सत्यमेव जयते

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

दिनांक: 13.11.2024

सेवा में/ To,

संलग्न सूची के अनुसार/As per list attached

विषय: दूरसंचार, स्काडा और टेलीमेटरी उपसमिति की 26 वीं बैठक।
Subject: 26th meeting of Telecommunication, SCADA& Telemetry Sub Committee

इस कार्यालय के पत्र दिनांक **25.10.2024** के क्रम करते हुए यह सूचित किया जाता है कि उत्तर क्षेत्रीय विद्युत समिति की दूरसंचार**,** स्काडा और टेलीमेटरी **(**टेस्ट**)** उप**-**समिति की **26 वीं बैठक दिनांक 19.11.2024 को 11:00 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 25.10.2024, it is to be intimated that the 26th meeting of Telecommunication, SCADA & Telemetry (TeST) Sub-committee of NRPC will be **held at conference room in NRPC, New Delhi on 19.11.2024 at 11:00 AM**. The agenda for the meeting is enclosed herewith for your information and necessary action.

अनुलग्नक– यथोपरि।

भवदीय,

Signed by Anzum Parwej
Date: 13-11-2024 12:48:24

(अंजुम परवेज)
अधीक्षण अभियंता

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26th Telecommunication, SCADA & Telemetry Sub-committee of NRPC
Agenda

I. Confirmation of Minutes

1. Confirmation of Minutes

The minutes of 25th meeting of TeST sub-committee held on 09th February, 2024 were issued on 27.05.2024. 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. Utilization of OPGW on 400kV D/c Samba (PG) – Jalandhar (PG) line (owned by M/s Indigrid) for ISTS communication purpose (*Agenda by CTU)*

2.1. Redundant communication for Samba by utilization of OPGW on 400kV D/c Samba (PG) – Jalandhar (PG) line (owned by M/s Indigrid) was deliberated in the 22nd & 23rd TeST Meeting of NRPC held on 24.05.2023 & 21.09.2023 respectively.

2.2. Utilization of this OPGW on 400kV D/c Samba (PG)-Jalandhar (PG) shall also provide ring protection to the following stations:

Samba (PG), Kishenpur (PG), Chamera-II (NHPC), Chamera-I (NHPC) & Jalandhar (PG)

2.3. In the above-mentioned TeST meeting, M/s Indigird informed that OPGW on 400kV D/c Samba (PG) – Jalandhar (PG) line was not originally in their scope as per TSA, however installation has been carried out for commercial utilization at their own cost.

2.4. After deliberations in the above meetings, a separate meeting was also held on 22.12.2023 under the chairmanship of MS, NRPC and following was concluded in the meeting for the utilization of OPGW on 400kV D/c Samba (PG) – Jalandhar (PG) line for ISTS Communication Purpose:

Quote

2.5. "Indigrid will install communication equipment at both ends and optically integrate with ULDC's equipment at both ends. Further, Indigrid may discuss the matter with its higher management internally for installation of end equipments at its own cost and inform at the earliest."

Unquote

2.6. Thereafter no further communication is received from Indigrid in this regard.

2.7. It is to mention that similar type of agenda was also discussed in the 50th WRPC meeting held on 24.08.2024 (Minutes attached at **Annexure-I**) for utilization of OPGW laid by M/s Indigrid on 765 kV Bhopal (BDTCL) – Indore (PG) for line wherein OPGW

was not originally in their scope as per TSA, however installation has been carried out for commercial utilization at their own cost. This OPGW is being used by Indigrid for the tele-protection of said line. Further LILO of 765 kV Bhopal (BDTCL) – Indore (PG) line is proposed at upcoming Kurawar ISTS S/s. For providing communication to the upcoming Kurawar station, OPGW on main line viz. 765 kV Bhopal (BDTCL) – Indore (PG) is essential. In view of this said OPGW is needs to be integrated with ISTS communication network for tele-protection & grid operation. In the meeting it was concluded that Indigrid shall provide the fibers from 765 kV Bhopal (BDTCL) – Indore (PG) line for ISTS communication and Grid- Operation as per the modalities laid down in Hon'ble CERC order 94/MP/2021.

2.8. It is proposed that in line with decision of 50th WRPC meeting, similar arrangement of OPGW on 400kV D/c Samba (PG) – Jalandhar (PG) line shall be provided by M/s Indigrid for ISTS communication, tele-protection & grid operation.

Members may deliberate.

3. OPGW installation on existing 765kV Fatehpur-Varanasi S/c & 765kV Fatehpur-Sasaram S/c Lines which are proposed to be LILOed at New Prayagraj (ISTS) S/s (*Agenda by CTU)*

3.1. In the 34th Consultation Meeting for Evolving Transmission Schemes in Northern Region held on 20.09.2024 (copy of MoM attached at **Annexure-II**) transmission scheme "Transmission system for connectivity of Pumped Storage Projects in Sonbhadra District in Uttar Pradesh" was deliberated. In the scheme LILO of existing 765kV Fatehpur-Varanasi S/c Line & 765kV Fatehpur-Sasaram S/c Line are proposed at the new Prayagraj S/s (ISTS). As per inputs received from POWERGRID, OPGW is not available on both lines.

3.2. To meet data, voice & protection requirement between Fatehpur, Varanasi, Sasaram & Prayagraj Substations, OPGW needs to be installed over the 765kV Fatehpur-Varanasi S/c Line (223 Km) and 765kV Fatehpur-Sasaram S/c Line (356 km) which are proposed to be LILOed on New Prayagraj S/s along with FOTE at Fatehpur, Varanasi, Sasaram Stations. Further as per CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022, "The primary path for tele-protection shall be on point-to-point Optical Ground Wire".

3.3. CTU has prepared a scheme for OPGW installation on existing 765kV Fatehpur-Varanasi S/c Line & 765kV Fatehpur-Sasaram S/c Line which is attached at **Annexure-III**. This scheme shall be taken up in upcoming NRPC Meeting along with transmission scheme of "Transmission system for connectivity of Pumped Storage Projects in Sonbhadra District in Uttar Pradesh" to match time frame with new transmission scheme.

Members may deliberate.

4. Dual reporting (2+2) of ISTS stations to Main RLDC and Backup RLDC (*Agenda by CTU)*

4.1. 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. To increase the redundancy in the system Grid-India requested that both main and backup channels should report to RLDCs as well as back up RLDCs (in dual mode). In this regard meetings were held among POWERGRID, Grid-India, CTU and CEA dated 09.05.2023 and 27.06.2023 (MoM attached at **Annexure-IV**) where dual reporting of SCADA Channels to main RLDC & Backup RLDC were deliberated.

4.2. Further, CERC has issued Guidelines on "Interface Requirements" under the CERC (Communication System for inter-State transmission of Electricity) Regulations, 2017 (Attached at **Annexure-V**) 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.

4.3. 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-VI**) also confirms these requirements of 2+2 channels to main and backup RLDC.

4.4. 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 POWERGRID, Indigrid, Sterlite existing SAS gateway / RTUs needs upgradation or replacement. Further TSPs stated that this requirement has cost implications, and they require a separate scheme to upgrade their existing substations.

4.5. As per discussions held within CTU (Engg. & Communication departments), the Engg. team suggested that as SAS upgradation comes under substation related work, this type of work can be carried out under O&M /AddCap as no separate transmission schemes are generally required at element level.

4.6. Agenda in this regard was also sent by CTU to NPC for deliberation and seeking their views and issuing guidelines, however NPC is 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-VII**)

4.7. Forum is requested to deliberate this requirement of SAS/RTU Upgradation/ Replacement for existing substations in Additional Capitalization for RTM substations and under Change in Law of TSA for the TBCB substations in line with CERC order on petition no. 94/MP/2021.

4.8. It is to inform the forum, that CTU has issued a letter for dual connectivity to RE generators of the Southern Region (attached at **Annexure-VIII**) as per the discussion held in 48th COM SR meeting & 6th CPM of SR held on 29.07.2024 and 13.08.2024

respectively. In the similar manner deliberations are required in this meeting for the Northern Region RE generators.

Members may deliberate.

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

5.1. After release of MoP Guidelines on Planning of Communication System for Inter-State Transmission System (ISTS) dtd. 09.03.22, CTU has prepared various communication schemes and same were awarded to TSPs e.g. POWERGRID, Indigrid, Adani, Sekura etc. after approval in NCT meetings. Details of the schemes awarded to various TSPs in Northern Region are attached at **Annexure-IX**.

5.2. It is requested that TSPs may provide the present status and commissioning details of these schemes for information to all stakeholders.

5.3. This agenda was also deliberated in the 7th CPM of NR held on 21.08.2024 regarding POWEREGRID schemes, however CTU is yet to receive the input on the same.

Members may deliberate.

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

6.1. 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.

6.2. 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.

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

6.4. Brief details are as follows:

a) Under SCADA upgrade project M/s Siemens at all 400KV / 220 KV and 132 KV substations/generating Stations of J&K PDD installed 66 RTUs.

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

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

d) 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.

e) 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.

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

g) 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.

h) 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.

i) 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.

j) 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.

k) 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.

l) 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.

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

n) 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.

Members may deliberate.

J&K/POWERGRID to update the status.

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

7.1. 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 (Attached at **Annexure-X**), 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.

7.2. 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-XI**): "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."

7.3. 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.

7.4. 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.

7.5. 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.

Members may deliberate.

CTUIL to update the status.

8. Redundant Communication from Sub-stations/Generating Stations *(Agenda by NRLDC)*

8.1. As per CERC communication Regulations, 2017 redundant communication shall be provided from Sub-stations/Generating Stations to concerned Load Dispatch Centre. Issue of redundant communication paths from different Generating Stations/Sub-Stations was discussed in 22nd, 23rd and 24th TeST Meeting were discussed. Details of various links is as given below:

S.No	Link	Discussion in 24th TeST Meeting
1.	Redundant communication for Alusteng, Drass, Kargil, Khalasti, Leh	CTU informed that they redundant link can be commissioned through JK link of Alusteng – Ziankote-Wagoora and requested JK to share 3 pair for ULDC purpose. They further informed that two FOTE will be required at Alusteng and Ziankote. J&K informed that OPGW is available. However, they will confirm availability after confirmation from higher management. CTU was requested to put up the agenda in forthcoming NRPC meeting after receiving consent from J&K.
2.	Redundant communication for Narora (NAPP) (NPCIL)	CTU informed that they redundant link can be commissioned after commissioning OPGW link on NAPPS – Simbhauli and further utilizing UP links till Modipuram. UP informed that OPGW is available. However, they will confirm availability after confirmation from higher management. CTU was requested to put up the agenda in forthcoming NRPC meeting after receiving consent from UP.
3.	Redundant Communication for Pithoragarh (PG) Sitarganj (PG) stations	CTU informed that they redundant link can be commissioned through PTCUL and requested HPPTCL to share 3 pair for ULDC purpose. HPPTCL informed that tender for OPGW is going to be floated and technical approval is in process. However, they will confirm availability after confirmation from higher management and requested to give request letter to PTCUL higher management. CTU agreed to give request letter and after consent for PTCUL higher management they will put the agenda in NRPC for approval.

4.	Redundant communication for Saharanpur (PG) S/s	CTU informed that they redundant link can be commissioned through UPPTCL link of Sahararnpur (PG)- Devband (UP)-Sahararnpur (UP)-Nanauta (UP)-Shamli (UP) -Muradnagar (UP) and requested UPPTCL to share 3 pair for ULDC purpose. They further informed that two FOTE will be required at Shamli and Muradnagar. UPPTCL informed that one pair of OPGW is available and can be utilized. However, they will confirm availability for 3 pairs after confirmation from higher management. Further, UPPTCL was requested to integrate Deoband, Saharanpur (UP) and Nanuta equipment's for integration in NMS and better maintenance etc. CTU was requested to put up the agenda in forthcoming NRPC meeting.

8.2. Issue was also discussed in 25th TeST Meeting held on 25.06.2024, during which NRLDC requested that redundant communication is essential and requested CTU/POWERGRID to arrange for redundant communication. After detailed discussion it was finalized that CTU will re-work on the detailed requirement of redundant communication.

8.3. CTU is requested to please update the status of redundant communication for these Stations.

Members may deliberate.

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

9.1. 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.

9.2. 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.

9.3. 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.

9.4. 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.

9.5. Issue as also discussed in 25th TeST Meeting and 50th TCC-74th NRPC Meetings. Details of states where integration is still pending is as given below:

S. No.	State	Status	Timelines
1	Punjab	Available	Script Automation shall be done in months' time
2	Haryana	Available	Script Automation shall be done in months' time
3	Uttarakhand	Not Available	Integration work is in process, will be done in months' time
4	Jammu & Kashmir	Not Available	J &K will discuss and revert

Members may deliberate.

All concerned are requested to update the status please.

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

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

10.2. The same issue was also informed to PTCUL vide letter (Ref: - NRLDC/SLII/2019-20) dated 05.03.2020. 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.

10.3. 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.

10.4. 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.

10.5. 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.

10.6. 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.

10.7. 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.

Members may deliberate

PTCUL to please update the status

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

11.1. 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

11.2. 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.

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

11.4. 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.

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

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

Members may deliberate

RRVPNL may update the status

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

12.1. It is to inform the provision of installation of 8 nos. 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.

12.2. 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 finalized. Accordingly, addresses/IP Details of PMUs was shared by NRLDC in April 2024.

12.3. 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.

Members may deliberate

POWERGRID to please update the status

13. Connectivity of 765kV transmission line from LPGCL to SLDC (Agenda for LPGCL, Lalitpur)

13.1. 765KV transmission line from LPGCL to the Fatehabad substation has been undercharged since 2016. However, communication over the Fiber network for LPGCL data transfer to SLDC has not yet been established. Currently, data communication is being facilitated through a telemetry network (GPRS).

Current Status:

i. **765KV Agra Circuit #1:** Out of 24 fibers, 12 are confirmed to be in good condition, based on the latest communication received from UPPTCL. The Microwave team and LPGCL are working to deploy a Commtel FOTE engineer to establish communication.

ii. **765KV Agra Circuit #2:** The Fiber has been damaged at multiple locations since the line was charged in 2016.

13.2. UPPTCL needs to ensure the health of all 24 fibers on both 765KV transmission lines.

Members may deliberate.

14. Regarding non availability of Ethernet port at Bhakra Left Bank Power House (Agenda by BBMB)

It is stated that BBMB is in the process of reporting the pending RTU's directly to Backup Control Centre and while doing so, it came out that there is no availability of Ethernet port at Bhakra Left Bank Power House. As such, it is requested to get the data reported directly to Backup Control Centre of BBMB at the earliest.

Members may deliberate.

III. Issues related to Unified Load Dispatch & Communication scheme of NR

15. Replacement of End-of-Life internal firewall of SCADA system and renewal of subscription of external firewall & Antivirus (Agenda by UPSLDC). (Agenda by UPSLDC)

POWERGRID is requested to apprise the status & timeline of this work.

16. Extension of ULDC Phase-II AMC with M/S Siemens (Agenda by UPSLDC)

A proposal has been received from M/S Siemens about the philosophy/methodology about the maintenance of the existing SCADA system beyond the extended AMC period (after 31.3.2025) for 1 year. A joint discussion with PGCIL & all Northern constituents is required to be done regarding the proposed price, duration & Terms and conditions.

Members may deliberate.

17. Regarding Timeline of ULDC Phase-III Scheme (*Agenda by BBMB)*

As per the DPR of upcoming ULDC Phase-III scheme circulated by POWERGRID, the ULDC Phase-III scheme is likely to be commissioned by November, 2025. The details of the events and timeline of the same maybe intimated.

Members may deliberate.

18. Regarding AMC extension of ULDC Phase-II Scheme (*Agenda by BBMB)*

It is stated that existing SCADA system equipment AMC is valid till 08.06.2025. As such, it is requested that the AMC Ccontract may be extended from M/s Siemens till the implementation/commissioning of ULDC Phase-III Scheme at the earliest please under unified manner.

Members may deliberate.

19. Non-displaying of Dynamic Values on SLDC Haryana Website (Agenda by HVPNL)

19.1. Since 20th TeST meeting, M/s Siemens ensuring to resolve the issue within one month but the issue hasn't been resolved till date. So, M/s Siemens may be asked to update the progress and resolve this issue at the earliest.

20. Issues with procurement of Replacement of Internal Firewalls (*Agenda by HVPNL)*

20.1. Issues with procurement of Replacement of Internal Firewalls with 2 years of subscription, External Firewall Subscription extension from AMC extension date (i.e. 1-Apr-2023 to 31-Mar-2025), Upgradation of Anti-Virus solution for all Windows Servers and Workstations with 2- year subscription thereof: -

a. The matter was deliberated in various meeting with PowerGrid and technical specifications were also almost finalized. However final financial implication and LoA is still pending from PowerGrid. It is pertinent to mention that delay in the replacement / renewal of above may cause cyber threat in the OT system. So,

M/s PowerGrid may be asked to update the progress and conclude this issue at the earliest.

21. AMC extension for ULDC Phase-II (*Agenda by HVPNL)*

21.1. The Annual Maintenance Contract (AMC) for the existing SCADA system is set to expire in March 2025. The new SCADA system, which is to be procured under ULDC Phase-III by PowerGrid in a unified manner for the entire Northern Region (NR), is expected to be commissioned by January 2025. It is important to note that the current system faces routine issues due to outdated hardware and software, heavily relying on the existing vendor, as it is a proprietary system. Given the critical role of the SCADA system, any disruption in its service would have a cascading effect on the entire national grid. The AMC for the existing system was last extended in March 2023 at the last moment, after considerable efforts, despite specific arrangements outlined in the existing contract with M/s Siemens. Currently, the existing contract has no provision for extending the AMC beyond March 2025.

21.2. Recently, M/s Siemens provided a non-binding commercial offer, which was significantly higher—approximately 14 times the current AMC rate. PowerGrid, in the last Project Review Meeting (PRM) for ULDC Phase-III, informed that they would discuss the matter with M/s Siemens at the ED level and provide an update accordingly. PowerGrid may be requested to provide the update on the issue please.

Members may deliberate.

22. End of Life of Internal Firewalls, subscription of External Firewall and Anti-Virus installed in SCADA/ EMS system under ULDC Phase-II Scheme (Agenda by HPSLDC)

22.1. M/s Siemens has intimated that the OEM has already declared the End of Life (EoL) for internal Firewall (Fortinet make) of SCADA/EMS system and its subscription has expired on 30.04.2023 which may pose Cyber Security risk. Further, M/s Siemens has intimated that the Internal Firewalls are required to be replaced at the earliest and the firm shall not be liable for any vulnerabilities arises due to end of life/subscription.

22.2. Further, a meeting between POWERGRID, Constitutes of Northern Region and M/s Siemens was held on 01.09.2023 through Video Conferencing for the finalization of modalities for procurement of Internal Firewall and subscription of External Firewall & Anti- virus where in all the Constituents opined that PGCIL may place LoA or Work Order centrally to M/s Siemens on behalf of all NR Constituents so that the implementation can be done timely & coordinated manner and the payment shall be made by the Constituents. But the LoA or Work order for the procurement of Internal Firewalls, subscription of External Firewall and Anti-Virus is still pending at the end of POWERGRID.

22.3. In view of Cyber Security & to protect the Critical Information & Infrastructure from Cyber Threats, POWERGRID may be asked to place the Letter of Award for the procurement of the above said security system.

Members may deliberate.

23. Extension of Annual Maintenance Contract (AMC) of existing SCADA/EMS system installed under ULDC Phase-II Scheme (Agenda by HPSLDC)

23.1. The extended AMC of 02 years of existing SCADA/EMS system installed at HPSLDC under ULDC Phase-II Scheme is going to expire on 31.12.2024. The work of upgradation/replacement of existing SCADA/EMS is under ULDC Phase-III expected to be implemented in March-2026. In view of above stated facts, AMC of existing SCADA/EMS is required to be extended for further period of 15months (after 31.12.2024) or till the implementation of the project of ULDC Phase-III. Further, M/s Siemens has provided budgetary quote amounting to Rs. 3,37,84,389/- only for HPSLDC to providing AMC services of SCADA system for 1 year which include only software part which is on very very higher side and needs to be reviewed on realistic base.

23.2. In view of above, POWERGID may be asked to take up the matter with M/s Siemens for supplying realistic budgetary quote for the extension of AMC of SCADA/ EMS system so that HPSLDC may take approval of management.

Members may deliberate.

24. Replacement of Fibrehome make Communication Equipment (Agenda by POWERGRID)

24.1. Replacement of Fibrehome make communication equipment was deliberated in 25th 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.

24.2. Subsequently the agenda was deliberated in 7th NR CPM meeting of CTU and following are the deliberations;

24.3. POWERGRID stated that around 250 to 260 equipment of Fibrehome make including SDH and PDH needs to be replaced. Further communication of STU nodes also depended on the Fibrehome make FOTE at Central Sector, therefore replacement of these FOTE requires phased manner implementation in coordination with STUs FOTE replacement schemes.

24.4. RVPNL stated they have 9 locations to be replaced. RVPNL also mentioned that they will carry out this replacement as part of ULDC scheme and will inform the critical locations to be replaced first.

24.5. UPPTCL informed that 49 locations need to be replaced, and same matter has been put up for management approval. UPPTCL stated that they will revert back with details of locations and criticality through email once approved by management.

24.6. PSTCL stated that replacement of all their FOTE will be done in their own project in phased manner.

24.7. POWERGRID also informed that 3 nos. of FOTE also needs to be replaced at PTCUL which are installed by POWERGRID and same shall be replaced by POWERGRID.

24.8. NRLDC stated that based on the feedback received from states it is felt that there might be need of AMC extension beyond April 2025 as many states are yet to start for replacement of Fibre homes equipment and requested that AMC shall be closed in phased manner as equipment are phased out.

24.9. For further deliberation of new scheme or replacement by states constituents, a separate meeting was planned by CTUIL wherein STUs, CTUIL and POWERGRID to discuss the replacement procedure in a phased manner, however deliberation still not done and future course of action including replacement of equipment or extension of AMC through POWERGRID is not still clear i.e., the scope including AMC requirement for future years.

Members may deliberate

25. Replacement of Coriant make FOTE at Alstung, Drass, Kargil, Khalsti, Leh & Kala Amb (Agenda by POWERGRID)

25.1. With regard to replacement of 6 no. of Coriant make FOTE installed in NR-II region namely 220kV Alstung, Drass, Kargil, Khalsti, Leh and 400kV Kala-Amb sub-stations which have been installed under various substation packages have almost completed their useful life of 7 years. Now, the AMC services & spares availability for these equipments is very difficult in the current market scenario where the manufacturing of this card has stopped by company and delivery of new cards is also have problem in make in India policy. Therefore, it is proposed to replace these 6 FOTEs with latest technology, so that telemetry data reporting, voice connectivity and protection system for lines might not get affected in future.

Members may deliberate

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

26.1. 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.

26.2. 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. 1.25 Cr is pending since long, out of that major outstanding is pending against JKPTCL, HPSEBL, UPPTCL and PTCUL which are of more than 3 years.

Constituents Name	Dues pending for less than 3 months	Dues pending for 3 to 6 months	Dues pending for 6 months to 1 year	Dues pending for 1 year to 2 year	Dues pending for more than 3 year	Grand Total
BBMB					114,621	114,621
DTL-MINTO ROAD	525,623	525,623			278,147	1,329,394
Electricity Department of U.T. Chandigarh Administration			5,493			5,493
Haryana Vidyut Prasaran Nigam Limited	29,438		58,873		527,984	616,295
Himachal Pradesh State Electricity Board	131,881		931,292	880,208	728,957	2,672,338
JKPDD				49,998	1,924,622	1,974,620
POWER TRAN CORP OF UTTARANCHAL	37,232	37,232	37,232		1,293,082	1,404,777
PSTCL-PATIALA	271,274		542,550			813,824
PSTCL-LUDHIANA			579,595			579,595
RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LTD	757,328		91,773			849,100
UPPTCL-SG PURAM	444,623				1,709,360	2,153,983
Grand Total	**2,197,398**	**562,855**	**2,246,807**	**930,206**	**6,576,773**	**12,514,040**

26.3. 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.

IV. Other Agenda

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

27.1. 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.

27.2. As discussed in 22nd TeST Meeting for commissioning of U-NMS Project, database is required of existing NMS of center 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.

27.3. 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.

27.4. However, till date any Network Equipments are yet to be integrated in U-NMS.

27.5. 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.

a) 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.

b) 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.

c) 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.

d) Regarding Fibcom equipments, representative from UPPTCL informed that they resolve the issue within one month.

e) 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.

f) 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 take up for integration of equipments with Keymile.

27.6. 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.

27.7. 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.

Members may deliberate.

CTU/POWERGRID is requested to please update the status

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

28.1. 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:

a) Through raised trouble tickets in Centralized Network Management System
b) Lodged complaint through web portal.
c) System generated alarms (including standalone NEs)
d) Through any other communication media (mail, phone etc.)

28.2. 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.

28.3. 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.

28.4. 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/extract 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.

Members may deliberate.

POWERGRID/CTU to please update the status

29. Status of Communication System Outage Planning Portal (Agenda by POWERGRID)

29.1. In the 50th TCC-74th NRPC Meeting held on 28th and 29th June 2024, It was decided that CTUIL may develop the Communication System Outage Planning Portal in UNMS based on a Standard Operating Procedure (SOP) finalized in 14th NPC meeting, held

on 3rd February, 2024. The specification of web-based outage planning portal may be taken from WRPC and SRPC for the development of the same in UNMS. The NRPC also highlighted that communication outage portal should be the same for all regions as outage procedures are same for all regions. It was emphasized that cyber security issues arising while mapping/ transferring the information available on isolated UNMS system to web-based outage planning portal may also be addressed.

29.2. Subsequently, CTUIL vide email dated 02.07.24, communicated to POWERGRID for development of Communication System Outage Planning Portal in existing UNMS system.

29.3. As NR-UNMS, NER-UNMS and ER-UNMS system have already been commissioned, and the system is under AMC So new development in NR-UNMS, NER-UNMS and ER-UNMS is not possible as scope of work under the Project has already been completed. The WR-UNMS and SR-UNMS is under implementation stages.

29.4. WR-UNMS is being awarded to M/s Sterlite technologies Limited, to whom NR-UNMS and NER-UNMS project was awarded. SR-UNMS is awarded to M/s NMS Works, to whom ER-UNMS was awarded. Moreover, Communication System Outage Planning Portal involves usage of existing inventory data of the region which is available in existing regional UNMS system.

29.5. There is requirement of integration of inventory data from existing Regional UNMS system to the Regional Communication System Outage Planning Portal, so it is decided to develop Communication System Outage Planning Portal for NR-UNMS, NER-UNMS and WR-UNMS from M/s Sterlite Technologies Limited under the WR-UNMS project. Similarly, the Communication System Outage Planning Portal for SR-UNMS and ER-UNMS shall be developed from M/s NMS Works under SR-UNMS project.

29.6. The Regional Communication System Outage planning portal shall be accessed by users such as RLDC, CTU, RPC, maintenance contractor for O&M, for fault reporting and rectification.

29.7. As per CEA Cyber security guideline, 2020

"Article 1. Cyber Security Policy.
a. Cardinal Principles: The Responsible entity will strictly adhere to following cardinal principles while framing cyber security policy:
i. There is hard isolation of their OT Systems from any internet facing IT system."

29.8. In compliance to CEA Cyber Security guidelines for maintaining hard isolation between UNMS system and Internet facing system, it is decided to host Communication System Outage Planning Portal on Cloud. The ticketing and outage portal shall be hosted as SaaS (Software as a service) on the cloud, and it shall be isolated from the existing UNMS system. The synchronization of inventory data between regional Communication System Outage Planning Portal and Regional UNMS system shall be offline based.

29.9. Estimated cost for development of Cloud based Communication System Outage Planning Portal for seven years for NR-UNMS, NER-UNMS and WR-UNMS shall be Rs. 2.64 crores. Estimated cost for development of Cloud based Communication System Outage Planning Portal for seven years for SR-UNMS and ER-UNMS shall be Rs. 2.99 crores. Cost shall be booked proportionality as per POC mechanism. For NR region cost shall be booked under ADD-CAP of NR-UNMS Project.

29.10. In the 76th NRPC held on 25.10.24 agenda was deliberated and NRLDC requested to discuss the features of Cloud based outage portal in upcoming NR-Test meeting.

29.11. Deliberation/Decisions in 14th NPC Meeting, the cloud-based Communication System Outage Planning Portal will be developed in line with SRLDC portal (Details attached at Annexure-XII) and a Standard Operating Procedure (SOP) for Communication System Outage Planning has been finalized in 14th NPC meeting, held on 3rd February, 2024 (Attached at Annexure-XIII).

Members may deliberate

30. Deployment of NMT for NR-UNMS (Agenda by POWERGRID)

30.1. CERC Communication Regulations, 2017 envisaged CTU as nodal agency for supervision of communication system in respect of inter-State communication system and implementation of centralized supervision for quick fault detection and restoration (Relevant extract attached at Annexure-XIV).

30.2. In compliance to above Regulations, the UNMS project for centralized supervision of ISTS communication network in Northern region is implemented by POWERGRID in RTM mode after approval from 46th NRPC dated 24.09.2019 & 48th NRPC dated 02.09.2020. NR UNMS has been commissioned and is operational as on date. Main control centre for NR UNMS is located at Katwaria Sarai, New Delhi and Back-up control centre is located at Lucknow. Subsequently, Procedure on “Centralized Supervision for Quick Fault Detection and Restoration of Communication System” was notified by CERC on 19th January 2024 (Attached at Annexure-XV). As per clause 8.1 of the said procedure, CTU shall deploy a Network Monitoring Team (NMT) at main & backup control centers for centralized supervision and monitoring of the communication network.

30.3. Subsequently, a letter from CTUIL dated 28.03.2024 (copy enclosed at Annexure-XVI) was received vide which they have asked POWERGRID to discharge functions of NMT for all Regional & National UNMS as and when the respective system is commissioned. They have further asked to nominate two (2) nodal officers each for main & back-up control centers.

30.4. In view of above letter from CTUIL, 2 (two) nodal Person has been nominated in Northern Region and additional manpower is being deployed at main & back-up Control Centers to discharge the functions of NMT in line with CERC/CEA guidelines. The detail of manpower for NMT is as below:

NR UNMS Control centres	Manpower for Shift rotation	Manpower for general shift
Main Control Centre at New Delhi	Four (4) persons in the level of E2/E3/E4/E5	Two (2) persons in the level of E4/E5
Back-up Control Centre at Lucknow	- -	Two (2) persons in the level of E4/E5

30.5. The cost for deployment of manpower in Main Control Centre (New Delhi) and Back-up Control Centre (Lucknow) shall be booked under O&M expenses of NR-UNMS project and cost shall be recovered through CERC tariff route under Operations and Maintenance head.

Members may deliberate

31. Replacing of NR Reliable Scheme for Parbati Pooling (Banala) (PG), Parbati-II (NHPC) & Parbati-III (NHPC) by different/Upcoming Package (Agenda by POWERGRID)

31.1. Under 72nd NRPC it was decided that Supply and installation of 24 Fibre OPGW & FOTE to providing redundant communication for Parbati Pooling (Banala) (PG), Parbati-II(NHPC) & Parbati-III (NHPC) stations will be implemented under "NR Reliable Scheme" Tentative implementation timeframe :18 months from the date of allocation.

31.2. Since all works under "NR Reliable Scheme" has been completed and scheme is on the verge of closure, it is proposed and informed that FOTE for providing redundant communication for Parbati Pooling (Banala) (PG), Parbati-II(NHPC) & Parbati-III (NHPC) stations will be implemented under different/upcoming package.

Members may deliberate

32. Deletion of 5 nos. of HPSEBL links from Fibre Optics Communication System (Additional Requirement) for Northern Region (HPSEBL State Sector OPGW head) (Agenda by POWERGRID)

32.1. OPGW supply and installation package is going on at HPSEBL transmission lines under Fibre Optics Communication System (Additional Requirement) for Northern Region under Package-I(a)) since 2015. Supply of materials has been completed under M/s SDGI, China. However, installation, testing and commissioning are being carried out under 613 KMs of OPGW package on various transmission lines of HPSEBL & BBMB Package No. N2JM/C&M/CS/07(16) requires deletion/shifting of 5 nos. of HPSEBL links from the detailed scope citing various issues facing since starting of the project viz. hurdles in Shutdown related requirements, Tower strengthening, weather conditions & forest areas. Currently works are going on in 220 KV Bhaba-Kashang TL where stringing work of 36.5 kms/38.5 Kms has been completed. The whole matter has been taken up with M/s HPSEBL & they have agreed for the same (Details attached in Annexure-XVII & Annexure-XVIII).

613 Kms OPGW Package-M/s TEN DOT (Package-1 (a)-Additional Scheme)

S.No.	Name of Link	Voltage (kV)	Total Length (Kms)	To be deleted (Kms)	Remarks
	HPSEBL				
1	Gumma - Jutogh	66	15	15	As agreed by M/s HPSEBL, the link is to be shifted to any other upcoming package.
2	Kangoo - Bagga	132	16	13	3 Kms of LILO portion work done by team and now link is commissioned. So final link is to be amended to **LILO portion of Kangoo-Bagga TL.**
3	Bagga - Darlaghat	132	14	14	
4	Barotiwala- Parwanoo	66	17	17	
5	Bhaba - Nathpa	66	2	2	
	Sub Total		**62**	**59**	

32.2. Deletion of 01 nos. of BBMB link from this package. The link details are mentioned in **Annexure-XIX**.

613 Kms OPGW Package-M/s TEN DOT (Package-1 (a)-Additional Scheme)					
S. No.	**Name of Link**	**Voltage (kV)**	**Total Length (Kms)**	**To be deleted (Kms)**	**Remarks**
	BBMB				
1	Jagadhari-Abdullapur(PG)	220	29	29	BBMB requested to delete the links citing 3-4 kms of transmission line shifted to underground cable in HVPNL section.
	Sub-Total		**29**	**29**	

Members may deliberate

Annexure-I

भारत सरकार
Government of India
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
पश्चिम क्षेत्रीय विद्युत समिति
Western Regional Power Committee
एफ -3, एमआयडीसी क्षेत्र, अंधेरी (पूर्व), मुंबई - 400 093
F-3, MIDC Area, Andheri (East), Mumbai - 400 093
दूरभाष Phone: 022- 28221636; 28200194/95/96; फैक्स Fax : 022 – 28370193
Website : www.wrpc.gov.in E-mail : as-wrpc@nic.in

आई एस ओ ः 9001-2015
ISO : 9001-2015

सं. : पक्षेविस/ 50वीं/ पक्षेविस बैठक/ सहा.स. /2024/ 9598-9709 दिनांक: 24 SEP 2024
No. : WRPC/50th/ WRPC Mtg./A.S./2024/ Dated:

सेवा में/To,

(संलग्न सूची के अनुसार/
As per enclosed list)

विषय : पश्चिम क्षेत्रीय विद्युत समिति (पक्षेविसमिति) की 50वीं बैठक का कार्यवृत्त।

Sub : Minutes of 50th meeting of Western Regional Power Committee (WRPC).

महोदय/Sir,

इस पत्र के साथ दिनांक 24 अगस्त, 2024 को ऊटी (तमिलनाडू) में आयोजित पश्चिम क्षेत्रीय विद्युत समिति की 50वीं बैठक एवं इससे पहले दिनांक 23 अगस्त, 2024 को आयोजित तकनीकी समन्वय समिति की बैठक का कार्यवृत्त आपकी सूचना एवं आवश्यक कार्रवाई हेतु संलग्न है ।

Please find enclosed herewith the Minutes of the 50th meeting of Western Regional Power Committee held on 24th August 2024 at Ooty (Tamilnadu) preceded by Technical Coordination Committee meeting on 23rd August 2024 for your kind information and necessary action.

बैठक का कार्यवृत्त पक्षेविसमिति की वेबसाइट www.wrpc.nic.in पर भी उपलब्ध है ।
Minutes of the meeting is also available in the WRPC website: www.wrpc.nic.in.

यह सदस्य सचिव, पक्षेविसमिति के अनुमोदन से जारी किया जाता है ।
This issue with the approval of Member Secretary, WRPC, Mumbai.

धन्यवाद / Thanking you,

भवदीय / Yours faithfully,

24/9/24

(दीपक शर्मा / Deepak Sharma)
कार्यपालक अभियंता / Executive Engineer

संलग्न: उपरोक्तानुसार/As above

50th TCC Discussions:

SE (Operation), WRPC stated that the proposal for developing an online software module for COMWR (Communication Equipment Outage Coordination Meeting WR) was approved in the 49th WRPC meeting. However, in the subsequent SCADA meeting, CTUIL informed that the communication outage portal would be a part of UNMS package and hence, WRPC need not develop a separate portal for the same. CTUIL confirmed that the communication outage portal would be a part of UNMS package.

TCC recommended that WRPC secretariat should not go ahead with the proposed development of a communication portal as it would be a part of the UNMS package implemented by CTUIL.

50th WRPC Discussions:

MS WRPC briefed the agenda items and discussions held in TCC meeting. Member GO&D stated that the implementation of UNMS project might take some time and raised concerns about the communication planning till that period. MS WRPC clarified that the communication outage planning is still discussed in the regular OCC/Pre-OCC meetings for which data are collected through offline mode or emails and the same practice will be continued till the development of the online portal.

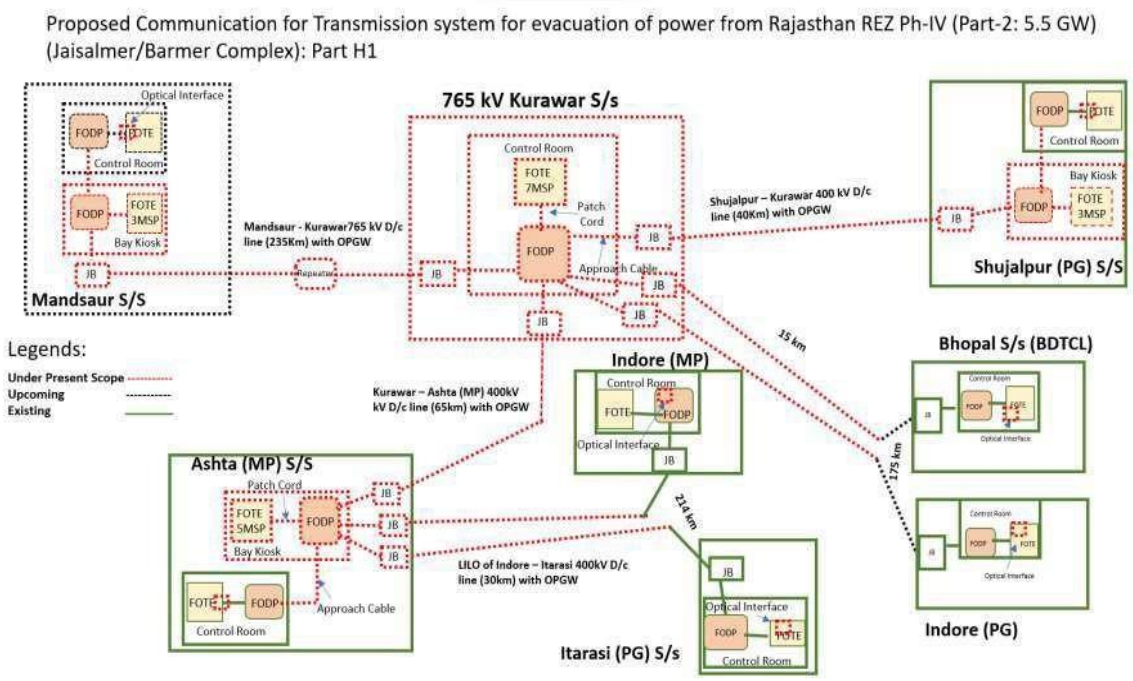
WRPC endorsed the recommendations of TCC.

Item No. 6: Utilization of OPGW laid by M/s Indigrid on 765kV S/c Bhopal (BDTCL) – Indore (PG) line for line protection of proposed LILO at upcoming Kurawar S/S & ISTS Communication.

(CTUIL)

765kV S/c Bhopal (BDTCL) – Indore (PG) line (175km) was constructed under the TBCB project "System Strengthening For WR" by M/s Indigrid. OPGW on this line was not envisaged in the scope of RFP (**Annexure-6.1**). However, M/s Indigrid has laid OPGW in place of earth wire on this line at their own cost. They have also installed FOTE(STM-1) at Indore (PG) and Bhopal (BDTCL) ends. The FOTE is being used for line protection only and is not integrated with POWERGRID FOTE at Indore for ULDC data communication. All the data of Bhopal (BDTCL) S/s is reporting to WRLDC through POWERTEL Leased line only.

2. 765kV S/c Bhopal (BDTCL) – Indore (PG) line is approved to be LILOed at upcoming Kurawar S/s under transmission project "Transmission System for Evacuation of Power from Rajasthan REZ Ph-IV (Part-2: 5.5 GW) (Jaisalmer/Barmer Complex): Part H1". The connectivity diagram is as follows:



3. Data of Kurawar S/s may be communicated through Shujalpur (PG) and Mandsaur S/s as both are connected to a wideband network. Earlier, OPGW on LILO part was not considered in the scope of RFP. CEA vide their letter dated 21.02.2024 stated that OPGW based tele protection may be mentioned in this scheme so that TSP can provide tele protection primarily based on OPGW and alternate path on PLCC as per clause 48, subclause 5 of Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022. Accordingly, CTU has modified the RFP of the scheme and included OPGW on LILO section in RFP.

4. For providing the OPGW for protection of LILO lines as mentioned above, this agenda of providing OPGW based line protection of LILO of 765kV S/c Bhopal (BDTCL) – Indore (PG) line at Kurawar S/s, was discussed in the 5th WR ISTS Communication Planning Meeting (CPM) held on 28.03.2024 (**Annexure-6.2**). In the meeting:

a) M/s Indigrid informed that they have put up one PLCC and one DCPS/ FOTE based line protection for the 765kV S/c Bhopal (BDTCL) – Indore (PG) line. They further stated that only one pair fiber is being used/ maintained for line protection and status of healthiness/ losses of rest of the fibers are presently not available.

b) CTU requested M/s Indigrid to provide the connection agreement where it has been mentioned to provide one PLCC based and second OPGW based line protection as in the scope of RFP of this line, only PLCC based protection was mentioned with 100% backup.

c) CTU also requested M/s Indigrid to provide the OTDR test report of all the fibers to assess the healthiness of the OPGW.

5. M/s Indigrid provided the OTDR test report dated 21.10.2022 for the OPGW on 765kV S/c Bhopal Indore line (**Annexure-6.3**). It is found that 23 fibers are healthy and only 1 fiber is broken. Further, M/s Indigrid haven't provided the Connection Agreement till date even after multiple reminders from CTUIL.

6. In view of above, utilization of existing OPGW on 765kV Bhopal – Indore line of M/s Indigrid for line protection (in case of LILO) and ULDC communication along with upgradation of existing FOTE (if required) may be considered.

10th SCADA meeting discussion:

CTU /CEA (PDC) stated that although OPGW was not originally in the scope of RFP for BDTCL project, M/s Indigrid has installed OPGW using ISTS RoW and using OPGW-based line protection by STM-1 link for 765kV Bhopal (BDTCL)-Indore (PG) line along with another PLCC based line protection.

CTU further informed that as per the OTDR test report submitted by M/s Indigrid, the fibers of the said OPGW link are in healthy condition and lived a life of 10yrs only. Hence OPGW laid on the line shall now be made available through the LILO path (OPGW being provided by TSP) for line protection of the proposed LILO at upcoming Kurawar S/S for GRID operation purpose. Moreover, CTU also suggested that these fibers shall be used for ULDC data communication purposes for routing the data upto RLDC in place of the present operational leased line being used by M/s Indigrid for sending data upto WRLDC to achieve greater reliability and to reduce the Annual Recurring Charges of the lease line. They emphasised that this is an optimum and feasible solution for providing the GRID management applications for the ISTS network. They also suggested that M/s Indigrid may approach CERC for the recovery of additional tariff in this regard.

PCD, CEA informed that sharing of the OPGW link will ensure optimal utilizations of the assets and referred to a similar case of M/s. Indigrid which was deliberated in the NRPC meetings, wherein it was concluded that M/s. Indigrid is requested to share the OPGW network for the Grid operation.
M/s Indigrid, however, did not agree with the proposal citing their already executed commercial arrangements for the said line.

MS WRPC stated that M/s Indigrid has laid OPGW using ISTS RoW and therefore, they should share the fibers for protection and communication purposes as proposed by CTU.

50th TCC Discussions:

SE (Operation), WRPC briefed the agenda. MS WRPC asked M/s Indigrid to clarify whether their system is a part of ISTS. As M/s Indigrid confirmed that their system is a part of ISTS system, MS WRPC stated that in that case, BDTCL is responsible for the operation and maintenance of ISTS assets including the associated communication system.

M/s Indigid stated that the installed OPGW has already lived most of its useful life and therefore, an alternate scheme needs to be planned. MS WRPC informed that as per the OTDR test report submitted, the fibres are in healthy condition and therefore, utilizing them for communication purposes is the optimal solution available at present.

COO, CTU agreed with the view of MS WRPC and stated that M/s Indigrid is unnecessary making an issue and should share the fiber. The other TCC members also agreed with this viewpoint.

MS WRPC requested M/s Indigrid to share the fibers. He also advised them to approach CERC for recovery of additional tariff in this regard.

M/s Indigrid agreed to provide the OPGW fibres at BDTCL for the utilisation for ULDC purposes as per the modalities laid down in Hon'ble CERC order 94/MP/2021.

50th WRPC Discussions:

MS NRPC stated that the issue is complex and all regions are facing similar issues. He added that each RPC deals with such issues on a case-to-case basis at present and for streamlining things, a committee has been set up under Member (Power system), CEA to formulate guidelines for sharing of OPGW. Member (GO&D) stated that till the time the guidelines from CEA are issued, such cases may be brought to respective RPCs for deliberations and decisions.

WRPC recommended for usage of OPGW fibre at BDTCL for grid purposes as per the modalities laid down in Hon'ble CERC order 94/MP/2021.

Item No.7: PSDF Funding for "Establishment of SOC at SLDC Gujarat Establishment of Security Operation Centre (SOC) at SLDC, Vadodara, Gujarat".

(GETCO)

GETCO has submitted a proposal of "Establishment of SOC at SLDC Gujarat Establishment of Security Operation Centre (SOC) at SLDC, Vadodara, Gujarat" for PSDF funding. The DPR of the project is attached as **Annexure - 7.1**.

Annexure-II

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

Ref: CTU/N/00/CMETS_NR/34 **Date:** 08-10-2024

As per distribution list

Subject: 34th Consultation Meeting for Evolving Transmission Schemes in Northern Region-Minutes of Meeting

Dear Sir/Ma'am,

Please find enclosed the minutes of the 34th Consultation Meeting for Evolving Transmission Schemes in Northern Region held on 20th September 2024 (Friday) through virtual mode.

The minutes are also available at CTU website (www.ctuil.in)

Thanking you,

Yours faithfully,

08/10/24

(Kashish Bhambhani)
General Manager (CTU)

Accordingly, the following ICT augmentation scheme is agreed at Bikaner-III PS in ISTS:

- Augmentation of 400/220 kV, 1x500 MVA (6th) ICT at Bikaner-III PS along with associated transformer bays

  Implementation Schedule: 18 months from allocation

B.5 Transmission System for connectivity of Pumped Storage Projects in Sonbhadra District in Uttar Pradesh:

It was stated that in the 31st CMETS-NR meeting held on 27.06.2, connectivity applications of cumulative quantum of 5152 MW from two developers i.e. M/s Greenko (6 nos. of applications with cumulative quantum of 4032 MW) & M/s Avaada WB (1 application of 1120MW) near Robertganj area in Sonbhadra district, Uttar Pradesh was discussed. As per the schedule indicated in the applications, these PSP projects are expected to be commissioned progressively from Nov'26 upto Mar'28. Details of applications are as under:

S.No	Applications	Connectivity (MW)	Start Date of Connectivity (As per Application)	Maximum Injection (MW)- As per application	Maximum Drawl (MW) – As per application
1	Greenko UP01 IREP Private Limited	672	16.11.2026	610	672
		672	01.02.2027	610	672
		672	16.04.2027	610	672
		672	16.04.2027	610	672
		672	01.07.2027	610	672
		672	16.12.2027	610	672
2	Avaada Waterbattery Private Limited	1120	31.03.2028	900	1120
	Total (MW)	**5152**		**4560**	**5152**

In the meeting, it was informed that to deliberate on planning of transmission System for evacuation of Power from Pumped Storage Plants, a meeting under Chairmanship of Chairperson, CEA was held on 28.05.2024. In the above meeting, it was decided that CTUIL while granting Connectivity to PSPs shall mention that PSPs shall not operate in generating mode during high RE generation period and if required, PSPs may inject power during high RE generation period based on margin available in the system. However, detail analysis must be done based on the combination of sources at that node.

M/s Greenko vide letter dated 21.05.24 informed that In the initial phases of PSP development, it is envisaged as a Stand-alone storage project, which means the PSP project will draw power from renewable generation sources or conventional generation sources located

at different location(s) in the grid for charging the pump storage plant and thereafter power will be injected into the grid for supplying power to the different beneficiaries connected to different location(s) in the grid. During PSP operation, typically during peak solar time (mainly between 11AM to 2 PM), the PSP project shall be able to draw power to the extent of 4032 MW (6X672MW) corresponding to pumping capacities of all six units. While, during generation hours which will be typically during non-solar or low solar hours, the maximum generation possible shall be to the extent of 3660 MW (6x610MW). For evolving the transmission scheme, the above-mentioned maximum values of drawl and Generation may be considered. Same was also discussed in 31st CMETS-NR meeting.

CEA in the above CMETS-NR meeting confirmed that the Sonbhadra area may be considered as a potential zone for pumped storage projects. Accordingly, the transmission system for connectivity of M/s Greenko & M/s Avaada at Roberstganj PS shall be considered as common transmission system.

CEA also informed that TOR has been issued to M/s Greenko Sonbhadra PSP (3660 MW) and presently under S&I. M/s Avaada in the meeting informed that the TOR of their project is approved and currently in pre DPR stage & they shall be submitting it to CEA for pre DPR chapter approvals.

M/s Avaada & Greenko clarified in the meeting that they shall operate PSP units in synchronous condenser mode as per the reactive power requirement of the grid. Further, M/s Greenko and M/s Avaada shall also keep future provision of Bus Reactor so that in case of future requirement the same can be installed by the applicant.

Accordingly, in the above CMETS-NR meeting, connectivity applications of M/s Avaada & Greenko were agreed for grant, and it was deliberated that the transmission scheme for Pump Storage plants in Sonbhadra district is presently under discussion. The scheme is currently tentative, which shall be finalized in subsequent CMETS-NR and other region (ER) CMETS meeting among CEA, CTUIL, Grid India & Stakeholders. The detailed transmission system shall be informed upon finalization and approval of the scheme.

Further, NR-WR inter regional scheme to relieve loading of 765 kV Vindhyachal – Varanasi D/c line shall also be required for connectivity of Pumped Storage Projects in Sonbhadra district.

In view of the above, studies were carried out considering PSPs in drawl mode in Solar Max scenarios & injection mode in Peak load scenarios (evening peak). All India Study files for various scenarios (solar maximized, evening peak and night off peak) were circulated to NR stakeholders on 12.09.24.

Subsequently, M/s Greenko had submitted requisite Connectivity BGs only for three application (3x672MW), out of 6 nos. M/s Avaada also submitted requisite Connectivity BGs for their 1120MW PSP project, therefore transmission scheme needs to be revised in view of reduction in connectivity quantum by M/s Greenko.

M/s Greenko vide letter 10.09.24 requested that as they are moving forward with three applications for their project, there may be a change in the transmission scheme from the originally planned scheme involving six Grid Connectivity applications. During CTU's review of this change in the transmission system, it may be necessary to consider including the bay implementation for terminating the dedicated transmission line at Robertsganj substation under the ISTS scope

In view of schedule of generation projects and for optimal utilization of transmission scheme, comprehensive tr. scheme is planned considering M/s Greenko and M/s Avaada PSP evacuation requirement (Maximum injection 3136MW, Maximum Drawl : 2730MW) including future requirement. However, in view of transmission being lumped elements, the planned scheme can cater upto 4 GW PSP connectivity quantum.

In the meeting, Grid-India stated to review the reactive compensation of 765kV Robertsganj PS – Prayagraj S/s D/c line. CTU stated that with proposed line reactors (240MVAr line reactor on both ends), Reactive compensation is bit on higher sider (~90%), therefore 330MVAr line at one of the end may be considered for above line based on studies. Accordingly, 330MVAr line reactor is considered at Robertsganj PS end for 765kV Robertsganj PS – Prayagraj S/s D/c line. On the query of direction of power flow from Varanasi to Robertsganj and Gaya to Robertsganj in Solar peak hours, CTU stated that during solar peak hours, PSP may operate in pumping mode and power will flow from Varanasi to Robertsganj PS and Robertsganj PS to Gaya S/s.

Grid-India enquired about line rating of 400kV Greenko- Robertsganj D/c line. CTU stated that considering three applications of 2016MW (3x672MW) of M/s Greenko, rating of dedicated line shall be considered commensurate to power transfer requirement under N-1 contingency of PSP plant.

Grid-India enquired that line reactors may be reviewed w.r.t. line length of each sections formed after proposed LILO arrangements i.e. LILO of 765 kV Fatehpur-Varanasi S/c line at Prayagraj & LILO of 765 kV Fatehpur-Sasaram S/c line at Prayagraj. Grid-India stated that 765kV Fatehpur – Prayagraj section may get overcompensated with existing line reactor configuration. CTU stated that after proposed LILO arrangement, reactive compensation is about 89% on 765kV Fatehpur – Prayagraj section (140 kms). Grid-India enquired about feasibility of removing 330MVAr existing line reactor at Fatehpur end or its replacement with 240MVAr line reactor. CTU stated that considering prevailing high voltage condition in NR (in some off peak scenarios), removal or replacement of 330MVAr line reactor at Fatehpur end may worsen the high voltage problem, however line length is tentative and will be reviewed in Gati Shakti portal. In the case of reduction of line length considerably, decision may be taken on removal/replacement of 330MVAr line reactor at Fatehpur end of 765kV Fatehpur – Prayagraj section (140 kms). CTU further stated that on all other line sections formed after LILO arrangement at Prayagraj S/s, reactive compensation is in order.

Grid-India enquired that whether PSP developers indicated their machine type i.e. fixed speed or variable speed type. M/s Greenko informed that they have fixed speed machines. M/s Avaada informed that they will revert on the same. M/s Greenko requested that during finalization of the scheme, 400kV bays at Robertsganj end for termination of 400kV Greenko-Robertsganj D/c line may be

considered in ISTS scope. CTU stated that as the scheme is still under approval and being revised in this meeting, same will be incorporated as part of comprehensive agreed transmission scheme and M/s Greenko shall have to fulfil Conn-BG2 requirement.

Grid-India also stated that 1200kV system may also be explored from above complex in future for evacuation of envisage PSP potential due to its proximal location form WR and ER region and firm power flow in most of the scenarios.

CTU further stated that based on agreed scheme in meeting, transmission system under applicant scope as well as common transmission system will be revised. It was also stated that M/s Avaada & Greenko shall operate PSP units in synchronous condenser mode (minimum one unit) as per the reactive power requirement of the grid.

CEA stated that both the projects are under advance stage, however DPR is yet to approve. On the query of CEA on additional generation considered at 400kV level, CTU informed that at present comprehensive scheme is planned for 4GW PSP potential and with connectivity quantum more than 4GW, adequacy of agreed transmission scheme shall be reviewed further. CEA and UPPTCL also agreed on the proposal

CTU enquired to UPPTCL about drawl requirement (220kV) from Robertsganj and Prayagraj S/s. UPPTCL stated that intra state transmission system (tentative) is already planned for evacuation of thermal power projects in the vicinity and in receipt of PSP application in future, new intra state schemes shall be planned. As part of above schemes, many new substations may be planned in intra state and can be utilized for drawl purpose of UP. Based on above, it was decided that provision of 220kV scope shall be deleted from future provisions at Robertsganj PS and Prayagraj PS, which was agreed by UPPTCL.

