सत्यमेव जयते

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
उत्तर क्षेत्रीय विद्युत समिति
Northern Regional Power Committee

दिनांक: 16.04.2025

सेवा में/ To,

संलग्न सूची के अनुसार/As per list attached

विषय: दूरसंचार, स्काडा और टेलीमेटरी उपसमिति की 27 वीं बैठक।
Subject: 27th meeting of Telecommunication, SCADA& Telemetry Sub Committee

इस कार्यालय के पत्र दिनांक **20.03.2025** के क्रम करते हुए यह सूचित किया जाता है कि उत्तर क्षेत्रीय विद्युत समिति की दूरसंचार**,** स्काडा और टेलीमेटरी **(**टेस्ट**)** उप**-**समिति की **27 वीं बैठक दिनांक 21.04.2025 को 10:30 बजे सम्मेलन कक्ष, एन.आर.पी.सी, नई दिल्ली** में आयोजित की जाएगी। बैठक की कार्यसूची आपकी सूचना एवं आवश्यक कार्यवाही हेतु संलग्न है।

In continuation to NRPC letter dated 20.03.2025, it is to be intimated that the 27th meeting of Telecommunication, SCADA & Telemetry (TeST) Sub-committee of NRPC will be **held at conference room in NRPC, New Delhi on 21.04.2025 at 10:30 AM**. The agenda for the meeting is enclosed herewith for your information and necessary action.

अनुलग्नक– यथोपरि।

भवदीय,

Signed by Anzum Parwej
Date: 16-04-2025 16:36:35

(अंजुम परवेज)
अधीक्षण अभियंता

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Contents

27th Telecommunication, SCADA & Telemetry (TeST) Sub-committee of NRPC
Agenda

I. Confirmation of Minutes

1. Confirmation of Minutes

The minutes of 26th meeting of TeST sub-committee held on 19th November, 2024 were issued on 23.12.2024. Minutes are available at NRPC website (http://164.100.60.165).

No comments have been received till date.

Members may kindly confirm the minutes.

II. Telecommunication and Telemetry issues

2. J&K Telemetry Issues (*Agenda by NRLDC)*

2.1. Reliability and accuracy of SCADA data and its associated communication system is essential for monitoring and coordinating operations of a large electricity grid. It helps in visualization and management of the critical grid element failure/grid incident in real time and minimizes the possibility of any untoward incidences/disturbances.

2.2. Real-Time data availability from Jammu and Kashmir is very poor. There is zero visibility of data in J&K stations at J&K and NRLDC. With poor monitoring of data, it is very difficult to monitor grid in efficient manner.

2.3. The matter has been discussed in various TCC and TeST Meetings but there is no improvement of the same.

2.4. Brief details are as follows:

i. Under SCADA upgrade project M/s Siemens at all 400KV / 220 KV and 132 KV sub- stations/generating Stations of J&K PDD installed 66 RTUs.

ii. RTUs were not integrated with Control centre due to non-availability of communication network.

iii. RTUs were tested locally and commissioned without data availability at Control Centre.

iv. Due to Non availability of data, JK PDD is not able to monitor its drawal from grid and its generation. It is dependent of Central sector data for monitoring of drawal.

2.5. Matter was also discussed in Special Meeting with J&K on 28.07.2020 where in Representative of J&K informed that they have given consultancy work to POWERGRID for installation of OPGW in J&K. However, due to funding issue OPGW work has been stalled by POWERGRID. According to J&K almost 95% of the work is

complete and once funding issue is resolved non-availability of telemetry issue will be resolved.

2.6. Further, it was informed that payment issues were resolved and many communication links were commissioned and pending link would be commissioned by December 2022.

2.7. Matter was also discussed in 47th TCC-49th NRPC Meeting, J&K confirmed that they will resolve the issues mutually with POWERGRID so that data starts reporting to SLDC/ NRLDC.

2.8. During 19th TeST Meeting dated 07.03.2022, J & K representative informed that by 31st December 2022 all 70 RTUs will be integrated with SLDC.

2.9. During 20th TeST Meeting held on 09.09.2022 it was discussed that J&K informed that although some of the links have been commissioned but data reporting is yet to start due to disconnection of CT/PT cables at site / other integration issues of the RTU. Further it was informed that they are in process of rectification of RTU issues and joint visit is planned with M/s Siemens.

2.10. During 64th NRPC Meeting held on 24th March 2023 it was informed that joint visit could not be conducted and after discussions it was decided that a joint meeting shall be conducted comprising members from Siemens, POWERGRID, J&K and NRLDC to resolve the RTU integration issues.

2.11. During 68th NRPC Meeting held on 18th Aug 2023 Representative from J&K informed that there is no improvement in regard to telemetry and they are taking up with POWERGRID and Siemens.

2.12. Issue was also discussed in 23rd TeST Meeting on 21st Sep 2023 and Special Meeting with J&K on 12th Oct 2023 where in J&K confirmed they will start the process of RTU integration with the support of Vendor. However, till date there is no improvement in data reporting from J&K Sub-stations.

2.13. Issue was also discussed in 24th TeST Meeting on 09th Feb 2024.

2.14. Further Issues was discussed in 50th TCC- 74th NRPC held on 28th/29th June 2024 where J&K representative informed that they are in discussion with OEM i.e., M/s Siemens for integration of RTUs. Further, they are arranging fund of approx. 34crore, so that communication links can be commissioned.

2.15. Issue was also discussed in 26th TeST Meeting on 19th Nov 2024.

2.16. During 77th TCC meeting held on 27.12.2024, POWERGRID representative informed the forum that under the PMRP-2004 scheme for the PDD, J&K, the plan included commissioning 76 RTUs and laying 1,781 km of OPGW. As of 2024, 1,280 km of OPGW has been laid, and 41 RTUs have been commissioned. However, no funds have been disbursed by J&K since September 2022, despite multiple meetings, including the most recent one on 31.05.2024 with the Secretary of Power, J&K

Government. Consequently, the work has stalled due to the non-payment of funds. POWERGRID's last demand for ₹34 crores, raised in September 2022, remains unpaid. The representative further stated that under the ULDC Phase-3 scheme, 76 RTUs in J&K are to be replaced, which will address both the commissioned and uncommissioned RTUs from the earlier scheme. However, an additional 501 km of OPGW still needs to be laid, for which funds from J&K are essential.

2.17. During J&K Special meeting held on 06.02.2025, representative from JKPTCL informed the Ministry of Power (MoP) sanctioned funds for J&K on January 9, 2025. The POWERGRID representative stated that 501 km of pending OPGW work would commence upon receipt of payment from J&K. Additionally, 76 RTUs (commissioned and uncommissioned) are to be replaced. POWERGRID formally communicated this to J&K through a letter dated January 15, 2025, urging immediate payment to start the work. It was emphasized that RTU commissioning and OPGW laying must be synchronized to meet ULDC Phase-3 timelines. Concern was also raised over TOC approvals, as seven TOCs from Jammu have been pending since June 2024, while Kashmir's TOCs have been received.

J&K/POWERGRID to update the status.

3. Redundant RTU Communication for Main / Backup RLDC (*Agenda by NRLDC)*

3.1. Presently SCADA data channels are reporting in main and backup mode (1+1) with 1 main channel to RLDC and 1 backup channel to Backup RLDC. As deliberated in the meetings held among POWERGRID, Grid-India, CTU and CEA dated 09.05.2023 and 27.06.2023, it has been finalized that to increase the redundancy in the system, 2 main and 2 backup channels should report to RLDCs as well as back up RLDCs considering the criticality of real time grid operations by the RLDCs.

3.2. It may also be mentioned that CERC has issued Guidelines on "Interface Requirements" under the CERC (Communication System for inter-State transmission of Electricity) Regulations, 2017 (Attached at **Annexure-I**): "The interfaces shall be designed to operate under single contingency failure condition. Equipment should support interfaces with multiple ports, cards, gateways etc. and configured in redundant mode so that failure of single hardware element, i.e., communication port, card, gateway etc. of the users shall not lead to failure of data communication."

3.3. For new ISTS stations, CTU is already including this requirement in the RfP inputs for TBCB projects. For existing ISTS sub stations, requirement for additional ethernet ports in RTU/SAS and FOTE were deliberated in various meetings. POWERGRID has provided the region wise data of additional requirement for equipment/port etc in respective SAS Gateway/RTU along with cost estimate for the implementation of dual redundancy to RLDCs & Backup RLDCs. Scheme for requirement of additional FOTE/ cards for dual redundancy in the existing POWERGRID stations has already been reviewed in 69th, 70th, 71st NRPC meetings and approved in 19th NCT meeting.

3.4. This scheme was also deliberated in the 72nd NRPC for northern region, where forum has the view that a comprehensive scheme shall be prepared considering the Private TSPs also.

3.5. Issue was also discussed in 25th TeST Meeting held on 25.06.2024, during discussion it was finalised that CTUIL shall internally finalize the draft scheme and take up in the next TeST meeting for deliberations.

3.6. Issue was also discussed in 26th TeST Meeting held on 19th Nov 2024, where it was decided that matter would be discussed with CEA as similar proposal for funding of firewall installation at Sub-station is in progress. And, In the meantime, concerned may finalise the details required for upgradation and necessary expenditure for the same.

CTUIL to update the status.

4. Dual reporting of ISTS stations to RLDC Main and Backup Control centers (Agenda by CTU)

4.1. Agenda for providing dual channels (2+2) to RLDC/ Backup RLDC were deliberated in various meetings viz. 8th NR CPM dtd 03.02.2025 (Minutes attached at **Annexure-III**), 23rd NRPC TeST held on 21.09.2023, 26th NRPC TeST held on 19.11.2025. CTU has also collected data pertaining to requirement for providing dual channels where SAS/RTU ports are needs to be upgraded.

4.2. In the 26th TeST Meeting held on 19.11.2024 following was concluded:

i. NRPC will issue a formal letter to POWERGRID requesting the expedited submission of cost and BoQ details for SAS/RTU upgrades.

ii. A dedicated meeting involving the NRPC Secretariat, NRLDC, CTUIL, and POWERGRID will be convened to resolve pending issues related to cost finalization and scheme implementation.

iii. The 2+2 scheme implementation will follow a mechanism similar to the firewall installation process, the final decision of which is pending in the 15th NPC meeting.

iv. NRLDC will convene a meeting with the participation of CTUIL, NRPC, and IPPs/ CGSs to discuss specific requirements and related concerns.

v. At present, renewable energy generators are exempted from the 2+2 channel requirement due to the absence of backup control centers for Renewable Energy Management Centers (REMCs).

4.3. As per the deliberation of the 15th NPC meeting, a special meeting was held on dtd. 24.12.2024 (Minutes attached at **Annexure-IV**) under the chairmanship of Member, PS regarding cost recovery of Firewall installation at existing substations. As decided in the meeting for existing RTM ISTS substations, the cost of firewall installation and associated cyber security measures may be considered under the TSP's O&M expenses. For existing TBCB ISTS substations, a separate meeting is to be conducted by CEA/PS wing to address cost-recovery and mode of implementation.

4.4. Further this agenda was discussed in the 8th NR CPM held on 03.02.2025 where forum agreed that similar methodology may be adopted for the cost recovery of

SAS/RTU upgradation for the purpose of dual reporting of SCADA channels (2+2) to main and backup RLDCs for the existing ISTS substations under RTM & TBCB.

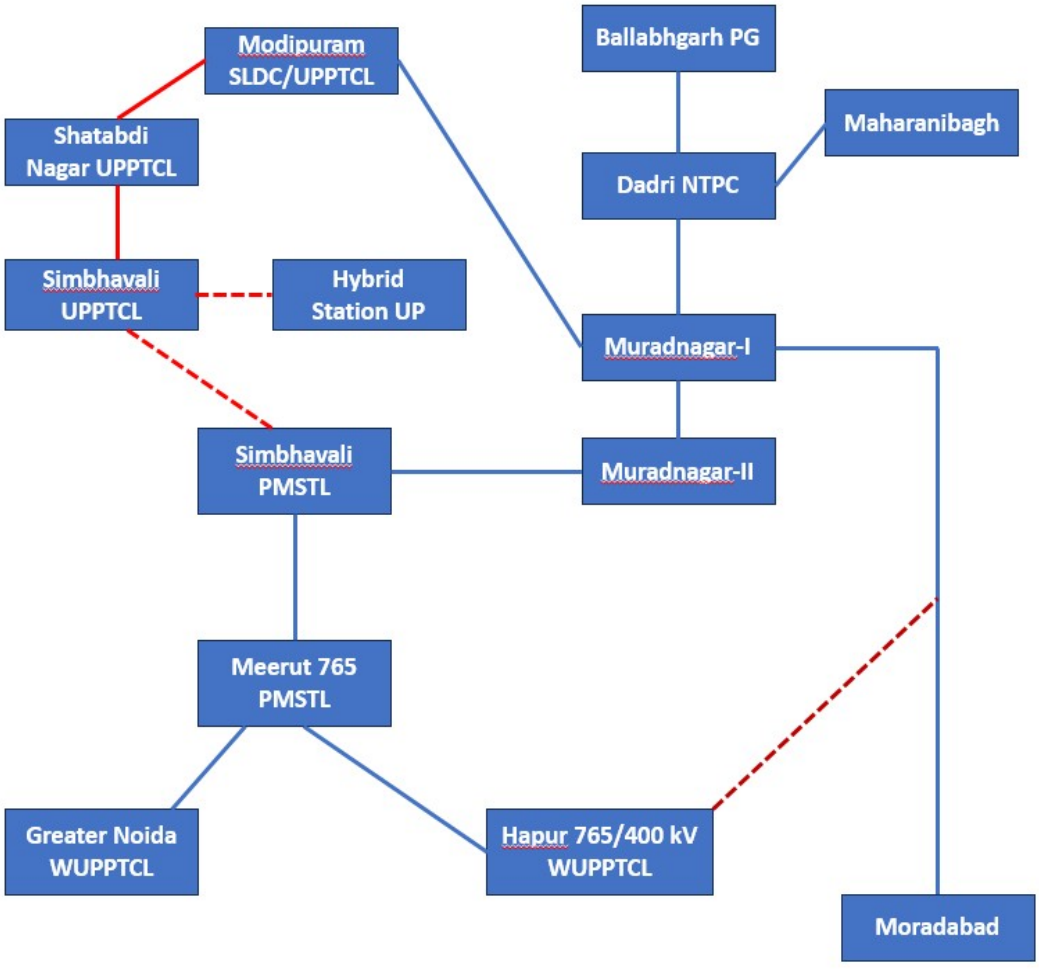
4.5. CTU suggest that respective TSP may take up SAS upgradation under add cap / change in law as per the substation type for RTM or TBCB. For the RTU upgradation same can be done under SCADA upgradation schemes of RLDCs

Members may deliberate.

5. Redundant Communication for 765/400/220kV Meerut GIS and 400/220kV Simbhavali Sub-stations(Agenda by POWERGRID)

4.1.1 PMSTL has commissioned 765/400kV Meerut GIS and 400/220kV Simbhavali sub-stations under Intra-State Transmission Network, however both of 765 and 400kV stations are connected linearly on communication network. On several occasions Telemetry data of these sub-stations got suspect due to issues in intermediate stations, resulting outage of data at SLDC Lucknow. Therefore, redundant communication network is required for both of these stations.

Present connectivity of these sub-stations is as below:



4.1.2 During commissioning of Simbhavali sub-station and DTPC of 220kV lines of UPPTCL, one connectivity was established with Simbhavali UPPTCL, however that was down

since 1 year from UPPTCL side, DTPC of both the lines are also out of service since then.

4.1.3 For establishment of redundancy for both Meerut and Simbhavali, LILO line OPGW of Hapur WUPPTCL Station can be utilized which is LILO of 400kV Muradnagar-Moradabad transmission line, POWERGRID has kept OPGW joint box during creation of LILO for WUPPTCL sub-station in 2017-18. Presently PMSTL's OPGW and communication Equipment is available at Hapur sub-station and further ULDC network is available at Muradanagar and Moradabad.

4.1.4 WUPPTCL and UPPTCL is requested to arrange 4 fibres for connectivity of between Hapur and Muradnagar for establishment of redundant network. No additional cost is required to incur on this, requirement can be met through available spares of PMSTL.

Members may deliberate

6. Display of DC/Schedule of Generating Stations in SCADA Display (Agenda by NRLDC)

6.1. In high-demand period there is requirement of monitoring Declared Capacity & Schedule of all Generating Stations so that reserves can be monitored for real-time grid operation. Schedule & DC of Central sector is being integrated with NRLDC SCADA system and same is being monitored by Control Room.

6.2. However, DC & Schedule of Punjab, Haryana Uttarakhand and J&K State generator is not integrated with their SCADA system. It was requested that all states take up for integration of state generator in their SCADA system for further integration with NRLDC.

6.3. Issue was discussed in 23rd TeST Meeting held on 21.09.2023 & 24th Test Meeting held on 09.02.2024. Present Integration from J&K, Uttarakhand and Rajasthan is still pending. Considering high-demand crunch period, it is very critical to monitor all the generators and corresponding reserves. In this regard, it is requested to please take for integration of Schedule / DC of generators in SCADA.

6.4. Issue was also discussed in 73rd NRPC Meeting held on 21.05.2024 where Rajasthan SLDC representative stated that the work is being carried out in association with L&T and would be completed within next one-two week. Uttarakhand SLDC representative stated that DC declaration portal is under M/S Secure and SCADA system under M/S GE compatibility issues are being noticed. The work would possibly be completed after SCADA upgradation system. NRLDC requested Uttarakhand SLDC to take up the matter with Secure and GE and resolve the issue.

6.5. Issue was also discussed in 25th TeST Meeting and 50th TCC- 74th NRPC Meetings. After discussion timelines shared by states.

6.6. Issue was also discussed in 26th TeST Meeting held on 19th Nov 2024 and after discussion timelines shared by states is as below:

S.No.	State	Status	Timelines
1	Punjab	Available	Script Automation shall be done in months' time
2	Haryana	Available	They will integrate schedule through SAMAST within 2 months.
3	Uttarakhand	Not	Integration work is in process, considering Cyber

		Available	security requirement procurement of firewall is in process will be done in 3 months' time
4	Jammu & Kashmir	Not Available	J &K will discuss and revert

All concerned are requested to update the status please.

7. Non-availability of Real-Time data from PTCUL (Agenda by NRLDC)

7.1. As per details submitted by PTCUL out of 58 Sub-Station/Generating Stations data from only 26 Sub-stations are integrated at SLDC.

7.2. The same issue was also informed to PTCUL vide letter (Ref: - NRLDC/SLII/2019-20) dated: - 05.03.2020 38.3. Issue was discussed in Special Meeting with PTCUL held in July 2020 and December 2020. Subsequently issue was also discussed in 17th, 18th & 19th Test Meeting and 45th TCC-48th NRPC and 47th TCC-49th NRPC, 64th NRPC.

7.3. During 47th TCC -49th NRPC dated 27.12.2021, representative from PTCUL informed that they are in the process of tendering of RTU and OPGW Installation work and informed that they would expedite the installation works, and is expected to be completed in 6 months.

7.4. During 52nd NRPC Meeting dated 31.12.2022 NRPC Meeting PTCUL informed that PTCUL representative informed that they are on the verge of finalizing the OPGW project and order will be placed in one-month duration. Tender has been floated for RTU.

7.5. During 22nd TeST Meeting representative from PTCUL informed that last tender was cancelled due to higher rates then estimate; there was approximate 39% more than estimate. Further, it was informed that they have prepared fresh DPR for RTU & OPGW installation and they would submit the proposal within next 7-10 days. After approval, PTCUL will initiate tendering process and try to expedite the work.

7.6. It may be noted that SCADA upgradation project is also in progress, PTCUL is requested to please match the timelines with SCADA project, so that RTU can be integrated along with new SCADA commissioned.

7.7. During 25th TeST Meeting, representative from PTCUL informed that the project is stuck due to non-availability of funding from PSDF. After detailed discussion forum suggested PTCUL to explore alternate arrangements for project funding such as its own funds or state PSDF and complete RTU /OPGW procurement.

7.8. Matter was discussed in 26th TeST Meeting & After detailed discussion forum suggested PTCUL to explore alternative funding mechanisms, including utilizing State PSDF or their own funds, to ensure the timely execution of the project. PTCUL agreed to the suggestion and confirmed that they would resubmit the proposal for approval by their management.

PTCUL to update the status

8. Non-Reliable Telemetry from RRVPN Sub-stations (Agenda by NRLDC)

8.1. Telemetry is not available from many RRVPNL substations, RRVPNL/NRLDC control room engineers take the decisions based on real-time SCADA data available to Control room. Hence, good quality SCADA input data of all the grid

substations/generators is pre requisite for all time monitoring & Control of integrated grid. Unavailability of data may have far-reaching implications for decision-making processes during real time grid operation

8.2. Further, it has impact on successful running of state estimator. Correct telemetry is essential for running State Estimator/ Contingency Analysis in EMS, Better SE output will aid in situational awareness of the system operators of NRLDC.

8.3. RRVPNL/Rajasthan SLDC is requested to please take up for resolution of the issue at the earliest.

8.4. Matter was also discussed in 24th TeST Meeting held on 09th Feb 2024, where representative from Rajasthan SLDC informed that they have already taken up with matter with STU. However, resolution is still pending from STU.

8.5. Further issue was discussed in 50th TCC /74th NRPC held in Raipur on 29th-30th June 2024. During the meeting RRVPNL informed the following:

i. Estimate of upgradation 22 SAS stations (2 no.- 765kV, 8 no.- 400kV, 5 no- 220 kV, 7 no. 132kV) is finalised and it is expected that NIT shall be floated by August 2024.

ii. Further, they are in the process of replacement of 132 number of obsolete RTUs and estimate has been finalized and its NIT is also likely to floated by August 2024.

8.6. Matter was also discussed in 26th TeST Meeting held on 19th Nov 2024, where Representative from RRVPNL informed that there was delay in tendering due to some approval. However, they confirmed that tendering for RTU/SAS upgradation would be carried out by December 2024.

RRVPNL may update the status

9. Non-availability of Telemetry from HVPNL Sub-stations (Agenda by NRLDC)

9.1. Telemetry is not available from many HVPNL substations (including 400kV also), HVPNL/NRLDC control room engineers take the decisions based on real-time SCADA data available to Control room. Therefore, for continuous monitoring and control of the integrated grid, good-quality SCADA input data from all grid substations and generators is required. Unavailability of data may have far-reaching implications for decision-making processes during real time grid operation.

9.2. Further, it has impact on successful running of state estimator. Correct telemetry is essential for running State Estimator/ Contingency Analysis in EMS, Better SE output will aid in situational awareness of the system operators of NRLDC.

9.3. Most importantly, telemetry of many substations isn't available, **which serves as Drawl point for other end Drawl calculations.**

HVPNL may update the status

10. Communication channel redundancy/ Telemetry Issues to NRLDC (Agenda by NRLDC)

10.1. The provision of redundant & reliable communication was discussed in various TeST Meetings. Redundant communication is to ensure that at least two ports at RTU

end are configured for RLDC. Also, data is configured with two different communication channels for bringing redundancy into the system and increase reliability of data to NRLDC/RLDC.

10.2. The reliability of communication channel to NRLDC was discussed in various TeST Meeting since November 2016(8th TeST Meeting).

10.3. It is to inform that many RTUs are still reporting to NRLDC on single channel. It is to note that stations where second is down since long is considered as single channel only. Thus, it is requested that reliability of redundant channel may also be ensured.

