of DGs is against the sustainable development goals and is also not economical. Accordingly, DGs need to be phased out progressively or be kept only as emergency back-up.

(b) Use of RE generation coupled with energy storage

Large part (>90%) of the ANI are heavily forested areas, classified as reserved forests or protected forests or sanctuaries, thus reducing the availability of usable land. A report titled "Greening of Andaman & Nicobar Islands" on joint visit by SECI and NIWE to different sites for RE plants in Andaman Island was prepared by SECI in Dec 2021. The key findings of the report are:

(i) South Andaman Island has a cumulative potential for setting up of 100 MW(AC) Solar Power Plant. The RE power will be supported by 250 MWh BESS for RE power smoothing, ramping and energy storage applications.

(ii) Wind potential is primarily available on the west coast. However, use of west coast is not feasible in entirety as the western part of South Andamans has a marine national park and Jarawa tribal reserve while the middle Andaman has marshy creeks.

Accordingly, based on available potential and available land, tendering of new solar plants of along with battery energy storage systems are being taken up. Further, roof-top solar on government buildings and 33/11kV substation area is also being taken up.

(c) Development of HVDC link to ANI as long-term measure

Present peak demand of ANI is about 65MW. As per 20th EPS the peak demand is expected to reach 75MW in 20231-32, 83MW in 2036-37 & 92MW in 2041-42, which cannot be met reliably through available RE potential. Thus, keeping in view the long-term power requirement of ANI; to supply clean and reliable power towards greening the island initiative; reduce dependency on diesel generators; reduce greenhouse gas emissions; and improve reliability, security and quality of power supply, a HVDC link from mainland to ANI through undersea cable has been planned. The Paradeep – Andaman interconnection is planned as ±320kV, 500MW HVDC Bipole link (about 1150km) with 250MW HVDC terminals to be installed in first phase at both ends. In future, this link shall be extended from Andaman Islands to Nicobar Islands with 2nd 250MW HVDC terminals at Paradeep and Nicobar. A schematic diagram of the planned link is enclosed herewith.

As per the directions of NCT / CEA, DPR of the said HVDC interconnection is presently under preparation by POWERGRID for perusal of NCT and Ministry of Power, Govt. of India.

Paradeep – Andaman HVDC Interconnection (through undersea cable) with provision to extend upto Nicobar

Annexure B.2.12

Cost Estimate For Equipment at Alipurduar

Sl. No.	Description	Amount (in Lakhs (Rs.)
	Equipment Cost	
A	**Supply**	**42.00**
	Sub- Total A	
B	**Services/Installation incl training, testing and commissioning**	**0.55**
C	**Inland Freight and Insurance**	**4.20**
	Subtotal (A to C)	**46.75**
D	**Taxes and Duties**	
i	GST on Supply	**7.56**
ii	GST on Service / Installation incl. Training	**0.10**
	Subtotal (D)	**7.66**
	Subtotal (A to D)	**54.41**
E	Incidental Expenditure during Construction	**5.85**
F	Contingency	**1.63**
	Total (A to F)	**61.89**
G	Interest During Construction (IDC)	**3.09**
	Grand Total	**64.98**
H	Annual maintenance charges for 1 year during warranty period and 6 years after warranty period incl. GST*	**0.71**

S.No	Items	Units	Quatity	Supply (Rs	Total	F&I (Rs.	Services(Rs.)		Total price (Rs.)
1	SDH EQUIPMENT (STM-4 MADM UPTO 5 MSP PROTECTED DIRECTIONS)-BASEEQUIPMENT (COMMON CARDS, CROSS CONNECT/CONTROL CARDS, OPTICAL BASECARDS, POWER SUPPLY CARDS, POWER CABLING, OTHER HARDWARE ANDACCESSORIES INCLUDING SUB	EA	1	700012	700012		52434	52434	752446
2	SFP S16.1	EA	2	15120	30240		136	272	30512
3	optical Line interface card- STM4 - 225 KM	EA	6	446784	2680704		120	720	2681424
4	TRIBUTARY INTERFACE- E1 INTERFACE (MINIMUM 16 NOS.)	Set	2	71876	143752		72	144	143896
5	ETHERNET INTERFACE 10/100 BASE T WITH LAYER-2 SWITCHING (MIN 8 INTERFACES PER	EA	2	94740	189480		124	248	189728
6	TRIBUTARY INTERFACE-GIGABIT ETHERNET INTERFACES 10/100 MBPS WITH LAYER-2 SWITCHING (MINIMUM 2 NOS.)	SET	1	35223	35223		72	72	35295
7	Equipment Cabinets For SDH	EA	1	463714	463714		1188	1188	464902
					4243125		**54146**		**4298203**

Minutes of meeting for VOIP Communication System for all regions held in virtual mode (MS-Teams) on 12th June 2024

The meeting for VOIP Communication System for all regions held in virtual mode (MS-Teams) on 12th June 2024.

The list of participants is attached at ***Annexure-I***.

Sr. GM (CTU) welcomed all the participants at the meeting and proceeded with the agenda items. CTUIL emphasised that as the existing VoIP system is under extended AMC till July 2025, so a new system has to be designed and planned by this time. Further CTUIL stated that as the proposed VoIP system shall be PAN India single package, the purpose of this meeting is to make all the functional requirement of the system uniformly in all the region. The agenda of the meeting is attached at ***Annexure-II.***

With reference to ***Annexure-II ;*** 6 . iv) GRID-INDIA requested for discussion on features technical specification etc before optimization of the Cost. CTUIL agreed for the same and discussed all the possible options of design during the meeting and stated that whatever is agreed by the participants in the meeting shall be taken up.

CTUIL shared a presentation (attached at ***Annexure-III***) and explained the present and proposed VOIP architecture. The proposed VOIP architecture is a server-based system with 4 level of redundancy through hierarchical control centre servers for each user including RLDC subscribers. The broad aspects and basic features of the proposed VOIP system were explained in detail by CTUIL. Tentative BoQ & Cost of the proposed VOIP system for all regions was presented with three different options in view of cost optimisation.

NRLDC (GRID-INDIA)/ TSTRANSCO enquired about the number of licenses required for each subscriber to achieve 4 level of redundancy in the proposed VOIP system. CTUIL replied that only a single license will be sufficient for each subscriber, regardless of the number of servers they register with, as the proposed VOIP system achieves four levels of redundancy through software configuration and IP mapping and only the capacity of servers shall be enhanced to cater the requirement rather than requiring multiple licenses. Further, GRID-INDIA inquired about the necessity of a hierarchical control centre with multiple levels of redundancy for servers instead of within the utility control centres wise redundancy in line with other ULDC schemes like SCADA, WAMS systems. Further, each Main or Backup Control Centre shall have redundant server (HA Mode) for each function (communication, voice server and NMS etc..). GRID-INDIA also requested for Voice recording System redundancy at each control centre at both application and Hardware level . AEGCL stated that in case of failure of STUs VoIP server the switches (to be procured under VoIP project and connected to VoIP server) which will be connected to STUs FOTE and ISTS FOTE, the VoIP traffic from state GSS will be routed to RLDC VoIP server and accordingly redundancy of VoIP services will be maintained. AEGCL further emphasized that with such design aspect redundant STU VoIP server may not be required . CTUIL replied that this VOIP system is operational PAN India and is instrumental in managing the regional and national grids through voice commands exchanged among various control centres. This calls for a high redundancy especially for the remote stations under central and state sector. Hence 4 level redundancy for all remote subscribers is

very much required. However, CTUIL stated that it was already decided in previous meetings with all constituent of all regions.

SRLDC (GRID-INDIA) enquired about whether the multiple level of redundancy planned is for Voice Recording Failure / application-level failure or supply failure or communication channel failure etc. at SLDC and its routing to the next level i.e RLDC. CTU explained that at SLDC level both hardware and channel level redundancy for STUs subscribers is considered but at RLDC level only hardware level redundancy for these subscribers is envisaged. In the similar fashion central sector and local subscribers of RLDC have both hardware and channel level redundancy but at NLDC level only hardware level redundancy is considered. .

TSTRANSCO further enquired about the voice recording backup of STUs at RLDC level. CTUIL replied that voice recording is limited to state level only as STUs/SLDC have already stated in the various meetings of all regions that there voice recording backup should not be kept at RLDC/other utility.

TANTRANSCO enquired about the number of servers whether single server will be used for communication, voice and NMS functions or separate for all functions. CTUIL replied that a set consisting of 3 separate servers shall be used at each control centre. This was discussed and agreed in various meetings of all regions. TANTRANSCO further asked that whether exchanges will be required along with servers in the proposed VOIP system. CTUIL replied that exchanges are not required in the proposed VOIP system. TANTRANSCO asked whether any special feature are required in VOIP phones to connect with RLDC. CTUIL replied that no extra feature is required in VOIP phones to connect with RLDC. TANTRANSCO asked that whether VOIP phones in the upcoming Scheme can connect with the existing exchange of STUs. CTUIL replied that they have discussed the same with the OEMs and it was clarified that once the existing exchange gets integrated with proposed VoIP system, all subscribers of existing exchange shall also be registered in upcoming system. So the existing subscribers can be connected in this manner. TANTRANSCO asked that whether UPS are considered with servers. CTUIL replied that UPS are not considered in the scope of the upcoming VOIP scheme. TANTRANSCO informed that they will revise their inputs and provide to CTUIL. SRLDC (GRID-INDIA) requested to explore the architecture/solution of other OEMs also for better participation and competition. CTUIL stated that proposed solution is complied by many OEMs and the cost of other prospective vendors is also expected soon and shall be taken into consideration in final proposal at RPC.

WRLDC (GRID-INDIA) enquired about the connectivity of VOIP phone with both (Main & Backup Control centre) and also informed that RLDC shall be operating as Main I and II Control Centre philosophy with Active-Active Mode and remote subscriber call shall be routed to acting Main control Centre by VOIP system itself based on the designated as acting Main Control Centre. This feature shall be incorporated in the detailed feature by the implementing agency. CTUIL replied that there are two different cards in the FOTE, one reports to main control centre and other reports to Backup Control Centre or Main II Control Centre. Through a switch VOIP phone is connected to the two different ports in the FOTE which are reporting to both main and backup control centre. Two different channels will be in active- active mode. WRLDC (GRID-INDIA) asked whether routers are considered in the scope of this scheme. CTUIL replied that routers are not required as present communication system is TDM based. Further CTUIL clarified that the L3 switches being used which shall work like routers.

WRLDC (GRID-INDIA) also enquired whether cyber security audit is considered in the scope of AMC. CTUIL replied that revised cost estimate with cyber security audit cost will be shared. WRLDC (GRID-INDIA) also requested to make VLANs for different channels for seamless operation. CTUIL replied that these aspects shall be covered under detailed engineering while implementation.

GRID-INDIA emphasized that managing a large network in a flat manner (Layer 2) would be extremely challenging for troubleshooting network issues, particularly network loops, which are common due to the involvement of multiple stakeholders across thousands of sites. This is because the network has a massive broadcast domain, this issue is also observed in the existing VOIP system which is designed back in the year 2013. To mitigate this, routers/firewalls at the SLDCs/RLDCs and NLDCs levels should be implemented with Access Control Limits for each utility Electronic Security Boundary (ESB) in line with the CEA Cyber Security Guidelines 2021GRID-INDIAFurther, the network should be segmented using VLANs with proper subnetting to prevent lateral movement and ensure need basis logical reachability among sites and control centres. GRID-INDIA has also informed that this suggestion is given to CTUIL from SRLDC as part of comments in format shared by CTUIL for sizing of the Exchange.. CTUIL stated that the detailed specifications shall be prepared by the implementing agency in consultation with stakeholders and shall be in accordance with the CEA cyber security guidelines 2021.

NERLDC (GRID-INDIA) requested to include various aspects for AMC period such as Patch Management of Servers, Firewalls, Switches and other devices of the system. Moreover, it is requested that responsibility of complying with cyber security guidelines and advisories during the maintenance phase should be of the implementing agency the system and it should in scope of AMC. GRID-INDIA suggested to include the scope work for AMC in line with the other ULDC Schemes like SCADA/EMS upgradation. CTUIL clarified that such aspects shall be covered in the bidding documents prepared by the implementing agency in consultation with stakeholders.

GRID-INDIA also requested for Provision (Optional Rate) of integration of all VOIP /phones etc with 3rd Party Voice Recording System during contract period . CTUIL stated that such feature is not envisaged in the present scope because any integration with 3rd party equipment /system may lead to cyber threats.

ERLDC (GRID-INDIA) enquired whether voice recording shall be stored at hot standby redundant the servers at each control centre. CTUIL replied that recording will be stored in the server through which call is connected and both main and backup servers will get synchronised periodically. CTUIL also clarified that if both main and backup servers at SLDC are down even then also, remote subscribers can connect with RLDC level server, but voice recording shall be restricted to SLDC servers due to administrative reasons. ERLDC (GRID-INDIA) also asked that NMS server that will be used here is for VOIP or complete communication system. CTUIL replied that NMS server proposed here is solely for proposed VOIP system.

ERLDC (GRID-INDIA) suggested that two number of VoIP phones along with two POE switches can be considered at remote subscriber end for better redundancy. CTUIL replied that such arrangement is not available with switching of 2 phones along-with POE switches. If

multi-port single POE switch is used for switching of the two phones may result in single point failure of the combined switch, hence the same will not result in better design. ERLDC (GRID-INDIA) requested to include the complete cabling at control centres in the scope of the scheme. CTUIL replied that local cabling at control centre level is included in the scope.

ERLDC /POWERGRID requested to include remote site installation also in the scope of this scheme. CTUIL stated that it will increase the cost further so if all constituents agree, this can be included. WRLDC & NRLDC (GRID-INDIA) informed that remote installation may not be included in the scope of this scheme but POWERGRID,ERLDC & NERLDC were of view that remote installation should be included. CTUIL stated that after taking cost of remote installation from OEMs, revised tentative cost estimate will be shared with the MoM. NERLDC MePTCL/ERLDC also requested to consider cordless VOIP phones for their remote generation plants. CTUIL replied that they have explored this aspect with various OEMs/suppliers. The OEMs suggested that a local tower will be required connecting the wireless users. This is not a feasible solution for the stations and involves high cost as compared to the normal cordless phones. In view of this this aspect is not advisable to be adopted with the said scheme.

Maha TRANSCO raised query that they do not have separate media from all substations which can provide redundant path upto SLDC. CTUIL suggested Maha TRANSCO to take up this as a separate agenda in the TeST meeting of the region. Maha TRANSCO further asked that whether existing Alcatel phones will be utilised in the upcoming scheme. CTUIL replied that existing Alcatel phones are proprietary in nature so they may not be used in the upcoming VOIP scheme. Maha TRANSCO asked about the configuration of despatcher console. CTUIL replied that configuration of despatcher console shall be taken care at the time of detailed engineering.

NLDC asked regarding the provision of international exchange for cross border links. CTUIL replied that a separate server set (with Voice, NMS and recording) with desired capacity shall be considered for the NLDC/Backup NLDC and RLDCs shall be Remote Subscribers for cross border voice communications. Tentative Cost of international exchange along with phones shall be included in the cost estimate shared with the MoM.

HVPNL also raised query regarding integration of their exchange. CTU replied that in case of integration, only servers are required at control centres as suggested by the OEMs, and the cost for integration of existing exchange will be added in the cost estimate shared with the MoM. HVPNL also asked the basis of cost estimate. CTUIL replied that the tentative cost is based on the budgetary quotes received from prospective OEMs/supplier.

MePTCL raised query regarding redundancy of fibre paths for FXS & FXO i.e. 2W phones.. CTUIL asked MePTCL to take up separate agenda in this regard in the TeST meeting.

AEGCL asked that if both switch and FOTE fails at a node then how it will route to SLDC, CTUIL explained that if both the switch and FOTE fails than it will not route to SLDC/RLDC.

POWERGRID asked whether POE switch and DC-AC converter are required for remote as well as local subscribers. CTUIL replied that POE switch and DC-AC converter are required only for remote sites and for remote sites installation, remote support shall be provided by OEM/vendor for installation purpose. AEGCL also informed that the switches required at both GSS

end and SLDC/RLDC end may be considered with dual source DC supply POWERGRID also suggested to take DC (48V) operated POE switch with 2 sources of supply instead of DC-AC converter. CTUIL replied that after taking cost of such DC operated POE switch, revised tentative cost estimate shall be shared with the MoM.

NERLDC (GRID-INDIA) requested that the inclusion of various minor components such as Rack for PoE Switches, MCB for DC connections etc., should also be considered in the project. CTUIL responded that the same will be done during detailed engineering by implementing agency.

NERLDC (GRID-INDIA) requested that PoE switch with AC Supply should be provided at SLDCs, RLDCs and NLDCs also for powering up the IP based local subscriber of LDCs, as connecting the individual phones with power adapter will not be feasible at all the desks. SRLDC (GRID-INDIA) also seconded the fact that PoE with AC Supply switch is very much required for LDCs. CTUIL clarified that covering of this feature shall be costlier than providing the adapters for the phones at these control centres which are already equipped with UPS/ battery banks/ DG Set hence it is not recommended. Further at the time of deliberation of final technical specification with the stakeholders by implementing agency same shall be taken care in agreement with all stakeholders.

KSEB enquired that two phones can be considered if one phone is engaged, call can be made on the other phone. CTUIL stated that overriding facility is considered in the upcoming VOIP system.

APTRANSCO enquired regarding sharing of cost for the server required for the integration of existing exchange and how the cost will be shared among various utilities. CTUIL informed that project shall be under Regulated Tariff Mode (RTM) and cost will be shared as per CERC sharing of ISTS charges regulation 2020.

MS,SRPC suggested that tentative cost breakup of phones at STU locations may be worked out and during RPC agenda same shall be presented accordingly. CTUIL agreed for the same and shall provide the Central sector (CS) and State sector (SS) cost and the cost shall be borne by the constituent as per the CERC Regulation.