CTUIL in the meeting as well as their mail dated 20.09.24 requested POWERGRID to provide availability of OPGW on below lines so that provision of OPGW may be kept as part of present agreed scheme in case of non-availability of OPGW system

- 765 kV Fatehpur-Varanasi S/c line (proposed to be LILOed at Prayagraj S/s)
- 765 kV Fatehpur-Sasaram S/c line (proposed to be LILOed at Prayagraj S/s)
- 765 kV Varanasi- Gaya 2xS/c line (proposed to be LILOed at Robertsganj PS)

As per the inputs received from POWERGRID, OPGW is not available on the existing 765 kV Fatehpur-Varanasi S/c line & 765 kV Fatehpur-Sasaram S/c line which is proposed to be LILOed at Prayagraj S/s. Therefore, OPGW installation needs to be done to cater voice/data/tele-protection requirement for the proposed new Prayagraj S/s in matching time frame of comprehensive transmission scheme. Further as per above inputs, existing 765 kV Varanasi- Gaya 2xS/c line (proposed to be LILOed at Robertsganj PS), OPGW is available on the 2nd S/c of above line, therefore on other S/c line OPGW is not required as existing OPGW can be used for voice/data/tele-protection requirement for both the S/c lines as source and destination stations are same. No other comments were received.

Based on above deliberations, following ISTS transmission system for evacuation of power from Pumped Storage Projects in Sonbhadra District was agreed :

- Establishment of 4x1500 MVA 765/400 kV Robertsganj Pooling Station* near Robertsganj area in Sonbhadra distt. (Uttar Pradesh) along with 2x240 MVAr 765 kV & 2x125 MVAr 400 kV bus reactors

  Future provisions at Robertsganj PS (excl. scope for present scheme): Space for

  - 765/400kV ICTs along with bays- 2 nos.
  - 765 kV line bays along with switchable line reactors – 6 nos.
  - 765kV Bus Reactor along with bay: 1 no.
  - 400 kV line bays along with switchable line reactor –6 nos.
  - 400kV line bays : 4 nos.
  - 400 kV Bus Reactor along with bays: 1 no.
  - 400kV Sectionalization bay: 2 sets

  ***along with provision of 80MVAr spare reactor (Single phase), 110MVAr (Single phase) & 500MVA spare transformer unit (Single phase)**

- 400kV line bays (4 nos.) for connectivity of PSP generation project (M/s Avaada & M/s Greenko) at Robertsganj PS
- LILO of both circuits of 765 kV Varanasi- Gaya 2xS/c line at Robertsganj PS (~50 km) along with 240MVAr switchable line reactor at each ckt of Robertsganj PS end of 765 kV Robertsganj PS - Gaya 2xS/c line (after LILO)
- Establishment of 765 kV Prayagraj S/s* near Prayagraj(Uttar Pradesh) along with 2x330 MVAr 765 kV Bus reactors

  Future provisions at Prayagraj S/s (excl. scope for present scheme): Space for

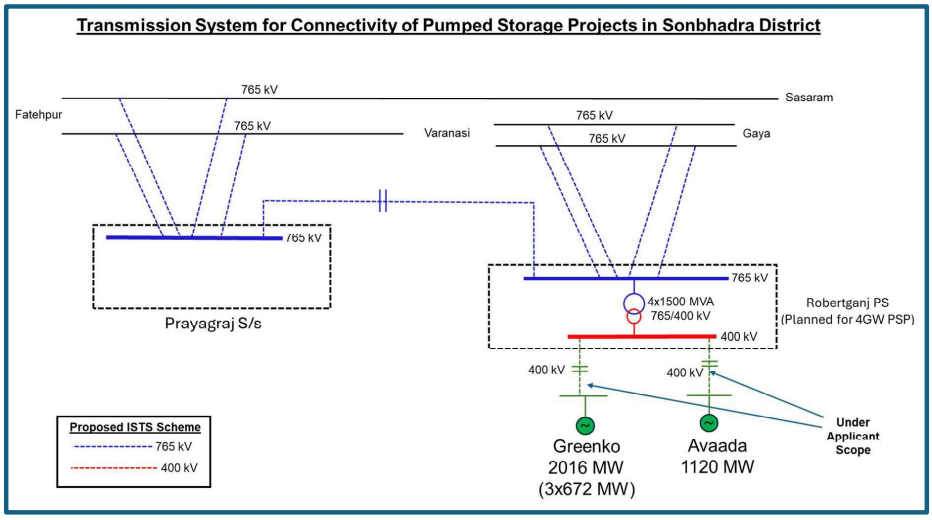
  - 765/400kV ICTs along with bays- 4 nos.
  - 765 kV line bays along with switchable line reactors – 4 nos.
  - 765kV Bus Reactor along with bay: 1 nos.
  - 400 kV line bays along with switchable line reactor –4 nos.
  - 400kv line bays : 2 nos.
  - 400 kV Bus Reactor along with bays: 2 no.
  - 400kV Sectionalization bay: 1 set

  ***along with provision of 110MVAr spare reactor (Single phase) & 500MVA spare transformer unit (Single phase)**

- LILO of 765 kV Fatehpur-Varanasi S/c line at Prayagraj (~30 km)

- LILO of 765 kV Fatehpur-Sasaram S/c line at Prayagraj (~30 km)
- Robertsganj PS – Prayagraj S/s 765 kV D/c line along with 330 MVAr line reactor at each circuit of Robertsganj end of Robertsganj PS – Prayagraj S/s 765 kV D/c line (~200 km)

From the studies, it was observed that considering drawl by PSPs in Peak RE hours (10AM to 2 PM), there is a requirement of additional inter-regional corridors towards WR which shall be discussed in subsequent section. However, it was gathered from Pump Storage project developers that they shall tie up with RE developers for drawing power in peak RE hours and shall be injecting power back in non RE peak hours(mainly during peak load period).



Further, Inter-regional (NR-WR) transmission System to relieve the loading of 765kV Vindhyachal-Varanasi D/c line was discussed and agreed in present meeting in subsequent section. This Inter regional transmission scheme is also required for evacuation of power from above Pumped Storage Projects in Sonbhadra District.

Transmission system for connectivity of M/s Greenko UP01 IREP Private Limited for its 6 nos. of connectivity applications ((App. No. 220000527-672 MW, 220000529-672 MW, 220000524-672 MW, 220000525-672 MW, 220000526-672 MW & 220000528-672 MW under GNA was agreed in 31st CMETS-NR meeting held on 27.06.24, which is as under:

Details of Transmission system for Connectivity under GNA:

A. Associated Transmission System (ATS): NIL

B. Transmission System under applicant scope

(i). Common Pooling station for Pumped Storage Projects of M/s Greenko UP01 IREP Private Limited (App. No. 220000527-672 MW, 220000529-672 MW, 220000524-672 MW, 220000525-672 MW, 220000526-672 MW & 220000528-672 MW) – Robertsganj Pooling Station 400 kV 2xD/c line(suitable to carry minimum 1400 MW per circuit at nominal voltage)*

**Minimum One unit to operate in Synchronous Condenser mode as per the requirement of the grid*

C. Transmission system for Connectivity under GNA (Tentative):

(i). Establishment of 5x1500 MVA 765/400 kV Robertsganj Pooling Station near Robertsganj area in Sonbhadra distt. Uttar Pradesh
(ii). LILO of both circuits of 765 kV Varanasi- Gaya 2xSc line at Robertsganj Pooling Station
(iii). Establishment of 765/400 kV 2x1500 MVA Prayagraj substation near Prayagraj(Uttar Pradesh)
(iv). Prayagraj – Sohawal 400 kV D/c line (Quad)
(v). LILO of 765 kV Fatehpur-Varanasi S/c line at Prayagraj S/s
(vi). LILO of 765 kV Fatehpur-Sasaram S/c line at Prayagraj S/s
(vii). Robertsganj PS – Prayagraj S/s 765 kV D/c line along with 240 MVAr line reactor for each circuit at Robertsganj end.

D. Additional Inter regional (WR-NR)Transmission system for Connectivity under GNA (Tentative):

(i). 765kV Vindhyachal Pool - Prayagraj D/c line along with 240MVAr line reactor (switchable) at Prayagraj end on each ckt of 765kV Vindhyachal Pool - Prayagraj D/c line
(ii). Bypassing of both ckts of 765kV Sasan – Vindhyachal Pool 2xS/c line at Vindhyachal Pool and connecting it with 765kV Vindhyachal Pool - Prayagraj D/c line, thus forming 765kV Sasan - Prayagraj D/c line

Start Date of Connectivity: 01.07.2027(interim). Final date shall be confirmed upon award of the system

Subsequently, as discussed above, M/s Greenko had submitted requisite Connectivity BGs only for three projects ((App No. 220000524-672 MW, 220000525-672 MW, 220000526-672 MW), out of 6 nos. of applications. In view of that revised transmission system for connectivity for three nos. of applications of M/s Greenko UP01 ((App No. 220000524-672 MW, 220000525-672 MW, 220000526-672 MW) is as under :

Details of Transmission system for Connectivity under GNA:

A. Associated Transmission System (ATS): NIL

B. Transmission System under applicant scope

(ii). Common Pooling station for Pumped Storage Projects of M/s Greenko UP01 IREP Private Limited (App. No. 220000524-672 MW, 220000525-672 MW, 220000526-672 MW) – Robertsganj Pooling Station 400 kV D/c line(suitable to carry minimum 2016 MW per circuit at nominal voltage)*

Minimum One unit to operate in Synchronous Condenser mode as per the requirement of the grid

C. Transmission system for Connectivity under GNA (Tentative):

(i). Establishment of 4x1500 MVA 765/400 kV Robertsganj Pooling Station near Robertsganj area in Sonbhadra distt. (Uttar Pradesh) along with 2x240 MVAr 765 kV & 2x125 MVAr 400 kV Bus reactors
(ii). LILO of both circuits of 765 kV Varanasi- Gaya 2XS/c line at Robertsganj Pooling Station along with 240MVAr switchable line reactor at each ckt of Robertsganj PS end of 765 kV Robertsganj PS - Gaya 2xS/c line
(iii). Establishment of 765kV Prayagraj substation near Prayagraj(Uttar Pradesh) along with 2x330 MVAr 765 kV Bus reactors
(iv). LILO of 765 kV Fatehpur-Varanasi S/c line at Prayagraj S/s
(v). LILO of 765 kV Fatehpur-Sasaram S/c line at Prayagraj S/s
(vi). Robertsganj PS – Prayagraj 765 kV D/c line along with 330 MVAr line reactor at each circuit of Robertsganj end of Robertsganj PS – Prayagraj 765 kV D/c line

D. Additional Inter regional (WR-NR) Transmission system for Connectivity under GNA (Tentative):

(i). 765kV Vindhyachal Pool - Prayagraj D/c line along with 330MVAr line reactor (switchable) at Prayagraj end on each ckt of 765kV Vindhyachal Pool - Prayagraj D/c line
(ii). Bypassing of both ckts of 765kV Sasan – Vindhyachal Pool 2xS/c line at Vindhyachal Pool and connecting it with 765kV Vindhyachal Pool - Prayagraj D/c line, thus forming 765kV Sasan - Prayagraj D/c line

Start Date of Connectivity: 30.06.2027(interim). Final date shall be confirmed upon award of the system

Further, Transmission system for connectivity of M/s Avaada Waterbattery Private Limited under GNA, was also agreed in 31st CMETS-NR meeting held on 27.06.24, which is as under:

Details of Transmission system for Connectivity under GNA:

A. Associated Transmission System (ATS): NIL

B. Transmission System under applicant scope

(i). M/s Avaada Waterbattery Private Limited Pumped Storage Project– Robertsganj Pooling Station 400 kV D/c line (Quad moose or equivalent conductor suitable to carry 1716 MW per circuit at nominal voltage)

C. Transmission system for Connectivity under GNA: (Tentative)

(i). Establishment of 5x1500 MVA 765/400 kV Robertsganj Pooling Station near Robertsganj area in Sonbhadra distt. Uttar Pradesh
(ii). LILO of both circuits of 765 kV Varanasi- Gaya 2xSc line at Robertsganj Pooling Station
(iii). Establishment of 765/400 kV 2x1500 MVA Prayagraj substation near Prayagraj(Uttar Pradesh)
(iv). Prayagraj – Sohawal 400 kV D/c line (Quad)
(v). LILO of 765 kV Fatehpur-Varanasi S/c line at Prayagraj S/s
(vi). LILO of 765 kV Fatehpur-Sasaram S/c line at Prayagraj S/s

D. Additional Inter regional (WR-NR) Transmission system for Connectivity under GNA (Tentative):

(i). 765kV Vindhyachal Pool - Prayagraj D/c line along with 240MVAr line reactor (switchable) at Prayagraj end on each ckt of 765kV Vindhyachal Pool - Prayagraj D/c line
(ii). Bypassing of both ckts of 765kV Sasan – Vindhyachal Pool 2xS/c line at Vindhyachal Pool and connecting it with 765kV Vindhyachal Pool - Prayagraj D/c line, thus forming 765kV Sasan - Prayagraj D/c line

Start Date of Connectivity: 31.12.2028(interim). Final date shall be confirmed upon award of the system

In view of that revised transmission system for connectivity application of M/s Avaada Waterbattery ((App No. 220000553-1120 MW) is as under:

Details of Revised Transmission system for Connectivity under GNA:

A. Associated Transmission System (ATS): NIL

B. Transmission System under applicant scope

(i). M/s Avaada Waterbattery Private Limited Pumped Storage Project– Robertsganj Pooling Station 400 kV D/c line (Quad moose or equivalent conductor suitable to carry minimum 1716 MW per circuit at nominal voltage)

C. Transmission system for Connectivity under GNA (Tentative):

(i). Establishment of 4x1500 MVA 765/400 kV Robertsganj Pooling Station near Robertsganj area in Sonbhadra distt. (Uttar Pradesh) along with 2x240 MVAr 765 kV & 2x125 MVAr 400 kV Bus reactors
(ii). LILO of both circuits of 765 kV Varanasi- Gaya 2xSc line at Robertsganj Pooling Station along with 240MVAr switchable line reactor at each ckt of Robertsganj PS end of 765 kV Robertsganj PS - Gaya 2xS/c line
(iii). Establishment of 765kV Prayagraj substation near Prayagraj(Uttar Pradesh) along with 2x330 MVAr 765 kV Bus reactors
(iv). LILO of 765 kV Fatehpur-Varanasi S/c line at Prayagraj S/s
(v). LILO of 765 kV Fatehpur-Sasaram S/c line at Prayagraj S/s

(vi). Robertsganj PS – Prayagraj 765 kV D/c line along with 330 MVAr line reactor at each circuit of Robertsganj end of Robertsganj PS – Prayagraj 765 kV D/c line

D. Additional Inter regional (WR-NR) Transmission system for Connectivity under GNA (Tentative):

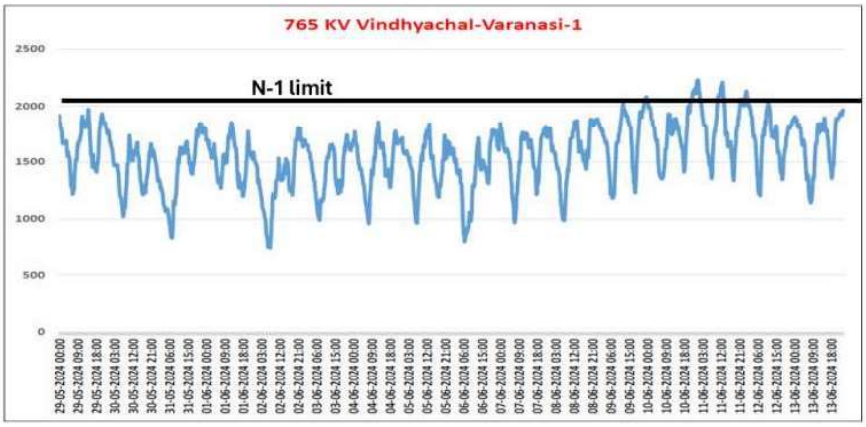
(i). 765kV Vindhyachal Pool - Prayagraj D/c line along with 330MVAr line reactor (switchable) at Prayagraj end on each ckt of 765kV Vindhyachal Pool - Prayagraj D/c line

(ii). Bypassing of both ckts of 765kV Sasan – Vindhyachal Pool 2xS/c line at Vindhyachal Pool and connecting it with 765kV Vindhyachal Pool - Prayagraj D/c line, thus forming 765kV Sasan - Prayagraj D/c line

Start Date of Connectivity: 31.12.2028(interim). Final date shall be confirmed upon award of the system

B.5 Inter-regional (NR-WR) Transmission System strengthening to relieve the loading of 765kV Vindhyachal-Varanasi D/c line

It was stated that in 220th NR-OCC meeting held on 19.06.24, it was deliberated that at the time of high demand in UP, it is being observed that the flow on WR-NR corridor is very high and issues related to high loading of 765 kV Vindhyachal – Varanasi D/C during high NR Import are being observed in real-time:



High loading, beyond N-1 limits of 765kV Vindhyachal-Varanasi D/C lines

Further, due to this high loading of 765kV Vindhyachal-Varanasi D/c, violation of WR-NR ATC and NR simultaneous import is also being observed in real-time. WR-NR ATC violations in real-time would lead to situation wherein NR states would not be able to draw further power from Western region and as a result, may need to resort to over drawl or load shedding in case internal generation in NR is not available

The issue was also highlighted by Grid-India in the meeting chaired by Addl. Secretary (MOP) on 29.05.24 & subsequent meeting in CEA regarding transmission constraints in Inter state and Intra state transmission system. It was deliberated that N-1 contingency of one ckt of 765kV Vindhayachal-Varanasi D/c line will over load the other ckt. In the meeting CTU stated that line loadings will be reviewed along with transmission scheme to be planned with PSP generation

In view of that studies were carried out and scheme was evolved to resolve critical loading of 765kV Vindhyachal-Varanasi D/c line in N-1 Contingency condition as well as for evacuation of PSP projects in UP.

In the meeting, UPPTCL stated that 765/400kV Fatehpur S/s is being implemented as part of Bhadla-III – Fatehpur HVDC transmission system. UPPTCL requested to explore feasibility of interconnection of Fatehpur S/s with Sasan/Vindhyachal PS to relieve high loading. CTU stated that as deliberated earlier, loading of 765kV Vindhyachal-Varanasi D/c line is already high and with envisaged PSP generation, loadings will further increase in 2027-28 time frame. CTU further stated that 765/400kV Fatehpur S/s will only be available in 2029 timeframe and about 300kms from Sasan S/s. Considering above it is not feasible to utilize Fatehpur S/s for WR-NR inter regional link. CTU informed that in planning of future ISTS transmission schemes, utilization of 765/400kV Fatehpur S/s (being implemented as part of HVDC scheme) shall be explored with additional envisaged PSP potential (beyond 4GW). Grid-India and CEA agreed on the proposal. It was also agreed that above strengthening scheme is required urgently to relive the loading of 765kV Vindhyachal-Varanasi D/c line. The NR-WR inter regional strengthening scheme was also discussed and agreed in 32nd CMETS-WR meeting held on 24.09.24

Based on above deliberations, following WR-NR Inter regional corridor is agreed in ISTS :

- 765kV Vindhyachal Pool - Prayagraj D/c line along with 330MVAr line reactor (switchable) at Prayagraj end on each ckt of 765kV Vindhyachal Pool - Prayagraj D/c line
- Bypassing of both ckts of 765kV Sasan – Vindhyachal Pool 2xS/c line at Vindhyachal Pool and connecting it with 765kV Vindhyachal Pool - Prayagraj D/c line, thus forming 765kV Sasan - Prayagraj D/c line

Implementation Schedule: 24 months from allocation

B.6 Requirement of additional 1x500 MVA (5th), 400/220kV ICT at Maharani Bagh (PG) Substation

Annexure-III

S. No.	Items	Details
1.	Name of Scheme	OPGW installation on existing 765kV Fatehpur-Varanasi S/c Line which is to be LILOed at Prayagraj S/s
2.	Scope of the scheme	OPGW installation on existing 765kV Fatehpur-Varanasi S/c Line which is to be LILOed at Prayagraj S/s including FOTE at Fatehpur & Varanasi locations. (**Total 223 kms.**)
3.	Objective / Justification	Under the transmission scheme for "Transmission system for connectivity of Pumped Storage Projects in Sonbhadra District in Uttar Pradesh" LILO of existing 765kV Fatehpur-Varanasi S/c Line is proposed on the Prayagraj S/s (OPGW to be installed on S/c line proposed to be LILOed). On the existing 765kV Fatehpur-Varanasi S/c Line, OPGW is not available. To meet data/ voice/ protection requirement between Fatehpur, Varanasi & Prayagraj Substations, OPGW to be installed over the 765kV Fatehpur-Varanasi S/c Line which is proposed to be LILOed on Prayagraj S/s. Further as per CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022, "The primary path for tele-protection shall be on point-to-point Optical Ground Wire" Therefore, this OPGW also serves as primary tele-protection path for Prayagraj – Fatehpur & Prayagraj – Varanasi Lines formed after LILO.
4.	Estimated Cost	**Rs. 13.38 crore (approx.) (excluding taxes and duties)**
5.	Implementation timeframe	**24 months from the date of allocation**
6.	Implementation Agency and mode	**POWERGRID**
7.	Implementation mode	**RTM mode**
8.	Deliberations in different meetings	34th Consultation Meeting for Evolving Transmission Schemes in Northern Region held on 19.09.2024

S. No.	Items	Details
1.	Name of Scheme	OPGW installation on existing 765kV Fatehpur-Sasaram S/c Line which is to be LILOed at Prayagraj S/s
2.	Scope of the scheme	OPGW installation on existing 765kV Fatehpur-Sasaram S/c Line which is to be LILOed at Prayagraj S/s including FOTE at Fatehpur & Sasaram locations. (Total 356 kms.)
3.	Objective / Justification	Under the transmission scheme for "Transmission system for connectivity of Pumped Storage Projects in Sonbhadra District in Uttar Pradesh" LILO of existing 765kV Fatehpur-Sasaram S/c Line is proposed on the Prayagraj S/s (OPGW to be installed on S/c line proposed to be LILOed). On the existing 765kV Fatehpur-Sasaram S/c Line, OPGW is not available. To meet data/ voice/ protection requirement between Fatehpur, Sasaram & Prayagraj Substations, OPGW to be installed over the 765kV Fatehpur-Sasaram S/c Line which is proposed to be LILOed on Prayagraj S/s. Further as per CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022, "The primary path for tele-protection shall be on point-to-point Optical Ground Wire" Therefore, this OPGW also serves as primary tele-protection path for Prayagraj – Sasaram & Prayagraj – Fatehpur Lines formed after LILO.
4.	Estimated Cost	**Rs. 21.36 crore (approx.) (excluding taxes and duties)**
5.	Implementation timeframe	**24 months from the date of allocation**
6.	Implementation Agency and mode	**POWERGRID**
7.	Implementation mode	**RTM mode**
8.	Deliberations in different meetings	34th Consultation Meeting for Evolving Transmission Schemes in Northern Region held on 19.09.2024

Minutes of the Meeting(Virtual mode) held on 09.05.2023 (Tuesday)regarding dual reporting of RTU, PMU, VOIP, AGC etc. applications

A meeting on the subject was held on 09.05.23 at 11:00 AM with participants from CEA, RLDCs, CTUIL, Grid-India, and POWERGRID. List of the participants is enclosed at Annexure-I. 2. At the outset Sr. .DGM (CTU) welcomed the participants and explained the agenda to all the participants. He requested all the participants to contribute their valuable suggestion for agenda to reach at some conclusion.

Agenda: Dual reporting of RTU, PMU, VOIP, AGC etc. applications on 2+2 channel to main RLDC and Backup RLDC

Presently, one data channel and one voice channel are routed for reporting to main RLDC and similarly one data & one Voice channel is reporting at backup RLDC.

It is proposed by GRID INDIA that to increase of the redundancy in the system at least two data channels and two voice channels shall be routed for reporting to main RLDC and another two data & two Voice channels shall report at backup RLDC.

A detailed deliberation in meeting dated 05/04/23 was done among RLDCs, POWERGRID, CEA for evolving a common planning philosophy for all regions.

In the meeting GRID INDIA stated that as per communication regulation 2017/IEGC dual channel reporting for all communication applications from each ISTS station is required for both main and back up RLDCs. This requirement has also been conveyed by ED, NLDC to ED, GA & C vide letter dtd.16.03.2020

It was stated in the meeting that present channel configuration operational at different RLDCs for main and back up CC respectively is as follows:

a) NRLDC:1+1 & 2+1(for few stations)

b) SRLDC:1+1

c) WRLDC:2+1

d) ERLDC:1+1

e) NERLDC:1+1

POWERGRID stated that they are designing the ISTS Communication system with 1+1 channel configuration i.e. one channel for main RLDC and one channel for back up RLDC.

However, CEA recommended as follows: Manual of Communication Planning in Power System Operation clause 4.1.2 states:- “To ensure redundancy with route diversity, each communication channel (working path) planned for the Users shall be provided with alternate channel (protection path) in different routes, i.e., the working path and protection path should be resource disjoint. For last mile connectivity to load dispatch center(s), additional redundancy in different route may be considered. In case of failure of the working path, the protection path shall be available for the required communication services.”

Therefore, dual redundancy may be planned for both main and back-up load dispatch centers.

At present following services are working on ISTS communication network:

- **i.** SCADA
- **ii.** PMU
- **iii.** Tele protection
- **iv.** Telecontrol
- **v.** AGC
- **vi.** Voice
- **vii.** Automated Metering Application
- **viii.** Telemetering
- **ix.** Video conferencing
- **x.** ICCP (between control canters)
- **xi.** PDC
- **xii.** PDC to PDC
- **xiii.** Supervision of communications System
- **xiv.** Video Surveillance
- **xv.** Data Sync between MCC & BCC

The above applications need to be deliberated for dual redundancy requirement.

POWERGRID shall implement this redundancy for both main and backup Regional load dispatch center(s) in all the regions wherever possible with the existing resources in coordination with GRID INDIA.

In case of any additional requirement for implementation of redundancy POWERGRID may update the details region wise i.e. availability of SAS gateway ports, spare ethernet ports in existing FOTE, new FOTE if any etc. . POWERGRID shall quantify these requirements along with tentative costs on Regional basis.

The action to be taken up by TSPs, IPPs, ISTS, ISGS besides POWERGRID also needs to be discussed.

Deliberations: CGM(SRLDC) explained that Main and Backup control centre is old terminology and now Main-I &Main-II control centre terminology is being used and at each control centre one main & one backup channel is required. Grid India(NRLDC) explained that at present data is being transmitted to respective main & Backup RLDCs using 101 protocol through terminal server/DCPC for old RTUs and by using 104 protocol for SAS. Grid India agreed to share this detail in a week time. Further, POWERGRID informed that RTUs are being replaced with SAS (104 PROTOCOL) as soon as their life is completed. POWERGRID shall share the plan for replacement of RTUs communicating on 101 Protocol.

POWERGRID queried that in CEA planning manual, only route redundancy is mentioned and no where port redundancy is stated. Hence it needs to be clarified whether port level redundancy is also required. CEA clarified that path should be resource disjoint and so both path and ports should be resource disjoint. POWERGRID (NR-ULDC), stated that there is constraint of ports for dual redundancy of SCADA data in the RTUs procured under sub-station package and agreed for upgradation of same subject to approval. POWERGRID further clarified that RTUs with sufficient ports for dual redundancy are being planned recently as requested by ED(NLDC) -GRID INDIA vide letter dated 16.03.2020.

At present PMU data is reporting to single location i.e. Main RLDC as per current planning under URTDSM project. Grid India further stated that PMU data is transmitted on dual channel through switch to main RLDC. Grid India require multi ports at PMU for dual redundancy. Further redundant communication between SLDC PDC to RLDC PDC, RLDC PDC to Main/backup NLDC PDC shall also be required.

Tele protection & Telecontrol are operated by TSPs and should be in dual redundancy.

For AGC services dual redundancy is already considered & being implemented by TSPs . Dual channels to Main and Backup NLDC are required for AGC.

For Voice dual redundancy is also required. For the same, exchange to exchange dual redundancy shall be planned. Exchanges are placed at all SLDCs &RLDCs. At present Substation to Exchange link level protection is already available.

For AMR dual redundancy is also required. At present single channel is reporting to RLDC. For video conferencing Grid India is requested to justify the requirement of dual redundancy as per industry practice as mentioned in ‘Manual For Communication Planning’ as suggested by CEA.

For ICCP dual redundancy is required for main RLDC to Backup RLDC, Main RLDC to main SLDC, Main RLDC to backup SLDC, Backup RLDC to Main SLDC, Backup RLDC to backup SLDC as planned under new SCADA system.

For PDC to PDC dual redundancy is also required. CTU requested Grid India to share the architecture of new SCADA,PDC communication, ICCP.

Supervision of communication channels & Video Surveillance are not used by Grid India. However, TSPs/ CTU may plan as per their requirement.

For data sync dual redundancy between MCC and BCC is also required.

ERLDC, Grid India suggested that planning for terminal equipment(SDH/PDH)at dual redundancy is also required. However, it is suggested that dual redundancy of terminal equipment may be planned for critical locations such as AGC, SPOFs(Single point of failures).

As per discussion, following applications are summarised below for dual redundancy up to existing and upcoming control centres of Grid India.

i. SCADA
ii. PMU
iii. AGC
iv. Voice
v. Automated Metering Application
vi. ICCP (between control canters)
vii. PDC to PDC
viii. Data Sync between MCC & BCC

Conclusion

1. Grid India shall share the data for all the RTUs/SAS , their connectivity type(single or dual redundancy) & all other relevant data for all the TSPs(IPPs, ISGS, TBCB,RTM etc.) within a week time.
2. POWERGRID shall analyse the existing system for dual redundancy and implement the dual redundancy with existing resources wherever possible.
3. POWERGRID shall further state the additional requirements of ports/cards/equipment etc. along with cost for implementation of dual redundancy to above mentioned services on priority where dual redundancy cannot be implemented because of resource constraints. Same shall be discussed at respective RPC forum and shall be finally approved in NCT.

Annexure-I

List of participants of the meeting

- **CEA**

1. Sh. Prateek Srivastava, Assistant Director, PCD
2. Sh. Akshay Dubey,
3. Ms. Priyam, Dy. Director, PSPA-I

- **CTUIL**

1. Sh. Shiv Kumar Gupta, Sr.DGM, CTUIL
2. Sh. Tej Prakash Verma, Ch.Mgr., CTUIL
3. Kalpana Shukla,DGM, CTUIL
4. Kaushal Suman, Manager, CTUIL

- **Powergrid**

1. Sh. Ajaya Kumar P, Sr.GM, ULDC
2. Sh. Satish Kr Sahare, GM, ULDC
3. Smt. Shyama Kumari, DGM, GA&C
4. Sh. Kapil Gupta, DGM, GA&C
5. Sh. Mahesh M, Ch. Mgr, ULDC
6. Sh. Narendra Kumar Meena, Ch. Mgr. ULDC
7. Sh. Santanu Rudrapal, Ch. Mgr, ULDC
8. Sh. Vishal Badlas, Mgr, GA&C
9. Sh. Kashif Bakht Muhammad Nabi, Dy. Mgr, ULDC
10. Sh. Ashish Kumar Das, Asst Mgr, ULDC

- **GRID- India**

1. Sh. MK Ramesh, CGM, SRLDC
2. Sh. Harish Kumar Rathour, GM, NLDC
3. Sh. Sanjeev, GM, WRLDC
4. Sh. L. Murlikrishna, Sr. DGM
5. Sh. Ankur Gulati, DGM, NRLDC
6. Sh. Sakal Deep, Engineer, NERLDC
7. Sh. Koti Naveen
8. Sh. Ananthakrishnan
9. Sh. Rakesh
10. Sh. Sudeep M
11. Bijender Singh Chhoer
12. P Doungel

RNOD (Recoded Notes of the discussion) of the virtual meeting held on 27.06.2023 (Tuesday) regarding dual redundancy of RTU, PMU, VOIP, AGC etc.

A meeting on cited subject was held on 27.06.2023 at 10:30 A.M. with the participants from CEA, RLDCs, CTUIL, GRID-India and POWERGRID. The list of the participants is enclosed at Annexure-I. At the outset Sr. GM (CTUIL) welcomed the participants and stated the requirement of two channels each at main and backup control centres, already discussed in the meeting held on 09.05.2023 and confirmed by PCD(CEA) subsequently. In view of this CTU requested the participants to provide their valuable views/suggestions for each application for the said redundancy.

Deliberation:

CTU stated that at present one data channel and one voice channel are routed for reporting to main RLDC and similarly one data & one voice channel is reporting at backup RLDC. However, during the meeting held on 09.05.2023, GRID-India requested for at least two data channels and two voice channels for reporting to each RLDC i.e. main RLDC and backup RLDC, to increase the redundancy in the system.

Further CTU stated to deliberate on all the data and voice applications being used from stations to control centres (CC) and among CCs viz SCADA,PMU, AGC,VOIP etc.. CEA suggested that the redundancy shall be developed in a phased manner and the constraints on the existing communication network shall be explicitly reviewed and taken up accordingly.

Detailed deliberations were held among GRID-INDIA-RLDCs, POWERGRID, CEA, CTU for the same and ISTS communication system was proposed for different services with redundancy:

1. SCADA

2. PMU

3. AGC

4. VOIP

5. Automated Metering Application(AMR)

6. ICCP (Between control centers)

7. PDC to PDC

8. Data sync between MCC & BCC

GRID-INDIA has submitted the data regarding present status of redundancy of these services which is enclosed as Annexure-I. POWERGRID has also submitted the data of utilization of optical fiber network for some links of Eastern region which is enclosed as Annexure-II. CTU again requested POWERGRID to provide requisite data for the implementation of said redundancy scheme.

It was also felt to analyze the enhancement required for the above mentioned 8 services on 2+2 redundancy as discussed below:

1. **SCADA :-** Currently SCADA is reporting through 1+1/2+1/2+2/1+0 (radial) channel in different regions. For 2+2 redundancy of SCADA data, it requires extra ethernet ports at RTU, SAS Gateway & FOTE along with suitable bandwidth in optical fiber network. CTU stated that POWERGRID shall provide data of utilized and spare ethernet ports for existing RTUs, SAS Gateways and FOTE and shall also asses the data for additional requirement of the said redundancy. POWERGRID agreed the same.
2. **PMU :-** POWERGRID stated that presently one port of central sector PMUs is split into two channels at MUX (SDH) level from where onwards one channel reports to NTAMC (PG) and other reports to PDC (RLDC). GRID-India stated that as at present there is no plan of backup PDC, hence PMU data may be sent to PDC at RLDC in 1+1 mode only. Accordingly, one additional channel is required from PMUs to RLDCs. POWERGRID is requested to check availability of additional port on PMU and FOTE along with bandwidth requirement for configuration of additional backup channel to RLDC. POWERGRID agreed the same.
3. **AGC :-** GRID-India-NLDC stated that **c**urrently 2 channels are reporting from generators up to HMI of the station and there after through fibre optic network to NLDC Main Control Centre (MCC). GRID-India explained that a separate RTU is provided to integrate the generator data and route it further through the existing FOTE. This is in addition to existing RTU/SAS Gateway reporting to RLDCs.. As per redundancy requirements of control centre, 2 additional channels for AGC from generator station (in addition to the SCADA data) are required for data reporting to Backup Control Centre (BCC). GRID-INDIA also

stated that AGC signal to generator is being planned from RLDC in future. POWERGRID is requested to check availability of ports on RTU (both SCADA and Generation), SAS Gateway of AGC system and FOTE for implementation of same. POWERGRID agreed the same.

4. **VOIP :-** POWERGRID stated that currently VOIP is communicating through single channel only. GRID-India stated that they require redundancy on Port level and additional port shall be required at VOIP phone, exchange & FOTE. As present VOIP exchange has completed its life, it is suggested that requisite features for VOIP phones & exchange shall be included during system upgradation/ replacement. POWERGRID agreed to provide relevant data for the same.
5. **AMR :-** GRID-India stated that new AMR architecture is in planning phase and they will provide required inputs after looking in architecture.
6. **ICCP :-** GRID-India stated that currently ICCP (Between NLDC, RLDC and SLDC) is working on 2 communication channels for main-to-main control center and 2 communication channels for backup to backup control center only. For redundancy, GRID-India requires 4 extra channels, 2 channels for main RLDC to backup SLDC communication and 2 channels for backup RLDC to main SLDC communication. POWERGRID is requested to provide additional requirements (if any) for implementation of same. POWERGRID agreed the same.
7. **PDC to PDC :-** GRID-India stated that at present '1' channel is provided between PDC(SLDCs) to PDC (RLDC), for redundancy in PDC(SLDCs) to PDC(RLDC) communication additional 1 channel is required as discussed in PMU above.
8. **Data Sync between MCC & BCC :-** GRID-India stated that presently 1 channel is working for data sync between Main Control Center and Backup Control Center i.e. main SLDC to backup SLDC, main RLDC to backup RLDC, main NLDC to backup NLDC, further it is required to provide 1 additional channel for redundancy.

As per above discussion POWERGRID is requested to provide the requisite data for implementation of redundancy of services as discussed above within 21 days. POWERGRID agreed for the same. Meeting ended after vote of thanks by SR.GM(CTU).

List of participants of the meeting

- **CEA**

1. Sh. Prateek Srivastava, Assistant Director, PCD
2. Ms. Priyam, Dy. Director, PSPA-I

- **CTUIL**

1. Sh. H.S. Kaushal, CGM, CTUIL
2. Sh. Shiv Kumar Gupta, Sr.DGM, CTUIL
3. Sh. Tej Prakash Verma, Ch.Mgr., CTUIL
4. Sh. Divesh Kamdar, AET, CTUIL

- **POWERGRID**

1. Sh. Satish Kr Sahare, GM, ULDC
2. Smt. Shyama Kumari, DGM, GA&C
3. Sh. Kapil Gupta, DGM, GA&C
4. Sh. Mangesh Shriram Bansod, DGM, IT
5. Sh. Sundeep Kumar Gupta, Ch. Mgr, GA&C
6. Sh. Narendra Kumar Meena, Ch. Mgr. ULDC
7. Sh. Santanu Rudrapal, Ch. Mgr, ULDC
8. Sh. Vishal Badlas, Mgr, GA&C
9. Sh. Hemanth Kumar, Asst. Mgr, ULDC

- **GRID- India**

1. Sh. Harish Kumar Rathour, GM, NLDC
2. Sh. Aukur Gulati, Ch. Mgr, NRLDC
3. Sh. Sakal Deep, Engineer, NERLDC
4. Sh. Akhil Singhal, NERLDC
5. Sh. P. Doungel, NERLDC
6. Sh. Amba Prasad Tiwari, NERLDC
7. Sh. Mohneesh Rastogi, NLDC
8. Sh. Ganesh, SRLDC
9. Sh. Rakesh, SRLDC
10. Sh. Ashutosh Pagare
11. Sh. Koti Naveen, WRLDC

CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

No.- L-1/210/2016/CERC

CORAM:

Shri Jishnu Barua, Chairperson
Shri I. S. Jha, Member
Shri Arun Goyal, Member
Shri P. K. Singh, Member

Date of Order: 19th January, 2024

In the matter of:

Approval of Guidelines on "Interface Requirements" under the Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017.

Order

The Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017 (hereinafter referred to as the 'Communication Regulations') were published on 29.05.2017 in the Gazette of India Extraordinary (Part-III, Section-4, No. 218).

2. Regulation 7.4, read with Regulation 14.2 of the Communication Regulations requires NLDC to prepare Guidelines on "Interfacing Requirements" in consultation with the stakeholders and submit the same for approval of the Commission.

3. Accordingly, NLDC has submitted the Guidelines on "Interfacing Requirements" after stakeholder consultation for approval of the Commission.

3.4. The communication media being used for data transfer and data rate shall be in accordance with the Central Electricity Authority(Technical Standards for Communication System in Power System Operations) Regulations, 2020.

4. Communication Interface

The Users shall support at least the following facilities and plan for communication interfaces accordingly at the time of implementation:

1. Real time data exchange including AGC/Control signal with Control Centre (Main & Backup).
2. Phasor data exchange
3. Meter data exchange
4. Protection signal transmission (SPS, Direct Tripping and Permissive Tripping Carrier Signal etc.)
5. Voice communication
6. Video Communication

Other requirements, if any, users may include while designing the local communication interface requirement.

The required communication interfaces shall be provided for both sending and receiving ends based upon jurisdiction/ownership. All the interfaces shall be provided with audio-visual status indication to indicate its normal operation as per relevant standards.

Users shall have functionality to support any of the interfaces given below based on requirement of data flow as per CEA/CERC guidelines from their respective end to control centres.

Interfaces are classified as following: -

1. Remote Station Interfaces
2. Control Centre Interfaces
3. Terminal Equipment Interfaces

4.1. Remote Station

"Interfacing Requirements" in respect of terminal equipment, Remote Terminal Unit (RTUs)/ Substation Automation System (SAS), Supervisory Control and Data Acquisition System (SCADA), Phasor Measurement Unit (PMU) /Phasor Data Concentrators (PDC), Automatic Generation Control

(AGC), Station Protection / System Protection Schemes (SPS), Automatic Meter Reading (AMR), Advanced Metering Infrastructure (AMI), etc. and for data communication is decided based on communication protocol used for transfer of data between user and respective control centres through dedicated and redundant communication channel with route diversity.

Remote end equipment like RTUs, PMUs, SAS, Metering Gateways, Meter Data Collection Unit, PLCs for AGC etc. shall report through communication protocol which is supported at the reporting Control Centre.

While designing the interface requirement of the remote locations, all the interfaces required for data (power system parameter, meter data, AGC/Control Signal), voice, video, protection signal shall be considered and shall be compatible with respective control centre as well as intervening Communication System equipment.

A typical General Arrangement drawing for a Remote Station is enclosed as ***Annexure-III***.

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. Communication system shall be designed as per planning criterion to be notified by CEA.

Availability of communication links shall be maintained as per the CERC Communication Regulations, 2017. Further, the communication channel provided/configured for the real time data communication shall be made error free and shall not lead to intermittency in real time data at respective Control Centre.

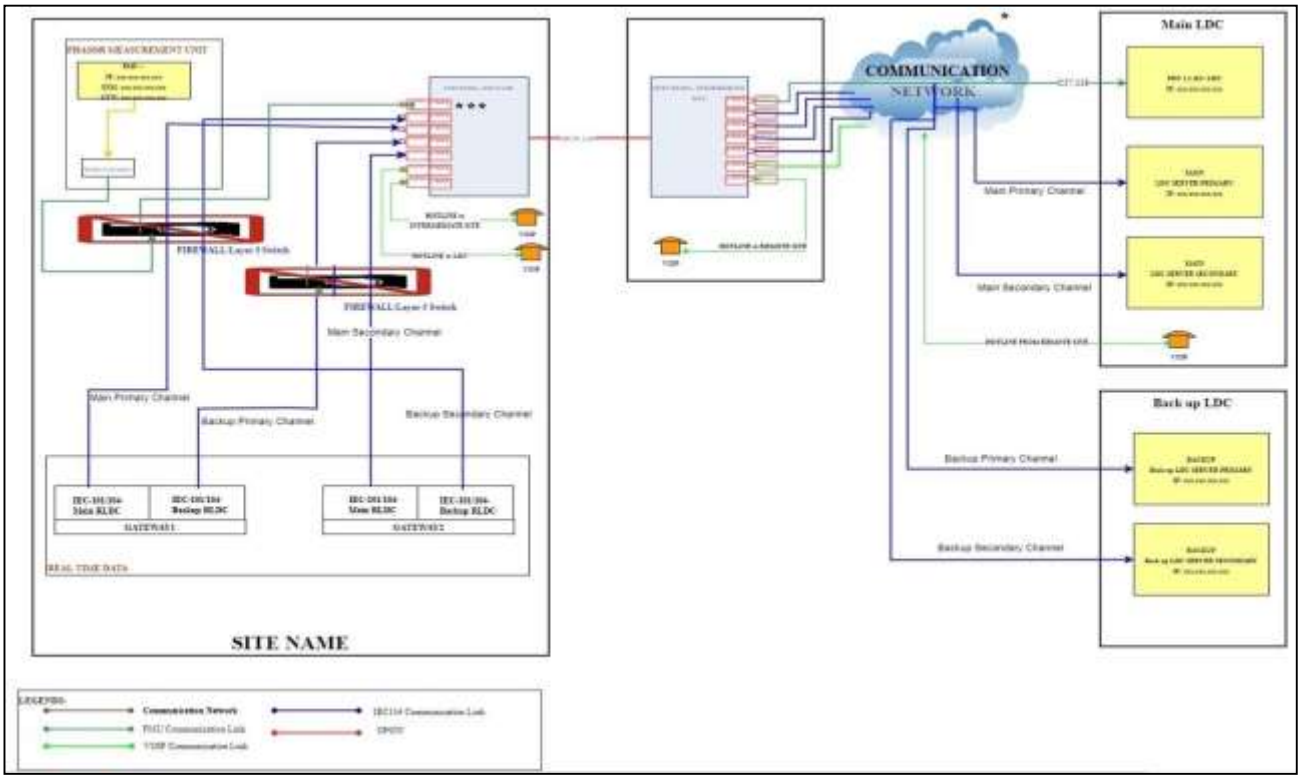
4.1.1. Remote Terminal Unit (RTU)/Substation Automation System (SAS)/PLCs

"Remote Terminal Units" (RTU) / Substation Automation System (SAS) is the device suitable for measuring, recording and storing the consumption of electricity or any other quantity related with electrical system and status of the equipment in real time basis and exchanging such information with the data acquisition system for display and control.

The RTU/SAS System /device should communicate with Control Centre front end system in either

ANNEXURE-III

Typical Remote Station General Arrangement Diagram having IEC-101/104 RTU



Annexure-VI

सत्यमेव जयते

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली संचार विकास प्रभाग
Power System Communication Development Division

सेवा में / To,

Chief Operating Officer, CTUIL,
Saudamini Plot, Gurgaon

Subject: **Requirement of Dual redundancy of communication services – regd**

Reference: CTU email dated 07.06.2024

CTU vide above mentioned reference has forwarded SRPC's email seeking clarifications in respect of requirement of dual redundancy of communication services for the existing stations (TBCB/RTM).

1.1. In this regard, it may be noted that ensuring redundancy with route diversity is the requirement stipulated in CEA's Manual of Communication Planning in Power System Operation. Further, it was proposed by GRID INDIA that to ensure redundancy with route diversity, at least two data channels and two voice channels shall be routed for reporting to main RLDC and another two data & two Voice channels shall report at backup RLDC.

1.2. Also, with issuance of Guidelines on "Interface Requirements" under the CERC (Communication System for inter-State transmission of Electricity) Regulations, 2017, it has been made amply clear that suitable redundancy at port, card and gateway level needs to be ensured to avoid any single point of failure which may lead to interruption in real-time grid operation.

1.3. CTUIL has already convened meetings amongst POWERGRID, POSOCO, CTUIL and CEA (PCD) on 09.05.2023 and 27.06.2023, for examining the availability of two channels each from the ISTS stations to Main & Back-up Control Centers and to deliberate on the need for the same. Various applications of data, phasor and voice were deliberated during these meetings and requirement of the dual redundancy for different communication services used for ISTS was agreed as below:

i. SCADA
ii. PMU
iii. AGC

iv. Voice
v. Automated Metering Application
vi. ICCP (between control canters)
vii. PDC to PDC
viii. Data Sync between MCC & BCC

1.4. This called for modifications in the existing ISTS infrastructure, besides inclusion of the same in the scope of the upcoming TBCB/ RTM schemes.

1.5. The technical inputs for RfP of the upcoming TBCB/RTM schemes have been updated based on decision taken in meeting convened by PCD, CEA on 28.06.2023, to ensure the compliance of dual redundancy.

1.6. For the existing system, CTUIL, Powergrid and Grid India were requested to coordinate in identifying the immediate measures/upgradations to be undertaken to ensure the dual channel reporting, for the identified communication applications, from each ISTS station to main and back up RLDCs.

भवदीय
Signed by Suman Kumar Maharana
Date: 22-07-2024 14:20:59

(एस.के.महाराणा / **S. K. Maharana**)
मुख्य अभियन्ता /**Chief Engineer (PSCD)**

Copy to:

1. Member Secretary, SRPC

Annexure-VII

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: C/CTU/COMM **Date:** 11/09/2024

To,
As per distribution list

Sub: Regarding RPCs view on the agenda to be put up in upcoming 15th NPC meeting.

Dear Sir/Madam,

This is with reference to the agenda sent by CTUIL for the upcoming 15th NPC meeting (Agenda attached at ***Annexure-I***). NPC after reviewing the agenda suggested CTU to seek the views of RPCs on the following two agenda:

A.3. Methodology for replacement of old ISTS communication elements e.g. OPGW and FOTE who have lived their useful life as per CERC tariff regulation.

A.4. Dual reporting of ISGS/RE Remote stations to RLDC Main and Backup Control centers.

In view of the above, RPCs are requested to give their valuable views/comments/suggestions within fortnight in order to take up the same for the deliberation in the subject NPC meeting.

Thanking you,

Yours faithfully,

(H.S. Kaushal)
Sr. GM (CTUIL)

List of Addresses:

1.	Member Secretary, Northern Regional Power Committee 18-A, Qutab Institutional Area, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110 016	2.	Member Secretary, Southern Regional Power Committee 29, Race Course Cross Road Bangalore – 560 009
3.	Member Secretary, Western Regional Power Committee MIDC area, Marol, Andheri East , Mumbai -400093	4.	Member Secretary, Eastern Regional Power Committee 14, Golf Club Road, Tollygunge Kolkata-700033
5.	Member Secretary, North Eastern Regional Power Committee (NERPC) Meghalaya State Housing Finance Co-operative Society Ltd. Building Nongrim Hills, Shillong, Meghalaya – 793003		

Annexure-VIII

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: C/CTU/COMM/ **Date:**18/10/2024

To,

As Per Distribution List

Sub: Regarding Dual reporting (2+2) of SCADA Channels (RTU/SAS) to the Main RLDC and Back-up RLDC for RE Generators

Dear Sir,

This is with reference to the Meeting convened by SRLDC dtd. 26.07.2024 (MoM attached at **Annexure-I**) regarding Dual reporting (2+2) of SCADA Channels (RTU/SAS) to Main RLDC and Back up RLDC, 48th COM SR Meeting held on 29.07.2024 (MoM attached at **Annexure-II**) and 6th CPM (Communication Planning Meeting) of Southern Region held on 13.08.2024 (MoM attached at **Annexure-III**).

Further as per CERC Guidelines on "Interface Requirements", published on 19th Jan 2024 (attached at **Annexure-IV**), following to be complied by remote stations connected with ISTS:

"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."

Therefore, as per deliberations in the above said meetings and the CERC Guidelines on "Interface Requirements", remote stations including Renewable Energy (RE) Generators which are connected with ISTS system are requested to provide two channels for SCADA data to Main RLDC and two channels to backup RLDC via diverse physical path. In view of this, 2 main channels and 2 backup channels to be configured to the nearest wideband node (Data Collection Point) by RE Generator and from there onwards channels to be configured by ULDC team upto Main RLDC and Backup RLDC.

Further for the existing RE stations, which are connected to ISTS system through a **Single Dedicated Transmission line (DTL)**, four SCADA channels (2+2) shall be provided through this DTL till diverse physical alternate path is planned. Moreover, as per CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022 for 110 kV & above transmission lines primary communication path must be on OPGW. Therefore, RE Generators which are not connected with OPGW may plan OPGW suitably on their DTL.

In this regard, you are requested to make necessary arrangement and update the status to CTU by 15 days with copy to RLDC/RPC.

Thanking you,

Yours faithfully

H S Kaushal 18/10/24
Sr. GM (CTUIL)

Copy to: 1. MS, SRPC
2. CGM, SRLDC

Distribution list:

Sl No	Name of Entity	Nodal Officers Names	Designation	Email ID
1	A P Solar Power Corporation Pvt Ltd	G Krishna Kishore	DEE	deenpkunta@gmail.com
2	NTPC Ananthapuramu Ultra Mega Solar park	Rama Mohan Reddy	SENIOR MANAGER	krmohan@ntpc.co.in
3	ACME BHIWADI SOLAR POWER Pvt. Ltd.	Rajesh	O&M – Site In-Charge	kalkarla.rajeswar@mahindra.com
4	ACME HISAR SOLAR POWER Pvt. Ltd.	Rajesh	O&M – Site In-Charge	kalkarla.rajeswar@mahindra.com
5	ACME KARNAL SOLAR POWER Pvt. Ltd.	Rajesh	O&M – Site In-Charge	kalkarla.rajeswar@mahindra.com
6	Azure Power thirty six private limited	Subba Reddy	Site-Incharge	subba.reddy@azurepower.com
7	SBG CLEANTECH PROJECTCO FIVE PVT LTD	Balaji	Site-Incharge	sriranga.balaji@adani.com BR.Chowdari@adani.com
8	Tata Power Renewable Energy Limited	Ravindra Joshi	Site-Incharge	rmjoshi@tatapower.com
9	FRV Andhra Pradesh Solar Farm-I Pvt.Ltd.	Pranesh	O&M – Site In-Charge	B.PRANESH@INDIGRID.COM
10		Venkatesh	O&M – Site In-Charge	nooli.venkatesh@indigrid.com
11	FRV Andhra Pradesh Solar Farm-2 Pvt.Ltd.	Alok sahu	O&M – Site In-Charge	alok.sahu1@indigrid.com
12	Ayana	Prosenjit Chakraborty	Head IT and Tech (AVP)	prosenjit@ayanapower.com
13	SPRNG AGNITRA PRIVATE LIMITED	Nagaraju Ponnaganti	O&M – Site In-Charge	nagarajuponnaganti@sprngenergy.com
14	Green Infra Renewable Energy Limited	ADITHYA	Assistant Manager	aditya.l@sembcorp.com
	Mytrah Energy (India) Private Limited	Kumar Rounak	Site Incharge	kumar.rounak@jsw.in
		mathanraj	Site Incharge	mathanraji@jsw.in

Sl No	Name of Entity	Nodal Officers Names	Designation	Email ID
15		Arun Selvam	Site Incharge	arulselvaam.d@jsw.in
16	Orange Sironj Wind Power Private Limited	Balasubramanian	Senior Manager	balasubramanian.v@greenkogroup.com
		Ramakrishnan	Assistant Manager	ramakrishnan.g@greenkogroup.com
17	BETAM WIND ENERGY PVT LTD	Arun Kumar	Manager (O&M)	arun.kumar@engie.com
18	Ettiyarpuram NTPC	Kumareshan	Site Incharge	kkumaresan@ntpc.co.in
19	JSW Wind energy	Ganeshkumar R	Site Incharge	ganeshr.kumar@jsw.in
20		Senthil Mani	Site Incharge	senthil.mani@jsw.in
21	GRT Jewellary	Muthukumar	Site Incharge	esakkimuthu.m@grtjewels.com
22	KSPDCL	Mahesh	AGM	mahesh2012ynh@gmail.com
23	ACME KURUKSHETRA SOLAR ENERGY PVT LTD	Krupananda Reddy	Manager	Krupananda.reddy@amplussolar.com
24	ACME REWARI SOLAR POWER PVT LTD	Krupananda Reddy	Manager	Krupananda.reddy@amplussolar.com
25	ADYAH_Block_1	Sumithkumar	Manager	sumit@ayanapower.com
26	ADYAH_Block_10	Sumithkumar	Manager	sumit@ayanapower.com
27	ADYAH_Block_13	Sumithkumar	Manager	sumit@ayanapower.com
28	ADYAH_Block_2	Sumithkumar	Manager	sumit@ayanapower.com
29	ADYAH_Block_3	Sumithkumar	Manager	sumit@ayanapower.com
30	ADYAH_Block_6	Sumithkumar	Manager	sumit@ayanapower.com
31	AVAADA SOLAR ENERGY PVT LTD	Rajesh Bihari Dwivedi	Senior General Manager	rajesh.dwivedi@avaada.com
32	AvvadaSolarise	Rajesh Bihari Dwivedi	Senior General Manager	rajesh.dwivedi@avaada.com
33	Azure Power thirty six private limited	Chaitanya Reddy	Site-Inchage	chaitanyareddy.v@azurepower.com
34	FORTUM FINNSURYA ENERGY PVT LTD	Jayanta Padhi	Manager	padhi.jayanta@fortum.com

Sl No	Name of Entity	Nodal Officers Names	Designation	Email ID
35	FORTUM SOLAR ENERGY PVT LTD	Deepulal	Site-Incharge	deepulal@sprngemenergy.com
36	KREDL	Shivashankar	Site-Incharge	dssp@amararaja.com
37	PARAMPUJYA SOLAR ENERGY PVT LTD	Vinay	Manager	vinay.thumbala@adani.com
38	RENEW WIND ENERGY PVT LTD	Venkat Naidu	Manager	venkata.naidu@renew.com
39	TATA POWER RENEWABLE ENERGY LTD	Sanjay Dharuman	Manager	dharumana@tatapower.com
40	SBg ENERGY	Jagadeesh Adani	Site-Incharge	jagadish.ac@adani.com
41	YARROW INFRASTRUCTURE PRIVATE LIMITED	Kirnkumar	Site-Incharge	enturikiran.kumar@sembcorp.com
42	IRCON	Raghunath	Site-Incharge	raghunath@ayanapower.com
43	Ayana_wind energy	Suresh Murugan	Technical Head,Manager	sureshmurugan@ayanapower.com
44	RSRPL Roshini	Ravikant Sharma	AGM	ravikant.sharma@renew.com
45	RSOPL Renew Ojas	Ravikant Sharma	AGM	ravikant.sharma@renew.com
46	Serentica	prateek mohan rai		prateek.rai@serenticaglobal.com
47	Spring Energy Wind	Vikravel	site incharge	-
48	Ostro Energy Wind	Raja	site incharge	ostrokannada@renew.com
49	Dharapuram	Manikandan	site incharge	manikandan.s1@jsw.in

ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड

Grid Controller of India Limited

दक्षिण क्षेत्रीय भार प्रेक्षण केन्द्र / SOUTHERN REGIONAL LOAD DESPATCH CENTRE

No. 29, Race Course Cross Road, Bangalore – 560 009. Phone – 080 22254525.