10.4. List of RTUs with single channel is given below:

S.NO.	Name of RTU	Owner	Remarks
1	DHAULIGANGA	NHPC	
2	KISHANGANGA	NHPC	
3	PARBATI-2	NHPC	
4	PARBATI-3	NHPC	
5	SEWA-2	NHPC	
6	SALAL	NHPC	Create loop in communication system
7	URI-2	NHPC	
8	BUDHIL	IPP	
9	KARCHAM WANGTOO	IPP	
10	AD Hydro	AD Hydro	
11	Bhiwadi HVDC	POWERGRID	Second gateway Faulty
12	KalaAmb	POWERGRID	
13	CHAMBA	POWERGRID	
14	Lucknow 400	POWERGRID	Wrong analog data
15	KOTPUTLI	POWERGRID	
16	SOHAWAL	POWERGRID	
17	SAHAJAHANPUR	POWERGRID	
18	PATIALA	POWERGRID	Second gateway Faulty
19	Raibareilly	POWERGRID	
20	Fatehabad	POWERGRID	
21	Jhajjar	IPP	Communication link issue (Jhajjar to Hisar)
22	Prithla	Indigrid	Second gateway Faulty
23	SINGRAULI	NTPC	Main Gateway issue

10.5. It is requested to please take up for rectification of data on priority basis and confirm the dates of resolution of the points.

Concerned Utilities may update the status

11. Integration of PMUs at 220kV of RE Pooling Station (Agenda by NRLDC)

11.1. It is to inform the provision of installation of 8 no of PMUs at POI of RE pooling stations was approved in 62nd NRPC Meeting held on 31st Jan 2023 wherein NRPC forum approved for installation of PMUs through POWERGRID.

11.2. Further, issue was discussed in 218th OCC Meeting held on 18.04.2024 wherein POWERGRID informed that now PMUs has been delivered at all sub-stations. Also, substations and feeders where PMU needs to be installed were also finalised. Accordingly, addresses/IP Details of PMUs was shared by NRLDC in April 2024.

11.3. However, this is to inform that integration of these PMUs with NRLDC is still pending. It is requested to please advise the concern to expedite the installation and integration of PMUs at POI.

11.4. Matter was also discussed in 26th TeST Meeting held on 19th Nov 2024, where POWERGRID informed that there was some delay in installation due to finalisation of feeder and change in BOQ of CT/PT cables. They further informed that issue is resolved and installation activity is in progress and installation is likely to be completed by 31st December 2024.

POWERGRID to please update the status

12. Requirement for Additional VOIP SIP Numbers (Agenda by NRLDC)

12.1. The existing SIP numbers at NRLDC have been fully utilized, making it impossible to configure any new substations or plants.

12.2. We request POWERGRID to coordinate with M/s Orange for the allocation of additional SIP extension numbers to ensure seamless VOIP communication.

Members may deliberate

13. Extension of AMC for Hot Line Speech Communication System (M/s ORANGE) (Agenda by POWERGRID)

13.1. Hot line speech communication system was implemented by POWERGRID for PAN India basis wherein NLDC, RLDCs and all SLDCs are inter connected through **Alcatel Lucent make EPABX system**, VOIP/Analog phones are also installed at power plants/sub-station/IPPs, etc over dedicated OPGW network of ULDC. This scheme was executed by M/s ORANGE and 7 years of AMC was also part of the original contract. Subsequently the AMC for Hot line speech communication System was further extended for two years from July'2023 to July'25.

13.2. During extension of AMC for two years in 2023, it was envisaged that new project for Hot line speech communication system would be implemented by July' 2025, however this project was only approved in 27th NCT meeting held on 06.02.2025 with implementation schedule of 18 months and POWERGRID is implementation agency.

13.3. Further in earlier CEA/NRPC meetings, CTU, NLDC and RLDCs requested to extend AMC of Alcatel Lucent make EPABX system, implemented by M/s ORNGE till the commissioning of new system. In view of above and grid operation system requirement, AMC for Alcatel Lucent make EPABX system is required to be extended for further Two years through M/s ORANGE, provision for termination of contract/reduction of site may be kept in the contract, in case commissioning of new system.

13.4. For extension of AMC, POWERGRID requested to M/s ORANGE to extend AMC support for at least 2 years, so that we can get upgradation/replacement time, however M/s ORANGE has still not submitted their offer and they mentioned that they are exploring spare inventories with older version of cards, so that services can be run without upgradation of system. Further, they also mentioned that in case equipment becomes faulty during the AMC then, they shall render the services on best effort basis and SLA / Penalties shall not be applicable.

13.5. POWERGRID is proposing that additional financial implication on account of AMC extension through M/s ORANGE (Presently engaged in AMC) for next two years shall be booked in ULDC O&M charges and additional cost implication shall be recovered in tariff charges under CERC O&M cost.

Members may deliberate

14. Establishment of Redundant Communication Network for Centre Sector and RRVPNL (Agenda by POWERGRID)

14.1. For establishment of redundant Communication Network for Central Sector and RRVPNL in Rajasthan, a scheme was approved in 58th NRPC meeting wherein 3 pairs of OPGW fibres are to be spared from existing RRVPNL network for establishment of redundant communication network for RTU/PMU/SCADA applications data reporting at Jaipur SLDC and NRLDC/NLDC. For execution of works, a contract has been awarded to M/s Deejay System Consultants Private Limited, vide NOA Ref. No.: CC/NT/W-COMM/DOM/A00/24/05281/NOA-1/24-112268/01 and NOA-2/24-112268/02 both dated 27.09.2024. Survey, design and engineering works has been completed, equipment manufacturing is under process and materials likely to be delivered by first week of May' 2025. Subsequently installation and commissioning activities will be started.

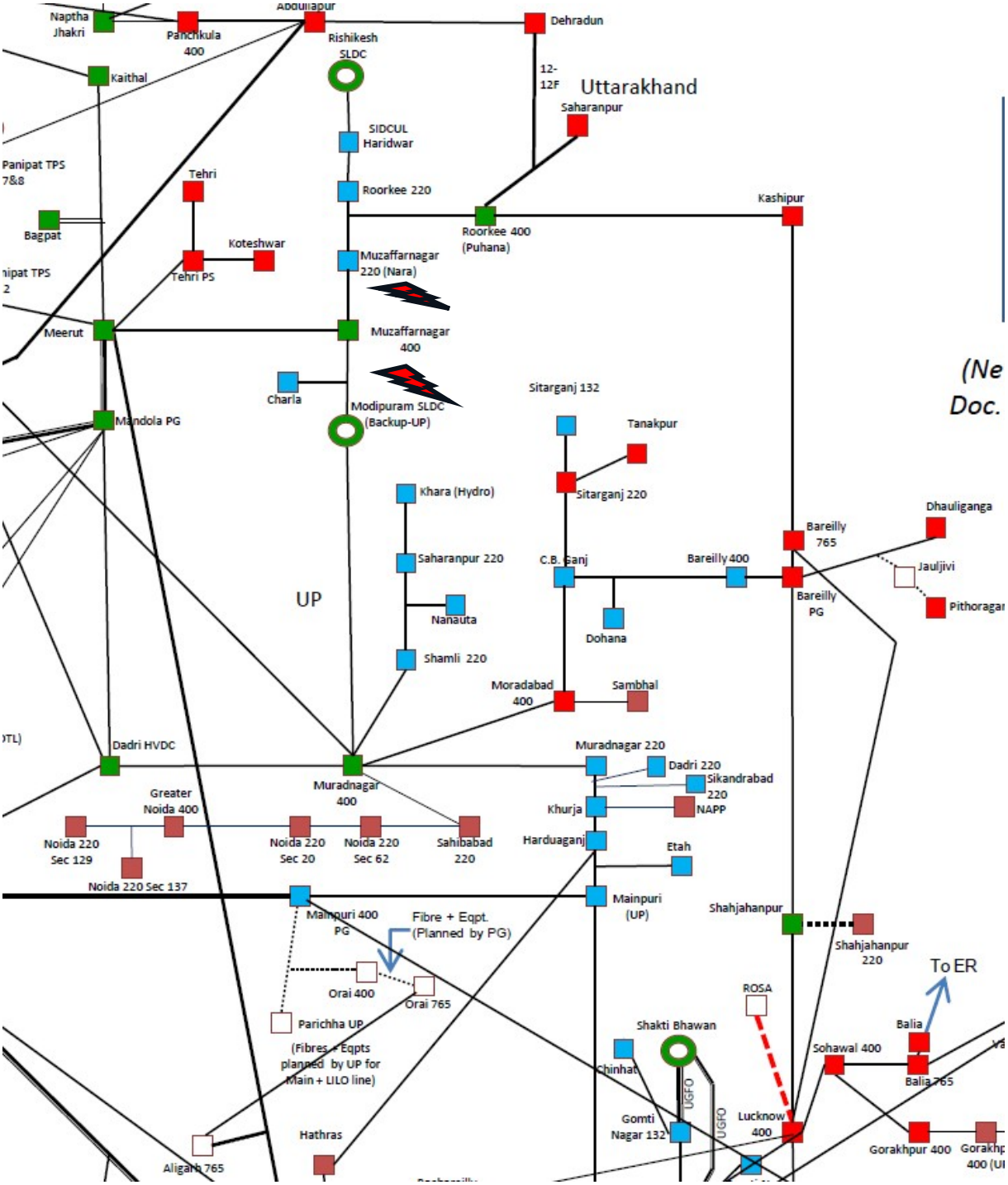
14.2. In addition to communication equipment, approx. 5 kms of 48Fibre OPGW was planned to be laid on 400kV Jodhpur-Bhadla line for establishing 24fibre network for Jodhpur-Merta and Jodhpur-Bhadla line. After survey, approx. 5 kms of 48Fibre OPGW needs to be laid on 400kV Ratangarh-Suratgarh line ckt-I or 400kV Ratangarh-Suratgarh line ckt-II (both single circuit lines, having 4 nos of earthwire peaks) to reach at 400kV Ratangarh RVPN sub-station to have additional optical redundancy for Rajasthan transmission network by shifting 400kV Bikaner-II to Khetri line Ratangarh repeater station to 400kV Ratangarh RVPN station. This will provide additional redundancy in communication network and reduce one equipment as well.

14.3. RRVPNL is requested to allow laying of 48Fibre OPGW on any of 400kV Ratangarh-Suratgarh Circuit-I or 400kV Ratangarh-Suratgarh Circuit-II to have additional redundancy for centre sector as well as RVPN network. (Detailed network is attached at **Annexure-V**)

Members may deliberate

15. Operational Issues in OPGW Network – Longer outages in UPPTCL owned OPGW links (outage in Muzaffarnagar 400kV – Nara 220KV and Modipuram – Charla link) (Agenda by POWERGRID)

15.1. NLDC, RLDCs and SLDCs & their Backup control centre connectivity are being provided by POWERGRID under Centre Sector communication network. Accordingly, Modipuram back up SLDC connectivity was planned in following manner:



15.2. In this case, no centre sector transmission network was available for Modipuram control centre, therefore Modipuram connectivity was planned through UPPTCL network under Microwave Replacement scheme. OPGW network was further strengthened under Fibre Optical Communication System for Centre Sector schemes and these links were utilized as part of Inter-Regional connectivity as well for reporting of data to Backup NRLDC at Kolkata and vice-versa.

15.3. Out of above OPGW connectivity, two (02) OPGW links i.e., Muzaffarnagar 400kV – Nara 220KV and Modipuram – Charla links were out of service/ Intermittent for more than 2 years, resulting Backup SLDC, Modipuram is working on single route and centre sector connectivity for Inter-Reginal links are disturbed since then.

15.4. It may be noted that recently SLDC Lucknow got some technical glitch and SCADA services got impacted, at the same time Modipuram backup control centre was also not able to put in service due to database sync issues, resulting outage of SCADA services for almost five ad half hours. Although communication links for Modipuram was found working on Single route but we need our communication network robust, reliable and availability should be 100% in line with communication regulation.

15.5. Therefore, UPPTCL is requested kindly to take up with concern wing of communication and get these OPGW network restored permanently instead of temporary majors like OFC laying on ground. 4 fibres has to be provided to ULDC as earlier since 2012-13 and 2 fibres have to keep as spare. This may be noted that RTU services at main SLDC are reporting through centre sector Tejas equipment and if back network is also robust then backup services of RTUs can also be reported through same network and establishment of New SCADA System is likely to be completed by Dec' 2025 but without redundant communication network, no control centre can work smoothly.

Members may deliberate

16. Issues being faced during OPGW installation and Diamond creation works specially in RE Pocket / Whole Rajasthan Area (Agenda by POWERGRID)

16.1. During installation of OPGW in live line condition (under Non-Auto Mode), work permits are being denied by NRLDC, resulting delay in completion of works. In recent times LIVE LINE work permit was delayed on 400kV S/C Deedwana-Bikaner line and OPGW works of approx. 4.6 Kms was took almost 20 days to complete the link commissioning. It may be noted that work was carried out in Dec' 2024 and due foggy conditions, work in night hours specially in LIVE LINE conditions suffers a lot. Hardly 2 to 3 hours of working window was available to labours and this is also a safety concern specially in LIVE LINE works.

16.2. This FY 2025-26, approx. 1300Kms of LIVE LINE OPGW installation are planned, in 2-3 lines works has also been started. NRPC, NLDC and NRLDC is requested kindly to consider above challenges in LIVE LINE works and allow work permits in day time as well, so that time lines of project execution can be achieved.

16.3. Problem being faced in OPGW Diamond creation working during night hours

16.4. OPGW (Optical Ground Wire) installation is being carried out by Power Transmission Utilities for establishment of communication system for Grid operation purpose. At power line crossings, OPGW diamonds are created to ensure adequate clearance and prevent line tripping at the crossings. However, now-a-days shutdowns are approved in night hours, especially in RE pockets.

16.5. Poor visibility in remote areas, increases risks to manpower and complicates precise measurements of clearance with risk of potential line tripping at the time of charging or during bad weather conditions. Whereas, daytime operations could address these issues, leveraging natural light for improved visibility and safety.

16.6. Forum may discuss and give suggestion regarding the requirement of daytime shutdowns for OPGW diamond creation works, addressing safety, technical and operational issues without compromising the grid stability.

Members may deliberate

17. Issues being faced by NMT Team at UNMS Control Centre (Agenda by POWERGRID)

17.1. UNMS System has been commissioned in Northern Region, most of the node (80%) were integrated, however integration of many Network Elements are still pending and support from States and CTU/NRLDC is required to take up for integration of pending NEs in UNMS, so that full utilization of UNMS system can be done.

17.2. Integration of ABB/Tejas/Fibcom equipment in UPPTCL network:

UPPTCL is in process of integration of their Tejas/Fibcom/ABB equipment in their NMS and once it is integrated with local NMS, they will auto reflect in UNMS system. For ABB equipment, node wise integration is required, for that separate link connectivity has to be provided. UPPTCL is requested to update the latest status.

17.3. Integration of Network Equipment from IPPs and TBCB:

With the support of CTU/NRLDC, 2-3 meetings were conducted with ISTS licensees and IPPs, however no integration has taken place.

17.4. Integration of GE make equipment in HPPTCL:

It is again requested to provide links for integration of the same. In earlier meetings, HPPTCL confirmed that there were some commercial issues with GE due to which link could not be provided. They are taking up with OEM for integration and trying to resolve the issue at the earliest. Latest status may be updated by HPPTCL/HPSEBL.

17.5. Integration of Keymile equipment in HVPNL Network:

POWERGRID informed that there is no support from HVPNL/Keymile for integration of Keymile equipment in UNMS. Earlier it was agreed by HVPNL that they will provide one equipment to POWERGRID/Sterlite for testing purpose; however, this could not materialize and no testing have done. Now it is understood that HVPNL's AMC partner M/s Velocis has left site and no support is available with HVPNL for integration and operation of Keymile equipment. HVPNL may intimate their future course of action including replacement of keymile equipment.

17.6. One more challenge, NMT team is facing that they are not able to get update network details i.e., total numbers of nodes/equipment in particular state and total integrated, balance integration in UNMS. This requires support from respective state utilities. During project implementation in 2022-23, POWERGRID have some figures and we are monitoring on that, however it is understood that after award of new packages by respective utilities, numbers of equipment/Node have got changed but no input is available with NMT team.

17.7. To resolve these issues, one nodal officer from each State may be nominated who will coordinate with centralized NTM team for day-to-day integration and operational issues.

17.8. One more challenge is being faced during upgradation of software version in existing NMS / individual nodes, sometimes equipment got faulty and we need spares but states don't have spare available for the particular equipment. To meet operational requirement, sufficient spares may be kept by all States constituents. We are facing issues with DTL and UPPTCL for ECI equipment.

17.9. Some constituents have shutdown UNMS System at their control centres due to non-availability of uninterrupted power supply (PTCUL) or non-availability of Air Conditioning system (DTL). DTL and PTCUL are requested kindly to work out solution for powering up UNMS system at their control centres. Others are also requested to make their infra suitable for smooth operations specially in summers.

17.10. Integration of JKPTCL communication system with UNMS. Earlier some temporary arrangements (local laptop with NMS software) were done to integrate JKPTCL network but sometimes it got out of service/ powered off. NMT team may also

requires Escalation matrix for ISTS node for intimation and resolution of outage issues – CTU/NRLDC may provide the details of concerned officials, so that time intimation may be issued to concerned ISTS/IPPs.

17.11. System Improvement: As per Bandwidth utilization report, some of the routes are facing bandwidth choking specially in STM-4 routes. System generated report from UNMS system is attached for further deliberation and consideration for upgradation.

17.12. Following sections have B.W. Utilization over 75%, may be proposed for upgradation to next higher capacity:

Source Node	Source Port	Destination Node	Destination Port	Layer Rate	B.W. Utilization (%)
Allahabad_PG	STM4-1-2-4	varanshi 765	STM4-1-7-1	STM-4	86.51
LUCKNOW400_ SDH-01	STM4-1-1-1	Sohwal	STM4-1-1-5	STM-4	88.89
BAGPAT	STM4-1-2-2	Meerut01	STM4-1-111-1	STM-4	80.95
Saharanpur	STM4-1-3-1	Dehradun PG	STM4-1-1-1	STM-4	77.78
Patiala_PG	STM4-1-2-3	SLDC_CHD.	STM4-1-111-1	STM-4	88.89
Bhiwani	STM4-1-2-2	Bhiwani 2	STM4-1-3-1	STM-4	82.94
SLDC_Panipat	STM4-1-3-5	BBMB_ DADRI_HR	STM4-1-2-3	STM-4	77.38
SHAHJAHANPUR	STM4-1-3-1	LUCKNOW400_ SDH-01	STM4-1-3-5	STM-4	85.71
Gagal	STM4-1-3-1	HAMIRPUR 2	STM4-1-3-1	STM-4	87.7
Ludhiana_PG	STM4-1-1-1	PG_MALERKOTLA	STM4-1-2-1	STM-4	80.95
Jalandhar-PG	STM4-1-1-5	Rep Jalandhar	STM4-1-2-2	STM-4	85.71
Jalandhar-PG	STM4-1-3-1	HAMIRPUR PG	STM4-1-3-1	STM-4	78.97
HAMIRPUR 2	STM4-1-2-3	HAMIRPUR PG	STM4-1-2-3	STM-4	80.16
Ballabhgarh02	STM16-1-2-1	Tughlakabad 400	STM16-1-2-1	STM-16	82.84

Members may deliberate

18. SDH equipment of FIBCOM make installed under Package-IV(a) & IV(c) at different locations in Himachal Pradesh are maloperating during transmission of real-time data. (Agenda by HPSEBL)

18.1. Under Package IV (a) & 1V(c) 24 Nos. SDH multiplexer equipment of FIBCOM Make has been installed under Establishment of Fibre Optic Communication System in Northern Region for State Sector by PGCIL at various sub-stations in HP. These SDH multiplexer equipment installed/ commissioned during year 2018. However, communication of the real time data through these equipment started w.e.f. March, 2022. In this regard it is submitted that these equipment are not working smoothly from starting and latency in communication link, frequent data halt without showing any indication.

18.2. Frequency of failure in various cards such as Optical card, LAN card, CMCC card in these equipment is very high. The issue has already been taken up time and again with the FIBCOM Engineer posted at Shimla, however, the issues always remain unresolved. Usually, manual resetting of equipment is required to re-establish Communication links, interfacing with other make SDH for handing over/taking over the real time data and voice cannot be easily configured with Fibcom devices. Due to these issues, seamless communication in the equipment is not fully established. These issues were also deliberated in 20th meeting of Telecommunication, SCADA & Telemetry Sub-Committee to rectify the problem but no reliable / fruitful / permanent solution has been provided by the quarter concerned(s) for seamless un-interrupted communication.

18.3. PGCIL requested to take up the matter with M/s. Fibcom Primatel private Ltd. to provide an adequate solution to resolve the issues to establish seamless and uninterrupted communication.

Members may deliberate.

19. Communication System for Transmission scheme "Transmission system for evacuation of power from Shongtong Karcham HEP (450 MW) in Himachal Pradesh" (Agenda by CTU)

19.1. Transmission scheme "Transmission system for evacuation of power from Shongtong Karcham HEP (450 MW) in Himachal Pradesh" was discussed in the 37th Consultation Meeting for Evolving Transmission Schemes (CMETS) in Northern Region held on 27.03.2025 (Minutes Awaited) wherein HPPTCL had proposed following interim arrangement for evacuation of power from Shongtong HEP.

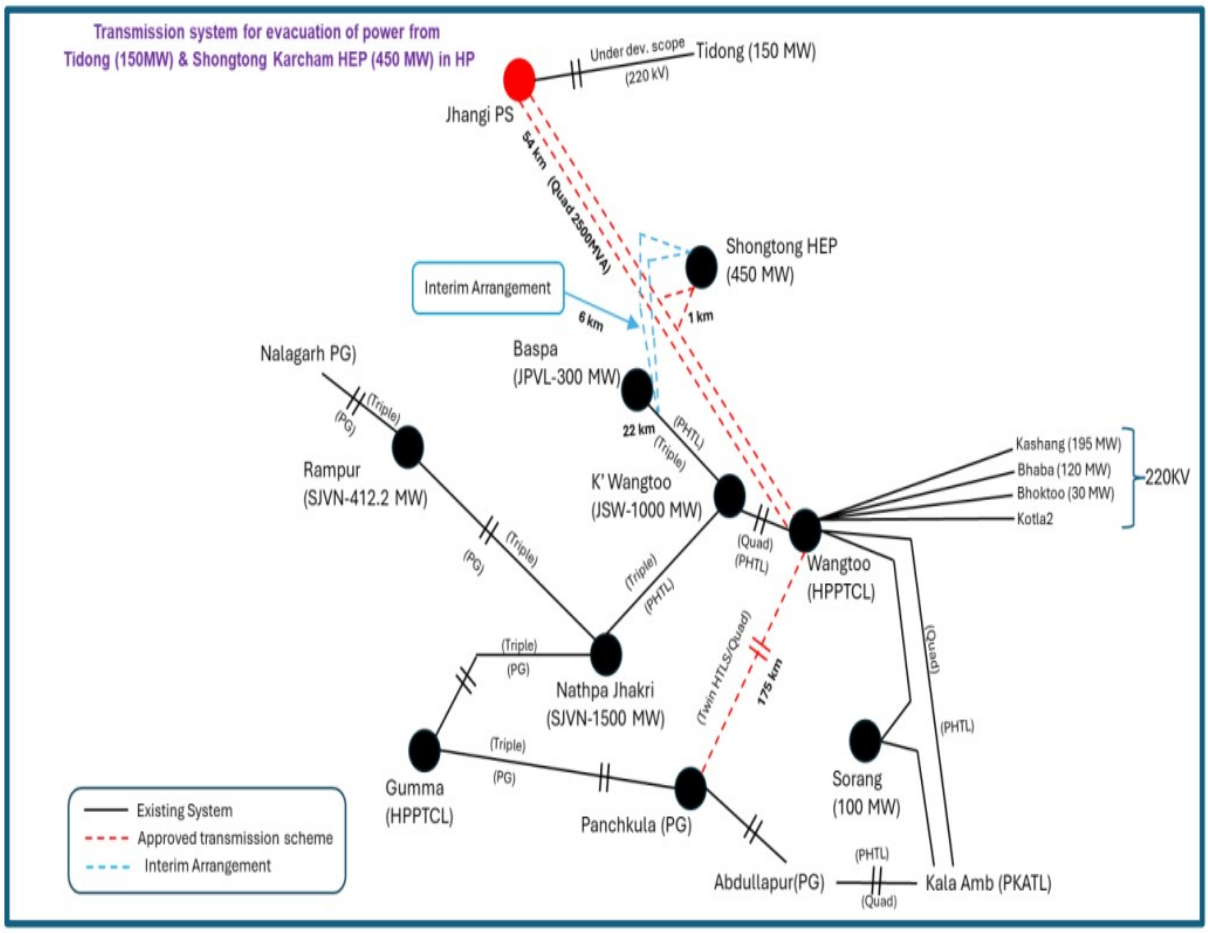
i. LILO of one circuit of Baspa — Karcham Wangtoo 400 kV line at Shongtong HEP

19.2. As per the database available with CTU, OPGW is available on Baspa to Karcham Wangtoo. POWERGRID may confirm the same.