Following was concluded in the meeting:

1. Draft Technical Specifications shall be prepared by implementing agency in which the scheme details along with BoQ shall be shared with all stakeholders before finalization..
2. Provision of separate international exchange server with phones to be considered.
3. Remote location cabling and installation shall be included in the scope
4. Cordless VOIP phones for ER/NER is not advisable with said scheme..
5. POE switch with dual DC input source shall be considered as per site condition and DC-AC converters shall be deleted.
6. Cyber security audit cost of VoIP system shall be considered.
7. Central Sector (CS) and State Sector (SS) wise cost breakup shall be shared.
8. Proposed System shall comply with the CEA Cyber Security Guidelines 2021.

Revised Cost estimate is prepared after incorporating inputs received from the utilities and is attached at **Annexure-IV**

Meeting ended with vote of thanks.

Annexure -I

List of Participants

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4	Priyanka Patel		NRPC		
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16					
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26	Raj Kumar		SRLDC		
27	Harish		SRLDC		
28	L Sharath chand		SRLDC		
29	Kapil Gupta	DGM	POWERGRID		
30	Narendra Kumar Meena	DGM	POWERGRID	9810082410	nkmeena@powergrid.in
31	Vishal Badlas	Manager	POWERGRID		
32	Dileep kumar rathore		POWERGRID		
33	Mayank dhar shukla		POWERGRID		
34	Biplo Sarkar		POWERGRID		
35	Representative from POWERGRID SR-1				
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49	Er. Manjit Singh	Addl.SE	PSTCL	9646118024	srxen-coc-pta@pstcl.org
50	Sh.Ramesh		TSTRANSCO		
51	Arup Sarmah		AEGCL		
52	K.Sridhar	Executive Engineer	APTRANSCO		
53	Representative from BBMB	Xen	BBMB		
54	Pongmei		SLDC Nagaland		
55	Representative from SLDC Panipat	Xen	SLDC Panipat		
56	N.K Patel	SE	GETCo		
57	Representative from SLDC Chattisgarh		SLDC Chattisgarh		
58	Niranjan Dalal		MahaTRANSCO		

Annexure-II

Agenda for combined meeting

VOIP System (Hotline speech communication)

1. Hot Line Speech Communication System (VOIP based Exchange system) was implemented in 2016 by POWERGRID in all the five regions for faster communication due to unavailability of dedicated **PAN India** speech communication between NLDC, RLDCs, SLDCs, important state and ISTS substations/generators. The said PABX was implemented by M/s Orange through Alcatel Lucent as OEM.

2. In the 67th NRPC meeting, POWERGRID representative stated that the scheme executed by M/s ORANGE was with a provision of AMC of 7 years as part of the contract and the same is expiring in July' 2023 for most of the sites.

3. AMC of the same was extended and approved in the 67th NRPC for further 2 years upto July'25. After July'25 there is no support shall be extended by Alcatel (OEM).

4. In 67th NRPC Meeting, MS, NRPC advised CTU to plan upgradation/ new system in view of expiry of AMC of existing VOIP System in July'25.

5. As life of existing system is 15 years as per CERC tariff petition, POWERGRID shall file petition to CERC for revised depreciation, after which new project shall be awarded.

6. CTU has discussed the requirement with various VOIP system suppliers and proposed VOIP System Architecture is attached at **Annexure-I**.

   Salient features of proposed VOIP system are given below as below:

   i. Server based architecture:
      Multiple level (4) of redundancy as compared to no redundancy in existing system.
   ii. SLDC & RLDC servers has Local (Central Sector phones) and Remote (Substation, generators) Phone support. However, at NLDC only local phone support will be there.
   iii. Power over ethernet switches proposed for all VOIP pone at stations for redundancy and powering the phones. In place of POC injectors, Switches with POE output are considered (additional DC to AC convertor will be required as switches operates at AC voltage)

   iv. For cost optimization single servers are proposed for Voice, NMS & Call Recording.

   v. There are no duplication of licenses for backup servers.

vi. Server size and software has been considered by taking future requirement of phones.

vii. Support for integration of future exchange of other utilities considered (their control centres).
viii. NMS for adding/ deleting users shall be provided at RLDC/ SLDC levels
ix. Operator console shall be provided to manage calls at RLDC/SLDC
x. Call recording features shall be provided at RLDC & SLDC level
xi. VOIP, Digital, Analog, Four Wire E&M (at PLCC locations) phones are considered
xii. Video Phones at RLDC/ SLDC for Senior officials
xiii. Sufficient numbers of licenses to cater future RE/ ISTS/ ISGS/ IPP and STU substations locations. The licenses for present and future requirement of the phones are considered under the scope of project, however phones for present requirement only shall be procured.
xiv. Firewall at control centres is considered
xv. Exchanges are not required at STUs where STUs have their own existing exchange, only integration shall be required which can be done through SIP/PRI lines
xvi. One Exchange for international connection at NLDC main and Backup of NLDC (25 lines) to be decided.
xvii. 1 year of warranty with 6 year of AMC which can be extendable up to 3 years
xviii. VOIP phones are to be installed at Control Centre Level, at Stations levels phones/ gateways to be handed over to utilities and remote support shall be provided.
xix. Cat-6 cable of 100 meter has been considered for remote locations.

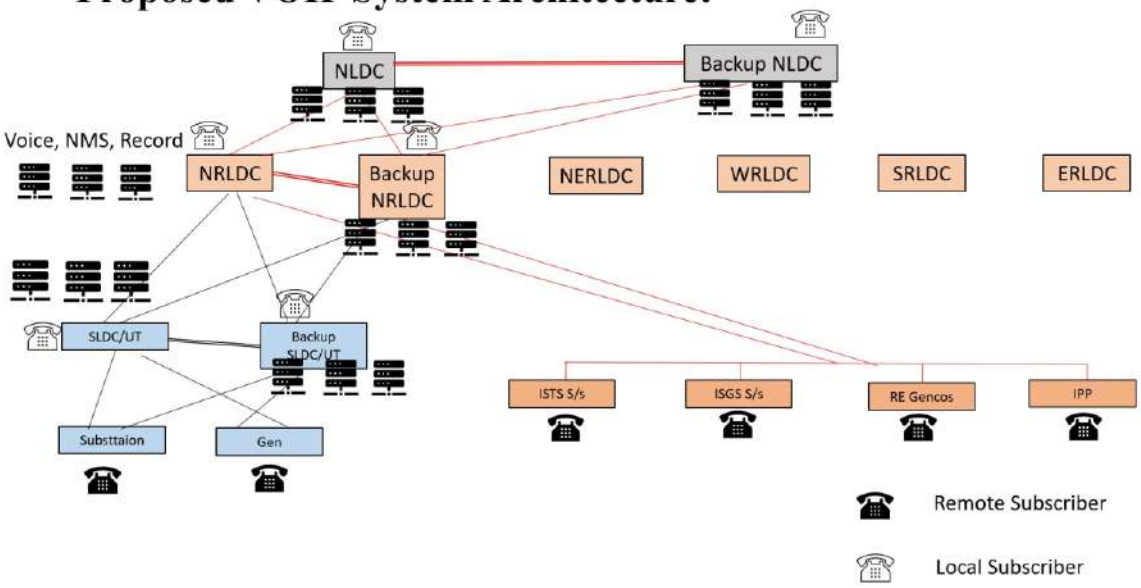
7. In this regard inputs were received from the utilities in the various meetings of CPM/ TeST of all five regions. For the utilities those have provided inputs we have considered the same in the cost estimate purpose. For the utilities where inputs are not available the present exchange license sizes have been considered for the cost estimate purpose.
8. Tentative cost estimate based on the budgetary quotation from prospective suppliers has been obtained and shall be presented during the meeting.
9. It is proposed that being a Nation wise project, the total cost of five regions including NLDC shall be put up in all five regions RPCs/NPC thereafter, getting views of RPCs scheme shall be put in the NCT for approval.

Tentative Region wise Cost estimates:

S. No.	**Region**	**Tentative Cost (in Cr.)**
1	NR	27.61
2	SR	24.71
3	WR	21.61
4	ER	16.69
5	NER	17.71
6	NLDC	2.63
Grand Total		**110.96**

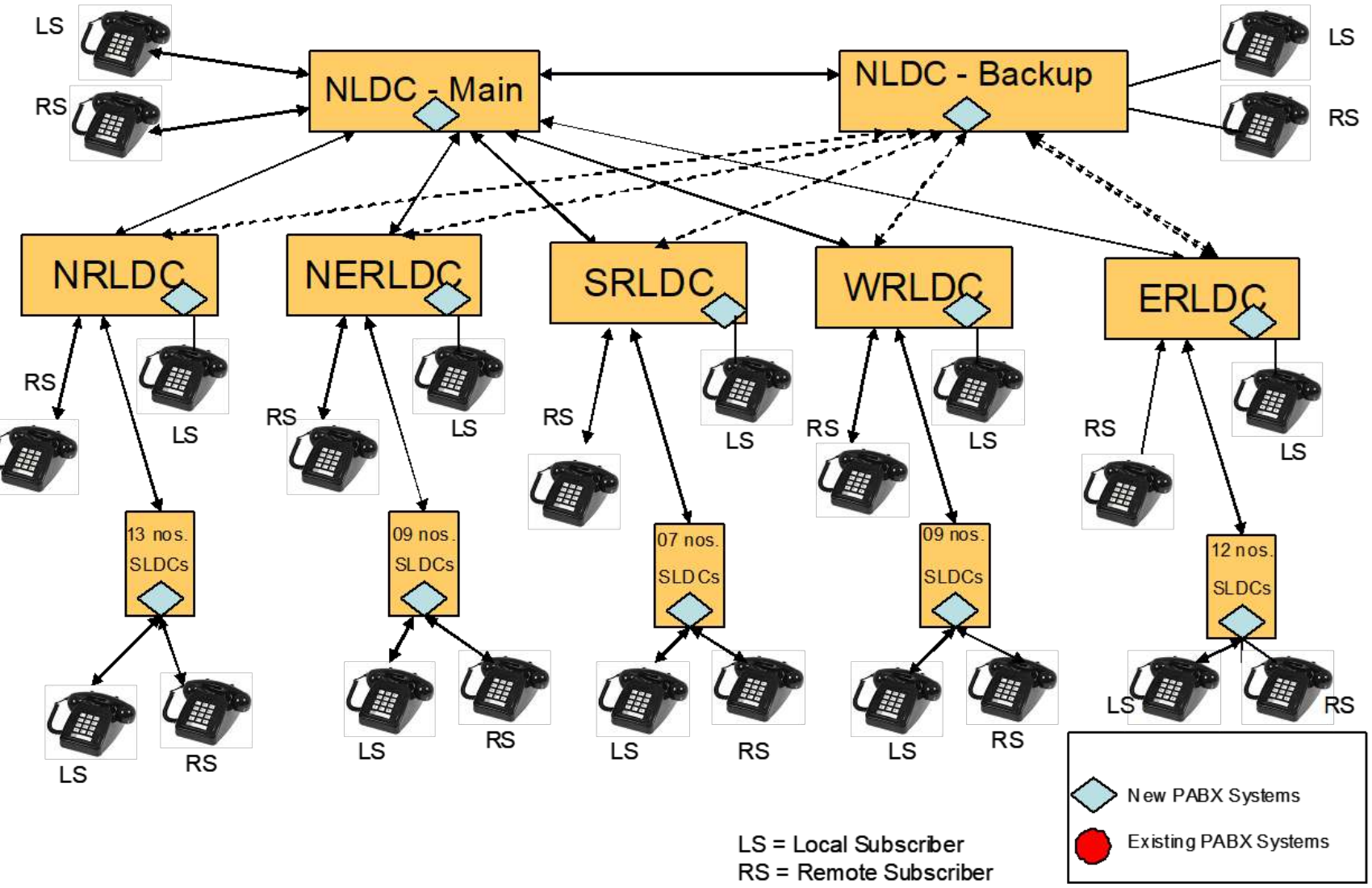
Annexure-I

Proposed VOIP System Architecture:



Annexure-III

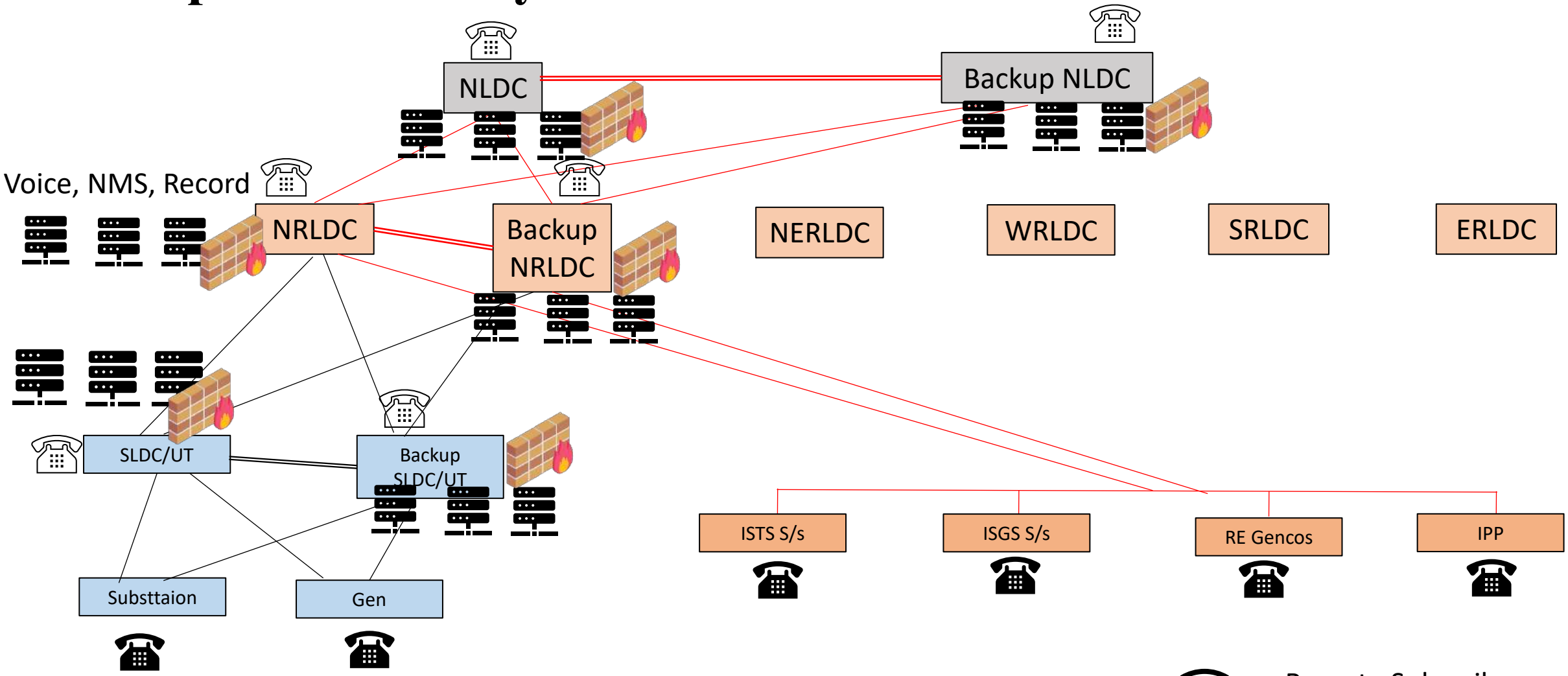
Combined CPM VOIP Communication System 12.06.2024



Present Hotline PABX Architecture

Proposed VoIP System Architecture

Proposed VOIP System Architecture:



Design Aspects

Each control center (Main & Backup) has 3 Servers

Voice NMS Recording

The main and its backup servers of the control centres (SLDC, RLDC & NLDC) shall be placed respectively at their physical locations.

Each Remote Subscriber of STU/UT shall be registered at four voice servers i.e. remote subscriber of SLDC will be registered at main SLDC, backup SLDC, Main RLDC and Backup RLDC in view of redundancy.

Call recording servers shall be provided at all main and backup control centres and will be sync through network periodically.

Configuration and management servers (NMS server) shall be provided at both main and backup SLDC, RLDC, NLDC individually.

Design Aspects

- The redundancy of subscriber channels between SLDC and RLDC shall be met by two discrete wide channels (similar to ICCP channel) containing the data of all SLDC subscribers. Similar is the case with backup SLDC and RLDC.
- The voice recording of subscribers of each utility shall be limited to that utility control centres only.
- In case communication link failed between subscriber to main SLDC server, subscriber will be switched automatically to the already active backup server and if both main and backup SLDC servers failed, subscriber will be connected with the already active Main RLDC server.
- Hardware level redundancy of SLDC servers has been considered at RLDC level.
- In case of central sector subscribers, similar redundancy has been planned for RLDC and NLDC level.

Design Aspects – Contd.

- VOIP as well as anolog both phones are considered at SLDC, RLDC, NLDC locations.
- Provision of Video phones for higher officials
- POE based switched at remote site for power supply to IP phones
- DC-AC converter for remote sites.
- Trunk/SIP lines integration is considered for outside network calls on mobile or another landline and the cost towards this shall be billed and settled by the respective utility.
- (4 wire E&M) phones are also planned through PLCC integration for few locations at SLDC level
- Integration with proposed Exchanges is kept at RLDC/ SLDC
- For Cyber Security Firewall are considered at each (main and backup) Control Centre
- Sizing of servers has been done as per the no. of subscribers at each control centres
- Cat-6 cable (100m) has been considered at each remote locations for VOIP phone/Gateway connection with FOTE

Features in Proposed VOIP system

- All Control Centres (NLDC, RLDCs and SLDCs) shall be provided with dispatcher console with advanced features such as touch screen dialing, directory sorting, user friendly display etc. The directory display in touch screen shall be configurable.
- A flexible closed numbering scheme shall be developed. The numbering scheme adopted shall take into account future network expansion so that introduction of new exchanges and subscribers shall require configuration of only those exchanges directly involved in the expansion.
- The proposed VOIP system is a PAN India system where any user can call to any user in Nation Wide.
- It will be possible to intrude on and/or disconnect ongoing calls of lower priority if free trunks are not available or if the called subscriber is engaged.
- Seamless network wherein existing multi-vendor Exchange/VOIP system of utilities are networked together.
- The equipment shall have flexibility to add/delete/modify Service Features and other facilities without requiring extensive modification and service discontinuity.