CIN No. U40105DL2009GOI188682, Website –www.srldc.in,email:srldcscada@grid-india.in

Minutes of Meeting on Dual reporting (2+2) of SCADA Channels (RTU/SAS) to Main RLDC and Back up RLDC

A meeting was conducted on 26th July 2024 at 10.30 hrs through VC (Webex) with participation from ISGS, IPP, SRPC, POWERGRID, CTUIL and SRLDC to update the status of provision of dual channel to the Main Control Centre (MCC) and Backup Control Centre (BCC) of SRLDC from ISGS and IPP stations.

Shri. T.R. Ganesh, CGM, SRLDC welcomed all the participants to the meeting. He emphasized that for effective utilisation of Decision support tools for SCADA/EMS, automation optimization, and AGC applications within the control center is depends on a consistent and reliable data stream from remote stations. Therefore, a redundant communication system with dual channels connecting remote stations to both MCC and BCC is essential to maximize the potential of these tools at SRLDC.

Shri. Meka Ramakrishna, Superintending engineer (P, C & SS), SRPC extended a warm welcome to all participants. He informed that SRLDC has called this meeting as per SRPC forum recommendation during 46th COMSR meeting. He briefed the participants regarding the regulatory mandate for dual reporting of SCADA data to Main and Backup SRLDC. CEA Manual for Communication planning for power system operation emphasizes the users to ensure redundant path with route diversity for remote stations reporting to RLDCs. Further guidelines on interface requirements, notified by Hon'ble CERC in January 2024 under CERC (Communication System for inter-State transmission of Electricity) Regulations, 2017, stipulates that communication equipment should support interfaces with multiple ports, cards, gateways etc. and configured in redundant mode so that failure of single hardware element of the users shall not lead to failure of data communication. He also informed that CEA(PCD) also clarified that for existing system CTUIL/GRID-INDIA to coordinate in identifying the immediate measures/upgradations to be undertaken to ensure the dual channel reporting, for the identified communication applications, from each ISTS station to Main and Back up RLDCs.

CTUIL informed that compliance with these guidelines to be ensured by all users of ISTS for existing as well as upcoming stations. Feasibility study has been startedfor POWERGRID/Other Pvt TBCB stations by CTU. To meet CERC interface guidelines if upgradation in the existing FOTE at ISTS stations is required same shall be planned by CTUIL as per inputs received from POWERGRID and other Pvt TBCB TSPs.. For ISGS/IPP stations etc. i.e. other than ISTS stations the responsibility for upgrading RTUs/Gateways lies with the respective owner/s. If existing FOTE at ISGS/IPP stations etc. i.e. other than ISTS stations are installed under ISTS , , CTUIL shall plan for the same; otherwise, the respective owner must make the necessary arrangements.

Renewable energy stations, which are connected to ISTS stations through a single dedicated transmission line (DTL), need to be informed of the requirements. For existing stations, four channels in this DTL may be used to comply with the regulations if no diverse path is available.

From the DCP (nearest ISTS wideband node) 2 nos. channels shall be routed to MCC and 2 nos. channels to BCC from these RE Generators wherever available.

In order to comply with the guidelines of the CERC Interface requirements of Communication system clause 4.1, all users need to provide the dual channel (2+2) to the MCC & BCC of SRLDC. SRLDC briefed the participants regarding the background and architecture of the dual channel requirement. SRLDC presentation attached as **Annexure 1.**

SRLDC have collected the present status of availability of port in RTU/SAS and ownership of communication panel from all ISGS and IPPs. The meeting was focused on the capability of the RTU/Gateway for providing dual channel's to MCC and BCC of SRLDC and the availability of ports in FOTE/SDH equipment's.

SRLDC appreciated that Chandragiri (GIREL), Sembcorp is the first plant complying with the requirement as per the regulation.

Name of Generating Station	**Gist of Discussion on 2 + 2 Channel**	**Timeline**
Simhadri NTPC	RTU upgradation planned from 101 to 104. No spare ports available in Tejas panel owned by POWERGRID. Empty card slots available and extra cards being procured by M/s Tejas for communication.	3 to 4 months for RTU upgradation 31st Oct 2024
Telangana STPP NTPC	Currently both channels are reporting partially through Telangana network and ULDC network. Connectivity agreement through Telangana network only. Extra ethernet card to be provided by TSTPP. TeSTPP to take up and provide resolution along-with Timeline	By end of August 2024
KUDGI NTPC	Ports are available in RTU and FOTE is provided and maintained by PGCIL	1-2 months
Vallur NTPC	Ports are available in RTU/Gateway. M/s Tejas will coordinate for configuration	Within 10 days

Name of Generating Station	Gist of Discussion on 2 + 2 Channel	Timeline
COASTAL (IPP)	Ports are available. Currently Two(2) gateways reporting through OPGW link. Spare ports are available in RTU and Tejas. Single OPGW path only will be available as per SRTS2, PGCIL from station to ISTS node. Coastal to revert back on timeline	Yet to be provided
IL&FS (IPP)	104 RTU upgradation planned but timeline to be updated. Considering for dual channel with 101 RTU. Tejas panel owned by ILFS and support required in configuration and taking up with the OEM of FOTE.	Within 1 month.
BHAVINI (NPCIL)	Tender opened for RTU. Commercial aspects under consideration. Ports to be considered in the gateway upgradation for dual channel reporting to Control centre.	Dec-24
Kalpakkam (MAPS)	RTU upgradation planned from IEC101 to IEC104. FOTE is provided and maintained by PGCIL	Mar-25
Kaiga Nuclear Power plant(NPCIL)	RTU upgradation planned from IEC 101 to IEC 104. FOTE is provided and maintained by PGCIL	Mar-25
KUDAMKULAM (NPCIL)	RTU upgradation planned from 101 to 104. FOTE is provided and maintained by PGCIL	Mar-25
NNTPS (Neyveli)	FOTE is available. Discussion planned with communication vendor for upgradation and dual reporting in the 1st week of Aug 2024	Yet to be provided
NEYVELLI TS2 EXP (Neyveli)	Discussion planned with communication vendor for upgradation and dual reporting in the 1st week of Aug FOTE is provided and maintained by PGCIL.	Yet to be provided
NEYVELLI TS1 EXP (Neyveli)	RTU/Gateway upgradation is planned. FOTE is provided and maintained by PGCIL. No representation in the meeting	Yet to be provided
NEYVELLI TS2 (Neyveli)	Discussion planned with communication vendor for upgradation and dual reporting in the 1st week	Yet to be provided

Name of Generating Station	Gist of Discussion on 2 + 2 Channel	Timeline
	of Aug FOTE is provided and maintained by PGCIL. No representation in the meeting.	
Ramagundam (NTPC)	No ports available. SAS upgradation planned. FOTE is provided and maintained by PGCIL	6 to 8 months
NTPL Tuticorin	FOTE is provided and maintained by PGCIL, PO will be placed within 1 week for RTU upgradation to IEC 104	Dec-24
TPCIL (SEIL-1)	1 card only available and RTU upgradation planned. Timeline yet to update	Yet to be provided
NCC GIS (SEIL-2)	One gateway of NCC reporting to STU in IEC 104 protocol. Timeline yet to update	Yet to be provided
Simhapuri Energy Limited (JSW)	IEC104 upgradation planned and offer awaited from vendor for further approval. FOTE procurement and integration with ULDC network yet to be done,	6 months
Meenakshi Power Energy limited (Vedanta)	IEC104 upgradations planned and offer awaited from vendor for further approval FOTE procurement and integration with ULDC network yet to be done	6 months
Lanco Komdapalli Stg 2 & 3	No OPGW to station and reporting through single channel. RTU upgradation to be planned by LANCO	6 months
Orange Sironj(Greenko)	Free ports available in RTU and FOTE. No representation in meeting.	Yet to be provided
NPkunta 220kV (APSPCL)	Ports available in gateway. No spare ports available in Tejas panel at NPKUNTA, PGCIL to extend dual channels. APSPCL/PGCIL to update on implementation	Yet to be provided
Galiveedu PS (APSPCL)	Ports available in gateway. No spare ports available in Tejas panel at NPKUNTA, PGCIL to extend dual channels. APSPCL/PGCIL to update on implementation	Yet to be provided
Maniyachi(MYTHRA Power)	Ports are available in RTU. Mytrah will revert back on FOTE ownership	Sep-2024
Kayamkulam NTPC	RTU upgradation of SCADA system to IEC104. Action plan and timeline to be updated	Yet to be provided

Name of Generating Station	Gist of Discussion on 2 + 2 Channel	Timeline
Talcher Stg II NTPC	Action plan and timeline to be mentioned	Yet to be provided

A comprehensive list of details, including data from every generating station, information on communication panels to be provided to CTUIL alongwith contact details (Email, Phone no. etc.) particulars, list is attached as **Annexure 2**.

CTUIL requested POWERGRID to review the FOTE/Cards upgrdation requirement at the ISTS/ISGS / IPP stations etc. where existing ISTS equipment are installed and provide to CTUIL within 15 days so that scheme may be planned for the same.

For RTU/Gateway upgradation of ISGS/IPP etc. users needs to be taken up at their end and inform the status to SRLDC with copy to CTUIL.

Shri. Harish Kumar Rathour, GM(SRLDC) thanked all participants for the positive response and SRPC and CTUIL and requested all ISGS/IPP entities to adhere to the timeline committed by each generator and remaining ISGS/IPPs to provide the firm timelines by next week.

Annexure-II

E-mail/Website

भारत सरकार केंद्रीय विद्युत प्राधिकरण **दक्षिण क्षेत्रीय विद्युत समिति** 29, रेस कोर्स क्रास रोड बेंगलूरु -560009	सत्यमेव जयते	Government of India Central Electricity Authority **Southern Regional Power Committee** 29, Race Course Cross Road Bengaluru-560 009
Email: **seprotnsrpc-ka@nic.in**	Web site: www.srpc.kar.nic.in	Ph: 080-22259343
सं/No. SRPC/SE(P,C&SS)/ COMSR/48/2024/	दिनांक /Date	**7th August 2024**

To
As per the mailing list

विषय/Sub: Minutes of the 48th Meeting of the communication equipment outage coordination [COM SR - Outage August 2024], held on 29.07.2024 - Reg.

महोदय / Sir,

दिनांक **29.07.2024** को एस आर पी सी बेंगलूरू में आयोजित हुआ , संचार उपकरणों की आउटेज समन्वय की बैठक के कार्यवृत, आपके अवलोकन केलिए हमारे वेबसाइट https://srpc.kar.nic.in में अपलोड किया गया है ।

Enclosed please find the minutes of the 48th Meeting of the Communication equipment outage coordination meeting [**COMSR – Outage August 2024]**, held on 29.07.2024 at SRPC, Bengaluru. The same has been uploaded in SRPC website https://srpc.kar.nic.in.

भवदीय/ Yours faithfully,

M. Ramakrishna 7/8/2024

(मेका रामकृष्ण/ Meka Ramakrishna)
अधीक्षणअभियंता (पी,सी&एस एस) /Superintending Engineer (P,C&SS)

डाक सूची / Mailing List

1. मुख्य अभियंता (एसएलडीसी), एपी ट्रांस्को / Chief Engineer (SLDC), APTRANSCO, Vijayawada.
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3. मुख्य अभियंता (एसओ), केएसईबीएल / Chief Engineer (SO), KSEBL, Kalamassery
4. मुख्यi अभियंता (प्र), टैनट्रांस्को / Chief Engineer (Opn.), TANTRANSCO, Chennai
5. मुख्य अभियंता (ग्रि.प्र.), टी.एस.ट्रानस्को / Chief Engineer (SLDC), TSTRANSCO, Hyderabad
6. अधीक्षक अभियंता-I, विद्युत विभाग, पुदुचेरी / S.E - I, Electricity Department, Puducherry
7. ई.डी, आरएसटीपीएस, एनटीपीसी, रामगुंडम / E.D, RSTPS, Jyothinagar, Ramagundam, Telangana
8. महाप्रबंध, तालचेर स्टेज-II, एनटीपीसी / G.M, STPP Stg - II, NTPC, Talcher, Odisha
9. समूह महाप्रबंधक, सिंहाद्री एस.टी.पी.एस, एन.टी.पी.सी. / G.G.M, Simhadri STPS, Visakhapatnam, AP.

10. महाप्रबंधक, एनटीपीसी कुड्गी एस.टी.पी.एस / G.M, Kudgi STPS, NTPC, Kudgi, Karnataka
11. DGM (EED), Telangana NTPC Ltd, Telangana STPP, Ramagundam, (PO), Peddapalli (Dist).
12. महाप्रबंधक (ओएस), एनटीपीसी एचक्यू / G.M (OS), SR HQ,NTPC, Secunderabad
13. महाप्रबंधक (ओ&एम), एनटीईसीएल, वल्लूर / G.M (O&M), NTECL, Vallur, Chennai
14. मुख्य महा प्रबंबंधक, एनएलसी टीपीएस-II / Chief General Manager, Neyveli TPS-II, Neyveli
15. महा प्रबंबंधक, एनएनटीपीपी / General Manager, NNTPP, Neyveli
16. Chief Manager, Neyveli 1 Expn, Electrical Maintenance, TPS1 Expansion NLC India Pvt Ltd, Neyveli – 607 807
17. Executive Engineer, NLC TPS II Expansion, Neyveli, Tamil Nadu
18. एन.टी.पी.एल / CGM (Ele), NLC Tamil Nadu Power Limited (NTPL), Harbour Estate, Tuticorin – 628 004, Tamil Nadu
19. Chief Manager, TAQA, Neyveli Power Co. Pvt. Ltd, 250 MW LFPP, Uthangal, Vridhachalam Taluk, Cuddalore District, Tamil Nadu – 607 804.
20. ओएम, एमएपीएस / Operation Superintendent, MAPS, Kalpakkam, Tamil Nadu
21. एस.टी.ई (ई&आई), कैगा स्टेज – 1 / STE (E&I), Kaiga GS Stage - I, Kaiga, Karnataka
22. एस.टी.ई (ई&आई), कैगा स्टेज – 2 / STE (E&I), Kaiga GS. Stage - II, Kaiga, Karnataka
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28. टी.पी.सी.आई.एल / Sembcorp Energy India Ltd – SEIL P1 (Formerly TPCIL), Nellore, Andhra Pradesh.
29. टी.पी.सी.आई.एल / Sembcorp Energy India Ltd – SEIL, 6-3-1090, A-Block, 5th Floor, TSR Towers, Rajbhavan Road, Somajiguda, Hyderabad – 500 082
30. सेंबकार्प गायत्री पावर SEIL P2 / SembCorp Gayatri Power Ltd (Formerly known as NCCPL), Ananthavarma Village, Thotapalli Gudur, SPSR Nellore – 524 344 (rajasekhar.m@sembcorp.com)
31. हिंदुजा, विसाखपट्टणम / Hinduja National Power Corporation Limited (HNPCL), Palavalasa Village, T.Devada (PO), Steel Plant (Sub Office), Pedaganttyada (Mandal), Visakhapatnam – 530 031, Andhra Pradesh
32. Associate Vice President, Adani UPCL, Adani corporate house, Adani Shanthigram, Near Vaishnodevi circle, SG highway, Khodiyar, Ahmedabad. (For the Plant @ Udupi, Karnataka
33. Associate Manager, Solar, Adani Green Energy, Tamilnadu Limited, Sengapadai, Village, Kamuthi Taluk, Ramanathapuram Dist, TN – 623 604.
34. General Manager, JSW Energy Ltd, Raheja Towers, East Wing, 6th Floor, MG Road, Bengaluru – 560 025.
35. महाप्रबंधक आई.एल & एफ़.एस / O&M Head, IL & FS (ITPCL), Cuddalore, Tamil Nadu
36. कोस्टल एनर्जेन / Coastal Energen Pvt Ltd., 7th Floor, Buhari Towers, No.4, Moores Road, Chennai – 600 006 (Ph : 4296 4296, Fax : 4296 4297)
37. कोस्टल एनर्जेन / The Electrical Advisor, Coastal Energen Pvt Ltd, Melamarudur Village, Ottapidaram (Taluk), Tuticorin – 628 105, Tamil Nadu

38. आर.एस.टी.सी.एल / Raichur – Sholapur Transmission Comp.Ltd, Patel Estate, S.V. Road, Jogeswari (West), Mumbai - 102
39. आर.एस.टी.सी.एल / The Project Manager, Raichur – Sholapur Transmission Company Limited, Plot No.6, Sy. No. 20/A, Above (VKG) TATA Show Room, Gunj Area, Hyderabad Road, Yadgir – 585 201, Karnataka (Ph : 9916759111)
40. परियोजना अधीक्षक (ओ&एम), केटीएल, तुमकूरु / O&M Project Head, Kudgi Transmission Ltd (KTL), 5, Vasantanarsapura, Near NH 4 (Behind Bellavi Road), Kora Hobli, Tumkur (Taluk & Dt) – 572128
41. निदेशक, केटीएल, तुमकूरु / The Director, Kudgi Transmission Ltd (KTL), TCTC Building, Ist Floor, Mount Poonamallee Road, Manapakkam, Chennai – 600 089
42. सीईओ, पीएसआईटीएसएल / CEO, PSITSL, C/o PGCIL HQ, Secunderabad – 500 080
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44. वरिष्ठ उपाध्यक्ष (तकनीकी), एम.ई.पी.एल, हैदराबाद / Sr. Vice President (Tech), MEPL, No.119, Road No.10, Jubilee Hills, Hyderabad – 33
45. वी.पी (ऊर्जा), एसईएल / The Vice President (Energy), Simhapuri Energy Ltd. (SEL), Thammina Patnam, Momidi Village, Vargali (Po), Chillakur (Mdl), SPSR Nellore (Dt) – 524 002
46. वी.पी (प्रचालन), लेनको / The Vice President (Operations), LANCO (LKPL), LANCO House, Plot No. 4, Software Unit Layout, Hytec City, Madhapur, Hyderabad – 81
47. Vice President, Operations LANCO, Kondapalli IDA, Pin No.-521 228, Andhra Pradesh (Connected to Kondapalli 220 KV SS).
48. CEO, KSPDCL, Beejaraja Complex, Hebbal, Bengaluru. Karnataka
49. The Deputy Executive Engineer/Elec., Kurnool Ultra Mega Solar Park (1000MW), AP Solar Power Corporation Ltd. (APSPCL), Site Office, Beside Pooling Substation No.02, Sakunala Village, Orvakal Mandal, Kurnool – 518 010, Andhra Pradesh (Connected to APTRANSCO's 400 KV SS, Ghani)
50. The Manager (O&M), Betam, arun.kumar@engie.com,
51. Mytrah Energy India Pvt Ltd / Mytrah vayu tungabhadra pvt ltd, Sy No:292/2, Jutur (VI) , Pathikonda (Md), Kurnool (Dt) – 518380. Andhra Pradesh (Connected to 220 KV SS Nansurala)
52. Executive Engineer, NP Kunta Solar Ltd, APSPCL, Kadiri, Anantapur Dt, Andhra Pradesh (Connected to 400 kV NP Kunta SS of PGCIL)
53. DEE/Electrical, Anantapur Ultra Mega Slolar Park II, Pooling Station - I, Talaricheruvu (V), Tadipatri Mandal, Anantapur Dist – 515 411, AP
54. Manager, M/s Orange, Plot No 13, Sy No 64, Block D, Hitech City Layout, Madhupur, Hyderabad 500 081, Telangana.
55. Asst. General Manager, Spring wind, Spring Renewable, Energy Pvt Ltd, 33/230 kV wind farm poling substation, Edakkalpadi village, Dharapuram, Tripur (D), Tamilnadu - 638 106.
56. DGM, Ostro Kannada Pvt Ltd, Anaburu village, Kasaba hobli, Davanagrer Dist pin_577528, Mobile No. 9686510682
57. Manager, Electrical-HOD, SEPC Power Plant, Harbour Estate, VOC Road, Thoothukudi, Tamil Nadu – 628 004
58. Technical Services Superintendent, Prototype Fast Breeder Reactor Project, BHAVINI, Kalpakkam 603 102

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SOUTHERN REGIONAL POWER COMMITTEE

BENGALURU

Minutes for the 48th COM SR –Communication System Meeting of SRPC

Held on 29th July 2024 at SRPC, Bangalore

1. Introduction

The 48th meeting of "SR Communication System" (COM SR – Outage August 2024) was held on 29th July 2024 at SRPC, Bangalore. The list of Participants is at **Annexure-LoP.**

Shri Asit Singh, Member Secretary, SRPC extended warm welcome to all the participants to the 48th COM SR meeting. He emphasized that this meeting marks the completion of four years since the Committee had been formulated, in accordance with CERC Communication Regulations.

He highlighted the growing importance of communication in the power sector, emphasizing that as the industry moves towards higher levels of automation, reliability and security, the demand for reliable communication services continues to increase. He stressed that the overall resilience and facilities within the power sector heavily rely on an effective and secure communication system.

Emphasizing on the forum's purpose, he mentioned that it was established four years ago specifically for monthly outage planning of communication system and to address the communication-related issues. He acknowledged the contributions of many individuals had played pivotal roles in formulating procedures for outages and developing necessary formats.

Further, he outlined the agenda for the meeting and requested PGCIL, CTUIL and other participants to focus on outage coordination and the ongoing communication issues. The planning issues for new communication requirements could be addressed in the Communication Planning Meetings of CTUIL. The primary focus of the COM SR forum remains on managing communication outage procedures and addressing regular communication challenges.

Shri Meka Ramakrishna, Superintending Engineer (P, C & SS), SRPC welcomed all participants to the meeting. It was noted that this meeting marks four years since the inception of the COM SR meetings, which have been conducted in compliance with CEA and CERC Regulations. While highlighting the significance of this milestone, he mentioned the Regulatory provisions under which these meetings are conducted as per Regulation 10 of the CEA Technical Standards for Communication Systems in Power

System Operations Regulations, 2020, notified on February 27, 2020, it is stated that monthly outages shall be planned and approved by the owner of the communication equipment in the concerned Regional Power Committee as per the detailed procedure finalized by the RPC. Additionally, as per Regulation 7.3 of the CEA Communication Regulations, 2017, the RPC secretariat is responsible for outage planning for the communication system in its region. Based on these provisions, a procedure for outage coordination and planning of the communication system was finalized by SRPC, and these meetings have been conducted accordingly. The primary purpose of these COM SR meetings is to facilitate outage planning and coordination of communication systems. Furthermore, as per Regulation 7.3(4) of the CERC Communication Regulations, the RPC secretariat is assigned task of monitoring the instances of non-compliance of the Regulations by the entities. Hence the instances of non-compliances reported by SRLDC as well as other entities and observed by SRPC Secretariat are regularly deliberated in regular COM SR meetings. For the past four years, these meetings have been consistently conducted on a monthly basis, coordinating the planning of communication system outages and discussing other non-compliance issues.

He informed that SRLDC has recently submitted operational feedback on communication systems for ISTS for the quarter April to June 2024. In line with Regulation 7.5 of the CERC Communication Regulations, 2017, the feedback should be considered by the CTUIL/concerned entities while planning the ISTS communication system. The operational feedback has highlighted issues with SR ISTS communication systems. According to the CERC Regulations 2017, CTU is the nodal agency for planning and coordinating the development of communication systems for of Interstate transmission of electricity. As per the planning procedure established by CTUIL, the planning of ISTS communication systems is categorized into two areas: new ISTS system communication planning and issues with existing ISTS communication systems. This includes planning for missing links, redundancy, system strengthening, capacity upgrades, equipment life cycle completion, and standalone projects like cybersecurity and UNMS. The planning process involves reviewing communication systems twice in a year with specified timelines. CTU shall take up and discuss the system upgrades, system strengthening, completion of the communication system's life, and cybersecurity aspects in the planning meetings, which should be conducted in a time-bound manner. CTUIL has submitted several agenda items for this meeting, mostly related to planning aspects, which will be deliberated, and technical feedback if any, may be provided for further discussion in CPM

meetings.

He further informed that after the last meeting, a procedure to identify network changes in remote stations and reporting to LDC was finalized. This procedure was established in response to issues being caused in the SR communication systems due to changes in network at remote ends. The procedure was finalized in consultation with all stakeholders in a special meeting held on 11.07.2024. If there are any further inputs from the entities, the same may be discussed and procedure can be refined. SRLDC has held a meeting on 26th July 2024 with all ISGS and RE entities regarding dual channel availability to the BCC and MCC. This was based on a decision made in earlier COM SR meetings to review the availability of these links. The meeting aimed to update the status of these links as required.

Shri T R Ganesh, CGM, SRLDC welcomed all to this physical meeting. He stated that physical meetings are preferable because they help us to know each other better and understand issues more thoroughly, which in turn enables to resolve it in a coordinated way. As mentioned earlier by Member Secretary, SPRC, with the increasing automation in the system, decisions are expected to be made by automated systems. In future, more advanced SCADA systems will be in place with enhanced automation features, including deviation settlement and AGC. However, these systems will not function effectively unless there is a robust communication system that ensures uninterrupted availability of accurate data to the control centre. Regardless of any reforms, regulatory changes, or new hardware and software, the effectiveness of these systems depends on the continuous availability of accurate data to the control centre. The importance of communication cannot be overstated, as even a single missing critical data point can affect computations. Just as the strength of a chain depends on its weakest link, every piece of data connected to the grid is crucial. All data is used in computations to make decisions based on collective information. Therefore, all must work together to ensure that data from all critical and important stations continuously reaches the control centre**.**

Shri M.K Ramesh, CGM, SRLDC extended warm welcome to all participants to the 48th COM SR meeting. Based on the current Grid condition, our visibility for improvement from a grid operation perspective is still lacking. In some states, the availability of real-time data is very limited. While they receive data through ICCP, there are numerous issues related to this. Always need to ensure that all forecasting and demand data, which are crucial for efficient grid operation, are made available and the data should be accurate. The support of the entire team is essential to enhance grid operations, as all decisions depend on this data. Over the past four years, SR

Constituents has made significant progress, as mandated by CERC Regulations. However, reports indicate that in some areas, voice and data availability remain inadequate. For example, with an installed RE capacity of around 8,900 MW, data availability is only about 5,000 MW. Data availability is crucial, and there might be internal departmental issues affecting communication between operators and SCADA/communication teams. Despite ongoing efforts, gaps remain, as operators are reporting that they are not receiving data as expected. Continual support is vital for effective decision-making and efficient grid operation.

2. Confirmation of Minutes of 47th COM-SR meeting

Minutes of the 47th meeting of "SR Communication System" (COM SR – Outage July, 2024) held on 24th June, 2024 through VC was issued vide letter No: SRPC/SE (P, C &SS)/ COMSR/47/2024/ 3273-30 dated 03.07.2024.

CTUIL informed that in the Minutes of 47th COMSR meeting, the following has been recorded under Item No.13:

(i) SRLDC was requested to consolidate all stations, including RE and ISGS stations not reporting in 2+2 configurations, and submit the list to CTUIL. SRLDC was advised to collect both Gateway and FOTE data comprehensively.

CTUIL further informed that the CTU has to plan the communication requirement only up to ISTS Pooling station and integration of data from REGs, ISTS entities etc needs to be ensured by respective REG/entity only. On submission of list by SRLDC to CTUIL, no action can be initiated by CTUIL as the same is not the CTU's purview. The responsibility lies with the respective entities.

It was noted that in the 47th COMSR meeting, CTUIL had stated to furnish the details collected by SRLDC to them and accordingly the same was recorded in the minutes. In the earlier meetings, it had been recorded that the jurisdiction of CTUIL lies only up to ULDC/ISTS stations. The data pertains to existing REGs/ISTS entities needs to be integrated at the nearest available ULDC/ISTS station by the respective REGs/entities only. As deliberated in the earlier COMSR meetings, the matter regarding dual channel availability to the BCC and MCC has been taken up by SRLDC during the meeting with all ISGS and RE entities on 26th July 2024.

SRLDC informed that the list has been published along with the Operational Feedback report submitted to CTUIL.

It was noted that CTUIL may use the details (furnished by SRLDC) as relevant/applicable to them.

Further CTUIL was requested to include the requirements for all new upcoming RE plants. CTUIL confirmed that the same would be ensured. CTUIL informed that regarding radially connected stations (as no feasibility of path redundancy), the matter has been taken up with CEA.

After deliberation, the Minutes of the 47th COMSR meeting were confirmed with the above observations.

3. Outage coordination of communication Links and equipment

3.1 Proposed Communication Links & Equipment outages for the month of August 2024

(i) The window for the outage proposals in respect of communication links and equipment to avail during the month of **August 2024** was opened by SRPC through the **"Communication Outage Coordination Portal"** for the submission of their outage proposals by 12.07.2024.

(ii) The consolidated list of outages of communication links and equipment proposed for the 48th meeting of "SR Communication System" (COM SR – Outage August 2024) has been circulated vide e-mail dated 16.07.2024 (**Annexure - 3.1**)

(iii) It was observed that the following entities have not proposed any outages of communication links / equipment for the month of August 2024:

- **APTRANSCO**
- **PGCIL SR II**

Deliberation:

a) SRLDC enquired with PGCIL SR-I that in the outage proposal of '*Tejas SDH TJ1400 STM16 equipment outage at Khammam PG and Ghanapur PG*' whether SDH will be in service. PGCIL SR-I confirmed that SDH will be in service and maintenance will be done on live. It was also enquired with KSEBL for SDH TJ1400 Equipment outage at Edappon whether alternate path is available. KSEBL confirmed that alternate path is available through Thiruvanathapuram - Pothencode KSEBL- Pothencode PGCIL- Cochin PGCIL - Kalamassery KSEBL.

b) APTRANSCO and PGCIL SR-II confirmed that no outages are planned for the month of August 2024.

- ***Forum approved the list of proposed outages of communication links and equipment for the month of August 2024.***
- ***All the SR Communication entities to avail the Outages of Communication links & equipment as per the SRPC approved procedure only and avoid availing the outages under Emergency as far as possible.***

- ***All the SR Communication entities to furnish the maintenance details/outage proposals in the Outage web portal even though it will not require any shutdown/will be carried out online.***

3.2 Assessment of availed outage duration of Communication links and equipment on monthly & rolling 12 months basis

(i) The Regulation 7 of Central Electricity Authority (Technical Standards for Communication System in Power System Operations) Regulations, 2020 envisages the following:

> *"Reliability. (1) Total outage period shall be less than* ***sixteen hours on monthly basis*** *each for interface node, wideband node and communication network.*
>
> *(2) The total outages in a rolling twelve months assessment period* ***shall be less than forty-eight hours****.*
>
> ……"

(ii) Details of outage duration (Planned/Forced/Emergency) of all Communication links & equipment in the month of June 2024 is at **Annexure-3.2a.**

(iii) Following are the communication links and equipment down for equal to more than 16 hours in the month of June 2024:

Communication Links:

Description of Link	Source	Destination	Channel Routing	Ownership	Reason for availing outage with the details of equipment attended	Outage availed Start Date: Time	Outage availed End Date: Time	Total hours of outage availed now	Outage Type
Name of Requesting Agency: TANTRANSCO									
(MCC-Remote Console Main Protection)	Sub-LDC/Erode	Chennai	Erode-Salem230-Myvadi230-Madurai400-Madurai230-Trichy-Sriperampudur-Chennai	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Data (MCC-Remote Console standby)	Sub-LDC/Erode	Chennai	Erode-Salem230-Myvadi230-Madurai400-Madurai230-Trichy-Sriperampudur-Chennai	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
(MCC-Remote Console Standby Protection)	Sub-LDC/Erode	Chennai	Erode-Salem230-Myvadi230-Madurai400-Madurai230-trichy-Sriperampudur-Chennai	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
(Erode DCPC-standby)	Sub-LDC/Erode	Chennai	Erode-Salem230-Myvadi230-Madurai400-Madurai230-Trichy-Sriperampudur-Chennai	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**

(Erode DCPC-standby)	Sub-LDC/Erode	Madurai	Erode-Salem230-Myvadi230-Madurai400-Madurai	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Data (Video conferencing) : Main	Sub-LDC/Erode	Chennai	Erode-Salem230-Madurai400-Madurai230-Trichy-Sriperampudur-chennai	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Data (TEJAS OLTE NMS Client)	Sub-LDC/Erode	Chennai	Erode-Salem230-Myvadi230-Madurai400-Madurai230-Trichy-Sriperampudur-Chennai	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Data (TEJAS OLTE NMS Client)	Sub-LDC/Erode	Chennai	Alternate Route provided for main channel , This standby channel do not have alternate route	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Data (DREL client server)	Sub-LDC/Erode	Chennai	Erode-Salem230-Myvadi230-Madurai400-Madurai230-Trichy-Sriperampudur-chennai	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Voice and Data (Main Control Center (MCC) data and Voice)	SALEM 400 kV SS	SLDC CHENNAI	Salem400-Salem230-Myvadi230-Madurai400-Madurai230-Trichy-Sriperampudur-Chennai	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Voice and Data (Main Control Center (MCC) data and Voice)	ARASUR 230 kV SS	SLDC CHENNAI	Arasur230-Arasur400-Myvadi230-Madurai400-madurai230-Trichy-Sriperampudur-Chennai	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Voice and Data (Main Control Center (MCC) data and Voice)	MEYVADI 400/ 230 kV SS	SLDC CHENNAI	Myvadi230-Madurai400-madurai230-Trichy-sriperampudur-chennai	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Voice and Data (Main Control Center (MCC) data and Voice)	METTUR TPS (Stg 3)	SLDC CHENNAI	Mettur TPS-Palavady400-Thiruvalam400-Alamathy-SVC-Sriperampudur-Chennai	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Myvadi DTPC Link	MYVADI 230 kV SS	Salem 400	Myvadi-Salem230-Salem400	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Voice& Protection (Trichy dial voice communication & SPS signals)	Sub-LDC/Erode	Trichy(E1)	Erode-Salem230-Myvadi230-Madurai400-madurai230-Trichy230	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**

Voice& Protection (Madurai Lift & Talk & SPS signals)	Sub-LDC/Erode	Madurai(E1)	Erode-Salem230-Myvadi230-Madurai400-madurai230	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Protection (TK3 SPS Signal)	Sriperumbudur	Kolar	Salem230-Erode-Salem230-Myvadi230-Madurai400-madurai230-Trichy230-Sriperampudur	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Protection (RS1 & KK2 SPS Trip signal)	Trichy 230KV SS	Kolar	SalemPG-Salem230-Erode-Salem230-Myvadi230-Madurai400-madurai230-Trichy230	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Protection (RS1 ,RS3 & KK2 SPS Trip signal)	Thiruvarur 230KV SS	Kolar	SalemPG-Salem230-Erode-Salem230--Myvadi230-Madurai400-madurai230-Trichy230-Alandur230-Tanjore230-Thiruvarur	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Protection (RS1& TK2 SPS Trip signals)	Madurai 230KV SS	Kolar	SalemPG-salem230-Erode-Salem230-Myvadi230-Madurai400-madurai230	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Protection (SPDR Dip 5000 DTPC)	SRIPERUMBUDUR 400 kV SS	Salem 400	Salem400-Salem230-Erode-Salem230-Myvadi230-Madurai400-madurai230-Trichy230-Sriperampudur	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Protection (Thiruvarur Dip 5000 DTPC)	THIRUVARUR 230 kV SS	Salem 400	Salem400-Salem230-Erode-Salem230-Myvadi230-Madurai400-madurai230-Trichy230-Alandur-tanjavur-Tiruvarur	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Protection (RS1 SPS TRIP for Echangadu - 110 kV Pennadam Load)	TRICHY 230 kV SS	Salem 400	Salem400-Salem230-Erode-Salem230-Myvadi230-Madurai400-madurai230-Trichy230	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
(URTDSM Alamathy PMU)	CHENNAI	SALEM 400 - Bangalore	CHI-SPDR-Trichy-Alundur-Trichy400-Nagai-Dharmapuri-Salem400	TANTRANSCO,PGCIL SR 2,PGCIL, PGCIL SR 1	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
PGCIL EPAX E1 (PGCIL EPAX voice)	CHENNAI	Salem 400	CHI-SPDR-Trichy-Alundur-Trichy400-Nagai-Dharmapuri-Salem400	TANTRANSCO,PGCIL SR 2,PGCIL, PGCIL SR 1	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**

Bangalore ICCP Prtn (Bangalore ICCP Prtn)	CHENNAI	Bangalore	CHI-SPDR-Trichy-Alundur-Trichy400-Nagai-Dharmapuri-Salem400	TANTRANSCO,PGCIL SR 2,PGCIL, PGCIL SR 1	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:35	29-Jun-2024 17:00	246:25	**Planned**
Voice & Data : Main Control Center (MCC)	ERODE 230 kV SS	SLDC CHENNAI	Erode-Salem230-Myvadi230-Madurai400-Madurai230-Trichy-Sriperampudur-Chennai	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:36	29-Jun-2024 17:00	246:24	**Planned**
Data (MCC-Remote Console Main)	Sub-LDC/Erode	Chennai	Erode-Salem230-Myvadi230-Madurai400-Madurai230-Trichy-sriperampudur-Chennai	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:36	29-Jun-2024 17:00	246:24	**Planned**
Voice& Protection (Chennai dial 1& 2 , Chennai Lift & Talk , SPS signals)	Sub-LDC/Erode	Chennai(E1)	Erode-Salem230-Myvadi230-Madurai400-madurai230-Trichy230-Sriperampudur-chennai	TANTRANSCO	Replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder	19-Jun-2024 10:36	29-Jun-2024 17:00	246:24	**Planned**

Deliberation:

1. TANTRANSCO stated that they have planned for replacement of old 24F OPGW by New 48F OPGW in Pugalur-Erode 110 kV feeder, due to which outage occurred.
2. SE (P, C &SS), SRPC stated that as per regulations *Total outage period shall be less than sixteen hours on monthly basis each for interface node, wideband node and communication network.* He requested TANTRANSCO to ensure the same as per regulation. The same was agreed by TANTRANSCO.

- ***All entities to ensure the compliance of total outage period on monthly basis in accordance with the Central Electricity Authority (Technical Standards for Communication System in Power System Operations) Regulations, 2020.***

- **Communication Equipment: Nil**

(iv) Details of month wise outage duration (Planned/Forced/Emergency) of all Communication links & equipment during the last 12 months (July 2023 – June 2024) on rolling basis are at **Annexure-3.2b.**

(v) The list of communication links and equipment down for the last 12 months (July 2023 – June 2024) with more than 48 hours is as below for the measures to be taken in future for the better outage management.

- Two communication links (VOIP (E1), Type: VOICE-SRLDC & voice & data at 132kV Kodada SS) pertain to TSTRANSCO. *-Deliberated in 37th COMSR meeting (24.08.2023) and 39th COMSR meeting (18.10.2023).*

- Two communication equipment ((Tejas SDH TJ1400 STM4 at Kalpakkam SS & PDH Valiant VCLMX Cochin PG PDH2 at Cochin PG) pertains to PGCIL SR-II
  -Deliberated in 43rd COMSR meeting (22.02.2024).
- One communication link(Bangalore REMC ICCP (Bangalore ICCP)- Chennai to Bangalore)) pertains to TANTRANSCO
  -Deliberated in 43rd COMSR meeting (22.02.2024)
- One communication link (Voice &Protection channel between SSLM RB & Dindi) pertains to APTRANSCO
  -Deliberated in 44th COMSR meeting (21.03.2024).
- Six communication equipment (48V DC Battery & 48V DC Charger) Pertains to TSTRANSCO
  -Deliberated in 45th COMSR meeting (22.04.2024).
- 16 communication links pertain to TANTRANSCO (prolonged outage was to carry out for replacement of OPGW fibre works)
  -Deliberated in 46th COMSR meeting (22.05.2024)
- One communication link (RTU Data: Coastal (main) RTU - SRLDC-DCPC (Data & Voice)) pertains to PGCIL SR-2

  -Deliberated in 47th COMSR meeting (24.06.2024).
- **Communication Links for deliberation:**

Owner/ User	Description of Link /Channel	Source Station	Destination Station	Channel Routing	Ownership	Forced (F)/ Planned(P)	Total OutageOn Rolling basis
1. Communication Links/equipment which were more than 48 hours on 12 month rolling basis are same as in 3.2(iii). 2. It was noted that as per the Regulations, the total outages in a rolling twelve months assessment period shall be less than forty-eight hours hence all the entities are requested to comply the Regulations. ***All entities to ensure the compliance of total outage period on monthly and 12 monthly rolling basis in accordance with the Central Electricity Authority (Technical Standards for Communication System in Power System Operations) Regulations, 2020.***							

4. Review of major outage of communication Link / Equipment availed during June 2024

4.1 Communication Outage Deviation Report for the month of June 2024

The Outage Deviation Report for the month of **June 2024** for approved Links

/ Equipment is at **Annexure - 4.1.**

Action Required:

(i) All the Entities - to adhere to the approved planned schedule of outage of communication links and equipment without deviation.

(ii) All the Entities - to submit the details of Planned / Forced / Emergency outages availed every month without fail by 12th of every month in respect of proceeding month.

- ***All SR communication entities to adhere to the above***

4.2 Communication links and equipment approved Vs availed during the month of June 2024

(i) The abstract on the planned outages of communication equipment approved Vs availed, unplanned outages & forced outages for the month of June 2024 are given as below**:**

Abstract on the outages of communication links and equipment availed Approved Vs Availed & Unplanned outages													
Entity	Approved Links			Approved Equipment			Links & Equipment Approved			No of planned outages not proposed in COMSR		No of Forced Outages	
	Nos approved	Nos availed	% Availed	Nos approved	Nos availed	% Availed	Total Approved	Total Availed	Total % availed	Links	Equipment	Links	Equipment
PGCIL SR 1	0	0	0	3	3	100	3	3	100	0	0	0	0
PGCIL SR 2	0	0	0	0	0	0			No Outage	0	0	0	3
APTRANSCO	0	0	0	0	0	0			No Outage	0	0	0	0
KPTCL	30	30	100	0	0	0	30	30	100	0	0	0	0
KSEBL	0	0	0	45	45	100	45	45	100	0	0	0	0
TANTRANSCO	52	52	100	0	0	0	52	52	100	0	0	0	1
TGTRANSCO	0	0	0	75	75	100	75	75	100	0	0	0	0
PED, Puducherry	2	2	100	1	1	100	3	3	100	0	0	0	0
Total	84	84	100	124	124	100	208	208	100	0	0	0	4

(ii) The following were observed from the above table**:**

(i) APTRANSCO, TGTRANSCO, KSEBL, PGCIL SR-I & PGCIL SR-II had not planned any outage of communication links.

(ii) KPTCL, TANTRANSCO, APTRANSCO & PGCIL SR-II had not planned any outage of communication equipment.

(iii) TANTRANSCO, PED & KPTCL has availed 100% of their planned outages for the links during **June 2024.** PGCIL SR-I, KSEBL, TGTRANSCO & PED had availed 100% of their planned outages

for the equipment during **June 2024**.

(iv) PGCIL SR-2 & TANTRANSCO has availed the following Forced outages (3 links & 1 links respectively) during the month of June 2024:

Communication Equipment:

Name of Requesting Agency	Name of the communication equipment	Location of the Equipment / Name of Station	Alternate Channel/Path available	Reason
TANTRANSCO	SDH, ABB, FOX 515T, with Fibre directions to Jambunathapuram & Perambalur	Trichy 230 kV SS	CHI-SPDR-Trichy-Alundur-Trichy4-Nagai-Dharmapuri-Salem400	OLTE at Trichy hanging over towards Sriperumbudur direction. After OLTE normalized.
Deliberation: TANTRANSCO stated that OLTE module got hanged at Trichy towards Sriperumbudur direction. After rebooting, the OLTE got normalized.				
PGCIL SR II	Tejas SDH TJ1400 STM16 SRLDC2	SRLDC	Standby card	SDH control card hardware issue
Deliberation: PGCIL SR-II stated that at SRLDC, control card has failed. The same has been replaced.				
PGCIL SR II	Tejas SDH TJ1400 STM16	Tuticorin PS	Tuticorin - Madurai-SRLDC	master card faulty - data affected while replacement of card
Deliberation: PGCIL SR-II stated that there was an issue with master control card and while replacing it, the system got rebooted.				
PGCIL SR II	Tejas SDH TJ1400 STM16	Salem 400kV PG	Salem DCPC-2	CEF card faulty
Deliberation: PGCIL SR-II stated that CEF card faulty and it has been replaced.				

5. New Communication Links & Equipment commissioned and inclusion in the portal

(i) All the entities are requested to include all the Communication Links & Equipment to the SR Communication Outage Portal and furnish the same to SRLDC/SRPC.

(ii) All the entities to report the new Communication Links & Equipment

commissioned during the previous month to SRLDC/SRPC by 10th of subsequent month and the same may be added in the Equipment/Link database of web portal.

(iii) In case of any issue related to web portal, the users may inform the same via mail at srldcscada@grid-india.in or over phone to:

- ☛ Smt. Vijitha K, Chief Manager ☎: 94808 11824
- ☛ Shri. L Sharath Chand, Chief Manager ☎: 94808 11821

Deliberation

a) SRPC enquired with SRLDC about the addition of any new links or equipment in July 2024. SRLDC confirmed that at 765kV Ariyalur and North Chennai Pooling stations of TANTRANSCO, the following additions have been made:

- **Battery**
- **Battery Charger**
- **SDH Equipment**

Entities to report the new Communication Links & Equipment commissioned during the previous month to SRLDC by 10th of subsequent month and the same may be added in the Equipment/Link database of web portal.

6. Procedure on Identification of Network changes at Remote Stations

(i) In view of communication failures to SRLDC REMC due to changes in the network connectivity/configurations at remote stations, in the 44th & 45th COMSR Meetings SRLDC was requested to prepare a draft procedure to identify network changes between Remote station and LDC communication in IEC 104 RTU data and reporting of further changes to respective LDCs in Network connectivity at Remote Station. SRLDC was also recommended to prepare a draft format of undertaking in this regard.

(ii) In the 46th COMSR meeting held on 22.05.2024, SRLDC had furnished the draft methodology/procedure to identify the network Issues in Remote Station to LDC communication IEC 104 RTU data & reporting network Connectivity changes along with the Undertaking format. SLDCs and SR entities were requested to furnish their inputs on the draft Procedure and draft Undertaking.

(iii) APSLDC, KPTCL, TGSLDC, PGCIL, TANTRANSCO, KSEBL & PED have furnished the inputs/comments on the above.

(iv) As decided in the 47th COMSR meeting 24.06.2024, Special Meeting for

finalization of Procedure to identify the network Changes in Remote Station to LDC communication IEC 104 RTU was held on 11.07.2024(MoM is awaited) wherein the Procedure has been finalized and TANTRANSCO, TGSLDC & PGCIL had agreed to furnish the details as discussed in the meeting. After receipt of the same, Finalized Procedures would be circulated among the entities.

(v) Subsequently, after incorporating the inputs received form the entities, minutes of the special meeting held on 11.07.2024 along with the finalized *procedure to identify network changes between Remote station and LDC communication in IEC 104 RTU data and reporting of further changes to respective LDCs in Network connectivity at Remote Station* have been circulated among the entities vide SRPC email dated 19.07.2024. Copy is at **Annexure-6a**.

Deliberation:

a) SRPC informed that the agenda regarding identifying network issues between remote stations and LDC communication, specifically for RTU data and reporting changes in network connectivity at remote stations, had been discussed in the 44th and 45th COM SR meetings. SRLDC was requested to furnish a draft procedure in this regard. The draft procedure was presented during the 46th COM SR meeting and sought the inputs from all entities in this regard.

b) It was noted that after receipt of inputs from all entities, a special meeting was convened on 11th July, 2024, as decided in the 47th COM SR meeting. TANTRANSCO and TGSLDC had furnished further inputs subsequently as agreed in the meeting. However, PGCIL/ULDC was to furnish the various testing procedures being carried out before & after commissioning as per the meeting deliberation, but PGCIL/ULDC had communicated that the procedure has already discussed during the meeting and hence the same procedure may be considered from POWERGRID. The finalized procedure was circulated, incorporating all information, views and comments, including those from the special meeting. Since no additional comments were received during this meeting, it was agreed that there were no further issues, and the procedure was finalized. Entities were requested to adhere to the finalized procedure to avoid network issues, particularly those related to IP changes, which could result in communication system outages.

c) SE (P, C & SS), SRPC highlighted that the goal of implementing this procedure is to reduce instances of network issues. All entities, especially IPPs and RE entities, were urged to comply with the procedure. The

finalized procedure will be circulated among all RE entities to ensure widespread adherence. The Procedure *to identify network changes between Remote station and LDC communication in IEC 104 RTU data and reporting of further changes to respective LDCs in Network connectivity at Remote Station* is at **Annexure-6b**. Regarding under taking format circulated along with the draft procedures, SRLDC may finalize the Undertaking format on Cyber Security considering the prevailing guidelines and regulations.

d) MS, SRPC requested SRLDC to circulate the Procedure to all ISTS entities including RE entities and to be insisted to follow the Procedure.

- ***All SR entities to adhere the Procedure to identify network changes between Remote station and LDC communication in IEC 104 RTU data and reporting of further changes to respective LDCs in Network connectivity at Remote Station.***

7. Guidelines on Availability of Communication System

(i) CERC vide order dated 19.01.2024 had approved the "Guidelines on Availability of Communication System" under the Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017.

(ii) In the earlier COMSR meetings, CTUIL was recommended to finalize the communication channels in consultation with Grid-India and bring out the methodology to proceed further for certification of communication availability by SRPC.

(iii) In line with the CERC approved Guidelines on Availability of Communication System, SRPC vide email dated 05.03.2024 has prepared a format for submission of availability reports of configured channel including the redundant channels by CTU. In the email, CTU was requested to submit the details of communication channels including the redundant channels and the performance/availability of configured channels of the previous month to SRLDC for verification by SRLDC and onward submission to SRPC for computation of availability of the communication system in the given format for previous month in line with CERC (Communication System for inter-State transmission of Electricity), Regulations, 2017.

(iv) In the earlier COMSR meetings, the following were deliberated/noted:

a) CTUIL was requested to take appropriate action in order to comply with the CERC Communication Regulations and the CERC Guidelines on Availability of Communication Systems and enable SRPC secretariat to

certify the Availability of Communication Channels. In case CTU has issues in complying the Regulations, CTUIL may seek clarification from CERC.

b) Forum had noted the non-compliance of CERC Regulations on the part of CTUIL by not furnishing the relevant data for the issuance of the availability certification of the communication system.

c) CTUIL had stated that a meeting was held with CERC on 20th May 2024 and the matter had been taken up. Subsequently, agenda has been shared with NPC too.

(v) In 47th COMSR meeting held on 24.06.2024, the following were deliberated/noted:

a) **SRLDC:** PGCIL and all other transmission licensees need to forward the details to CTUIL and CTUIL shall furnish the same to SRLDC. SRLDC would verify the data before furnishing to SRPC. ULDC data (configured channels) needs to be furnished by CTUIL in coordination with all the transmission licensees, in order to commence the availability certification process during interim period, i.e. till commissioning of UNMS. Channel requirement will be shared with CTUIL, the details of channels which are in operation need to be furnished by CTUIL.

b) **SRPC Secretariat:** CTUIL, SRLDC and PGCIL were requested to follow the Availability Guidelines notified by CERC. CTUIL needs to take care of other transmission licensees too.

c) **CTUIL:** The matter needs to be clarified by CERC. UNMS works have been awarded to POWERGRID. All the aspects in this matter will get cleared once CERC clarifies through an Order.

d) Forum noted that a meeting may be convened by CTUIL to finalize the list of communication channels for which availability certification to be issued and in the meanwhile existing configured channel data channel may be given.

(vi) SRLDC vide letter dated 04.07.2024 **(Annexure-7a)** had taken up with CTUIL to furnish the communication channel availability data in the prescribed format to SRLDC using the call logging facility with timestamps until the centralized NMS is operational. It was also requested to coordinate with all relevant entities as outlined in clause 3.3 of the guidelines. CTUIL vide letter dated 18.07.2024 **(Annexure-7b)** had replied to above SRLDC letter.

(vii) Subsequently, SRLDC vide letter dated 25.07.2024 (**Annexure-7c**) has replied to CTUIL letter.

Deliberation:

a) SRLDC informed that they have replied to CTUIL letter dated 18.07.2024 vide their letter dated 25.07.2024 and CTUIL was again requested for the submission of the necessary details in the SRPC devised format to SRLDC in line with the Guidelines on Communication availability.

b) CTUIL informed that they have been following it up with CERC in this matter. They are planning for filing a petition with CERC for resolution of the matter.

CTUIL added that the procedure mentioned in centralized supervision for quick fault detection is depicted below under (8) Procedure for Centralized Supervision, Monitoring and Fault Reporting of Communication System:

8.2 "NLDC, RLDC & SLDC in coordination with NMT of CTU shall integrate & supervise the communication systems of ISTS, ISGS, IPP, STU, etc. for monitoring, supervision & control of Power System and adequate data availability in real time. Further RLDCs shall collect and furnish data related to communication system of various users, ISTS, ISGS, IPP, STU, SLDC, RLDC to RPCs for certifying availability of ISTS Communication System on monthly basis. RLDCs & SLDCs shall provide operational feedback to CTU & STU on quarterly basis or as applicable"

CTUIL reiterated that evidently, there is contradiction between the referred CERC Guidelines and Procedure regarding the entity responsible for making the communication system data available for certification.

c) Forum noted the Non-compliance of the CERC Communication Regulations as the certification of availability of communication channels is not being carried out in the absence of the data from CTUIL & SRLDC.

d) SE (P, C &SS) stated that, in order to comply the Regulations, Communication channel availability data shall be furnished to SRPC Secretariat for the availability certification until the clarification/Order from CERC is received.

e) SRLDC reiterated that the present ULDC data (configured channels) needs to be furnished by CTUIL in coordination with all the transmission licensees, in order to commence the availability certification process during interim period, i.e. till commissioning of UNMS.

f) SRLDC highlighted that earlier CTUIL has informed that till UNMS is commissioned they will collect data from PGCIL from existing NMS and furnish the data to RLDC. Further it was mentioned that due to non-receipt of data from CTUIL, they are unable to send the Availability reports to RPC.

g) On enquiry from MS, SRPC regarding the updates/developments in this regard, CTUIL replied that they will proceed by filing a petition before the Commission.

8. SCADA displays of SR Islanding schemes

(i) As per the Standard operating Procedure (SoP) issued by MoP/CEA, SRLDC and SLDC need to monitor the generation, load and other vital parameters in the Electrical Islands on real-time basis. In the Review Meetings of the SR Islanding Schemes, it was decided that the Island SCADA displays shall be monitored by respective SLDCs and SRLDC in real time and their observations on Island LGB along with the data shall be furnished to SRPC. The same will be reviewed/deliberated in the monthly PCSC meetings. SRLDC shall bring out the issues, if any, regarding Island SCADA display to the monthly COM-SR meetings for resolution.