19.3. HPPTCL shall also needs to install OPGW on the proposed LILO portion so that data of upcoming Shongtong HEP may be sent to SLDC and further to RLDC till the availability of Jhangi PS (HP) -Wangtoo (HP) link. For final arrangement this LILO portion shall be disconnected and to be connected with proposed Jhangi – Wangtoo line. Therefore,

OPGW provided on the LILO portion of as interim measure shall be utilised to be integrated with OPGW of Jhangi – Wangtoo line later on.

19.4. In the 37th CMETS HPPTCL stated that regarding installation of OPGW on the LILO portion, they shall confirm in the separate meeting. CTU suggested same can be deliberated in the upcoming 27th NRPC TeST meeting scheduled in April'25.



20. Status of schemes approved in various NCT (Agenda by CTU)

20.1. In the 26th NRPC TeST Meeting, Status of various ISTS communication schemes approved in NCT were deliberated. Forum suggested that this monitoring could be held under the NRPC level.

20.2. Details of the schemes approved in the NCT are attached at **Annexure-VI**, Respective Implementing Agency/TSP is requested to provide current status of these schemes.

Members may deliberate.

III. Other Agendas

21. Utilizing the Asset in the Deployment of the OPGW Network (96 cores (Agenda by POWERLINKs)

21.1. Powerlinks Transmission Limited carries out O&M of EHV transmission line(220kV and 400kV) having towers spread across 3 states from West Bengal to Uttar Pradesh. In existing transmission infrastructure, appx. 90% of the transmission line does not have OPGW which can be utilized for:

i. System Integration - OPGW facilitates the integration of Supervisory Control and Data Acquisition (SCADA) systems, which are essential for real-time monitoring, automation and control of the electrical grid.

ii. High Speed communication/ Data Transmission - The optical fibers within the OPGW are used for high-speed data transmission, which supports a range of communication needs.

iii. Lightning Protection - OPGW is installed at the top of the transmission tower, where it can intercept lightning and safely divert it to the ground.

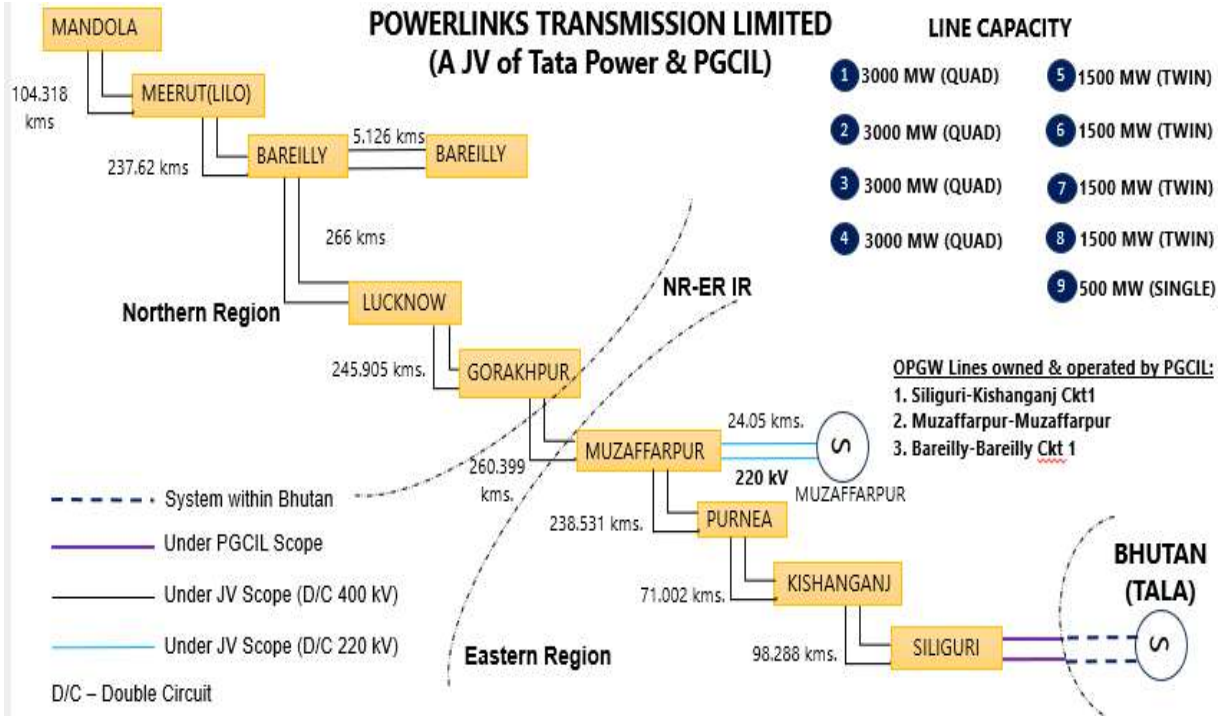
21.2. Also, as per the advisory by Central Electricity Authority dated 22.05.24 (reference attached), Central and State Sector utilities must prioritize the implementation of the OPGW laying across its transmission network to ensure compliance with regulatory requirements.

21.3. Hence, to optimally utilize the existing transmission assets covering three states with a significant line length and adhere to the compliance with regulatory requirements, Powerlinks propose to set up OPGW network in entire line length of Powerlinks Transmission Limited.

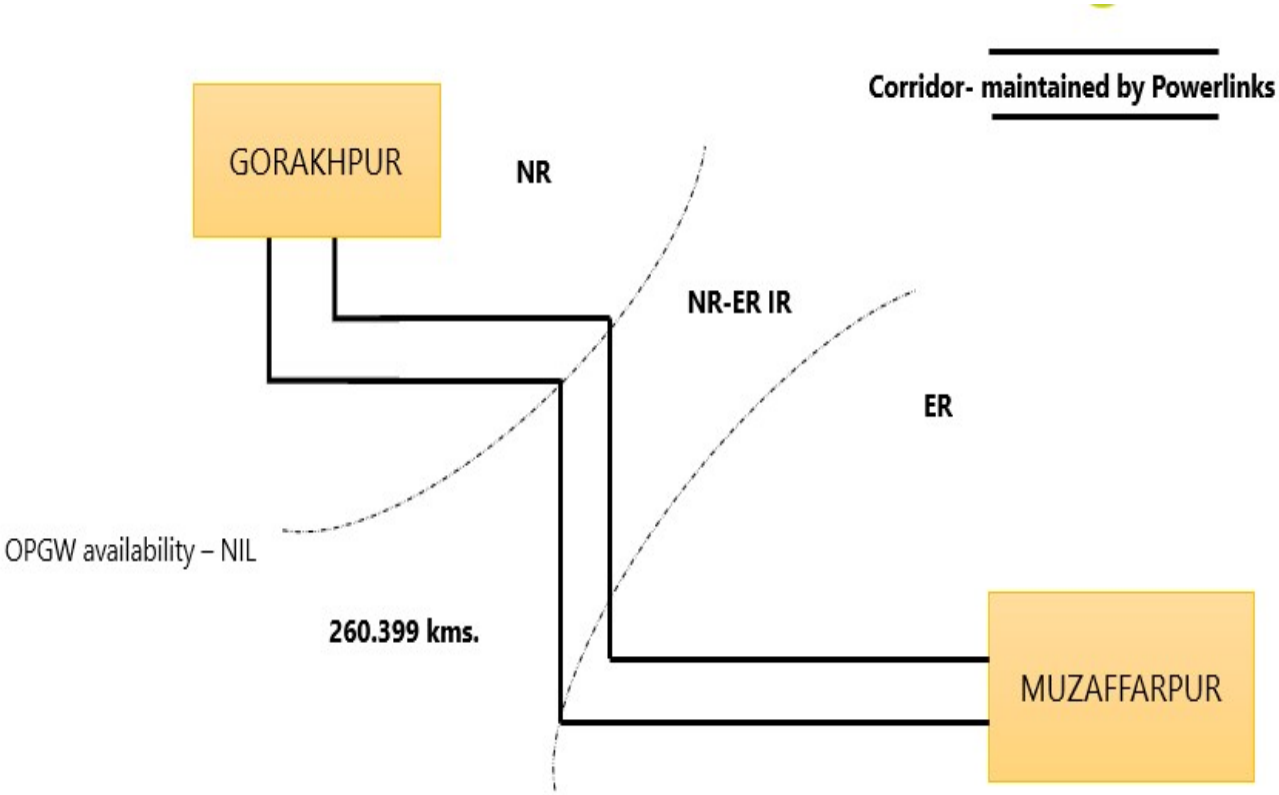
21.4. Details of transmission lines owned and maintained by Powerlinks in the Northern Region

S.N.	Line name	Line Length (In KM)
1	Muzaffarpur-Gorakhpur Circuit 1	260.399
2	Gorakhpur-Lucknow Circuit 1	245.905
3	Bareilly-Lucknow Circuit 1	266
4	Bareilly-Meerut Circuit 1	237.62
5	Meerut-Mandola Circuit 1	104.318
	Total line length (kms.)	**1114.24**

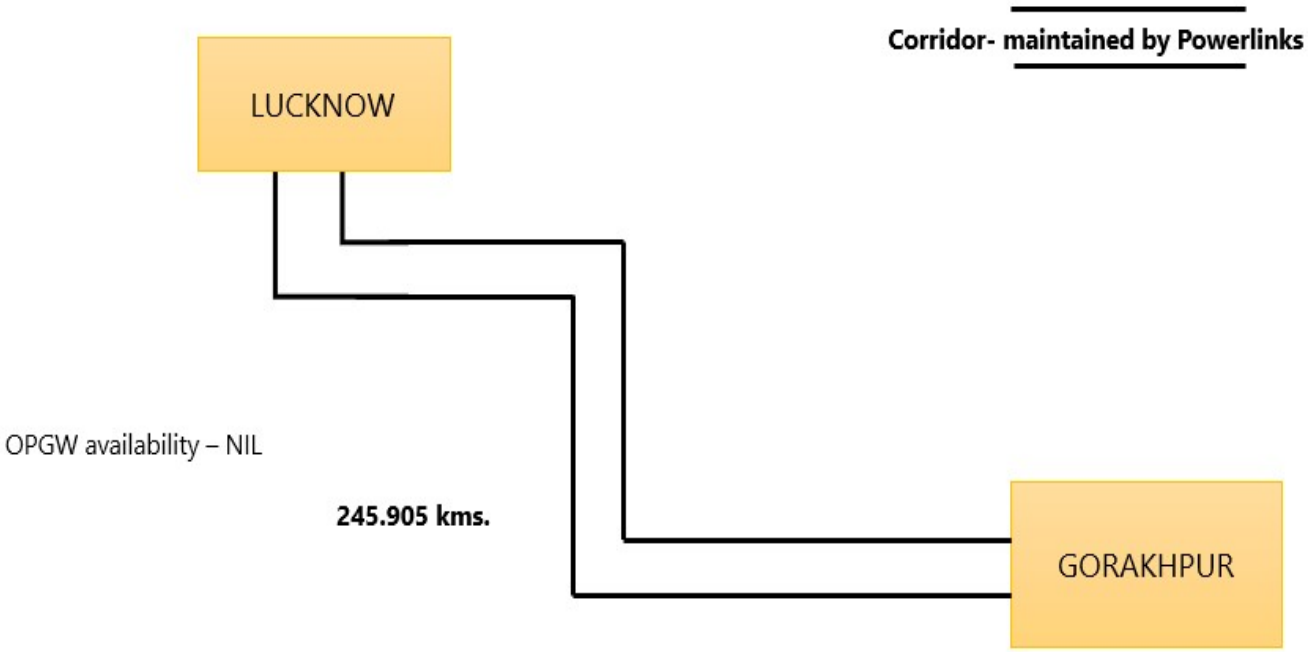
OVERVIEW



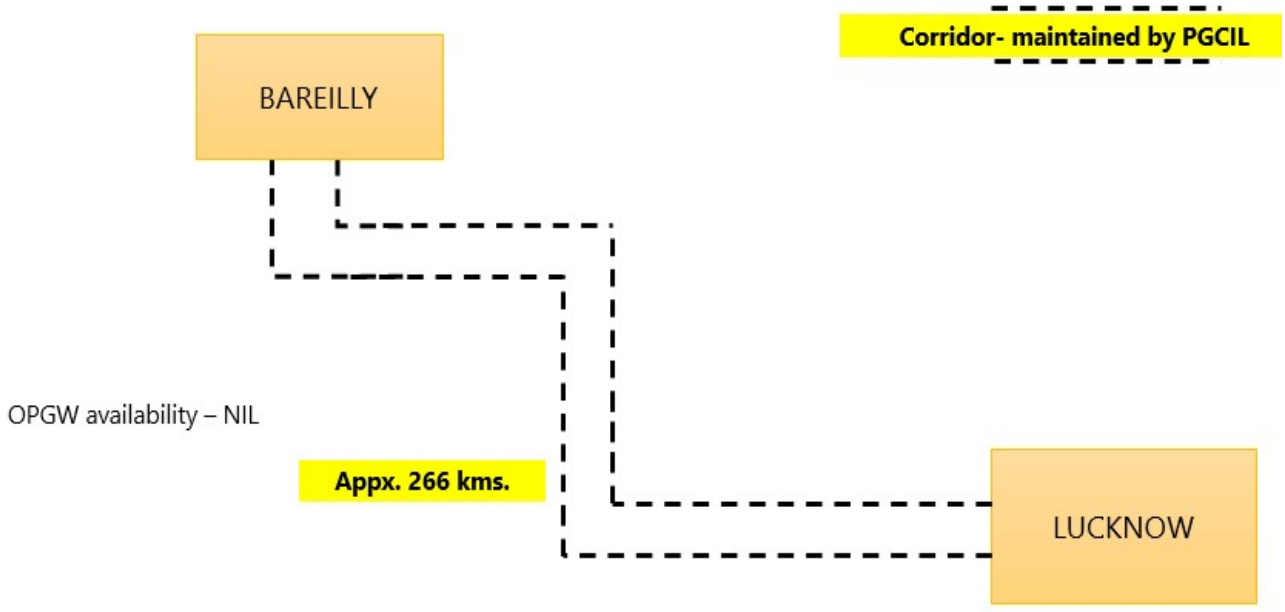
SECTION 1 (MUZAFFARPUR-GORAKHPUR)

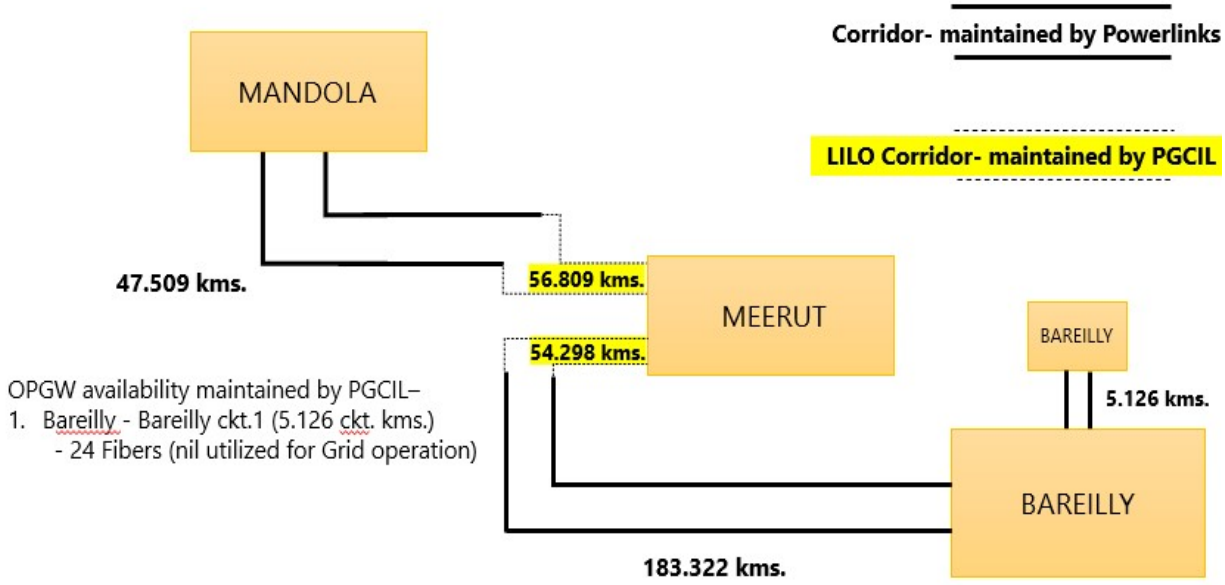


SECTION 2 (GORAKHPUR- LUCKNOW)



SECTION 3 (LUCKNOW-BAREILLY)





SECTION 4 (BAREILLY-MANDOLA)

22. Implementation of U-NMS Project (Agenda by NRLDC)

22.1. U-NMS project is being implemented by POWERGRID in Northern Region through M/s Sterlite. As per information given by POWERGRID that FAT/SAT of the system is complete and System Availability test is going to start and final commissioning is expected in November 2023.

22.2. As discussed in 22nd TeST Meeting for commissioning of U-NMS Project, database is required of existing NMS of centre sector / state sector/ IPPs / Solar developer/ other transmission licensee and independent nodes which are reporting data for grid operation. Technical details/ information pertain to integration has been obtained for POWERGRID installed NMS system(s) which were part of ULDC schemes, whereas details from state sector/ IPPs / other transmission licensee are still not been available in full shape to UNMS vendor, which may further delay the works for database development and integration.

22.3. As it is essential that all NMS and Network Equipments are required to be integrated in the U-NMS for monitoring and configuration of elements in Northern Region.

22.4. However, till date any Network Equipments are yet to be integrated in U-NMS. During 23rd TeST Meeting held on 21.09.2023 it was informed that out of 1300 equipments around 900 Equipments has been integrated in U-NMS and details of pending integration was shared as given below.

22.5. Integration of ABB equipments from UPPTCL: POWERGRID informed due to limitation in ABB NMS they require separate link from individual ABB Equipments for its integration in U-NMS and requested UPPTCL provide the same. UPPTCL informed that they will check and provide within next 15 days.

22.6. Regarding integration of Network Equipments from IPPs and TBCB, it was requested that CTU shall convene special meeting with IPPs and other transmission licensee for integration of the same.

22.7. Integration of Tejas and Fibcom Equipment from UPPTCL: Representative from UPPTCL informed that Tejas project is under implementation and upon implementation of all Equipments NMS will be commissioned which in turn can be integrated with U-NMS. POWERGRID requested UPPTCL to expedite the commissioning of NMS first so that it can be integrated with U-NMS and as and when new equipments is commissioned it will be integrated with U-NMS automatically. UPPTCL agreed for the same.

22.8. Regarding Fibcom equipments, representative from UPPTCL informed that they resolve the issue within one month. Regarding integration of GE make equipments from HPPTCL POWERGRID requested HPPTCL to provide links for integration of the same. HPPTCL confirmed that they will provide the same in next 15 days.

22.9. Regarding integration of Keymile equipment, POWERGRID informed that HVPNL has given test equipment to POWERGRID for development of adapter for integration of Keymile equipment with U-NMS. Upon development of adapter, they will takeup for integration of equipments with Keymile.

22.10. During 24th TeST Meeting held on 09th Feb 2024 it was agreed and POWERGRID shall share with CTU the list of NEs which are yet to be integrated with UNMS in next 7 days. Upon receipt of list, CTUIL shall take with all concerned for integration of NEs in UNMS and try to resolve all the issues at the earliest.

22.11. During 25th TeST Meeting held on 25.06.2024 Representative from POWERGRID informed that 948 nodes out of 1268 nodes have been integrated with U-NMS and CTU in coordination with POWERGRID shall take up with all concerned for integration of pending Network Equipment. Further, CTU to convene a special meeting within 15 days with all stakeholders-SLDCs, TBCB projects/ REGS/ RLDC/ RPC/ POWERGRID to resolve integration challenges.

22.12. Matter was discussed in 26th TeST Meeting held on 19th Nov 2024, where Representative from POWERGRID informed that approx. 1054 out of 1300 equipments has been integrated with U-NMS. Further, they shared status of pending Network Equipment.

22.13. Approx. 100 Keymile equipment of Haryana could not be integrated due to no support from Keymile and informed that Haryana is in process of these Network equipments. On replacement new equipment will be integrated with U-NMS.

22.14. Many Equipment of ABB/GE make of Himanchal Pradesh are yet to be integrated. However, technical issues have been resolved and they are in the process of integration and informed that pending equipments will be integrated within 1 month.

22.15. Uttar Pradesh: Integration of ABB make PMUs is pending in Uttar Pradesh due to non-availability of support contract with OEM. UP informed that they are in process of award for support services. They further informed that integration shall be done within 2 months.

22.16. Many equipment's supplied under TBCB and RE generator equipment's integration is pending and they requested CTUIL for coordination with them. CTUIL informed that they will convene a special meeting and will try to integrate these at the earliest.

CTUIL/Powergrid to update the status.

23. Ticketing/Complain portal provided under UNMS (Agenda by NRLDC)

23.1. As per CERC procedure of "Centralized supervision for quick fault detection and restoration" issued on 19th Jan 2024, NMT of CTU shall monitor the communication network and logs of fault/ event reporting as raised by the Communication System Owner/ Users and Nodal Agencies in the following manner:

i. Through raised trouble tickets in Centralized Network Management System

ii. Lodged complaint through web portal.

iii. System generated alarms (including standalone NEs)

iv. Through any other communication media (mail, phone etc)

23.2. In this regard it is to inform that U-NMS in Northern Region has been commissioned by POWERGRID. CTUIL/POWERGRID is requested to please deploy NMT as per CERC approved procedure. Further, it is requested that necessary details along with detailed procedure for accessing Ticketing/Complain portal may be shared by CTUIL.