SIP based open sources VOIP phones can be integrated

Cost & BoQ of Proposed VOIP System for all regions (Option-1)

Region	Server Set		Phone (No.)		POE Switch	DC-AC Converter	Cat 6 cable (100m set)	NGFW (No.)	Grand Total (with AMC) (in Crs.)
	Main	Backup	VOIP	Analog Phone (including gateway)					
NR	10	10	2479	951	2368	2368	2368	20	**₹ 27.61**
SR	7	7	2875	252	2517	2517	2517	14	**₹ 24.02**
WR	8	6	2192	1044	2092	2092	2092	14	**₹ 21.62**
ER	7	7	1079	1059	942	942	942	14	**₹ 15.96**
NER	8	8	1424	619	1311	1311	1311	16	**₹ 19.19**
NLDC	1	1	42	400				2	**₹ 2.63**

Grand Total **₹ 110.62**

Cost & BoQ of Proposed VOIP System for all regions (Option-2)

Region	Server Set		Phone (No.)		POE Switch	DC-AC Converter	Cat 6 cable (100m set)	Remote VOIP Phone with POE injector	NGFW (No.)	Grand Total (with AMC) (in Crs.)
	Main	Backup	VOIP	Analog Phone (including gateway)						
NR	10	10	2479	951	0	0	4736	4736	20	₹ 18.65
SR	7	7	2875	252	0	0	5034	5034	14	₹ 15.23
WR	8	6	2192	1044	0	0	4184	4184	14	₹ 13.53
ER	7	7	1079	1059	0	0	1884	1884	14	₹ 12.41
NER	8	8	1424	619	0	0	2622	2622	16	₹ 14.23
NLDC	1	1	42	400					2	₹ 2.63
									Grand Total	₹ 76.71

Cost & BoQ of Proposed VOIP System for all regions (Option-3)

Region	Server Set		Phone (No.)		POE Switch	DC-AC Converter	Cat 6 cable (100m set)	Remote VOIP Phone with POE injector	NGFW (No.)	Grand Total (with AMC) (in Crs.)
	Main	Backup	VOIP	Analog Phone (including gateway)						
NR	10	10	2479	951	0	0	4736	4736	0	₹ 15.80
SR	7	7	2875	252	0	0	5034	5034	0	₹ 13.10
WR	8	6	2192	1044	0	0	4184	4184	0	₹ 11.54
ER	7	7	1079	1059	0	0	1884	1884	0	₹ 10.42
NER	8	8	1424	619	0	0	2622	2622	0	₹11.96
NLDC	1	1	42	400						₹ 2.35
									Grand Total	₹ 65.2

Thank you

Annexure-IV Revised Cost estimate

Tentative Cost & BoQ of Proposed VOIP System for All regions CS +SS(Option-1 revised)

Region	Server Set		Phone (No.)		POE Switch (with dual DC)	Cat 6 cable (100m set)incl. installation	NGFW (No.)	Grand Total (with AMC) (in Crs.)
	Main	Backup	VOIP	Analog Phone (including gateway)				
NR	10	10	2479	951	2368	2368	20	**₹ 34.3227**
SR	7	7	2875	252	2517	2517	14	**₹ 32.8099**
WR	8	6	2022	1044	1882	1882	14	**₹ 26.1236**
ER	7	7	1032	1093	822	822	14	**₹ 17.8878**
NER	8	8	1599	326	1138	1138	16	**₹ 22.0682**
NLDC	1	1	42	400	0	0	2	**₹ 2.6325**
Intl.	1	1	29	0	0	0	2	**₹ 1.209754**
Cyber Audit of complete VoIP network for 7 years								**₹ 2.8**

Grand Total **₹ 139.85**

Tentative Cost & BoQ of Proposed VOIP Syst. for NR SS(Option-1)

State	Server Set		Phone (No.)		POE Switch (with dual DC)	Cat 6 cable (100m set)incl. installation	NGFW* (No.)	Grand Total (with AMC) of SS (in Crs.)
	Main*	Backup*	VOIP	Analog Phone (including gateway)				
SLDC DTL, Minto Road	1	1	226	0	193	193	2	1.61
SLDC,RRVPNL, Heerapura	1	1	24	49	0	0	2	0.081
SLDC,BBMB, Chandigarh	1	1	182	116	182	182	2	1.57
SLDC,PSTCL, Patiala	1	1	203	8	197	197	2	1.64
SLDC,HPSEBL, Shimla	1	1	182	164	182	182	2	1.59
SLDC, UPPTCL, Lucknow	1	1	820	0	800	800	2	6.49
SLDC, HVPNL, Panipat	1	1	0	0	0	0	2	0
SLDC, JKPTCL, Jammu	1	1	182	148	182	182	2	1.58
SLDC, PTCUL, Dehradun	1	1	182	116	182	182	2	1.57
						Grand Total		₹16.14

* This BoQ pertains to Central Sector(CS) and has not been included in the cost.

Tentative Cost & BoQ of Proposed VOIP System for SR SS (Option-1 revised)

Region	Server Set		Phone (No.)		POE Switch (with dual DC)	Cat 6 cable (100m set)incl. installation	NGFW* (No.)	Grand Total (with AMC) of SS (in Crs.)
	Main*	Backup*	VOIP	Analog Phone (including gateway)				
KSEB, Kalamessary	1	1	563	0	546	546	2	4.49
TSTRANCO, Hyderabad	1	1	862	20	800	800	2	6.73
KPTCL, Bangaluru	1	1	2	0	0	0	2	0.0015
Puducheery	1	1	75	64	41	41	2	0.50
TANTRANSCO, Chennai	1	1	141	18	130	130	2	1.14
APTRANSCO, Vijaywaya	1	1	0	0	0	0	2	0.00

* This BoQ pertains to Central Sector(CS) and has not been included in the cost.

Grand Total **₹ 12.86**

Tentative Cost & BoQ of Proposed VOIP System for WR SS (Option-1 revised)

Region	Server Set		Phone (No.)		POE Switch (with dual DC)	Cat 6 cable (100m set)incl. installation	NGFW* (No.)	Grand Total (with AMC) of SS (in Crs.)
	Main*	Backup*	VOIP	Analog Phone (including gateway)				
SLDC,Panjim/Madgo	1	1	100	84	100	100	2	0.89
SLDC,Bhopal	1	1	440	220	400	400	2	3.40
SLDC,Raipur	1	1	400	148	400	400	2	3.34
SLDC,Vododara	1	1	200	244	200	200	2	1.77
SLDC,Mumbai	1	1	182	244	182	182	2	1.62
SLDC Daman & Diu	1	0	50	84	50	50	1	0.49
SLDC DNH	1	0	50	0	50	50	1	0.40

* This BoQ pertains to Central Sector(CS) and has not been included in the cost.

Grand Total ₹ 11.92

Tentative Cost & BoQ of Proposed VOIP System for ER SS (Option-1 revised)

Region	Server Set		Phone (No.)		POE Switch (with dual DC)	Cat 6 cable (100m set)incl. installation	NGFW* (No.)	Grand Total (with AMC) of SS (in Crs.)
	Main*	Backup*	VOIP	Analog Phone (including gateway)				
SLDC,Ranchi	1	1	60	100	60	60	2	0.59
OPTCL ,Bhubneshwar	1	1	108	85	92	92	2	0.85
SLDC Bihar Patna	1	1	182	212	182	182	2	1.61
SLDC WB Howrah	1	1	182	212	182	182	2	1.61
SLDC DVC backup Maithan	0	1	87	150	70	70	1	0.71
SLDC DVC Kolkata	1	0	81	150	54	54	1	0.60
SLDC Sikkim	1	1	182	84	182	182	2	1.56

* This BoQ pertains to Central Sector(CS) and has not been included in the cost.

Grand Total **₹ 7.53**

Tentative Cost & BoQ of Proposed VOIP System for NER SS (Option-1 revised)

Region	Server Set		Phone (No.)		POE Switch (with dual DC)	Cat 6 cable (100m set)incl. installation	NGFW* (No.)	Grand Total (with AMC) of SS (in Crs.)
	Main*	Backup*	VOIP	Analog Phone (including gateway)				
SLDC Imphal	1	1	70	24	40	40	2	0.47
SLDC,Meghalay (Nehu)	1	1	108	63	92	92	2	1.03
SLDC Guwahati-kahilipara	1	1	265	10	180	180	2	1.68
SLDC Mizoram(Aizwal)	1	1	68	23	38	38	2	0.45
SLDC (Nagaland)Diamapur	1	1	74	26	44	44	2	0.50
SLDC Agartala	1	1	90	34	60	60	2	0.65
SLDC Itanagar	1	1	114	46	84	84	2	0.76

* This BoQ pertains to Central Sector(CS) and has not been included in the cost.

Grand Total **₹ 5.54**

Tentative Cost & BoQ of Proposed VOIP System for All regions CS +SS(Option-1 revised)

Region	CS(ISTS) (in Crs.)	SS(in Crs.)	Total(in Crs.)
NR	₹18.18	₹16.14	₹ 34.3227
SR	₹19.95	₹ 12.86	₹ 32.8099
WR	₹14.20	₹ 11.92	₹ 26.1236
ER	₹10.36	₹ 7.53	₹ 17.8878
NER	₹16.53	₹5.54	₹ 22.0682
NLDC	₹ 2.64	₹ 0	₹ 2.6325
Intl.	₹ 1.20	₹ 0	1.209754
Cyber Audit	₹ 2.8	₹ 0	₹ 2.8
	₹ 85.86	₹ 53.99	₹ 139.85

Annexure-B2.14.2

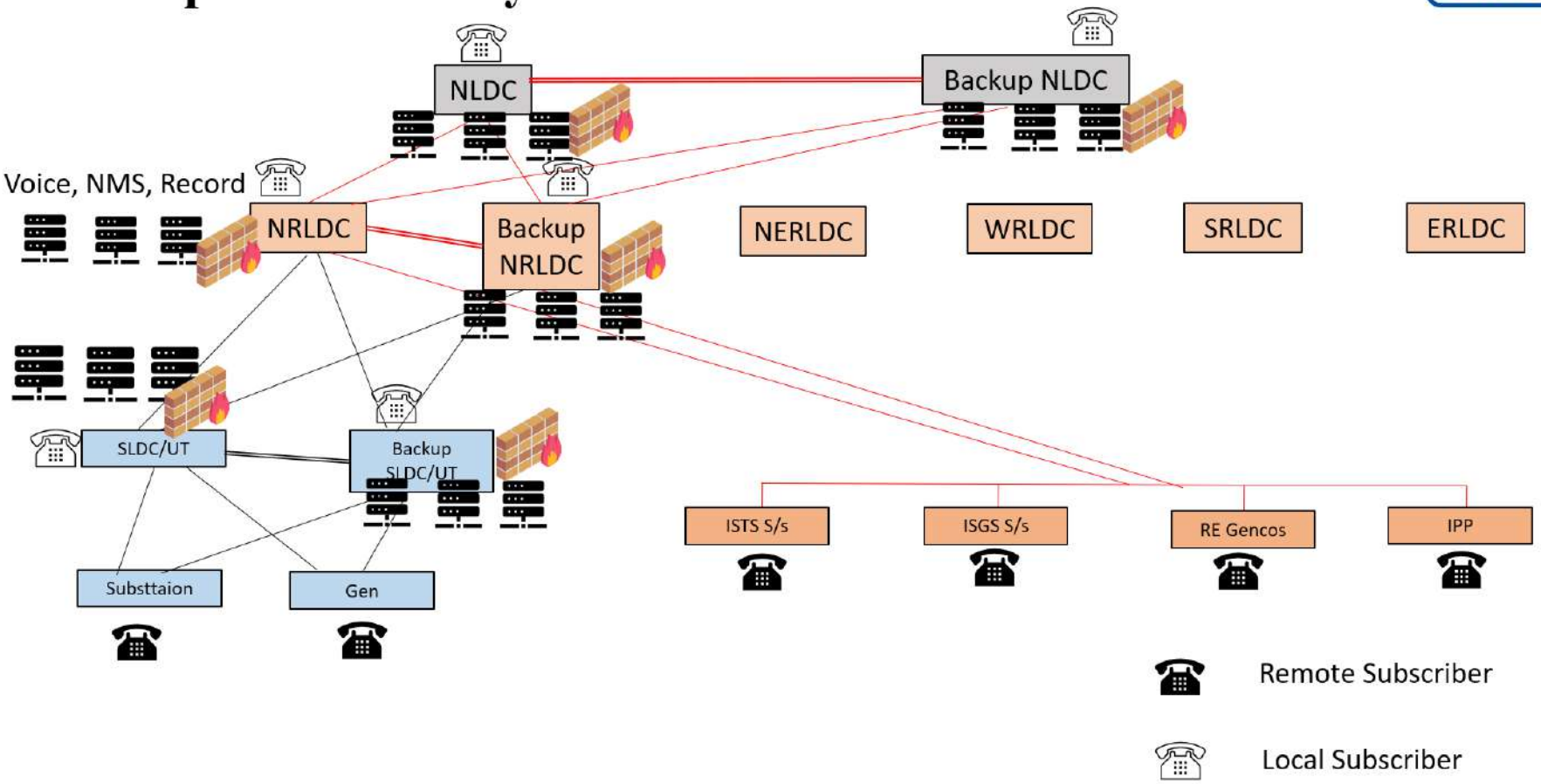
GS. No.	Items	Details
1.	Name of Scheme	VOIP Communication system for Grid-Operation for all Five Regions NR, NER, SR, WR, ER as PAN India
2.	Scope of the scheme	Supply and installation of VOIP Communication system including Phones, Voice Recorder etc. for Grid-Operation for all Five Regions NR, NER, SR, WR, ER as PAN India at NLDC, RLDCs, SLDCs
3.	Objective / Justification	1. Hot Line Speech Communication System (VOIP based PABX system) was implemented in 2016 by POWERGRID in all five regions after grid disturbance in 2012 where grid operators faced problem of fast communication due to unavailability of dedicated speech communication **PAN India** between NLDC, RLDCs, SLDCs, important state and ISTS substations and generators. The said PABX was implemented by M/s Orange through Alcatel Lucent as OEM. The lead region for the existing VoIP system is Northern Region of POWERGRID. 2. In the 67th NRPC meeting, POWERGRID representative stated that the scheme executed by M/s ORANGE was with a provision of AMC of 7 years as part of the contract and the same is expiring in July' 2023 for most of the sites. 3. AMC of the same was extended and approved in the 67th NRPC for further 2 years upto July'25 with financial implication and shall be booked under ULDC O&M charges as per the CERC norms. After July'25 there is no support shall be extended by Alcatel (OEM). POWERGRID stated they are not able to maintain the system beyond that AMC expiration. MS-NRPC advised CTU to plan upgradation/ new system in view of expiration of AMC in July'25.

GS. No.	Items	Details
		4. Grid-India in 23rd NRPC- TeST meeting stated that as VOIP system is utmost requirement of Grid-Operation and shall be planned by CTU parallel as POWERGRID has to file petition in the CERC for revised depreciation of existing VOIP System in view of 15 years of useful life. 5. In this regards CTU discussed the requirements with utilities & various VOIP system suppliers/OEMs and proposed the VOIP System Architecture which is attached at **Annexure-IIA**. 6. Comparison between present and proposed VOIP System is attached at **Annexure-IIB**. 7. Broad Specifications of the proposed VOIP system is attached at **Annexure-IIC** 8. In this regard inputs are acquired from the utilities in the various meetings of CPM, COM/ TeST/SCADA of all five regions. For the utilities those have provided inputs we have considered the same in the cost estimate purpose. Further a combined CPM(Communication planning meeting) of all five region was also held on 12.06.2024 to obtain uniformity of features and functions of the VoIP system among all regions. After incorporating the comments of all utilities MoM was issued. 9. The project is of utmost importance for grid management and operation by grid operators and also time critical. As the AMC of existing system is expiring by July,2025 the proposed system needs to be placed before that.

GS. No.	Items	Details
		10. It is proposed that being a Nation wide project, the total cost of five regions including NLDC and international Exchange (Cross border links) VoIP system shall be put up in all five regions for RPC/s review followed by NCT approval as single Scheme and package PAN India Basis for seamless integration and installation purpose. 11. Tentative cost of the scheme is **Rs. 137.46 Crs.** (including 6 years AMC after completion of 1 year warranty period) Excluding taxes & Duties 12. There are three types of cost involved, Regional Central Sector, National Central Sector, State Sector. The sharing of cost shall be done as per following mechanism between constituents: (i) Regional Central Sector Cost to be shared by respective region DICs as per CERC (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020 under Regional Component. (ii) National Central Sector Cost to be shared by all regional DICs as per CERC (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020 under National Component. (iii) State Sector Cost shall be shared by respective state/s for their portion as per CERC (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020. (iv) AMC for State Sector shall be shared by respective states for their portion as per CERC (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020.