(ii) As per the deliberations in 43rd COMSR meeting, validation of surviving generation, load, UFR and df/dt loads in each islanding scheme to be carried out for every quarter.

(iii) A special meeting was conducted on 14.06.2024 with all SLDCs, SCADA teams of SLDCs and TRANSCOs and SRLDC to discuss on the issues and action plan to make the proper data availability at Island SCADA displays. In the meeting, the following were recommended:

a) APSLDC/APTRANSCO to expedite the process (RTU procurement etc.) for 100% mapping of the Island feeders to Island SCADA displays of Vijayawada & Vishakhapatnam IS.

b) TGSLDC/TGTRANSCO to expedite the process (RTU procurement etc.) for 100% mapping of the Island feeders to Island SCADA display of Hyderabad IS.

c) APSLDC, KARSLDC, KSEBL, TNSLDC, TGSLDC, PED & SRLDC to update the SCADA display as per the final reviewed document along with the revised Island peripheral lines.

d) APSLDC, KARSLDC, KSEBL, TNSLDC, TGSLDC, PED & SRLDC to coordinate for updating of the Island peripheral feeders at SRLDC SCADA display.

e) APSLDC, KARSLDC, KSEBL, TNSLDC, TGSLDC, PED & SRLDC to monitor the Vital Parameters of the Island in real time as per the SoP. If any discrepancies observed in the SCADA data in real time, SLDC and SRLDC to resolve the same in coordination.

f) APSLDC, KARSLDC, KSEBL, TNSLDC, TGSLDC, PED & SRLDC to store the SCADA display data/Island data at SLDC.

(iv) SLDCs and SRLDC were requested to make the proper data available at Island SCADA displays and comply the recommendation agreed during the special meeting.

Deliberation:

a) As per the recommendations of the 46th COMSR meeting, SRPC requested SRLDC to display the current SCADA display of the Islanding page. SRLDC presented the current snapshot of all the IS (Islanding Schemes) in the Southern Region.

Islanding Snapshot : 29-07-2024

ISLANDING SCHEMES IN SR

Name of Island	State(s) Involved	NET GEN	NET LOAD	UFR-1	UFR-2	UFR-3	UFR-4	SOLAR	WIND	LIS	DFDT-1	DFDT-2
HYDERABAD IS	Telangana	3283	1519	182	288	223	367	372	84	1330	401	364
CHENNAI IS	Tamilnadu	2612	2598	98	190	85	117		—	—	55	21
NEYVELI IS	Tamilnadu	4313	2570	347	219	259	443	0	1514	—	155	396
	Kerala	—	291	—	21	37	—	—	—	—	41	41
	Puducherry	—	377	78 *	—	—	—	—	—	—	—	—
KUDANKULAM IS	Tamilnadu	3900	3303	653 *	—	—	—	1108	3585	—	—	—
	Kerala	896	1322	236	35	128	51	—	—		70	28
VISHAKAPATNAM IS	Andhra Pradesh	2025	2362	104	183	82	145	9	—	68	122	123
VIJAYWADA IS	Andhra Pradesh	1674	1522	107	94	31	142	7	—	0	—	—
BANGALORE IS	Karnataka	2186	3367	337	231	213	89	—	—	—	337	252

* Total AUFR point mapped instead of individual stages

Display Updated as on 02-05-2024

29-Jul-2024 09:32:14

b) SE (P,C&SS), SRPC enquired if there were any discrepancies in the Islanding data reporting at SRLDC SCADA display. SRLDC confirmed that all systems are currently reporting correctly.

c) For Hyderabad Islanding Scheme, TGTRANSCO stated that the RTU upgradation would be completed within 2-3 months, resulting in increased SCADA visibility.

d) MS, SRPC enquired about the set points for Lift Irrigation Substations (LIS) loads. TGTRANSCO mentioned that they would check and provide an update. MS, SRPC emphasized that LIS loads should be tripped before the UFR stage-1 tripping. The same will be ensured by TGTRANSCO.

e) SRLDC reported that updated displays from all entities have been

requested and received the updates from all except TANTRANSCO for Neyveli and Kudankulam. TANTRANSCO assured that they would share the data soon.

f) SE (P, C & SS), SRPC enquired about the reason for low generation in Bengaluru IS as observed in the SCADA snapshot of 29th July 2024 (shown above). SRLDC explained that this might be due to the current ramping down of hydro generation in Sharavathy.

g) MS, SRPC enquired about the present capacity of Talcher-Kolar. PGCIL SR-II replied that the capacity had been enhanced to 2000 MW from earlier 1700 MW with effect from 3rd July 2024.

h) MS, SRPC requested all SLDCs and SRLDC to ensure that proper data is made available on the Island SCADA displays since it is being monitored by MoP/CEA. All vital parameters need to be examined by respective SLDCs and SRLDC.

- ***Respective SLDCs and SRLDC to adhere the recommendations finalized in the special meeting held on 14.06.2024.***
- ***All SLDCs and State SCADA wings to validate the summation nodes considered to arrive the net load and generation data i.r.o Islanding Schemes.***
- ***SRLDC to present the screenshot of SR Islanding Scheme data on the date of the COMSR meeting.***

9. Communication Audit of Sub stations for FY 2023-24

(i) As per clause 10 of the Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017, RPC shall conduct annual audit of the communication system as per the procedure finalized in the forum of the concerned RPC.

(ii) Communication Audit for 12 No. of Substations had been carried out during the period of February-March 2024.

(iii) SRPC Secretariat vide letters dated 28.03.2024 had addressed to the audited substations/respective entities regarding the audit observations/deficiencies and requested to initiate the necessary measures to comply with those observations/recommendations.

(iv) Mytrah Park developer and Orange Park developer are yet to furnish the Compliance report.

(v) Status update on the following recommendations may please be updated:

Sub Station	Details of Observation	Compliance status furnished by the entity	Deliberations
NTPL	Data not reporting through redundant BSNL channel	Upgradation of SCADA system is under progress. Shifting the data communication from 101 to 104 protocol with OPGW communication. Tender is floated and expect to commission by Dec 2024.	Upgradation of SCADA system is under progress. Shifting the data communication from 101 to 104 protocol with OPGW communication. Tender is floated and expect to commission by Dec 2024.
NTPC Simhadri	48 V Battery charger alarms shall be made available to SAS	Material procurement in progress, will done by 30.05.2024.	NTPC vide email dated 24.07.2024 informed that 48V charger alarms are integrated to SAS from 04/07/2024
	For SDH/PDH equipment spare cards to be maintained at site	Informed to PGCIL and APTRANSCO, Feedback awaited	PGCIL Vide mail dated 17.07.2024 informed that Spares are available at the centralized store. Also, the AMC (Annual Maintenance Contract) which is in place is a comprehensive and any card failure is immediately being replaced by the agency with the healthy card. The faulty cards are being repaired in timely manner so as to have healthy cards in hand.
	Historical data available for 45 days only for AP Transco SDH/PDH, Shall be made available for minimum 90 days as per CEA guidelines	Informed to APTRANSCO, Feedback awaited	APTRANSCO stated that the existing old equipment will be replaced under 2024-25 R&M scheme.
	Thermal data reporting to SRLDC through SAS gateway is IEC-101 protocol to be upgraded to IEC-104 protocol	Internal approval works in progress, Will be done by 31.10.2024	NTPC informed that Internal approval works in progress, Will be done by 31.10.2024
	Wide band network delay testing reports of APTRANCO equipment are not available at site	Informed to APTRANSCO, Feedback awaited	APTRANSCO stated that the existing old equipment will be replaced under 2024-25 R&M scheme.
	Existing Foxu PDH (AP TRANCO asset) is very old and obsolete version, should be replaced with SDH.	Informed to APTRANSCO, Feedback awaited	APTRANSCO stated that the existing old equipment will be replaced under 2024-25 R&M scheme.
	Regular OT DR readings should be taken for proper maintenance of OPGW cable.	Informed to PGCIL and APTRANSCO, Feedback awaited	PGCIL Vide mail dated 17.07.2024 informed that OTDR readings are taken regularly, once every six months. The latest reports are enclosed.
	Communication channel route path diagram should be maintained at site.	Informed to PGCIL and APTRANSCO, Feedback awaited	PGCIL Vide mail dated 17.07.2024 informed that Channel routing diagram is attached, same shall be maintained at Site.
Edamon KSEBL	Requirement for enhancing capacity of battery set II (200 Ah) to 400 Ah	Initiated	KSEBL stated that action has been initiated and currently technical specification are under review.

	Cyber Security audit activities for vulnerability assessment of IT and OT devices in order to obtain certification	Under progress.	KSEBL stated that Cyber security audit is completed, and report will be submitted soon.
Guttur, KPTCL	All patch cords should be run through proper conduit pipe to avoid rat bites/damages and proper labelling to be done by PGCIL	Dressing of patch cords through conduit pipe shall be taken up during next maintenance visit, tentatively by Jun 2024	PGCIL SR-II stated that dressing of patch cords through conduit pipe shall be completed by next week.
	VOIP communication should be established through SDH to control room for better communication with SLDC	This is considered under the ongoing KPTCL OPGW project	KPTCL stated that OPGW will be ready by next month.
	Suggested for SAS as the station is old and having more transmission lines	Action initiated for upgrade	KPTCL stated that DPR has been prepared in this regard.
	Redundant communication to be provided for 220kV lines through PLCC/OPGW	OPGW project is under progress	KPTCL stated that OPGW will be ready by next month.
SV Chatram, TANTRANSCO	In FOX 615 SDH system, there are two SAMO 1 cards present, but MSP Configuration is not implemented. There is no redundancy established for any directions	Will be rectified on or before 30.06.2024	TANTRANSCO stated that equipment procurement is in progress and will be completed by December 2024.
	Specific gravity readings are low as per the maintenance register. Boost charging should be conducted to rectify the specific gravity in accordance with the OEM's recommended value.	Replacement of battery under progress and time period required up to 31.12.2024	Replacement of battery under progress and time period required up to 31.12.2024
	It is recommended to extend the battery charges alarm to the annunciator panel in the control room	Time period required 30.06.2024	TANTRANSCO stated that the work will be completed by Next month.
	There is only one data channel available. Redundancy of data channel must be implemented.	1 No. Gateway required with I/O configuration support for establishing of redundancy data channel. Time period required up to 31.12.2024	TANTRANSCO stated that 1 No. Gateway required with I/O configuration support for establishing of redundancy data channel. Time period required up to 31.12.2024

	The fixing of Splice box of 400kV Pondy OPGW line is in very bad condition. Similarly, the routing of the approach cable and OPGW in the terminal tower is also substandard. Rectification is necessary to align with the Standard installation practices.	Informed officials of M/s PGCIL, Bangalore for early rectification since the line is under the purview of PGCIL.	PGCIL stated that they will attend and rectify the work in next month.

Deliberation:

1. SRPC highlighted that Mytrah Park developer and Orange Park developer are yet to furnish the Compliance report. There was no representation from Mytrah Park developer and Orange park developers.
2. SE (P, C &SS), SRPC expressed concern that in spite of several reminders and communications from SRPC, Mytrah Park developer and Orange Park developer are yet to furnish the Compliance report. The matter was taken up in the special meeting of RE entities held on 12.07.2024 wherein M/s Mytra & M/s Orange has agreed to to furnish the compliance of the communication audit within a week. However, no response received so far.
3. SE (P, C &SS), SRPC requested all entities to furnish the status updates through mail on the above pending audit points.

- ***Mytra Park Developer and Orange Park Developer to furnish the Status of Compliance of Audit Recommendations.***
- ***Respective entities to furnish the status of compliance report of respective substations.***

10. Presentation on Communication related topic by CTUIL

In the 47th COMSR meeting held on 24.06.2024, CTUIL was requested to present on any Communication related topic for knowledge sharing among the SR communication entities in the upcoming COMSR meeting.

Deliberation:

1. CTUIL presented on overview of Power System Communication (Presentation is at **Annexure-10**), following were highlighted:
   - ❖ CTUIL emphasized the following:
     - ➢ Communication role in Power System
     - ➢ Different types of Substation architectures
     - ➢ Communication System in Brief – Media & Equipment
   - ❖ Usage of Communication in Power System

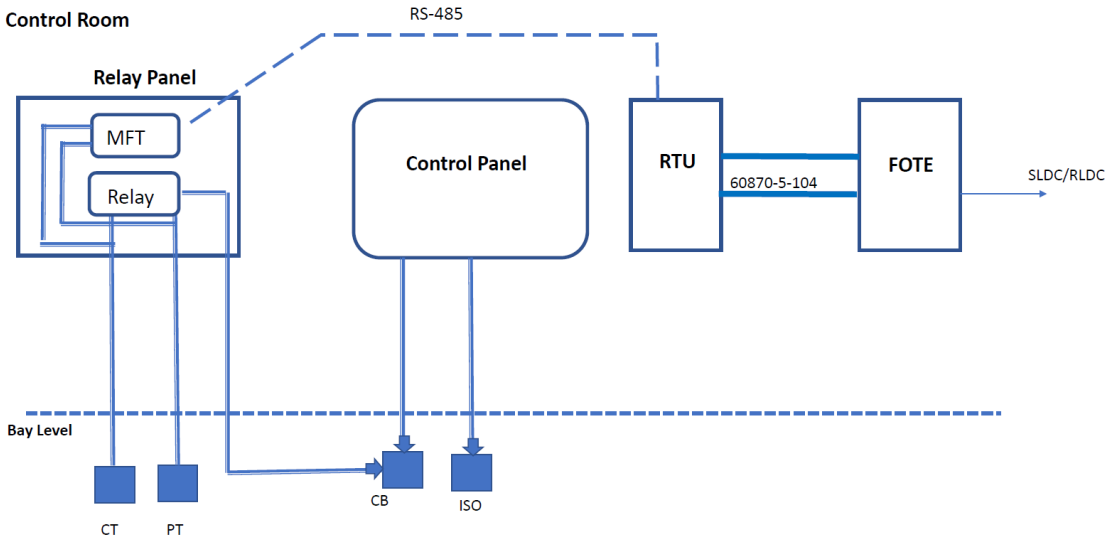
Communication required for following applications

- Grid Operation from RLDC/NLDC/SLDC
- Voice Communication (VoIP, PABX etc.)
- PMU
- Metering (AMR)
- AGC Operation
- ICCP – Inter Control Centre Protocol (RLDC-RLDC, SLDC-RLDC, RLDC-NLDC)
- Protection – Distance (DTPC), Differential
- TWFL (Transmission wave fault locater)
- Local communication between Substations devices (Control of CB/Isolator, Relay/IEDs to HMI/Engg PC, SAS LAN) (IEC-61850 etc.)
- Remote Control of S/s elements (e.g. NTAMC/STNAMS)

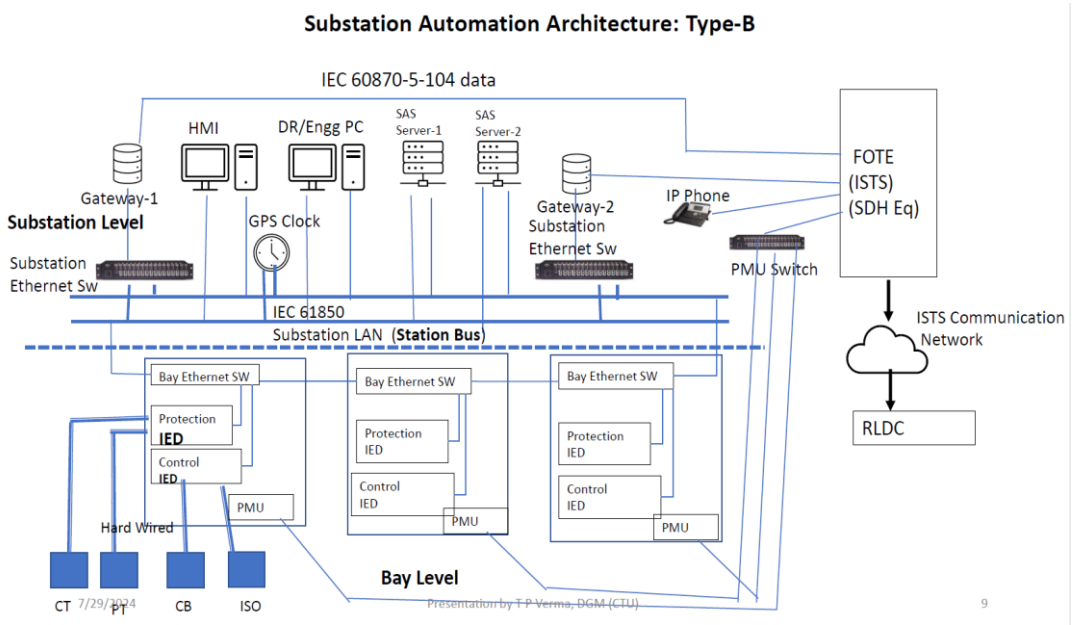
❖ Different types of Substations Architectures

Type A – Conventional Substations with Relay Panel and Control Panel in Control Room. CT, PT, Circuit Breaker and Isolators are connected with Relays and Control panel hard-wired. MFT (Multi-Function Transducer) and RTUs are used for SLDC/RLDC communication.

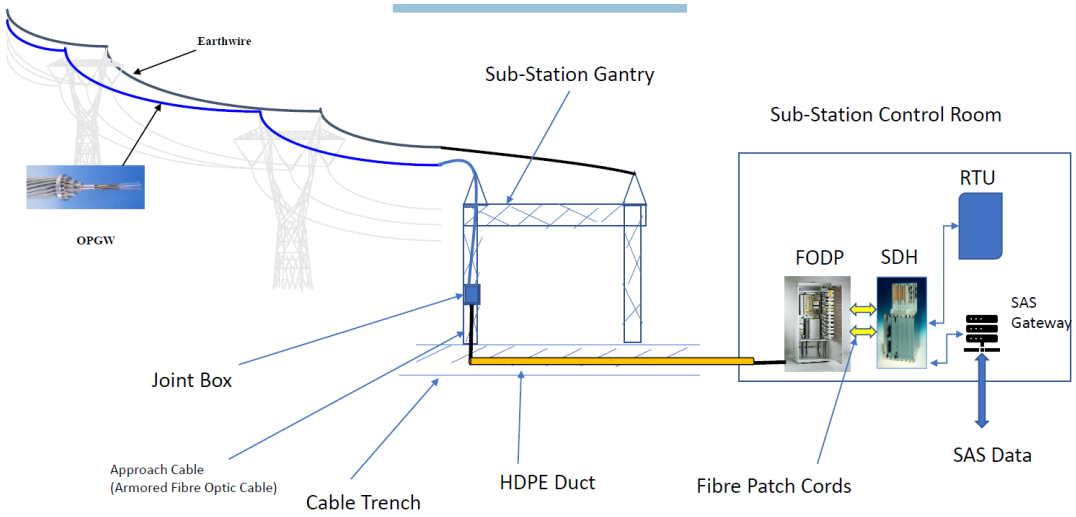
Substation Automation Architecture: Type-A Conventional



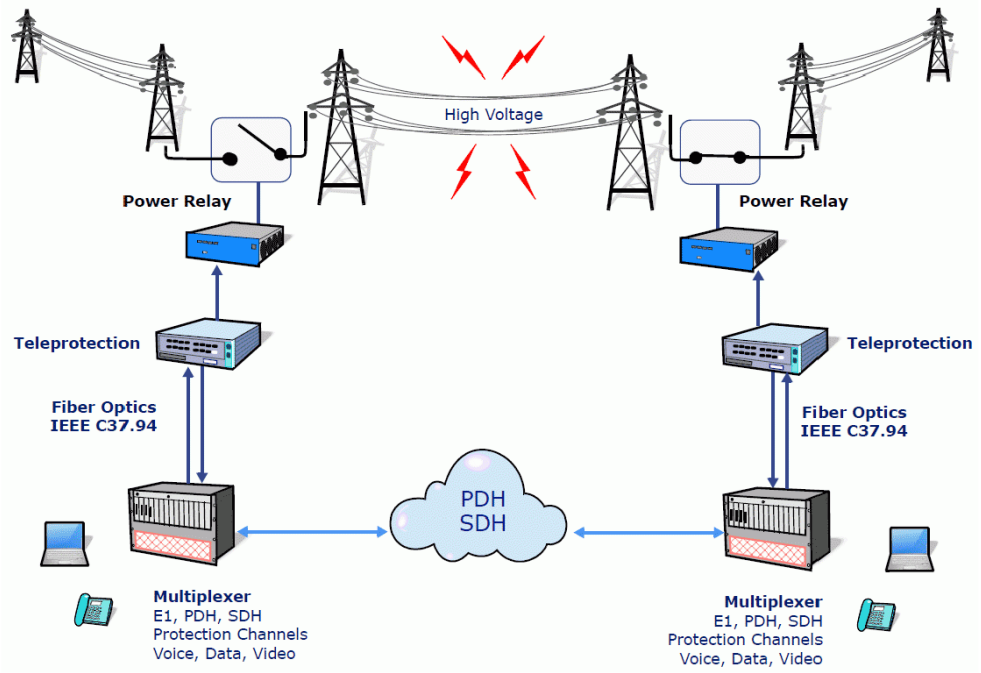
Type B – Substation Automation System (IEC 61850) based substation. At present most of the stations in India (ISTS & STUs) fall under this category.



❖ OPGW Based Communication System At Substation Level



❖ Protection by SDH Network



❖ Different types of Fibre Optic cables used in Power Sector

• Optical Ground Wire (OPGW) Fibre Optic Cable

• Underground Fibre Optic Cable (UGFO)

• All Di-electric self-supporting (ADSS) Fibre Optic Cable

- UGFO is a very common and worldwide used optic cable that used in various utilities like Telecom Sector (by ISP & Cellular operators), Power Sector, Distribution Sector, Gas Authorities and various industries for telemetry and SCADA purpose. UGFO used in Power sector generally for last mile connectivity, connecting SLDC/RLDC/NLDC which are situated inside city. Some places where Overhead FO cable is not feasible. Such as along with underground Power cables.
- ADSS cable can be installed along with 11kV/33kV transmission lines and even at LT lines. There is no separate RoW required, Maintenance and fault finding is also easier compared to UGFO cable. ADSS Cable installed just below the lowest conductor on transmission line by maintaining minimum ground clearances.
- OPGW used mostly in Power Sector on various EHV transmission lines such as 765kV/400kV/132kV and HVDC lines. OPGW is a replacement of conventional earth wire that serves both the purposes as an earth wire (or ground wire) and also works as Optical Fibre Cable for high speed data transmission.

❖ **Communication Equipment**

- PDH (Plesiochronous Digital Hierarchy)
  - PDH is multiplexor that multiplex different Analog or digital channels to create an E1 (2MBPS) channel.
  - Different signals like RS485, RS232, V.35, X.21, 64kbps, E&M can be given as tributary to PDH. E1 than connected to SDH E1 port to send data over fibre
- SDH (Synchronous Digital Hierarchy)
  - SDH is an ITU-T standard for a high-capacity telecom network. SDH is based on TDM (Time Division Multiplexing). It allows different types of transmission signal formats to be carried on one line as a uniform payload.
  - Over SDH mixture of data like voice, video, ethernet, E1, Optical can be sent via TDM.

- **STM (Synchronous Transport Module)**
  - STM-1 : 155 Mbps
  - STM-4: 622 Mbps
  - STM-16: 2.5 Gbps
  - STM-64: 10 Gbps
  - On STM-16 we can transport up to 225kms. without repeater with amplifiers

❖ **WDM (Wavelength Division Multiplexing)**

- In Wave Division Multiplexing (WDM) a beam of light is divided into segments called lambdas. The Greek letter Lambda (λ) is used to represent the wave channels. These lambdas are actually different colors of light
- Two variables of WDM are used, CWDM (coarse wave division multiplexing) and DWDM (dense wave division multiplexing). DWDM systems can carry as many as 96 channels at 100 gigabits per second per channel over a single pair of fiber

❖ **MPLS (Multi-Protocol Label Switching)**

- Multiprotocol Label Switching, or MPLS, is a networking technology that routes traffic using the shortest path based on "labels," rather than network addresses.
- Combines the best features of layer-2 and layer-3 on a single platform. Offers routing at a speed of Layer-2 Switching and data security at the level of a dedicated network. Generally referred to as Layer -2.5 Protocol.

❖ **Benefits of MPLS over SDH**

- Bandwidth Optimization – in SDH always bandwidth is blocked even data is not flowing
- Quality of service: MPLS comes with the quality of service (QoS) options, which empowers to treat latency-sensitive traffic like protection over VoIP/SCADA
- With MPLS, there is an option to use alternative paths and avoid high traffic congestion, thus reduced network congestion.

2. Forum appreciated the presentation of CTUIL which gives detailed information regarding Overview of Power System Communication.
3. Forum requested PGCIL (G&C wing) /ULDC to present on the various aspects (requirement, architecture, function etc.) of Firewalls being/to be

used in the Power Sector in consideration with the prevailing guidelines/regulations in next COMSR meeting. The same was agreed by PGCIL.

- ***PGCIL (G&C) / ULDC to on the various aspects (requirement, architecture, function etc.) of Firewalls being/to be used in the Power Sector in consideration with the prevailing guidelines/regulations in next COMSR meeting.***

11.SRLDC Agenda Items

SRLDC vide email dated 18.07.2024 (**Annexure-11**) has furnished the following agenda items:

11.1 Non-availability of proper SCADA data

Deliberations:

1. TGTRANSCO and KPTCL requested to discuss intra-state RE-related data issues in the COMSR forum. They raised a concern that SRLDC is currently sending reports directly to the Ministry of Power regarding intra-state RE issues, which has subsequently been highlighted at higher levels within the state. They requested to have separate meetings to discuss these issues and then report to higher forums.
2. CGM, SRLDC stated that as per MoP Guidelines, REMC issues needs to be appraised to ministry on a monthly basis. Based on MoP grant, the REMC has been established in State sector. The same will be audited by CEA at any time. Few entities did not integrate the full REMC data (less than 85% of data) with SRLDC and it is yet to be complied. CGM SRLDC clarified that monthly reports on REMCs are being furnished to CEA and CEA may be further submitting to Ministry of Power.
3. MS, SRPC suggested holding meetings on a fortnightly basis with state entities to resolve the issues. Still if any pending issues exist, the same can be reported to the CEA/Ministry at the end of the month. The same was agreed by SRLDC.

a. *Powergrid SR-1 & SR-2*

Updated analog data discrepancy files for POWERGRID SR-1 & SR-2 transmission systems were shared via letter and email in July 2024

SRTS-I, POWERGRID:

In the 46th & 47th COMSR meetings, SRTS-I informed that Nagarjuna Sagar data will be rechecked and rectified, but data rectification is still pending. Below is the summary of the non-availability analog points of SR-1 stations for the month of June 2024.

S.No	Substation Name	Voltage Level	No of Non Reporting Points - June 2024	Total No of Points	Non of non reporting points as on 17th Jul 24
1	CUDDAPPAH 765	765	11	35	0
2	GHANAPUR	400	15	49	15
3	CUDDAPAH	400	5	27	5 (Shared 101 address of transformer secondary)
4	CPETA 765	765	6	35	5
5	NELLORE	400	2	14	2
6	GOOTY	400	4	37	2
7	GAZUWAKA	400	4	38	4
8	MUNIRABAD	400	2	21	2
9	NAGARJUN SAGAR	400	3	32	3
10	SRIKAKULAM 765	765	2	27	2
11	NP KUNTA 400	400	5	74	5 (Statcom points checking under progress)
12	NIZAMABAD 765	765	2	36	0
13	KHAMMAM	400	2	40	2
14	VIJAYWADA	400	1	34	1

Deliberations:-

1. SRLDC presented the latest status of pending points from PGCIL SR-I

Substation Name	Voltage Level	No of Non Reporting Points as on 30th June	No of Non Reporting Points as on 26th July	Total No of Points	Remarks
GHANAPUR	400	8	7	49	
CUDDAPAH	400	5	5	27	
NP KUNTA 400	400	5	5	74	
KHAMMAM	400	2	3	40	OLTC points pending
MUNIRABAD	400	2	2	21	OLTC points pending
GAZUWAKA	400	3	2	38	
GOOTY	400	2	2	37	OLTC points pending
NLR POOLING STN	765	1	1	40	OLTC point pending
VEMAGIRI 765	765	6	0	39	
NELLORE	400	2	0	14	
NAGARJUN SAGAR	400	4	0	32	
WARANGAL	400	3	0	39	
CPETA 765	765	2	0	30	
SRIKAKULAM 765	765	1	0	27	
VIJAYWADA	400	1	0	34	

2. PGCIL SR-1 confirmed that all pending points will be rectified by next month.

SRTS-II, POWERGRID:

In the 47th COMSR meeting, SRTS-II informed that transducers at Mysore, Udamalpet, and Trichy have been replaced. Further, below is the summary of the non-availability percentage for non-availability analog points of SR-2 stations.

S.No	Substation Name	Voltage Level	No of Non Reporting Points - June 2024	Total No of Points	No. of non reporting points as on 17.07.24
1	PUGALUR HVDC	400	13	57	13
5	KOLAR AC & RCI	400	12	96	9
15	PAVAGADA SS	400	8	124	8
2	PALAKKAD	400	7	40	0 (rectified)
3	UDUMALPET	400	7	41	0(rectified)
6	MYSORE	400	6	54	4
4	SOMANHALLI	400	4	32	4
7	TRICHY	400	4	37	4
10	NARENDRA	400	4	43	3
12	TUMKUR	400	4	57	1
8	MADURAI	400	3	31	0 (rectified)
14	HOSUR	400	3	44	2
19	HIRIYUR	400	3	61	3
20	TIRUNELVELI	400	3	61	0 (rectified)
9	DHARMAPURI	400	2	21	1
13	TRIVENDRUM	400	2	29	2
17	YELHANKA	400	2	35	2
18	THRISSUR GIS	400	2	36	2
21	ARASUR	400	2	45	0 (rectified)
11	TRICHUR NORTH	400	1	14	0 (rectified)
16	SRIPERUMBDUR	400	1	17	0 (rectified)
22	KUDGI	400	1	27	1
23	KOZHIKODE	400	1	37	0 (rectified)
24	TIRUVALAM	765	1	47	1
25	TUTICORIN GS	400	1	67	1
26	KOCHI	400	1	79	1

SR-I & SR-II are requested to expedite the rectification process and update the latest status of rectification in each station wise remarks, which require addressing identified issues and ensuring compliance with relevant regulations and standards. Timely rectification and reporting of the latest status are crucial for maintaining the reliability and security of the power grid.

Deliberations:

1. SRLDC has presented the latest status of pending points from PGCIL SR-II.

Substation Name	Voltage Level	No of Non Reporting Points as on June 24	No of Non Reporting Points as on 26th July 24	Total No of Points
PAVAGADA SS	400	8	8	124
PUGALUR HVDC	400	13	7	51
TRICHY	400	4	4	37
SOMANHALLI	400	4	4	32
KOLAR AC & RCI	400	12	4	96
NARENDRA	400	4	3	43
HIRIYUR	400	3	3	61
MYSORE	400	6	3	54
TRIVENDRUM	400	2	2	29
YELHANKA	400	2	2	35
HOSUR	400	3	2	44
DHARMAPURI	400	2	1	21
KUDGI	400	1	1	27
TUMKUR	400	4	1	57
KOCHI	400	1	1	79
THRISSUR GIS	400	2	0	36
UDUMALPET	400	7	0	41
TIRUVALAM	765	1	0	47

2. PGCIL SR-II stated that issues have been attended for 12 stations and for the balance stations they will update by next month.

b. *NPCIL stations*

NPCIL to expedite the RTU upgradation (Kaiga, MAPS), as it is a long pending issue. In the 47th COMSR, NPCIL-MAPS agreed to provide an update on the RTU upgradation and SRLDC is yet to receive a response. With regard to transducers replacement at MAPS as an interim arrangement, MAPS informed that it is expected to receive supply in July first week. MAPS was requested to update on the transducer replacement status.

SRLDC letter dated 04th July 2024 issued to MAPS listing the discrepancy in the stations. Response from the MAPS, NPCIL is awaited.

SRLDC letter dated 04th July 2024 issued to Kaiga listing the discrepancy in the stations. Kaiga has proposed some changes in the signal address of 220 kV Bus frequency measurands based on the checking done by the site. Some critical measurements like GT. Unit and Bus analog measurements are yet to be resolved.

Deliberations:-

1. SRLDC presented the status of points at NPCIL Kaiga

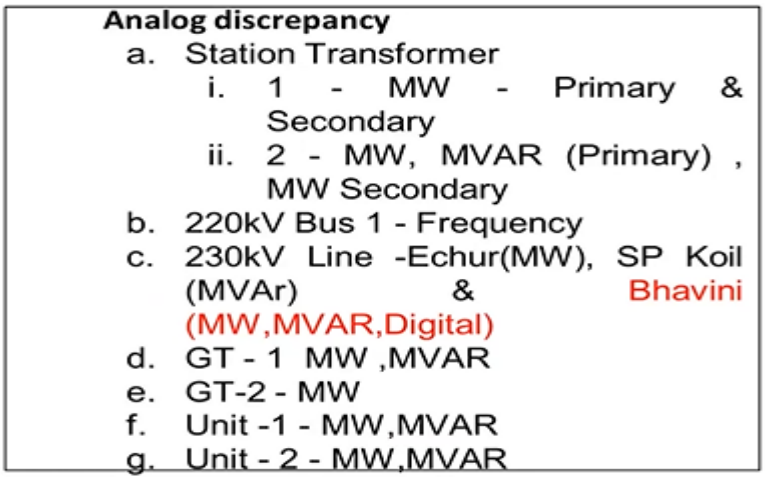
Substation_Name	ELEMENT DESCRIPTION	ELEMENT CATEGORY	Metric Type	KGS 3&4 Proposals	SRLDC Remarks
KAIGA	UNIT 1 XF PRIMARY	XFMR_P	OLTC	**Pls remove from the faulty list; Complied**	Still not reporting
KAIGA	UNIT 2 XF PRIMARY	XFMR_P	OLTC	**Pls remove from the faulty list; Complied**	Still not reporting
KAIGA	220Kv Bus Bar 2	BUS	HZ	RTU point is not responding to input simulation; hence **proposed to reconfigure the input to point 2011 instead of 2036**	Address will be modified at SRLDC
KAIGA	220Kv Bus Bar 1	BUS	HZ	RTU point is not responding to input simulation; hence **proposed to reconfigure the input to point 2010 instead of 2035**	Address will be modified at SRLDC
KAIGA	20_T1 (Primary)	XFMR_P	OLTC	RTU point is not responding to input simulation	Action plan may be intimated
KAIGA	20_G2	XFMR_P	MW	**Value is coming correctly & it is varing as per communication on 11/07/2024 with SRLDC personsal. Complied**	Reporting correctly now.
KAIGA	20_T3 (Primary)	XFMR_P	MVAR	RTU point is not responding to input simulation & transducer also not working; the sam eto be checekd in next KGS3 Shutdown.	Unit shut down dates may be mentioned
KAIGA	400Kv Bus Bar 1	BUS	HZ	RTU point is not responding ro input simulation	Action plan may be intimated
KAIGA	20_T4 (Primary)	XFMR_P	OLTC	RTU point is not responding ro input simulation	Action plan may be intimated
KAIGA	20_T3 (Primary)	XFMR_P	OLTC	RTU point is not responding ro input simulation	Action plan may be intimated
KAIGA	20_T4 (Primary)	XFMR_P	MW	RTU point is not responding to input simulation & transducer also not working; the sam eto be checekd in next KGS3 Shutdown.	Action plan may be intimated
KAIGA	20_T4 (Primary)	XFMR_P	MVAR	RTU point is not responding ro input simulation	Action plan may be intimated
KAIGA	UNIT 4 XF PRIMARY	XFMR_P	MW	Point is responding properly. **Requested to change the range at SRLDC to -25 to 300 MW instead of -100 to 300 MW;**	Value is stuck even after changing the scaling at SRLDC
KAIGA	UNIT 3 XF PRIMARY	XFMR_P	MW	Point is responding properly. **Requested to change the range at SRLDC to -25 to 300 MW instead of -100 to 300 MW;**	Value is stuck even after changing the scaling at SRLDC

2. NPCIL Kaiga stated that points are getting frozen in the RTU card, and do not have spare points available to divert. Therefore, they need additional cards to be installed, which are not available at their site. Planned to procure the cards from their station in Tarapur. Regarding the IEC 104 protocol communication migration, NPCIL Kaiga is placing a tender on behalf of SR NPCIL stations and assured that it will be completed by March 2025.

3. It was noted in the earlier meetings that TGTRANSCO had the spare RTU cards and KGS had been offered to use those cards. However, KGS had not turned up on the same. TGTRANSCO restated that they have some spare cards available and NPCIL Kaiga, if required, may send an official communication requesting the spare cards.

4. NPCIL MAPS stated that the transducers have been received at the site, and

the mounting pre-arrangement is in progress. The replacement of transducers for the 4 transmission lines and the generator will be completed by 10.08.2024. Analog points need to be addressed at the earliest:



5. SRLDC stated that the BHAVINI bay is not integrated into SCADA at the MAPS end. NPCIL MAPS stated that they will check and update.

c. *NLCIL Stations*

NNTPP- SRLDC letter dated 04th July 2024 had issued to NNTPP listing the discrepancy in the stations. SRLDC is yet to receive a response from NNTPP.

Deliberations:

1. SRLDC informed that except tap position of GT, all other points are reporting in NNTPP.
2. NLCIL stated that GT-1, GT-2 are offline tap changer, so it is not possible to take data. CGM, SRLDC requested to furnish their concerns through email. The same was agreed by NLCIL.

Neyveli TS2- SRLDC letter dated 04th July 2024 had issued to Neyveli TS2 listing the discrepancy in the stations.

Deliberations:

1. NLCIL stated that OLTC tap position RTU is having Analog availability and MW, MVAR points are working fine and affirmed the healthiness of the cards.
2. Forum expressed concern regarding the delay in responding to the emails as well as non-participation from NLCIL in the various sub-committee meetings. NLCIL informed that the delay is mainly caused due to the administrative delay.
3. NLCIL was requested to take up the issue with Management and update.

Neyveli TS-1 expansion- In response to the non-compliance letter dated 13.06.2024 issued to Neyveli TS1 Expn, few points were only rectified. Out of 11 points, 5 points pertaining to MW, MVAR of Nagapattinam lines, HV side of GT-2 and MVAR of 400kV Neyveli TS-2 line were only rectified. As per the 47th COMSR

new RTU supply is expected by July 2024.

Deliberations:

NLCIL informed that new RTUs were not received at site and new timeline will be updated after the receipt of information from M/s GE.

d. *States & Intra State Stations:*

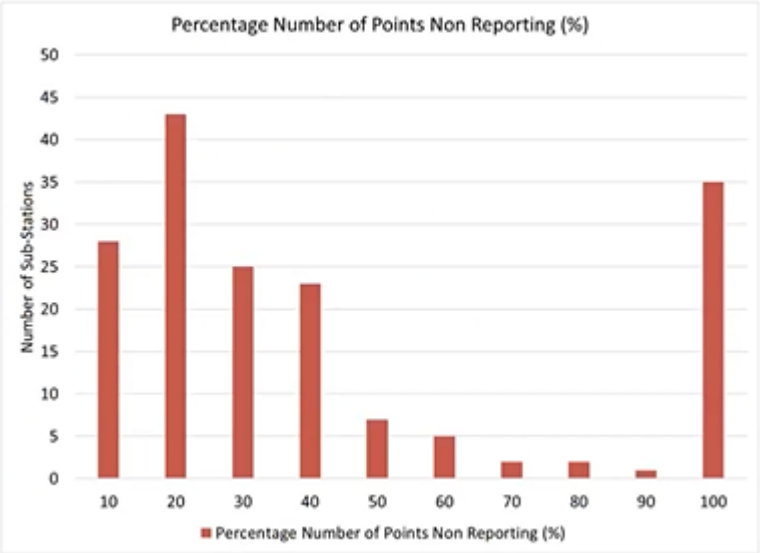
Andhra Pradesh:

In the 47th COMSR meeting APTRANSCO had informed that, a letter had been addressed to VTPS and issued non-Compliance notices to Ecoren and Suzlon (Vjrakrur) pooling stations.

SRLDC is yet to receive a response to the mail sent on 04th July 2024 regarding the data discrepancy for AP stations.

Deliberations:

1. SRLDC informed that APTRANSCO had responded to points w.r.t older mails, and have not replied for the new mail's points.
2. APTRANSCO replied that SRLDC had sent a file consisting of around 171 stations having issues of data availability. The points pertaining to eleven generating stations & consumers have been rectified. Balance issues will be verified and send a report by next week. Few Gas stations have been disconnected and the same needs to be removed. Details will be shared by next week.
3. SRLDC stated that for the month of June 2024, the percentage number of non-reporting points has been depicted below:



4. It was highlighted that 35 stations are 100% non-reporting, which needs to be rectified at the earliest as operation of the grid will be difficult without the data.
5. CGM, SRLDC enquired regarding the standard operating procedure being followed within SLDC during non-availability of SCADA data. It's crucial for SLDC operations to have visibility, or else it becomes challenging to manage operations.

6. APTRANSCO stated that when data issues arise, minor problems will be addressed immediately. For more extended issues, they procure equipment through tenders. If a station is not reporting, they use alternative data to ensure no loss of information. They have already issued notices to non-reporting stations and expect them to resolve the issues within two months.
7. Field operators have been trained to rectify minor problems on the spot. For long-term issues, tenders have been floated, especially for RTU/cards procurement, and some zones have awarded POs. Data will be ensured by using alternative sources. The procedure is the same for ICCP points.
8. CGM, SRLDC added that for stations that are officially removed, if the bus is still charged then they should receive data like bus voltage.
9. APTRANSCO stated that for stations that are decommissioned, they have removed them from the database but kept them as loads for record-keeping. However, some stations have completely disconnected, and they have confirmed this with their higher officials.
10. SRLDC stated that as long as the station is still connected to the grid and energized, they should receive telemetry data. Only when the station is officially decommissioned, the data should be nil. The same needs to be confirmed with the CEA records. APTRANSCO stated that they will check and update.

Karnataka:

In 47th COMSR, KPTCL had informed that 220 KV Soudatti and Athani are under progress and unable to give a timeline because of the issue with OEM.

Further, Nelamangla, 220 kV Soudatti, 220 kV Athani stations analog data need to be rectified.

SRLDC is yet to receive a response to the mail sent on 04th July 2024 regarding the data discrepancy of Karnataka Stations.

Deliberations:

1. SRLDC stated that for the month of June 2024, around 1386 points were not updating from KPTCL for at least 10% of the time.

S.No	Parameter	Quantity
1	NOT UPDATING	466
2	ICCP Issue	47
3	Not Integrated in SCADA	29
4	Manual Entry	66

2. As of 23rd July 2024, around 718 points are mentioned as updated, and the same have been checked and majorly found okay. However, around 43% of points, i.e., approximately 600 points, are still not updating.
3. KPTCL informed that Athani, Soudathi station issue will be resolved within one month, many points that are not reporting are OLTC, Bus Frequency and voltage.
4. SRLDC stated that many of the RE stations within the Karnataka are not

having telemetry data at 220 kV also, which need to have of telemetry as per the CERC Interface Requirement guidelines and CEA technical standards grid connectivity.

KPTCL replied that the telemetry data at remote end is made available through SCADA. However, the same will be reviewed and ensure the data at Generating station. Regarding the pending points, the same will be rectified within a week's time.

5. MS, SRPC enquired regarding the manual entry of points. KPTCL replied that OLTC points are being entered manually.

Kerala:

In the 47th COMSR, KSEBL had stated that BPCL Ambalamugal will be attended by the BPCL refinery, and 220kV Ambalamughal given order for new RTU and it will be replaced in 4 months. SAS issue at 220kV Pallivasal and 220kV Kothamangalam stations informed to OEM. KER SLDC is requested to update the rectification status of all discrepancy points shared through mail.

SRLDC is yet to receive a response to the mail sent on 04th July 2024 regarding the data discrepancy.

Deliberations:

1. SRLDC stated that for the month of June 2024, a total of 401 points were not updating from Kerala. Based on the response submitted, the analysis is as below:

   It is observed that around 95 points are future points/decommissioned, but almost 289 points are not reporting at SRLDC despite reporting at KSEBL. It is kindly requested to furnish the ICCP names for those 289 points to rectify the same at the earliest.

S.No	Category	Count
1	Values Reporting	12
2	Informed Field	5
3	Values Reporting at KSEBL but not at SRLDC	289
4	Future Points	95

2. KSEBL stated that the same will be checked and reply by mail.

Tamil Nadu:

In the 46th COMSR meeting TANTRANSCO had informed that NCTPS Stg 3 issue is taking up with OEM (M/s. GE). In the 47th COMSR meeting it was informed that payment issued to OEM and rectification will be rectified soon.

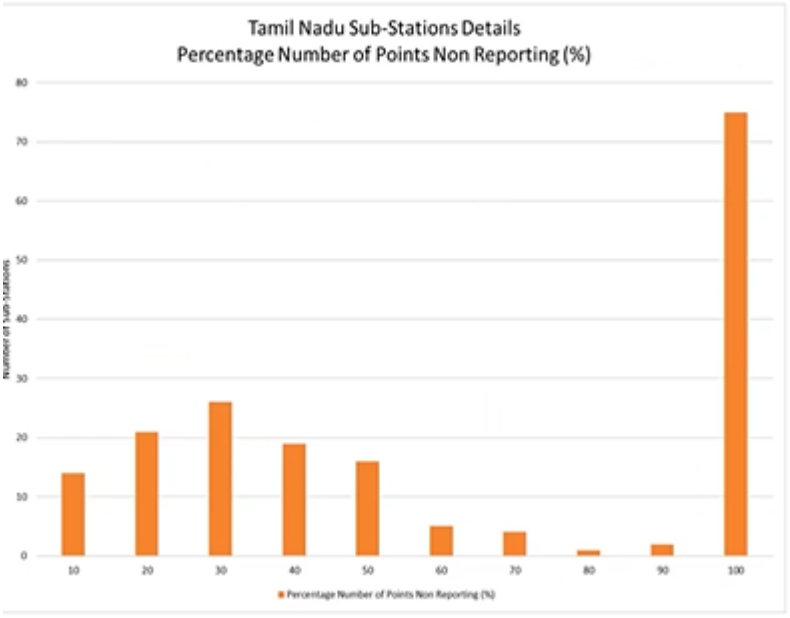
400kV Thenampatti, 220kV Oragadam, 220kV Paruthiyur, Sanganeri, Sankaraperi, Amuthapuram, Mettur tunnel, 220kV Mambakam, 220kV Cuddalore, 220kV Basin bridge, 765kV North Chennai Stg 3, 230kV STCMS, 230 kV Mosur, 220 kV Checkkanurani stations analog points and Kayatar, Sripermbudur, Tirunalveli (PG)

BCU 212 and Mettur Stg 3 stations status data rectification status need to be updated with fixed timeline. SRLDC has not received a response in this matter since Feb 2024.

Further, TN is yet to respond to the mail sent on 4th July 2024 regarding the data discrepancy of TN Stations.

Deliberations:

1. TN SLDC responded that reply has been sent to SRPC, the same shall be forwarded to SRLDC. Representation from TN SCADA was not there to update the pending points. CGM, SRLDC requested that a SCADA representative from the utility, along with a telecommunications representative, must be ensured in the COMSR the meeting.
2. SRLDC highlighted that more than 70 substations are not reporting 100%. TANTRANSCO stated that majority are RE stations and RE entities are not responding to their mails.



3. MS, SRPC suggested that TNSLDC to issue a non-compliance letter/notice to those RE entities who are not complying the Regulations. TANTRANSCO agreed to the same.
4. SRLDC enquired regarding the source of data being utilized for billing purpose. TANTRANSCO replied that AMR data is being used for billing.

Telangana:

In the 47th COMSR meeting, TGTRANSCO had informed that RTU replacement is under progress for 17 numbers of old RTUs and an updated timeline needs to be furnished for data discrepancy stations, response was awaited. TGTRANSCO to furnish the timeline for rectification of all works through mail.

As informed in 46th COMSR regarding Yelluru substations, PLCC card issue had been observed and also fibre is being erected which will be completed within 10 days.

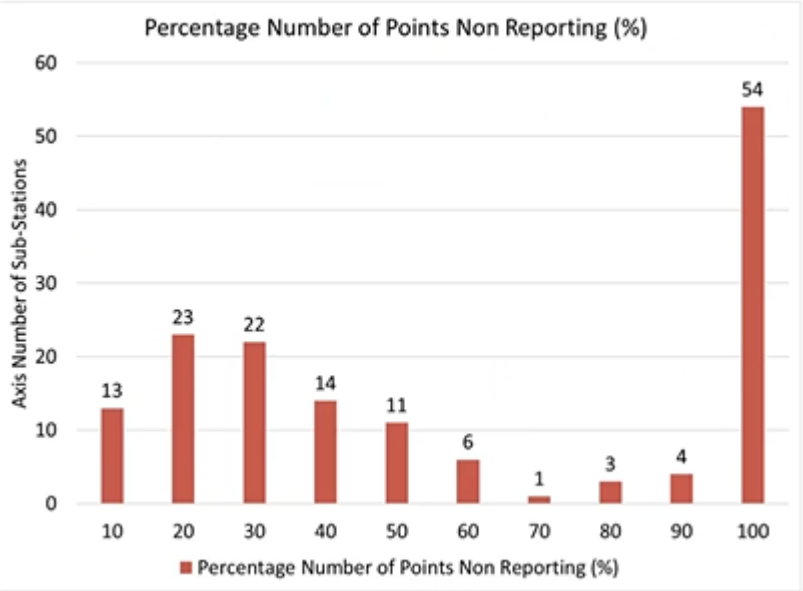
TGTRANSCO need to update on Mehabubnagar, 400 kV ASUPAKA, 400 kV

Surypet, 220kV Regumanagadda, 220 kV Ramadugu, 220kV Budidampad, 220kV Nettempadu -1 & 2, 220 kV Jonnalaboguda, 220 kV Heavy Water Plant, 220kV Medchal, 220kV Gudipallygattu, 220kV Malyalapalli, 220 kV KTSO2, 220kV Gachibowli and 220 kV Nirmal stations data rectification status need to be updated.

Further, TG is yet to respond to the mail sent on 4th July 2024 regarding the data discrepancy of TG Stations.

Deliberations:

1. SRLDC highlighted that 54 stations are 100% non-reporting for the month of June 2024.



2. TGTRANSCO stated that as per their reports, only 15 stations are not reporting and they would discuss the balance pending points with SRLDC through one-on-one meeting. SRLDC agreed to the same.

e. APSPCL

SRLDC letter dated 04.07.24 issued to APSPCL regarding list of non-updating points in real time from Galiveedu & NP Kunta stations. APSPCL was requested to resolve the discrepancy points.

Deliberations:

1. APSPCL stated that the data will be checked and update regarding the pending points.
2. SE (P, C & SS), SRPC enquired with APTRANSCO whether the communication aspects of APSPCL have been taken over by APTRANSCO. APTRANSCO responded that they were yet to take over the same.

f. Mytrah

SRLDC letter dated 04.07.24 issued to Mytrah regarding SCADA data discrepancy. Mytrah is requested to resolve the discrepancy points.

Deliberations:

1. SRLDC stated that out of 21 analog points in pooling station, 13 points are

not reporting in real time. Non-availability percentage of these analog stations are 100%. No response received for the letter sent.

2. There was no representation from M/s Mytrah.

g. MEPL

SRLDC letter dated 04.07.24 issued to MEPL regarding SCADA data discrepancy. MEPL was requested to resolve the discrepancy points pertaining to units in service (Unit-1 & Unit-2) on priority basis.

Deliberations:

MEPL informed that an ABB engineer has visited their site and suggested to upgrade to IEC 104. Requested a revised offer from the OEM and plan to complete the upgradation within six months after receiving the offer. At present only 1 communication channel is in working condition due to issues in RTU.

h. Non reporting of SoE data

Tripping of all lines (due to fault or other reasons) are monitored in SRLDC and the SoE signals received from stations are checked to identify the cause of tripping. It is found that in several instances of Tripping in June-July 2024 the SoE wasn't received (esp. during GD). The list of the same is attached along with SRLDC annexures. SRLDC received response only from AP and Kerala for the list of SOE sent in May 2024. All utilities were requested to rectify at the earliest for the issues reported in June-July 2024.

All entities were requested to update the action taken in this regard.

Deliberations:

1. SRLDC presented on the non-reporting of SoE data:

Utilities	No of instances SOE not received
APTRANSCO	6
TGTRANSCO	6
KPTCL	1
PGCIL SR-2	4
Simhadri	1

2. SRLDC stated that reply has been received from APSLDC & KSEBL. Other utilities are yet to reply.

3. KPTCL noted that the list mentioned a tripping on Bastipur-Kadakola line on 30th June 2024 at 21:23 hours, but they confirmed that no such tripping occurred at that time. SRLDC explained that there was a time error and that the GMT offset of 05 hours and 30 minutes should be added to the displayed time. KPTCL confirmed that they will check and update accordingly.

Other Deliberations:

1. State entities expressed concern on tabulating the percentage number of points non-reporting for the month. They sought that the methodology for arriving the table data may be furnished. It was observed that SRLDC has changed the methodology followed earlier.

2. Forum requested SRLDC to streamline the methodology to project the non-reporting data points corresponds to each State. The same can be communicated to the Forum.

3. It was noted that SRLDC have taken initiative by issuing letters to all respective entities who is non-complying the Regulations. Respective entities are requested to take immediate actions to resolve the non-reporting measurements in order to comply with the provisions of IEGC Regulations: 11(1) read with CERC Interfacing Regulations under the Communication Regulations of 2017 and CEA (Technical Standards for Connectivity to the Grid). If the issue persists and no action taken or no action plan furnished by any of the entity, SRLDC may address the non-compliance to MS, SRPC through letter. SRPC will also take up with the respective entity.

- ***PGCIL SR-I & SR-II, NLCIL Stations, MAPS, Kaiga GS, APSPCL, Mytrah, MEPL, Tamil Nadu, Andhra Pradesh, Kerala, Telangana & Karnataka to resolve all the SCADA issues and furnish the action plan with timeline to SRLDC.***
- ***All entities to rectify the issue of non-reporting of SoE data/data loss during tripping time. Reasons for the same to be furnished by the entities.***

11.2 Main and Standby Communication Path Redundancy

Following stations are reporting only on single channel to SRLDC as on 16.07.24, which is noncompliance with the IEGC 2023 Regulation 11(1) read with clause 4.1 of the approved Interfacing Requirements under the Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017.

Following stations are reporting in single channel to SRLDC:

Station	Non reporting channel (Main/Standby)	June 2024 RTU Availability in %	47th COMSR & previous Discussion Summary	Current Status	Responsible utility	Deliberations
LANCO	Standby	98.17	No representation from LANCO. the data is being reported through single channel wherein LANCO needs to provide the secondary channel	LANCO updated through mail that order placed for communication equipment for an alternate data channel through BSNL leased circuit and they will establish the second data channel by the end of 2nd week of July,24	LANCO	There was no representation from LANCO. SRLDC stated that they received reply from LANCO that they will establish dual channel soon after confirmation from PGCIL for BSNL line up to nearest wideband.