23.3. During 25th TeST Meeting CTUIL informed that ticketing portal is available in U-NMS remote console, specific detailed timelines for deployment of a web ticketing portal for UNMS will be apprised by CTU to all stakeholders within 15 days.

23.4. It may be noted that ticketing portal prepared in U-NMS is basically for U-NMS asset and there is no provision of fetching link/channel details and it is very difficult to communicate exact issues through this portal. As discussed in 25th TeST Meeting CTUIL is requested to please update detailed timelines for deployment of a web ticketing portal for UNMS.

23.5. It was discussed in 26th TeST meeting held on 19th Nov 2024 and representative from CTUIL informed that as discussed/approved in 15th NPC Meeting provision of Web Based Outage Portal for communication system and ticketing portal has been kept under National U-NMS and can be commissioned along national U-NMS only. POWERGRID/CTUIL confirmed to explore possibility of existing functionality given in U-NMS can be modified, so that it can utilised for ticketing purpose.

POWERGRID/CTU to please update the status

24. URTDSM (Unified Real Time Dynamic State Measurement) Phase-I Cyber Security Issues (Agenda by POWERGRID)

24.1. The URTDSM Phase 1 System was made operational from year 2018-19 onwards. The Contract was awarded in 2014. The AMC of URTDSM phase 1 system is available till Jan 2027. The various systems (IT hardware/Software) were procured in 2015-16 and are about 10 years old and most items have reached technical obsolescence.

24.2. The URTDSM phase-II project for replacement of these items is still under DPR stage and will take at least 3 years for implementation. Hence the URTDSM phase 1 system are to be kept functional and secure till Jan 2027 and beyond.

24.3. Also, CEA cyber security regulations require certain changes in the URTDSM phase 1 system architecture, which necessitates addition of few cyber security components. Also, the Auditors of cyber security have raised NCs (Non-Conformity) for this deviation. The following are the three measures proposed to resolve these issues.

A. <u>Virtual patching for Servers with Windows 2012 R2 Operating system</u>

a. Support from Microsoft for Windows2012 R2 Operating system has expired on 10th October-2023:

b. M/s GE informed that Win OS (Servers) upgrade is not feasible under current circumstances owing to following reasons:

   i. Some of the current applications will not be supported on new operating systems as GE WAMS application Roadmap is heading for different application suite i.e., GridOS WAMS

   ii. Associated applications of 3rd party tools will also not be supported on new operating systems.

c. In view of above, a system upgrade on existing infra is not feasible in current set-up.

POWERGRID explored the following alternative of Virtual patching to ensure the security of existing Windows Server until Phase-II systems which are in place:

- URTDSM WAMS System is being maintained air-gapped with perimeter protection at Firewall level and available updated Anti-virus patches for system robustness and security.
- Additionally, at HIPS level, option for Virtual patching shall take care of the obsolete Windows Server 2012 OS. 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.
- POWERGRID discussed with the OEM M/s TrendMicro and obtained budgetary quote. The OEM quoted approximately Rs. 1.50 Crores for all 500+ Servers installed in URTDSM System pan India (approximately Rs 30,000/- per Sever for 3 years license support)
- The solution is under PoC in one of the RLDCs. The cost at each control centre is **Rs.4.05 lakhs excluding GST.**

Members to deliberate and concur the proposed solution of virtual patching to address the obsolete Windows Server 2012 OS issue.

Upon concurrence from the RPC, licenses from the OEM shall be procured on Cost sharing basis.

B. <u>PMU Data Streaming through Firewall:</u>

a. There is an observation in Cyber Security Audit to stream the data from PMU to PDC through a Firewall.

b. Also, CEA Cyber Security guidelines 2021 stipulates creating of electronic security perimeter (ESP). This necessitates the requirement of streaming PMU data through firewalls at all control centres.

c. The same requirement was not envisaged in the URTDSM Phase-1 system design. Hence, M/s GE was asked to submit the techno-commercial offer for the segregation.

d. Based on the discussions in SCADA Work Group meeting in some RPCs, it was proposed to use the existing internal firewalls only (by configuring separate VLAN) for PMU data streaming instead of purchasing a new firewall. This solution also needs procurement of an additional 2 LAN switches.

e. Accordingly, based on the quotation given by GE, the cost of the solution for each Control centre is **Rs. 15.35 Lakhs excluding GST** (Services for configuring internal firewall and supply of 2 new LAN switches).

Members may deliberate and concur the above proposal to address the requirement of PMU data streaming through firewall.

C. <u>Retention of logs up to 6 months:</u>

a. There is an observation in Cyber Security Audit to retain security event logs for 6 months (180 days).

b. CEA Cyber Security Guidelines 2021 stipulates System logs need to be maintained for at least 6 months.

c. In URTDSM Phase-1 log retention was envisaged for only 1 month.

d. In view of above, POWERGRID obtained the techno-commercial offer from M/s GE which proposed 6TB additional storage requirement at each LDC to meet the log retention for 6 months.

e. The cost quoted by M/s GE for each Control Centre is **Rs. 19.35 Lakhs excluding GST**.

f. Members may deliberate and concur the proposal to procure the additional storage for Syslogs.

<u>Summary of POWEGRID Agenda for URTDSM Phase-I AMC Issues:</u>

S No	Description of the Issue being faced in URTDSM Phase-I AMC	Solution Proposed by POWERGRID	Tentative Cost in Rs. Lakhs excluding GST	Remarks
1.	**Windows 2012 R2 OS Obsolescence:** Support from Microsoft for Windows2012 R2 Operating system has expired for different Server applications in the URTDSM system. Microsoft declared End-of-Support for the Win2012 R2 OS and system upgrade on existing IT infra is not feasible.	To procure Virtual patching solution (Software License) from the present anti-virus OEM M/s TrendMicro (the solution protects the system from known vulnerable systems and legacy systems from any remote code execution attacks. POWERGRID budgetary of Rs. 1.5 Crores (approx.) for 3-year license support.	**4.05 per LDC**	Budgetary quote from TrendMicro
2.	**PMU Data Streaming through Internal Firewall**: As per feedback from Cyber Security audits	To stream PMU data through the internal firewall which needs following to be procured:	**15.35 Lakhs per LDC**	Budgetary quote from M/s GE

	conducted on URTDSM system and also as per CEA Cyber Security Guidelines 2021, PMU data is to be streamed through firewall at all control centres.	a) 2 LAN switches (Hardware) b) Configuration of Internal Firewall (Services)		
3.	**Retention of Logs up to 6 months:** As per feedback from Cyber Security audits conducted on URTDSM system and also as per CEA Cyber Security Guidelines 2021, security event logs are to be stored for at least 6 months (existing system has provision for only 1 month logs storage)	To procure additional storage of 6TB (Hardware) for each control centre to cater to the need of log retention for 6 months. Techno commercial proposal obtained from GE.	**19.35 Lakhs per LDC**	Budgetary quote from M/s GE

TOTAL Cost for NR: **Rs. 3.87 Crores for NRLDC and 9 SLDCs of NR**

Upon concurrence of RPC for cost sharing of this solution, process for award of this work shall be initiated by POWERGRID.

Status of Approval in RPCs:

POWERGRID took up the above three proposals for addressing the Cyber Security requirements for the existing URTDSM Phase-I system on Cost sharing basis in following RPCs/OCCs:

- **a.** 52nd ERPC meeting held on 05.09.2024 - Approved
- **b.** 51st WRPC meeting held on 11.01.2025 – Approved
- **c.** 54th SRPC Communication meeting of on 21.01.2025 – Agreed for Point (1) and (2). To be taken up to SRPC board.
- **d.** 28th NERPC & TCC on 20.02.2025 - the matter could not be deliberated.
- **e.** 78th NRPC meeting held on 17.03.2025 – concluded to discuss first in TEST meeting.

Members may deliberate and concur the above three proposals for immediate augmentation of the system considering the Cyber Security issues. Cost shall be booked under Add CAP in URTDSM Project.

25. ADMS implementation in NR (Agenda by NRPC)

25.1. In the 229th OCC meeting, status of ADMS implementation in NR, which is mandated in clause 5.4.2 (d) of IEGC by SLDC/SEB/DISCOMs was discussed wherein status of implementation of ADMS in was discussed.

25.2. DTL intimated that TPPDL has informed that they have engaged SCADA OEM for the implementation of ADMS. However, OEM has confirmed that incorporation of ADMS logic into the current SCADA system is not feasible and it would require an upgrade or refresh of the system, necessitating additional expenditure for which DERC has been approached. TPPDL has stated that they expect to complete it by August 2025, if materialized

25.3. BRPL and BYPL informed that their existing SCADA system is obsolete and it is in the up-gradation phase by OEM. After the up-gradation of SCADA system, the ADMS is expected to be implemented in BRPL & BYPL by Oct 25.

25.4. It was decided that the requirement of up-gradation of SCADA system will be discussed in the next TeST Sub-Committee meeting.

Members may discuss

IV. Issues related to Unified Load Dispatch Center scheme of NR

26. Change of Training Venue of Trainings under the ULDC Phase-III project from Noida to New Delhi or Powergrid Manesar (Agenda by UPSLDC)

26.1. Change in the venue for the upcoming trainings under ULDC Phase-III SCADA/ EMS upgradation project is proposed due to the non-applicability of hotel charges at Noida. Considering the circumstances, moving the venue to either Delhi or Manesar is suggested, both of which are convenient alternatives that would align better with the necessary arrangements.

27. AMC renewal from SIEMENS under SCADA Phase-II for sufficient period (Agenda by UPSLDC)

27.1. Extended annual maintenance contract (AMC) from Siemens under ULDC Phase-II has expired as on March 31st 2025. PGCIL is requested for the renewal of AMC for a sufficient period of time to ensure continuous service and support.

28. AMC Extension of ULDC Phase-II Scheme. (Agenda by BBMB)

28.1. BBMB vide office Memo No. 1557-59/LDiG-181 dated 02.04.2025 addressed to Powergrid, intimated that the AMC period for BBMB will expire in June,2025 instead of March,2025 for other constituents. Therefore, the AMC extension period for BBMB may be considered w.e.f. 09.06.2025 to 08.06.2026. Further, it is informed that during the implementation of ULDC Phase-III Scheme, the TOC from GE will be taken by BBMB only after the completion of AMC period of ULDC Phase-II Scheme by M/s Siemens (i.e., June,2026 or for any extended quarter).

28.2. Also, as per the deliberations during Special TeST meeting held on 24.03.2025 at New Delhi, POWERGRID is requested to provide the price justification of AMC Extension Cost so that the same may be put up to the higher management for approval.

29. Replacement of S-900 RTU's of ULDC-Phase-I Scheme and Integration of 61850 compliant Numerical Relays with HMI Servers for providing functionality of Event logger (Agenda by BBMB)

29.1. Contract Agreement No. N1/C&M/18-19/ULDClCA-11/162-Service Portion dated 01.04.2019 for Replacement of S-900 RTU's of ULDC-Phase-1 was signed between M/s Synergy Systems and Solutions and Powergrid for NR constituents having

additional work of integration of 61850 compliant Numerical Relays with HMI Servers to extract dedicated GPS time stamped station events to analyse multiple element tripping. This additional work requires to be completed by the firm as reconciliation of advance payment to Powergrid paid by BBMB could be finalized only after completion of this work by the firm.

29.2. In this regard, it is submitted that BBMB officers/officials along with M/s Synergy authorized representative carried out a site visit to Dhulkot substation on 28.01.2025. During the visit, it was found out that the various details of Node addresses and CID files were required to be submitted to the firm by BBMB. The same were submitted to the quarter concerned and intimated to PGCIL vide this office email dated 04.03.2025 and requested to expedite the work of integration at Dhulkot substation.

29.3. In view the above, it is requested to get the long pending work of integration of 61850 compliant Numerical Relays with HMI Servers at all the stations of BBMB completed from M/s Synergy at the earliest.

30. Replacement of Fiberhome make Communication Equipment (Agenda by POWERGRID)

30.1. Replacement of Fibrehome make communication equipment was deliberated in 25th and 26th TeST meeting of NRPC. During the meeting, POWERGRID informed that Fibrehome devices had STM-1/STM-4 capacities and several technical limitations, such as supporting only two optical directions and using optical cards instead of an SFP solution and limitation of Ethernet ports. In this scenario, maintenance cost of these equipment is very high, and availability of spares is also challenging.

30.2. During the 26th TEST meeting, it was informed by constituents that;

30.3. UPPTCL mentioned that it has Fibrehome equipment at 49 locations, at some stations other FOTE equipment are also available. There are 16 stations where only Fibrehome equipment is present. They have made proposal for replacement of Fibrehome equipment at all 49 locations and it is pending from management.

30.4. Uttarakhand stated that it can replace equipment but has not planned yet. POWERGID informed that Uttarakhand has only 3 equipment at Rishikesh, Haridwar and Sitarganj 132.

30.5. PSTCL also informed that they are also replacing fibrehome equipment at key nodes (passing through main backbone network) under their Reliable Communication Scheme, rest nodes shall be planned in upcoming scheme.

30.6. RVPNL mentioned that POWERGRID is installing Tejas make new communication equipment which will create parallel route of Fibrehome equipment and likely all equipment will be installed by April/May'2025 but Fibrehome and Nokia make PDH shall be in service.

30.7. POWERGRID mentioned that AMC of Fibrehome and Nokia make equipment is going to expire in mid-April'2025. Either all equipment should be replaced before that or suitable arrangement shall be taken care of for smooth running of services. POWERGRID further, stated that if any constituents may further require AMC extension, then they have to confirm site/node name along with equipment numbers to be included in AMC.

30.8. Forum concluded that all Constituents to inform POWERGRID about the requirement of AMC and timeline of replacement of equipment if already planned.

30.9. This is to inform NRPC forum that PSTCL and PTCUL have not provided details for upgradation of Fibrehome Equipment or further requirement of AMC. Rajasthan, BBMB

and UPPTCL submitted their consent in first/second week of April'2025 for further extension of AMC.

All constituents are again requested kindly to confirm the requirement of fibrehome equipment in service otherwise POWERGRID will stop AMC extension for their nodes which might impact services of state constituents due to integrated network. If AMC is further required then period of AMC extension may be intimated, so that timely action of AMC extension may be planned.

31. Delay in Payment for ULDC consultancy works (Agenda by POWERGRID)

31.1. POWERGRID is providing consultancy services on OPGW/Wideband/APS maintenance to constituents on overhead charges basis as per MOU signed with respective Constituents. Constituents are paying on quarterly or yearly basis as advance payment.

31.2. POWERGRID is doing these ULDC AMC services for continuous and uninterrupted grid operation, and common AMC was agreed at NRPC forum among all Constituents for better coordination and reliability of data. We are doing these AMC works based on fund received from constituents and the same shall be disbursed to AMC vendors. However, approx. Rs. 1.35 Cr is pending since long, out of that major outstanding is pending against HPSEBL, JKPTCL, PTCUL. Details list is mentioned below:

Invoice Raised from POWERGRID, NR-1, Faridabad Office

Constituents Name	0-3 MONTHS	3-6 MONTHS	6 MONTHS-1 YEAR	1-2 YEARS	More Than 05 years	Total Balance
BBMB					114,621.00	114,621.00
DTL-MINTO ROAD	564,427.76					564,427.76
Electricity Department of U.T.			5,492.60			5,492.60
Haryana Vidyut Prasaran Nigam					527,984.08	527,984.08
Himachal Pradesh State Electricity	674,458.40	87,884.53	143,164.31	252,478.27	728,957.00	1,886,942.51
JKPDD					1,720,417.74	1,720,417.74
POWER TRAN CORP OF UTTARANCHAL	37,231.83				705,204.56	742,436.39
PSTCL-LUDHIANA	2,529,235.78					2,529,235.78
RAJASTHAN RAJYA VIDYUT PRASARAN	1,724,390.62					1,724,390.62
UPPTCL, EMTC-II	217,327.94					217,327.94
Total						10,033,276.42

Invoice Raised from POWERGRID, NR-II, Jammu Office

Constituents Name	0-3 MONTHS	3-6 MONTHS	6 MONTHS-1 YEAR	1-2 YEARS	More Than 05 years	Total Balance
Himachal Pradesh State Electricity	348,208.00	2,018,580.00				2,366,788.00
PSTCL-LUDHIANA	798,309.00	96,419.00				894,728.00

Haryana Vidyut Prasaran Nigam (BBMB Portion)		197,827.00				197,827.00
Electricity Department of U.T. (BBMB Portion)		24,973.00				24,973.00
Total						3,484,316.00

31.3. All these outstanding dues/receivables are repeatedly pointed out by Auditors during the audits. In view of accumulated pending dues, our senior management has instructed to withdraw AMC teams from NMS locations. Accordingly, POWERGRID has no option to but to withdraw teams from NMS as well as OPGW maintenance.

Members may deliberate.

Central Electricity Regulatory Commission
New Delhi

Coram: Shri Gireesh B. Pradhan, Chairperson
Shri A. K. Singhal, Member
Shri A. S. Bakshi, Member
Dr. M. K. Iyer, Member

Date: 31.5.2017

Statement of Reasons

Subject: Central Electricity Regulatory Commission (Communication system for inter-State transmission of Electricity) Regulations, 2017.

1. Introduction:

1.1 Communication systems are essential to facilitate secure, reliable and economic operation of the grid. It is also an important pre-requisite for the efficient monitoring, operation and control of power system. For integrated operation of all India Grid, uninterrupted availability of the real time data of various Power System elements assumes utmost importance. With the increase in the size and complexity of the grid, the communication needs of the power sector have increased drastically. Supervision and monitoring of grids call for transfer of real time operational data such as voltage, frequency, real and reactive power flow, energy, and status of circuit breaker & isolators positions, transformer taps and other parameters from their station to Data Collection Point (DCP) of CTU. The data is required to be automatically updated cyclically (typically every ten seconds) at the load dispatch centre for giving up to date information about the health of power systems on round the clock basis for enabling efficient and effective monitoring, supervision and control of the power system. The telemetry system is still poor in various parts of the country's network.

1.2 At present, the provisions relating to communication systems for the power sector have been spelt out in the Central Electricity Regulatory Commission (Indian Electricity Grid Code), Regulations, 2010 and Central Electricity Authority (Technical Standard for connectivity to the grid) Regulation.

1.2.1 Regulation 4.6.2 of the Indian Electricity Grid Code (IEGC) provides as under:

"4.6.2. Reliable and efficient speech and data communication systems shall be provided to facilitate necessary communication and data exchange, and supervision/ control of the grid by the RLDC, under normal and abnormal conditions. All Users, STUs and CTU shall provide

Systems to telemeter power system parameter such as flow, voltage and status of switches/ transformer taps etc. in line with interface requirements and other guideline made available by RLDC. The associated communication system to facilitate data flow up to appropriate data collection point on CTU's system shall also be established by the concerned User or STU as specified by CTU in the Connection Agreement. All Users/STUs in coordination with CTU shall provide the required facilities at their respective ends as specified in the Connection Agreement."

1.2.2 Regulation 6 (3) of the Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations provides as under:

"The requester and user shall provide necessary facilities for voice and data communication and transfer of online operational data, such as voltage, frequency, line flows and status of breaker and isolator position and other parameters as prescribed by the appropriate load dispatch centre."

1.3 As per the above provisions, all requesters, users, STUs and CTU are obligated to provide Systems to telemeter power system parameters. However, many of the entities have not provided necessary facilities and in many cases the adequacy, consistency and reliability of data is far from satisfactory. The Commission has from time to time given requisite directions inter-alia seeking plan for establishment of communication system. The Commission, in its order dated 26.9.2012 in Petition No. 168/MP/2011, had observed as under:-

"45. We also observe that many State Transmission Utilities, State Power Departments/Electricity Departments have not responded to our directions to submit a clear-cut action plan for the establishment of the communication system for the existing system and the time schedule for completion including the provisioning for integration of new generating stations and the substations coming in future. ……"

1.4 It is noted that the existing provision in IEGC does not dwell upon a mechanism for planning of communication systems, roles and responsibilities of various organizations and standards/protocols to be followed, which are very vital in view of the criticality of communication systems for the power sector. IEGC as well as Tariff Regulations also do not provide norms for availability of communication system for inter-State transmission system in the country. It has, therefore, been proposed that new Regulations be framed covering the aforementioned aspects and duly taking in to consideration the new developments and emerging requirements of the grid operation and control such as Smart Grid/Smart Metering/Automatic Generation Control, PMUs, solar roof top and other RE sources for proper forecasting, scheduling, operation and control.

1.5 The Commission, in exercise of the power under section 79(1) (h) read with section 178(2)(g) and in compliance with the requirement of previous

publication under section 178(3) of the Electricity Act, 2003 (the Act), published the draft regulations on the Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations,2016. Vide public notice No. L-1/210/2016 CERC on 7th September, 2016 and 28th October, 2016 Comments were invited from all stakeholders/public on the draft regulations.

1.6 In all, comments/suggestions were received from 4 stakeholders which included: (i) POSOCO, (ii) PGCIL (iii) NTPC (iv) MPPTCL. Subsequently, public hearing was held on 17th November, 2016 where oral presentations were made by PGCIL and NTPC.

1.7 The comments are available on CERC's website. The important issues raised by the stakeholders, and Commission's analysis and decisions thereon are presented in the subsequent paragraphs.

1.8 The Regulations shall be effective from 1.7.2017 keeping in view that certain Procedures/ Guidelines to be notified under these Regulations have been provided with 60 days for notification.

General Comments and Suggestions

2. Draft Regulation 2 : DEFINITIONS AND INTERPRETATIONS:

2.1 POSOCO has stated that Communication Channel is a virtual link which is finally assigned to the user for data and voice communication. The final aim is to have dedicated reliable communication channel for the users. Accordingly, POSOCO has suggested to include the following definition of "*Communication channel*" under "Definitions and Interpretations" in Regulation 2:

> *"Communication Channel" means a dedicated virtual path configured from one user's node to another user's node, either directly or through intermediary node(s) to facilitate voice, video and data communication and tele-protection system".*

2.2 We have considered the submissions of POSOCO. We are of the view that Communication Channel is used to convey information signal from one or several senders to one or several receivers. A channel has a certain capacity for transmitting information, often measured by its bandwidth in Hz. We accept the POSOCO's suggestion and accordingly the definition of *"Communication Channel"* has been inserted by clause (f) in Regulation 2(i).

2.3 POSOCO has suggested the following modification to the definition of "Communication network" in Regulation 2(i)(g) to bring further clarity to the Regulations:

"Communication network" means an interconnection of communication nodes through a combination of media either directly or through intermediary nodes"

2.4 We agree with POSOCO's suggestions and accordingly, Regulation 2(i)(g) has been modified as follows:

"Communication network" means an interconnection of communication nodes through a combination of media either directly or through intermediary nodes"

2.5 POSOCO has suggested the following modification to the definition of "*Communication* system" in Regulation 2(i)(h) to bring further clarity in the Regulations.

"Communication system" is a collection of individual communication media, terminal equipment, relaying stations, tributary stations, usually capable of interconnection and inter-operation to form an integrated communication backbone for Power Sector. It includes the Auxiliary power supply system along with battery banks used to cater to the power supply of the communication equipment. It also includes existing communication system of Inter State Transmission System, Satellite and Radio Communication System and their auxiliary power supply system etc."