GS. No.	Items	Details
4.	Estimated Cost	Total project cost : 137.46 Crs. (including 6 years AMC after completion of 1 year warranty period) (Excluding taxes & Duties) NR – Rs. 34.46 Crs ER – Rs. 19.76 Crs. SR – Rs. 27.98 Crs. NER- Rs. 22.36 Crs. WR – Rs. 26.35 Crs. National – Rs. 6.55 Crs. Breakup of estimated cost and tentative BoQ at Regional, National and State Sector wise is attached at **Annexure-IID.** After approval of the scheme POWERGRID shall prepare detailed BoQ as per actual requirement.
5.	Implementation timeframe	9 months from the date of allocation
6.	Implementing Agency / Mode	**POWERGRID/ RTM**
7.	Deliberations in different meetings	i. 67th NRPC dtd. 30.06.2023 ii. Joint CPM of all Region dtd. 12.06.24 iii. 23rd NRPC TeST dtd. 21.09.2023 iv. 24th NRPC TeST dtd. 09.02.2024 v. NR CPM 5th ,6th dated 20-03-2024 & 23.04.2024 respectively. vi. 44th COM SR dtd.21.03.2024 vii. 46th COM SR dtd.22.05.2024 viii. SR CPM 4th ,5th dated 31.07.2023 & 18.04.2024 respectively ix. WR 4th ,5th CPM dated 26-07-2023 & 28-03-2024 respectively. x. 28th NETeST meeting dtd. 14.05.2024 xi. 4th CPM of NER region dtd. 28.07.2023 xii. 14th ER TeST dtd. 16.04.24 xiii. ER 4th CPM dtd. 27.07.2023

Proposed VOIP System Architecture:



Annexure-IIB

Comparison of features between present and proposed VOIP System

S. No	Present VOIP Exchange	Proposed VOIP system
1	Exchange based system	Server based system
2	Star based architecture and no redundancy between exchanges (SLDC/RLDC/NLDC)	Multiple level of Redundancy kept. At phone level two channels are proposed for main and backup exchanges of SLDCs and RLDCs. For State sector four level Hardware redundancy has been considered as e.g. Main SLDC/ Back Up SLDC/ Main RLDC/ Backup RLDC For Central sector four level Hardware redundancy has been considered as e.g. Main RLDC/ Back Up RLDC/ Main NLDC/ Backup NLDC
3	Proprietary License based system	SIP based open source licenses
4	The IP Phones connected at NLDC, RLDC and	IP Phones shall not be proprietary in nature.

	SLDC are proprietary IP Phones of Alcatel	
5	No PoE Switches	POE switch with dual redundancy considered
6	NA	Firewall are considered for cyber security
7	NA	Cyber Security Audit is considered
8	NA	Provision of video phones at Control Centre for higher officials
9	NA	Sufficient numbers of licenses considered to cater future RE/ ISTS/ ISGS/ IPP and STU substations locations.
10	Recording done at one location	Recording at each Control Centre shall be done locally and later at regular intervals transferred to a backup server for storage and archival

Annexure-II C

Broad Specifications of proposed VOIP System

1. Server based architecture: Multiple level (4 level) of redundancy as compared to no redundancy in existing system.
2. SLDC & RLDC servers has Local (Control Centre phones) and Remote (Substation, Generators) Phone support. However, at NLDC only local phone support has been considered.
3. Power over ethernet (PoE) switches with dual DC supply ports has been considered for all VOIP phones at remote stations for redundancy and powering the phones.
4. One set of three servers are proposed for Voice (VOIP), NMS & Call Recording at each control centre.
5. There is no duplication of licenses for backup servers.
6. Server size and software has been considered by taking future requirement of phones.
7. Support for integration of future exchange of other utilities considered (their control centres).
8. NMS for adding/ deleting users shall be provided at RLDC/ SLDC levels
9. Operator console shall be provided to manage calls at RLDC/SLDC
10. Call recording features shall be provided at RLDC & SLDC level with backup.
11. VOIP, Analog & Four Wire E&M (at PLCC locations) phones are considered
12. Video Phones at RLDC/ SLDC for Senior officials
13. Sufficient numbers of licenses to cater future RE/ ISTS/ ISGS/ IPP and STU substations locations. The licenses for present and future requirement of the phones are considered under the scope of project, however phones for present requirement only shall be procured.
14. Firewall at control centres is considered
15. Installation with 100m Cat-6 cable considered at remote locations.
16. Integration with existing STU exchanges has been considered.
17. One Exchange for international communication for cross border links has been considered at NLDC main and Backup NLDC.
18. **6 year of AMC has been considered after 1 year warranty.**
19. Cyber Security Audit has been considered.

Annexure-IID

Cost Breakup Between Regions and Central Sector and State Sector

Region	Central Sector (ISTS) (in Crs.)	State Sector (in Crs.)	Total (including 6yr AMC after completion of 1 yr warranty period & excluding taxes) (in Crs.)
NR	₹18.54	₹15.92	₹ 34.46
SR	₹15.3	₹ 12.68	₹ 27.98
WR	₹14.61	₹ 11.74	₹ 26.35
ER	₹12.32	₹ 7.44	₹ 19.76
NER	₹16.91	₹5.45	₹ 22.36
National Component (NLDC, International exchange and Cyber audit)	₹ 6.55	₹ 0	₹ 6.55

Grand Total ₹ 137.46 Crs. (including 6year of AMC after completion of 1 yr warranty period) (excluding GST/TAXES)

Northern Region Cost Breakup

Northern Region Utility	Servers		Phones			POE Switch (with dual DC) (No.)	Cat 6 cable (100m set) incl. installation (No.)	NGFW* (No.)	Total Cost with AMC (6 Yr after 1 Yr. warranty (in Crs.)	Total cost (in Crs.)	Central Sector (CS)/State Sector (SS)
	Main (No.)	Backup (No.)	VOIP (Local) (No.)	VOIP (Remote) (No.)	Analog Phone (including gateway) (No.)						
NRLDC	1	1	28	450	350	450	450	2	18.44	**18.44**	**CS***
SLDC DTL	1*	1*	33	193	0	193	193	2*	1.59	**16.02**	**SS**
SLDC, RRVPNL	1*	1*	24	0	49	24	25	2*	0.180		
SLDC, BBMB	1*	1*	30	152	116	152	152	2*	1.55		
SLDC, PSTCL, Patiala	1*	1*	6	197	8	197	197	2*	1.62		
SLDC, HPSEBL	1*	1*	30	152	164	152	152	2*	1.57		
SLDC, UPPTCL	1*	1*	20	800	0	800	800	2*	6.40		
SLDC, HVPNL	1*	1*	0	0	0	0	0	2*	0		
SLDC, JKPTCL	1*	1*	30	152	148	152	152	2*	1.56		
SLDC, PTCUL	1*	1*	30	152	116	152	152	2*	1.55		

***Servers and NGFW shall be physically placed at SLDCs for STUs but their cost has been included in Central Sector Portion**

Grand Total ₹34.46 Crs. (including AMC) (excluding GST/TAXES)

Cost breakup of Southern Region

Southern Region Utility	Servers		Phones			POE Switch (with dual DC) (No.)	Cat 6 cable (100m set) incl. installation (No.)	NGFW* (No.)	Total Cost with AMC (6 Yr after 1 Yr. warranty (in Crs.)	Total cost (in Crs.)	Central Sector (CS)/State Sector (SS)
	Main (No.)	Backup (No.)	VOIP (Local) (No.)	VOIP (Remote) (No.)	Analog Phone (including gateway) (No.)						
SRLDC	1	1	232	400	150	400	400	2	15.30	**15.30**	**CS***
KSEB	1*	1*	1□	546	0	546	546	2*	4.43	**12.68**	**SS**
TSTRANCO	1*	1*	□□	800	20	800	800	2*	6.64		
KPTCL	1*	1*	□	0	0	0	0	2*	0.0015		
Puducheery	1*	1*	□□	41	64	41	41	2*	0.49		
TANTRANSCO	1*	1*	11	130	18	130	130	2*	1.12		
APTRANSCO	1*	1*	□	0	0	0	0	2*	0.00		

***Servers and NGFW shall be physically placed at SLDCs but cost has been included in Central Sector Portion**

Grand Total ₹27.98 Crs. (including AMC) (excluding GST/TAXES)

Cost breakup of Western Region

Western Region Utility	Servers		Phones			POE Switch (with dual DC) (No.)	Cat 6 cable (100m set) incl. installation (No.)	NGFW* (No.)	Total Cost with AMC (6 Yr after 1 Yr. warranty (in Crs.)	Total cost (in Crs.)	Central Sector (CS)/State Sector (SS)
	Main (No.)	Backup (No.)	VOIP (Local) (No.)	VOIP (Remote) (No.)	Analog Phone (including gateway) (No.)						
WRLDC	1	1	100	500	20	500	500	2	14.61	**14.61**	**CS***
SLDC, Panjim	1*	1*	1□	48	84	48	48	2*	0.87		
SLDC, Bhopal	1*	1*	□□	400	220	400	400	2*	3.35		
SLDC, Raipur	1*	1*	□□	400	148	400	400	2*	3.30		
SLDC, Vadodara	1*	1*	□□	150	244	150	150	2*	1.75	**11.74**	**SS**
SLDC, Mumbai	1*	1*	□□	200	244	200	200	2*	1.60		
SLDC Daman & Diu	1*	0	1□	40	84	40	40	1*	0.48		
SLDC DNH	1*	0	1□	40	0	40	40	1*	0.39		

***Servers and NGFW shall be physically placed at SLDCs but their cost has been included in Central Sector Portion**

Grand Total ₹26.35 Crs. (including AMC) (excluding GST/TAXES)

Cost breakup of Eastern Region

Eastern Region Utility	Servers		Phones			POE Switch (with dual DC) (No.)	Cat 6 cable (100m set)incl. installation (No.)	NGFW* (No.)	Total Cost with AMC (6 Yr after 1 Yr. warranty (in Crs.)	Total cost (in Crs.)	Central Sector (CS)/State Sector (SS)
	Main (No.)	Backup (No.)	VOIP (Local) (No.)	VOIP (Remote) (No.)	Analog Phone (including gateway) (No.)						
ERLDC	1	1	150	200	100	200	200	2	12.32	**12.32**	**CS***
SLDC, Ranchi	1*	1*	1□	50	100	60	60	2*	0.58	**7.44**	**SS**
OPTCL	1*	1*	1□	92	85	92	92	2*	0.84		
SLDC Bihar Patna	1*	1*	□□	152	212	152	152	2*	1.59		
SLDC WB Howrah	1*	1*	□□	152	212	152	152	2*	1.59		
SLDC DVC backup Maithan	0	1*	1□	70	150	70	70	1*	0.70		
SLDC DVC Kolkata	1*	0	□□	54	150	54	54	1*	0.60		
SLDC Sikkim	1*	1*	□□	152	84	152	152	2*	1.54		

***Servers and NGFW shall be physically placed at SLDCs but their cost has been included in Central Sector Portion**

Grand Total ₹19.76 Crs. (including AMC) (excluding GST/TAXES)

Cost breakup of North Eastern Region

Northern Eastern Region Utility	Servers		Phones			POE Switch (with dual DC) (No.)	Cat 6 cable (100m set) incl. installation (No.)	NGFW* (No.)	Total Cost with AMC (6 Yr after 1 Yr. warranty (in Crs.)	Total cost (in Crs.)	Central Sector (CS)/State Sector (SS)
	Main (No.)	Backup (No.)	VOIP (Local) (No.)	VOIP (Remote) (No.)	Analog Phone (including gateway) (No.)						
NERLDC	1	1	210	600	100	600	600	2	16.91	**16.91**	**CS***
SLDC Imphal	1*	1*	□□	40	24	40	40	2*	0.46	**5.45**	**SS**
SLDC, Meghalaya	1*	1*	1□	92	63	92	92	2*	1.01		
SLDC Guwahati	1*	1*	□□	180	10	180	180	2*	1.66		
SLDC Mizoram	1*	1*	□□	38	23	38	38	2*	0.44		
SLDC (Nagaland)	1*	1*	□□	44	26	44	44	2*	0.49		
SLDC Agartala	1*	1*	□□	60	34	60	60	2*	0.64		
SLDC Itanagar	1*	1*	□□	84	46	84	84	2*	0.75		

***Servers and NGFW shall be physically placed at SLDCs but cost has been included in Central Sector Portion**

Grand Total **₹22.36 (including AMC) (excluding GST/TAXES)**

National Component of VOIP System

Utility	Servers		Phones			POE Switch (with dual DC) (No.)	Cat 6 cable (100m set)incl. installation (No.)	NGFW (No.)	Total Cost with AMC (6 Yr after 1 Yr. warranty (in Crs.)	Central Sector (CS)/State Sector (SS)
	Main (No.)	Backup (No.)	VOIP (Local) (No.)	VOIP (Remote) (No.)	Analog Phone (including gateway) (No.)					
NLDC	1	1	42	0	400	0	0	2	2.60	**CS**
International Exchange	1	1	30	0	0	0	0	2	1.19	
Cyber Audit Cost									2.76	
Grand Total ₹6.55 (including AMC) (excluding GST/TAXES)										

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केंद्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली योजना एवं मूल्यांकन प्रभाग- II
Power System Planning & Appraisal Division-II

सेवा में /To

As per list of Addresses

विषय:ट्रांसमिशन पर राष्ट्रीय समिति (एनसीटी) की पन्द्रहवी बैठक का कार्यवृत - के सम्बन्ध में ।

Subject: Minutes of the 15th Meeting of National Committee on Transmission (NCT) – regarding.

महोदया (Madam) / महोदय (Sir),

The 15th meeting of the "National Committee on Transmission" (NCT) was held on 25th August, 2023. The minutes of the meeting are enclosed herewith.

भवदीय/Yours faithfully,

18/11/2023

(राकेश गोयल / Rakesh Goyal)
मुख्य अभियन्ता एवं सदस्य सचिव,एन.सी.टी.
/ Chief Engineer & Member Secretary (NCT)

प्रतिलिपि / **Copy to:**

Joint Secretary (Trans), Ministry of Power, New Delhi

4.5 **North Eastern Region Expansion Scheme-XXI Part-B (NERES-XXI Part-B)**

4.5.1 The existing 132 kV Badarpur (POWERGRID) switching station was commissioned in 1999 and shall be completing 25 years in service by 2024. POWERGRID, the owner of the substation has informed that they are facing issues in O&M of the switching station and to improve the reliability it would be prudent to upgrade the switching station from single main and transfer bus scheme to double main transfer bus scheme by converting from AIS to GIS.

4.5.2 The scheme was also discussed in the 23rd TCC & NERPC meetings held on 18th-19th November 2022 wherein the subject upgradation was agreed to be carried out in Green GIS.

4.5.3 Chairperson, CEA, opined that life of sub-stations is generally about 35 years and hence, the reasons for replacement/upgradation of switching station after 25 years needs to be ascertained.

4.5.4 After detailed deliberations, it was decided to review the scheme subsequently.

4.6 **Implementation of Unified Network Management System (UNMS) in the Western Region**

4.6.1 Representative of CTUIL informed that Central Electricity Regulatory Commission (Communication System for inter-State transmission of Electricity) Regulations 2017, mentions that, CTU shall in due consideration of the planning criteria and guidelines formulated by CEA be responsible for planning and coordination for development of reliable National communication backbone for Inter-State Transmission System (ISTS). CEA Technical Standards 2020 calls for centralized monitoring by integrating its network management system with network management system of other users and standalone network elements on regional and national basis. Further, CTUIL shall implement centralized supervision for quick fault detection and restoration.

Accordingly, communication scheme i.e. Establishment of State-of Art Unified Network Management System (U-NMS) for ISTS and State Utility Communication System for all the Regions have been envisaged for five Regional systems and one National system integrating all the regional ones; in main & backup configuration. This will facilitate centralized supervision of ISTS as well as Intra-state communication system at State level, Regional level and Inter-Regional Communication system at national level.

CTUIL updated status for nationwide UNMS Scheme implementation being undertaken by POWERGRID; UNMS for Northern, Eastern and Northeastern Regions are scheduled for commissioning in year 2023/ 2024. And Southern Region scheme approved in 13th NCT meeting in May'23 is under bidding stage.

4.6.2 WRPC has approved implementation of the WR-UNMS project in RTM mode in 47th WRPC meeting held on 14th & 15th June 2023.

4.6.3 Representative of PCD Division, CEA, stated that a workstation console with redundant connectivity would be required under UNMS-WR scheme at WRPC. It was also suggested to include feature for Long, Medium & Short Term Planning for preparing planning projections while including user configurable inputs such as topology, congestion status, utility/ area wise, type of network, product life cycle, sector growth etc. and provision for import of data in .xls or other similar forms for consuming in preparing the planning projection for 2 years, 5 years, 10 years.

4.6.4 It was also discussed that UNMS workstation console with its associated hardware & software along with redundant connectivity is required at all RPC locations for the previously approved regional UNMS Scheme for NER, NR, ER and SR.

4.6.5 Chairman, NCT, started that central planning of the communication network for ISTS and State system shall take the leverage from these Regional & National UNMS having the details of both ISTS and State sector communication network. He also emphasized that National UNMS system should be planned at the earliest to have a holistic view of the network comprising of regional, intra-regional and intra state network and this scheme shall have additional scope of Planning Software tool having features as enlisted by representative of PCD Division.

He also emphasized that SOP for Centralized supervision & Maintenance of ISTS Communication system should be finalized at the earliest while specifying the roles & responsibilities of concerned entities/ agencies for smooth implementation of the hierarchical UNMS Scheme situated in state, regional & national level.

4.6.6 After detailed deliberations, the followings were approved:

- WR UNMS scheme as per agenda along with additional scope listed below to be implemented under RTM mode by POWERGRID.
  a. Inclusion of Workstation Console and associated HW & SW along with redundant communication link & AMC at WRPC location.
  b. Additional feature of Planning Tool

- The National UNMS project proposal to be taken up at the earliest, as all regional systems have been approved for implementation. The national UNMS scheme shall have additional scope of Planning Software tool having features for Long, Medium & Short Term Planning for preparing planning projections while including user configurable inputs such as topology, congestion status, utility/ area wise, type of network, product life cycle, sector growth etc and provision for import of data in .xls or other similar forms for consuming in preparing the planning projection for 2 years, 5 years, 10 years., along with Workstation Console and associated hardware/software with redundant connectivity at PCD Division, CEA.