Station	Non reporting channel (Main/Standby)	June 2024 RTU Availability in %	47th COMSR & previous Discussion Summary	Current Status	Responsible utility	Deliberations
MEPL	Main	99.99	MEPL stated that the vendor will be visiting SRLDC by next week to resolve the issue. SRLDC	Reporting in a single channel. Issue at Site and requires termination of channels at nearest wideband,	MEPL/SR1	MEPL stated that the termination of channels at nearest wideband n/w, will be done within six months.
SEPL	Main	91.57	SRLDC advised all entities to drop on 101 protocol at SRLDC to have a roadmap to terminate at the nearest wideband node as per Regulations	Highly intermittent, issue is resolved on 16th July 2024 in existing setup. But requires permanent termination at nearest wideband.	SEPL/SR1	SEPL stated that as of now both channels are reporting and termination of channels at nearest wideband n/w, will be done within six months.
NLC 1E	Main	100	Channel is down since long	NLC vide their mail dated 25th June 2024 informed that main channel is down due to RTU issue. Purchase of RTU is under progress and expected delivery by 25th July 2024	NLC/SR2	PGCIL SR-II stated that TS1 expansion - one path to SRLDC is via TS2 expansion. Communication from TS2 expansion to SRLDC is clear. Issue is between TS1E to TS2E.
NTPL	Main	99.99		NTPL vide their mail dated 09th July 2024 informed that termination feasibility to terminate the link at Tuticorin end is under progress, the response from BSNL side for the same is delayed.	NTPL/SR2	No representation from NTPL
Talcher RC (HVDC)	Standby	99.64	SRLDC stated that only a single channel is currently available, resulting in poor availability in the month of May. 2) PGCIL SR-II stated that they are planning to establish an alternate path and will be complete it by next week	Reporting in a single channel and restoration is taking time. Email sent to SRTS II regarding the establishment of a second channel for IEC 101.	SR2	PGCIL SR-II stated that at Talcher HVDC only two ports are available at present in which each port reporting to ERLDC and SRLDC. Addition of ports as per SRLDC requirement shall be taken up in next ADD -CAP works of Talcher-Kolar package
Kochi	Main	100		Not available since 04th June 2024	SR2	SRLDC stated that currently it is reporting in both channels since 26.07.2024.
Kayamk	Main	99.99		Not Available since	NTPC/S	SRLDC stated that currently it is

Station	Non reporting channel (Main/Standby)	June 2024 RTU Availability in %	47th COMSR & previous Discussion Summary	Current Status	Responsible utility	Deliberations
ulam				24th June 2024	R2	reporting in both channels since 26.07.2024.
Dharmapuri	Standby	99.99		Not Available since 24th June 2024	SR2	SRLDC stated that remote loop is received. PGCIL SR-II stated they will check and update. SRLDC suggested to upgrade to 104 protocol. SR-II stated that it is in final stage of work award.
Karaikudi	Standby	99.99		Not Available since 19th June 2024	SR2	SRLDC stated that currently it is reporting in both channels since 23.07.2024
Pavagada	Standby	99.43		Not Available since 9th July 2024	SR2	SRLDC stated that currently it is reporting in both channels since 19.07.2024

- ***All entities to furnish the action plan with timeline for provision of Communication redundancy to SRLDC.***

11.3 Non-availability of telemetry data from BHAVINI

SRLDC vide letter dated 14.09.2023 had taken up with BHAVINI for expediting the integration process of real time SCADA data from 230kV BHAVINI to SRLDC. BHAVINI informed that the contract for RTU and SAS system upgradation is under the tendering stage and expected to place order by March 2024.

SRLDC vide letter dated12.06.2024 has again taken up, however response from BHAVINI is awaited even after reminders. As per minutes of 47th COMSR meeting, it was informed by BHAVINI (through email) that technical bid was opened and technical clarification obtained from M/s. Schneider Electric. Commercial aspects are under process and expected to place the order within 20 days.

Deliberation:

a) BHAVINI informed that the commercial and technical bids have been opened. Since it is a nuclear power plant, bidders must provide an end-user certificate specifying that they are not engaging in the reprocessing or enrichment of plutonium or uranium. They need to obtain a certificate from DAE. There are commercial issues involved, and although the order was opened in March 2024, their commercial team is finding it challenging to place the order. The same will be finalized soon.

b) Forum noted that the status has been persisting for almost a year, with no progress despite regular follow up in the meetings. Such delays are

unacceptable.

c) BHAVINI stated that the tendering process was completed but placing the order had become complicated due to commercial issues. SRLDC requested whether dual redundancy is considered in the tender. BHAVINI replied that they have not considered it earlier and they will amend the order to ensure dual redundancy as per Guidelines.

d) SE (P, C & SS), SRPC requested BHAVINI to expedite the process. Also BHAVINI to ensure the dual redundancy, and update/modify the bid accordingly.

e) Regarding the timeline for installing dual redundancy, BHAVINI stated that they expect to complete the process within six months.

- ***BHAVINI to expedite the activities for telemetry upgradation and confirm integration of telemetry signals to Main and Backup SRLDC.***

11.4 Upgradation of existing RTUs / Gateways reporting in IEC 101 to Ethernet on IEC 104 protocol

Utility	No of Stations in 101RTUs	Remarks
SR-1, PGCIL*	**13**	**All stations reporting in IEC-101protocol.**
SR-2, PGCIL*	**23**	**All stations reporting in IEC-101protocol.**

*STATCOM RTUs also included.

Deliberations:-

a) PGCIL SR-I stated that for standalone stations, 101 RTUs have been converted to the IEC 104 protocol. However, the mentioned 13 substations cater to the needs of RTAMC, NTAMC, and SRLDC, and therefore, firewalls need to be installed to convert from the 101 to 104 protocols. No vendor meets the technical specifications of the firewall. SRLDC enquired with PGCIL whether the current operational 104 RTUs have firewalls. PGCIL replied that those RTUs also don't have firewalls as they were installed prior to the CEA Cybersecurity Guidelines.

b) SRLDC pointed out that many RTUs are using the 101 protocols, and it is not feasible for SRLDC to maintain DCPC at the remote substations (at SRLDC building). PGCIL SR-I stated that in such a case, to transmit 101 data, PDH needs to be installed at SRLDC MCC and BCC and requested CTUIL to plan accordingly.

c) SE (P, C & SS), SRPC enquired PGCIL whether they can comply with the CEA Cybersecurity Guidelines using the IEC 101 protocol. PGCIL confirmed that they can comply with the regulations using the 101 protocols. TG SLDC opined that existing IEC 101 protocol based RTUs by default is not complaint with IEC 60870-5-7 and IEC 62351-100 security extension. Therefore, conversion to 104 protocol is required.

d) CGM, SRLDC highlighted modern technologies favour IEC 104, and encouraged all entities to plan for migration to IEC 104 protocol.

SRLDC suggested that it would be better to procure firewalls in a single package, as procuring different makes from various OEMs might complicate the integration.

e) SE (P, C & SS), SRPC requested CTUIL for an action plan in this regard. CTUIL stated that they have just become aware that no vendor meets the technical specifications

which were already in place, and therefore, the technical specifications may need to be modified in consultation with all stakeholders and CEA.

f) MS, SRPC requested PGCIL to officially communicate to CTUIL the problems being faced in the Technical Specifications migrating from the IEC 101 to IEC 104 protocol.

- ***PGCIL to take up the matter with CTUIL regarding firewall technical specifications for upgradation from IEC 101 to IEC 104 protocol.***

NTPC	**2**	**Simhadri & Kayamkulam**

Deliberations:-

NTPC stated that procurement of the Ethernet port add-on card for the Tejas panel is under progress and seeking assistance from the vendor for gateway modification for the IEC-104 protocol. The timeline for completion is six months, with an expected completion date by December 2024.

NLCIL	**4**	**All stations reporting in IEC-101protocol.**

Deliberations:-

a) NLCIL stated that in NLC TS Exp, SCADA is of serial communication, and they are using 101 convertor. They are exploring whether it can support 104 Protocol.

b) MS, SRPC requested NLCIL to give station wise update through mail. The same was agreed by NLCIL.

SEIL	**2**	**All stations reporting in IEC-101protocol.**

Deliberations: -

There was no representation from SEIL. As per Special Meeting held on 26th July 2024, it was informed that RTU upgradation is under consideration for both stations.

IL&FS	**1**	**Station reporting in IEC-101 protocol**

Deliberations: -

There was no representation from IL&FS. As per Special Meeting held on 26th July 2024, it was informed that RTU upgradation is under consideration.

NTPL	**1**	**Station reporting in IEC-101 protocol**

Deliberations: -

SRLDC stated that in the special meeting, it was informed that the purchase order would be placed within one week, and migration to the IEC 104 protocol expected by December 2024.

LANCO	**1**	**Station reporting in IEC-101 protocol**

Deliberations:-There was no representation form LANCO.

- ***PGCIL SR-I & SR-II, NTPC, NLCIL stations, SEIL, LANCO, NTPL & IL&FS to update on the action plan on migrating the existing IEC - 101RTUs to IEC 104 protocol.***

11.5 Intermittent and partial Reporting of Pooling stations from Galiveedu DCPC to SRLDC

Galiveedu station RTU/DCPC of APSPCL is aggregating 10 RE Sub Stations (Galiveedu I, II, III, TATA P4, TATA P5, FRC Solar 1, FRV Solar 2, Athena Solar P1, P3, P6, and Azure Solar) data has intermittent since 22.05.2024 09:22 hrs, and could restore only few stations and on 14th June 2024 13:10 hrs entire RTU/DCPC stopped reporting to SRLDC (MCC and BCC). Data was restored on 25th June 2024.

Galiveedu PS is not reporting to Backup CC of SRLDC since 01st July 2024.

Deliberation:

a) SRLDC stated that the data is intermittent and currently not reporting to Backup CC. It was also mentioned that this issue is part of a broader problem; many NP Kunta stations are combined and put into one port of the SDH. This issue has been raised previously. SRLDC emphasized that the handover should occur at the optical level, not the port level. If the converter power supply goes down, the problem persists. This issue needs to be resolved, and stations connecting to the nearest wideband station must use optical media.

b) APSPCL stated that they will conduct troubleshooting and restore the problematic issues.

c) SRLDC suggested that some RE stations, particularly older ones, might have different setups. There should be a direct Ethernet connection from RTU to MUX at these stations and MUX should transmit on Optical Media to nearest Wideband MUX.

d) PGCIL SR-I stated that APSPCL needs to bring all data from STM to one SDH, and from there, they can integrate into their network.

e) SE (P, C & SS), SRPC enquired with APSPCL whether they can bring all STM into one SDH. APSPCL assured that they will check and update.

f) MS, SRPC requested APSPCL to coordinate with PGCIL and SRLDC and develop an implementation plan. The same was agreed by APSPCL.

APSPCL to rectify the issues within ten days

11.6 Dual Reporting of SR Stations to SRLDC Main and Backup Control Centre's

SRLDC has requested to all central sector Generating stations integrated with SCADA systems of SRLDC for the feasibility of Dual channels to each Control Centre vide email dated 7th June 2024 in order to comply with the CERC Guidelines on Interface Requirements by 12th June 2024, However the Response from many are pending even after multiple reminders. **SRLDC is yet to receive responses from LANCO, Mytrah, BHAVINI, SEIL-1, Orange and Neyveli stations.**

Deliberation:

a) SRLDC informed that, as decided in 46th COMSR meeting, a meeting was conducted with ISGS/IPPs on 26.07.2024 regarding dual channel reporting of ISGS and IPP stations to Main and Backup SRLDC to discuss the data furnished on port availability in RTU/SAS Gateway of ISGS/IPP stations.

Name of Generating Station	Whether reporting in IEC 101/IEC 104	Discussion on 26.07.24	Timeline
Simhadri Stg 2	101	RTU upgrdation planned from 101 to 104. No spare ports available in Tejas panel.	3 to 4 months
KUDUGI NTPC	104	Ports are available in RTU	1-2 months
Vallur	104	Ports are available	Within 10 days
IL&FS	101	104 RTU upgrdation planned but timeline not fixed.Currently for dual channel with 101 RTU. Tejas panel owned by ILFS	Within 1 month. Tejas support required
BHAVINI	104	Tender opened for RTU. Commercial aspects under consideration	Dec-24
Kalpakkam (MAPS)	101	RTU ugrdation planned by 3 stations from 101 to 104.	Mar-25
Kaiga Nuclear Power plant	101	RTU ugrdation planned by 3 stations from 101 to 104.	Mar-25
KUDAMKULAM	101	RTU ugrdation planned by 3 stations from 101 to 104.	Mar-25
NTPL Tuticorin	101	PO will be placed within 1 week for RTU upgrdation to 104	Dec-24
Maniyachi(MYTHRA Power)	104	Ports are available in RTU. Mytrah will revert back on FOTE ownership	Sep-2024

b) Regarding NTPC TSTPP, TGTRANSCO stated that they have configured only one channel and requested NTPC-TSTPP to provide one Ethernet card to configure the second channel. NTPC HQ stated that they would discuss this with their management and provide an update.

c) NLCIL informed that the requirement has been consulted with their vendor and will give an update by 1st week of August 2024. NLCIL assured that further updates will be provided.

d) NTPC stated that the Ramagundum SAS upgradation is planned and expected to be completed within 6-8 months.

e) SEPL and MEPL informed that they are discussing the matter with their management and will provide an update.

f) After deliberation, SRLDC highlighted that all entities planning for upgradation should ensure a minimum of four ports are available.

All entities must comply with the requirement of Dual channel reporting to control centres(MCC & BCC) and action plans to be submitted.

11.7 Integration of RE/IPP station Network Elements to U-NMS

In 44th COMSR Meeting held on 21st March 2024. CTUIL had informed that according to the CEA Technical Standard 2020, all ISTS users are required to integrate their systems (communication system) with the Centralized Supervision System. RE Developers commissioned before 2020 are responsible for integrating their systems with either the state NMS or UNMS as per their obligations.

However, in the recent project update meeting with SLDCs on 5th July 2024,

the SR UNMS project implementing agency, PGCIL has stated that the integration of RE Developers' Network elements like FOTE connected to the ISTS is not currently planned for integration into SR-UNMS for unified communication system monitoring as these elements are currently not managed through OEM EMS/NMS, being standalone network elements.

The SR-UNMS must be comprehensive, adhering to the CERC Communication Regulation 2017, and envisaged to enhance communication system availability through centralized supervision, which is a continuous system requirement for real time grid operation. Further as per the decision in Petition 728/MP/2020, dated December 15, 2022, operational control has been entrusted to CTUIL. Hence CTUIL needs to plan the integration of the RE Developers' FOTE nodes with SR-UNMS in line with the requirements of the CEA (Technical Standards for Communication System in Power System Operations) Regulations, 2020, and the CERC (Communication System in Inter-state Transmission of Electricity) Regulations, 2017.

Deliberation:

a) SRLDC stated that in 44th COMSR Meeting held on 21st March 2024 CTUIL had informed that according to the CEA Technical Standard 2020, all ISTS users are required to integrate their systems (communication system) with the Centralized Supervision System. RE Developers commissioned before 2020 are responsible for integrating their systems with either the state NMS or UNMS as per their obligations.

   SRLDC added that there are standalone systems (FOTE) which are not being integrated to UNMS.

b) CTUIL stated that RE entities need to integrate to the existing NMS, and from NMS to UNMS, it can be configured. All RE FOTE owners with standalone network elements need to share the necessary details to develop the custom adapters and may not be completed within the project timelines. CTUIL requested all the entities to submit the necessary details to PGCIL.

c) TGTRANSCO raised a concern that as CTUIL is implementing the UNMS project, intra-state RE equipment details need to be integrated into UNMS as standalone since currently, most intra-State RE generators' equipment do not have NMS installed. PGCIL/ULDC replied that those RE entities need to integrate with State NMS, and further it can be integrated into UNMS.

d) It was noted that those will be integrated into UNMS that were mentioned in the SRPC approved scheme. Whereas the new and which were not included during the finalization of Technical Specification of UNMS, and others need to be integrated by the state to regional NMS. PGCIL/ULDC

confirmed that the requirements given during the finalization of the technical specification have been included in the scope of the project.

e) SRLDC mentioned that ISTS RE stations are also not being integrated. PGCIL/ULDC informed that some RE/IPP entities are not providing the details which are necessary for integration to the UNMS from this Standalone equipment and requested SRLDC to get the relevant details.

f) SRLDC stated that as per the Centralized Supervision for Quick Fault Detection Procedure, CTUIL is the nodal agency, and they need to provide the data. CTUIL stated that they will check and update but requested SRLDC to provide the contact details of RE stations. SRLDC informed that in the operational feedback furnished to CTUIL, the details of communications channels etc. i.r.o ISTS RE are available. However, the details as sought will be furnished to CTUIL/PGCIL.

g) MS, SRPC emphasized that the CTUIL and PGCIL shall conduct meetings with all the stake holders before and during the implementation stage of UNMS and appraise the updates.

h) After deliberations, CTUIL, SRLDC, and PGCIL/ULDC were requested to coordinate each other and ensure that RE/ISTS entities are integrated into UNMS.

11.8 Path redundancy between Somanahally - SRLDC existing building - SRLDC new building at CPRI

The Status of the links which are updated are given below:

Other links update remains no change as mentioned in the earlier minutes.

Link	Action So far	Updates in the meeting
CPRI 220KV SS to CPRI Campus/SRLDC new Building through BESCOM ducts	In the Meeting with Director (Tech) BESCOM held on 31.08.2023, BESCOM has agreed to lease out and maintain OFC to meet SRLDC operational requirements and provide end to end connectivity on the desired routes. Payables would be finalized shortly by BESCOM and intimated to SRLDC.	**PGCIL**: they have taken up with their higher management it is under discussion. **Deliberation:-** a. SRLDC stated that BESCOM had floated a proposal and requested POWERGRID to participate in the tender, but PGCIL did not participate. b. PGCIL/ULDC stated that they had discussed this with their management and was decided to pursue an MoU with BESCOM instead, considering the participation in the tender is impossible. They also

		mentioned that if BESCOM insists for tender participation, they can only participate through their Telecom department. c. SRLDC suggested holding a combined meeting with BESCOM to discuss the issue. PGCIL stated that they would discuss with their management and provide an update in this regard.
Tapping point to CPRI CAMPUS through Air Force Station, 24F from Peenya	T-Junction to SRLDC new building is 2Km length. T-junction to CPRI Campus will be through OPGW cables and from CPRI to SRLDC new building is through UGFO.	**SRLDC:** Joint survey is done and report is prepared. They will submit report after approval. **Deliberations**: SRLDC stated that the Air Force DEO has requested to apply online. They will apply this week on the AIR FORCE portal with the help of PGCIL SR-II.
Hoody – Existing SRLDC	• M/s RailTel submitted a preliminary quotation for providing 2.5 G P2P leased line 1:1 between SRLDC and KPTCL Hoody S/s. • The terminal equipment for this P2P link will be provided by M/s RailTel at both ends, and necessary integration with existing POWERGRID equipment at both ends will be conducted by M/s RailTel in association with M/s POWERGRID. • The bandwidth requirement for SRLDC was reassessed and proposed at 1.5 G, a revised quote from Railtel is obtained • POWERGRID (SR-2 & CC) along with SRLDC to negotiate quoted price from RAILTEL and convey the negotiated price to CTUIL for further action.	**SRLDC:** Regarding the modalities of the payment may be updated by PGCIL. **Deliberations**: a) PGCIL SR-II stated that site survey is done and laying of cables are planned to start in this week. b) CGM, SRLDC requested PGCIL SR-II to display the work progress chart. c)

BOQ for Terminal equipment requirement at CPRI &Hebbal	• SRLDC had informed that Joint meeting of Powergrid, Grid India and KPTCL conducted on 11.06.2024. BOQ is finalized and it is suggested to go with five directions of STM level optical connections.	

11.9 Integration of additional digital signals in PMUs in SR URTDSM system

As unutilized slots are available for integrating digital signals at each existing PMU, it would be prudent to utilize these spare channels to integrate digital signal inputs (Main, Tiebreaker & Protection (M3)) from other 400kV lines which are not monitored by PMU in the SR URTDSM project. Integration of these signals would aid in corroborating time synchronization of disturbance recorders during any fault/tripping of the lines and would help in post event fault analysis and shall be used as SOE in fault location applications at Control Centers.

Deliberation:

a) SRLDC informed that the integration of additional digital signals in PMUs within the SR URTDSM system has been completed at all stations under PGCIL SR-I.

b) For PGCIL SR-II, the integration at Dharampuri Substation is pending. PGCIL SR-II stated that the integration at Dharampuri Substation will be completed by this week.

11.10RE PMU

As per approval received in 44th Meeting of SRPC & 54th Meeting of Commercial Sub-Committee held on 20.02.2023 PMUs were proposed at following RE POOLING STATION:

SUB STATION	PMU	SPARE	TOTAL
NPKUNTA	6	1	7
PAVAGADA	4	1	5
TUTICORIN GIS	3	1	4
TOTAL			16

Deliberation:

a) PGCIL SR-I stated that a tender has been floated for procurement and that

the bid price quoted by vendors shows a 53.1% increase from the estimated rate. Consequently, they are proceeding with reverse tendering.

b) MS, SRPC enquired about the approved value and the estimated value. PGCIL SR-I responded that the approved value in the RPC meeting is ₹4.1 Crore and the estimated value is ₹3.3 Crore. Therefore, if the quoted value falls within the approved range, they will proceed with the placement of the order.

c) MS, SRPC suggested that PGCIL may submit a revised proposal to the SRPC in case the bid values do not fall within the approved range.

11.11Restoration of URTDSM system after Fire in KPTCL SLDC

Due to the fire incident which occurred on 26.05.2023 at KPTCL URTDSM Server Room, PMUs reporting to KPTCL URTDSM were re-routed to SRLDC PDC to avoid loss of data.

In the 45th and 46th COMSR meeting, PGCIL SR-II informed that an offer had been received from M/s GE and procurement was under progress. However, for supplying the firewall, M/s GE has requested a timeframe of 2-3 months.

POWERGRID to update on the timeline of completion of work.

Deliberation:

a) PGCIL SR-II informed that the M/s GE has requested for 2-3 months' time, stating that the firewall needs to be imported from other country.

b) SE (P, C & SS), SRPC highlighted that this is long pending issue and requested PGCIL to expedite the process. PGCIL SR-II assured for faster resolution.

11.12PAVAGADA Rectification of Non-Reporting/Compliance points

i. Non-reporting/faulty points to be rectified are listed Block wise and pooling station-wise latest summary status is provided via email dated 14th June 2024.

ii. In this regard a meeting KSPDCL along with developers were convened on 07-05-2024 @ 15:30 Hrs through VC to discuss the progress on integration of Telemetry in Pavagada Solar Park with SRLDC REMC.

iii. KSPDCL conveyed that rectification of faulty points is already completed for some blocks & remaining blocks are also under progress. Upon completion, joint verification is planned. Regarding non-compliance points like air density, cloud cover etc. & PPC points where configuration is required, KSPDCL has requested a month's time

Sl. No.	Substation /Developer	Element Name (Not reporting)		KSPDCL Remarks	SRLDC Remarks
1	KSPDCL 1	220kV BUS 2 Frequency	SOE test Pending for all 8 Pavagada Pooling Substation	220 kV BUS-02 is in shut down condition.	Need to check during charged condtion
2	KSPDCL 3	All 4 ICT's (230/33kV) MW and MVAR		All points reporting now.	Reporting
		33kV BUS 2 Voltage			
3	KSPDCL 4	All 4 ICT's (230/33kV) MW and MVAR		All points reporting except 33kV BUS-02 voltage, due to BCPU faulty.	Remaining points are reporting
		33kV BUS 1 and 2 Voltage and Frequency			
4	RYCLRU 1	220kV BUS 2 Voltage and Frequency		Not reporting due to BCU issue.	Issue Pending
5	RYCLRU 2	220kV BUS 2 Voltage and Frequency		Recitified the BCU card issue & it is reporting.	Reporting
6	TRMNI 1	220kV BUS 1 and 2 Voltage		All points reporting.	Reporting
7	TRMNI 2	66kV BUS 1 and 2 Voltage and Frequency		Not reporting due to BCU power card issue.	Issue Pending

Deliberation:

a) KSPDCL stated that the issue of non-reporting of 220kV BUS-2 frequency in KSPDCL-1 has been attended and rectified. Regarding the non-reporting of 220kV BUS-2 voltage and frequency at RYCLURU 1 and TRMNI 2, it was informed that the BCU is faulty in these stations and there is a delay in the supply of materials by OEM M/s GE. The materials are expected to be received in the first week of August 2024.

b) Regarding the non-reporting of SoE, KSPDCL mentioned that a service engineer is expected to visit by first week of August 2024 and the issue will be resolved during that time.

c) Regarding cloud cover and air density points, it was informed that all developers have been notified, and Azure has already been installed and Procurement under progress by TATA. In similar manner, some developers have approached vendors, and it is expected to be completed by September 2024.

d) SE (P, C&SS), SRPC highlighted that this is a long-pending issue and requested KSPDCL to expedite the process.

- ***KSPDCL to expedite the rectification of non-reporting points & pending compliance works from Pavagada Solar Park.***

For information of the forum (as furnished by SRLDC)

11.13 Intermittent reporting after prolonged outage of 230kV Chandragiri SS (GIREL)

230kV Chandragiri data (Connected to Tuticorin GIS station) is not reporting to SRLDC from 07.02.2024 09:41 hrs and to Backup Control Centre of SRLDC from 18.01.2024 22:15 hrs. After the 46th COMSR meeting, station data started reporting to both MCC and BCC on 24th May 2024 and again both channels have not been reporting since 12th June 2024 11:40 hrs and restored on 12th July 2024.

During the rectification GIREL has provided 4 channels (2+2 configuration)

up to the nearest wideband node, thereby the first station to comply with dual channel reporting to MCC and BCC of SRLDC with VLAN segregation.

Deliberation:

a) SRLDC stated that the 230kV Chandragiri data, which is connected to the Tuticorin GIS station, has not been reported to the SRLDC Main Control Centre (MCC) since 18.01.2024 22:15 hrs. and since 07.02.2024 09:41 hrs to Backup Control Centre (BCC), both data started reporting only from 24th May 2024.

After the 46th COMSR meeting, station data started reporting to both MCC and BCC on 24th May 2024 and again both channels have not been reporting since 12th June 2024 11:40 hrs and restored on 12th July 2024.

SRLDC further stated that during the rectification GIREL has provided 4 channels (2+2 configuration) up to the nearest wideband node, thereby the first station to comply with dual channel reporting to MCC and BCC of SRLDC with VLAN segregation.

11.14 Operational Feedback on the Communication System for ISTS in the Southern Region

RLDCs has to provide the operational feedback to CTU on the Communication system under the Regulation 7.5 of the CERC (Communication System for Inter State Transmission of Electricity) Regulations, 2017. Further clause 8.2 of the Procedure for Centralized Supervision, Monitoring and Fault Reporting of Communication System mandates for quarterly feedback to CTU & STU on quarterly basis or as applicable.

SRLDC have furnished the operational feedback to CTU highlighting following critical areas of ISTS Communication System for the quarter April-June2024:

- Substation/Generating station reporting in a single channel,
- Frequent interruptions of RTUs reporting to the BCC of SRLDC,
- Dual reporting of SR ISGS/IPP Remote stations RTUs to SRLDC Main and Backup Control Centre's,
- Radial fiber connectivity of ISGS and RE stations,
- Substations with a poor percentage of telemetry reporting, and
- Feedback on the Southern Region Unified Network Management System (SR-UNMS) Project.

Deliberation:

a) SRLDC informed that the CERC Communication Regulations 2017 & the Procedure for Centralized Supervision, Monitoring, and Fault Reporting of Communication Systems mandates that the operational feedback on ISTS communication systems shall be furnished to CTUIL on quarterly basis. Accordingly, SRLDC has provided feedback to CTUIL for the quarter April-June 2024.

b) CTUIL stated that the RTU/SAS gateway is part of the Substation SAS and should not be considered as a communication system as per the definition in the Communication Regulations 2017. Only the associated communication system from the wideband location is planned by CTUIL. The respective users are responsible for the RTU/SAS gateway and channel up to the nearest wideband. Thereafter, CTUIL will assess the need for augmentation or upgradation of communication equipment or paths to the appropriate control centre.

c) SRLDC mentioned that the operational feedback is based on the performance of RTUs and ICCP channels as observed through the diagnostic features of the SCADA systems at SRLDC.

d) CTUIL noted that providing an alternate path up to the wideband node for the radial fibre connectivity of RE stations may not be feasible, as these RE generators are connected by a single line. RE stations might face challenges in complying with Clause 4.12 of the CEA Manual of Communication Planning in Power System Operation, which mandates route-diversified paths for each communication channel.

e) It was suggested that while RE stations up to the CTU wideband node are connected through a single line, dual channels for control centres should be ensured via a single OPGW path. After handover at the CTUIL FOTE, the channels should have route diversity, ensuring a working path and protection path with resource disjoint.

12. CTUIL Agenda

CTUIL vide email dated 22.07.2024 (**Annexure-12**) had furnished the following agenda:

12.1 Supply & Installation of Firewall for POWERGRID (RTM & TBCB) sub-stations.

CTUIL vide email dated 22.07.2024 has furnished the following:

(i) POWERGRID has informed that in the existing 273 nos. of Substations of POWERGRID, Firewall is not available for electronic security perimeter as per CEA (Cyber Security Guidelines), 2021.

(ii) A meeting was conducted on 28.11.2023 among CTU, POWERGRID, CEA, NRPC & Grid-India to finalize the firewall architecture. Finalized architecture is given at Annexures of CTUIL agenda.

(iii) Later on, a committee was formed under the Chairmanship of CE (Cyber Security Division), CEA in line with the minutes of meeting dated 12.04.2024 convened by CEA and chaired by Member, Power System Later CEA vide letter dated 25.06.2024 had communicated that utilities are required to comply the CEA (Cyber Security Guidelines), 2021 and deploy Intrusion Prevention and Intrusion Detection System. Further, as Cyber Security Regulations of CEA are in advanced stage so there is no necessity for constitution of aforesaid committee.

(iv) POWERGRID has communicated to CTU that Firewall installation at existing substations involved a huge amount which cannot be covered through O&M expenses, therefore a scheme / Project may be prepared for supply and installation of Firewalls at the existing substations of POWERGRID. They further informed that, the Firewall shall be having electrical ethernet interfaces/ports and placed between FOTE & Communication Gateways. All ethernet based applications shall be terminated in the firewall ports directly (e.g. PMU, AMR, VOIP, SAS/SCADA etc.) before mapping into communication equipment for further optical transmission. There shall also be Main and Backup Centralized Management Console (CMC) required along with remote console at Regional level to manage these firewalls. The CMC will seamlessly integrate existing firewall (if any) and upcoming firewalls of different makes.

(v) POWERGRID has provided a list of substations where Firewall needs to be installed for southern region. There are 57 no. of PGCIL RTM Substations and 1 no. of PGCIL TBCB substation. For the RTM substations, expenditure of firewall installation can be booked in Add CAP or a new scheme may be prepared. For the TBCB substations, expenses can be booked under change in law as CERC order on petition no. 94/MP/2021.

Deliberations:

a) PGCIL (G&C)/ULDC stated that as per the CEA (Cyber Security Guidelines) 2021, it is mentioned to deploy Intrusion Prevention and Intrusion Detection Systems. For compliance with these guidelines, it

is necessary to procure the next-generation firewall and only in these typed the above specifications will be met. Basic Firewall does not have the above functionalities as stated in the Guidelines.

b) MS, SRPC enquired whether the next-generation firewall is required to comply with the regulations. PGCIL/ULDC clarified that Intrusion Prevention and Intrusion Detection Systems are provided by many OEMs within the next-generation firewall itself.

c) TGTRANSCO informed that all SCADA data is secured and it is nowhere being connected to internet so the data is protected. PGCIL added that one station data can be seen by other station data while using the IP address, hence the Firewall is required to avoid the interruption.

d) PGCIL (G&C) informed that in the existing 273 substations of Powergrid, firewalls are not available for the electronic security perimeter as per the CEA (Cyber Security Guidelines), 2021. PGCIL/ULDC stated that under these guidelines, it is necessary to provide firewalls for 57 RTM stations and one TBCB station in SR region.

e) SE (P, C & SS), SRPC enquired whether this issue has been discussed in other regions. PGCIL (G&C)/ULDC replied that this discussion was initially proposed in SR region and is planned to be subsequently discussed in other regions. PGCIL (G&C)/ULDC highlighted that it was thought to include under O&M expenses but this implementation cannot be done under this head due to the high cost.

f) PGCIL (G&C)/ULDC requested the forum to suggest CTUIL should formulate a scheme for procurement of firewall.

g) After deliberation, forum requested CTUIL to put up this agenda item in the NPC forum, as it pertains to all regions and obtain the conceptual approval to proceed further by RPCs. Commercial implications may also be deliberated during NPC meeting. CTUIL agreed the same.

12.2 Communication Issues at SEPL & MEPL

CTUIL vide email dated 22.07.2024 has furnished the following:

In the 47th COM SR meeting CTUIL was requested to convene a meeting to resolve SEPL & MEPL communication issues. In this regard CTUIL has called a meeting among SRPC, Grid India, POWERGRID, CTU, SEPL, & MEPL in Virtual Mode on 17.07.2024.

Following points were concluded in the meeting:

1. SEPL & MEPL to install 1 no. FOTE each at SEPL and MEPL stations.
2. POWERGRID to provide the required no. of ports at 765kV Nellore PS and at 400kV Nellore PG.

3. Configurations of communication equipment shall be done by respective utility at their end.
4. Configuration of data and voice channels to be done by POWERGRID after installation of FOTE at SEPL & MEPL stations.
5. SEPL/MEPL to check the feasibility for installation of OPGW on the other peak of SEPL/MEPL- Nellore and revert by 15 days.

Deliberations:

a) It was noted that in the meeting conducted by CTUIL, SEPL and MEPL had agreed to install one FOTE each at their respective stations.

b) Regarding the feasibility of installing OPGW on the other peak of SEPL/MEPL-Nellore, MEPL/SEPL informed that currently, one OPGW and one PLCC are available. The installation of an additional OPGW for better reliability/path redundancy was deemed unfeasible due to significant cost implications.

c) It was noted that as per regulations, path diversity needs to be ensured. MEPL mentioned that they currently have PLCC, and hence the installation of another OPGW may not be required to comply with the diversified path requirement. SRLDC stated that in such a case, they would need to install digital PLCC as there are plans to migrate to the IEC 104 protocol.

d) SEPL proposed that through VSAT communication, connectivity can be extended to Nellore Pooling stations. CGM, SRLDC suggested that installing OPGW would be more cost-effective compared to VSAT and other options, and requested SEPL/MEPL to conduct a cost-benefit analysis and decide accordingly.

e) After deliberations, MEPL/SEPL were requested to explore the available options and ensure the compliance of Regulations.

12.3 Dual reporting of SCADA Channels (RTU/SAS) to RLDC and Back up RLDC

CTUIL vide email dated 22.07.2024 has furnished the following:

(i) The agenda for dual reporting of SCADA Channels (RTU/SAS) to RLDC and Back up RLDC was deliberated in the 46th and 47th COM SR meeting.

(ii) CEA-PCD has issued a letter dtd. 22.07.24 for requirement of 2+2 channel in the existing ISTS stations also. For which necessary measures/upgradations are to be taken by CTUIL, POWERGRID and Grid-India.

(iii) For the requirement of SAS upgradation at existing ISTS substations a meeting has been held between CTU & POWERGRID Engg & Asset Management team on 15.07.2024. In the meeting OEM wise requirement was deliberated where some of the stations SAS Gateway may be needs to be upgraded and some stations cards needs to be upgraded. For the detailed requirement POWERGRID required 10-15 days and thereafter final requirement can be summarized. After finalization of inputs two separate schemes may be formed one for communication system and other for SAS system under transmission system.

(iv) For the ISTS stations CTU is planning for 2+2 requirement of Grid-Operation. For RE, IPP and ISGS stations, as deliberated in the 47th COM SR meeting, SRLDC was requested to convene a meeting with these utilities and advise to do the needful accordingly.

(v) As Grid-India is also doing SCADA upgradation work, a wider range of the stations where spare ports in the gateways/RTUs are not available can be covered under this project for providing the same.

(vi) It is also to be mentioned that RE/IPP generally connect with ISTS system by constructing Dedicated Transmission Lines (DTL), which is most of the time only a single transmission line for their power evacuation. As no diverse transmission line is available, it is not possible to install redundant OPGW. Further these RE generators are located in the remote areas where connectivity of Public Telecom operators is also limited for providing leased line. Moreover, this will call for additional expenses which may be burdensome for the RE/IPP/GENCO and needs a formal direction from CEA.

Deliberations:

a) CTUIL stated that a meeting was held between CTU and POWERGRID Engineering & Asset Management team on 15.07.2024 regarding the requirement for SAS upgradation at existing ISTS substations. During the meeting, the OEM-wise requirements were deliberated, noting that some station SAS Gateways may need to be upgraded and some station cards may need to be upgraded. POWERGRID requested 10-15 days to detail the requirements, after which the final requirements would be summarized.

Following the finalization of inputs, two separate schemes may be formed: one for the communication system upgradation and the other for the SAS system under the transmission system.

b) SRLDC responded that the relevant data has been shared to PGCIL, and PGCIL is required to consolidate the data and forward it to CTUIL.

c) PGCIL SR-II stated that dual Port reporting to SRLDC and backup NRLDC, presently each gateway has 4 ports in which ports reporting to NTAMC, backup NTAMC and RTAMC. If the number of ports increased, the performance of gateway may affect. Hence, new gateways need to be provided as per RLDC requirement. Also, existing software to be upgraded wherever required for compatibility of new gateway integration.

d) Forum requested PGCIL to consolidate all the details and submit the data to CTUIL.

13.PGCIL / ULDC Agenda

PGCIL/ULDC vide email dated 25.07.2024 (**Annexure-13**) had furnished the following agenda:

13.1 Laying of OPGW in 400 kV Maheshwaram -Hyderabad Link.

PGCIL/ULDC vide email dated 25.07.2024 has furnished the following:

(i) CTU vide office memorandum C/CTU/AI/00/18th CCTP dated: 14.06.2024 has approved for implementation of '' Reconductoring of Maheshwaram (PG) -Hyderabad 400kV S/c line -56 Km'' with HTLS conductor.

(ii) The original line i.e 400kV Hyderabad to Kurnool (AP) which was LILOed at Maheswaram PG was commissioned during 2005. LILO portion of the Line to Maheshwaram PG was commissioned on 31.08.2017.

(iii) In Maheshwaram (PG) -Hyderabad 400kV S/c line one peak is having OPGW which is operational from 01.10.2017 and another peak is having Earth wire. As the part of reconductoring work conductor along with earth wire need to be replaced. Instead of replacing it with the Earthwire it is proposed to replace it with OPGW of approximately 56.139 km to meet the future requirement and also degradation of the existing OPGW.

(iv) Cost towards the same shall be booked in above reconductoring project.

Deliberation:

a) PGCIL/ULDC stated that the original 400kV Hyderabad to Kurnool (AP) line, which was LILOed at Maheswaram PG, was commissioned in 2005. The LILO portion to Maheshwaram PG was commissioned on

31.08.2017. In Maheshwaram (PG) - Hyderabad 400kV S/c line, one peak is equipped with OPGW, operational since 01.10.2017, while the other peak has an earth wire. As part of the reconductoring work, the conductor along with the earth wire needs to be replaced. Instead of replacing the earth wire, it is proposed to replace it with OPGW of approximately 56.139 km to meet future requirements and address the degradation of the existing OPGW.

b) SE (P, C & SS), SRPC queried about the present capacity and utilization of existing OPGW on the line. PGCIL SR-I stated that the current OPGW has 24 fibres, of which 4 are used by ULDC and some by Telecom.

c) CTUIL stated that as per the current project scope, only the conductor is to be replaced, and the replacement of the earth wire is not mentioned in the project scope.

d) PGCIL SR-I stated that if the replacement of the earth wire is not in the approved project scope, agenda item can be dropped.

13.2 Laying of OPGW in 400 kV NPS_TPCIL Line

PGCIL/ULDC vide email dated 25.07.2024 has furnished the following:

(i) NPS _TPCIL Line – 32.756 km has been commissioned on 01.Sep.2013. OPGW in the said line has been commissioned on 01.03.2014.

(ii) As the area is nearer to coastal area, due to salinity, pollution (ash ponds, power plant etc.,) OPGW along with the tower parts are getting rusted. The same is damaging the OPGW. It is therefore requested to lay OPGW on the other peak of the Line.

(iii) Cost towards the same shall be booked in the proposed Southern Region Strengthening scheme.

Deliberation

a) PGCIL/ULDC mentioned that these lines are very close to ash ponds, and coal dust is also causing damage to the OPGW. They have also observed huge attenuation in the fibres. Due to salinity, the OPGW down clamps are getting rusted, causing damage to the tubes and fibres, and currently, not all 24 fibres are operational as some are damaged. Further, it was stated that even tower parts are getting rusted and recommended zinc coating on the towers earlier.

e) MEPL stated that their network runs parallel to the NPS-TPCIL line and is also close to coastal areas, yet they have not faced such issues, suggesting it might be due to improper stringing of OPGW.

f) It was noted that as per CERC Tariff Regulations, 2024, the useful life of OPGW is 15 years. The above proposed OPGW cable has not completed 15 years. PGCIL was suggested to furnish technical supporting documents along with the OTDR test reports from NABL accredited agency.

g) MS, SRPC enquired whether the lines fall under POC billing or bilateral billing with TPCIL.

h) PGCIL stated that they would check and update in this regard.

13.3 CTU Agenda (Item 14 of 44th COM_SR meeting): Replacement of old OPGW cable on 13 Communications Links in SR

PGCIL/ULDC vide email dated 25.07.2024 has furnished the following:

(i) As per minutes of deliberation of 44th COM-SR meeting item 14: (point e) Testing of the fibers through third party has been explored and found that only one NABL Accredited agency, Birla Cable Limited was carrying out ageing Testing. However, upon discussion with the agency it was informed that they are presently not carrying out the said Testing.

(ii) As no agency is available, it is proposed to get the fibers tested through OPGW agency in presence of members from CTU, RLDC and state Utility.

(iii) Coordination and arrangement for Testing shall be done by POWERGRID. Inclusion of 400kV Ramagundam -Warangal line - 99.48 kM which has completed 15 years of useful life which was not included in the list.

Deliberation:

a) PGCIL/ULDC stated that as per the deliberation of the 44th COM-SR, testing of the fibers through a third party was explored, and it was found that there was only one NABL Accredited agency, Birla Cable Limited, but not carrying out the testing. In the 44th COMSR meeting, the replacement of OPGW for 13 lines (400kV) were proposed and now one more line 400kV Ramagundam -Warangal line (99.48 kM) is proposed to be included to that list for replacement of OPGW as these lines have surpassed their life period of 15 years.

b) SE (P, C & SS), SRPC enquired with PGCIL whether they have undertaken such replacements in other regions and if so, on what basis/justification, the replacement works were undertaken.

c) CTUIL stated that MS, NRPC, in the TeST meeting, suggested that NPC is forming an SOP on Communication Audit, which will cover this aspect. Based on audit recommendations, actions can be taken. MS,

SRPC clarified that communication audit may not cover this aspect in detail, and detailed testing by a certified agency is necessary.

d) TANTRANSCO stated that if the fibers are healthy, the OPGW can be used for an extended period without replacement.

e) TGTRANSCO opined that if losses are increasing, it would be prudent to replace the fibers. The attenuation coefficient for wavelengths between 1525nm and 1575nm shall not exceed the attenuation coefficient at 1550nm by more than 0.05db/kM. The attenuation coefficient between 1285nm and 1330nm shall not exceed the attenuation coefficient at 1310nm by more than 0.05db/kM. The attenuation of the fiber shall be distributed uniformly throughout its length such that there are no point discontinuities in excess of 0.1db.

f) KSEBL suggested that by analyzing the OTDR graph, loss details can be assessed. If link loss and splice loss are within the limits, the sensitivity of the receiving equipment should be checked. As long as these are within limits, the fibers can continue to be utilized.

g) PED stated that in the past 10 years, they have not faced any such issues.

h) It was noted that the overall optical fiber path attenuation shall not be more than calculated as below:

*Maximum attenuation @ 1550nm: 0.21db/kM * total kM + 0.05db * no.of splices + 0.5db * no.of connectors.*

*Maximum attenuation @ 1310nm: 0.35db/kM * total kM + 0.05db * no.of splices + 0.5db * no.of connectors.*

i) SE (P, C & SS), SRPC enquired SRLDC whether any data issues/ data loss issues are faced form these links during the grid operation or anytime PGCIL has reported the communication issues attributing to the OPGW /fibers. SRLDC informed that the loss of data has never been reported due to OPGW cable issue and the data seems to be updating correctly.

j) Forum opined that there is no need for replacement when no issues are observed even if the life period of the OPGW is completed.

k) After deliberations, PGCIL was requested to provide more details/detailed reports regarding the number of fibers used, the number of fibers damaged, number of breakdowns, OTDR test reports, dark fibers etc. The matter will be further discussed in the ensuing COMSR meetings. PGCIL/ULDC agreed to furnish all the details.

14. Agenda items for information

i. Up gradation / Replacement of SCADA / EMS Systems in SR

a) The following were noted in the earlier meetings:

i) Grid-India would execute SCADA up-gradation project jointly with SLDCs in SR & WR. PGCIL would execute the SCADA up-gradation project jointly with SLDCs in ER & NR.

ii) It was noted that Karnataka is going for up-gradation of their SCADA on their own.

iii) SRLDC had informed that they were under the process of floating tenders and tendering process would be completed in 3 months. Execution was stated to be completed in 26 months for SRLDC, 20 months for all the States except Puducherry and 16 months for Puducherry.

iv) The timelines for extended AMC was stated to be as below:

SL	State / SO	Existing Contract validity	Maximum Extension Possible as per Contract
1	SRLDC	31st May 2023	31st May 2025
2	Andhra Pradesh	03rd Dec 2022	03rd Dec 2024
3	Telangana	15th Feb 2023	15th Feb 2025
4	Kerala	30th Jun 2023	30th Jun 2025
5	Tamil Nadu	01st Sep 2024	01st Sep 2024
6	U.T of Puducherry	23rd Feb 2022	23rd Feb 2024

v) The Communication utilities were suggested to consider the extension of AMC for the SCADA up gradation with the latest features / updates in the Cyber Security, as the SCADA up gradation is anticipated to be completed at the end of 2024.

vi) Based on the approvals received from other SLDCs, Grid Controller of India Limited published the tender on 6th March, 2023. The first pre-bid discussion meeting was held on 20th March, 2023 in connection with the execution of SCADA up-gradation project by Grid-India jointly with SLDCs in SR & WR. SRLDC had informed that the placement of LOA would be expected to be issued up to 6 months from tender issued month of September, 2023.

vii) It was noted that PSDF funding would not be available for SCADA up-gradation / replacement of SCADA / EMS Systems and hence requested all the States to mandatorily go for SCADA up-gradation as per MoP directives.

viii) In 48th TCC meeting (15.03.2024) and 50th SRPC meeting (16.03.2024), SRLDC had informed that the Tender evaluation process

and issue of LoI may be completed by April-May 2024.

ix) In 46th COM SR meeting, SRLDC had informed that prospective bidders have to submit the second stage of tender by 15th June 2024. So, after that it will take another month. Therefore, tender evaluation process may be expected to complete by July 2024. SRPC had requested SRLDC to furnish the updated table in this regard. Still yet to receive from SRLDC.

x) In the 47th COMSR meeting held on 24.06.2024, SRLDC had informed that two bids have been received and financial bids will be opened by end of July 2024. Updated Table has been furnished by SRLDC as below:

S. No.	Description	SRLDC	Kerala, Tamil Nadu, Telangana, Andhra Pradesh	Puducherry
1	Finalization of Technical Specifications and BOQ for all SLDCs and RLDC for new SCADA system	December 2022	December 2022	December 2022
2	Tender publishing Date	06th March 2023	06th March 2023	06th March 2023
3	Tender Opening Date (original)	26th April 2023	26th April 2023	26th April 2023
4	Number of Extension done opening tender	04	04	04
5	Date of submission of proposal	27th June 2023	27th June 2023	27th June 2023
F 6	Actual date of tender opening after receiving consent from SLDCs	03rd July 2023	03rd July 2023	03rd July 2023
7	Tender Evaluation process and Issue of LOI by GRID-INDIA for new SCADA system	July 2024 (Tentative)	July 2024 (Tentative)	July 2024 (Tentative)
8	Completion Schedule (in Months)	26	20	16
9	Start of Parallel Operation	July 2026 (Tentative)	December 2025 (Tentative)	August 2025 (Tentative)
10	Execution of project (ToC)	September 2026 (Tentative)	March 2026 (Tentative)	November 2025 (Tentative)

xi) SRLDC, Grid-India vide mail dated 16.07.2024 had furnished the following status update:

S. No.	Description	SRLDC	Kerala, Tamil Nadu, Telangana, Andhra Pradesh	Puducherry
7	Tender Evaluation process and Issue of LOI by GRID-INDIA for new SCADA system	**August 2024 (Tentative)**	**August 2024 (Tentative)**	**August 2024 (Tentative)**
8	Completion Schedule (in Months)	**26**	**20**	**16**
9	Start of Parallel Operation	**August 2026**	**January 2026**	**December 2025**
10	Execution of project (ToC)	**October 2026**	**April 2026**	**February 2026**

Forum noted the same.

ii. Non-Availability of Entire Telangana data at SRLDC

(vi) As decided in the 39th COM SR meeting held on 18.10.2023, SRPC vide letter dated 02.11.2023 had constituted a Task Force to carry out the root cause

analysis of the event of Non-reporting of real time data to Telangana SLDC on 14.09.2023 with the following Terms of Reference (ToR):

1. To carry out the root cause analysis of the event (Non- reporting of real time data to Telangana SLDC) happened on 14.09.2023 and suggest any changes, if required.
2. To recommend the remedial measures to be taken by all Control Centers.
3. To study the implemented architecture for RTU data reporting to SLDC/SRLDC by SR STU, POWERGRID SR-1 and 2 and formulate best practices for network implementation for RTU data reporting.
4. Any other suggestions/recommendation on related matters.

(vii) Taskforce vide email dated 12.01.2024 had submitted its Report and informed that the committee has conducted 7 number of meetings and finalized the Report. The Task force had analyzed the event and reported their observations/deficiencies in the TS communication network/system. Task force has also specified the recommendations in the Report to TSSLDC/TSTRANSCO so as to avoid such instances in future. In the meeting, TSSLDC/TSTRANSCO was requested to comply with the observations/recommendations of the Taskforce so that no deficiencies are observed in future and to avoid the recurrence of such major incidents.

(viii) In the 43rd COMSR meeting held on 22.02.2024, TSTRANSCO had informed that they had done testing at two of their stations with CVLAN configurations and it was working. Many equipment addition and change in configuration are being carried out. In a phased manner, they will implement at all stations. TSTRANSCO had also tested implementation of data routing with CVLANs (allocated different CVLANs to three RTU stations and merged at the control center) in Tejas equipment successfully. Currently total data is being transmitted through one network (mainly 10 series) and decided to divide the network into multiple ways. In consultation with TSSLDC, the network will be designed and finalized. Further, CVLAN configuration will be carried out. Details of the same will be furnished in this regard. All recommendations of Task Force will be able to complete within two months' time.

(ix) In 44th COMSR meeting, TSTRANSCO had furnished the report/action taken on the Recommendations of Task Force. The same was deliberated. In the 45th COMSR meeting, it is informed that the agenda item will be kept under information items of COMSR meetings and requested TSTRANSCO to update if any action is taken on recommendations.

(x) In 47th COMSR meeting, TGTRANSCO stated that the main data has been separated out from RE generation data. VLAN configuration is in process and stated that the status will be updated by next month.

Deliberations: -

TGTRANSCO stated that RE generation data has been segregated from main data. VLAN segregation is also in progress.

- ***TGTRANSCO to furnish the status of the recommendation.***

iii. Taskforce recommendations for SR STUs /SLDC regarding SCADA/ Communication system

(i) Taskforce, constituted to carry out the root cause analysis of the event of Non-Reporting of real time data to Telangana SLDC on 14.09.2023, has submitted its report vide email dated 12.01.2024. In line with the ToR given, Taskforce also studied the implemented architecture for RTU data reporting to SLDC/SRLDC by SR STUs, POWERGRID and suggested the Recommendations & Remedial measures. Taskforce had also formulated the best practices for network implementation.

(ii) In the 42nd COMSR meeting held on 22.01.2024, the report submitted by the Taskforce was deliberated and SRLDC was requested to bring out the common recommendations for all the SR STUs communication systems. The same would be circulated among the STUs/SLDC for implementation.

(iii) SRLDC vide email dated 26.01.2024 had submitted the common points/recommendations and the same were circulated to all SR STUs, PGCIL & CTUIL to furnish the action plan for implementation of the same. 4 schemes are proposed for the communication network for Remote Terminal Units (RTUs) in a utility system that can be segmented and configured to enhance efficiency, security, and manageability. General Recommendations has also been given under the following heads:

1. Logs archival and retrieval
2. Communication Network Configuration
3. Cyber Security
4. Regular Monitoring
5. Regular Testing
6. Documentation and operating and Testing Procedures

(iv) In the 43rd COMSR meeting held on 22.02.2024, all entities were requested to furnish a point-wise reply regarding the implementation status of the Common Recommendations of the Taskforce to SRPC.

(v) In the 46th COMSR Meeting held on 22.05.2024, it was noted that all SR entities had furnished the details.

MS, SRPC had suggested that few compliances on recommendation needed to be monitored. Therefore, requested all entities to update if any action is taken on recommendations. Henceforth the agenda item will be kept under information items of COMSR meetings.

(vi) In the 47th COMSR meeting held on 24.06.2024, it was informed that no updates have been received from any of the entities. All entities have been requested to update as and when any recommendations are compiled by them.

Deliberations: -

SRPC requested all entities to furnish the compliance status by mail as and when the points are complied.

- ***All entities to furnish the status of the recommendations.***

iv. Cyber Security

(i) Chapter 8 (CYBER SECURITY) of CERC (Indian Electricity Grid Code) Regulations 2023, envisages as follows:

Quote

50. GENERAL

…..

(2) All users, NLDC, RLDCs, SLDCs, CTU and STUs, power exchanges, QCAs, SNAs, shall have in place, a cyber-security framework in accordance with Information Technology Act, 2000; CEA (Technical Standards for Connectivity) Regulations, 2007; CEA (Cyber Security in Power Sector) Guidelines, 2021and any such regulations issued from time to time, by an appropriate authority, so as to support reliable operation of the grid.

51. CYBER SECURITY AUDIT

All users, NLDC, RLDCs, SLDCs, CTU and STUs, power exchanges, QCAs, SNAs, shall conduct Cyber Security Audit as per the guidelines mentioned in the CEA (Cyber Security in Power Sector) Guidelines, 2021 and any other guidelines issued by an appropriate Authority.

52. MECHANISM OF REPORTING

(1) All entities shall immediately report to the appropriate government agencies in accordance with the Information

Technology Act, 2000, as amended from time to time, and CEA (Cyber Security in Power Sector) Guidelines, 2021, in case of any cyber attack.

(2) NLDC, RLDCs, SLDCs, RPCs and the Commission shall also be informed by such entities in case of any instance of cyber-attack.

Unquote

(ii) Article 14 of CEA (Cyber Security in Power Sector) Guidelines, 2021 amended to date are reproduced as below:

Article 14 Cyber Security Audit

a) *The Responsible Entity shall implement Information Security Management System (ISMS) covering all its Critical Systems.*
b) *The Responsible Entity shall through a CERT-In Empanelled Cyber Security OT Auditor shall get their* ***IT system audited at least once in every 6 (six) months*** *and* ***OT System audited at least once in a year.*** *The Responsible Entity shall close all critical and high vulnerabilities within a period of one month and medium as well as low non-conformity before the next audit. Effective closure of all non-conformities shall be verified during the next audit.*
c) *The Cyber Security Audit shall be as per ISO/IEC 27001 along with sector specific standard ISO/IEC 27019, IS 16335 and other guidelines issued by appropriate Authority if any. These mentioned standards shall be current with all amendments if any and in case if any standard is superseded, the new standard shall be applicable. CISO shall ensure immediate closure of non-conformance, based on the criticality and by means all non-conformances are to be closed before the next audit.*
d) *The Responsible Entity shall ensure that CISO has all the required systems and documents in place, as mandated by NSCS for base line cyber security audit.*

- ***All entities to ensure the compliance of CEA Cyber Security Guidelines.***

15. 49th Meeting of Communication System / COM SR

49th COM SR Outage September 2024 meeting will be held on **23rd August 2024 (Friday) through VC.** All entities are requested to furnish the agenda pertains to Communication issues if any, by 15th August 2024.

16. Conclusion

MS, SRPC thanked all the members and participants for their active participation in the COM SR meeting.