2.6 In regards to above, POSOCO has stated that Communication media is the physical matter or substance e.g. wire pairs, Coaxial cable, Microwave transmission, Communication satellites, Fiber optics etc. that carry the voice and data. Further, regarding specific inclusion of "battery bank", POSOCO has stated that at present the dedicated DC power supply (DCPS) are not being provided for all the nodes of the communication system and supply is provided from the DC source available in nearby sub-stations. The ownership of these DCPS is not always with the owner of the communication node. The health of these battery sets needs to be reliable to maintain the DC supply in case of main supply failure to ensure the reliability of the communication node.

2.7 We agree with POSOCO's suggestion and accordingly the words "Communication media" has been added in Regulation 2(i)(h). We note that Tributary stations are any data station other than the control station. The suggestion of POSOCO for specific inclusion of "battery bank" is not required since auxiliary power supply system comes with battery banks even in existing systems. The owner of the communication system should ensure that adequate

battery backup should be available at all times to ensure that the communication system is interruption free.

2.8 Since the scope of this regulation covers both inter-State and intra-State transmission system, the definition of communication system has been modified accordingly to include Intra-State transmission system.

2.9 It is felt the definition of "Control Centre" should be included in the Definitions and Interpretations to bring in more clarity. Accordingly, the definition of "Control Centre" is included in Regulation 2(i)(i) as follows:

"i) "Control Centre" means NLDC or RLDC or REMC or SLDC or Area LDC or Sub-LDC or DISCOM LDC including main and backup as applicable."

2.8 POSOCO has submitted that to transmit control signal (∆P) from NLDC to the generating station over the communication channel under AGC pilot project under execution. In case of pilot project, transfer of analog signal is envisaged however it may be analogue or digital depending upon the type of control. The switching device status is transmitted from the field to Master Stations to monitor the switching device state. Though this is a digital data, it is proposed to include the same for better clarity. The phasor data is being transferred over the communication channel to the Master Station under URTDSM project under execution. POSOCO has suggested the following modification of definition of "data" in Regulation 2(i)(j) so as to include details of parameter which will be communicated from user end to control centre and the same is as follows:

"*Data" means a set of values of analogue and digital signal including a text, voice, video, tele-protection, alarm, control signals, switching device status, phasors, weather parameters, and parameter of a machine or the power system."*

2.9 We have considered suggestions of POSOCO. We are of the view that control signal data may be required to implement upcoming requirement of Automatic Generation Control. Similarly, phasors are being installed by CTU. POSOCO shall specify the requirement of control signal wherever applicable and shall have to be provided by the User. Similarly, phasor data shall be made available wherever PMUs are being installed by CTU. As per Grid Code, "User" should provide switching device status data and other data and as such there is no need to specify the same here. Accordingly, we have modified the definition of "Data" as follows:

"j) "data" means a set of values of analogue or digital signal including a text, voice, video, tele-protection, alarm, control signal, phasor, weather parameter, parameter of a machine or the power system."

2.10 NTPC has sought exclusion for embedded generation plant in the definition of User. NTPC has submitted that Regulation 8 of the Connectivity Regulations provides that the Renewable Energy (RE) generating station developed by the existing generating station can seek connectivity if the existing generating station agrees to act as a principal generator. It also provides that the connectivity is to be sought through the electrical system of the existing generating station. Accordingly, embedded generators may be excluded.

2.11 We are of the view that for maintaining the grid security each RE generator covered under the ambit of these Regulations should provide adequate communication facilities for control and grid security. In case of RE generator for which there exists a separate Principal Generator, the Principal Generator should ensure that required data is made available to RLDC or SLDC. Further, the embedded generators should make provisions to provide data till the control room of its Principal generator so that the same can be shared with RLDC / SLDC. Hence the suggestion of NTPC is not acceptable.

2.12 NTPC has suggested to include the following definition of "Wide band Node" under "Definitions and Interpretations" in Regulation 2(i) for better clarity :-

"Wide band Node: Wide bandwidth data transmission with an ability to simultaneously transport multiple signals and traffic types."

2.13 We have considered the suggestion of NTPC. As per Grid Code "*The associated communication system to facilitate data flow up to appropriate data collection point on CTU's system shall also be established by the concerned User or STU as specified by CTU in the Connection Agreement".* Further, the draft Connection Agreement notified alongwith Central Electricity Regulatory Commission (Grant of Connectivity, Long-term Access and Medium-term Open Access in inter-State Transmission and related matters) Regulations, 2009 provides that *"The location of data collection point (DCP) of CTU shall be the nearest station connected electrically where wideband communication capacity of POWERGRID is available."* Hence, there is a need to define term "*Wide band Node* ". We agree with the suggestion made by NTPC. Wide band is for transmitting large amounts of digital data over a wide spectrum of frequency bands. Accordingly, the definition has been included.

2.14 POWERGRID has submitted that with regard to Regulation 2 under definitions and Interpretations, non-availability of any suitable product of insurance exclusively for the transmission line/ overhead OPGW for communication, the transmission licensees have to adopt self-insurance policy as the risk loss can be mitigated internally out of the self-insurance reserve instead of following with the insurance companies for settlement of claim and also the funds remain

available with the licensees except in case of high value equipments having higher risk operation. Therefore, the definition of O&M expenses should include 'insurance as well as self-insurance'.

2.15 We have considered the suggestion of PGCIL. "O&M expenses" have already been defined in Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 and shall be only as per those Regulations. Since we are not determining tariff for Communication System under these Regulations currently, we do not find any merit in keeping the definition of O&M expenses in these Regulations and hence the same has been deleted.

2.16 Further, it has been observed that the definition of "Requester", which was proposed in the draft regulations, is same as that of "User". To avoid duplication, the definition of "Requester" has been deleted from the Regulations. The definition of "User" is already provided in Grid Code and shall be applicable in terms of those Regulations. In addition to the definition mentioned in Grid Code, the definition of user has been modified to include intra-State transmission system also because these regulations are applicable for both ISTS and intra-state transmission system. The definition has been modified accordingly as follows:

"aa) "User" means a person such as a Generating Company including Captive Generating Plant, RE Generator, Transmission Licensee [other than the Central Transmission Utility (CTU) and State Transmission Utility (STU)], Distribution Licensee, a Bulk Consumer, whose electrical system is connected to the ISTS or the intra-State transmission system."

3. Draft Regulation 4 : Objective

3.1 POSOCO has suggested to include "field data and phasors" under Regulation 4. POSOCO has submitted that "field data and phasors" are required to be exchanged through the proposed communication links. We are of the view that phasors are measured with Phasor Measurement Units. We are of the view that the requirement of field data and phasors are well within the definition data wherever applicable. Hence, there is no need to include the same specifically. Apart from above, the country has one synchronous integrated grid and the communication system is required for integrated operation of the entire grid. In the light of above, suitable modification has been made in Regulation 4 as under:

"4. OBJECTIVE:

These regulations provide for planning, implementation, operation and maintenance and up-gradation of reliable communication system for all communication requirements including exchange of data for integrated operation of National Grid."

4. Draft Regulation 5 : Scope and Applicability

4.1 No comments have been received from the stakeholders on this Regulation. However, in light of the fact that the country has one synchronous integrated grid and State Commissions may take some time to develop their own Regulation on communication system of the State, it is felt that the communication regulation should have pan India application. Accordingly, the provision has been modified to include the power system at the State level. However, the State Electricity Regulatory Commission's may come out with their own regulation in due course. These Regulations would be applicable for intra-State entities till the separate regulations are framed by State Electricity Regulatory Commission's.

5. Draft Regulation 6 : Nodal Agency

5.1 POSOCO has requested to replace the word "ISTS" with "Inter State Users" in Regulation 6(i) as the intent is to develop communication system for inter State users who will be using the communication system for exchange of data as follows:

"The nodal agency for planning, and coordination for development of communication system for Inter State Users shall be the Central Transmission Utility (CTU)."

5.2 We agree with the suggestion made by POSOCO and accordingly Regulation 6(i) has been modified as follows:

"(i) The nodal agency for planning and coordination for development of communication system for inter-State transmission system user shall be the Central Transmission Utility"

5.3 POSOCO has requested to replace the words "intra-State transmission system" in Regulation 6(ii) with "Intra State Users" as the intent is to develop communication system for intra-State users who will be using the communication system for exchange of data as shown below:

"The nodal agency for planning, and coordination for development of communication system for Intra State Users shall be the State Transmission Utility (STU)."

5.4 We agree with the suggestion made by POSOCO and accordingly Regulation 6(ii) has been modified as follows:

"(ii) The nodal agency for planning, and coordination for development of communication system for intra-State transmission system user shall be the State Transmission Utility (STU)."

5.5 POSOCO has suggested to indicate full forms of VCS as Video Conferencing System, AMR as Automatic Meter Reading. POSOCO has also suggested to include "at LDC end" and "for inter-State system" as the intent is to include all the control centres at regional and State level, which includes Sub-LDCs/ ALDCs, RE developer's control centres. POSOCO's suggestion is as follows:

"Nodal agency for integration of communication system with SCADA, WAMS, Video Conferencing System, Automatic Meter Reading, EPABX, Tele-protection system at LDC end shall be respective RLDCs for Inter State system and SLDCs for Intra state system."

5.6 We agree with the suggestion made by POSOCO that all the control centres at regional and State level which includes Sub-LDCs/ ALDCs, RE developer's control centres are to be included in the above definition. We also agree with POSOCO's suggestion to include "at LDC end" since RLDCs or SLDCs shall be responsible to integrate communication system at Load despatch centre. However, we do not find need to modify the Regulation since the proposed Regulation covers the suggested intent. Regulation 6(iii) has accordingly been modified for having more clarity. The revised Regulation 6(iii) is as follows:

"(iii) Nodal agency for ensuring integration of communication system at regional level with SCADA, WAMS, Video Conferencing System (VCS), Automatic Meter Reading (AMR), EPABX, Tele-protection system shall be respective RLDCs for ISGS, ISTS and SLDCs; and respective SLDC for State Generating Stations, distribution companies, Intra-State entities, intra-State transmission system, etc."

6. Draft Regulation 7.1 : Role of Central Electricity Authority (CEA)

6.1 POSOCO has submitted that route redundancy is important in case of communication failure in one path and capacity requirements should be taken care in order to obtain desired bandwidth for data transfer. POSOCO has stated that communication planning for renewable, especially for RE generators, for

proposed implementation of control features shall also be planned. POSOCO has suggested to include 'route', 'capacity', 'adequacy', 'REMC/RE generators (having capacity more than 50 MW)' in Regulation 7.1(i) as follows:

"CEA shall formulate communication planning criterion/ philosophy and guidelines for development of reliable Communication system for power system, duly considering requisite route redundancy, capacity, adequacy as well as requirements of smart grid, REMC/RE Generators (having capacity more than 50 MW) and cyber security."

6.2 We agree with the suggestions made by POSOCO partly. We are not inclined to restrict the RE generator to more than 50 MW. Further we do not feel the need to specifically include "REMC" or RE generator. CEA may formulate planning criterion development of reliable Communication System for entire power system considering the upcoming developments. Regulation 7.1(i) has been accordingly modified as under:

"CEA shall formulate communication planning criterion and guidelines for development of reliable communication system for power system of India duly considering requisite route redundancy, capacity, as well as requirements of smart grid and cyber security."

6.3 Regulation 7.1(ii) is modified to specifically state that CEA would formulate and notify technical standards in accordance with the Cyber Security Policy of Government of India as follows:

"(ii) CEA shall formulate and notify technical standards, cyber security requirements in accordance with the Cyber security Policy of the Govt of India from time to time, protocol for the communication system for Power Sector within the country including the grid integration with the grid of the neighbouring countries."

6.4 POSOCO has suggested to modify the Regulation 7.1(iii)(c) by adding the words "existing and planned" as follows:

"Monitor and facilitate timely completion of schemes and projects for improving and augmenting the communication system along with existing and planned transmission system in the power sector."

6.5 We have considered the suggestion of POSOCO. We do not find any need to specifically include the words "existing and planned" in the proposed Regulation since "transmission system" will include these. The focus of the regulation is on

"improving and augmenting associated communication system". Accordingly, the proposed Regulation 7.1(iii)(c) is retained with minor modification as follows:

"c. monitor and facilitate timely completion of schemes and projects for improving and augmenting the associated communication system along with transmission system in the power sector."

6.6 CEA has been entrusted with preparation of technical standards for communication system. It is suggested that CEA may prepare such standards expeditiously within 6 months of issue of these Regulations to enable NLDC to prepare guidelines on interfacing requirement.

7. Draft Regulation 7.2 : Role of CTU

7.1 POSOCO has submitted that generally the communication path is provided with protection path (separate communication channel). In case of failure of the main channel/path, the data flow is automatically shifted to the protection path which provides the reliability in the communication. Accordingly, POSOCO has suggested to include the words "alongwith appropriate protection path, REMCs and using a latest technology." in Regulation 7.2(i).

7.2 PGCIL has submitted that development of reliable backbone communication system, CTU should carry out planning process from time to time as per the requirement of ISTS and inter-regional links for which authenticated data is required to be collected from Users as well as operational feedback from NLDC, RLDC, and SLDC and accordingly suggested to add following at the end of the Regulation 7.2(i):

"While carrying out planning process from time to time, CTU shall in addition to the data collected from and in consultation with the users consider operational feedback from NLDC/RLDC/SLDC."

7.3 We have considered the submission of POSOCO. We agree with the suggestion made by POSOCO that appropriate protection path i.e. alternate channel with route redundancy should be provided as a protection of main path or channel. However, "route redundancy" is covered in planning criteria to be formulated by CEA and CTU shall plan based on the same duly taking care of POSOCO's concern. Hence, the word "route redundancy" is not included here specifically. We agree with suggestion of POSOCO to include term "REMC" along with other control centres. We have also defined REMC in the definitions for clarity. We are not inclined to specifically include the term "using latest technology" under Regulation 7.2(i). We are of the view that the same may be addressed duly by the Standing Committee on Communication System keeping

in view the technical advancements, requirements of power sector as well as the performance of existing communication facilities.

7.4 We also agree with PGCIL's suggestion regarding operational feedback. Accordingly, Regulation 7.2(i) is modified as under:

> *"(i) The 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 Communication System among National Load despatch Centre, Regional Load Despatch Centre(s) and State Load Despatch Centre(s)and REMCs along with Central Generating Stations, ISTS Sub -Stations, UMPPs, inter-State generating stations, IPPs, renewable energy sources connected to the ISTS, Intra -State entities, STU, State distribution companies, Centralised Coordination or Control Centres for generation and transmission. While carrying out planning process from time to time, CTU shall in addition to the data collected from and in consultation with the users consider operational feedback from NLDC, RLDCs and SLDCs."*

7.5 PGCIL has also suggested that the responsibility to provide operational feedback may be added in the scope and role of NLDC, RLDC and SLDC under Regulation 7.4, 7.5 and 7.6.

7.6 We agree with the submission of PGCIL regarding "operational feedback" and accordingly, provision regarding "operational feedback" has been included in Regulation 7.4, 7.5 and 7.6.

7.7 In the draft Regulation 8.2, it was proposed that wideband communication systems shall be planned prospectively considering the expected nodes to ensure comprehensive planning for the Communication System by the respective agencies and all grid station including pooling stations may be considered for Broad Band Communication System in consultation with Standing Committee to be constituted by CEA. We are of the view that CTU should plan a comprehensive Communication System taking into consideration expected nodes in consultation with Standing Committee to be constituted by CEA. Accordingly, this clause with slight modification has been inserted in Regulation 7.2 and the draft Regulation 8.2 is deleted. The new clause (ii) of Regulation 7.2 is as follows:

"(ii) The CTU shall plan the communication system comprehensively and prospectively for users considering the requirement of the expected nodes in consultation with Sanding Committee to be constituted by CEA."

7.8 PGCIL has submitted that to ensure seamless integration with the international grid and in the interest of the power sector, the communication system including terminal equipments not only up to national boundary but for both ends for cross border exchanges needs to be planned by CTU in consultation with the respective transmission utilities of the neighbouring country. Accordingly, PGCIL has suggested to modify the draft Regulation 7.2(ii) to include communication system for the cross border as follows:

"CTU shall also plan communication system for the cross border transmission system for cross border exchange of power."

7.8 The draft Regulation 7.2(ii) is now renumbered as Regulation 7.2(iii).

7.9 We have considered the submission of PGCIL. We are of the view that seamless integration with the international grid will ease the communication planning for cross border exchange and also integration of communication system for neighbouring countries. We agree with the suggestion of PGCIL and accordingly draft Regulation 7.2(ii) (now renumbered as Regulation 7.2(iii)) has been modified as under:

"(iii) The CTU shall also plan communication system for the cross border transmission system for cross border exchange of power."

7.10 The draft Regulation 7.2(iii) is now renumbered as Regulation 7.2(iv) and retained without any modification.

7.11 POSOCO has submitted that CTU should also consult SLDCs besides CEA, STUs, ISGS, etc. and accordingly suggested to include "SLDCs" in the draft Regulation 7.2(iv).

7.12 The draft Regulation 7.2(iv) is now renumbered as 7.2(v). Further, we agree with the suggestion made by POSOCO. Accordingly, Regulation 7.2(v) is modified by including SLDCs as under:

"(v) The CTU shall discharge the above function in consultation with the CEA, State Transmission Utilities, ISGS, Regional Power Committees, NLDC and RLDCs and SLDCs."

7.13 POSOCO has submitted that the access means the connectivity. The access is required to be provided by CTU to facilitate the network connectivity between communication network developed by CTU and the network developed by STU. This will lead formation of a seamless communication network across India. Accordingly, POSOCO has suggested to insert a new clause in Regulation 7.2 as under:

"CTU shall provide access to its communication node to interface the wideband network being implemented by State Transmission Utilities to have a single interconnected network and shall coordinate with State Utility for the interface requirement."

7.14 We agree with POSOCO's suggestion. Accordingly, as suggested by POSOCO, a new clause (vi) under Regulation 7.2 is introduced.

7.15 POSOCO has submitted that the Network Monitoring System (NMS) is provided by the communication vendors to monitor the communication system status which is installed and commissioned by them. Necessary visualization and alerts are provided in NMS to facilitate trained operator to monitor/detect the faulty parts in the communication network. This in turn facilitates quick fault identification and restoration. POSOCO has proposed that a new clause may be included in Regulation 7.2 as under:

"CTU shall be the Nodal Agency for supervision of communication system in respect of Interstate communication system and will implement centralized supervision for quick fault detection and restoration."

7.16 We agree with POSOCO. We are of the view that CTU should prepare a "Procedure for centralized supervision for quick fault detection and restoration" within 60 days from the notification of the Regulation. Accordingly, new clause (vii) is introduced in Regulation 7.2 as given below:

"(vii) CTU shall be the Nodal Agency for supervision of communication system in respect of inter-State communication system and will implement centralized supervision for quick fault detection and restoration. CTU shall prepare Procedure for same and submit to Commission for approval within 60 days of notification of these Regulations"

7.17 POSOCO has submitted that CEA has been given the responsibilities to do the perspective planning for the communication system in India. CTU is proposed to coordinate with STUs and plan in an integrated manner, as a nodal agency, for development of the backbone network across India as per the perspective plan. POSOCO has proposed that a new clause may be added to Regulation 7.2 as under:

"The CTU shall in consultation with STUs carry out the integrated planning for development of backbone communication systems providing interfaces to wideband communication networks of STUs at interface nodes."

7.18 We agree with POSOCO. Accordingly, new clause (viii) is included in Regulation 7.2 as proposed by POSOCO.

7.19 MPPTCL has submitted that in Regulation 7.7(iv) it is mentioned that "STU shall also provide access to their wideband network for grid management by all users". The similar clause should also be included under Regulation 7.2. We agree with suggestion of MPPTCL. Accordingly, following new clause (ix) is included in Regulation 7.2.

"(ix) The CTU shall provide access to its wideband network for grid management and asset management by all users."

7.20 POSOCO has suggested that RLDC should be the nodal agency for integration of Communication System with necessary assistance from CTU and STU. Accordingly, a new clause (x) is inserted in Regulation 7.2 making it obligatory to extend support to the Control Centres for integration of Communication System, as under:

"(x) The CTU shall extend the required support to Control Centres for integration of communication system at respective ends."

8. Draft Regulation 7.3 : Role of National Power Committee (NPC) and Regional Power Committee (RPC)

8.1 The guidelines for availability of communication system shall be developed by NPC in consultation with other RPC's, NLDC and RLDC's and other states. Accordingly, following new clause, i.e. clause (i) is included in Regulation 7.3:

"(i) NPC shall be responsible for issuance of the guidelines with the approval of the Commission on "Availability of Communication System" in consultation with RPCs, RLDCs, CTU, CEA and other stakeholders within a period of two months from the date of notification of these regulations."

8.2 POSOCO has proposed that RLDCs should certify the availability of communication equipment based on the date furnished by CTU and also report to the Commission on monthly basis and accordingly introduce a new clause in Regulation 7.5. We have considered the suggestion of POSOCO. We agree with suggestion of POSOCO that there is a need to monitor the availability of communication system. However, the availability of transmission system is currently being certified by RPCs. We are of the view that availability of communication equipment should also be certified by RPCs based on data furnished by RLDCs. The availability data should be furnished by owner of communication equipment to respective RLDCs. Accordingly, following clause (ii) is added to Regulation 7.3:

"(ii) The RPC Secretariat shall certify the availability of communication equipment for CTU, ISGS, RLDCs, NLDC, SLDCs based on the data furnished by RLDC."

8.3 The proposed draft Regulation 7.3 is modified and re-numbered as clause (iii) of Regulation 7.3 as follows:

"(iii) The RPC Secretariat shall monitor instances of non-compliance of these regulations as amended from time to time and make endeavour to sort out the issues in the respective region in such a way that cases of non-compliance are prevented in future. Unresolved issues and non-compliance of any of the provisions of these regulations shall be reported by the Member Secretary of respective RPC to the Commission."

8.4 We are of the view that outage planning for communication system should also be carried out at RPC so that reliable communication is ensured at all times. Accordingly, clause (iv) is added in Regulation 7.3 as given below:

"(iv)The RPC Secretariat shall be responsible for outage planning for communication system in its region. RPC Secretariat shall process outage planning such that uninterrupted communication system is ensured."

9. Draft Regulation 7.4 : Role of NLDC

9.1 POSOCO has suggested replacing the words "AMI (Advanced Metering Infrastructure)" with "Automatic Meter Reading (AMR)" in clause (i) of Regulation 7.4. We have considered the submission of the POSOCO. AMI is an integrated system of smart meters, communication networks and data management systems that enables two way communication between utilities and customers. Automatic Meter Reading (AMR) means automatic collection of meter readings and transfer to a central database for further processing. We are of the view that both are required and hence we have included "Automatic Meter Reading (AMR)" and "Advanced Metering Infrastructure (AMI) in clause (i) of Regulation 7.4. NLDC shall issue guidelines keeping in view the requirements as applicable. Accordingly, clause (i) of Regulation 7.4 is modified as under:

"(i) The National Load Despatch Centre (NLDC) shall be responsible for preparation and issuance of guidelines with the approval of the Commission on the "Interfacing Requirements" in respect of terminal equipment, RTUs, SCADA, PMUs, Automatic Generation Control (AGC), Automatic Meter Reading (AMR), Advanced Metering Infrastructure (AMI), etc. and for data communication from the User's point to the respective control centre(s) based on technical standards issued by CEA within 60 days of issuance of technical standards."