- Additional scope for Supply, Installation & AMC for UNMS workstation console with its associated hardware & software with redundant connectivity at all four RPC locations for the previously approved regional UNMS Scheme for NER, NR, ER and SR.

4.6.7 Summary of the WR UNMS scheme is as given below:

Sl.No.	Name of the scheme and implementation timeframe	Estimated Cost (Rs. Crores)	Remarks
1.	Establishment of State-of Art Unified Network Management System (U-NMS) for ISTS and State Utility Communication System for Western Region Tentative Implementation timeframe: 24 months from date of allocation	Rs. **84*** Crs. (approx.) and 19.07 Crs. AMC charges for 7 years.	Approved to be implemented under RTM mode by POWERGRID

4.6.8 Detailed scope of the scheme is as given below:

Sl. No.	**Scope of the scheme**	**Estimated Cost (Rs. Crs)**
1.	• Main & Back-up UNMS software and hardware along with required Application software including Video Projection System (VPS), firewall and IDPS. • Remote Workstation for SLDCs. • Video Projection System (VPS), Printer, furniture etc. at main & back-up U-NMS location. • Integration of existing NMS/NEs of ISTS and State Utility in a region in the proposed UNMS. • Integration of upcoming U-NMS for National & other regions and upcoming NMS/NEs of ISTS and State Utility in a region during implementation and AMC period of the project. • Operational support, training & maintenance for proposed UNMS software and hardware. • Auxiliary Power System for U-NMS system. • Workstation Console along and other associated software and hardware such as firewall, router, switch etc. at WRPC, CTUIL HQ and WRLDC location • Bandwidth connectivity & Its recurring charges for WRPC & CTUIL HQ Office.	Rs. **84*** Crs. (approx.) and 19.07 Crs. AMC charges for 7 years.

Standard Operating Procedure (SOP)

Procurement & Installation of ISTS Interface Energy Meter (IEM/SEM)

Introduction:

This Standard Operating Procedure (SOP) for Procurement and Installation of Interface Energy Meter (IEM/SEM) will be applicable only for the IEM/SEM falling under the purview of CTU as per the provisions under Regulations 49.12 (a) of CERC (Indian Electricity Grid Code), Regulations, 2023 and as per clause 6 (1)(a) of CEA (Installation and Operation of Meters) Regulations and amendments thereof. The Regulation 49.12(a) & 6 (1) is re-produced below:

"*49.12* ***Energy Metering and Accounting:***

(a) The CTU shall be responsible for procurement and installation of Interface EnergyMeters (IEM/SEM), at the cost of respective entity, at all the ISTS interface points, points of connections between the regional entities, cross border entities and other identified points for recording of actual active and reactive energy interchanged in each time-block through thosepoints, and its operation and periodic calibration shall be done by the respective entity. CTU shall be responsible for replacement of faulty meters."

"6. ***Ownership of meters-***

(1) ***Interface meters*** *(a) All interface meters installed at the points of interconnection with Inter-State Transmission System (ISTS) for the purpose of electricity accounting and billing shall be owned by CTU.*

The objective of this procedure is to ensure timely installation of IEM/SEM in the new ISTS system and timely replacement of the defective IEM/SEM by CTU or their authorized agency. The procedure also aims for timely payment by the respective entities to authorized agency of CTUIL against supply & installation of the IEM/SEM.

Presently, POWERGRID is the authorized agency for procurement of IEM/SEM, installation of new IEM/SEM and replacement of defective IEM/SEM. Any mention of POWERGRID in this procedure shall also mean any other agency authorized by CTUIL, if any, to carry out the aforesaid functions. CTUIL may authorize any other agency to carry out the aforesaid functions in future. Replacement/Installation of IEM/SEM shall mean all the activities including supply of new IEM/SEM, its installation, testing and commissioning.

The complete cycle of installation/replacement of IEM/SEM has been divided in various steps as described in Part A & B. Since timely procurement and availability of sufficient no. IEM/SEM is the key requirement, Part D of this procedure deals with timely estimation of requirement & procurement of IEM/SEM. Part C and Part F are for payment & warranty and inventory management respectively.

Applicability:

The procedure shall be applicable for the entities which are in the RLDCs control area and whose metering and energy accounting is done at the regional level. Thus, all Gencos including RE generators and all other utilities connected to ISTS Grid are the entities for the purpose of this procedure.

Effectiveness:

The date of effectiveness of this procedure shall be notified separately on CTUIL website.

A. Procedure for replacement of Faulty ISTS IEM/SEM

1. Identification of faulty IEM/SEM and communication to CTU:

1.1 Any Entity who wants IEM/SEM replacement shall inform concerned RLDC about such requirement along with the reasons thereof. RLDC also identify inconsistent SEM/IEM based on its observations on IEM/SEM data (received through AMR system or otherwise). The RLDC shall send a communication to the entity within 3 working days from the detection of inconsistent data or defective IEM/SEM.

1.2 The Entity shall take immediate steps to get all the issues rectified within 7 working days from receipt of above communication from RLDC. If the issue is not rectified within 7 working days or if it is established that IEM/SEM needs to be replaced, the Entity shall send a communication (through letter or e-mail) to CTUIL, within next 3 working days requesting replacement of the defective IEM/SEM. The said communication shall include the followings:

a. The location, serial no., make and model of the defective IEM/SEM along with accessories (required if any)
b. The date of installation of the above IEM/SEM
c. The observations w.r.t. the said defective IEM/SEM
d. Consent for payment, as per the provision of this procedure, towards supply and installation of IEM/SEM

A copy of this communication shall be sent to respective RLDC and regional nodal officer of POWERGRID. The contact details of POWERGRID Nodal officers shall be made available on CTUIL's website. The amount to be charged by POWERGRID towards Supply & Installation of the IEM/SEM shall be made available on CTUIL website.

1.3 In line with applicable Regulations, the replacement of IEM/SEM shall be on a chargeable basis. The Entity shall undertake in the said communication that they will make payment for supply & installation of the IEM/SEM, in accordance with the provisions of this procedure, as per the invoice raised by POWERGRID.

2. Communication to POWERGRID:

2.1 On receipt of the above communication from the Entity, CTUIL within 3 working days from receipt ofthe said communication, shall advise POWERGRID to replace the defective IEM/SEM. A copy of the advice shall also be sent to the respective Entity.

3. Replacement of Faulty IEM/SEM:

3.1 The POWERGRID shall raise the invoice on the concerned Entity within 7 working days from the receipt of the advice from CTUIL and shall replace the defective IEM/SEM within 8 working days from date of acceptance of invoice by the entities. POWERGRID shall inform CTUIL after replacement of the defective IEM/SEM.

3.2 After replacement of faulty IEM/SEM, the entity shall inform respective RLDC & CTUIL about the same with necessary details (Meter Sl.No, Make, Model, Date of replacement and meter location) within 2 days. The verification testing with respective RLDC shall be ensured by the Entity.

B. Procedure for Installation of ISTS IEM/SEM for new systems

1. The Entity shall request CTUIL for installation of new IEM/SEM along with the Metering Scheme Letter issued by respective RLDC in line with the scheme approved by RPC, if any. Entity shall make such request to CTUIL at least three months in advance of the anticipated COD of the new system.

2. On receipt of the above request from the Entity, CTUIL within 5 working days from receipt ofthe said request, shall advise POWERGRID to install the IEM/SEM in the new system as per the scheme suggested by RLDC. A copy of the advice shall also be sent to the respective Entity.

3. The entity shall approach POWERGRID along with the CTUIL letter regarding requirement of IEM/SEM along with required accessories, intimating the timeframe for IEM/SEM installation. Accordingly, POWERGRID shall raise the invoice on the Entity. The entity shall accept the invoice in next 7 days thereafter.

4. The entity shall approach POWERGRID regarding requirement of IEM/SEM and the accessories along with the CTUIL letter intimating the timeframe for IEM/SEM installation. Accordingly, POWERGRID shall raise the invoice on the Entity. The entity shall accept the invoice in next 7 days thereafter.

5. POWERGRID shall install IEM/SEM in the new system at least 15 days before anticipated COD of the new system. POWERGRID shall inform CTUIL after installation of the IEM/SEM in the new system.

6. After installation of IEM/SEM, the entity shall inform respective RLDC & CTUILabout the same with necessary details (Meter Sl.No, Make, Model, Date of replacement and meter location) within 2 days. The verification testing with RLDC shall be ensured by the Entity.

C. Payment and Warranty:

1. The Entity shall make payment to POWERGRID within 45 days from the date of replacement of IEM/SEM failing which the late payment surcharge @ 0.04% of the invoice amount per day shall be payable for the delayed period. In no case, the delayed period shall exceed 60 days. In case, any payment is pending even after 60 days from the date of last IEM/SEM replaced for the particular entity, no further supply/replacement of any IEM/SEM for that entity will be carried out. In such a case, the onus of continuing with the defective IEM/SEM shall solely be on the entity.

2. IEM/SEM once replaced, shall be under warranty for a period of 1 year from the date of installation. During this warranty period, the entity shall take up the matter directly with POWERGRID's nodal officers with a copy to CTUIL. POWERGRID's nodal officer shall arrange to replace such faulty IEM/SEM within 15 working days from the date of intimation by the entity.

D. Standardized charges for Supply, and Supply and Installation of IEM:

1. CTU, in consultation with POWERGRID, shall device region wise standardized rate for Supply, and Supply and Installation of IEM for each Financial Year.

E. Bulk Procurement of ISTS IEM/SEM

1. By the end of September of each year, CTUIL/STU shall provide the details of ISTS projects coming up in the next 2 years to respective RLDC.

2. RLDC shall work out the metering scheme for total requirement of IEM/SEM under the following heads:

   i. For new ISTS system
   ii. Spares @10% of the IEM/SEM population in the region
   iii. Projected requirement towards replacement of defective IEM/SEM based on past 2-year trend.

   RLDC will get the total IEM/SEM quantity approved by respective RPCs and inform to CTUIL by November end.

3. On receipt of the IEM/SEM quantity from RLDCs, CTUIL shall aggregate the requirement on PAN India basis and issue procurement advice to POWERGRID by December end.

F. Inventory Management

Each month RLDC would furnish the report on working, suspect and defective IEM/SEM in respective region to CTUIL. POWERGRID would furnish the region-wise numbers of the IEM/SEM available with them to CTUIL.
Based on this input CTUIL may issue suitable directions for diversion of spares from one region to another or initiate timely action for procurement of spares.

*****

Annexure- B.2.36.

Distance b/w tower & river bank was 70m in year 2011 and 2022

The distance after flash flood is 25m

Photographs of current situation

Annexure B2.42.1

SUMMARY OF DEVIATION CHARGE RECEIPT AND PAYMENT STATUS

BILL PUBLISHED UPTO 13-08-2024 (W-18 of FY 2024-25)
AS on 21-08-24

Figures in ₹ Lakhs

CONSTITUENTS	Net outstanding upto 2023-24	Receivable by Pool	Received by Pool	Payable From Pool	Paid From Pool	Outstanding for 2024-25	Total Outstanding
BSPTCL	792.59119	14,524.02025	0.00000	15.22215	0.00000	14,508.79810	15,301.38929
JUVNL	4,919.55115	7,513.90840	0.00000	0.30147	0.00000	7,513.60693	12,433.15808
DVC	0.00000	1,308.45809	1,308.45809	880.02950	143.69277	-736.33673	-736.33673
GRIDCO	0.00000	2,445.78043	2,445.65744	1,753.15988	378.99110	-1,374.04579	-1,374.04579
WBSETCL	0.00000	299.00809	298.96503	5,358.46298	3,548.85410	-1,809.56582	-1,809.56582
Sikkim	2,521.99052	539.53207	0.00000	102.46560	31.88283	468.94930	2,990.93982
NTPC	0.00000	12,289.48633	12,289.48633	223.46835	223.44929	-0.01906	-0.01906
NHPC	0.00000	23.22618	23.22618	6.07302	5.95334	-0.11968	-0.11968
MPL	0.00000	29.41695	29.41695	450.54393	269.44259	-181.10134	-181.10134
APNRL	0.00000	193.26589	180.81547	0.00000	0.00000	12.45042	12.45042
CHUZACHEN	0.00000	74.95856	63.99129	27.08662	7.41684	-8.70251	-8.70251
NVVN-BD	0.00000	125.77196	125.77196	368.99166	212.58017	-156.41149	-156.41149
GMR	0.00000	82.96089	52.48266	9.34324	2.10930	23.24429	23.24429
JITPL	0.00000	300.29135	299.43535	37.77397	27.99822	0.00000	0.00000
TPTCL (Dagachu)	0.00000	0.00000	0.00000	11.64448	11.64448	0.00000	0.00000
JLHEP	0.00000	26.00823	18.10384	41.86940	29.76688	-4.19813	-4.19813
NVVN-NEPAL	0.00000	5,304.05786	5,304.05786	657.48958	68.23696	-589.25262	-589.25262
BRBCL	0.00000	638.96337	638.96337	10.76585	10.76585	0.00000	0.00000
PGCIL SASARAM	0.00000	13.46477	13.46575	11.40295	11.03417	-0.36976	-0.36976
SUL (Teesta-III)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Dikchu	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
PGCIL-Alipurduar	0.00000	21.75811	20.39268	0.00000	0.00000	1.36543	1.36543
Tashiding(THEP)	0.00000	46.63937	26.18971	58.56511	46.24144	8.12599	8.12599
RONGNICHU	0.00000	20.24414	20.17194	137.37704	14.52871	-122.77613	-122.77613
NVVN-Bhutan	0.00000	52.69851	52.69851	2,213.08221	737.16225	-1,475.91996	-1,475.91996
ECR	0.00000	186.01841	178.70340	0.00621	0.00621	7.31501	7.31501
IBEUL	0.00000	2,688.46597	2,773.74477	0.00000	85.27880	0.00000	0.00000
NEA-Bihar	0.00000	648.16856	648.16856	11.93520	0.00000	-11.93520	-11.93520
Total	**8,234.13286**	**49,396.57274**	**26,812.36714**	**12,387.06040**	**5,867.03630**	**16,073.10125**	**24,307.23411**

Receivable: Receivable by ER Payable: Payable by ER POOL
Received: Received by ER P Paid: Paid by ER POOL
'- ve' Payable by ER pool '+ ve' Receivable by ER pool

Annexure B2.42.2

STATUS OF REACTIVE CHARGES

A□ □n □1-□□-□□

Figures in ₹ Lakhs

Name of Parties	Net outstanding upto 2023-24	Receivable Amount by pool	Received Amount by pool	Payable Amount by pool	Paid Amount by pool	Outstanding Amount Receivable(+Ve) / Payable by pool(-Ve)
Bhutan	0	15.95	15.95	36.41	29.42	-6.99
Bangladesh	0	1.81	1.72	0.00	0.00	0.09
Nepal	0	3.19	3.19	2.64	1.10	-1.54
NEA-Bihar	0	0.68	0.66	1.68	1.68	0.02
BSPHCL	0	2.76	0.00	108.30	105.66	0.13
JUVNL	0	23.74	19.61	0.72	0.00	3.42
DVC	0	3.11	1.88	27.11	19.23	-6.65
GRIDCO	0	1.01	0.29	80.01	74.28	-5.02
SIKKIM	0	0.06	0.00	0.85	0.74	-0.05
WBSETCL	0	25.23	0.00	17.17	0.00	8.06
JITPL	0	0.00	0.00	0.16	0.16	0.00
Alipurduar	0	0.07	0.02	0.00	0.00	0.05
Sasaram	0	0.04	0.03	0.00	0.00	0.01
MPL	0	0.00	0.00	0.00	0.00	0.00
APNRL	0	0.00	0.00	0.82	0.46	-0.37
BRBCL	0	0.00	0.00	1.51	1.40	-0.11
JLHEP	0	0.05	0.00	0.00	0.00	0.04
Chuzachen	0	0.03	0.03	0.38	0.33	-0.05
TUL	0	0.00	0.00	0.00	0.00	0.00
RHEP	0	0.08	0.07	0.10	0.01	-0.08
THEP	0	0.08	0.08	0.01	0.00	-0.01
Dikchu	0	0.00	0.00	0.00	0.00	0.00
ECR	0	1.45	1.45	0.89	0.68	-0.21
GMR	0	0.36	0.36	0.76	0.76	0.00
IND_Bharat	0	1.31	0.24	3.90	3.82	1.00
NHPC	0	0.00	0.00	4.89	4.31	-0.58
NTPC	0	0.00	0.00	328.47	290.36	-38.11

Receivable: Receivable by ER POOI Payable: Payable by ER POOL
Received: Received by ER POOL Paid: Paid by ER POOL
'- ve' Payable by ER pool '+ ve' Receivable by ER pool

Annexure B.2.42.3

Current Status of Letter of Credit (LC) amount against DSM charges for ER constituents

Figures in Lacs of Rupees

Sl No	ER Constituents	No. of weeks in which Deviation Charge payable	No of times payment was delayed during 2023-24	Total Deviation charges payable to pool during 2023-24	Average weekly Deviation Charge liability (C)/52 weeks	LC Amount 110% of (D)	Defaulting Weeks	Due date of expiry	Remarks
		(A)	(B)	(C)	(D)	(E)	(G)	(F)	(G)
1	[illegible] बिहार	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
2	[illegible] झारखंड	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
3	[illegible] डीवीसी	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
4	[illegible] सिक्किम	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
5	[illegible] एनटीपीसी	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
6	[illegible] अधुनिक शक्ति	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	LC opened for ₹ 25,95,437 /-
7	[illegible] चुजाचेन	[illegible]	11	[illegible]	[illegible]	[illegible]	[illegible]		
8	[illegible] जीएमआर	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
9	[illegible] जिंदल	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	LC opened for ₹ 23,19,395 /-
10	[illegible] डेन्स ऊर्जा	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	LC opened for ₹ 25,22,302 /-
11	[illegible] एनटीपीसी-नेपाल	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
12	[illegible] बीआर बीसीएल	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
13	[illegible] सासाराम	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	LC opened for ₹ 1,00,311 /-
14	[illegible] दिकचू	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	LC opened for ₹ 7,44,904 /-
15	[illegible] अलीपुरदुआर	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	LC opened for ₹ 96,036/-
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible] शिगा ऊर्जा	1	1	[illegible]	[illegible]	[illegible]	[illegible]		

EASTERN REGIONAL POWER COMMITTEE

KOLKATA

PROTECTION PROTOCOL OF EASTERN REGION

Prepared in Compliance to

Clause 12(2) and Clause 13 of Central Electricity Regulatory Commission Indian Electricity Grid Code Regulations, 2023

Contents

PROTECTION PROTOCOL OF EASTERN REGION

1. Background

1.1. The Protection Protocol of Eastern region is prepared in accordance with Clauses 12(2) & 13 of the Indian Electricity Grid Code, 2023 (IEGC 2023) notified by the Central Electricity Regulatory Commission.