*****

Annexure-III

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/SR **Date:** 30/08/2024

Subject: Minutes of 6th Southern Region ISTS Communication Planning Meeting (SR-CPM) held in virtual mode (MS-Teams) on 13th August 2024

Dear Sir/Madam,

Please find enclosed the minutes of the 6th Southern Region ISTS Communication Planning Meeting (SR-CPM) held on 13th August 2024 through virtual mode.

Thanking you,

Yours faithfully,

(H S Kaushal)
Sr. GM (CTUIL)

Minutes of 6th Southern Region ISTS Communication Planning Meeting (SR-CPM) held in virtual mode (MS-Teams) on 13th August 2024

The 6th meeting of SR-CPM held on 13.08.2024 through virtual mode (MS-Teams).

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

Sr. GM (CTU) welcomed all the participants at the 6th meeting of SR-CPM. He emphasised about the need of Communication Planning Meetings which have come up with several Communication schemes in all regions by the active participation and support of all members which got finally approved by NCT. Sr. GM (CTU) also thanked MS, SRPC for his presence in the meeting and getting consistence guidance and support from him.

Sr. GM (CTU) requested MS, SRPC to give an address note to the forum. MS, SRPC highlighted the importance of communication system in the Power Sector and also mentioned that cooperative approach is appreciated from all members for better participation in the planning of communication systems.

Sr. GM (CTU) requested DGM (CTU) to proceed in the meeting with the agenda items.

Agenda wise deliberation is as under:

Agenda 1: SRLDC Operational feedback on communication system received on 16.07.2024

I. Substation/Generating station reporting in single channel

Following RTUs are reporting to SRLDC in single channel

Sl. No	Name of the station	Owner	Protocol	Reporting to	Apr-June 2024 Availability	Status
1	400kV LANCO	LANCO	IEC 101	SRLDC DCPC at Bangalore	94.57%	Reporting through PLCC. Secondary link yet to be provided.
2	400KV MEPL	MEPL	IEC 101		96.79%	No connectivity to ULDC Network, both links established through leased line (POWERTEL) which is highly intermittent
3	400kV SEPL	SEL	IEC 101		93.45%	No connectivity to ULDC Network. Both links established through leased line (POWERTEL) which is highly intermittent
4	400kV NTPL	NLC/TN	IEC 101		99.81%	Reporting on ULDC network, Secondary link established through leased line (BSNL) which is highly intermittent

To understand and resolve the communication issues of 400KV MEPL & 400kV SEPL, an online

meeting has been convened by CTU among SRLDC, POWERGRID, MEPL & SEPL on 17.07.24. Further matter also discussed in 48th COM SR meeting held on 29.07.2024.

Communication issue of 400kV LANCO & 400kV NTPL shall be discussed in 6th SR CPM.

Deliberations:

Grid-India explained the issue of single channel reporting of LANCO & NTPL to SRLDC and their availability of communication channel is below the desired level in last quarter.

Representative of LANCO stated that their link to Vijayawada (PG) is through PLCC and second communication channel is planned over BSNL leased line for which associated hardware has been purchased. LANCO also stated that only permission from SR-1 PG is pending. SRTS-1 informed that permission accorded by Vijayawada (PG) for termination of BSNL circuit for the communication up to ULDC PDH for SRLDC standby Channel.

SRLDC has informed that DCPC at Vijayawada along with other PGCIL sites is scheduled to dismantled in the year 2026 as per SRLDC SCADA upgradation scheme. Consequently, data transfer using the IEC 101 protocol will become challenging from DCPC sites, hence suggested for upgrading the RTUs to the IEC 104 protocol as soon as possible.

LANCO: LANCO informed that BSNL leased line will be completed by end of August 2024 and as OPGW cable laying requires high expenditure and they will discuss with management and revert in one week.

CTU requested to CEA-PCD to give their views on connectivity in cases where OPGW is not available, and backup communication is planed over leased lines.

CEA-PCD stated that as per CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022 for 110 kV & above transmission lines primary communication path must be on OPGW while secondary path can be on PLCC or physically diversified OPGW cable. CEA-PCD further advised that LANCO should provide primary communication path on OPGW and use an alternate medium for the secondary channel to meet the availability criteria. If there are any constraints, then LANCO and other such utilities may be given some additional time for the installation of the OPGW on case-to-case basis. CTU then sought clarification regarding this clause, specifically whether this regulation, which applies to the new transmission lines, is also applicable to existing lines. CEA-PCD confirmed that the Regulation is indeed to comply for new as well as existing transmission lines.

In line with the above deliberation, it was concluded that the M/S LANCO should plan for OPGW Link as a primary mode of communication with the existing PLCC as standby path of communication.

NTPL:

NTPL informed forum that they are connected to Tuticorin S/s using PLCC and BSNL leased line as primary and secondary link respectively for communication.

SRLDC enquired about readiness of 104 protocol, NTPL replied that IEC104 protocol will be available by Dec'24. They also mentioned that OPGW is presently only used for AGC operation purpose. CTUIL enquired whether by existing FOTE can they use OPGW for SCADA data. NTPL stated that they shall confirm the same. SRLDC further stated that secondary OPGW path is required to comply with CEA communication planning criteria for Communication system through TNEB OPGW network. OPGW on 230kV NTPL- TANTRASCO TTPS- TTPS AUTO S/C – Kayathar 400 kV- Karaikudi PGCIL network owned by TNEB. CTU enquired TANTRANSCO

about OPGW availability on this section and wideband network availability on TTPS station. TANTRANSCO informed that last-mile connectivity to NTPL is incomplete, with approximately 700 meters lacking OPGW, TANTRANSCO stated that they will provide detailed information to CTUIL at later time. NTPL & TRANTRANSCO are requested to provide necessary details to CTU.

After Deliberation the following were concluded

1. NTPL to take up with PGCIL for second communication OPGW path through the existing on 230kV NTPL- TANTRASCO TTPS- TTPS AUTO S/C – Kayathar 400 kV- Karaikudi PGCIL line in co-ordination with CTU, STU & POWERGRID.
2. NTPL in coordination with PGCIL shall upgrade /install necessary ethernet cards in existing ULDC FOTE equipment.
3. NTPL to comply with the 2+2 channel requirement during the 104 upgradations

SEPL and MEPL connectivity has been discussed on 17.07 2024 and 48th COMSR and SEPL and MEPL to revert on integration with ULDC network with timelines in line with the CEA technical standards for construction of electrical plants and electric lines 2022.

CTU requested CEA-PCD views regarding the guidelines for RE and IPPs generators for data communication on two physically diverse paths in cases where only a single dedicated transmission line is available upto the nearest wideband node. CEA-PCD informed that Member, PS may form a committee to discuss such issues related to for RE/IPP generators connected through dedicated transmission lines. CEA also suggested that RLDCs may allow some time to generators to implement OPGW if the primary communication path is not currently on OPGW.

II. Frequent interruption of RTUs reporting to Backup CC

Approximately 40 no of IEC 104 RTUs are reporting to the Backup Control Centre (CC) through the ULDC network in single channel. SRLDC observed that there is insufficient protection for the path for these RTUs to report at the Backup CC.

Deliberation:

SRLDC presented the agenda, highlighting that IEC 104 RTUs to Backup Control Centre (BCC) is currently reporting through the ULDC network using only single channel. It was noted that communication path for theRTUs report to Backup CC lacks sufficient protection. Therefore, requested for provision of alternate channels to strengthen the communication links to the BCC of SRLDC from the Remote Sites. It was also informed that ICCP from SLDC BCCs to SRLDC BCC is running on POWERTEL single channel, so requested for provision of alternate channel to strengthen the communication links from SLDC BCCs to SRLDC BCC from ULDC Network.

SRLDC mentioned that the NEW SCADA and the existing SCADA systems will run parallel for three months, necessitating spare ports to facilitate seamless parallel operation at SRLDC BCC. Further, it is crucial to ensure that IEC 101 RTUs report directly to the SRLDC BCC, with PDH provisions in place at the SRLDC BCC. Following the SCADA upgrade, SRLDC will no longer maintain the DCPC at PGCIL sites for IEC 101 remote stations.SR-1 and SR-2 PGCIL ULDC representative stated that communication channels up to BCC involves WR and NR ULDC networks, requiring coordination with ULDC teams from WR and NR regions and assured that the challenges should be addressed collectively. SRLDC requested to monitor integrational channels for the purpose of BCC of RLDC need to be monitored through the EMS/NMS system.

CTUIL proposed that a separate meeting to be organised with the NR, WR and SR ULDC teams, as well as CC- GA&C team of POWERGRID, SRLDC, NRLDC, CTU to address these issues. The Meeting shall be convened by CTU.

III. Dual reporting of SR ISGS/RE Remote stations to SRLDC Main and Backup Control centres

A. ISGS/IPP reporting at SRLDC

A meeting was conducted by SRLDC on 26th July 2024 with participation from ISGS, IPP, SRPC, POWERGRID & CTUIL to update the status of provision of dual channel to the Main Control Centre (MCC) and Backup Control Centre (BCC) of SRLDC from ISGS and IPP stations. Minutes of meeting has been issued on 07.08.2024. As per minutes inputs are required from POWERGRID to plan additional FOTE/Cards for requirement of 2+2 channels.

B. RE Generators reporting at SRLDC

SRLDC has already conducted a meeting to apprise RE generators for 2+2 channel requirement. CTU requested SRLDC to provide e-mail and contact details of RE generators in the 48th COM SR meeting. CTU may communicate the RE generators for 2+2 channel requirement, a separate meeting may also be called if required for the same.

Deliberation:

CTUIL requested PG SR-1 & SR-2 ULDC to provide details of FOTE & ethernet card if any, requires upgradation for providing dual channel connectivity at ISGS stations at ISGS level if FOTE are installed under ISTS schemes at ISTS stations. PGCIL stated that they will cross check and inform within one week.

CTUIL also requested SRLDC to provide contact details of RE /IPP generators so that CTU can communicate them regarding 2+2 channel requirement and meeting can be convened if required, SRLDC agreed for the same.

C. Radial Fibre connectivity of ISGS/RE stations

The following ISGS/IPP/RE stations is connected to the ISTS through radial fibre connectivity without sufficient redundancy and route diversity.

Substation Name	ISGS/IPP/RE	Installed/Planned capacity (in MW)	Nearest wideband node
400kV Coastal Energen	IPP	1200MW	400kV Tuticorin PS 400kV Tuticorin PS
400 kV NTPL	ISGS	1000 MW	
400kV ILFS	IPP	1200MW	400kV Nagapatinam
400kV TPCIL (SEIL-1)	IPP	1320MW	765kV Nellore Pooling station
400kV NCC (SEIL-2)	IPP	660MW	
400 kV MEPL	IPP	300 MW	
400 kV SEPL	IPP	600 MW	
400 kV LANCO (No OPGW)	IPP	366 MW	400 KV Nunna (Vijayawada)
230kV Maniyachi (MYTHRA Power)	RE	300MW	400kV Tuticorin GIS
230kV GIREL (Chandragiri)	RE	250MW	
230kV Orange Sironj		200MW	
230kVBetam		220MW	
230kV JSW Renew F1		300MW	
230kV JSW Vilathikulam		210MW	

Substation Name	ISGS/IPP/RE	Installed/Planned capacity (in MW)	Nearest wideband node
230kV JSW Savalperi		330MW	
230kV GRT Solar		150MW	
230kV Etyarpuram (NTPC)		230MW	
220kV NPkunta PS-1 (APSPCL)		250MW	400kV NPKunta
220kV Galiveedu PS(APSPCL)		400MW	
220kV NPkunta PS-2 (APSPCL)		250MW	
220kV NPkunta PS-3 (APSPCL)		250MW	
220kV NPkunta PS-4 (APSPCL)		250MW	
220kV Renew Surya Ojas		300MW	400kV Koppal
220kV Ayana		300MW	
220kV Renew Roshini		300MW	
220kV Serentica		200MW	
220kV Ostro Kannada		300MW	400kV Hiriyur
220kV Spring Wind		300MW	400kV Pugalur
230kV Dharapuram		250MW	400KV Karur

CTU may kindly explore the feasibility of redundant channel through alternate path from the above generating stations to nearest wideband node to ensure redundant connectivity to nearest wideband node.

Deliberation:

SRLDC pointed out that Real-time data from Coastal Energen, a major generating station of 1200 MW capacity was interrupted for 221 hours and 59 minutes from May 27, 2024, to June 5, 2024, due to a fibre damage caused by a flashover, underscores the need for redundancy with route diversity.

CTUIL requested SRLDC to provide segregated list of ISGS/IPP/RE so that CTU can examine the possibility of establishing redundant communication paths. CTU further explained that while they can plan second path for the ISGS stations which areconnected with ISTS lines, however RE & IPP owners need to plan and install second OPGW path wherever feasible, of their own.
CEA-PCD also informed that this aspect should be addressed by the committee to be formed by Member, PS.

D. Substations with poor percentage of telemetry reporting

Following Substations had poor percentage of telemetry reporting in Quarter 1 of FY 2024-25:

Sr.No	Substation	Type	Telemetry Availability Percentage (Q1: 2024-25)		
			April (%)	May (%)	June (%)
1	230kV GIREL (Chandragiri)	ISTS Wind	0.00	99.98	0.00
2	400 kV Tumkur	ISTS	99.85	98.84	17.77
3	400kV Gajuwaka	ISTS	98.74	28.04	98.96
4	400 kV SEPL	IPP	97.07	91.72	91.57
5	400 kV LANCO	IPP	80.68	99.99	100.00
6	400kV Coastal Energen	IPP	99.98	83.93	99.79
7	400 kV Nagarjuna Sagar	ISTS	86.77	100.00	100.00
8	765 kV Kurnool	ISTS	99.76	87.33	100.00
9	400 kV MEPL	IPP	96.72	93.66	99.99
10	Neyveli Expansion II	ISGS	94.28	99.99	100.00

Deliberation:

SRLDC stated that the availability is not as desirable due to single communication path and IEC101 legacy protocol issues. This issue can be resolved once alternate path becomes available.

E. Feedback on SR-UNMS Project

CTUIL informed that UNMS group of CTUIL is y working on the operational feedback related to UNMS.

Agenda 2: Updated Power map and FO map of STU network

For ISTS communication planning purpose, all the STUs of southern Region may provide their latest power map and fiber optic map to the CTU.

Deliberation:

CTUIL requested utilities to provide state power map and FO map for future planning requirements.

In response to a query by some STUs, MS-SRPC clarified that all the states should provide latest Power map of 220kV & above and FO map of 110kV & above to CTUIL, this information is essential for comprehensive planning of the communication network for southern region. also stated that CEA and CERC communication system related regulations mandates for the sharing of information with CTUIL.

Agenda 3: Strengthening of Backup SRLDC communication channels.

SRLDC has informed the failures of RTU channels to BCC of SRLDC in the last quarter through Operational feedback of Q1 FY 2024-25, and even ICCP links are working on single channels from State Backup SLDCs, SRLDC SCADA/EMS upgrade project is expected in near future, hence there is need for the review and plan the Communication links with redundancy for SRLDC BCC.

It is to be noted that there are numerous unknown factors related to the failures of the BCC of SRLDC. The specific reasons for each failure have yet to be intimated, and it is essential to receive detailed, point-by-point confirmation that redundancy and path diversity are provided for the above links. As these necessities for long term reliable solution by enhancing the communication links for the SRLDC Backup and ensure its effectiveness, the following strengthening measures are necessary:

1. Reasons for failure of Frequent communication failures and associated strengthening at SRLDC BCC ad plan for future to avoid interruptions.

2.Establishment of ICCP standby communication channels from SLDCs to SRLDC BCC.

3.Monitoring these links up to SRLDC BCC in the upcoming SR UNMS systems for remote monitoring of link availability, complying with CEA Communication regulations.

4.SRLDC SCADA/EMS project has a provision for the AGC application, considering the same in future SRLDC backup may operate AGC from Backup CC SRLDC and associated communication links from Remote Sites need to be planned.

5.There are many RTUs are reporting on IEC 101 to SRLDC through DCPC, migration plan to IEC 104 under discussion and wherever the IEC 104 is not possible, Integration plan for IEC 101 RTUs to SRLDC BCC need to be devised.SR-1 and SR-2, PGCIL agreed to upgrade all RTUs to IEC-104 protocol by June 2025.

It is essential to address these requirements and plan accordingly

Deliberations:

CTUIL stated that for this purpose a separate meeting shall be convened among NR, WR, SR ULDC team, CC- GA&C team of Powergrid, SRLDC, NRLDC, CTU to resolve these issues.

Agenda 4: Status of Hotline Speech Communication System

In 4th, 5th CPM and Special meeting on VOIP upgradation, CTU has informed that upgradation

of existing Hotline Speech systems is under consideration and shifting to New Building is required in case of SRLDC, and CTU is requested to provide the status of upgradation of existing Hotline Speech system and requested to consider the shifting to New Building under the scope of the Project**.**

Deliberation:

CTUIL provided latest update on the VoIP Communication scheme, the agenda has been put up in the 52nd SRPC/49th TCC meeting has been technically agreed with comments of TGTRANSCO, minutes are yet to be issued. Further same was in principle approved in the special WRPC meeting held on 29.07.24. CTU informed that after approval from all the RPCs, same shall be put up by CTU in NCT. SRLDC stated that Draft Technical Specifications prepared by implementing agency in which the scheme details along with BoQ shall be shared with all stakeholders before finalization.

SRLDC stated that AMC is going to expire in July,25 therefore contingency arrangement is required to be made. CTUIL replied that POWERGRID shall make necessary arrangement for functionality of existing VOIP system till the commissioning of proposed new VOIP system for the purpose of Grid-Operation. Further CTUIL stated that POWERGRID to file petition for revised depreciation of existing VOIP system as useful life of same was 15 years which is yet to be completed. POWERGRID to confirm for the same.

Agenda 5: Streamlining of integration of RE station in ISTS Wideband.
As per the 48th COMSR Meeting deliberations, at ISTS node many RE stations are integrated at Ethernet through Media converters, for example at NP Kunta. All these non-homogenous integrations should be standardized by integrating the two stations at STM level and Demultiplexing should happening at final handover point i.e at Control Centre. As per the last CPM Meeting PGCIL has proposed additional FOTE at Np Kunta subject to approval of NCT, status of the same is requested to update and requested to streamline such integrations to avoid frequent failures of telemetry from these stations.

CTUIL is requested to update and streamline the integration of these FOTE at ISTS wideband as per connection Agreement.

Deliberations:

SRLDC outlined the agenda concerning the non-homogenous integration of RE station at ISTS wideband nodes such as NP Kunta. SRLDC emphasized that RE generator should be integrated at the optical level with nearest wideband via FOTE.

CTUIL stated that for upcoming stations (RE/IPP/ISGS etc.) integration methodology shall be ensured on optical SFP level only to mitigate ports and bandwidth limitations at ISTS nodes.

POWERGRID requested CTU to take up with existing RE generators at NP-Kunta about the optical integration requirement. CTU responded that POWERGRID may provide current integration details of the generators at NP Kunta, CTU will then send communication to RE Gen for optically patch FOTE among them and send a single optical connectivity with NP Kunta ULDC FOTE.

Agenda 6: Status update on the last CPM deliberation on following agenda points

As per the 4th CPM Meeting on 31st July 2023 deliberations
i on planning resource disjoint, it was decided to list out the nodes where capacity has been exhausted up to 75% and/or nodes which SPoF, where resource disjoint requirement is possible in view of upgradation /replacement/ addition of equipment. In view of the above PGCIL/CTUIL to

update the status of such nodes and upgradation plan.

ii Upgradation of existing STM4 to STM 16 capacity at below paths:

a) Kudankulam - Tutricoin PS- Madurai- Udumelpet
b) Kudankulam- Tirunelveli- Trivandrum
c) Tirunelveli - Edamon
d) Gooty- Kurnool
e) Gooty- Gooty (AP)

As per deliberation STM4 to STM 16 upgradation need to be taken up considering multiple channels and redundancy for RTU, VOIP, PMU, Meter and AGC, SPS and protection etc. In view of the above PGCIL/CTUIL to update the status of upgradation of these paths.

iii FO connectivity between UDUPI (KPTCL) - HASSAN (STM-16)

As per deliberations, keeping in view of the importance of upcoming Kasargode ISTS S/s connectivity, OPGW on 400kV Udupi (KPTCL) – Hassan line of KPTCL is essentially required and requested to take up installation of OPGW on this line either by KPTCL/CTUIL. KPTCL informed that it shall discuss with Management on this proposal and update the same. CTUIL/KPTCL is requested to update the status.

iv SEPL - MEPL - OPGW (STM-16)

As per the deliberations of 48th COMSR SEPL and MEPL agreed to provide the FOTE to integrate with ULDC network and there was discussion on feasibility of installing OPGW on the other peak of SEPL/MEPL-Nellore.
SEPL/MEPL and CTUIL s requested to finalize the scheme.

Deliberations

(i) CTUIL stated that new STM-16 FOTE can be installed if existing STM-4 FOTE are having bandwidth constraints. CTU requested POWERGRID to provide year wise commissioning details of FOTE.

(ii) CTUIL stated that Tuticorin- GIS is on radial connectivity, to provide backup path OPGW can be installed over another D/c line between Tuticorin PS – Tuticorin GIS that required 25 kns. Of OPGW (24F). Same was agreed in the meeting, CTUIL to prepare the agenda for upcoming SRPC/TCC meeting for the same.

(iii) Redundant Communication for UPCL & KASARGODE stations:
This agenda was also deliberated in the 4th CPM of SR where OPGW feasibility was deliberated between UPCL and Hassan (KPTCL) stations. KPTCL stated that there is no direct fiber availability from UDUPI to HASSAN. however, OPGW connectivity is planned on 220kV lines between UPCL, Udupi (KPTCL) – Hassan (with multiple S/s in between Hasan - Chikmangaluru - Shimoga – Varahi - Heggunje - Kemar -UPCL) and communication link can be established, but in 4th CPM, KPTCL was requested by forum for feasibility of laying OPGW on 400kV Udupi (KPTCL) – Hassan line of KPTCL either by KPTCL or PGCIL under ULDC scheme.

MS SRPC stated that this agenda was already discussed around one year ago, KPTCL to expediate and provide the their view on the said proposal.

KPTCL stated that they will provide their view within one week.

(iv) SEPL-MEPL

CTUIL informed that a meeting has been convened with SEPL & MEPL and both SEPL MEPL have agreed for FOTE upgradation by December 24.

Agenda 7: BoQ finalization for SRLDC new building communication

Considering the requirement of uninterrupted real time voice/ data exchange between upcoming SRLDC (CPRI campus), POWERGRID (Somanhalli) and existing SRLDC, two (2) redundant paths interconnecting SRLDC (CPRI campus), POWERGRID (Somanahalli) and existing SRLDC is to be ensured.

As per the finalized scheme for last mile connectivity to SRLDC CPRI CAMPUS, SR-2 PGCIL is requested to update the status of BOQ Finalization on the following links/equipment:

i. OPGW on 220 kV Peenya – Hebbal
ii. OPGW on 220 kV Hebbal – Hoody
iii. OPGW on 66 kV Hebbal – RMV 4. UGFO from CPRI S/S to CPRI boundary wall - (2km)
iv. UGFO from RMV to CPRI boundary wall (for redundancy) - (2 km)
v. UGFO from CPRI S/S to CPRI through AIRFORCE LAND
vi. STM -16 at HOODY HEBBAL & PEENYA
vii. STM-16 equipment with min 3 MSP (1+1) shall be installed at new SRLDC building at CPRI campus and 220 kV Hebbal S/s with one direction towards Peenya- NRS- existing SRLDC and other one towards Hebbal - Existing SRLDC.
viii. Ten (10) hrs Battery backup as per Clause (8.11) from Central Electricity Authority (Technical Standards for Communication System in Power System Operations) Regulations, 2020.

Deliberation:

POWERGRID stated that that they have submitted BOQ to GA&C and shall submit cost estimate to CTUIL.

CTUIL requested GA&C to submit details urgently so that scheme may be prepared and put up for approval of SRPC by CTUIL.

During the meeting, SRLDC informed the following:

1. Ethernet port availability should be based on the control centre's current consumption needs, with provisions for future expansion.
2. The Ethernet port de-multiplexer should have a greater number of ports than the sub-station level FOTE, incorporating multiple Ethernet distribution cards to meet the requirements of various OT systems with redundancy needs. This is because the purpose of the FOTE at the control centre is different, and all communication channels must be de-multiplexed.
3. It is also requested to provision the DC power supply capacity needed for the ULDC communication system.
4. The entire scheme needs to be approved and supply and commissioned need to be expedited as the works of New Building are under Engineering stage.

The schemes deliberated in this meeting at agenda number 6(i)&6(ii) and at agenda number 7, POWERGRID needs to provide cost and BoQ to CTUIL for finalisation of schemes. Further MS, SRPC suggested that these schemes shall be taken up directly to upcoming TCC/RPC meeting as this forum agreed for the schemes.

Meeting was concluded with closing remarks from MS, SRPC.

Annexure-I

List of Participants:

S.No	Name	Organisation
1.	Shri. Asit Singh , MS	SRPC
2.	Shri. Meka Ramakrishna , SE	SRPC
3.	Ms. Priyam Shrivastava , Dy.Director	CEA
4.	Shri. H.S Kaushal , Sr.GM	CTUIL
5.	Shri. T.P Verma, DGM	CTUIL
6.	Shri. Prakhar Pathak, Engineer	CTUIL
7.	Shri. Abhay Kumar , Engineer Trainee	CTUIL
8.	Shri. Harish Rathore ,	SRLDC
9.	Shri. Rajkumar A DGM,	SRLDC
10.	Shr. Sharath Chand CM	SRLDC
11.	Shri. D.Surendra , Sr.DGM	POWERGRID
12.	Shri. Mangesh S Bansod	POWERGRID
13.	Shri. Mahesh	POWERGRID
14.	Shri. K N Srinivasan EE	TANTRANSCO
15.	Shri. Ramesh	TSTRANSCO
16.	Shri.K.Sridhar, EE	APTRANSCO
17.	Shri. Rafeeque KP ,SE	KSEB
18.	Shri. Chandra shekhar	KPTCL
19.	Shri. Ramesh	NTPL
20.	Shri. Ramchandra	LANCO

CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

No.- L-1/210/2016/CERC

CORAM:

Shri Jishnu Barua, Chairperson
Shri I. S. Jha, Member
Shri Arun Goyal, Member
Shri P. K. Singh, Member

Date of Order: 19th January, 2024

In the matter of:

Approval of Guidelines on "Interface Requirements" under the Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations,

Order

The Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017 (hereinafter referred to as the 'Communication Regulations') were published on 29.05.2017 in the Gazette of India Extraordinary (Part-III, Section-4, No. 218).

2. Regulation 7.4, read with Regulation 14.2 of the Communication Regulations requires NLDC to prepare Guidelines on "Interfacing Requirements" in consultation with the stakeholders and submit the same for approval of the Commission.

3. Accordingly, NLDC has submitted the Guidelines on "Interfacing Requirements" after stakeholder consultation for approval of the Commission.

4. The Commission has examined the Guidelines submitted by NLDC, and after incorporating suitable changes, the Commission hereby approves the Guidelines on “Interfacing Requirements”, which are enclosed as an Annexure to this Order.

Sd/-	**Sd/-**	**Sd/-**	**Sd/-**
(P. K. Singh)	**(Arun Goyal)**	**(I. S. Jha)**	**(Jishnu Barua)**
Member	**Member**	**Member**	**Chairperson**

Annexure

GUIDELINES ON "INTERFACING REQUIREMENTS"

1. Introduction

1.1. These Guidelines have been prepared in accordance with the Regulation 7.4 (i) of the CERC (Communication System for inter-State transmission of electricity) Regulation, 2017. The relevant extract of the same is as follows:

> "*The National Load Despatch Centre (NLDC) shall be responsible for preparation and issuance 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 technicalstandards.*"

1.2. The Central Electricity Authority (Technical standards for Communication System in Power Systems Operations) Regulations, 2020 was issued by CEA on 27th February, 2020.

1.3. The Guidelines on "Interfacing Requirements" focus on the general data acquisition systems for RTUs, SAS Gateway computers, communications and AMI metering systems required for reliable, secure and economic operations of the control centre(s).

1.4. All Users, SLDCs (State Load Despatch Centres), RLDCs (Regional Load Despatch Centres), NLDC (National Load Despatch Centre), CTU (Central Transmission Utility), STUs (State Transmission Utilities), NHPTL (National High Power Test Laboratory), REMC (Renewable Energy Management Centre), FSP (Forecasting Service Provider), Power Exchanges and ISTS (inter State Transmission System) licensees etc. shall abide by these guidelines as applicable to them.

1.5. Requirement mentioned herein under this document shall be applicable to Main and Backup Control Centre (wherever applicable) irrespective it is mentioned or not mentioned separately in subsequent sections.

2. Definitions

2.1. The words and expressions used in these guidelines shall have the same meaning assigned in the Electricity Act, CERC (Communication System for inter-State transmission of Electricity) Regulations, 2017, Indian Electricity Grid Code Regulations, 2023 and CEA (Technical Standards for Communication System in Power System Operations) Regulations, 2020, and amendments thereof.

2.2. "Remote Station" means transmission substations/ generating stations operated by the users from which data/real-time data is collected.

3. Real time data Telemetry

3.1. All entities as specified in Para 1.4 of these Guidelines, as applicable, shall provide Systems to telemeter power system parameter such as flow, voltage and status of switches/ transformer taps, Sequence of Events (SOE) etc. in line with interface requirements and other guideline made available by NLDC. While many of design details related to control systems are not included in these guidelines, the Users, who are getting connected to the ISTS, shall require to include functionalities and the interfaces compatible with the respective Control Centre data collection systems available and being maintained at NLDC / RLDCs and SLDC/Sub-LDC and other LDC level. Control Centre may request or transmit data periodically or "by exception" (periodically, as the need for information arises) on demand, or interactively.

3.2. A list showing the parameters to be telemetered from various sub-stations and generating stations with respect to various equipment is enclosed for reference as ***Annexure-I***. This list shows minimum required parameters, however, some other parameters shall be provided as per Control Centre requirement. The analog signal sign convention shall be as per IEEE power flow convention and digital status shall be as per IEC standard. Digital status for circuit breaker must be double point while Isolator status can be either single point or double point as per end device. All users shall comply with interface requirements as specified and shall share interface details with respective control centre.

3.3. The typical layout diagram showing point of interface for real time telemetry is attached as ***Annexure- II***.

3.4. The communication media being used for data transfer and data rate shall be in accordance with the Central Electricity Authority(Technical Standards for Communication System in Power System Operations) Regulations, 2020.

4. Communication Interface

The Users shall support at least the following facilities and plan for communication interfaces accordingly at the time of implementation:

1. Real time data exchange including AGC/Control signal with Control Centre (Main & Backup).
2. Phasor data exchange
3. Meter data exchange
4. Protection signal transmission (SPS, Direct Tripping and Permissive Tripping Carrier Signal etc.)
5. Voice communication
6. Video Communication

Other requirements, if any, users may include while designing the local communication interface requirement.

The required communication interfaces shall be provided for both sending and receiving ends based upon jurisdiction/ownership. All the interfaces shall be provided with audio-visual status indication to indicate its normal operation as per relevant standards.

Users shall have functionality to support any of the interfaces given below based on requirement of data flow as per CEA/CERC guidelines from their respective end to control centres.

Interfaces are classified as following: -

1. Remote Station Interfaces
2. Control Centre Interfaces
3. Terminal Equipment Interfaces

4.1. Remote Station

"Interfacing Requirements" in respect of terminal equipment, Remote Terminal Unit (RTUs)/ Substation Automation System (SAS), Supervisory Control and Data Acquisition System (SCADA), Phasor Measurement Unit (PMU) /Phasor Data Concentrators (PDC), Automatic Generation Control

(AGC), Station Protection / System Protection Schemes (SPS), Automatic Meter Reading (AMR), Advanced Metering Infrastructure (AMI), etc. and for data communication is decided based on communication protocol used for transfer of data between user and respective control centres through dedicated and redundant communication channel with route diversity.

Remote end equipment like RTUs, PMUs, SAS, Metering Gateways, Meter Data Collection Unit, PLCs for AGC etc. shall report through communication protocol which is supported at the reporting Control Centre.

While designing the interface requirement of the remote locations, all the interfaces required for data (power system parameter, meter data, AGC/Control Signal), voice, video, protection signal shall be considered and shall be compatible with respective control centre as well as intervening Communication System equipment.

A typical General Arrangement drawing for a Remote Station is enclosed as ***Annexure-III***.

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. Communication system shall be designed as per planning criterion to be notified by CEA.

Availability of communication links shall be maintained as per the CERC Communication Regulations, 2017. Further, the communication channel provided/configured for the real time data communication shall be made error free and shall not lead to intermittency in real time data at respective Control Centre.

4.1.1. Remote Terminal Unit (RTU)/Substation Automation System (SAS)/PLCs

"Remote Terminal Units" (RTU) / Substation Automation System (SAS) is the device suitable for measuring, recording and storing the consumption of electricity or any other quantity related with electrical system and status of the equipment in real time basis and exchanging such information with the data acquisition system for display and control.

The RTU/SAS System /device should communicate with Control Centre front end system in either

IEC-60870-5-101 or IEC-60870-5-104 protocol.

i) IEC - 101 works on serial communication between site and control centre and it requires serial interface. Different Physical interface that can be used for 101 communications which are:
   a) RS-232 / RS 422 / RS 485.

ii) IEC 104 works on TCP/IP based communication and it can use following Physical interface:
   a) Ethernet (IEEE 802.3 / IEEE 802.3u)
   b) Optical communication Port
   c) 10/100 BaseT(Electrical) or 100BaseFX(Optical) Ethernet Link

The communication interface equipment at the remote (RTU/SAS) location shall support the interfaces as mentioned above and the communication provider shall ensure the proposed data sharing protocol by the stations so that the compatible interface is provided.

4.1.2. Phasor Measurement Unit

PMU (Phasor Measurement Unit) provides phasor information (both magnitude and phase angle) for one or more phases of AC voltage or current waveforms including positive sequence phasors and analog quantities like MW, MVAR, frequency, Rate of Change of Frequency (ROCOF) in real time.

Control Centre shall exchange phasor information between their respective Synchrophasor systems via high-speed real-time data acquisition networks, using the protocol specified in latest IEEE C37.118 communication standard preferably.

PMU shall report on C37.118 2011 or higher protocol with configuration Frame 3 or better for data communications. Different Physical Interface for PMU includes:

1. Ethernet (IEEE 802.3 / IEEE 802.3u)
2. Optical Interface (100 BASE-FX Multimode 850 nm/1300nm nm)
3. 10/100/1000 BaseT(Electrical) or 100/1000 BaseFX(Optical) Ethernet Link

All data items, regardless of type, are generally collected and disseminated at a frequency of 25 samples per second (can be higher rate of samples per second in future) and should be sent to Control Centre with the associated data quality codes in compliance with latest IEEE C37.118 communication standards.

4.1.3. Metering gateway

Automatic Meter Reading system uses its front end for transferring meter data from interface meters' gateway / Meter Data Collection Unit to control centre. It uses DLMS protocol for data communication. Different types of interface required are:

1. Ethernet (IEEE 802.3 / IEEE 802.3u) or Ethernet VLAN IEEE 802.1 P/Q).
2. 10/100/1000 BaseT(Electrical) or 100/1000 BaseFX(Optical) Ethernet Link.
3. For Meters-Three ports accessible only through optically isolating modules
4. RS 485/LAN port for communication with Local PC

The internal communication with the main meter data gateway and other meters in a particular location may use available communication and interface may be decided based on local available communication protocol.

4.1.4. Tele-protection/Control

Equipment protection, Tele-protection /control interface shall be used for transmitting control signalfrom one end to other, it can be from one sub-station to other sub-station or control centre to sub- station/generating station. Interface requirement for tele-protection devices are given below:

1. E1 G.703 Interface Option for transmission over E1 Link
2. 10/1000BaseT (Electrical) or 100/1000BaseFX (Optical) Ethernet Link
3. Optical interface
4. IEEE C37.94, ITU-T G.703 interface.
5. 4W Analog / Digital PLCC
6. IEC 61850 GOOSE Interface

4.1.5. Voice communication

Voice communication interface shall have following network interface for voice communication between user location to Control Centre:

a. 2-wire FXO/2-wire FXS

b. 4- wire E&M.
c. VOIP system uses TCP/IP communication and it can use Ethernet (IEEE 802.3 / IEEE 802.3u) or Ethernet VLAN IEEE 802.1 P/Q).
d. 10/100BaseT (Electrical) or 100BaseFX (Optical) Ethernet Link
e. EPABX exchange to be interfaced with Wide-band network

There shall be provision for establishing voice communication to main and backup control Centre. The user end communication equipment shall be compatible with respective Control Centres.

4.1.6. Video Communication

Video communication interface shall be provided on TCP/IP communication and it can use Ethernet (IEEE 802.3 / IEEE 802.3u) or 10/100/1000BaseT (Electrical) or 100/1000BaseFX (Optical) Ethernet Link.

4.2. Control Centre

The communication interfaces to be provided at the control centre end shall support all the interfaces that is required at the remote end. Apart from interface requirements of the remote stations, high bandwidth links are required for inter control centre protocol (ICCP) communication and proprietary protocol like ISD / Multisite for Main & Backup operation. Configurable Ethernet ports supporting up to 1 Gbps may be provided at the control centre end.

The communication equipment shall also support internal VLAN configuration to optimise the communication with the remote end.

Different types of interface required at Control Centre are:

a) E1/ G.703 Interface Option for transmission over E1 Link
b) 10/100/1000BaseT(Electrical) or 100/1000BaseFX(Optical) Ethernet Link
c) Optical interface
d) IEEE C37.94, ITU-T G.703 interface.
e) Gigabit Ethernet or Gigabit optical interface

4.3. Communication Equipments

The various types of Interfaces required in communication equipment at Remote Station and ControlCentre shall be governed in accordance with Schedule II of CEA (Technical Standards for Communication System in Power System Operations) Regulations, 2020, as applicable.

5. Cross-Border Power System Connections

The Regulation 18 (Data and Communication Facilities) of the CERC (Cross Border Trade of Electricity) Regulations2019 stipulates as follows:

> *"Reliable and efficient voice and data communication systems shall be provided to facilitate necessary communication and data exchange, and supervision or control of the grid by the NLDC or RLDC, under normal and extraordinary conditions. Such communication system must be established from generating station or concerned grid substation(s) to control room of System Operator of a neighbouring country and from there to control room of System Operator of India. Provided that the Cross Border Transmission Link shall necessarily have reliable and efficient voice and data communication systems with the System Operators on both the sides."*

Accordingly, at each point of interconnection on Indian side; respective transmission licensee should ensure facilitating interface requirement for cross border interconnections and shall take necessary measures to comply with the aforesaid regulation and the interface guidelines issued by NLDC in this regard.

From Network Security point of view, at Landing Locations (in India Side) a layer of isolation shall be made between interfacing point/node & ISTS (Inter State Transmission System) Communication Network node. Further complete separation shall also be maintained for configuring End-to-End connectivity of Identified Data & Voice Channels.

The provisions mentioned under this Clause 5 shall comply with the cyber security requirements outlined in Clause 6 of this document.

6. Cyber Security Requirements

The communication service provider while providing the interfaces for the data exchange between the control centres, between the user station and the Control Centre must comply with CERT-In, NCIIPC (National Critical Information Infrastructure Protection Centre) guidelines for the interface

being provided to the end user in accordance with CEA (Technical Standards for Communication System in Power System Operations) Regulations, 2020.

Necessary firewall/router as per requirement shall be provided by the respective users while connecting the remote equipment with the control centre network. Direct connectivity with the operational network be avoided while connecting the remote station and shall be through firewall with necessary VLAN configuration.

A typical diagram related to the cyber security requirements is attached at ***Annexure – IV***.

7. Maintenance, Validation and Testing

Users shall facilitate for periodic maintenance and testing of interface equipment owned by them in accordance with procedure for maintenance and testing to be prepared by CTU in accordance with CERC Communication Regulations, 2017.

8. Document Revision

The interface requirement is based on current protocols implemented at different control centres and remote end equipment and the available protocols and communication interfaces available based on the available communication technology. The documents shall be revised as and when there is change in technology, and as and when any deficiency is noticed with approval of CERC.

ANNEXURE-I

A list of parameters to be telemetered from various sub-stations and generating stations with respect to various equipment

A. SCADA System

Sl. No	Description	Analog Points	Digital Points	Protection Signal
1	Line	-MW -MVAR	- line Isolator Status SOE with Time Stamping	Main1/Main2 protection, Over Voltage protection, LBB
2	Bays		- Breaker -Isolator/ Disconnector (Line Selection in DMT scheme) SOE with Time Stamping	
3	Main Buses, Transfer Bus, Bus Coupler, Bus Sectionalizer	-Voltage -Frequency -MW & MVAR flow in case of bus sectionalizer -MW& MVAR flow across Bus Couplers	- Breaker, Isolator, - SOE with Time Stamping	Main1/Main2 protection
4	Transformer	-MW/MVAR for HV/LV Side -Tap Position	-Breaker -Isolator Status SOE with Time Stamping	Main1/Main2 protection
5	(Hot standby) Transformer	-MW/MVAR for HV/LV Side	-Breaker -Isolator Status	
6	Reactor	MVAR	-Breaker -Isolator Status --Bypass isolator status of NGR -SOE with Time Stamping	Main 1 and 2 Protection
	(Hot standby) Spare Reactor	MVAR	-Breaker -Isolator Status	
7	FSC/TCSC	-% compensation	-Bypass Breaker -Bypass Isolator -FSC ON/OFF Status	Oscillation Damping Controller

Sl. No	Description	Analog Points	Digital Points	Protection Signal
			SOE with Time Stamping	(Operated or not) status
8	SVC	-Slope -Gain -Q-Ref -V-Ref -V min -Vmax -Current for each branch -total MVAR compensation	-Isolator Status for each branch with SOE -SVC Mode (Automatic/Manual) -Q Control Mode (Enable/Disable) SOE with Time Stamping	Oscillation Damping Controller (Operated or not) status
9	HVDC (Both Type: Line Commutate Converter & Voltage Source Converter)	-DC Voltage -DC Power Flow -DC Current -Individual Filter MVAR -Firing Angle-Alpha -Extinction angle- Gamma, etc. -Power order, set point Compensation settings if applicable	-Individual Filter Status -HVDC Mode (Metallic return / Ground return) -Isolator/CB Status of DC Switchyard -RPC Status -Run back Status -POD Status -SSDC Status - SOE with Time Stamping -DMR -1 status -DMR-2 status -MRTB status -GRTB status -SoE for HVDC auto-restart	DC line Fault Protection, ESOF (emergency Switch Off) and HVDC Pole Block protection, POD Status (operated or not
10	Converter Transformer	-MW/MVAR for HV/LV Side -Tap Position	-Breaker -Isolator Status	
11	Spare Converter transformer	-MW/MVAR for HV/LV Side	-Breaker -Isolator Status	
12	Generator	-MW (HV/LV) -MVAR (HV/LV) -LV Voltage / Frequency Unit Set point -Unit DeltaP for AGC,	- RGMO/FGMO ON/OFF Status - LV Breaker Status - AGC Local / Remote status - PSS ON/OFF status	Class A, B, C protection status

Sl. No	Description	Analog Points	Digital Points	Protection Signal
		-Droop settings Value, -AVR Reference Voltage	- AVR ON/OFF Status - SOE with Time Stamping	
13	Generator Transformer	-MW/MVAR for HV/LV Side -Tap Position	-Breaker -Isolator Status	Main1/Main2 protection
14	Synchronous Condenser	-MW (HV/LV) -MVAR (HV/LV) -LV Voltage / Frequency	-Breaker -Isolator Status	
15	STATCOM	Qstat, QMSC, QMSR, VHV, VMV, Q_{tra} , P_{aux}, Q_{aux}, Tap Position of Coupling transformer Power Oscillation damping setting Inductive slope Capacitive slope Up set reference/ Down set reference Feedback signal voltage MSC/MSR switching in and out setting (voltage, time)	- CB - Isolator STATCOM modes status (Voltage/Reactive/NSC etc) POD status - SOE with Time Stamping	
16	Phase Shifter	MW / MVAR Angle of shift	- CB - Isolator - SoE with time stamping	
17	Wind	- Wind speed at hub height - Wind direction - Blade Angle - Ambient air temperature - Relative Humidity (%) - Air Density -Atmospheric Pressure - Total MW/MVAR - Individual Turbine MW, -MVAR, wind speed - Total number of turbines online - Total Power Capacity.	WTG CB Status CB and Isolator status of pooling station Turbine Availability PPC modes status (Voltage/PF/Reactive Power) Frequency control (FGMO/RGMO) status	

Sl. No	Description	Analog Points	Digital Points	Protection Signal
		- Available Power Capacity -Available Power (Active and Reactive) at Plant level. -Active Power set point -Reactive Power set point -PPC modes signals: Reference and actual values of Voltage Control mode, Power Factor Control mode and Reactive Power Control mode) -Droop setting of Voltage Control mode -Active power ramp rate UP and down setting	LVRT/HVRT status	
18	Solar	-Global horizontal irradiance -Global plane of array irradiance - Diffusion Irradiance- Watt per meter square - Direct Irradiance- Watt per meter square - Sunrise and Sunset timings -Tilt angle - Dust fall -Ambient temperature (deg C) -Back of PV module temperature -Battery charge -MW/MVAR -Relative Humidity - Performance Ratio - Cloud Cover (Okta)	- Inverter Status (ON/OFF) -Module Availability -CB/Isolator Status -Rectifier Availability -PPC modes status Voltage/PF/Reactive Power) Frequency control (FGMO/RGMO) status AGC status LVRT/HVRT status	

Sl. No	Description	Analog Points	Digital Points	Protection Signal
		-Temperature, Wind Speed, Rainfall, Wind Speed, Wind Direction - Inverter MW/MVAR (AC Side & DC Side) -Available Power (Active and Reactive) at Plant level. -Active Power set point -Reactive Power set point -PPC modes signals Reference and actual values of Voltage Control mode, Power Factor Control mode and Reactive Power Control mode) -Droop setting of Voltage Control mode -Active power ramp rate UP and down setting		
19	Energy Storage Resource	State of Charge MW/MVAR (AC Side & DC Side) Modes (Energy storage, Frequency regulation, etc.)	CB/Isolator Status Controller status, RGMO/FGMO	
20	SPS Signal		DIGITAL STATUS: Enable/Disable, Operated/No Operated. (Condition/Logic Wise)	
21	Weather Parameter	-Temperature - Wind Speed -Humidity -Rainfall		
22	AGC	-Unit Load Set Point (ULSP) -Actual Generation MW -Unit Capability	-Circuit Breaker Status on/off -Governor status on/off	

Sl. No	Description	Analog Points	Digital Points	Protection Signal
		-RGMO/FGMO/Governor input to governor -DeltaP -Reactive Power -AVR Voltage Set Point -Low Voltage (LV) side Actual Voltage -Generator Transformer (GT) Tap Position -Distribution Factor Additional Analog inputs from Hydro power plants -Minimum load at which unit can stably run after synchronization – Unit wise (P1) (in MW) - Forbidden zones or high cavitation zones - Unit-wise (From MW to MW) - P2 to P3 - Maximum loading possible on unit (continuous) (P4) - Declared Energy for the day - Schedule Energy (Cumulative) - Water gross head (m) Additional Analog inputs from Gas power plants - Reference exhaust gas temperature - Actual exhaust gas temperature	- AGC Local/Remote Additional Digital inputs from Hydro power plants - Pumping Status on/off	
23	Loads (Lift Irrigation etc.)	- MW/MVAR	-Breaker -Isolator Status	

B. PMU Signal List

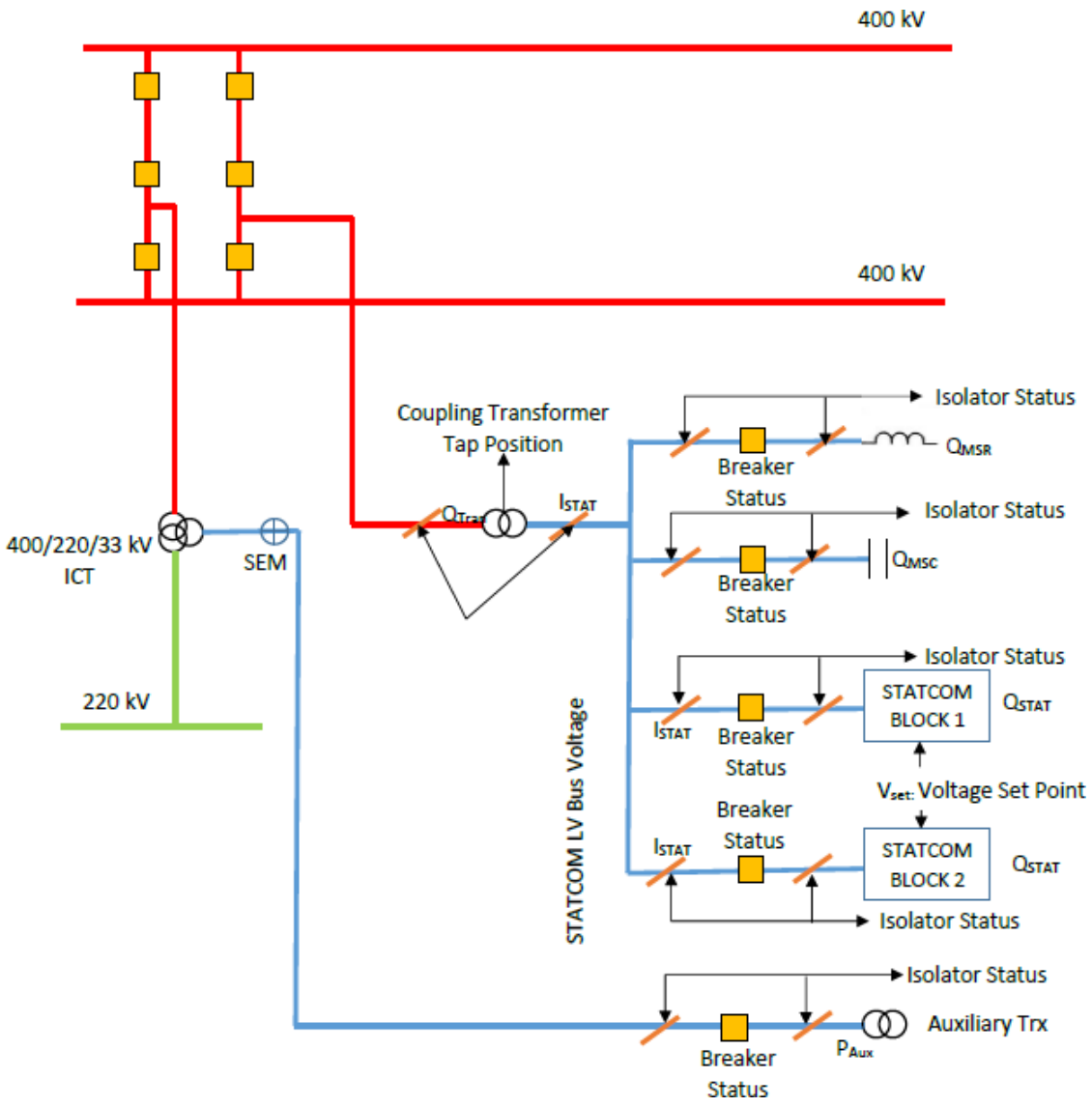
Sl. No	Description	Analog Points	Digital Points	Protection Signal
1	Line	**VOLTAGE** {VRM, VYM, VBM, VPM, VRA, VYA, VBA, VPA} **CURRENT** {IRM, IYM, IBM, IPM, IRA, IYA, IBA, IPA} MW, MVAR, F , DF/DT	-Main Breaker status -Tie Breaker status -Isolators	Main1/Main2 protection,
2	Bays		- Breaker -Isolators	
3	Main Buses, Transfer Buses	- **VOLTAGE** {VRM, VYM, VBM, VPM, VRA, VYA, VBA, VPA} F, DF/DT	Bus Sectionalizer, Bus Coupler Breaker	
4	Transformer/Coupling Transformer/Converter Transformer	- **VOLTAGE** {VRM, VYM, VBM, VPM, VRA, VYA, VBA, VPA} **CURRENT** {IRM, IYM, IBM, IPM, IRA, IYA, IBA, IPA} MW/MVAR for HV& LV Side	-Breaker -Isolators	Main1/Main2 protection
5	Reactor	**VOLTAGE** {VRM, VYM, VBM, VPM, VRA, VYA, VBA, VPA} **CURRENT** {IRM, IYM, IBM, IPM, IRA, IYA, IBA, IPA} MVAR	-Breaker -Isolators	
6	FSC/TCSC	**VOLTAGE** {VRM, VYM, VBM, VPM, VRA, VYA, VBA, VPA} **CURRENT** {IRM, IYM, IBM, IPM, IRA, IYA, IBA, IPA} MVAR	-Bypass Breaker - -FSC ON/OFF Status	

7	SVC	**VOLTAGE** {VRM, VYM, VBM, VPM, VRA, VYA, VBA, VPA} **CURRENT** {IRM, IYM, IBM, IPM, IRA, IYA, IBA, IPA} MVAR	Breaker	
8	Generator	**VOLTAGE** {VRM, VYM, VBM, VPM, VRA, VYA, VBA, VPA} **CURRENT** {IRM, IYM, IBM, IPM, IRA, IYA, IBA, IPA} MW, MVAR, F, DF/DT for HV& LV Side	-RGMO/FGMO ON/OFF Status Breaker Status -Isolators	V
9	STATCOM	**VOLTAGE** {VRM, VYM, VBM, VPM, VRA, VYA, VBA, VPA} **CURRENT** {IRM, IYM, IBM, IPM, IRA, IYA, IBA, IPA} MW, MVAR, F, DF/DT	- CB OF EACH MODULE MSR, MSC	
10	Phase Shifter	**VOLTAGE** {VRM, VYM, VBM, VPM, VRA, VYA, VBA, VPA} **CURRENT** {IRM, IYM, IBM, IPM, IRA, IYA, IBA, IPA} HV & LV MW / MVAR F, DF/DT	- CB	