9.2 POSOCO has submitted that proper integration of their equipment with communication system is required for smooth functioning of communication system and has suggested modification of Regulation 7.4(ii) as follows:

"The National Load Despatch Centre shall be responsible for integration of their equipment to be used for monitoring, supervision & control of Power System and adequate data availability in real-time and Video Conferencing System, Automatic Meter Reading, EPABX, Tele-protection system at NLDC with Communication system provided to NLDC with necessary assistance from CTU."

9.3 We agree with suggestion of POSOCO. However, the details of integration have already been covered under Regulation 7.4(i) and shall be applicable accordingly. POSOCO has submitted that CTU will provide the communication system and the necessary access to NLDC/RLDCs/SLDCs to connect the telemetry systems e.g. SCADA, RTU/SAS, AMR, Tele-protection system, VCS etc. As the communication between the telemetry equipment at two ends depends upon the configuration of the communication system, necessary assistance is proposed. The assistance is required at the time of commissioning the telemetry equipment as well as during O&M and at the time of communication failure.

9.4 We agree with POSOCO's suggestion that CTU should provide necessary assistance or support for integration as required by POSOCO so that communication system is implemented on priority. Such assistance shall be required from all users including NLDC / RLDC in integration of associated communication systems. The same has been provided under Regulation 7.2 under Role of CTU. Further, we are of the view that RLDC should provide the real time data of communication system to respective RPC. Accordingly, the provision has been modified and included in role of RLDC. Accordingly, the revised clause (ii) of Regulation 7.4 is as follows:

"(ii) NLDC shall be responsible for integration of the Communication system at NLDC end for monitoring, supervision and control of Power System and adequate data availability in real-time within 60 days of the issue of the guidelines."

10. **Draft Regulation 7.5 : Role of RLDCs**

10.1 POSOCO has suggested to modify Regulation 7.5 (i) as under:

"The Regional Load Despatch Centre shall be nodal agency for integration of their equipment to be used for monitoring, supervision & control of Power System and adequate data availability in real-time and Video Conferencing System, Automatic Meter Reading, EPABX, Tele-protection system at NLDC

with Communication System provided to RLDC with necessary assistance from CTU/STU."

10.2 We agree with submission of POSOCO. However, the details of integration have already been covered under Regulation 7.5(i) and shall be applicable accordingly. Hence, the same are not included specifically in clause (i) of Regulation 7.5. We agree with POSOCO's suggestion that CTU or STU should provide necessary assistance or support for integration as required by Control Centres so that communication system is implemented on priority. We have provided the same under Regulation 7.2 and Regulation 7.7 under Role of CTU and Role of STU respectively. However, agencies like ISTS, ISGS, SLDCs and IPPs are included for clarity. Accordingly, clause (i) of Regulation 7.5 is modified as under:

"(i) The Regional Load Despatch Centre shall be nodal agency for integration and supervision of Communication System of the ISTS, ISGS, SLDCs and IPPs at RLDC end for monitoring, supervision and control of Power System and adequate data availability in real time."

10.3 POSOCO has suggested to include the following new clause in Regulation 7.5 as under:

"RLDC's shall certify the availability of communication equipment based on the data furnished by CTU and shall report to the Commission on monthly basis."

10.4 We are of the view that availability of communication equipment should be certified by the concerned RPCs and accordingly suitable provision has been included in Regulation 7.3 dealing with "Role of NPC & Role of RPCs". As POSOCO's suggestion regarding certification of availability of communication equipment has been taken care in Regulation 7.3, we are of the view that there is no need to make any provision under Regulation 7.5.

10.5 POSOCO has suggested to include the following new clause to Regulation 7.5 as under:

"RLDC's shall approach the Commission in case of repeated non-compliance of the regulation and non-availability/intermittency of data."

10.6 POSOCO's suggestion to include additional clause regarding non-compliance has already been dealt in Regulation 7.3, where it has been stated that any non-compliance shall be reported to RPC and if needed, RPC shall report the same to Commission. RLDCs may approach the Commission in case the

issues are not resolved at RPC. Accordingly, specific provision has not been included in Regulation 7.5.

11. Draft Regulation 7.6: Role of SLDC

11.1 POSOCO has suggested to modify Regulation 7.6(i) as follows:

"The State Load Despatch Centre's shall be nodal agency for integration of their equipment with Communication System in the STU network and shall be responsible for interfacing the telemetry system at SLDC end for monitoring, supervision & control of Power System and adequate data availability in real time."

11.2 We have considered the suggestion of POSOCO. We are of the view that the proposed regulation in the present form is self contained. However, the draft regulation is modified for better clarity as follows:

"(i) The State Load Despatch Centres shall be nodal agency for integration of Communication System in the intra-State network, distribution system and generating stations at SLDC end for monitoring, supervision and control of Power System and adequate data availability in real time. "

11.3 POSOCO has submitted that SLDCs should participate in coordination of O&M related to communication equipment with CTU and STU and accordingly proposed the following new clause (ii) under regulation 7.6:

"SLDCs shall also be responsible for appropriate coordination for O&M with CTU / STU of all control centre end communication equipment so that it remains healthy round the clock."

11.4 We have considered the suggestion of POSOCO. As per Regulation 7.2(i) and 7.7(i), CTU and STU are responsible for coordination. We have already stated that "users" will be responsible for operation and maintenance of communication equipment. Further, outage planning shall be decided at RPC forum which shall take care of POSOCO's concerns. Accordingly, there is no need of specific addition of the proposed clause.

11.5 PGCIL has suggested that responsibility to provide operational data may be added in the scope of SLDC. We are agree with the suggestion of PGCIL, accordingly, the following clause (ii) has been included in Regulation 7.6:

"(ii) SLDC shall provide operational feedback to CTU and STU."

12. Draft Regulation 7.7 : Role of STU

12.1 POSOCO has stated that protection path is important in case of communication failure in main path and hence suggested to include "protection, system, Main, back- up and area/Sub-LDCs in Regulation 7.7(i) as follows:

"The STU shall be responsible for planning and coordination for development of reliable backbone/protection communication system for data communication within a State among State Load Despatch Centre's (Main, Back-up and Area/Sub-LDCs),DISCOM control centre's along with Generating Stations in the State, STU Sub-Stations, IPPs, and renewable energy generators within State system."

12.2 We agree with suggestion of POSOCO and accordingly clause (i) of Regulation 7.7 is modified as under:

"(i) The STU shall be responsible for planning, coordination and development of reliable communication system for data communication within a State including appropriate protection path among State Load Despatch Centre, Area LDC, Sub-LDC and DISCOM LDC including Main and backup as applicable along with STU Sub-Stations, intra-State Generating Stations."

12.3 No comments are received with respect to clause (ii), (iii) and (iv) of Regulation 7.7 and hence they are retained as proposed in the draft regulations.

12.4 We are of the view that STUs should extend the required support to control Centres for integration of communication system at respective ends. Accordingly, following clause (v) is included in Regulation 7.7:

"(v) The STU shall extend the required support to Control Centres for integration of communication system at respective ends."

13. Draft Regulation 7.8 : Role of Users

13.1 As stated earlier, the definition of "Requester" and "User" are the same and hence the definition of "Requester" has been deleted. Accordingly, the words "Requester" is deleted in Regulation 7.8.

13.2 POSOCO has submitted that users shall be responsible for appropriate interface of communication equipment and has accordingly suggested following modification to Regulation 7.8(i):

"The Requesters and Users including renewable energy generators shall be responsible for provision of compatible equipment along with appropriate interface for un-interrupted communication with the concerned control centre's and shall be responsible for successful integration with the

communication system provided by CTU/STU for data and voice communication as per guidelines issued by NLDC."

13.3 We agree with submissions of POSOCO that user should provide and maintain appropriate interface for communication equipment. Accordingly, the same is considered under Regulation 7.8(i). POSOCO has also suggested to include the word "voice" in Regulation 7.8(i). It is observed that "voice" is covered under definition of 'Data' and hence there is no need to specify the word "voice" separately in Regulation 7.8(i).

13.4 Clause (ii) of Regulation 7.8 is retained unmodified.

13.5 POSOCO has stated that to bring further clarity, clause (iii) of Regulation 7.8 may be modified as under:

"The Users shall also be responsible for expansion /up gradation as well as operation and maintenance of communication equipment owned by them, if any, at their terminal end, interface ends and LDC end."

13.6 We agree with the POSOCO's suggestion that users should be held responsible for expansion or up-gradation of communication equipment owned by them. However, we are of the view that there is no need to specify the location which shall be applicable on as is where basis. Accordingly, Regulation 7.8 (iii) is modified as under:

"(iii) The Users shall also be responsible for expansion /up-gradation as well as operation and maintenance of communication equipment owned by them."

13.7 POSOCO has proposed that new Regulation 7.8(iv) may be added to Regulation 7.8 as under:

"The requesters and users shall be responsible for successful integration of data, voice and video at LDC system."

13.8 POSCO's suggestion has already been taken care in Regulation 7.8 (i) and hence we are of the view that there is no need for a specific clause in Regulation 7.8.

14. Draft Regulation 8 : Boundary of the ISTS communication system

14.1 Sub-clause (i) and (ii) of clause (1) of Regulation 8 is retained unmodified.

14.2 Sub-clause (iii) of clause (1) of Regulation 8 is modified to specify that the boundary of ISTS Communication System shall be considered as SLDCs (ISTS

interconnection). Accordingly, Sub-clause (iii) of clause (1) of Regulation 8 is modified as under:

"(iii) SLDCs (ISTS interconnection)"

14.3 Sub-clause (iv) of clause (1) of Regulation 8 has been added to state that boundary of ISTS Communication System shall be considered as ISTS sub-stations of the transmission licensees. Accordingly, Sub-clause (iv) of clause (1) of Regulation 8 is modified as under:

"(iv) ISTS sub-stations of transmission licensee"

14.4 NTPC has suggested to exclude embedded solar and renewable generator under Regulation 8.1(V). NTPC has submitted that all embedded generators connectivity is through the electrical system of the existing generating station, requirement of dedicated ISTS node for such generating plants may be excluded.

14.5 We have considered the submission of the NTPC. We have already clarified above that for maintaining the grid security each RE generator covered under the ambit of these Regulations should provide adequate communication facilities for control and grid security. In case of RE generator, for which there exists a separate Principal Generator, the Principal Generator should ensure that required data is made available to RLDC or SLDC. Further, the embedded generators should make provisions to provide data till the control room of its Principal Generator so that the same can be shared with RLDC / SLDC. Hence, the suggestion of NTPC is not acceptable.

14.6 During the public hearing, NTPC submitted following:

(i) As per provisions of IEGC, all Users, STUs and CTU shall provide Systems to telemeter power system parameter such as flow, voltage and status of switches/ transformer taps etc. in line with interface requirements and other guideline made available by RLDC. The associated communication system to facilitate data flow up to appropriate data collection point (DCP) on CTU's system shall also be established by the concerned User or STU as specified by CTU in the Connection Agreement. All Users/STUs in coordination with CTU shall provide the required facilities at their respective ends as specified in the Connection Agreement.

(ii) Data Collection Point of CTU is not firmed up at the time of finalisation of ATS. There is appreciable difference in time line between award of contact by Generator and Transmission Service Provider (TSP). Providing equipment same make to remote end (e.g for data transfer on IEC 60870-5-101 PDH) at later stage may be difficult.

(iii) Data and Voice communication from generating plant switchyard to control centre involves number of transmission lines and substations, some of intermediate communication links may be existing, whereas some may be upcoming. Due to non-availability of spare channels at existing intermediate sub stations and readiness of upcoming Data collection point, location of DCP has been modified on several occasions. (Unchahar IV, Darlipalli STPP, BRBCL Nabinagar etc).

(iv) This results in requirement of a contingent point to point communication between generating plant and respective RLDC. Sometimes line charging and start-up power drawl also gets delayed on this account.

(v) One or more transmission lines emanating from Generating switchyard generally have optical ground wire (OPGW) which forms backbone of CTU communication network.

(vi) As per present practice, all other equipment required for transmission line protection like analogue and digital PLCC of both ends except Fibre optic Terminal Equipment (FOTE) for Generating switchyard are included in scope of supply of TSP.

(vii) In view of this and also for seamless data integration, Switchyard of generating station may be defined as DCP and supply of FOTE for both end in the scope of TSP which may be selected through TBCB process or on nomination basis by empowered committee as the case may be.

NTPC has further suggested that Data Collection Point (DCP) is of CTU is not firmed at the time of finalisation of Associated transmission system (ATS) due to which data collection point has been modified several times.

14.7 We agree with suggestion of NTPC that DCP should be identified and informed to the concerned generator. The same should be discussed in SCM/RPC meetings and accordingly finalise the DCP. As regards NTPC's suggestion that Switchyard of generating station may be defined as DCP, CEA may consider the point in the planning criteria to be specified by CEA. Supply and maintenance of fibre optic terminal equipment shall be the responsibility of CTU.

14.8 POSOCO has suggested to include the word “comprehensively” in Regulation 8.2 to bring in further clarity as under:

“In addition to the above, the wideband communication systems shall be planned **comprehensively and** prospectively considering the expected **upcoming** nodes by the respective agencies and all Grid station including pooling stations may be considered for Broad Band Communication system in consultation with Standing Committee to be constituted by CEA.”

14.9 We agree with submission of POSOCO partly and accordingly word "comprehensively" has been included. However, since the issue pertains to planning, the said clause is removed from Regulation 8.2 and is included in Regulation 7.2 under "Role of CTU".

14.10 As stated in Regulation 5 under “Scope and Applicability” these regulations are made applicable to the power system at the State level till suitable regulations are framed by the respective State Commissions. Accordingly, the boundaries of intra-State communication system is included in these regulations as under:

“8.2 Intra-State Communication System:
(i) SLDC (State Inter-connection)
(ii) STU
(iii) Distribution Companies
(iv) State Generating Stations including renewable generators connected to State network.
(v) Sub-stations of STU and State Transmission licensees”

14.11 MPPTCL has submitted that a suitable provision should be included to clarify that renewable generators are responsible to provide telemetry and wideband communication channel up to the nearest grid sub-station of CTU or STU. MPPTCL has further submitted that the responsibility for providing the wideband communication from such grid sub-station to the nearest wideband node shall be of the respective CTU/STU.

14.12 We agree with suggestion of MPPTCL, as adequate communication system is also required for renewable generators. CEA may consider the same while framing the planning criteria and CTU and STU should plan the system accordingly.

15. Draft Regulation 9: Access to Communication System

The proposed Regulation 9, pertaining to access to communication system is deleted as the aspect of access to communication system has already been covered in Regulations 7.2 and 7.7 pertaining to “Role of CTU” and “Role of STU” respectively.

15.2 POSOCO has suggested to modify Regulation 9 as under:

“Access to the communication system shall be allowed to the requester in line with the standards and guidelines issued under the Regulations. All CTU/STU/User/SLDC/RLDC shall share/give access to their infrastructure/space/network for common cause.”

15.3 We have considered the submission of POSOCO. We agree with POSOCO’s suggestion that CTU, STU, User, SLDC and RLDC should provide access to its

infrastructure and network for all users for grid management. Regulation 7.2(ix) and Regulation 7.7(iv) makes it mandatory for the CTU and STU respectively to provide access to its wideband network to all users for grid management. We are also of the considered view that User, SLDC and RLDC should also provide access to its infrastructure and network for the grid management.

16. Draft Regulation 10 : Periodic testing of the communication system

16.1 As Regulation 9, pertaining to "Access to Communication System" is deleted, the regulation pertaining to "Periodic testing of the Communication System" is renumbered as Regulation 9 now.

16.2 POSOCO has suggested to replace the word "system" with word "channels" in the (renumbered) Regulation 9(i) for bringing clarity.

16.3 We have considered the suggestion of POSOCO. We are of the view that the "channel" is a path configured from one user's node to another user's node. However, "system" is a comprehensive communication system which includes many individual communication channels. The idea here is to test periodically the whole communication system and not limited to a communication channel and hence POSOCOs suggestion is not accepted.

16.4 POSOCO has suggested to modify (renumbered) Regulation 9(ii) as under:

"Testing process for communication network security should also be included even for third party system if exists. Appropriate O & M arrangement / policy /procedure must be adopted for all communication equipment, in accordance with the guidelines to be prepared by CTU under these Regulations."

POSOCO has also suggested that CTU should prepare guidelines regarding operation and maintenance and all should follow it as best practices for quality maintenance.

16.5 We agree with suggestion of POSOCO and accordingly we have included a provision requiring CTU to prepare a 'Procedure' within 60 days of notification of these regulations, which shall include procedure for maintenance and testing for communication system.

17. New Regulation 10: Periodic Auditing of Communication System

17.1 Communication System is critical for safe and secure operation of the grid. In view of the integrated operation of Indian electricity grid, uninterrupted availability of the real time data of various power systems elements is crucial. Therefore, we are of the view that there should be regular periodic audit of

Communication System to identify short comings and take necessary remedial measures. Accordingly, a separate provision has been included as under:

*"**10. Periodic Auditing of Communication System:***

The RPC Secretariat shall conduct performance audit of communication system annually as per the procedure finalised in the forum of the concerned RPC. Based on the audit report. RPC Secretariat shall issue necessary instructions to all stakeholders to comply with the audit requirements within the time stipulated by the RPC Secretariat. An Annual Report on the audit carried out by respective RPCs shall be submitted to the Commission within one month of closing of the financial year."

18. Draft Regulation 11: Fault reporting:

18.1 POSOCO has submitted that Load Despatch Centre's shall be able to check communication equipment with RTU/SAS/PMU, etc. In case of any failure, it shall report the same to the communication system owner. POSOCO has suggested to modify Regulation 11(i) as under:

"RLDC and SLDC in case of outage of telemetered data or communication failure shall inform the respective user so that the user can check its RTU/SAS/PMU and terminal communication equipment. In case outage pertains to communication system fault, the user shall lodge complaints for failure of the communication with the communication system owner for quick restoration."

18.2 We have considered the submission of the POSOCO. We are of the view that RLDC may inform the user in case of outage of telemetered data and Users shall check its respective communication system. However, we do not find any need to specifically provide details of equipment to be checked in the Regulation. Users shall be responsible for healthy functioning of systems owned by them. However, the draft regulation is modified slightly to bring in more clarity. The modified Regulation 11(i) is as follows:

"(i) RLDC and SLDC in case of outage of telemeter data, or communication failure shall inform the respective user so that the user shall ensure healthiness of its communication system. In case outage pertains to fault in communication system of other user, the user shall lodge complaints for failure of the communication to the communication system owner for quick restoration."

18.3 PGCIL has submitted that Communication System being an integrated network has sender, receiver and communication media. Fault in any of the three may

lead to communication outage. Therefore, the communication providers should explore the possibility for route diversion on the existing facility in their respective system in close co-ordination with the concerned providers where fault has occurred. Accordingly, PGCIL has suggested to modify the draft Regulation 11(ii) as follows:

"All communication providers shall explore the possibility for route diversion on their existing facility in close co-ordination with concerned provider in case the fault restoration is prolonged. No separate charges shall be paid for such route diversion or channel reallocation. However, such rerouting shall be discontinued once the original channel restored."

18.4 We agree with submission of PGCIL and accordingly Regulation 11(ii) has been modified by including the words "in close co-ordination with concerned provider" as under:

"(ii) The communication provider shall explore the possibility for route diversion on the existing facility in close co-ordination with concerned provider in case the fault restoration is prolonged. No separate charges shall be paid for such route diversion or channel re-allocation. However, such rerouting shall be discontinued once the original channel is restored. "

19. Draft Regulation 12 : Communication System Availability:

19.1 PGCIL has submitted that the communication network is complex involving connectivity of Central Sector and State Sector Communication Systems geographically spread out. The communication system established by utilities are not having redundant path for most of the station connectivity. Improvement in availability can be achieved to some extent only when OPGW based fibre optic network with redundant path across the country is established. Under the upcoming Communication schemes expansion of communication network is planned, the implementation of which may take some time. Even after expansion, redundant path may not be possible for all stations. Further, some of the sub-stations in the communication link pertain to utilities where the Auxiliary power supply source is not reliable. Maintaining high availability of such a large communication system having inter-dependence on resources of various utilities is a daunting task. The OPGW is subjected to snapping/high fibre loss in case of natural calamity or tower collapse, etc. Under such circumstances transmission licensees may not be penalized by enhancing the normative availability. This might also hamper the preventive maintenance and periodic testing as prescribed in Regulation 9. PGCIL has proposed that the communication system channel availability needs to be defined for (a) system having single communication path and (b) system having Redundant Communication path. The owner of Communication System shall maintain channel availability up to 90% for systems having non-redundant

communication path and channel availability up to 95% system having redundant path. These availabilities shall be excluding non-availability of communication channel under force majeure condition. PGCIL has further suggested that suitable provisions for norms for Communication System availability may be provided in the 2014 Tariff Regulations. Under the 2015 RLDC Fees and Charges Regulations there is a system of incentive/disincentive for availability upto benchmark level and beyond. Similar incentive/disincentive need to be provided under this regulation.

19.2 PGCIL has also submitted that Network Management System (NMS) for Communication System is required to be established at NLDC with console at CTU premises/SLDC/RLDC/NTAMC.

19.3 POSOCO has submitted that availability percentages are defined at different level of requirements to ensure reliability. POSOCO has suggested to modify the draft Regulation 12 as follows:

"The owner of communication system shall maintain the individual communication channel availability of at least 99.9%. The owner of communication system shall maintain the availability of all communication equipment at the respective nodes of at least 99.9%. The owner of the communication system shall maintain the availability of the communication media of at least 99.9%.The owner of the communication system shall maintain the availability of the auxiliary power supply of at least 99.9 %. The mechanism for calculation of availability shall be detailed in the procedure to be prepared by NLDC and amended from time to time. The availability thus calculated shall have suitable implications while determining the tariff as per Terms and Conditions of Tariff Regulation for communication system.

The communication system shall be restored within 4 hours of reporting the fault to the concerned service provider i.e. CTU/STU. However service provider shall also have centralized monitoring for detection of fault and failure for quick restoration of the communication system."

19.4 MPPTCL has submitted that a provision may be included for imposing suitable penalty on the owners of communication by RLDC/SLDC in case availability is less than 99.9%.

19.5 We have considered the submissions of the PGCIL, POSOCO and MPPTCL. As regards PGCIL's submission, we are of the view that availability of Communication System is necessary for analyzing and maintaining various grid elements of power system and also the disturbances before the fault and after the fault. PGCIL has not submitted the rational for suggesting the availability percentage of 90% and 95% for communication systems with non-redundancy and redundancy communication path respectively. Hence, PGCIL's suggestion is not considered. As regards the norms for communication system availability

the Commission will take appropriate action based on the guidelines prepared by NPC.

19.6 As regards PGCIL's suggestion to specify the provisions for incentive/disincentive based on the availability of communication system, we are not inclined to consider incentive/disincentive in these Regulations, as of now.

19.7 We agree with suggestion of PGCIL regarding establishment of NMS for Communication System. POSOCO has suggested that NMS shall aid in quick fault restoration. Since the nodal agency for quick fault restoration is CTU, the responsibility for establishing integrated NMS shall be that of CTU. A console may be provided at NLDC/SLDC/RLDC/NTAMC. However, the operating rights shall be decided by CTU in consultation with NLDC/RLDCs.

19.8 We have considered the submissions of POSOCO. POSOCO has defined availability percentages of various communication systems. We are of the view that presently, communication system availability is restricted to Communication Channel availability. NPC should prepare guidelines for availability of various Communication System elements and submit for approval of the Commission.