1.1.1. **The clause 12(2) of the IEGC 2023:**

"There shall be a uniform protection protocol for the users of the grid:

a) for proper co-ordination of protection system in order to protect the equipment/system from abnormal operating conditions, isolate the faulty equipment and avoid unintended operation of protection system;

b) to have a repository of protection system, settings and events at regional level;

c) specifying timelines for submission of data;

d) to ensure healthiness of recording equipment including triggering criteria and time synchronization; and

e) to provide for periodic audit of protection system."

1.1.2. **The clause 13 of the IEGC 2023:**

"13. Protection protocol

(1) *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.*

(2) *Back-up protection system shall be provided to protect an element in the event of failure of the primary protection system.*

(3) *RPC shall 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 the CEA Technical Standards for Construction, the CEA Technical Standards for Connectivity, the CEA Technical Standards for Communication, the CEA (Grid Standards) Regulations, 2010, the CEA (Measures relating to Safety and Electric Supply)*

Regulations, 2010, and any other CEA standards specified from time to time.

(4) *The protection protocol in a particular system may vary depending upon operational experience. Changes in protection protocol, as and when required, shall be carried out after deliberation and approval of the concerned RPC.*

(5) *Violation of the protection protocol of the region shall be brought to the notice of concerned RPC by the concerned RLDC or SLDC, as the case may be."*

1.2. The Protection Protocol of Eastern Region stipulates General Protection Philosophy of Protection System, Protection Schemes for Generators & various Transmission Elements in Power System, Protection Settings & their Coordination among entities, Disturbance Monitoring, Analysis and Reporting, Time Synchronization of Protection Systems, Protection Audit Plan, Performance of Protection Systems & Compliance Monitoring.

2. Applicability

The Protection Protocol of Eastern Region shall be applicable to all Eastern Regional entities, State/Central/Private Generating Companies/ Generating Stations including REGs, RHGS, integrated RE with Pumped Storage Plant (PSP), SLDCs, ERLDC, CTU, STUs, Transmission Licensees and ERPC.

3. Definitions

Words and expressions used in this Protection Protocol are defined in the Act or any other regulations specified by the Central Commission or Central Electricity Authority shall, unless the context otherwise requires, have the meanings assigned to them under the Act or other regulations specified by the Central Commission, as the case may be.

4. General Philosophy of Protection System

4.1. Protection philosophy shall be in accordance with below mentioned objectives, design criteria and other details. However, protection design in a particular system may vary depending upon judgment and experience in the broad contours of the protection philosophy. Consideration must also be given to the type of equipment to be protected as well as the importance of this equipment to the system. Further, protection must not be defeated by the failure of a single component.

4.1.1. **Objectives**:

The basic objectives of any protection schemes should be to:

(i) Automatically isolate the faulty element.

(ii) Mitigate the effect of short circuit and other abnormal conditions in minimum possible time and area.

(iii) Indicate the location and type of fault and

(iv) Provide effective tools to analyses the fault and decide remedial measures.

4.1.2. **Design Criteria:**

To accomplish the above objectives, the four design criteria for protection that should be considered are:

(i) fault clearance time/speed;
(ii) selectivity;
(iii) sensitivity and
(iv) reliability (dependability and security)

4.1.2.1. **Fault clearance time/speed**: To minimize the effect on customers and maintain system stability, Fault clearance time shall be as per CEA Grid Standard Regulations 2010, as amended to date.

4.1.2.2. **Selectivity:** To ensure Selectivity, coordination shall be ensured with the adjacent protection schemes including breaker failure, transformer downstream relays, generator protection and station auxiliary protection.

4.1.2.3. **Sensitivity**: To ensure Sensitivity, the settings must be investigated to determine that they will perform correctly for the minimum fault current envisaged in the system, yet remain stable during transients and power swings from which the system can recover.

4.1.2.4. **Reliability**: To ensure Reliability, two independent auxiliary direct current-supplies shall be provided for Main-I and Main-II relays. The Main-I and Main-II relays should be from two different makes or operating with different algorithm. The CB´s shall have two independent trip coils and two independent trip circuits. Each protection device should trip at least one of them by independent auxiliary DC- supplies.

4.1.2.5. **Security**: To ensure Security, the protection shouldn't limit the maximum transmission capacity of the element. Distance protection in particular could cause spurious tripping due to specific grid conditions, in case of high load operation. Therefore, any special topologies must be known and considered for protection parameterization. For parallel Over Head Lines it is necessary to consider the rapid increase of load current in the healthy line when the faulty line trips and the protection operation must allow such conditions The load encroachment detection function of the relays must be used, when the highest distance zone resistance reach conflicts with the maximum transmitted load on the protected element.

4.2. All generating units shall have standard protection system to protect the units not only from faults within the units and within the Station but also from faults in sub-stations and transmission lines.

4.3. The generator, generator transformer, unit auxiliary transformer shall be provided with protection systems connected to two independent channels or groups, such that one

channel or group shall always be available for any type of fault in the generator and these transformers;

4.4. Protection relays shall be configured in such a way that digital input points shall not pick up due to stray voltages.

4.5. Protective relays shall be used to detect electrical faults, to activate the alarms and disconnect or shut down the faulted apparatus to provide for safety of personnel, equipment and system.

4.6. Electrical faults shall be detected by the protective relays arranged in overlapping zones of protection.

4.7. The protection relays for the generators, motors, transformers and the transmission lines shall generally be of numerical type.

4.8. All relays used shall be suitable for operation with CTs secondary rated for one ampere or five amperes as per relevant Indian Standards or International Electrotechnical Commission or Institute of Electrical and Electronics Engineers standards.

4.9. Relevant Indian Standards or International Electrotechnical Commission or Institute of Electrical and Electronics Engineers standards shall be applied for protection of generators, transformers and motors.

5. Protection Schemes

The electrical protection functions for equipment connected with the grid shall be provided as per the Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations 2022 amended to date, the CEA (Technical Standards for connectivity to the Grid) Regulations 2007 amended to date, the CEA (Technical Standards for Communication System in Power System Operation) Regulations 2020 amended to date, the CEA (Grid Standards) Regulations 2010 amended to date, the CEA (Measures relating to Safety and Electric Supply) Regulations 2023 amended to date, and any other CEA standards specified from time to time.

5.1. **Thermal Generating Units**

The electrical protection functions for generator, generator transformer, unit auxiliary transformer and station transformer shall be provided in accordance with but not limited to the list given in **SCHEDULE-I** of CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations 2022 amended to date.

5.2. **Hydro Generating Units**

5.2.1. For the generating units with a rating of more than one hundred megawatt, protection system shall be configured into two independent sets of protection (Group A and B) acting on two independent sets of trip coil fed from independent DC supplies, using separate sets of instrument transformers, and segregated cables of current transformers and voltage transformers.

5.2.2. The protection functions for Generator, Excitation Transformer, Generator Transformer, Generator and Generator Transformer, Unit Auxiliary Transformer, and Station Auxiliary Transformer shall be provided in accordance with but not limited to the list given in SCHEDULE-IV of CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations 2022 amended to date except for variable speed units which will have specialized protection functions.

5.3. **REGs/RHGS/BESS**

Protection Schemes for Renewable Energy (RE) Power Plants of Solar power generation, Wind power generation, Battery Energy Storage System (BESS) and Hybrid of these connected with grid at voltage level above 650 volts shall be in accordance with the Central Electricity Authority (Technical Standards for Construction of Renewable Energy Power Plants) Regulations, 2023 from the date as & when these regulations are notified (Presently the finalization of these Standards by CEA is under progress).

5.4. **Substations & Transmission System Elements**

5.4.1. All major protection relays for the Voltage levels 66 kV and above shall be of numerical type and communication protocol shall be as per IEC-61850.

5.4.2. Grouping of Protection systems for the voltage level 66 kV and above:

i. The protection circuits and relays shall be electrically and physically segregated into two groups each being independent and capable of providing uninterrupted protection even in the event of one of the protection group fails or taken out for maintenance.

ii. Interconnection between these two groups shall not generally be attempted. However, such interconnection shall be kept to the bare minimum, if found absolutely necessary.

5.4.3. The protections required in respect of transmission lines, transformers, reactors and bus bars but not limited to shall be in accordance with **SCHEDULE-V** of CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations 2022 amended to date.

General relays

High speed tripping relays shall be provided for lockout/tripping relays (86) for trip functions and pick value shall be minimum 60-70% of rated voltage.

Dc supply Supervision (80)

5.4.4. **Bus Bar Protection and Local Breaker Backup Protection (breaker failure protection):**

i) Bus bar protection and local breaker backup protection shall be provided in 220 kV and higher voltage interconnecting sub- stations as well as in all generating station switchyards. Bus bar protection and local breaker backup protection shall be of numerical in type.

ii) Duplication of bus bar protection shall be done for all main buses of 400kV and above voltage class.

iii) The bus bar protection scheme shall be centralized or distributed type and have provision for planned future expansion.

5.5. **HVDC Terminals/ Stations**

5.5.1. **Classical HVDC Terminals/ Stations**

i) HVDC system protection shall consist of two parts:

(A) AC side protection:

AC side protection function shall cover the zone for converter transformer, AC filters, shunt capacitors, shunt reactors, and bus bars. These protections shall generally follow the same philosophy as in a typical substation i.e. detection of fault by relay and tripping of circuit breaker.

(B) DC side protection:

DC side protection shall cover the zones consisting of the valve hall, DC switchyard including smoothing reactor and DC filters, DC line, DMR line / electrode line and ground electrode. The protection equipment shall be designed to be fail safe and shall ensure high security to avoid mal-operation/ unwanted shutdown due to protection equipment failures.

ii) Following a DC Line fault, the HVDC System shall have the facility to restart, one or more times, the faulted pole at a variable pre-selected DC voltage level(s), not below 80% of the nominal voltage rating. The DC transmission system shall be capable of recovery in a controlled and stable manner without commutation failures during recovery following ac and dc system faults. The post fault power order shall be equal to the pre-fault power order unless AC/ DC systems dictate otherwise.

iii) Protection system required in respect of Classical HVDC Terminals/ Stations but not limited to shall be in accordance with 13 (b) of Part A of **SCHEDULE-VI** of CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations 2022 amended to date.

iv) Software based controls and protection shall be used to permit flexibility in effecting modifications. Protection and controls shall be duplicated for reliability. The control & protection shall provide fast controllability of the HVDC system.

5.5.2. **Voltage Source Converter (VSC) based HVDC Terminals/Stations**

i) The protection equipment shall be designed to be fail-safe and shall ensure high security to avoid mal-operation/ unwanted shutdown due to protection equipment failures.

ii) Protection system required in respect of Voltage Source Converter (VSC) based HVDC Terminals/ Stations but not limited to shall be in accordance with 8 (b) of Part B of **SCHEDULE-VI** of CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations 2022 amended to date.

iii) Software based controls and protection shall be used to permit flexibility in effecting modifications. Protection and controls shall be duplicated for

reliability. Protection shall be provided by numerical relays to suit the requirement of the HVDC system.

5.6. **Philosophy of Transmission Line Protection**

5.6.1.

Sl. No.	Zone	Direction	Protected Line Reach Settings	Time Settings (in Seconds)	Remarks
1	Zone-1	Forward	80%	Instantaneous (0)	As per CEA
2a	Zone-2	Forward	For single ckt- 120 % of the protected line	0.5 to 0.6 - if Z2 reach overreaches the 50% of the next shortest line; 0.35- otherwise	As per CEA
			For double ckt- 150 % of the protected line		As per CEA
2b	Zone-2 (for 220 kV and below voltage Transmission lines of utilities)	Forward	For single ckt- 120 % of the protected line, or 100% of the protected line + 50% of the adjacent shortest line	0.35	As per CEA with minor changes
			For double ckt- 150 % of the protected line	0.5 to 0.6 - if Z2 reach overreaches the 50% of the next shortest line ; 0.35- otherwise	
3	Zone-3	Forward	120 % of the (Protected line + Next longest line)	0.8 - 1.0	As per CEA
4	Zone-4	Reverse	10%- for long lines (for line length of 100 km and above) 20%- for shot lines (for line length of less than 100 km)	0.5 (Where Busbar Protection is not available: 0.25)	As per CEA

Note:

1) Zone-2:- Z2 Reach should not encroach the next voltage level.
2) Zone-3:- If Z3 reach encroaches in next voltage level (after considering "in-feed"), then Z3 time must be coordinated with the fault clearing time of remote end transformer.
3) Zone-4:- If utility uses carrier blocking scheme, then the Z4 reach may be increased as per the requirement. It should cover the LBB of local bus bar and should be coordinated with Z2 time of all other lines. Zone-4 reach of all elements at one S/s should not be more than 50% of the adjacent shortest line at that S/s. Zone-4 reach should not encroach next voltage level
4) The above settings are recommended primarily (exclusively) for uncompensated lines.

5.6.2.

Lines with Series and other compensations in the vicinity of Substation	• Zone-1: 80% of the protected line with 100ms-time delay. POR Communication scheme logic is modified

	such that relay trips instantaneously in Zone-1 on carrier receive. • Zone-2: 120 % of uncompensated line impedance for single circuit line. For Double circuit line, settings may be decided on basis of dynamic study in view of zero sequence mutual coupling. • Phase locked voltage memory is used to cope with the voltage inversion. Alternatively, an intentional time delay may be applied to overcome directionality problems related to voltage inversion. • over-voltage stage-I setting for series compensated double circuit lines may be kept higher than 113%.

5.6.3.

	Power Swing Blocking	For all 132 kV and above lines, block tripping in all zones except zone-1. Out of Step tripping to be applied on all inter regional tie lines. Deblock time delay = 2s
	Protection for broken conductor	Negative Sequence current to Positive Sequence current ratio more than 0.2 (i.e. I2/I1 ≥ 0.2) Only for alarm: Time delay = 3-5 sec
	Switch on to fault (SOTF)	Switch on to fault (SOTF) function to be provided in distance relay to take care of line energization on fault
	VT fuse fail detection function	VT fuse fail detection function shall be correctly set to block the distance function operation on VT fuse failure. In case of VT fuse fail, Earth fault detection shall become Non-directional.
	Carrier Protection	To be applied on all 220kV and above lines with the only exception of radial feeders.

	Back up Protection	On 220kV and above lines with 2 Main Protections: • Back up Earth Fault protections alone to be provided. • No Over current protection to be applied. At 132kV and below lines with only one Main protection: • Back up protection by IDMT O/C and E/F to be applied.

5.6.4. Overvoltage Protection:

FOR 765kV LINES:	Low set stage (Stage-I): 106% - 109% (typically 108%) with a time delay of 5 seconds. High set stage (Stage-II): 140% - 150% with a time delay of 100 milliseconds.
400kV LINES/CABLE:	Low set stage (Stage-I): 110% - 112% (typically 110%) with a time delay of 5 seconds. High set stage (Stage-II): 140% - 150% with a time delay of 100 milliseconds.
FOR 220 KV LINES:	No over-voltage protection shall be used in general. If necessary, may be enabled on case-to-case basis after due approval from SLDC/ERLDC.
FOR 220 KV CABLE:	Low set stage (Stage-I): 110% - 112% (typically 110%) with a time delay of 5 seconds. High set stage (Stage-II): 140% - 150% with a time delay of 100 milliseconds.

- The lines emanating from same substation shall be provided with pick- up as well as

time grading to avoid concurrent trippings. Grading to be done in such a way that inter-regional lines and lines with generation evacuation should trip last, as far as practicable.

- The overvoltage relay shall have better than 98% drop-off to pick-up ratio.
- To achieve required discrimination for OVR grading on account of limitation imposed by voltage resolution of the relay, Ph-to-Ph voltage to be used for Over Voltage detection.

5.6.5. Resistive Reach Setting

Setting for Phase-earth fault:

a. Calculation of minimum load impedance shall be as per Ramkrishna Committee Recommendations.

b. Maximum load current (Imax) may be considered as 1.5 times the thermal rating of the line or 1.5 times the associated bay equipment current rating (the minimum of the bay equipment individual rating) whichever is lower. Minimum voltage (Vmin) to be considered as 0.85pu (85%).

c. Minimum setting for resistive reach shall be such that it must cover fault resistance, arc resistance and the tower footing resistance.

d. In general, maximum reach setting shall be 80% of the minimum load impedance.

e. Utility should try to set Resistive reach setting < 4.5 times the zone reactive reach setting, however if there is any limitation from relay manufacturer's side then recommendation of OEM may be followed for maximum resistive reach setting.

Resistive reach shall be the maximum of the value determined by the above rules.