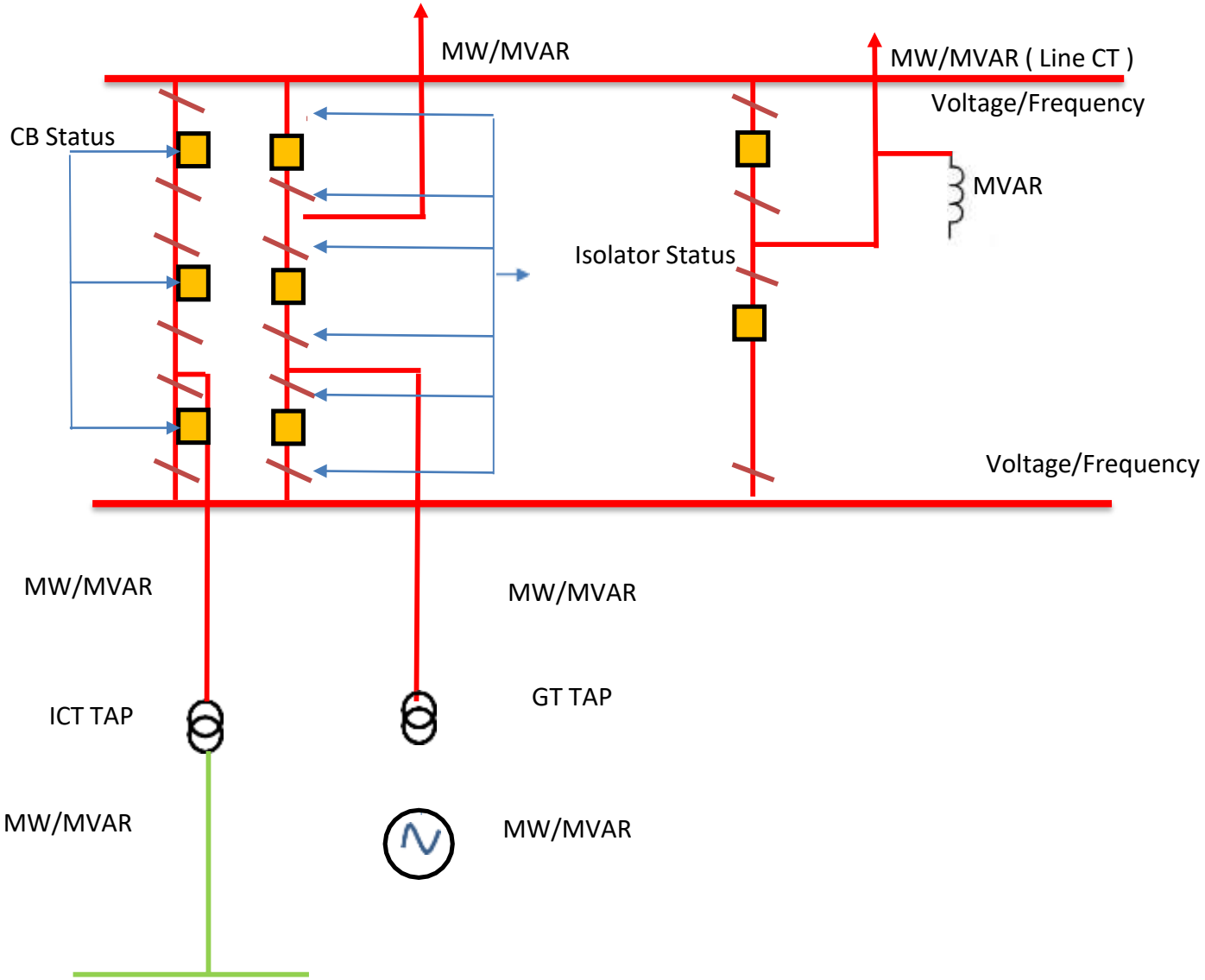
ANNEXURE-II

The layout diagrams showing point of interface for real time telemetry

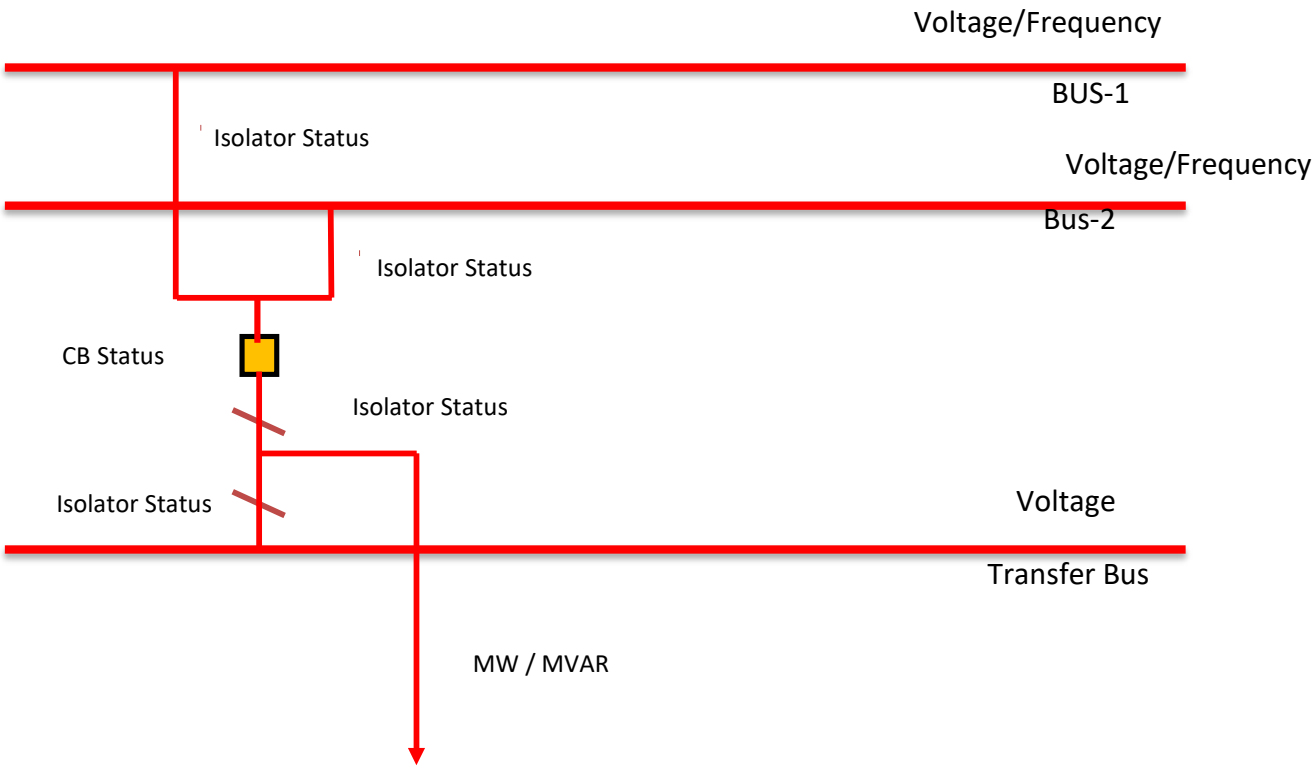
A. TYPICAL BAYS DIAGRAM: *STATCOM*



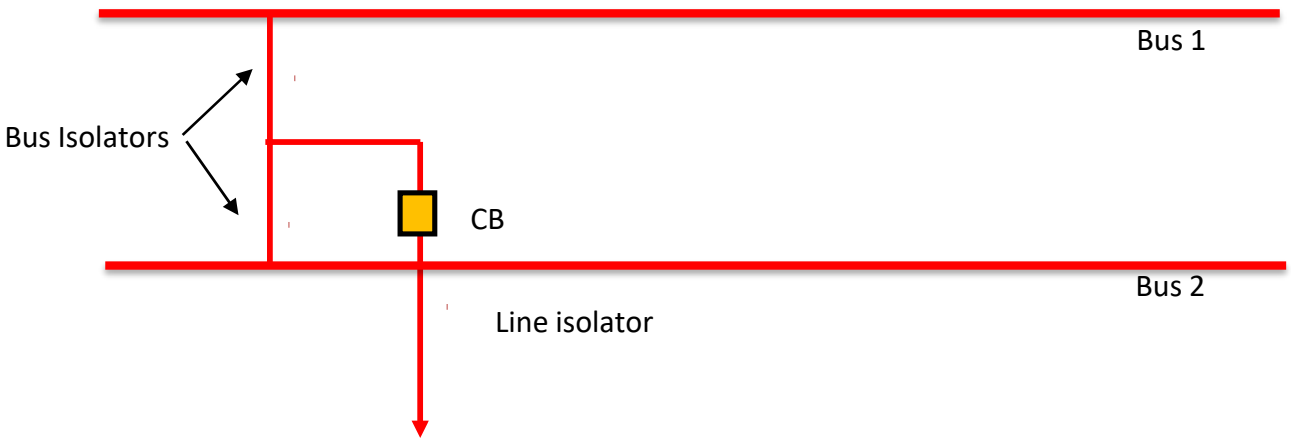
B. TYPICAL BAYS: *One and a half breaker Scheme*



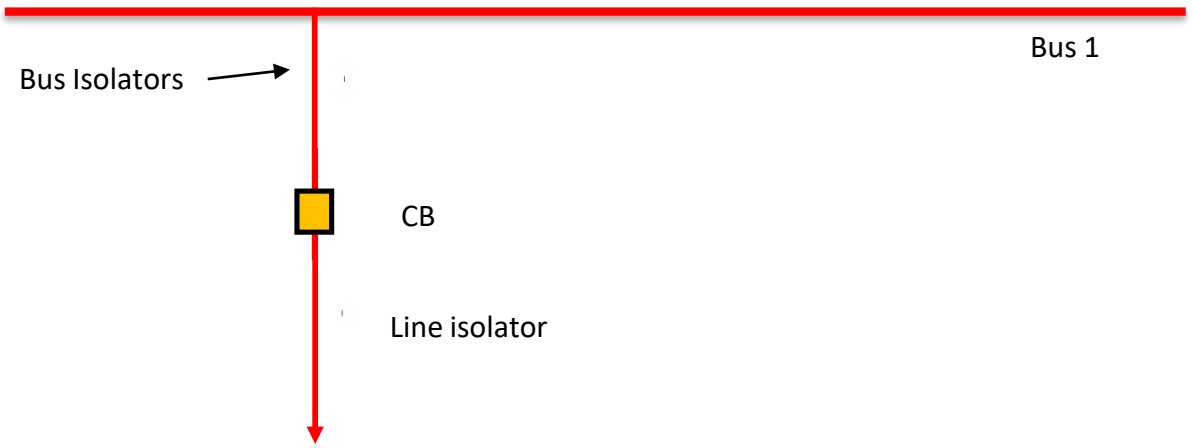
C. TYPICAL BAYS: *Double Bus and Transfer Scheme*



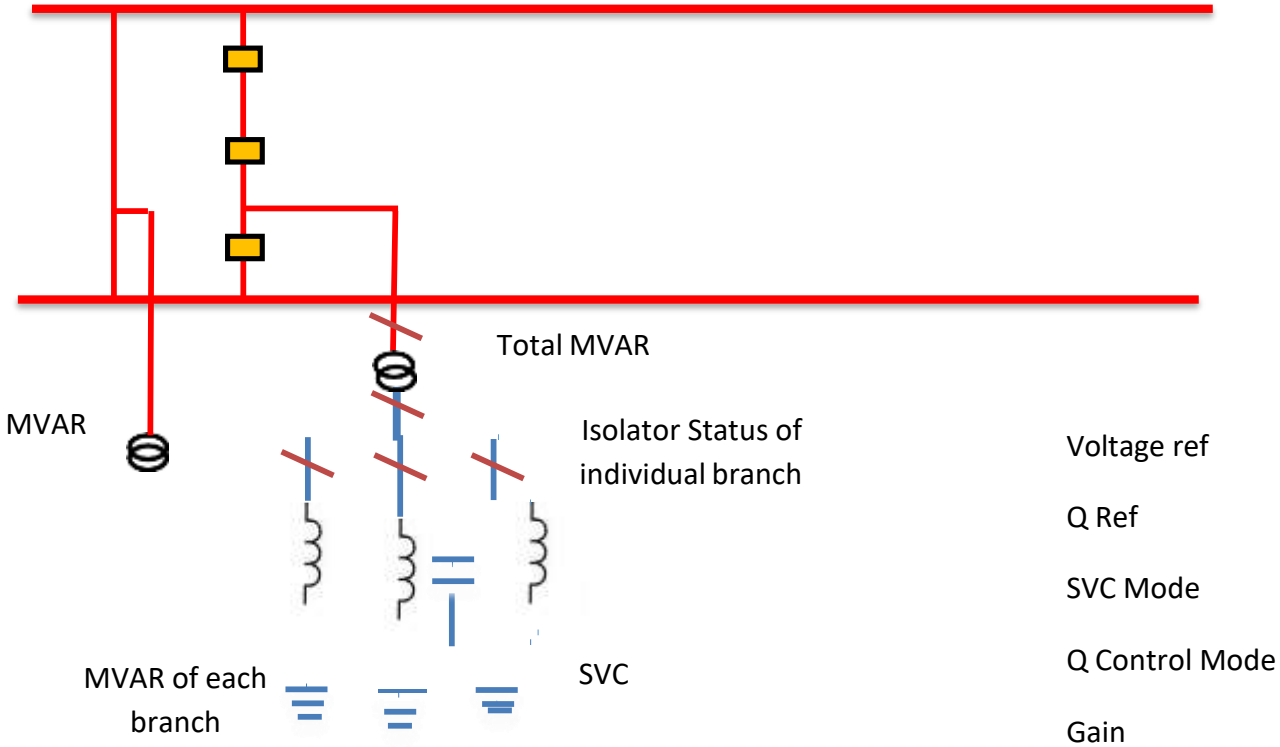
D. TYPICAL BAYS: DOUBLE BUS SCHEME



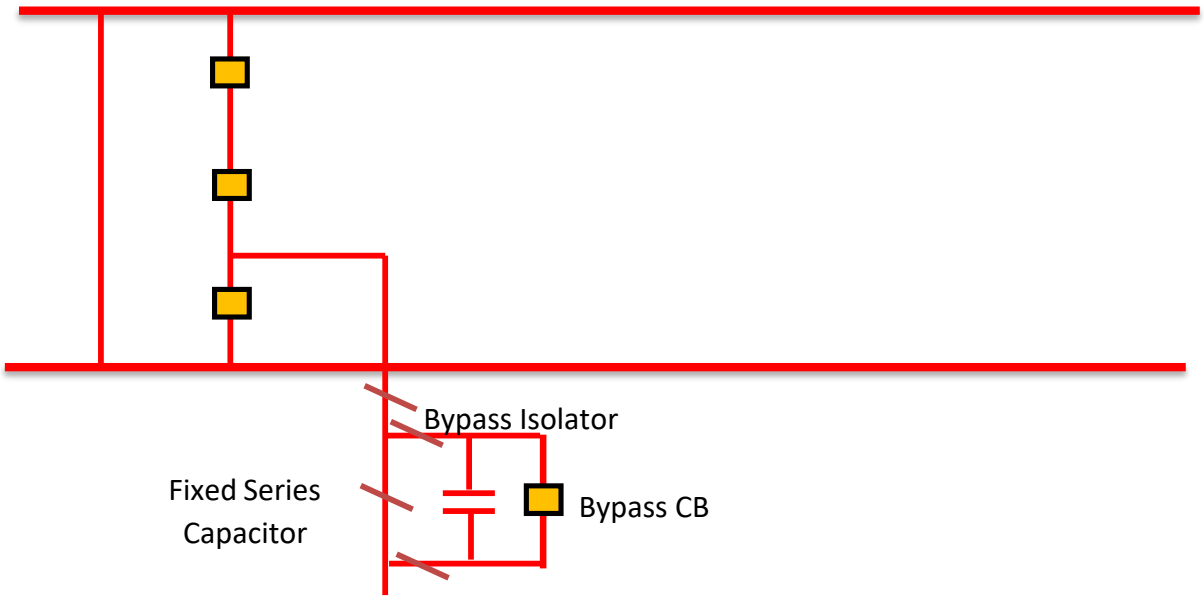
E. TYPICAL BAYS: SINGLE BUS SCHEME



F. STATIC VAR COMPENSATOR/BUS REACTORS

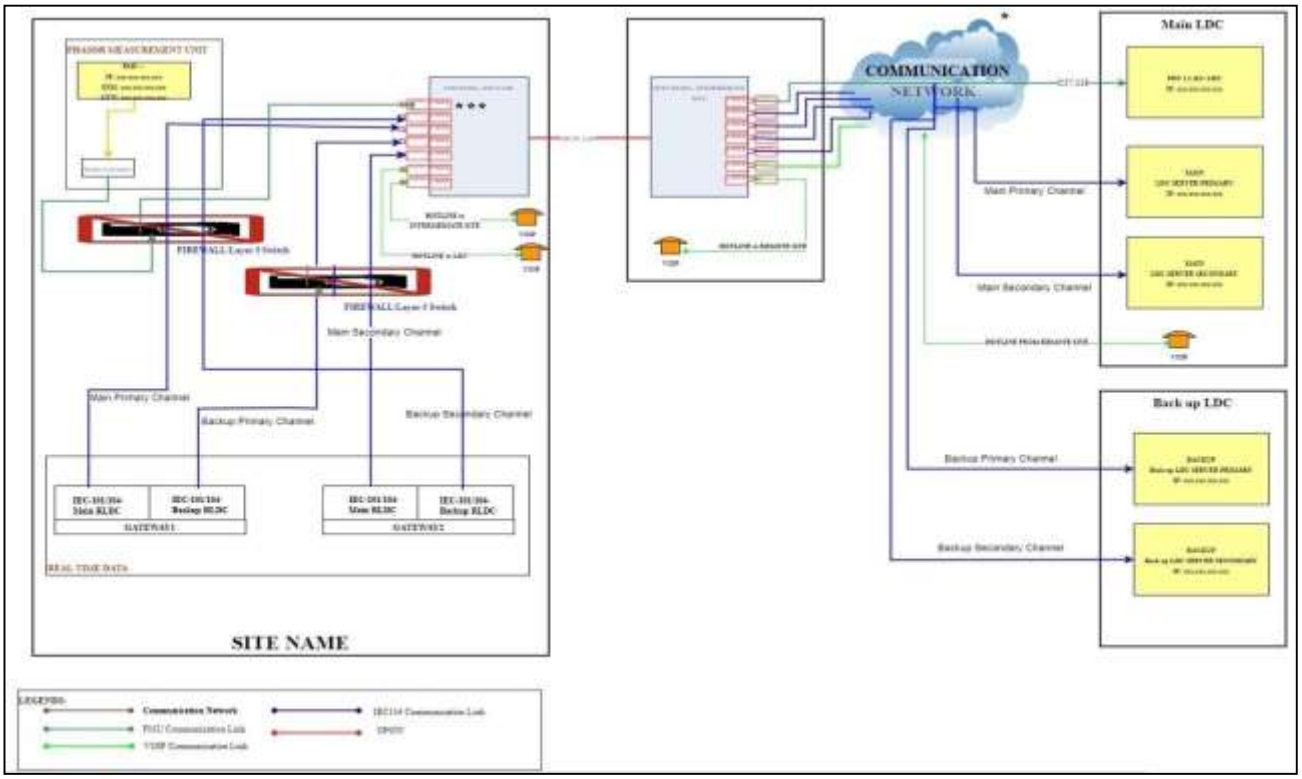


G. Fixed Series Capacitor



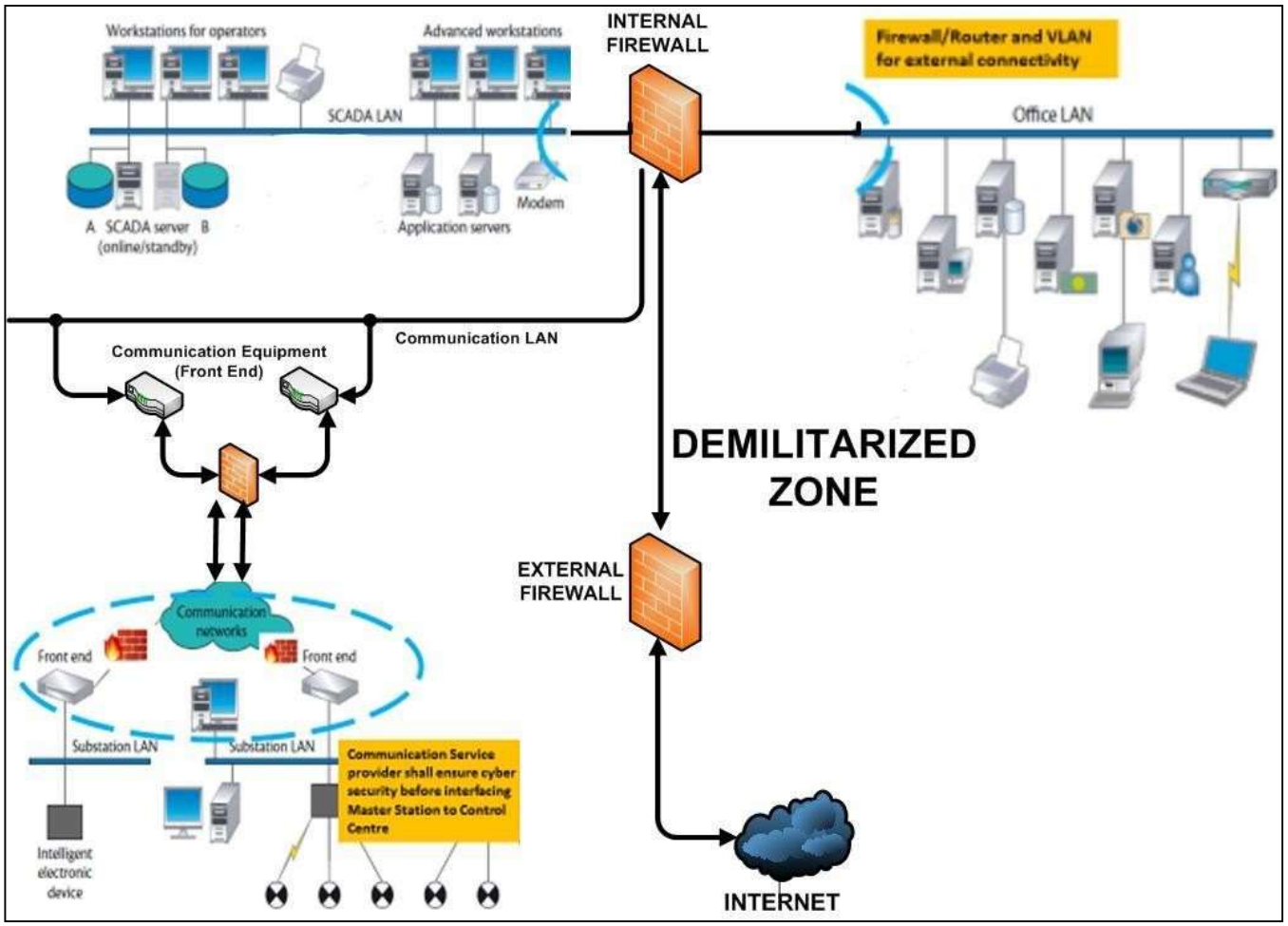
ANNEXURE-III

Typical Remote Station General Arrangement Diagram having IEC-101/104 RTU



ANNEXURE-IV

Typical Diagram showing Cyber Security Measures in Data Transfer



Annexure-IX

S. No.	Name of Scheme	Implemeting Agency	FOTE (No.)	OPGW (Km.)	Cost (Cr.)	Status
Schemes approved in 22nd NCT, awarded through OM Letter dtd. 02.09.2024						
1	Optical fiber connectivity for NLDC new building August Kranti Marg, New Delhi	POWERGRID	3	35	7.2	
Schemes approved in 20th NCT, awarded through OM letter dtd. 15.07.2024						
2 (a)	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 (Indigrid)	0	88.635	5.31	
2 (b)	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	4	0.783	1.24	
3	Redundant Communication for Chamera-III (NHPC) & Budhil (GreenCo) using 3 pairs of fibers sharing from HPPTCL network.	POWERGRID	1	0	0.3	
Schemes approved in 19th NCT, awarded through OM letter dtd. 29.05.2024						
4	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	3	311	18.5	
5	Supply and Installation of 12 nos. FOTE and additional ethernet (125 nos.) cards for existing FOTE in view of resource disjoint and	POWERGRID	12	0	5.2	

	critical locations.					
6	Supply and Installation of 11 nos. FOTE Equipment at Backup SLDCs in NR & Backup NRLDC.	POWERGRID	11	0	3.3	
7	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.	0	6.5	0.325	
8	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	2	335	16.5	
9 (a)	OPGW installation on existing 400 kV Kurukshetra - Malerkotla line alongwith FOTE at both ends. Part-A	NRSSXXXI (B) Transmission Ltd (Sekura)	0	140	9	
9(b)	OPGW installation on existing 400 kV Kurukshetra - Malerkotla line alongwith FOTE at both ends. Part-B	POWERGRID	2	0	0.6	
Schemes Modified/approved in 16th NCT, awarded through OM letter dtd. 03.01.2024						
10	Supply and Installation of OPGW on 400kV Kishenpur-Wagoora line.	POWERGRID	2	183	9.15	
11	Supply and Installation of OPGW on 400kV Agra-ballabhgarh line.	POWERGRID	2	181	9.05	
Schemes approved in 11th NCT, awarded through OM letter dtd. 16.02.2024						
12	OPGW installation on existing 400 kV Jallandhar (PG) – Kurukshetra (PG) line which is to be LILOed at 400 kV Dhanansu (PSTCL)	POWERGRID	2	229	10.3	
13	Supply and Installation of	Indigrid	2	150	6.7	

	OPGW on existing 400 kV Koldam- Ludhiana (PG) line which is to be LILOed at 400 kV Ropar (PSTCL)					
14	Redundant communication System for Bhinmal (PG) and Kankroli (PG) ISTS stations	POWERGRID	8	5	2.55	
15	OPGW installation on 220 kV Anta (NTPC) - Bhilwara Line	POWERGRID	2	187	9.35	
Schemes approved in 9th NCT, awarded through OM letter dtd. 15.11.2022						
16	Supply and Installation of OPGW and FOTE for the following lines • 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	2 2	312 254	28.5	

Annexure-XII

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

दिनांक: 30 जुलाई, 2024

सेवा में/To,
एनआरपीसी एवं टीसीसी के सभी सदस्य एवं विशेष आमंत्रित (संलग्न सूचीनुसार)
Members of NRPC & TCC & Special Invitees (As per List)

विषय: उत्तर क्षेत्रीय विद्युत समिति की **74** वीं और तकनीकी समन्वय समिति **(टीसीसी)** की **50** वीं बैठक का कार्यवृत।

Subject: MoM of 74th Northern Regional Power Committee (NRPC) & 50th Technical Co-ordination Committee (TCC)-reg

महोदय/महोदया,

तकनीकी समन्वयन समिति (टीसीसी) की 50 वीं बैठक दिनाँक 28.06.2024 (सुबह 10:00 बजे) एवं उत्तर क्षेत्रीय विद्युत समिति की 74 वीं बैठक दिनांक 29.06.2024 (सुबह 10:00 बजे) को रायपुर, छत्तीसगढ़ में आयोजित की गयी थी। बैठक का कार्यवृत संलग्न है। यह उ.क्षे.वि.स. की वेबसाइट (http://164.100.60.165/) पर भी उपलब्ध है।

50th meeting of Technical Co-ordination Committee (TCC) was held on 28.06.2024 (10:00 AM) and 74th meeting of Northern Regional Power Committee (NRPC) was held on 29.06.2024 (10:0 AM) at Raipur, Chhattisgarh. MoM of the same is attached herewith. The same is also available on NRPC Sectt. website (http://164.100.60.165/).

भवदीय
Yours faithfully

Signed by Vijay Kumar Singh
Date: 30-07-2024 17:36:19

(वी.के. सिंह)
(V.K. Singh)
सदस्य सचिव
Member Secretary

18-ए, शहीद जीत सिंह मार्ग, कटवारिया सराय, नई दिल्ली-110016 फोन: 011-26513265 ई-मेल: ms-nrpc@nic.in वेबसाइट: www.nrpc.gov.in
18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016 Phone: 011-26513265 e- mail: ms-nrpc@nic.in Website: www.nrpc.gov.in

i. *Forum adopted the approved SOP. NRPC secretariat and NRLDC will hold a joint workshop in July/August, 2024 with all stakeholders of NR on the SOP for detailed understanding of audit process as well as CEA and CERC communication regulations. CEA will also be requested to jointly host the workshop.*

ii. *Forum directed utilities to do compliance of the SOP.*

A.5 Standard Operating Procedure (SOP) for Communication System Outage Planning (agenda by NRPC secretariat)

TCC Deliberation

A.5.1 EE (C), NRPC apprised that Regulation 7.3 of Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017 provides that:

"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."

A.5.2 Regulation 10 of Central Electricity Authority (Technical Standards for Communication System in Power System Operations) Regulations, 2020 provides that:

"10. Outage Planning: Monthly outage shall be planned and got approved by the owner of communication equipment in the concerned regional power committee, as per detailed procedure finalized by the respective regional power committee."

A.5.3 In compliance of above and in order to maintain uniformity across all regions, a Standard Operating Procedure (SOP) for Communication System Outage Planning has been finalized in 14th NPC meeting, held on 3rd February, 2024.

A.5.4 As per SOP, a Communication System Outage Planning Sub-Group/ TeST Sub Committee shall be formed in each region constituting the members from all the entities connected to ISTS including all CGS, ISGS, REGs/SPPDs/SPDs, STUs, SLDCs etc., of the respective Region, RLDC/Grid-India, PGCIL, CTUIL, Private Transmission licensees in respective region & RPC secretariat. The Sub-Group / Sub Committee may co-opt any other member from any organization for facilitating the activities of the Sub-Group / Sub Committee.

A.5.5 Communication System Outage Planning will be limited to the following systems:

i. ISTS Communication System including ISGS

ii. Intra-state Communication System being utilized for ISTS Communication

iii. ICCP links between Main & Backup RLDCs, Main & Backup SLDCs & Main & Backup NLDCs.

iv. Inter-regional AGC links

v. Any other system agreed by the Sub-Group.

A.5.6 A web Portal named as "Communication System Outage Planning Portal" shall be developed by respective RLDC or a module shall be provided in the U-NMS. Log in credentials shall be provided to all the ISTS connected entities/concerned entities

A.5.7 Entities/Users/Owners shall apply for outage of communication links/equipment through web portal by 7th/ 8th of every month. NRPC Secretariat shall circulate the list of outage proposals by 15th of every month. Communication System Outage Planning (CSOP) meeting shall be conducted during 3rd week of every month. Approved outages shall be published on NRPC website within 3 days from date of CSOP meeting. Communication outage shall be availed as per procedure mentioned in SOP. There is also provision of availing emergency outage in approved SOP.

A.5.8 Outage of the approved communication links and equipment shall be availed by the respective owner /entities after confirming the same with RLDC on D-3 basis.

A.5.9 Further, SOP enclosed as **Annexure-IV** was presented and discussed.

A.5.10 DGM, NRLDC conveyed that planned outage of communication system will lead to rerouting the traffic of communication data. Further, he addressed that as per CEA regulation, only 48 Hours outages shall be allowed in one year for a communication equipment. By this. It will be easy to have an account/record of all outages period and future planning may be done accordingly. As per CERC regulation, availability of communication equipment is also to be assessed.

A.5.11 NRLDC opined that all communication assets are mapped in U-NMS which is already operational. It will be prudent to utilise this capability for outage planning rather than developing a new portal afresh. MS, NRPC appreciated the same to use the existing system is better way.

A.5.12 EE (C), NRPC conveyed that in UNMS, all communication assets are mapped. Hence with some modification or advancement, the outage planning may be done through UNMS itself.

A.5.13 Accordingly, outage planning shall be carried out through UNMS.

A.5.14 MS, WRPC queried CTUIL to confirm the capability of availing the outage planning facilities in UNMS as WRPC has started the tendering process for implementation the communication outage portal. MS, NRPC also requested CTUIL to confirm the same.

A.5.15 It was mentioned that CTUIL may take the specification of web-based outage planning portal from WRPC and SRPC for the development of the same in UNMS.

A.5.16 In view of above discussion, Forum requested CTUIL to confirm about development of such capabilities in U-NMS on a web-based portal. After finalisation of above issues, a joint-workshop will be held with all stakeholders by NRPC secretariat, NRLDC and CTUIL.

NRPC Deliberation

A.5.17 MS, NRPC highlighted that communication outage portal should be the same for all regions as outage procedure is same for all regions. In view of above, CTUIL may refer the specifications of WRPC and SRPC. Although, cyber security issues arising while mapping the information available on isolated UNMS system to web-based outage planning portal may be addressed.

A.5.18 Forum was in consonance of the deliberation held in TCC meeting and adopted the approved SOP.

Decision of Forum

a. Forum requested CTUIL to confirm within 10 days whether outage planning *capability can be developed in U-NMS through a web-based portal.*

b. After finalisation of above issues, a joint-workshop will be held with all stakeholders by NRPC secretariat, NRLDC and CTUIL.

A.6 Actions for improvement in grid operation (State wise) (agenda by NRLDC)

TCC Deliberation

A.6.1 NRLDC representative mentioned that as mentioned by Member Secretary, NRPC in his opening remarks, most of the NR states record their maximum demand met and maximum energy consumption during summer/monsoon months. Some of the states have already met their all-time maximum demand and energy consumption during May-Jun this year.

A.6.2 With the increase in temperature and humidity, demand of Northern Region starts increasing. This year already average Northern region energy consumption has been higher by 12%, 30% & 24% in April, May & June respectively compared to previous year. With this growth, this year maximum demand met and energy consumption of Northern region is expected to break many previous records.

Final Standard Operating Procedure (SoP) for Communication System Outage Planning

1. As per the following CEA and CERC Regulations, the Communication Outage for the Region shall be carried out by RPC Secretariat:

a) Regulation 7.3 of Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017 stipulates as below:

Quote:

7.3 Role of National Power Committee (NPC) and Regional Power Committee (RPC):

……

(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.

……

Unquote

b) Regulation 10 Central Electricity Authority (Technical Standards for Communication System in Power System Operations) Regulations, 2020 notified on 27.02.2020 envisages as below:

Quote:

10. Outage Planning: Monthly outage shall be planned and got approved by the owner of communication equipment in the concerned regional power committee, as per detailed procedure finalized by the respective regional power committee.

Unquote

2. A Communication System Outage Planning Sub-Group/ TeST Sub Committee shall be formed in each region constituting the members from all the entities connected to ISTS including all CGS, ISGS, REGs/SPPDs/SPDs, STUs, SLDCs etc., of the respective Region, RLDC/Grid-India, PGCIL, CTUIL, Private Transmission licensees in respective region & RPC secretariat. The sub-group/ Sub Committee may co-opt any other member from any organization for facilitating the activities of the sub-group/ Sub Committee.

3. Communication System Outage Planning will be limited to the following systems:

(i) ISTS Communication System including ISGS

(ii) Intra-state Communication System being utilized for ISTS Communication

(iii) ICCP links between Main & Backup RLDCs, Main & Backup SLDCs & Main & Backup NLDCs.

(iv) Inter-regional AGC links.

(v) Any other system agreed by the sub-group.

4. Communication Equipment/link within the scope of the Procedure would include :

   (i) Optic Fibre links
   (ii) Any other link being used for ISTS communication
   (iii) ICCP links between Main & Backup RLDCs, Main & Backup SLDCs & Main & Backup NLDC
   (iv) VC links between LDCs
   (v) Inter-regional AGC links
   (vi) SPS Links
   (vii) Tele-Protection
   (viii) AMR
   (ix) PMU
   (x) SDH & PDH
   (xi) DCPC
   (xii) RTU & its CMU cards
   (xiii) DTPCs
   (xiv) Battery Banks and Charging Equipment
   (xv) EPABX
   (xvi) Any other equipment/link agreed by the sub-group

5. A Web Portal named as "Communication System Outage Planning Portal" shall be developed by respective RLDCs or a module shall be provided in the U-NMS. Log-in credentials shall be provided to all the ISTS connected entities/concerned entities.

6. Entities/Users/Owners shall add their communication links and the equipment to the Web Portal as soon as they are commissioned. The same has to be furnished to RPC Secretariat /RLDCs.

7. Entities/Users/Owners of the communication equipment shall upload the outage proposals of communication links and the equipment (in the prescribed format only) to be availed during subsequent month by 7th/8th of every month in the Web Portal.

8. RPC Secretariat consolidates the list of outage proposals received from various Entities/Users/Owners of the communication links and equipment by downloading from the Web portal and circulate the same among all the respective region entities by 15th of every month. Communication outages affecting other regions would be coordinated by respective RLDC through NLDC.

9. Communication System Outage Planning (CSOP) meeting shall be conducted during the third week of every month normally (preferably through VC) to discuss and approve the proposed outages of communication links and equipment.

10. The approved outages of Communication links and equipment in the CSOP meeting shall be published in the RPC website and respective RPCs Communication Outage Portal within 3 days from the date of CSOP meeting.

11. Outage of the approved communication links and equipment shall be availed by the respective owner /entities after confirming the same with RLDC on D-3 basis.

12. In case of any emergency outage requirement of communication links and equipment, Entities/Users/Owners may directly apply to respective RLDC with intimation to respective RPCs on D-2 basis. Confirmation of approval/rejection will be provided on D-1 basis by RLDCs in consultation with respective RPCs considering 24hrs processing window.

13. Entities/Users/Owners shall take the code from the respective RLDC before availing the planned outage of the communication links & equipment and before restoration of the same.

14. Entities/Users/Owners of the communication links and equipment shall submit the deviation report for the approved outages (approved dates & approved period) availed during the previous month and the report on planned / forced / other outage of communication links / equipment by 10th of the month to RPC Secretariat as per the format at **Annexure-I** .

15. In the monthly CSOP meetings, communication links and equipment whose outage duration (Planned / Forced / Others) more than 48 hours for the last 12 months of rolling period shall be deliberated for the measures to be taken in future for the better outage management. The date deviations and non-availing the outages that were approved in the previous CSOP meetings shall also be deliberated in the CSOP meetings.

***

Annexure: DCOA-I

Outage Deviation Report : List of outages of Communication Links, availed / deviated during the month of

mmm-yyyy

Dated : **dd-mm-yyyy**

A **Details of Communication Links (Point to Point) availed :**

SL	Name of Requesting Agency	Description of Link	Source	Destination	Channel Routing	Ownership	Reason for availing outage with the details of equipment attended	Approved Start Date : Time [dd-mm-yyyy hh:mm]	Approved End Date : Time [dd-mm-yyyy hh:mm]	Approved Outage Hours	Outage availed Start Date : Time [dd-mm-yyyy hh:mm]	Outage availed End Date : Time [dd-mm-yyyy hh:mm]	Total hours of outage availed now	Deviation ? (Y/N)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	**Example**	Back up Control Center (BCC) : Data	KAYATHAR 230 kV SS	MADURAI LDC	Data will be availble through the alternate route - 230 KV Kayathar-TTPS-TTN Auto-400 KV Kayathar-BCC/Madurai	TANTRANSCO	Shifting of FODB panel at Kayathar 230 KV SS	10-Mar-2021 09:00	10-Mar-2021 18:00	**09:00**	10-Mar-2021 14:07	10-Mar-2021 17:30	**03:23**	**N**

Annexure: DCOA-II

Outage Deviation Report : List of outages of Communication Equipment availed / deviated during the month of

mmm-yyyy

Dated : **dd-mm-yyyy**

B Details of Communication Equipment availed :

SL	Name of Requesting Agency	Name of the communication equipment	Location of the Equipment / Name of Station	Name of the Link/Channel/Path / directions affected	Alternate Channel/Path available ? (Furnish details)	Ownership	Reason for availing outage with the details of faults	Approved Start Date : Time [dd-mm-yyyy hh:mm]	Approved End Date : Time [dd-mm-yyyy hh:mm]	Approved Outage Hours	Outage availed Start Date : Time [dd-mm-yyyy hh:mm]	Outage availed End Date : Time [dd-mm-yyyy hh:mm]	Total hours of outage availed now	Deviation ? (Y/N)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	**Example**	DC Charger -2, Amararaja, 48v,200A	Edamon	Nil	Nil	KSEBL	Monthly maintenance. No interruption as alternate chargers available	16-Mar-21, 11:00	16-Mar-21, 16:00	**05:00**	16-Mar-21, 10:30	16-Mar-21, 16:00	**05:30**	**Y**

Annexure-XIII

COMSR MANUAL-2023

ग्रिड-इंडिया
GRID-INDIA

PREPARED BY

SRLDC, GRID-INDIA

Table of Contents

1. Need for Communication Outage Portal?

In line with the requirements for outage planning of communication equipment as per CERC Communication System for Inter State Transmission of Electricity Regulations 2017, SRPC has devised a procedure for Outage planning for Communication system in Southern Region available at the website of Southern Regional Power Committee (SRPC) (https://www.srpc.kar.nic.in/website/2020/communication/com_outg_proc.pdf) and attached as **Annex-I**. As per the "Procedure on Outage Planning for Communication System -SR", monthly meetings are being conducted with participation of Nodal Officers from users, SLDCs, SRLDC, SRPC & CTU. These meetings are conducted to discuss and approve/reschedule / dispose of the proposed list of outages pertaining to communication links / equipment scheduled for the next month. In order to provide a seamless experience for applying and availing communication outages and monitoring availed outage timelines, SRLDC has developed a web portal which is used to register communication equipment/links, configure outage proposals for already registered equipment/links, view deviations between approved outage timelines and actual outage timelines .The web portal facilitates entering observations/remarks by RLDC/RPC on any outage proposal with the facility to concur/deny the proposal by SRPC.

2. COMSR (Communication Equipment Outage Coordination Meeting - SR) Outage Portal:

The web portal is accessible through the following URL: https://srcom.srldc.in/login

2.1. Login Page:

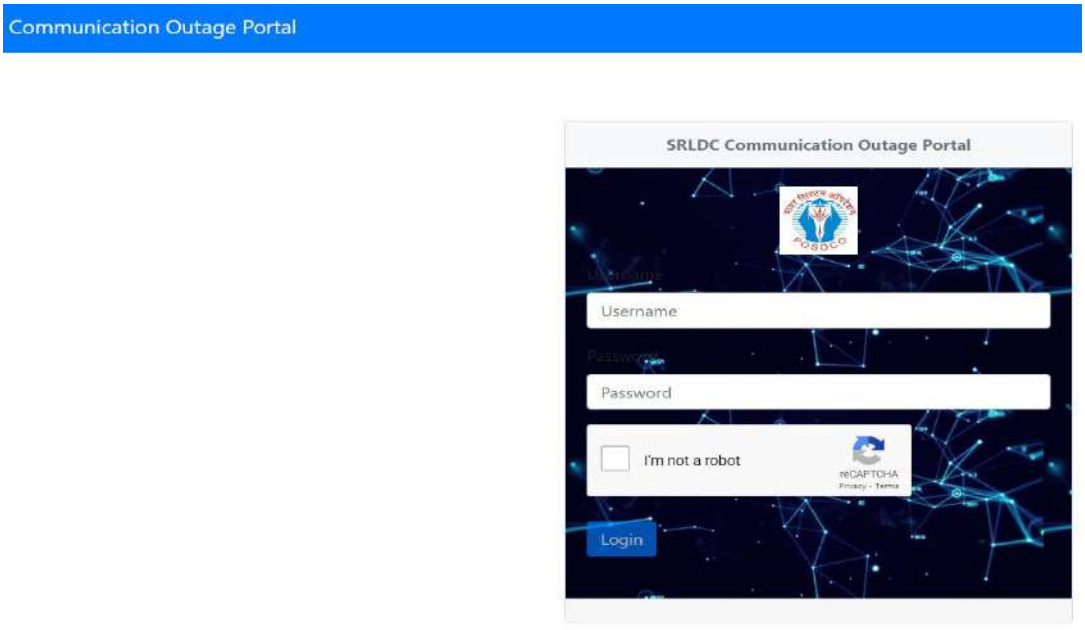


Figure 1 COMSR Portal Login Page

- User name & initial password are created and shared by web admin (SRLDC).
- Note: Password Change can be enforced after first time login.

2.2. Roles defined in the Communication outage portal

1. **Administrator (RPC)**
2. **Supervisor (RLDC)**
3. **User**
4. **Operator**

The administrator role is assigned to the respective RPC. Supervisor Role is assigned to the respective RLDC. User Role is assigned to each entity/utility, who can apply for outages. Operator Role is assigned to real time shift operators at RLDC.

- Only Administrator can approve/deny the proposed outages. Supervisor can provide remarks against each proposed outage and do necessary configuration and maintenance of web-portal front end and Db for smooth functioning of the entire process.
- Operator can view the portal for list of approved outages and issue codes for availing outages
- User can apply for the outages proposed for the next month and once the outage is approved, the respective user can view the approval details under their account login . User can also apply for emergency outages. User can also update the actual time duration (Start time, End time) of each outage availed.

2.3. Main Tabs in COMSR Portal:

- **Meetings**
- **Links**
- **Equipment**
- **COA1(Link) -** Communication Outage Approval for Communication Links
- **COD1(Link) -** Communication Outage Deviation for Communication Links
- **COA2(Equipment)-** Communication Outage Approval for Communication Equipment
- **COD2(Equipment) -** Communication Outage Deviation for Communication Equipment
- **Rolling Report- 12 Months Outage Time > 48hours**
    - **COD3- Communication Outage Rolling 12 Months Deviation – Links**
    - **COD4-Communication Outage Rolling 12 Months Deviation - Equipment**

Note:
1. Formats for COA1, COA2, COD1, COD2, COD3 & COD4 have been finalized by SRPC.
2. All Reports can be downloaded from the web portal in Excel Format

2.4. Meetings Tab

Figure 2 below shows the Meeting summary Page, where details for upcoming monthly meeting can be configured with a unique meeting number for each meeting. The details configured include opening and closing dates for receipt of applications for

communication links/equipment outages proposed for next month (M+1month outages proposed in timelines defined in Mth month).

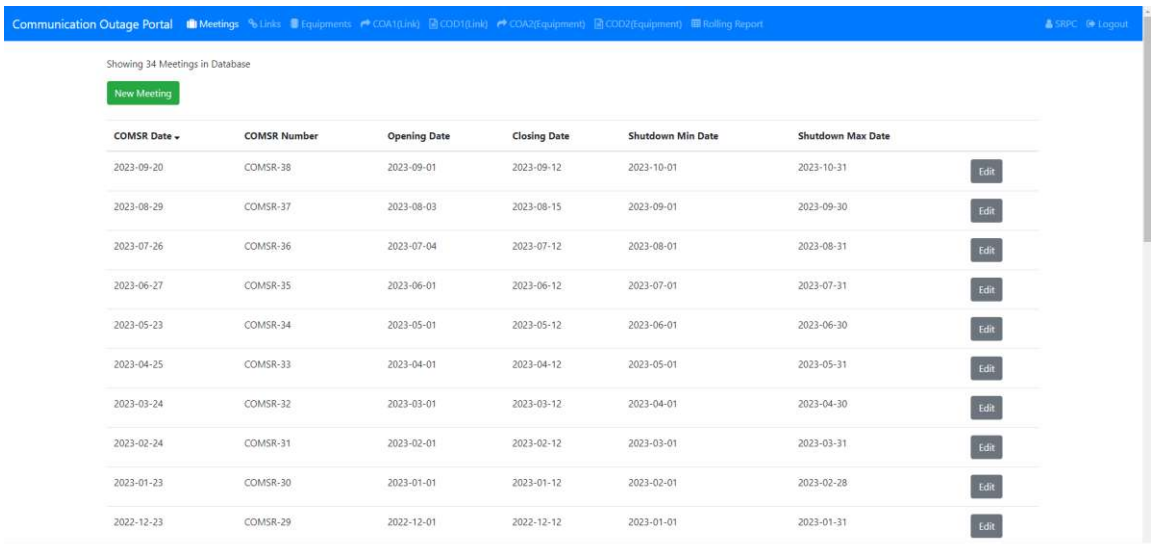


Figure 2 Meeting summary Page

A sample meeting creation page screen in shown in Figure 3 below:

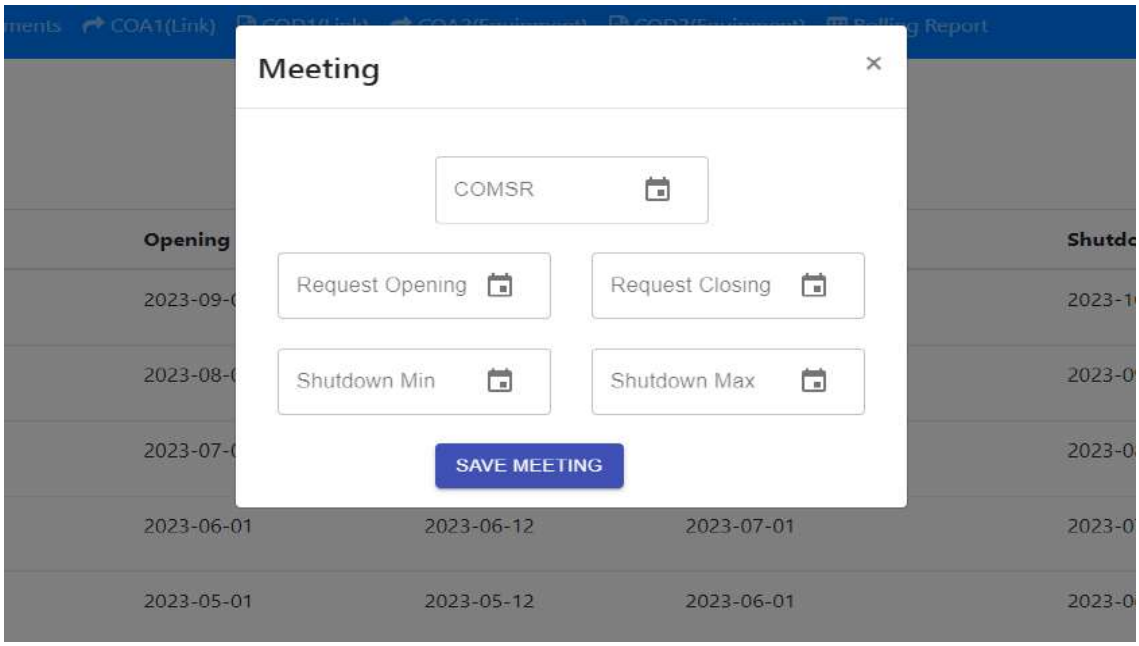


Figure 3 New Meeting Creation Page

All options available on this webpage are customisable and presently the meeting creation option is automated with default Opening and Closing dates for proposed outages as 1st and 12th of the current month.

2.5. Work Flow for availing communication outages:

RPC (Administrator Login) configures the upcoming COMSR Meeting details in the web portal through manual/automated mode and intimation for the next meeting is sent to all stakeholders through e-mail.

2.5.1. Planned Outages:

- User can apply planned outages for the M+1 month by furnishing various details during current month (M) window (planned outages to be submitted between defined timelines---*opening and closing date* as shown in Figure 3 above) and the applied outage details intimation are sent automatically through mail to RLDC and RPC by the portal itself.
- User can edit their applied outages till end of c*losing date* of requests for M+1 Month.
- RLDC can provide observations for the proposed outages.
- RPC consolidates the list of outage proposals received from various Users/Owners and releases the list around mid of the M^{th} month for outages proposed for M +1 month.
- On the meeting date, the proposed outages are deliberated, and RPC approves, revises or rejects the applied outages as per the outcome of discussions.
- Facility has been provided in the portal for RPC to change/defer (approval/rejection) of approved requests till D-1 day (D being the day of availing outage).
- User need to intimate RLDC about availing approved outages(confirmation) before D-3 through email (D being the date of availing outage).
- A consolidated view of day-wise approved outages is available under Operator Login. The facility has been made available to enable Grid Operators to issue unique codes to the concerned user seeking equipment/link outage on the day of outage.

Detailed flowcharts covering activities involved in creating a meeting instance on web portal, entering of planned outages by Users, provision for entering review/observations by RLDC/RPCs, discussions on proposed outages in monthly meeting, approval/denial of proposed outages, availing of outages on the proposed dates, computing deviations between actual outage timeline with proposed timeline and preparation of Rolling Window for outages for last 12 months are depicted in figures 4 and 5 below.

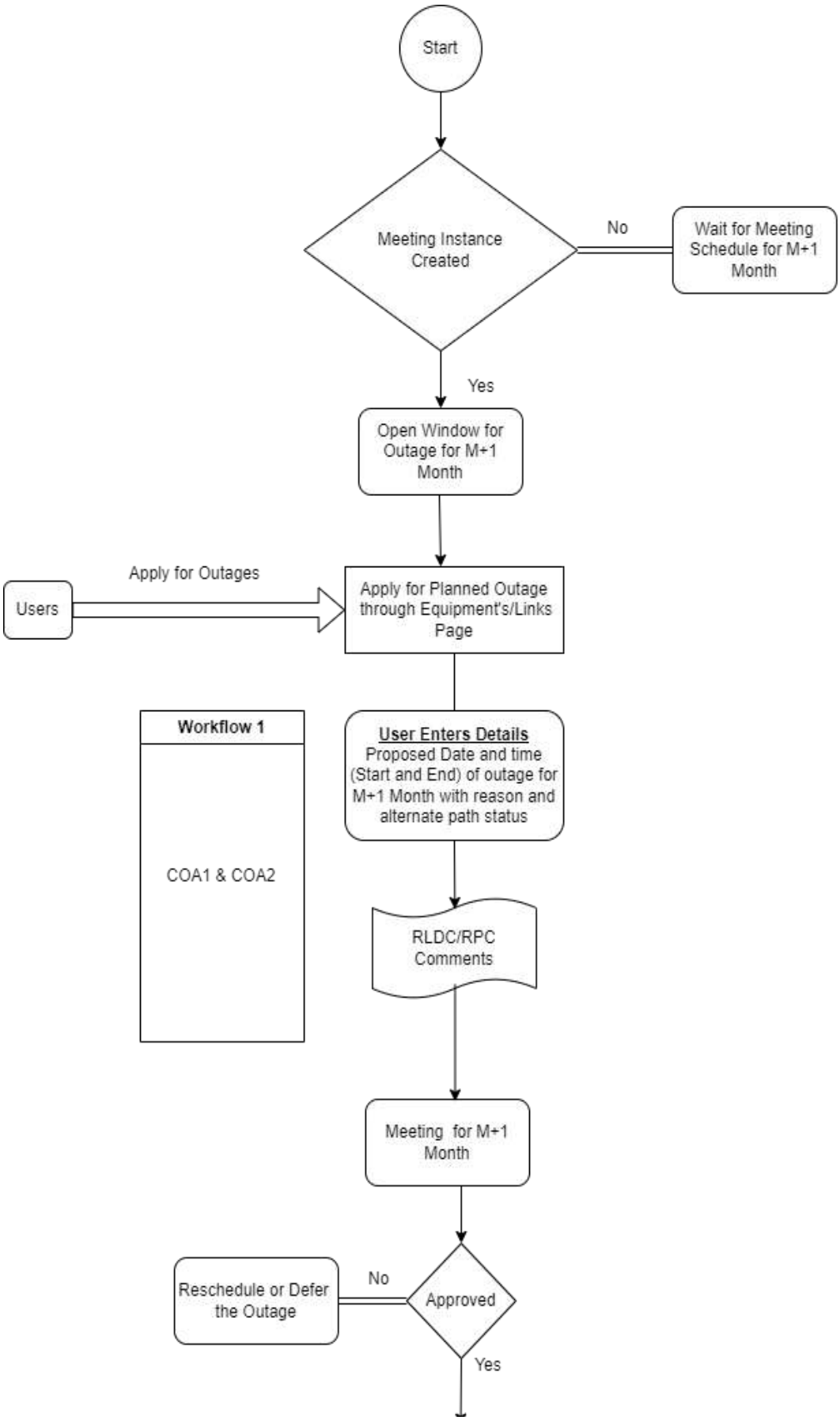


Figure 4 Flowchart for Planned Outage processing through web portal

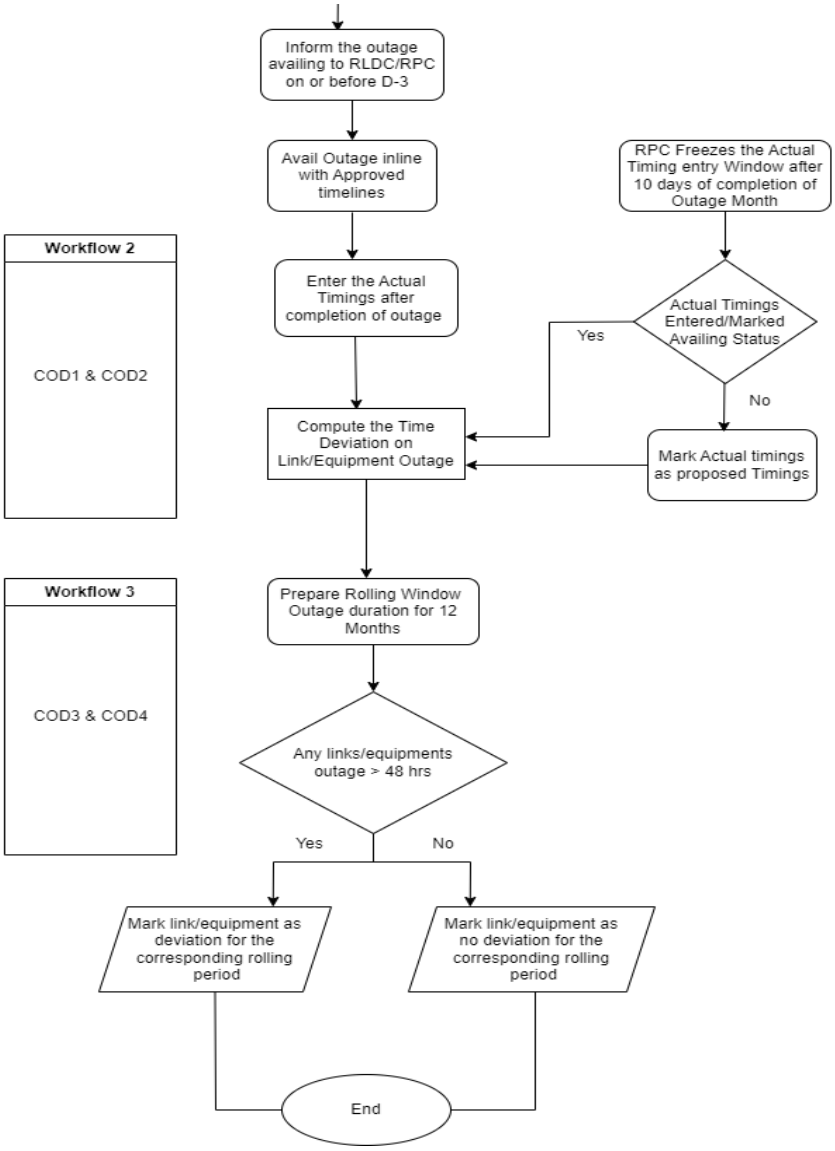


Figure 5 Flowchart for availing approved outages and entering deviations between approved/actual outage timelines through web portal

2.5.2. Emergency & Forced Outages:

- User can apply Emergency outages for D Day on D-1 Day i.e1 Day before the proposed outage. The details of applied Emergency Outage will be sent to registered email ids of RLDC and RPC for concurrence.
- User can submit details for Forced outages availed for links/equipment in previous Month (M-1) till 12th of the current Month(M). The details of reported Forced Outages will be sent to registered email ids of RLDC and RPC.