19.9 As regards MPPTCL submission regarding availability, we are of the view that in case the availability is less than 99.9%, the concerned RLDCs will analyze the reasons for less than 99.9% availability of Communication System and communicate the same to the concerned SLDC and the regional entities. The same may be discussed at RPC level. The Member secretary, RPC may report issues that could not be sorted out at RPC forum to the Commission.

19.10 Availability of Communication System is critical for the management of grid and any relaxation of this availability may prove to be fatal for the maintenance of grid. Accordingly, we are of the view that all the stakeholders should maintain availability of Communication Channel at 99.9% and in case of Communication System with back up facility, the availability should be 100%. Accordingly, the draft Regulation 12 is modified as under:

"All users of CTU, NLDC, RLDCs, SLDCs, STUs shall maintain the communication channel availability at 99.9% annually:

Provided that with back up communication system, the availability of communication system should be 100%."

20. **Draft Regulation 13 : Cyber Security**

20.1 The draft Regulation 13(i) is amended to ensure that the proposed Cyber Security is in compliance with the Cyber Security Policy of Government of India. The modified Regulation 13(i) is as follows:

"(i) Communication infrastructure shall be planned, designed and executed to address the network security needs as per standard specified by CEA and shall be in conformity with the Cyber Security Policy of the Govt. of India, issued from time to time."

20.2 POSOCO has suggested that CTU should be made responsible, and not NLDC, for monitoring cyber security incidences and accordingly modify the draft Regulation 13(ii).

20.3 Cyber security is of paramount importance and any laxity on this account may lead to a big loss. We are of the view that NLDC is the appropriate body for dealing cyber security incidences. Hence, POSOCOs suggestion is not accepted. Moreover, the manufacturer should be selected after due diligence keeping in view Government's policy/advice on cyber security. Further, RPC should ensure that audits are conducted periodically. The frequency for conducting audit may be decided at RPC forum as per standard timeline specified by CERT-In but the period for audit should not be less than twelve months.

20.4 The communication infrastructure should be up to date Further, it is felt that any updating of communication system should be in accordance with the cyber security policy/guidelines of the Government of India. Accordingly, Regulation 13(ii) has been retained unmodified.

20.5 POSOCO has proposed to include the following new clause (iii) under Regulation 13:

"Third party cyber security audits shall be conducted annually and appropriate measures shall be implemented to comply with the findings of the audits."

20.6 We agree with the POSOCO's suggestion that third party cyber security audits should be conducted periodically. We are of the view that conducting third party audits and recommendations of audit findings should be implemented so that security and safety of the communication system from cyber incidences is secured. Further, we are of the view that the concerned RPC should ensure that the audits are conducted in accordance with the CERT-In certified third party audits. Accordingly, following new clause (iii) is added to Regulation 13(iii) as under:

"(iii) RPC shall ensure that third party cyber security audits shall be conducted periodically (period to be decided at RPC) and appropriate measures shall be implemented to comply with the findings of the audits. The audits shall be conducted by CERT-In certified third party auditors."

21. Draft Regulation 14 : Guidelines to be issued by NLDC

21.1 POSOCO has suggested to modify clause (i) of Regulation 14 to bring in more clarity as follows:

"Clause 14, (i), Guidelines to be issued by NLDC

Subject to the provisions of these regulations, NLDC shall submit the Guidelines for Interfacing Requirement between different communication equipment at individual nodes, calculation of availability of the communications equipment i.e. MUX, Media, Power supply equipment etc., and individual communication channel to the Commission for approval within 60 days of notification of these regulations in the Official Gazette:

Provided that prior to submitting the guidelines to the Commission for approval, NLDC shall make the same available to the public and invite comments by putting the draft on its website and giving a period of one month to submit comments; Provided further that while submitting the detailed procedure to the Commission, NLDC shall submit a statement indicating as to which of the comments of stakeholders have not been accepted by it along with reasons thereof."

21.2 We have considered the submission of the POSOCO. POSOCO has suggested that NLDC should frame the guidelines for calculation of availability of communication equipment besides the guidelines for interfacing requirement of the communication system. NPC has been entrusted with the responsibility of framing the guidelines for calculation of availability of communication system in consultation with RPCs, CEA, CTU, RLDCs and other stakeholders in Regulation 7.3(i), which includes communication equipment as well and hence POSOCO's suggestion is taken care of.

21.3 POSOCO has also suggested that procedure for testing and maintenance should be prepared by CTU and accordingly requested to add the following new clause in Regulation 14:

"Subject to the provisions of these regulations, CTU shall submit the Guidelines for O&M of communication system, detailing the procedure routine maintenance, fault reporting and rectification process to the Commission for approval within 60 days of notification of these regulations in the Official Gazette:

Provided that prior to submitting the guidelines to the Commission for approval, CTU shall make the same available to the public and invite comments by putting the draft on its website and giving a period of one month to submit comments; Provided further that while submitting the detailed procedure to the Commission, CTU shall submit a statement indicating as to which of the comments of stakeholders have not been accepted by it along with reasons thereof."

21.4 We agree with submission of POSOCO. The procedure for (a) "quick fault detection and restoration" and (b) "maintenance and testing" of communication system are to be prepared by CTU as per Regulations 7.2 and 9 respectively of these Regulations. Accordingly, clause (i) of Regulation 14 is modified as under:-

"14.1 The following entities shall be responsible for preparation, consultation and finalisation of the Guidelines / Procedure required under these Regulations:

(i) NLDC shall prepare Guidelines on "Interfacing Requirements" in terms of Regulation 7.4(i) of these Regulations.

(ii) CTU shall prepare Procedure on "Centralized supervision for quick fault detection and restoration" in terms of Regulation 7.2 and on "Maintenance and testing of communication system" in terms of Regulation 9 of these Regulations.

(iii) NPC shall prepare Guidelines on "Availability of Communication system" in terms of Regulation 7.3 of these Regulations."

22. Draft Regulation 17 : Power to Remove difficulty

22.1 POSOCO has suggested to modify Regulation 17 as follows to bring in more clarity:

"If any difficulty arises in giving effect to the provisions of these regulations, the Commission may, by order, make such provision consistent with the provisions of the Act or provisions of other regulations specified by the Commission, as may appear to be necessary for removing the difficulty in giving effect to the objectives of these regulations."

22.2 We feel that there is no need to modify the proposed Regulation 17. Accordingly, it is retained unmodified.

23 POSOCO has suggested to add a new Regulation 18 providing details of Computation and Payment of Communication Asset Charge for Inter-State Communication System. We have considered the submission of the POSOCO. With regard to calculation of availability of the communication system and computation and payment of communication asset charge for inter-State communication system it is observed that we have already provided that NPC will submit the guidelines for calculation of availability of the communication

system within 60 days of notification of these Regulations in the official gazette. The objective of these Regulations is for planning, implementation, operation and maintenance and up-gradation of reliable communication system and it is not for determination of charges for communication system and equipment. Further, at present the charges for the communication system and equipment are computed and allowed alongwith the transmission assets as provided under the 2014 Tariff Regulations. Thus, we do not find any requirement to provide for computation of charges for the communication system and equipment in these Regulations. Accordingly, POSOCO's suggestion is not accepted.

24. Activities to be carried out by CEA, CTU, RPCs, NLDC,NPC

(i) CEA shall prepare communication planning criterion/guidelines as required under Regulation 7.1

(ii) CTU shall prepare procedure on "Centralized supervision for quick fault detection and restoration" in terms of Regulation 7.2 and on "maintenance and testing of Communication System" in terms of Regulation 9 within 60 days of notification of these regulations in the Official Gazette

Provided that prior to submitting the procedure to the Commission for approval, CTU shall make the same available to the public and invite comments by putting the draft on its website and giving a period of one month to submit comments;

Provided further that while submitting the detailed procedure to the Commission, CTU shall submit a statement indicating as to which of the comments of stakeholders have not been accepted by it along with reasons thereof.

(iii) NLDC shall prepare guidelines on "Interfacing Requirements" as required under Regulation 7.4 within 60 days of issuance of technical standards issued by CEA for approval of Commission.

Provided that prior to submitting the guidelines to the Commission for approval, NLDC shall make the same available to the public and invite comments by putting the draft on its website and giving a period of one month to submit comments;

Provided further that while submitting the guidelines to the Commission, NLDC shall submit a statement indicating as to which of the comments of stakeholders have not been accepted by it along with reasons thereof.

(iv) NPC secretariat shall prepare guidelines for availability of Communication system in consultation with other RPCs, NLDC, RLDC and other stake holders within 2 months of notification of these regulations.

sd/-	sd/-	sd/-	sd/-
(Dr. M.K. Iyer)	**(A. S. Bakshi)**	**(A.K. Singhal)**	**(Gireesh B. Pradhan)**
Member	**Member**	**Member**	**Chairperson**

पावरग्रिड
POWERGRID

पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

संदर्भ : N2JM/AM-ULDC/J&K-PDD/ULDC

दिनांक : 13-03-2025

To,
The Managing Director
J&K Power Transmission Corporation Limited,
Jammu.

Subject: Redundant communication for Alusteng, Drass, Kargil, Khalasti, Leh (data reporting) to NRLDC

Our earlier letter reference : N2JM/AM-ULDC/J&K-PDD/ULDC dated 27-02-2025

महोदय,

This is in reference to the above-mentioned letter dated 27.02.2025 wherein the consent has been sought from JKPTCL for fiber sharing requirement in Alusteng (PG) - Zainakote (JKPTCL) and Zainakote (JKPTCL) - Wagoora (PG) for data reporting of subject mentioned substations. It is further intimated that as per CEA guidelines dated 03-03-2025, Para no. 4, "***OPGW Laid by** STU: Fibers to be **spared free of cost** as per Allocation Requirements outlined in Clause 2, whenever required by **STUs, ISTS Licensees/TSPs** for any type of future grid communication*". Therefore, the consent may be provided as per above.

धन्यवाद,

भवदीय,

13/03/2025

Shafat Ahmed Wani
Sr. General Manager (AM,NR-II)

पावरग्रिड
POWERGRID

पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

संदर्भ : N2JM/AM-ULDC/J&K-PDD/ULDC

दिनांक : 27-02-2025

To,
The Managing Director
J&K Power Transmission Corporation Limited,
Jammu.

Subject: Redundant communication for Alusteng, Drass, Kargil, Khalasti, Leh (data reporting) to NRLDC

महोदया,

This is in reference to the establishment of redundant communication for Alusteng, Drass, Kargil, Khalasti, Leh for data reporting to NRLDC. Presently Alusteng, Drass, Kargil, Khalasti, Leh are connected with ISTS communication network on radial path using PowerTel Network. Redundant communication for these substations was deliberated in 2nd, 3rd & 4th CPM held on dtd. 25.07.2022, 17.02.2023 & 25.07.2023 respectively. Later on, this agenda was discussed in 23rd TeST Meeting, 26th Test Meeting on 19.11.2024 wherein fiber sharing requirement in Alusteng (PG) - Zainakote (JKPTCL) and Zainakote (JKPTCL) - Wagoora (PG) for data reporting of subject mentioned substations was discussed. A letter to J&K was also issued by CTU dated 08.11.2023 regarding their consent on the Fiber Sharing. Further, during 8th ISTS Communication Planning Meeting (CPM) of Northern Region held on 03.02.2025 in virtual mode, consent has been sought from JKPTCL in this regard. It is requested to provide the consent at earliest.

धन्यवाद,

भवदीय,

Shafat Ahmed Wani
Sr. General Manager (AM,NR-II)

सेंट्रल ट्रांसमिशन यूटिलिटी ऑफ इंडिया लिमिटेड
(पावर ग्रिड कारपोरेशन ऑफ इण्डिया 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: CC/CTU/COMM/CPM/NR/8 **Date:** 25.02.2025

Subject: Minutes of 8th Northern Region ISTS Communication Planning Meeting (NR-CPM) held in virtual mode (MS-Teams) on 3rd February 2025

Dear Sir/Madam,

Please find enclosed the Minutes of the 8th Northern Region ISTS Communication Planning Meeting (NR-CPM) held on 3rd February 2025 through virtual mode.

Thanking you,

Yours faithfully,

25/02/25

(H S Kaushal)
Sr. GM (CTUIL)

Minutes of Meeting of 8th ISTS Communication Planning Meeting (CPM) of Northern Region held on 03.02.2025 in virtual mode.

The 8th meeting of NR-CPM was held on 03.02.2025 through virtual mode. The list of participants is attached at ***Appendix-I.***

DGM (CTU) welcomed all the participants at the meeting and proceeded with the agenda items.

A. Confirmation of minutes of 7th NR-CPM

The minutes of the 7th meeting of NR-CPM was held on 03.09.2024 and minutes were issued on dtd. 05.09.2024. As no comments has been received, the minutes were considered to be confirmed as circulated.

B. Agenda wise deliberation of 8th NR-CPM is as under:

Agenda 1: Requirement of number of DTPCs on newly commissioned 220 kV lines (Agenda by PSTCL)

PSTCL furnished following agenda for the deliberation in the CPM.

As per Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022 clause 5(b) of 48, Protection and control:

"Protection couplers installed for tele-protection shall have primary communication path through OPGW and redundant path shall be either on PLCC or physically diversified OPGW."

Presently, two protection coupler were used for 220kV lines connected to 400kV stations, one of which communicates on point-to-point Optical Ground Wire and other on PLCC through same transmission line.

The optical network of PSTCL has been established and being upgraded further for providing diversified or redundant communication paths for most of the stations. We have recently started installation of 8 channels DTPC which operates on Optical Fiber Network equipment.

As per our understanding, only one pair protection coupler needs to be installed for tele-protection which should have two physically diversified communication path for redundancy. In case no alternative optical fiber path is available another pair of protection coupler shall be installed with communication on PLCC.

Please clarify engineering concept in light of prevalent CEA Guidelines for providing tele-protection Sub-clauses under Clause 48 of Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022 and our design as above.

Deliberations:

PSTCL explained the agenda that as per Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022 clause 5(b) of 48, Protection and control:

"Protection couplers installed for tele-protection shall have primary communication path through OPGW and redundant path shall be either on PLCC or physically diversified OPGW."

And as per clause 5 (d) of above regulation:

The protection system for 400kV and higher voltage transmission line and the line compensating equipment shall have one hundred percent back up communication channels i.e. two channels for tele-protection in addition to one channel for speech plus data for each direction. Provided that, for 220 kV, 132 kV, 110 kV and 66 kV lines, the channel for speech plus data can also be used for tele-protection.

As per above clause 2 nos. of protection channels to be used 400kV and higher, however there is no clarity about number of DTPC to be used for 220kV system.

They provide issue of two lines being constructed from Amritsar to Patti and Amritsar to Shyana. PSTCL stated that currently they are having single DTPC per line and POWERGRID is requesting 2 DTPC per line.

Representative from CEA-PCD stated that they have already furnished a reply to this query earlier to PSTCL that two no. of DTPC are required for each circuit for protection purpose one is on OPGW and other on PLCC, in case two diversified OPGW path are available both DTPC can be taken on OPGW and PLCC will not be required.

CTU enquired POWERGRID for their philosophy of DTPC and configuration in such cases. POWERGRID stated that in their current configuration they have one DTPC and one PLCC. Dual DTPC is still in transition. POWERGRID further stated that they are using are using two DTPC as most of the lines are 400kV and above in POWERGRID.

For the clarity of PSTCL queries regarding DTPC, CEA-PCD to convene a physical meeting among PSTCL, POWERGRID, CEA and CTU .

Agenda 2: Dual reporting (2+2) of SCADA channels of ISTS S/s to Main RLDC and Backup RLDC

1) Requirement of dual reporting (2+2) SCADA channels were deliberated in the meetings held among POWERGRID, Grid-India, CTU and CEA dated 09.05.2023 and 27.06.2023.

2) Further, CERC has issued Guidelines on "Interface Requirements" under the CERC (Communication System for inter-State transmission of Electricity) Regulations, 2017 (Attached at **Annexure-I**) in Jan'24. Which also mandated that users shall provide communication interfaces with multiple ports, cards, gateways etc. to avoid failure of single hardware element.

3) To meet this requirement for new ISTS stations, CTU has started to include this requirement in the RFP inputs for the TBCB projects from Aug'23 onwards. For the existing substations CEA-PCD vide letter dtd.22.07.2024 (attached at **Annexure-II**) also confirms these requirements of 2+2 channels to main and backup RLDC.

4) For existing ISTS sub stations, CTU has requested all the TSPs e.g. POWERGRID, Adani, Sterlite, Indigrid, Aparaava, Renew Power etc. to provide status for readiness of 2+2 channels upto RLDC. As per inputs received from POWERGRID, Indigrid & Sterlite, existing SAS gateway / RTUs needs upgradation or replacement to meet 2+2 channel requirement. Further TSPs stated that this requirement has cost implications, and they require a cost recovery methodology to upgrade their existing substations.

5) As per discussions held within CTU (Engg & Communication departments), the Engg team suggested that as SAS upgradation comes under substation related work and not part of Communication system, this work can be carried out under O&M /AddCap as no separate transmission schemes are generally prepared by CTU at element level.

6) Agenda in this regard was also sent by CTU to NPC for deliberation and seeking their views and issuing guidelines for the cost recovery methodology of upgradation of SAS/RTU in view of 2+2 requirement, however NPC has of the view, that this agenda first needs to be put up in RPC level for consensus of all stakeholders. Thereafter CTU has forwarded the same to all the RPCs vide letter dtd. 11.09.2024 (attached at **Annexure-III**)

7) This Agenda was discussed in 26th TeST meeting of NR also, where forum suggested that this SAS/RTU upgradation work for 2+2 channels may be taken up in similar fashion as the finalized cost recovery method of Firewall installation by NPC.

8) A special meeting was held on dtd. 24.12.2024 under the chairmanship of Member, PS (MoM attached at **Annexure-IV**) after deliberations of 15th NPC meeting regarding cost recovery of Firewall installation at existing substations. In the meeting it was decided that for existing RTM ISTS substations, the cost of firewall installation and associated cyber security measures may be considered under the TSP's O&M expenses. For existing TBCB ISTS substations, a separate meeting will be conducted by CEA/PS wing to address cost-recovery and mode of implementation.

9) Therefore, it is proposed that similar methodology may be adopted for the cost recovery of SAS/RTU upgradation for the purpose of dual reporting of SCADA channels (2+2) to main and backup RLDCs for the existing ISTS substations under RTM & TBCB.

10) It is proposed that TSPs e.g. POWERGRID, ADANI, STERLITE may provide cost breakup of SAS/RTU upgradation station wise for RTM & TBCB both so that same can be deliberated in the RPCs for cost recovery approval purpose under O&M/ Change in law.

Deliberations:

CTU elaborate the agenda and provided the update on the same. CTU explain that in the 26th TesT meeting it was agreed that for cost recovery method of SAS/ RTU upgradation of RTM /TBCB station similar philosophy can be adopted as finalised for Firewall installation at existing substation which was proposed in the 15th NPC meeting.

As decided in the 15th NPC meeting a special meeting was held on dtd. 24.12.2024 under the chairmanship of Member, PS regarding cost recovery of Firewall installation at existing substations. As decided in the meeting for existing RTM ISTS substations, the cost of firewall installation and associated cyber security measures may be considered under the TSP's O&M expenses. For existing TBCB ISTS substations, a separate meeting will be conducted by CEA/PS wing to address cost-recovery and mode of implementation.

It is proposed that similar methodology may be adopted for the cost recovery of SAS/RTU upgradation for the purpose of dual reporting of SCADA channels (2+2) to main and backup RLDCs for the existing ISTS substations under RTM & TBCB.

CTU requested views of other members on this proposal and all the members agreed for the same.

CTU suggested that for RTM substations POWERGRID may put up agenda to the next NRPC for recovery under O&M budget. For TBCB substations POWERGRID, ADANI, STERLITE, Indigrid etc. may provide the cost break up for SAS/RTU upgradation stationwise so that same can be deliberated in the meeting to be taken up by CEA.

Sterlite Power enquired whether breakup for both SAS/RTU upgradation and firewall is required. CTU explained as per MoM issued by CEA for meeting under member PS chairmanship dtd 24.12.2024 (MoM attached at **Annexure-IV**) cost breakup is required for both Firewall and 2+2 purpose.

CTU requested POWERGRID and Sterlite Power to provide station wise Cost Breakup for TBCB S/s within 15 days. Adani and Indigrid were not present in the meeting. CTU stated that they shall inform Adani and Indigrid for the same.

Agenda 3: Redundant communication for Alusteng, Drass, Kargil, Khalasti, Leh (Agenda by NRLDC)

Presently Alusteng, Drass, Kargil, Khalasti, Leh are connected with ISTS communication network on radial path using PowerTel Network. Redundant communication for these substations was deliberated in 2nd, 3rd & 4th CPM held on dtd. 25.07.2022, 17.02.2023 & 25.07.2023 respectively. Later on, this agenda was discussed in 23rd TeST Meeting, where it was finalized that, as no alternate physically diversified fiber path is available, redundant communication can be established using separate pairs of fibers and FOTE available under substation package to provide redundant communication to these substations. Further fiber sharing shall also be required on the following JKPTCL links:

1. Alusteng (PG) - Zainakote (JKPTCL)

Annexure-IV

सत्यमेव जयते

भारत सरकार/Government of India
विद्युत मंत्रालय/Ministry of Power
केन्द्रीय विद्युत प्राधिकरण/Central Electricity Authority
एन.पी.सी. प्रभाग/National Power Committee Division
Ist Floor, Wing-5 ,West Block-II, RK Puram, New Delhi-66

No. CEA-GO-15-14/2/2020-NPC Division /17 Date: 20.01.2025

To

(As per distribution list)

विषय: मौजूदा आईएसटीएस उप-स्टेशनों और फ़ायरवॉल आर्किटेक्चर के लिए फ़ायरवॉल स्थापना पर चर्चा के लिए 24.12.2024 को आयोजित बैठक का कार्यवृत्त -के सम्बन्ध में।

Subject: Minutes of the Meeting held on 24.12.2024 to discuss Firewall Installation for existing ISTS Sub-stations and Firewall Architecture -Reg.

महोदया/महोदय,

सदस्य (पीएस), सीईए की अध्यक्षता में मौजूदा आईएसटीएस उप-स्टेशनों और फ़ायरवॉल आर्किटेक्चर के लिए फ़ायरवॉल स्थापना पर चर्चा करने के लिए 24.12.2024 को आयोजित बैठक का कार्यवृत्त आपकी जानकारी और आवश्यक कार्रवाई के लिए संलग्न है।

The Minutes of the Meeting held on 24.12.2024 to discuss Firewall Installation for existing ISTS Sub-stations and Firewall Architecture under the Chairmanship of Member (PS), CEA is enclosed herewith for your kind information and necessary action, please.

RPCs are requested to communicate this MoM to their constituents for further necessary action at their end.

This has been issued with the approval of Member (PS), CEA.