Setting for Phase-Phase fault:

a. Calculation of minimum load impedance as per the method mentioned above for phase earth fault.

b. Minimum setting for resistive reach shall be such that it must cover fault resistance and arc resistance.

c. In general, the resistive reach of zone-3 is set less than 80% of minimum load impedance. For power swing consideration, a margin of DR is given. Therefore, it is essential that load should not encroach this DR. In view of this, R3ph-R4ph may be set 60% of minimum load impedance. R2ph and R1ph may be set 80% of R3ph-R4ph respectively.

d. Utility should try to set Resistive reach setting < 3 times the zone reactive reach setting, however if there is any limitation from relay manufacturer's side then recommendation of OEM may be followed for maximum resistive reach setting.

Resistive reach shall be the maximum of the value determined by the above rules.

e. For underground cable, as the fault mechanism and earthling resistance of sheath are different from tower footing resistance of overhead lines, the resistive reach setting of cable may be set as per OEM recommendation. However, effort shall be made to keep the setting within the above-mentioned range as far as possible honoring OEM guidelines.

5.6.6. **Auto Reclosing**:

The single-phase high-speed auto-reclosure (HSAR) at 220 kV level and above (except for the composite feeders: overhead plus underground) shall be implemented, including on lines emanating from generating stations. If 3-phase auto reclosure is adopted in the application of the same on lines emanating from generating stations should be studied and decision to be taken on case to case basis.

i) **Scheme Special Requirements:**

a) Modern numerical relays (IEDs) have AR function as built-in feature. However, standalone AR relay or AR function of Bay control unit (BCU) for 220kV and above voltage lines may be used. For 132kV/110kV lines, AR functions built-in Main distance relay IED can be used.

b) Fast simultaneous tripping of the breakers at both ends of a faulty line is essential for successful auto-reclosing. Therefore, availability of protection signalling equipment is a pre-requisite.

c) Starting and Blocking of Auto-reclose Relays:

Some protections start auto-reclosing and others block. Protections which start A/R are Main-I and Main-II line protections. Protections which block A/R are:

i. Breaker Fail Relay
ii. Line Reactor Protections
iii. O/V Protection
iv. Received Direct Transfer trip signals
v. Busbar Protection
vi. Zone 2/3 of Distance Protection
vii. Carrier Fail Conditions
viii. Circuit Breaker Problems.
ix. Phase to Phase Distance Trip
x. AR selection switch in OFF position
xi. Logic AR OFF in SAS

xii. Phase Distance Start (when Auto reclosure is in progress)

When a reclosing relay receives start and block A/R impulse simultaneously, block signal dominates. Similarly, if it receives 'start' for 1-phase fault immediately followed by multi- phase fault the later one dominates over the previous one.

ii) **Requirement for Multi breaker Arrangement:**

Following schemes shall be adhered to multi-breaker arrangements of one and half breaker or double breaker arrangement:

a) In a multi-Circuit Breaker (C.B.) arrangement one C.B. can be taken out of operation and the line still be kept in service. After a line fault only those CBs which were closed before the fault shall be reclosed.

b) In multi-C.B. arrangement it is desirable to have a priority arrangement so as to avoid closing of both the breakers in case of a permanent fault.

c) A natural priority is that the C.B. near the busbar is reclosed first. In case of faults on two lines on both sides of a tie C.B. the tie C.B. is reclosed after the outer C.Bs. The outer C.Bs. do not need a prioritizing with respect to each other.

d) In case of a line connecting a generating station and a substation, first substation breaker should reclose and after that generation station breaker should close.

iii) **Setting Criteria:**

a) Auto reclosing requires a dead time which exceeds the de-ionising time. The circuit voltage is the factor having the predominating influence on the de-ionising time. Single phase dead time of 1.0 sec. is recommended for 765 kV, 400 kV and 220 kV system. For the lines emanating from generating stations single-phase dead time upto 1.5 sec may be adopted.

b) According to IEC 62271-101, a breaker must be capable of withstanding the following operating cycle with full rated breaking current:

O - 0.3 s - CO - 3 min - CO

O stands for Open

CO stands for Close-Open

The rated operating cycle of the circuit breaker consisting of an opening, a holding time of 0.3 seconds, a CO cycle, a 3-minute wait, and another CO cycle.

The recommended operating cycle at 765kV, 400 kV and 220 kV is as per the IEC standard. Therefore, reclaim time of 25 Sec. is recommended.

5.7. **Transmission Relay Loadability**

Transmission Relay Loadability means the loading permitted in the transmission line by

the relay including a security margin. The relay loadability is to be arrived in such a way as far as possible not to interfere with system operator actions, while allowing for short-term overloads, with sufficient margin to allow for inaccuracies in the relays and instrument transformers. Transmission relay do not prematurely trip the transmission elements out-of-service and allow the system operators from taking controlled actions consciously to alleviate the overload.

5.7.1. Protective relay settings shall

i) Not limit transmission loadability;

ii) Not interfere with system operators' ability to take remedial action to protect system reliability and;

iii) Be set to reliably detect all fault conditions and protect the electrical network from the faults.

5.7.2. The protective functions which could trip with or without time delay, on load current i.e. load responsive phase protection systems including but not limited to:

i) Phase distance.

ii) Out-of-step tripping.

iii) Switch-on-to-fault.

iv) Overcurrent relays.

v) Communications aided protection schemes including but not limited to:

- Permissive overreach transfer trip (POTT).
- Permissive under-reach transfer trip (PUTT).
- Directional comparison blocking (DCB).
- Directional comparison unblocking (DCUB).

vi) Phase overcurrent supervisory elements (i.e., phase fault detectors) associated with current based, communication-assisted schemes (i.e., pilot wire, phase comparison, and line current differential) where the scheme is capable of tripping for loss of communications.

5.7.3. Each Transmission Licensee and Generating Company shall use any one of the following criteria for any specific circuit terminal to prevent its phase protective relay settings from limiting transmission system loadability while maintaining reliable protection of the Grid for all fault conditions. Relay loadability at 0.85 per unit voltage and a power factor angle of 30 degrees shall be evaluated.

i) For Distance protection relays of transmission lines, the Zone-3 shall prevent load encroachment, considering the following criteria:

a) Maximum load current (I_{max}) may be considered as 1.5 times the thermal rating of the line or 1.5 times the associated bay equipment current rating (the Minimum of the bay equipment individual rating) whichever is lower.

(The rating considered is approximately 15 minutes rating of the Transmission facility).

b) For setting angle for load blinder, a value of 30 degree may be adequate in most cases.

c) The Distance protection relays shall have provision for load blinder characteristic or load encroachment detection.

ii) For Directional Overcurrent relays, wherever used in a transmission line (132/110 kV level), the following shall be adopted:

a) An overload alarm shall be set at 110% of the thermal rating of the line with sufficient delay. This alarm shall allow the operator to take corrective action.

b) The Directional Overcurrent relay shall allow the line to carry 1.2 times of the thermal rating of the associated line or bay equipment (whichever is lower) at least 10 minutes.

iii) For transformer protection relays the following shall be adopted:

- Set the definite time transformer overload relay at 105% of the transformer ratings with sufficient delay. It shall be wired for alarm purpose only to allow the operator to take corrective action. No tripping shall be issued from this relay.
  - The back-up overcurrent relays shall use IDMT characteristics and be suitably coordinated with the upstream transmission network.
  - Install supervision for the transformer using either a top oil or simulated winding hot spot temperature element. The alarm and trip settings for these relays shall be set by individual entities based on the manufacturer's recommendation.

Thermal ratings as specified in the prevailing CEA's Manual on Transmission Planning Criterion shall be used for above requirement.

5.8. **Relay Setting of idle charged lines**

5.8.1 Distance Protection Setting: Time delays for Zone 1, Zone 2, Zone 3 and Zone 4 should be made instantaneous.

5.8.2 Directional Earth Fault: Pick Up Current should be set as 120 % of the line charging current of the idle charge length and should be under definite time with instantaneous trip. (Directionality should be retained)

5.8.3 Over Voltage setting : Stage-I overvoltage pick-up should be minimum of that of all the lines connected from the charging substation with minimum time delay (Say 105 % with 3 Seconds delay)

6. Protection Settings & Coordination

The purpose is to ensure system protection is coordinated among the grid connected entities. The Protection systems coordination comprises the following:

i) Each Transmission Licensee, Load Dispatch Centre (LDC) and Generating Company shall keep themselves familiarized with the purpose and limitations of Protection System schemes applied in its area of control.

ii) Each Transmission licensee shall coordinate its Protection System schemes with concerned transmission system, sub-transmission system and generators.

iii) Each Generating Company shall coordinate its Protection System schemes with concerned transmission system and station auxiliaries.

iv) Each Transmission Licensee and Generation Company shall be responsible for settings calculations for protection of elements under its ownership. It shall be the responsibility of the respective asset owner to obtain the inputs (adjacent line settings, infeed values etc.) from STU/Generating Company/ Transmission Licensee necessary for calculation of the settings.

v) STU/Generating Company/Transmission Licensee shall provide the infeed values/latest network model to the requesting entity, within 15 days of receipt of such a request from the entity.

vi) Each Generating Company and Transmission Licensee, for voltage levels 400kV and above and interstate lines, shall submit the protection settings as per the format prescribed, along with the calculation sheets, co-ordination study reports and input data, in advance, to ERPC/ERLDC for every new element to be commissioned. The mentioned information shall be submitted to the ERPC/ERLDC two months in advance for all the elements proposed to be commissioned. ERPC shall furnish the approved settings within forty days from the date of submission of the settings by the entity.

vii) The PCC of ERPC shall review the settings to ensure that they are properly coordinated with adjacent system and comply with the existing guidelines. The onus to prove the correctness of the calculated settings shall lie with the respective Transmission licensee/Generation Company. In case, the PCC feels that the adjacent transmission system settings need to be changed, in view of the new element, it shall inform the concerned entity for revision of the existing settings.

viii) The PCC of ERPC shall review and approve the settings based on the inputs /report submitted by the entities.

ix) Each Transmission licensee and Generating Company shall co-ordinate the protection of its station auxiliaries to ensure that the auxiliaries are not interrupted during transient voltage decay.

x) Any change in the existing protection settings, for voltage levels 400kV and above & interstate lines, shall be carried out only after prior approval from the ERPC. The owner entity shall inform all the adjacent entities about the change being carried out.

xi) In case of failure of a protective relay or equipment failure, the Generating Company and Transmission Licensee shall inform appropriate SLDC/ERLDC/ERPC. The Generating Company and Transmission Licensee shall take corrective action as soon as possible.

xii) Each Transmission Licensee shall coordinate Protection Systems on major transmission lines and interconnections with neighbouring Generating Company, Transmission Licensee and appropriate LDC.

xiii) ERPC in consultation with the ERLDC & Eastern Regional entities shall undertake review of the protection settings, assess the requirement of revisions in protection settings and revise protection settings, from time to time and at least once in a year. The necessary studies in this regard shall be carried out by the ERPC & ERLDC. The modifications/changes, if any, in protection settings shall be advised to the respective users and STUs.

xiv) ERPC shall 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. ERLDC also shall maintain such database. Respective Transmission licensee/Generating Company/Entities are responsible for ensuring to make available the implemented protection settings in the centralized database within fifteen days from the date of commissioning.

xv) If System Protection Schemes (SPS) is recommended to be implemented by the appropriate forum/Sub-Committee of ERPC on account of operational & system constraints, the same shall be implemented by the concerned Transmission licensee/Generating Company/Entities within the specified timelines.

7. Disturbance Monitoring, Analysis and Reporting

The Purpose is to ensure that adequate disturbance data is available to facilitate Grid event analysis. The analysis of power system disturbances is an important function that monitors the performance of protection system, which can provide information related to correct behavior of the system, adoption of safe operating limits, isolation of incipient faults,

7.1. **The Disturbance Monitoring Requirements include the following:**

i) Each Transmission Licensee and Generating Company shall provide Sequence of Event (SOE) recording capability by installing Sequence of Event recorders or as part of another device, such as a Supervisory Control and Data Acquisition (SCADA) Remote Terminal Unit (RTU), a generator plants Digital (or Distributed) Control System (DCS) or part of Fault recording equipment.

This capability shall be provided at all substations and at locations to record all the events in accordance with CEA Grid Standard Regulations, 2010 amended to date. The following shall also be monitored at each location:

a) Transmission and Generator circuit breaker positions

b) Protective Relay tripping for all Protection Groups that operate to trip circuit breakers identified in (a) above.

c) Tele protection keying and receive

ii) In either case, a separate work station PC shall be identified to function as the event logger front end. The event logger work-station PC should be connected to UPS (Uninterrupted Power Supply).

The event logger signals shall include but not limited to

- All Circuit Breaker and isolator switching Operations
- Auxiliary supply (AC, DC and DG) supervision alarms
- Auxiliary supply switching signals
- Fire-fighting system operation alarms
- Operation signals (Alarm/Trip from all the protection relays.)
- Communication Channel Supervision Signals.
- Intertrip signals receipt and send.
- Global Positioning System (GPS) Clock healthiness.
- Control Switching Device healthiness (if applicable).
- RTU/Gateway PC healthiness
- All Circuit Breaker Supervision Signals.
- Trip Circuit Supervision Signals.

iii) Each Transmission Licensee/Generating Company/Users shall provide Disturbance recording capability for the following Elements at facilities:

- All transmission lines (Each line shall be provided with facility for distance to fault locator)
- Autotransformers or phase-shifters connected to busses.
- Shunt capacitors, shunt reactors.
- Individual generator line interconnections.
- Dynamic VAR Devices.
- HVDC terminals.
- Bus Bars

iv) The Disturbance recording feature shall be enabled and configured in all the numerical relays installed. Disturbance recording system shall have minimum recording time of 3 seconds (0.5 seconds for pre-fault and 2.5 seconds for post fault).

v) Each Generating Company shall provide Disturbance recording capability for Generating Plants in accordance with Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations 2022 amended to date, the CEA (Technical Standards for connectivity to the Grid) Regulations 2007 amended to date.

vi) Each Transmission Licensee and Generating Company shall record for Faults, sufficient

electrical quantities for each monitored Element to determine the following:

- Three phase-to-neutral voltages. (Common bus-side/line side voltages may be used for lines.)
- Three phase currents and neutral currents.
- Polarizing currents and voltages, if used (As applicable).
- Frequency (As applicable).
- Real and reactive power (As applicable).

The Minimum parameters to be monitored in the Fault record is given at Annexure.

vii) Each Transmission Licensee and Generating Company shall provide Disturbance recording with the following capabilities:

- The Disturbance recorders shall have time synchronization and a standard format for recording analogue and digital signals (DR labels to be standardized as per the Report of FOLD Working Group - 3 on DR Parameter Standardization). The data files shall be capable of being viewed, read, and analyzed with a generic COMTRADE analysis tool as per the latest revision of IEEE Standard C37.111.
- Each Fault record duration and the trigger timing shall be settable and set for a minimum 3 second duration including 0.5 seconds for pre-fault and 2.5 seconds for post fault
- Each Fault recorder shall have sampling frequency of 1 kHz or better.
- Each Fault recorder shall be set to trigger for at least the following:

  Internal protection trip signals, external trigger input and additional triggers may be assigned as necessary.

viii) Each Transmission Licensee and Generating Company shall keep the recording instruments (disturbance recorder and event logger) in proper working condition and shall establish a maintenance and testing program for Disturbance Recorder (DR) that includes

- Maintenance and testing intervals and their basis.
- Summary of maintenance and testing procedures.
- Monthly verification of communication channels used for accessing records remotely (if the entity relies on remote access and the channel is not monitored to a control centre staffed around the clock, 24 hours a day, 7 days a week (24/7)).
- Monthly verification of time synchronization (if the loss of time synchronization is not monitored to a 24/7 control centre).
- Monthly verification of active analog quantities.
- A requirement to return failed units to service within 90 days. If a Disturbance Recorder (DR) will be out of service for greater than 90 days, the Transmission

Licensee and Generating Company shall keep a record of efforts aimed at restoring the DR to service.

ix) The time synchronization of the disturbance recorders shall be corroborated with the PMU data or SCADA event loggers by ERLDC. ERLDC shall list out for Disturbance recorders which are non- compliant for discussion in PCC meetings of ERPC.

x) Each Transmission Licensee and Generating Company shall submit the data files to the ERLDC conforming to the following format requirements:

- The data files shall be submitted in COMTRADE and PDF format.
- File shall have contained the name of the Relay, name of the Bay, station name, date, time resolved to milliseconds, event point name, status.

The DR archives shall be retained for a period of three years.

xi) A separate work-station PC, powered through UPS (Uninterrupted Power Supply) shall be identified with access to all the relays for extraction of DR. Auto- Download facility shall be established for automatic extraction of the DR files to a location on the work- station PC.

xii) **Time Synchronization Equipment**

a) Time Synchronizing Equipment complete with antenna, all cables and processing equipment shall be provided to receive synchronizing pulse through Global Positioning System or Indian Regional Navigation Satellite System Navic compatible for synchronization of event logger, disturbance recorder, Phasor Measurement Units, and Supervisory Control and Data Acquisition System or Substation Automation System.

b) Each substation shall have time synch equipment to synchronize all the numerical relays installed. Before any extension work, the capability of the existing Time-sync equipment shall be reviewed to ensure the synchronization of upcoming numerical relays.

c) The status of healthiness of the time-sync device shall be wired as "Alarm" to SCADA and as an "Event" to Event Logger.

d) The time synch status of all the installed numerical relays and event logger shall be monitored monthly and recorded. The Monthly records for relays not in time-sync shall be reported to ERLDC and ERPC. This record shall be archived for a period of three years by each concerned agency.

e) Remedial action shall be taken by the concerned substation/ Protection department immediately to make the relays in time synchronization with reference to external time source.

f) All the new Grid elements/Bay extension shall have accurate and precise Time synchronization equipment.