Encl: As above

भवदीय/Yours faithfully

20/01/2025

(ऋषिका शरण/Rishika Sharan)
मुख्य अभियन्ता एवं सदस्य सचिव,रा.वि.स /
Chief Engineer & Member Secretary, NPC

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Distribution List (Members of NPC):

1. Member Secretary, ERPC, Tollygunje, Kolkata-700033.
2. Member Secretary, NRPC, Katwaria Sarai, New Delhi-110066
3. Member Secretary, SRPC, Bengaluru-560009.
4. Member Secretary, WRPC, Mumbai-40093
5. Member Secretary, NERPC, Shillong-793006.
6. CMD, GRID-INDIA, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi -110016.
7. COO, CTU, Saudamini, Plot No.2, Sector-29, Gurugram-122001
8. CMD, PowerGrid, Saudamini, Plot No.2, Sector-29, Gurugram-122001.
9. Chief Engineer, PCD Division, CEA, Sewa Bhawan, New Delhi-110066
10. Chief Engineer, PSPA I & II Division, CEA, Sewa Bhawan, New Delhi-110066
11. Chief Engineer, ET&I Division, CEA, Sewa Bhawan, New Delhi-110066
12. Chief Engineer, Cyber Security Division, CEA, NRPC Building, 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110066

Copy for kind information to:-

1. SA to Chairperson, CEA, New Delhi
2. SA to All Members, CEA, New Delhi

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Minutes of the Meeting held on 24.12.2024 to discuss Firewall Installation for existing ISTS Sub-stations and Firewall Architecture under the Chairmanship of Member (PS), CEA

1. A Meeting was held on 24.12.2024 under the chairmanship of Member (PS), CEA on Firewall Installation for existing ISTS sub-station and Firewall architecture at Manthan Hall, 2nd Floor, Sewa Bhawan, CEA, New Delhi. The meeting was conducted through physical as well as virtual mode. The list of participants is enclosed at **Annexure.**

2. **Member (PS), CEA** welcomed all the participants in the meeting and requested Member Secretary (NPC) to start the agenda for discussion.

3. **Member Secretary (NPC)** briefed the agenda and informed that Firewall are not installed at existing substations of POWERGRID and some of the other Transmission Service Providers(TSPs) to ensure perimeter security as per CEA (Cyber Security Guidelines), 2021.

   Further, she informed that in the 15th NPC meeting held on 14.11.2024, Chairperson, NPC/CEA advised that the proposal of recovery of costs for firewall installation at existing ISTS substations (RTM & TBCB) may be examined by the Power System Wing of CEA in consultation with Cyber Security Division, CEA, F&CA Division, CEA, PSPA-I & II Division, CEA, PCD Division, CEA, GRID-India, RPCs, CTU and POWERGRID at the earliest.

4. **POWERGRID** representative gave a brief presentation and informed about the proposed architecture of firewall installation at the existing ISTS substations of POWERGRID only.

   Further he stated that there is no Firewall at POWERGRID Stations for any type of Data communication towards RLDC and for the existing substation (under RTM & TBCB) also Firewall needs to be installed for providing the cyber security at the ISTS integrated communication system level.

   He also informed that 548 firewalls are being procured for 274 S/s (259 RTM and 15 TBCB) and they are procuring two firewalls for each of their 274 ISTS substations, including those implemented under RTM/TBCB of POWERGRID. The total project cost is around Rs.110 crores, which includes maintenance for 7 years. Since this is an IT system, the project has a lifecycle of 7 years. Further, POWERGRID requested for approval of the project implementation under RTM mode.

   Draft Technical specifications has been shared by POWERGRID on 16.01.2025.

5. **CTU** representative informed that a committee was formed earlier under the Chairmanship of CE (Cyber Security Division), CEA to resolve this issue of firewall installation at all the ISTS stations including Pvt TBCB licensees. However, vide CEA letter dated 25.06.2024 communicated that all utilities (POWERGRID & Pvt. TBCB) are required to comply with the CEA (Cyber Security Guidelines), 2021 and deploy Intrusion Detection Systems (IDS) and Intrusion Prevention Systems (IPS).

Further, he informed that as per letter dated 25.06.2024, it was informed as Cyber Security Regulations of CEA are in advanced stage so there is no necessity for constitution of aforesaid committee.

He also informed that in the 26th NRPC TeST meeting held on 19.11.2024, it was decided that 2+2 scheme [Dual reporting (2+2) of ISTS stations to Main RLDC and Backup RLDC] shall follow a similar mechanism similar to the firewall installation process. Where SAS Gateway/RTU of existing ISTS substations needs to be upgraded as per Grid-India requirement to meet dual channel reporting of SCADA channels of substations up to RLDCs.

Additionally, he informed that to ensure cyber security compliance as per CEA's Cyber Security guidelines, Firewall devices are being specified in Substations and CTU has prepared technical specification for Firewall after discussion with CERT-Trans (POWERGRID) and CEA. After finalization of the same with CEA, CTU started to include in the inputs to RFP documents from Nov'2021 wherever applicable.

6. **Member (PS)** suggested a national-level plan to be prepared for all TSPs, Genco's, and TBCB in a phase-wise manner for the implementation of firewall installation works. It was also suggested to plan the modalities for implementation in cross-border interconnections like Nepal, Bhutan, Bangladesh, etc. It was also suggested that CTU shall assess the complete requirement of firewall installation works, including TBCB projects.

7. **Member Secretary, SRPC stated that:**
   - As per CEA (Cyber Security in Power Sector) Guidelines, 2021 and in the Draft CEA (Cyber Security in Power Sector) Regulations, 2024, it was noted that Intrusion Detection Systems (IDS) and Intrusion Prevention Systems (IPS) are required to be provided by all the Responsible Entities/Users. The same may be formally recorded and communicated for compliance at the field level.
   - Being mandatory requirement, the compliance needs to be ensured by respective Responsible Entities/ Users. The IDS/ IPS compliant Firewall comes between Application Devices and the Communication Equipment, and there may be issues of data continuity to the control centers if the firewall is installed by third party; therefore, the same needs to be installed by Responsible Entities/ Users to resolve compatibility/interoperability issues.
   - Since the above Guidelines came into force w.e.f. 07.10.2021, any bidding involving Firewalls needs to comply with the relevant provisions of guidelines on Firewall at the cost of Entity.
   - As ISTS basically involves players like POWERGRID, POWERGRID-TBCB, TSP-ISTS-TBCB, Regional Entity Generator, ISTS connected Bulk Consumer, Grid-India and SLDCs, all these entities need to provide IDS/ IPS complaint Firewalls at their respective needs. Similar approach needs to be adopted/ followed in Intra-State System.
   - Respective Entity may need to take a call on absorbing the cost for providing the IPS/IDS compliant Firewall through O&M or through RTM/ Change in Law or as a separate scheme.

8. **Director (Cyber Security), CEA informed that Electronic Security Perimeter devices** are not installed at existing substations of POWERGRID and some of the other Private TSPs substations to ensure perimeter security. The following clauses from CERC and CEA guidelines and regulations highlight the importance of Electronic Security Perimeter devices for strengthening the cyber security of the Powergrid: -

    - **Clause 13(i) of the CERC (Communication System for inter-State transmission of electricity) Regulations 2017 states:** Communication infrastructure shall be planned, designed and executed to address the network security needs as per standard specified by CEA and shall be in conformity with the Cyber Security Policy of the Govt. of India, issued from time to time.
    - **Regulation 14(1) of the CEA (Technical Standards for Communication System in Power System Operations) Regulations, 2020 states:** All users and Control Centres connected to the communication system shall have robust programs in place to adequately and continuously manage cyber security risks that could adversely impact power system communications infrastructure.
    - **CEA Cyber Security Guidelines 2021, Article 4&5. Electronic Security Perimeter & Cyber Security Requirements:**

        - The Responsible Entity shall ensure that every Critical System resides within an Electronic Security Perimeter.
        - The Responsible Entity shall ensure that it has deployed an Intrusion Detection System and Intrusion Prevention System capable of identifying behavioral anomaly in both IT as well as OT Systems.

9. **CSIRT-Power submitted the followings:**

    - Firewalls should be installed in High Availability (HA) mode to ensure continuous operation, even in case of a failure.
    - As per Cyber Security Guidelines, 2021 there is no explicit mention about next generation firewall. However, it does include requirements for Intrusion Detection Systems (IDS) and Intrusion Prevention Systems (IPS) [Article 5] to secure the electronic perimeter security. These requirements can be fulfilled using Next-Generation Firewalls (NGFW), which integrate IDS and IPS capabilities. Firewalls may be referenced in future upcoming cybersecurity regulations.
    - There is no further need to form a committee for finalizing the firewall specifications. PowerGrid will independently prepare the specifications document to proceed with the process.

    .

10. **GRID-INDIA** stated that, as per the meeting held with POWERGRID and CTUIL, it was decided that the Proof of Concept (POC) for firewall installation shall be carried out by POWERGRID and requested to share the tentative date for conducting the Proof of Concept (POC) of the proposed architecture. POWERGRID informed that the necessary hardware has

already been received at the site, and the POC is planned soon. They further stated that the POC is scheduled at two locations in the Northern Region.

Additionally, GRID-INDIA highlighted that for RTU data, the firewall is installed at the RLDC end. However, for URTDSM and Voice Over Internet Protocol (VOIP) systems, firewalls are not available at the RLDC end. Since these systems are under the ownership of POWERGRID, it was requested that firewalls be arranged for these systems at RLDCs/NLDC ends as well. POWERGRID agreed to consider this within the projects scope.

It was discussed that restricting the RTM mode for ISTS substations to only POWERGRID is inequitable to other users, as firewall installation is mandated for all. Therefore, it was suggested that POWERGRID consider including the firewall installation project under O&M by proposing it under a special head of O&M expenses.

11. After detailed deliberations, the followings were emerged:

a) Every node is very important from cybersecurity perspective. The ISTS system, which includes entities such as POWERGRID, TSPs, Regional Entity Generators (including RE & ESS), ISTS-connected Bulk Consumers, Grid-India, and SLDCs, must ensure the deployment of firewalls at their respective sites for IDS/IPS-perimeter cyber security or other requirements as per the existing CEA guidelines/upcoming regulations on Cyber security.

The mode of firewalls installation should also address scenarios involving substations with multiple entities and assets belonging to more than one TSPs.

A similar approach should be adopted for the Intra-State System consisting of. STUs, GENCOs, RE generators, and DISCOMs etc.

A phased approach may be considered for implementing firewalls at all nodes. CTU may prepare a comprehensive implementation plan.

(Action: CTU, POWERGRID, TSPs, Regional Entity, cross Border Entities, Generator (including RE & ESS), ISTS connected Bulk Consumer, Grid-India and SLDCs and STUs, Discoms)

b) The draft technical specifications for firewall may be prepared and shared with Cyber security Division, CEA, PCD Division, CEA, MeitY, DoT, CTU, Grid India, TSPs, and OEMs for their comments. While finalising Technical Specifications, following may be taken care of:

i. **All provisions in the CEA guidelines, IS/IEC standards, or other relevant regulations issued by the Government of India must be incorporated into the final technical specifications.**

(Action: CTU/POWERGRID)

ii. **The associated architecture for placing firewall may be clearly defined in the technical specifications. Requirement of main and backup protection for Firewall Installation at substations may also be ascertained as per relevant practices. The number of firewalls proposed for installation may be reviewed accordingly.**

(Action: CTU/POWERGRID)

iii. **CTU and POWERGRID may coordinate Cyber security Division and PCD Division of CEA for finalization of technical specification for firewall.**

(Action: Cyber security Division and PCD Division, CEA, CTU and POWERGRID)

c) **Regular cybersecurity audits and mock drills should be conducted to ensure system integrity and readiness.**

(Action: POWERGRID, TSPs, Regional Entity Generator (including RE & ESS), ISTS connected Bulk Consumer, Grid-India and SLDCs and STUs, Discoms)

d) **Gencos, Railways and distribution utilities may also be consulted to address their specific cybersecurity needs.**

(Action: Cyber security Division, CEA /CTU)

e) **For existing ISTS substations under RTM, the cost of firewall installation and associated cyber security measures may be considered under the TSP's O&M expenses. For existing ISTS substations under TBCB, a separate meeting will be conducted by PS wing to address cost-recovery and mode of implementation.**

(Action: PS wing)

Meeting ended with vote of thanks to chair and all participants.

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Annexure

List of Participants in the Meeting on Firewall Installation for existing ISTS substation held on 24th December, 2024 under the Chairmanship of Member (PS), CEA

Central Electricity Authority (CEA)

1. Shri. Ashok Rajput, Member, Power System
2. Smt. Rishika Sharan, Member Secretary, NPC
3. Shri. Surata Ram, Chief Engineer, ET & I D
4. Shri. B S Bairwa, Chief Engineer (I/C), PSPA-II
5. Shri. L K S Rathore, Director, Cyber Security
6. Shri. Satyendra Kumar Dotan, Director, NPC
7. Shri. Ravi Shankar Singh, Dy. Director, NPC
8. Shri. S K Pradhan, Dy. Director, NPC
9. Ms. Priyam Srivastava, Dy. Director, PCD
10. Shri. Arjun Agarwal, Asstt. Director, PCD
11. Shri. Akshay Kr. Kumar Gupta, Asstt. Director, PCD
12. Shri. Rakesh Bairwa, Asstt. Director, NPC

NRPC

1. Shri. D K Meena, Director

NERPC

1. Shri. K B Jagtap, Member Secretary
2. Smt. Maya Kumari, Executive Engineer

ERPC

1. Shri. Pratham Kumar, EE,
2. Ms. Kumari Swati, Asstt. Director
3. Shri. Shubhayu Das, Asstt. Director

SRPC

1. Shri. Asit Singh, Member Secretary

GRID INDIA

1. Shri. Surajit Banerjee, CGM
2. Shri. Pramod Singh, Sr, DGM
3. Shri. Ankur Gulati, DGM
4. Shri. Mohneesh Rastogi, Chief Manager

POWERGRID

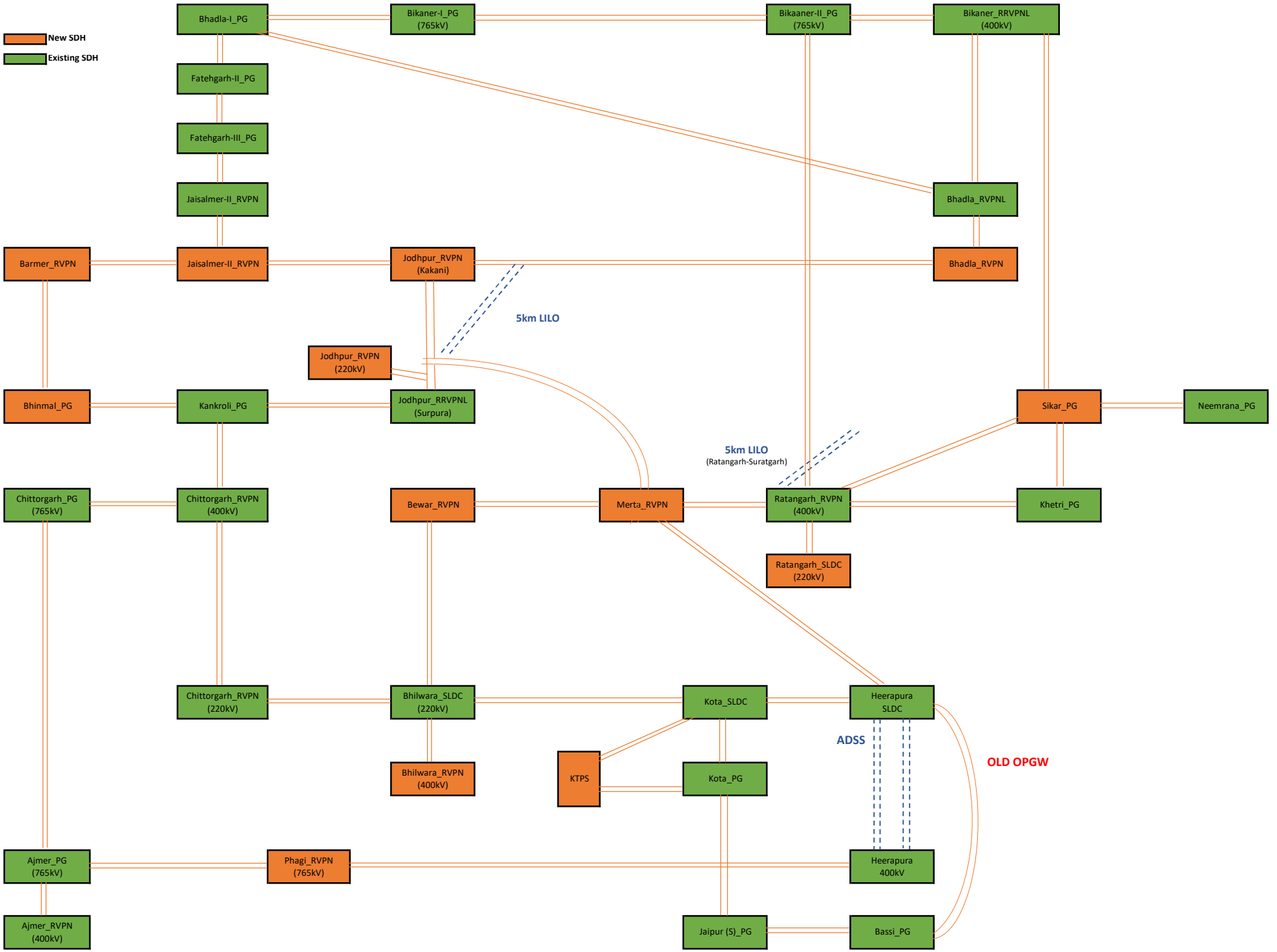
1. Shri. D. Yadav, ED(GA&C)
2. Shri. Anjan Kumar Das, General Manager
3. Shri. Gaurav Awal, Chief Manager

CTU

1. Shri. H S Kaushal, Sr. GM
2. Shri. Shiv Kumar Gupta, Sr. DGM
3. Smt. Kalpana Shukla, DGM
4. Shri. Tej Prakash, DGM
5. Shri. Kaushal Suman, Chief Manager
6. Shri. Prakhar Pathak, Engineer

Network Diagram for Redundant Communication for RRVPNL

Annexure-V



S. No.	Name of the Scheme	Implementing Agency	Implementation schedule	FOTE (No.)	OPGW (Km.)	Cost (Cr.)	Constraint Faced	Status update by TSP
	Schemes approved in 27th NCT, awarded through OM Letter dtd. 24.02.2025							
1	OPGW installation on existing 765 kV Fatehpur-Varanasi S/c & 765 kV Fatehpur-Sasaram S/c Lines which are proposed to be LILO at New Prayagraj (ISTS)	POWERGRID	24 months from the date of allocation or with matching timeframe of the transmission project "Interregional (NR-WR) Transmission System strengthening to relieve the loading of 765 kV Vindhyachal-Varanasi D/c line" whichever is earlier	2	120	7.2		
	Schemes approved in 26th NCT, awarded through OM Letter dtd. 30.01.2025							

2	Redundant Communication for Salal (NHPC) station	POWERGRID	18 months from the date of allocation		62	3.41		
	Schemes approved in 22nd NCT, awarded through OM Letter dtd. 02.09.2024							
3	Optical fiber connectivity for NLDC new building August Kranti Marg, New Delhi	POWERGRID	02.03.2026 (Revised in 26th NCT)	3	35	7.2		
	Schemes approved in 20th NCT, awarded through OM letter dtd. 15.07.2024							
4	Supply and installation of 24 Fibre OPGW on PKTCL lines for providing redundant communication for Parbati Pooling (Banala) (PG) S/s, Parbati-II (NHPC) & Parbati-III (NHPC) stations	PKTCL	18 months from the date of allocation		88.635	5.31		
5	Supply and installation of 24 Fibre OPGW & FOTE to providing redundant communication for Parbati Pooling (Banala) (PG) S/s, Parbati-II (NHPC) & Parbati-III (NHPC) stations	POWERGRID	18 months from the date of allocation (with matching schedule with Scheme 4)	4	0.783	1.24		

6	Redundant Communication for Chamera-III (NHPC) & Budhil (GreenCo) using 3 pairs of fibers sharing from HPPTCL network.	POWERGRID	18 months from the date of allocation	1	0	0.3		
	Schemes approved in 19th NCT, awarded through OM letter dtd. 29.05.2024							
7	OPGW installation on existing 400 kV Kota – Merta line which is LILOed at ShriCement & proposed to be LILOed at 765/400 kV Beawar (ISTS) S/s	POWERGRID	24 months from the date of allocation	3	311	18.5		
8	Supply and Installation of 12 nos. FOTE and additional ethernet (125 nos.) cards for existing FOTE in view of resource disjoint and critical locations.	POWERGRID	12 months from the date of allocation	12	0	5.2		
9	Supply and Installation of 11 nos. FOTE Equipment at Backup SLDCs in NR & Backup	POWERGRID	12 months from the date of allocation	11	0	3.3		

	NRLDC.							
10	Supply and installation of OPGW on 400kV Fatehgarh I (Adani) - Fatehgarh-II (PG) line (6.5 kms), (Fatehgarh-I (Adani) – Bhadla(PG) line LILOed at Fatehgarh-II) as redundant communication for Fatehgarh-I (Adani)	Adani Transmission Ltd.	18 months from the date of allocation	0	6.5	0.325		
11	OPGW installation on 765kV Agra (PG) -Fatehpur (PG)D/c line may be consisdered as a separate scheme in matching timeframe of Ph-IV (Part-4:3.5GW) scheme	POWERGRID	24 months from the date of allocation	2	335	16.5		
12	OPGW installation on existing 400 kV Kurukshetra - Malerkotla line alongwith FOTE at both ends. Part-A	NRSSXXXI (B) Transmission Ltd (Sekura)	18 months from the date of allocation		140	9		
13	OPGW installation on existing 400 kV Kurukshetra - Malerkotla line alongwith FOTE at both ends. Part-B	POWERGRID	18 months from the date of allocation (with matching time	2		0.6		

			frame of OPGW on 400 kV Kurukshetra – Malerkotla transmission line)					
	Schemes Modified/approved in 16th NCT, awarded through OM letter dtd. 03.01.2024							
14	Supply and Installation of OPGW on 400kV Kishenpur-Wagoora line.	POWERGRID	21.11.2026 (Revised in 26th NCT)	2	183	9.15		
15	Supply and Installation of OPGW on 400kV Agra-ballabhgarh line.	POWERGRID	21.05.2026 (Revised in 26th NCT)	2	181	9.05		
	Schemes approved in 11th NCT, awarded through OM letter dtd. 16.02.2023							
16	OPGW installation on existing 400 kV Jallandhar (PG) – Kurukshetra (PG) line which is to be LILOed at 400 kV Dhanansu (PSTCL)	POWERGRID	10.01.2027 (Revised in 26th NCT)	2	229	10.3		
17	Supply and Installation of OPGW on existing 400 kV Koldam- Ludhiana (PG) line which is to be LILOed at 400 kV Ropar (PSTCL)	Indigrid	implementation timeframe of 18 months	2	150	6.7		

18	Redundant communication System for Bhinmal (PG) and Kankroli (PG) ISTS stations	POWERGRID	21.05.2026 (Revised in 26th NCT)	8	5	2.55		
19	OPGW installation on 220 kV Anta (NTPC) – Bhilwara Line	POWERGRID	implementation timeframe of 18 months	2	187	9.35		
	Schemes approved in 9th NCT, awarded through OM letter dtd. 15.11.2022							
20	Transmission lines which are to be provided with OPGW alongwith necessary accessories and FOTE are mentioned as under · 765kV S/c Jaipur (Phagi) (RVPNL) – Gwalior line (312 km) (Ckt-1 is proposed) (to be LILOed at Dausa) · 400kV D/c Agra – Jaipur (South) (PG) line (254 km) (to be LILOed at Dausa)	POWERGRID	21.11.2026 (Revised in 26th NCT)		312 254	28.5		