7.2. **Disturbance Analysis and Reporting**

i) Immediately following an event (grid disturbance or grid incidence as defined in the CEA Grid Standards) in the system, the concerned user or SLDC shall inform ERLDC through voice message.

ii) Written flash report shall be submitted to ERLDC and appropriate SLDC by the concerned Transmission Licensee/Generating Company/User within eight (8) hours from Grid event.

iii) Disturbance Recorder (DR), station Event Logger (EL), Data Acquisition System (DAS) shall be submitted by the respective Transmission licensee and Generating Company within twenty-four (24) hours from Grid event. These records shall be uploaded by the respective Transmission licensee and Generating Company in the Web Based Tripping Portal of ERLDC.

iv) ERLDC shall classify the grid incidents and grid disturbances according to CEA (Grid Standards) Regulations, amended to date. ERLDC shall report the event (grid disturbance or grid incidence) to CEA, ERPC and all regional entities within twenty-four (24) hours of receipt of the flash report.

v) After a complete analysis of the event, the Transmission licensee and Generating Company/User shall submit a detailed report in the case of grid disturbance or grid incidence within one (1) week of the occurrence of event to ERLDC and ERPC.

vi) ERLDC shall prepare a draft report of each grid disturbance or grid incidence including simulation results and analysis which shall be discussed and finalized in the PCC meetings of ERPC as per the timeline specified in Table below.

Sl. No	Grid Event (GD/GI Classification as per the CEA Grid Standards)	Flash report submission deadline (Users/ SLDC)	Disturbance record and station event log submission deadline by Users/ SLDC)	Detailed report and data submission deadline by Users/ SLDC)	Draft report submission deadline by ERLDC	Discussion in PCC and final report submission deadline by ERPC
1	GI-1/GI-2	8 hours	24 hours	+7 days	+7 days	+60 days
2	Near miss event	8 hours	24 hours	+7 days	+7 days	+60 days
3	GD-1	8 hours	24 hours	+7 days	+7 days	+60 days
4	GD-2/GD-3	8 hours	24 hours	+7 days	+21 days	+60 days
5	GD-4/GD-5	8 hours	24 hours	+7 days	+30 days	+60 days

vii) The analysis reports submitted by ERLDC shall be discussed in the Protection Coordination Sub-Committee (PCC) meetings of the ERPC. The PCC shall identify the lessons learnt during the events being discussed. The PCC shall scrutinize the correctness of operation of subject protection systems put in place by the concerned Constituents and the final analysis repot along with the recommendations shall be concluded. It shall also recommend the appropriate remedial measures for system improvement.

viii) The implementation of the recommendations of the final report shall be monitored by

the PCC of ERPC.

ix) Any additional data such as

- Single line diagram (SLD)
- Protection relay settings,
- HVDC transient fault record,
- Location of fault with distance
- Fault details with type & relay indications
- CT/PT/CVT rating details with location
- Bus-bar arrangement/ Configuration of feeders
- CB positions (OPEN/ CLOSE) at the time of fault
- Isolator & Earth-switch positions (OPEN/CLOSE)
- Voltage, frequency & power flows with direction at the time of fault
- DR&EL records
- switchyard equipment

and any other relevant station data required for carrying out analysis of an event by ERPC, ERLDC and concerned SLDC shall be furnished by the Users including ERLDC and respective SLDC, as the case may be, within forty- eight (48) hours of the request. All Users shall also furnish high-resolution analog data from various instruments including power electronic devices like HVDC, FACTS, renewable generation (inverter level or WTG level) on the request of ERPCs, NLDC, ERLDCs or SLDCs.

x) Triggering of STATCOM, TCSC, HVDC run-back, HVDC power oscillation damping, generating station power system stabilizer and any other controller system during any event in the grid shall be reported to the ERLDC and ERPC if connected to ISTS and to the concerned SLDC if connected to an intra-state system. The transient fault records and event logger data shall be submitted to the ERLDC or concerned SLDC within 24 hours of the occurrence of the incident. Generating stations shall submit 1 second resolution active power and reactive power data recorded during oscillations to ERLDC or concerned SLDC within 24 hours of the occurrence of the oscillations.

xi) A monthly report on events of unintended operation or non-operation of the protection system shall be prepared and submitted by each user/owner of important elements in the regional grid, as identified by the appropriate forum of ERPC including those in the State grids that are critical for regional grid operation to ERPC and ERLDC within the first week of the subsequent month.

xii) The detailed analysis reports shall be archived periodically. The archive shall be retained for a period of three years by each concerned agency.

8. Protection Audit Plan

i) All Users/Entities connected at 220 kV and above, shall conduct internal audit, as per the prescribed audit checklist, of their protection systems annually, and any shortcomings identified shall be rectified and informed to ERPC. The audit report along with action plan for rectification of deficiencies detected, if any, shall be shared with ERPC.

ii) All Users /Entities shall also conduct third party protection audit of each sub-station at 220 kV and above once in five years.

iii) After analysis of any event, PCC of ERPC may identify a list of substations / and generating stations where third-party protection audit is required to be carried out and accordingly advise the respective users to complete third party audit within three months.

iv) The third party audit report shall contain all the information as in *Annexure-1(Third Party Protection System Checking & Validation Template for a Substation) of CERC (Indian Electricity Grid Code), Regulations 2023).* The protection audit reports, along with action plan for rectification of deficiencies detected, if any, shall be submitted to the respective ERPC and ERLDC or respective SLDC, as the case may be, within a month of submission of third party audit report. The necessary compliance to such protection audit report shall be followed up regularly in the PCC meetings of ERPC.

v) ERPC shall keep all compliance monitoring reports/audit reports at least for five years.

vi) Annual audit plan for the next financial year shall be submitted by the Users/entities to ERPC by 31st October of every year. The users shall adhere to the annual audit plan and report compliance of the same to ERPC.

9. Performance Monitoring of the Protection Systems

9.1. Users/Entities shall submit the following protection performance indices of previous month to ERPC and ERLDC on monthly basis for 220 kV and above by 15th of the subsequent month and the same shall be reviewed in the ensuing PCC meeting of ERPC.

a) The Dependability Index defined as D= Nc / (Nc+Nf)

Where, Nc is the number of correct operations at internal power system faults and *N*f is the number of failures to operate at internal power system faults.

b) The Security Index defined as S= Nc/ (Nc + Nu)

Where, Nc is the number of correct operations at internal power system faults and N_u is the number of unwanted operations.

c) The Reliability Index defined as

$$R = Nc / (Nc + Ni)$$

Where, N_C is the number of correct operations at internal power system faults and

N_i is the number of incorrect operations and is the sum of N_f and N_u

9.2. Users/Entities shall furnish the reasons for performance indices less than unity of individual element wise protection system to the ERPC and action plan for corrective measures. The action plan will be followed up regularly in the PCC Meetings.

10. Compliance Monitoring

10.1. The Protection Protocol of ER shall be reviewed as and when required, in consultation with the stakeholders of the Eastern Region.

10.2. Violation of the Protection Protocol of the Eastern Region shall be brought to the notice of ERPC by the ERLDC or concerned SLDC, as the case may be.

10.3. In case any User/Entity fails to comply with the Protection Protocol or fails to undertake remedial action identified by the PCC of ERPC within the specified timelines, the ERPC would approach the Commission with all relevant details for suitable directions.

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ERLDC Fees & Charges

Annexure 3.7

		2021-22				2022-23				2023-24				2024-25
Sl No	**Entity Name**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**
1	Adhunik PNRL	Yes	Yes				Yes		Yes	Yes				Yes
2	Alipurduar HVDC													
3	Alipurduar Transmission Limited													
4	BARH STG-I	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
5	BARH-II	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
6	Bharatiya Rail Bijlee Company Ltd.	Yes				Yes	Yes							
7	Bihar State Power Transmission Company Ltd.								Yes					
8	Darbhanga-Motihari Transmission Company Ltd.	Yes	Yes											
9	Darlipali Super Thermal Power Project	Yes	Yes											
10	DVC													
11	DVC Seller													
12	ENICL													
13	FSTPP-I - II	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
14	FSTPP-III	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
15	GATI INFRASTRUCTURE PVT. LTD					Yes	Yes				Yes			
16	GMR Kamalanga Energy Ltd.													
17	GRIDCO	Yes	Yes	Yes	Yes							Yes	Yes	Yes
18	HVDC SASARAM													
19	Jharkhand Bijli Vitran Nigam Limited													
20	JINDAL INDIA THERMAL POWER LTD.													
21	Jorethang Loop HEP							Yes	Yes	Yes	Yes			
22	Kanti Bijlee Utpadan Nigam limited	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	
23	KHSTPP-I	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
24	KHSTPP-II	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
25	Maithon Power Limited	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
26	Nabinagar Power Generation Corporation Ltd.					Yes		Yes	Yes	Yes	Yes	Yes	Yes	
27	NORTH KARANPURA TRANSCO LIMITED													
28	NVVN Bangladesh						Yes				Yes		Yes	Yes
29	NVVN Nepal										Yes			
30	Odisha Generation Phase-II Transmission Limited													
31	PMJTL													
32	PMTL													
33	POWERGRID ISTS													
34	POWERLINK ISTS													
35	Purulia & Kharagpur Transmission Comp. Ltd.													
36	RANGEET HEP													
37	Rognichu HEP					Yes								
38	Shiga Energy Private Ltd							Yes	Yes	Yes	Yes			
39	SIKKIM													
40	Sneha Kinetic Power Project Private Ltd													
41	TALCHER SOLAR PV POWER STATION,NTPC LIMITED	Yes	Yes											
42	Tata Power Trading Company Limited		Yes	Yes		Yes								
43	TEESTA HEP													
44	Teesta Urja Ltd.(Teesta -III HEP)	Yes												
45	Teestavalley Power Transmission Ltd.												Yes	
46	TSTPP-I	Yes	Yes											
47	WBSEDCL				Yes		Yes			Yes				
48	ERNVVNBHUTAN_NIKACHHU												Yes	Yes
49	NVVN_DGPC Basochhu												Yes	

DSM account Reconciliation Status of ER constituents **Annexure 3.8**

	2019-20				2020-21				2021-22				2022-23				2023-24				2024-25
Name of The Utility	Q1 (17.07.19)	Q2 (21.10.19)	Q3 (13.01.20)	Q4 (15.04.20)	Q1 (15.07.20)	Q2 (23.10.20)	Q3 (20.01.21)	Q4 (28.04.21)	Q1 (06.07.21)	Q2 (07.10.21)	Q3 (11.01.22)	Q4 (18.04.22)	Q1 (15.07.22)	Q2 (21.10.22)	Q3 (19.01.23)	Q4 (28.04.23)	Q1 (28.07.23)	Q2 (19.10.23)	Q3 (25.01.24)	Q4 (24.04.24)	Q1 (30.07.24)
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□□□□□	□□□	□□□	□□□	□□□	□□□	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
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□R□D□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	NO
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□□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□	□□	□□	□□□	□□□	NO
M□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□	□□	□□□	□□□	□□□	□□□	□□□	□□□
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□MR	□□□	□□□	□□□	□□□	□□	□□	□□	□□□	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
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□□□□	□A	□A	□A	□A	□A	□A	□A	□A	□A	□A	□A	□A	□A	□A	□A	□A	□A	□A	□A	NO	NO
□□□□□ □DA□A□□□□	□□□	□□□	□□□	□□□	□□□	□□	□□	□□	□□□	□□□	□□□	□□□	□□	□□	□□	□□	□□	□□	□□□	□□□	NO
□□□□□□DA□□ □□□R□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□	□□	□□	□□	□□□	□□□	□□	□□□	NO
□R□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□	□□	□□	□□□	□□□	□□□	□□□	NO
□□□ □R□R□D □□R-□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□
□□□ □R□R□D □□R-□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□	□□□	NO
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D□□□□□	□□□	□□□	□□□	□□□	□□□	□□	□□	□□	□□	□□	□□	□□	□□□	□□	□□	□□	□□□	□□	□□	□A	NO
□□□□A □□A□□□D□□□□	□□□	□□□	□□□	□□□	□□□	□□	□□	□□□	□□□	□□□	□□□	□□□	□□	□□	□□	□□	□□□	□□□	□□	□□□	NO
R□n□n□□□u	□A				□A				□A				□□	□□	□□	□□□	□□	□□	□□□	□□□	NO

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Annexure 3.9

Reconciliation Between Open Access department of ERLDC and SLDCs, STUs and CTU

Sl. No.	STUs / SLDCs Name	Quarter-I (2022-23)	Quarter-II (2022-23)	Quarter-III (2022-23)	Quarter-IV (2022-23)	Quarter-I (2023-24)	Quarter-II (2023-24)	Quarter-III (2023-24)	Quarter-IV (2023-24)	Quarter-I (2024-25)
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□	□□□r-□□D□ □nd □□□	□□□	□□	□□	□□	□□	□□	□A	□A	□A
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□	□MA□□A□ □RAD□□□	□□	□□	□□	□□	□□	□□	□A	□A	□A
1□	□AMM□ □ □A□□M□R	□□	□A	□A	□A	□A	□□	□A	□A	□A
11	□AR□A□A□A	□□	□□	□□	□□	□□	□□	□A	□A	□A
1□	MAD□□A □RAD□□□	□□	□□	□□	□□	□□	□□	□A	□A	□A
1□	MA□ARA□□RA	□□	□□	□□	□□	□□	□□	□A	□A	□A
1□	M□n□ur	□A	□A	□A	□A	□□	□□	□A	□A	□A
1□	RA□A□□□A□	□□	□□	□□	□□	□□□	□□□	□A	□A	□A
1□	□u□r□□	□A	□□	□□	□A	□□	□□	□A	□A	□A
1□	□□□r □r□de□□	□A	□□	□□	□□	□□	□□	□A	□A	□A
1□	□□□ □□□ □du	□A	□A	□A	□A	□□	□□	□A	□A	□A
1□	□e□n□□n□	□A	□A	□□	□□	□A	□A	□A	□A	□A
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Reconciliation Between Open Access department of ERLDC and Applicants

Sl. No.	Applicants Name	Quarter-I (2022-23)	Quarter-II (2022-23)	Quarter-III (2022-23)	Quarter-IV (2022-23)	Quarter-I (2023-24)	Quarter-II (2023-24)	Quarter-III (2023-24)	Quarter-IV (2023-24)	Quarter-I (2024-25)
	Date of Issuance	□□-□□-□□□□	□□-1□-□□□□	□□-□1-□□□□	1□-□□-□□□□	□1-□□-□□□□	□□-1□-□□□□	□□-□1-□□□□	□□-□□-□□□□	□□-□□-□□□□
1	Bihar State Power Holding Company Limited	□A	□A	□A	□A	□A	□A	□A	□A	□□□
□	GRIDCO Ltd	□□□	□□□	□A	□A	□□□	□□□	□□□	□□□	□□
□	Jindal India Thermal Power Limited	□□	□□	□□	□□	□□□	□□□	□□□	□A	□A
□	Jharkhand Bijli Vitaran Nigam Limited	□□	□□	□□	□□	□□	□□	□□	□□	□□
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□	Arun□□□□□□r□de□□ □□□er □□r□□r□□□n □r□□e □□□ ed	□□	□□	□□	□□	□□	□□	□□	□□	□□
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□	□□D□□□A□ □□□ □R □□□□A□□□ □M□□□D	□A	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□
1□	□□D□A□ □□□R□□ □□□□A□□□ □M□□□D	□□	□□	□□	□□□	□□□	□□□	□□□	□□□	□□
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1□	□□□ □□D □dder□□re	□□	□□	□□	□A	□A	□A	□A	□A	□A
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1□	□□□ □□□ ed □□r□□r□e □ □□□e □□□□□□□	□A	□A	□A	□A	□A	□□	□A	□A	□□□
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1□	□A□□□ □A□ A□□M□□ □□M □□M□A□□ □M□□□D A□	□A	□A	□A	□□	□□	□□	□A	□A	□A
1□	□A□□□ □A□ A□□M□□ □□M □□M□A□□ □M□□□D-□D	□A	□A	□A	□□	□A	□□	□□	□□	□□
1□	□□□□ □D□□□ □□A□AR □□□AM □M□□□D	□□□	□A	□A	□A	□□□	□A	□A	□A	□□
□□	□□□ □R □□□□A□□□ □□D□A □M□□□D	□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□
□1	□□□ □□D□A □M□□□D	□□□	□□□	□□	□A	□A	□A	□A	□A	□□□
□□	□A□A □□□ □R □RAD□□□ □□M□A□□ □M□□□D	□□	□□	□□	□□	□□□	□□□	□A	□A	□□
□□	□A□A □□□□□ □M□□□D □ 1□□□	□□	□A	□A	□A	□□□	□□	□A	□A	□A
□□	□□r□n□u □□□er □r□d□n□ □r□□□e □□□ ed	□A	□□	□A	□□	□A	□A	□A	□A	□A
□□	□□□□□□□□□A AD□□□□R□ □R□□A□□ □M□□□D	□A	□A	□A	□A	□A	□□	□A	□A	□A
□□	□□□□u□r□ □e□en□□ □r□□	□A	□A	□A	□A	□A	□A	□A	□A	□□
□□	MA□□ARA□ □□□ □R □M□□□D	□A	□A	□A	□A	□A	□A	□□□	□A	□□
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□□	□□□□ □□ee□□□□ ed □err□A□□□□ □□n□□□d□	□A	□A	□A	□A	□A	□A	□A	□A	□□
□□	□□□RA□□□□ □□M□□□ □M□□□D- □□□□□D□D□□	□A	□A	□A	□A	□A	□A	□A	□A	□□
□1	□□□RA□□□□ □□M□□□ □M□□□D □□□□□□□□A□□ □□M□□□ □ □R□□	□A	□A	□A	□A	□A	□A	□A	□A	□□
□□	□□□R□ □A□□ADA □□□ □R □R□□A□□ □M□□□D	□A	□□	□A	□A	□A	□A	□A	□A	□A