Flowchart covering various activities involved in application and approval of emergency outages is depicted in Figure 6 below.

Flowchart covering various activities involved in reporting of forced outages and its inclusion in 12 months rolling report is depicted in Figure 7 below.

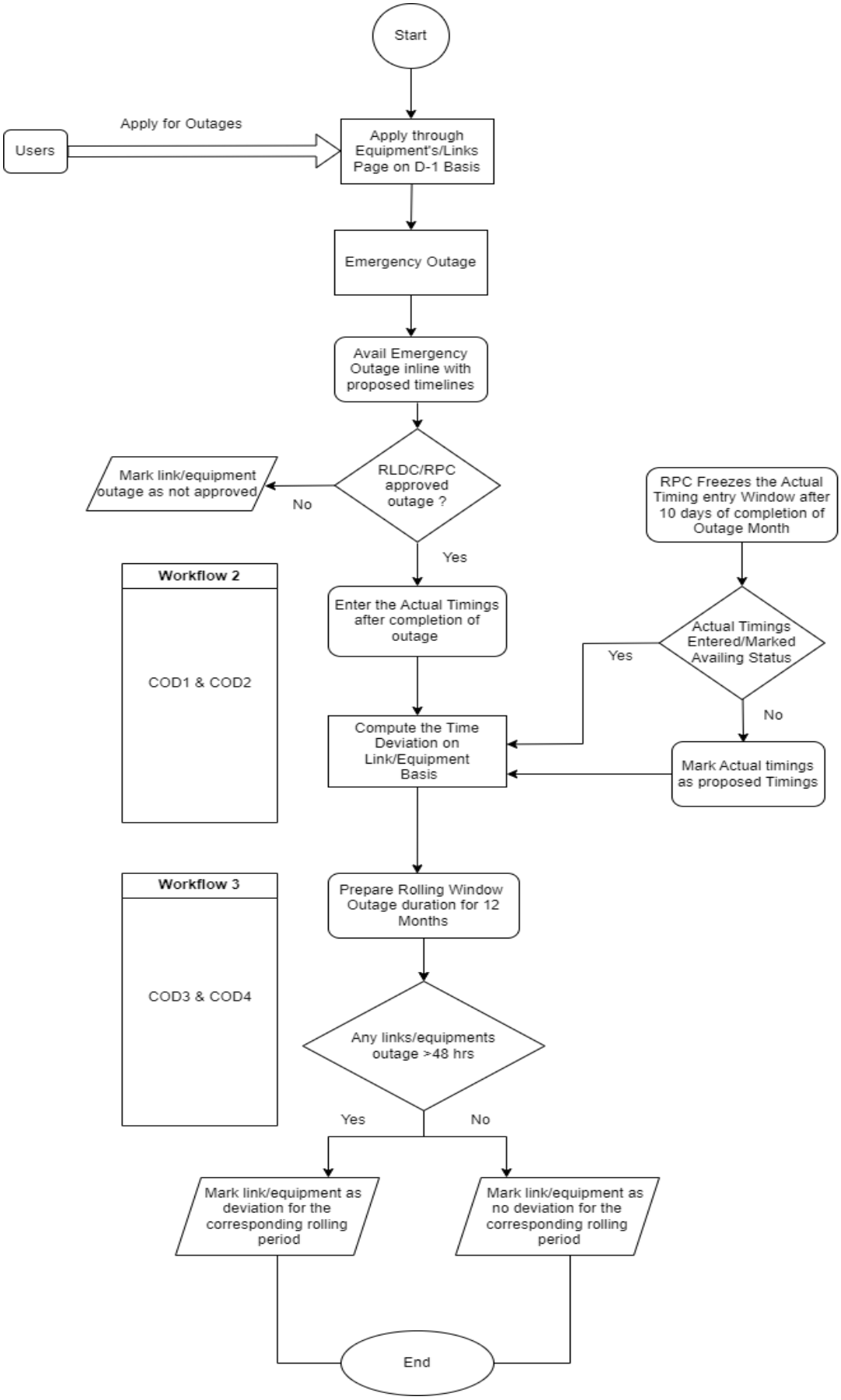


Figure 6 Emergency Outage Workflow

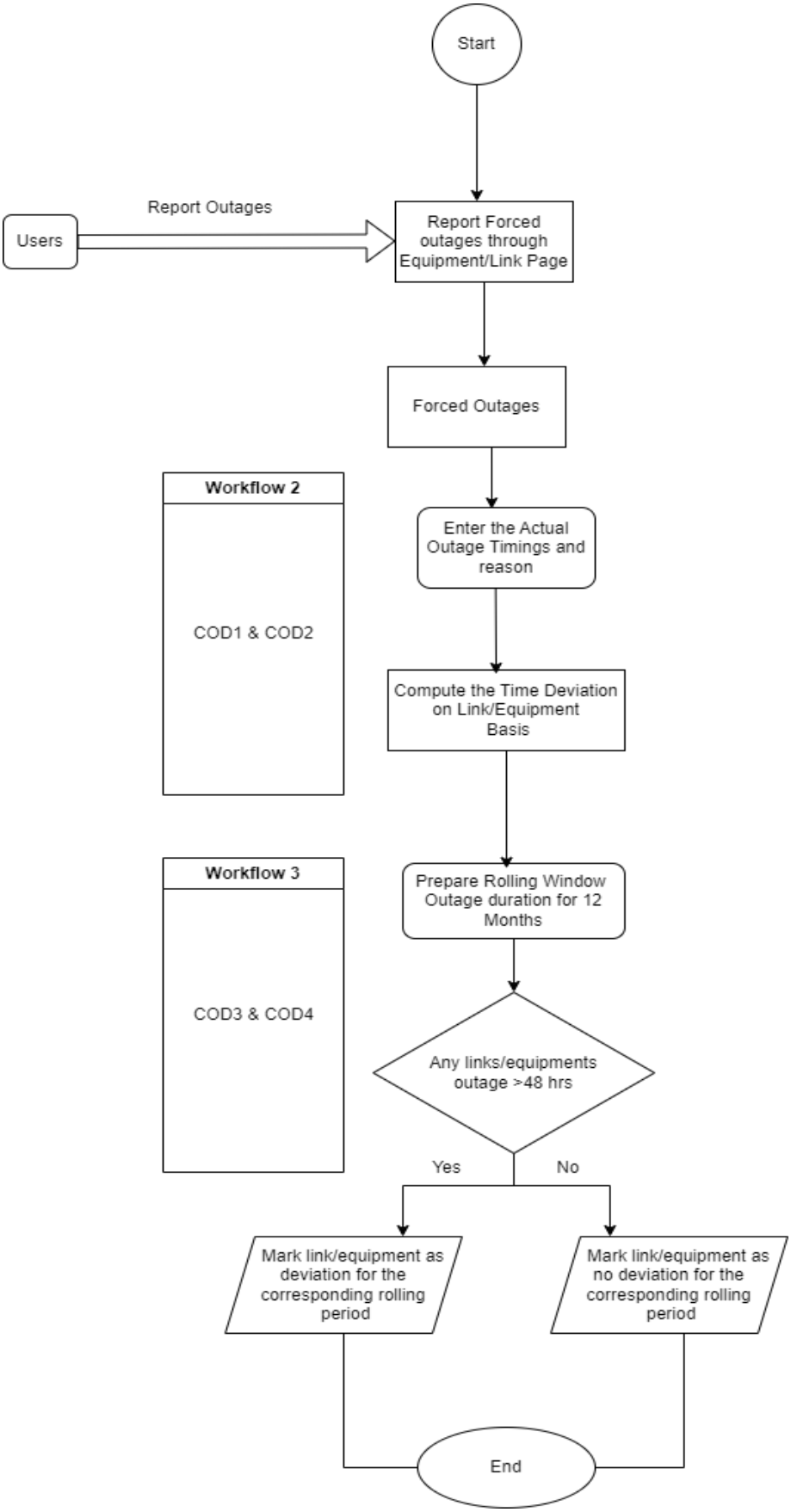


Figure 7 Forced Outage Workflow

2.6. Adding new/modified Equipment/Link to the portal database:

- Under the **Equipment** Tab, provision is there for User to add new/modified equipment details and request RPC/RLDC for addition/updating of the equipment in COMSR Database through "Request to Add new Equipment to Database option". Screenshot of the "Create New Equipment" widget is shown in Figure 8 below.

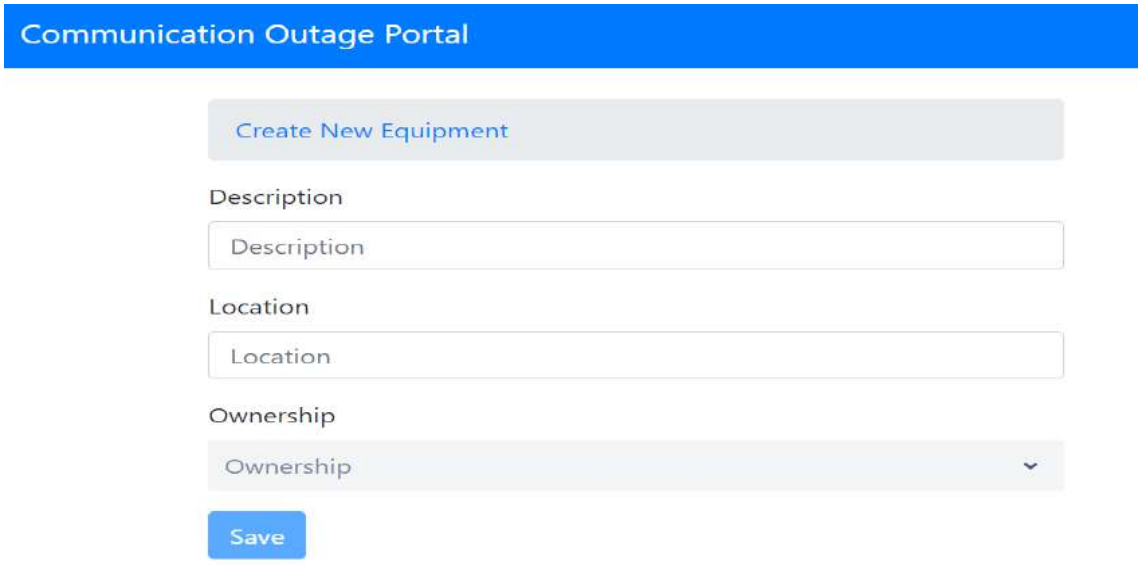


Figure 8 Create new Equipment Request screen

Similarly, any new/modified Communication Channel (links) can be added through the **Links** Tab by User and User can further request RPC/RLDC for approval of addition of the same in Communication outage portal database, Screenshot of the "Create New Link" widget is shown in Figure 9 below.

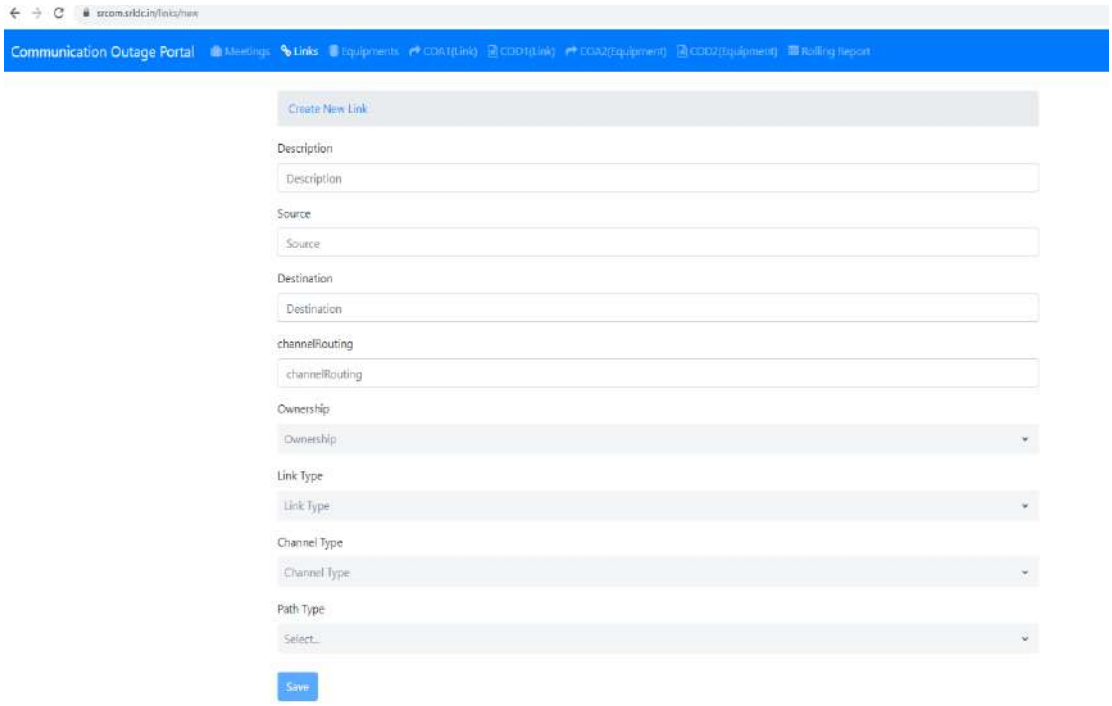


Figure 9 Create the communication Channel screen

Workflow depicting activities involved in adding new/modified Equipment/Link to the portal database is depicted below (Figure 10).

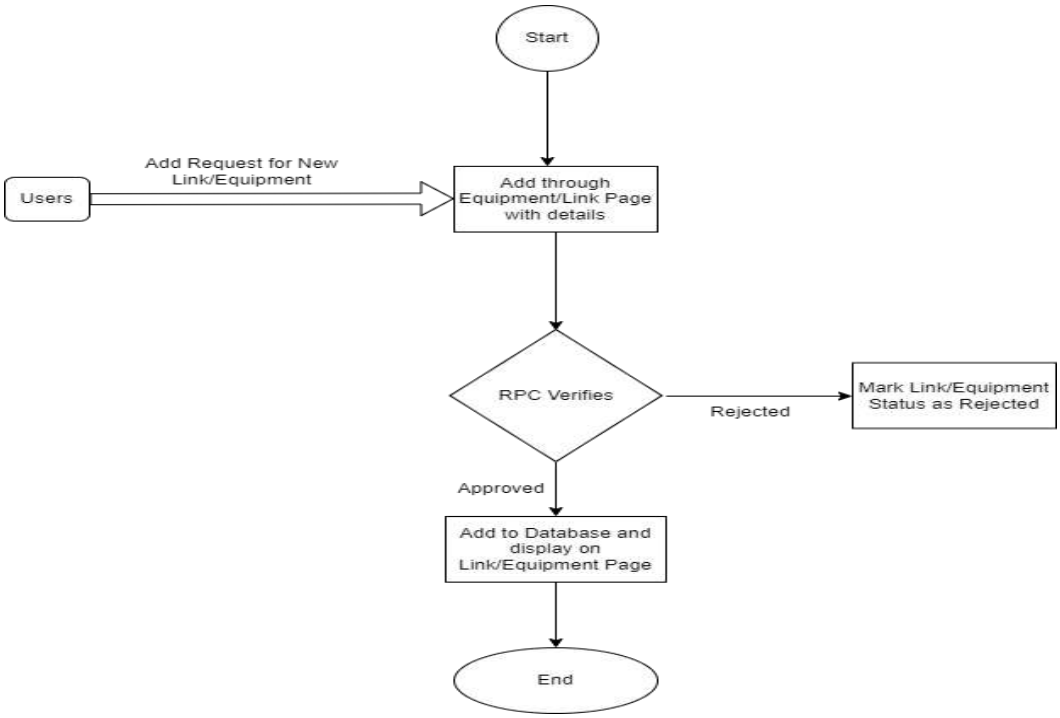


Figure 10 Adding New Links/Equipment's Workflow

Once a user requests for the addition/modification of the communication equipment or links, the request is forwarded to RPC for approval. Screenshot of widget showing the pending equipment/link approval of respective RPC/RLDC sample view is shown in Figure 11 below.

Figure 11 Pending Approval Widget for equipment's

- RPC/RLDC can add/update the Communication outage portal database with equipment/links proposed by users through **Equipment** tab on the web portal which contains a widget for **Pending Equipment to be added to Database** or through **Links** tab on the web portal with a widget for **Pending Links to be added to Database.**

2.7. Links Tab

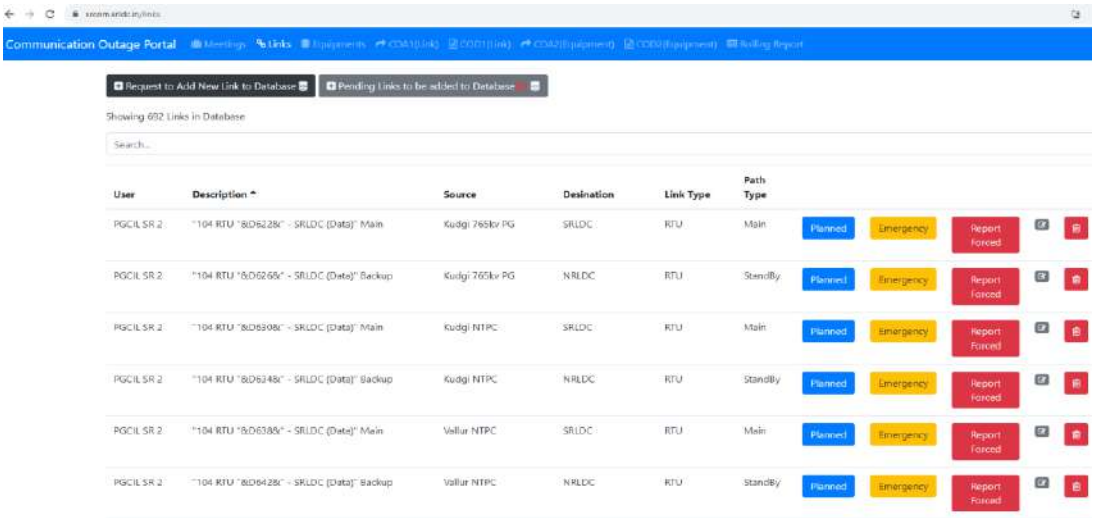


Figure 12 Links Tab sample screen

From **Links** tab, user can apply for proposed outages in communication links in either planned or emergency category and can also report the forced outages availed.

Sample View page screens for entering planned, emergency or forced outage details for communication equipment by the User are shown below in Figures 13,14 and 15 respectively.

2.7.1. Planned Outage Application for Links:

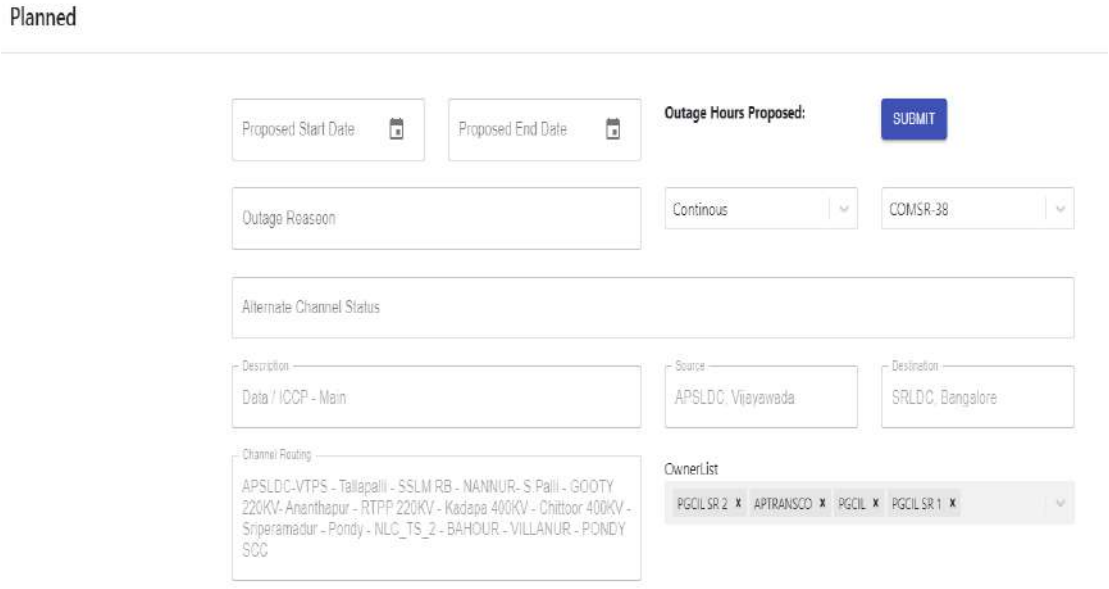


Figure 13 Planned Outage Application Screen for Links

2.7.2. Emergency Outage Application for Links:

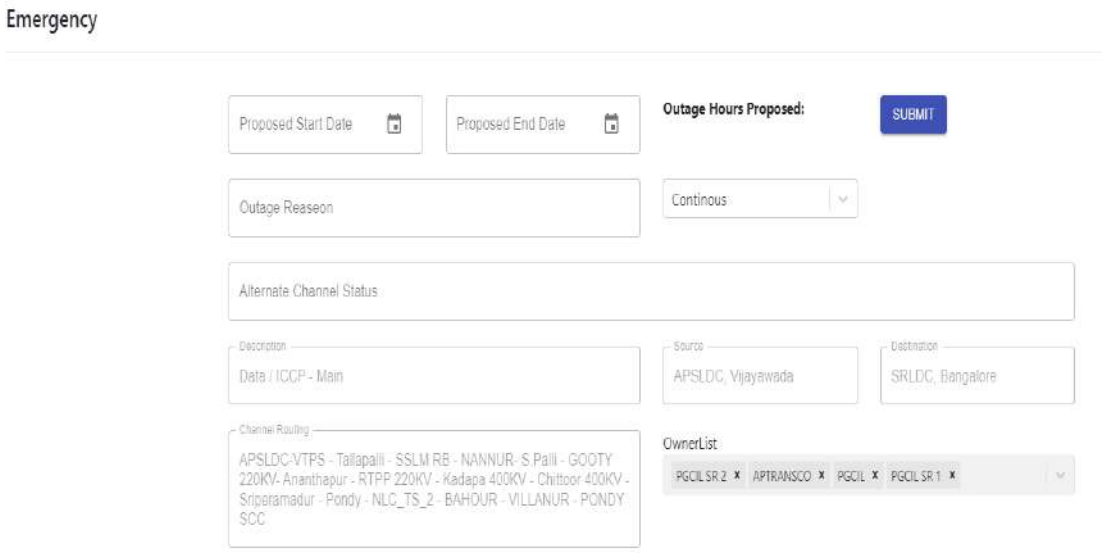


Figure 14 Emergency Outage Application Screen for Links

2.7.3. Forced Outage Reporting for Links:

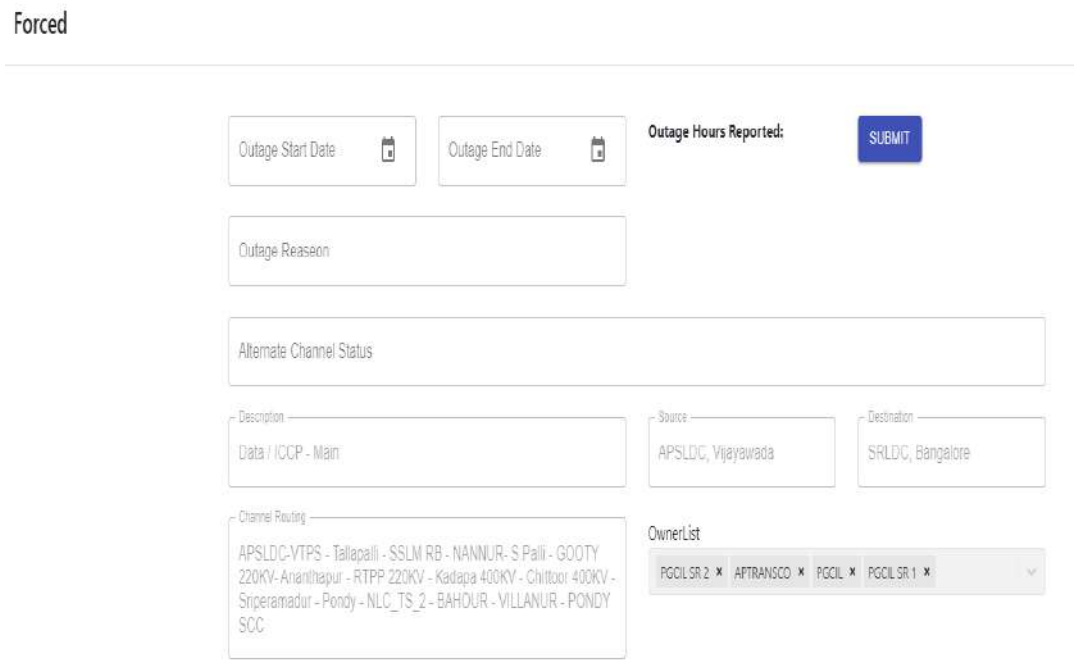


Figure 15 *Forced Outage Reporting Screen for Links*

2.8. Equipment Tab

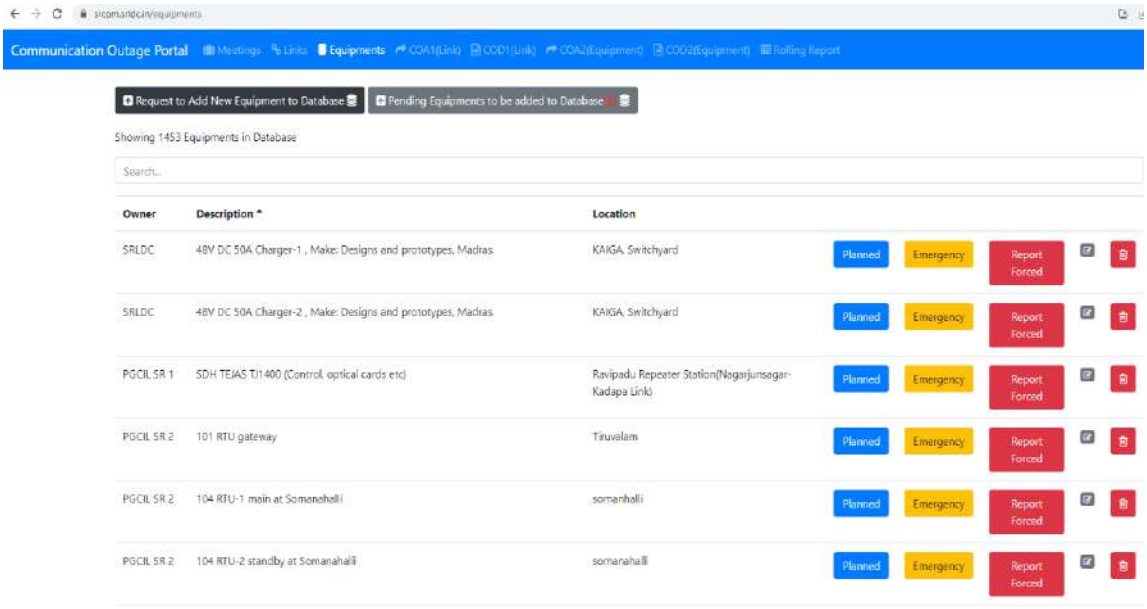


Figure 16 Equipment Tab sample screen

From **Equipment** tab (Figure 16 above), user can apply for proposed outages in communication equipment in either planned or emergency category and can report the forced outage availed. Sample View page screens for entering planned, emergency or forced outage details for communication equipment by the User are shown below in Figures 17,18 and 19 respectively.

2.8.1. Planned Outage Application for Equipment:

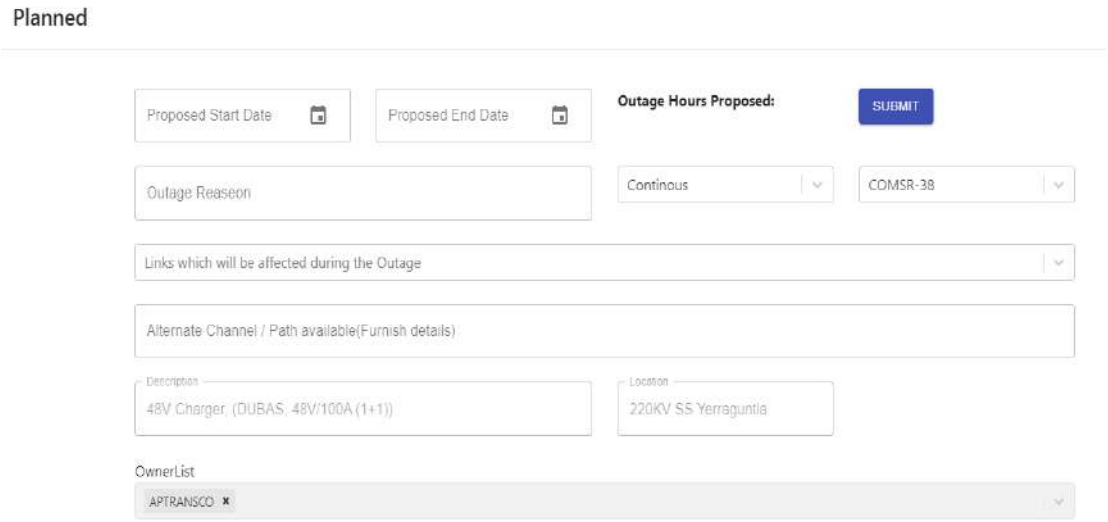


Figure 17 Planned Outage Application Screen for Equipment

2.8.2. Emergency Outage Application for Equipment:

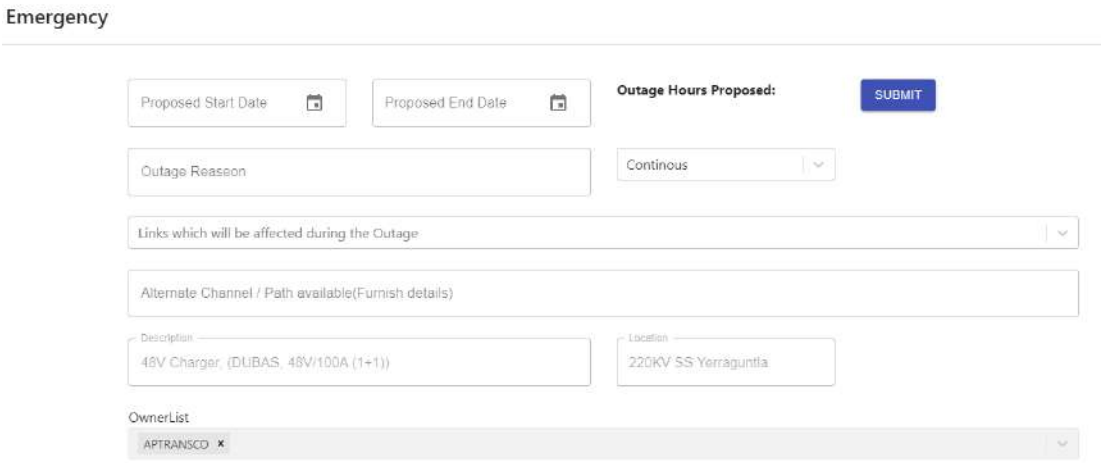


Figure 18 Emergency Outage Application Screen for Equipment

2.8.3. Forced Outage Reporting for Equipment:

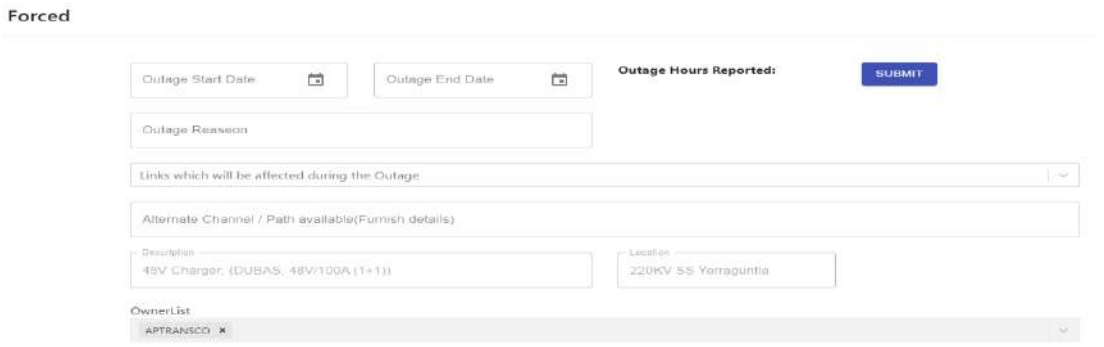


Figure 19 Forced Outage Reporting screen for Equipment

2.9. COA1(Link) - Communication Outage Approval Links

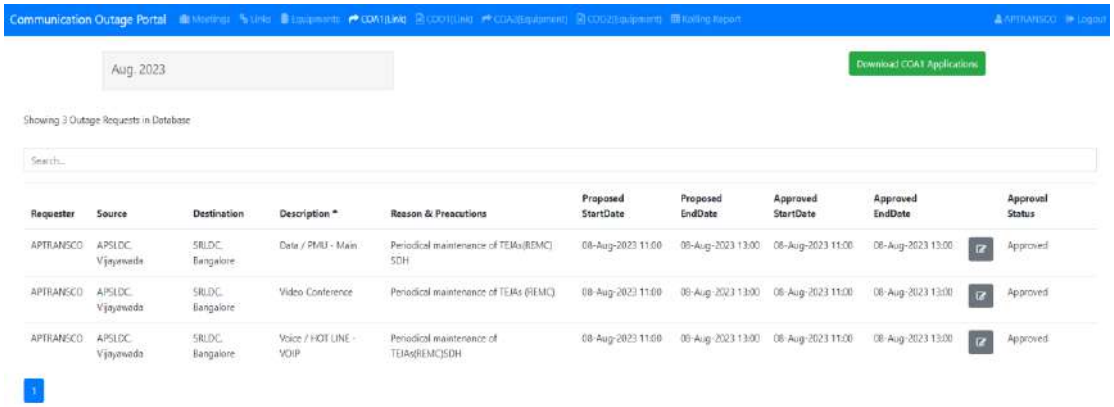


Figure 20 Communication Outage Application links (COA1) details for selected month

Through COA1 tab (Figure 20 above), Users can view the consolidated list of outage requests (for communication channels) submitted by them along with the current status of each outage request i.e., whether approved/rejected/revised (along with approved

timelines). Through this tab, users can edit their outage requests within the scheduled timeline window for submission of proposed outages.

Under Admin/Supervisor logins (RPC/RLDC) COA1 tab provides a consolidated list of all outage requests (for communication channels) from all users with proposed start and end date / time along with approved start and end date/ time for each outage.

2.10. COD1(Link) - Communication Outage Deviation - Links

Once communication link outage is approved in COMSR meeting, the final approved list for outage of communication links is communicated by RPC to all stakeholders and also updated on COMSR web portal. After availing the approved outage, concerned users have to enter the actual outage times (including start and end date, time) through COD1(Links) Tab (Figure 21 below) for communication channels

Note: In case of Emergency outage, approved start and end date times shall be null.

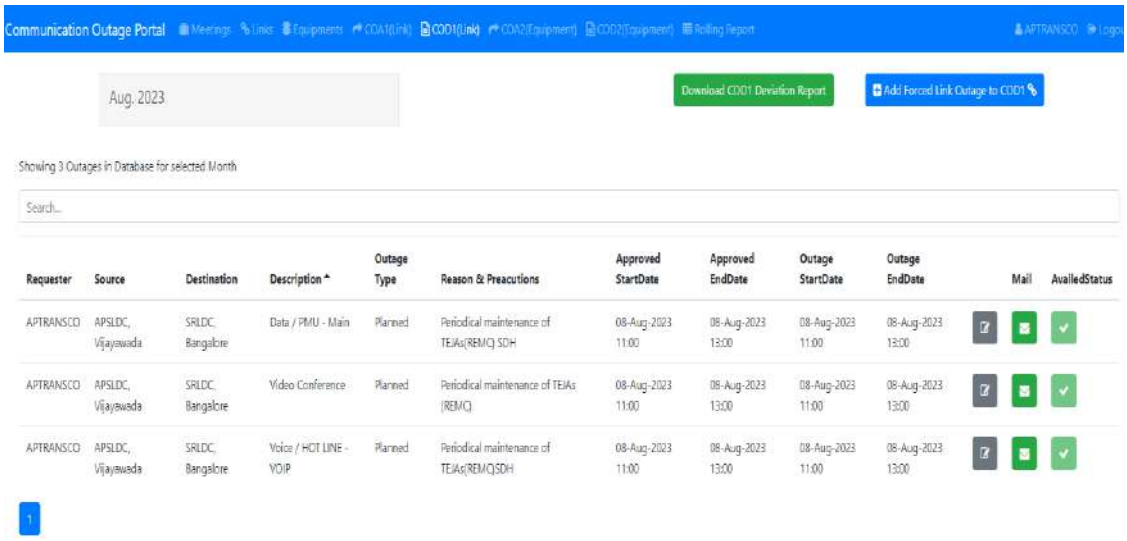


Figure 21 Communication Outage Deviation entry page for communication links (COD1)

Once the User enters the timings for actual outage duration for each approved outage, any deviation between the actual outage timing from the approved outage timing is computed and displayed in the COD1 tab. Sample screen for entry options available for Users against each approved outage under COD1 tab is shown in Figure 22 below. In case the user didn't avail the approved outage, user can select the "*Not availed*" option and submit the same in Communication Outage web portal. Similar Procedure is to be followed by Users for entering details of Emergency Category outages also.

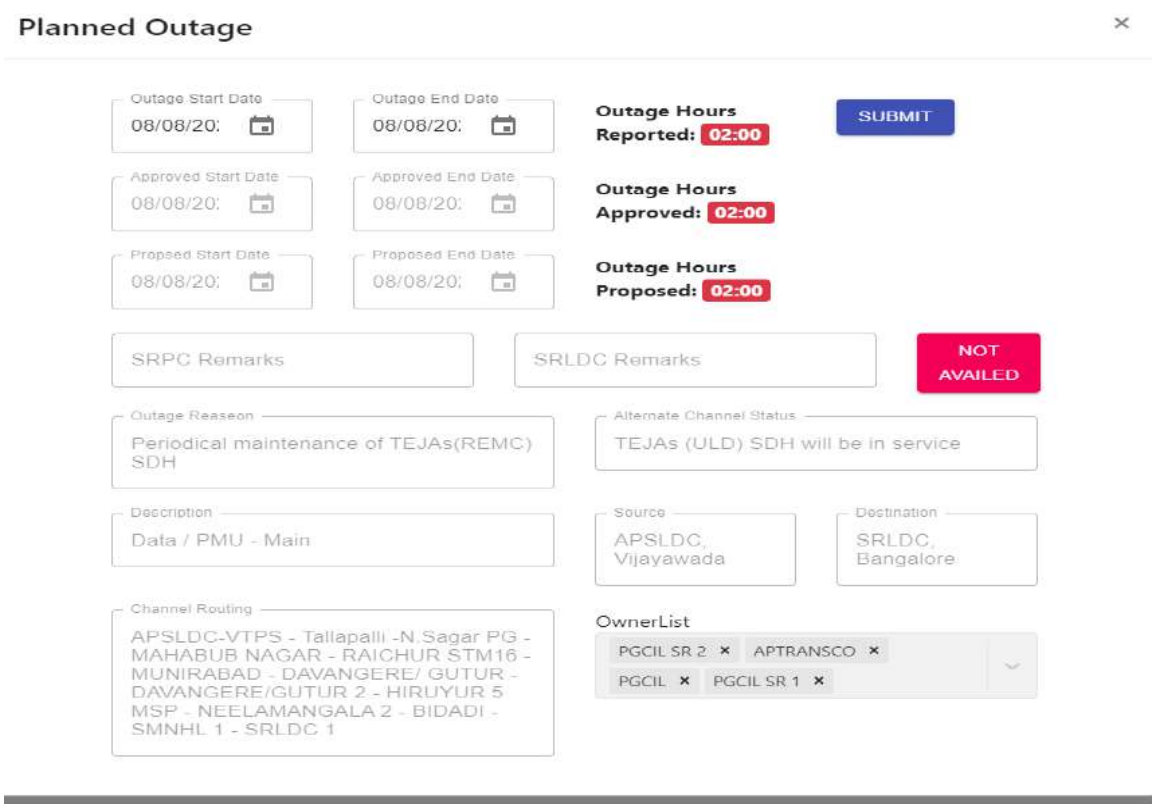


Figure 22 Planned Outage - actual time reporting entry screen

For reporting forced outages of communication links, user can use the "Add Forced Link Outage to COD1" Button which is located in the right corner of COD1(Links) Page (Fig. 22 above). On clicking this button, it shall navigate to Links Page where user can submit the details for the outage by selecting the respective links Sample screen for Forced Outage reporting widget is shown in Figure 23.

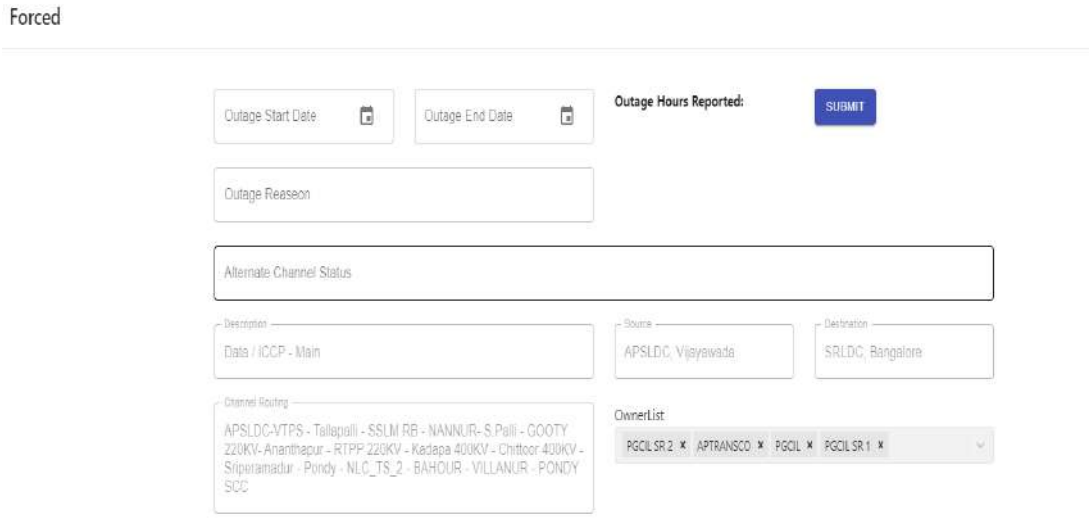


Figure 23 Forced Outage Reporting with actual outage times screen

2.11. COA2 (Equipment)- Communication Outage Approval for Equipment

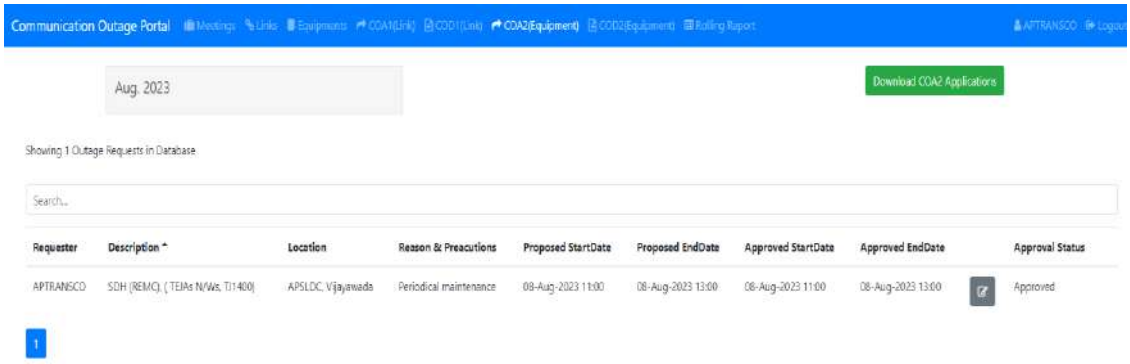


Figure 24 Communication Outage Application links (COA2) details for selected month

Through COA2 tab (Figure 24 above), Users can view the consolidated list of outage requests (for communication equipment) submitted by them along with the current status of each outage request i.e., whether approved/rejected/revised (along with approved durations). Through this tab, users can edit their outage requests within the scheduled timeline window for submission of proposed outages.

Through COA2 tab, RPC/RLDC can view consolidated list of all outage requests (for communication equipment) from all users with proposed start and end date / time along with approved start and end date/ time for each outage.

2.12. COD2(Equipment) - Communication Outage Deviation for Equipment

Once communication equipment outage is approved in COMSR meeting, the final approved list for outage of communication equipment is communicated by RPC to all stakeholders and also updated on COMSR web portal. After availing the approved outage, concerned users have to enter the actual outage times (including start and end date, time) through COD2(Equipment) Tab (Figure 25 below) for communication equipment.

Note: In case of Emergency outage, approved start and end date times shall be null.

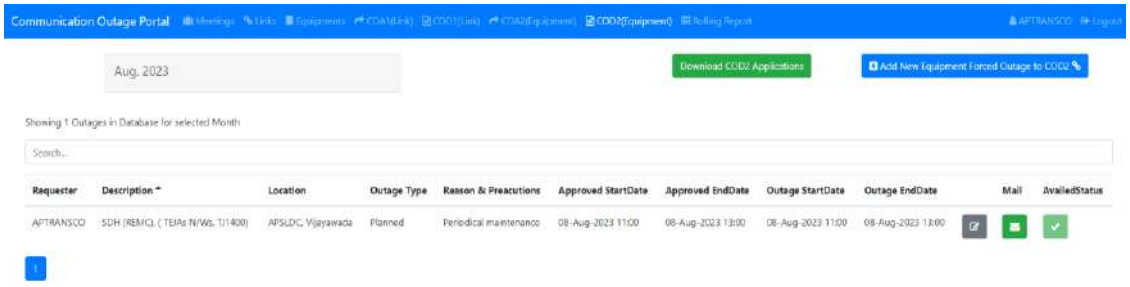


Figure 25 Communication Outage Deviation entry page for communication Equipment (COD2)

Once the User enters the timings for actual outage duration for each approved outage, any deviation between the actual outage timing from the approved outage timing is computed and displayed in the COD2 tab. The sample screen for entry options available for Users against each approved outage under COD2 tab is shown in Figure 26 below.

In case the user didn't avail the approved outage, the user can select the "Not Availed option" and submit the same in COMSR web portal. Similar Procedure is to be followed by Users for entering details of Emergency Category outages also.

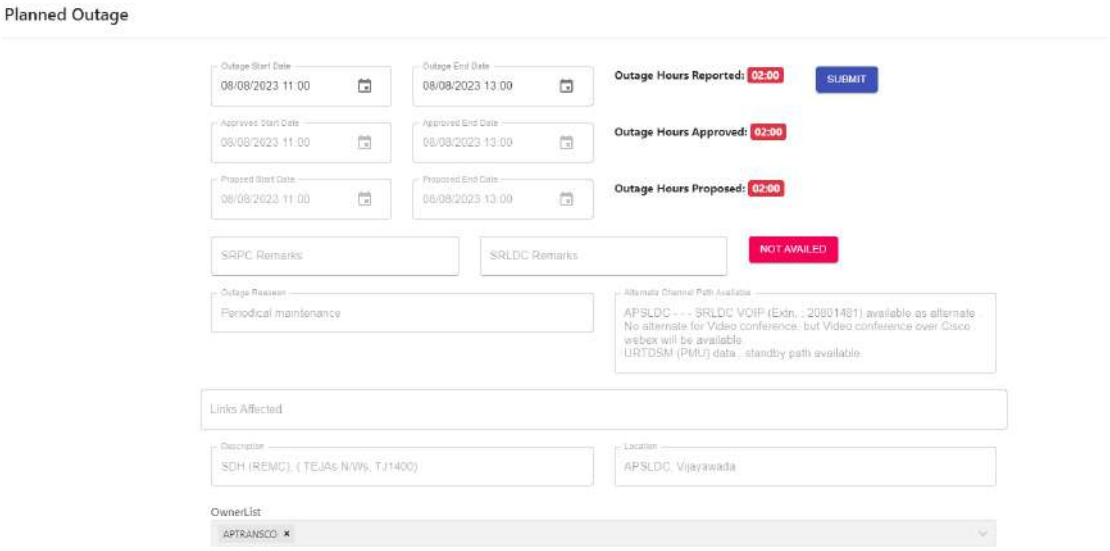


Figure 26 Planned Outage (Equipment) - actual time reporting entry screen

For reporting forced outages of communication equipment, user can use the "Add Forced Link Outage to COD2" Button located in the right corner of COD2(Equipment's) Page (Fig. 27 below). On clicking this button, it shall navigate to Equipment Page where user can submit the details for the respective Forced Outage.

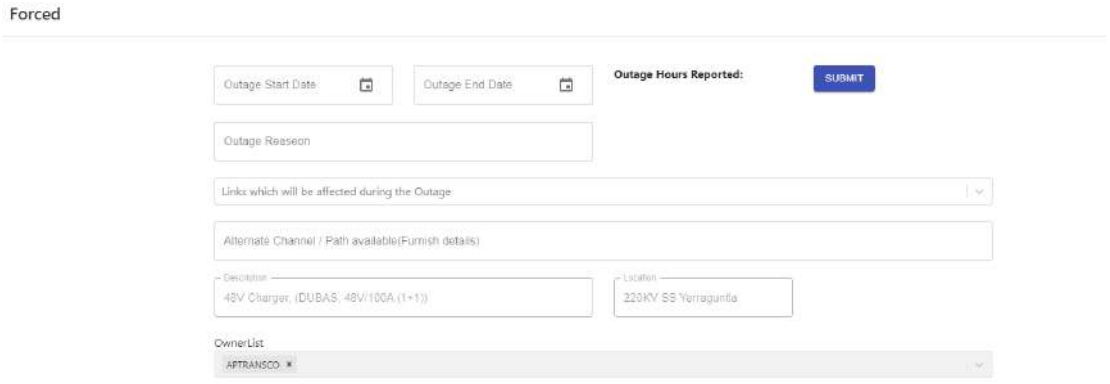


Figure 27 Forced Outage (Equipment's) Reporting with actual outage times screen

As per the approved Outage Procedure, all users/owners of communication equipment's/links need to submit the deviation report for outages availed by them in the M-1 month (considering M as current month) by 10th of the Mth Month. This requirement has been facilitated through the COD1(Links) & COD2(Equipment) tabs in the Communication Outage web portal.

Once this COD1 (links) & COD2 (equipment) is filled by respective Users/owners, RPC freezes the COD1& COD 2-page entry option after 10th of Mth month for outages availed in M-1 Month using "Freeze COD Application button" (Figure 28 and 29 below), available under Admin role login. In cases wherein the user has not entered the actual outage

timelines of approved outages, the portal automatically takes the approved outage timelines as actual outage timelines for planned outages. In case of emergency outages, if the user doesn't enter the actual outage timelines for the outage availed, the portal automatically takes proposed outage timings as actual outage timings. In all such cases, wherein User doesn't enter the actual outage timelines, the outage is deemed to be availed by respective entity.

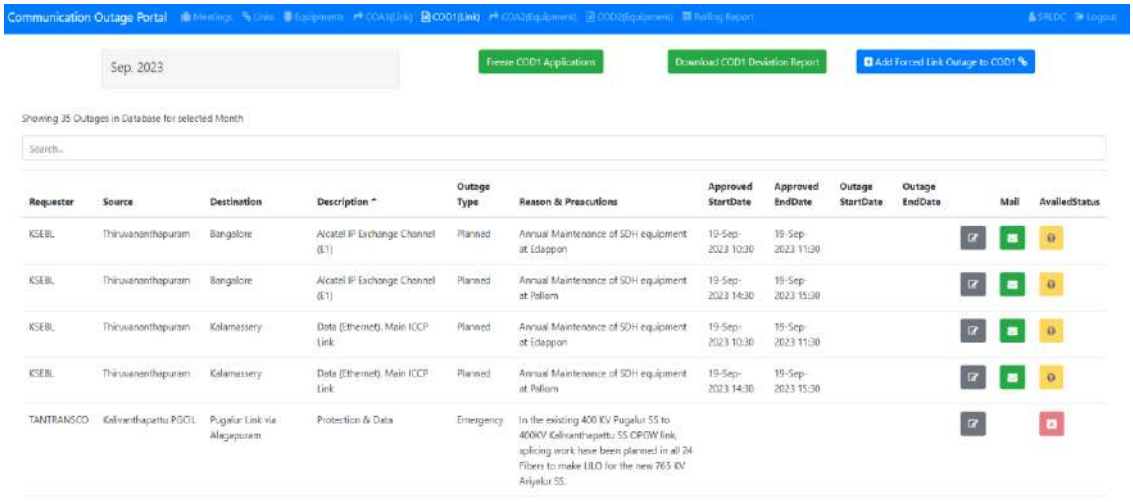


Figure 28 RPC view for Freezing COD1 Application.

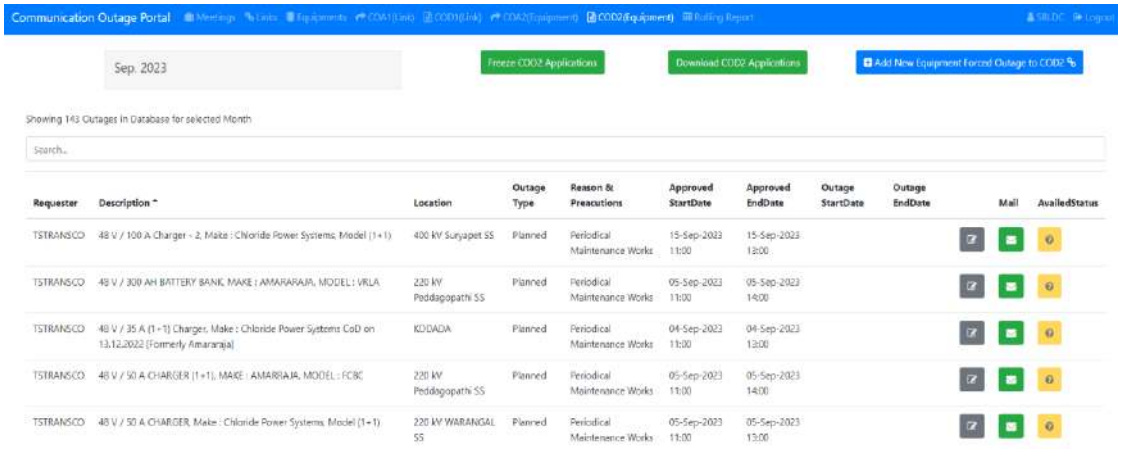


Figure 29 RPC view for Freezing COD2 Application

2.13. Rolling Report-- 12 Months Outage Time > 48hours

In order to monitor and highlight excessive outages of any of the communication link/equipment registered in the COMSR Db, Rolling Outage Reports for last twelve (12) months are provided which cumulatively adds the outage duration of communication links/equipment as per COD1/COD2 reports of last 12 months and summarizes the same in COD3 report (for communication links) and COD4 report (for Equipment). COD3 and COD4 reports are available for downloading in excel from the web portal. Sample screen showing download option is shown in Figure 30 and sample report format for COD3 (links) and COD4 (equipment) are shown in Figure 31 and Figure 32 below.

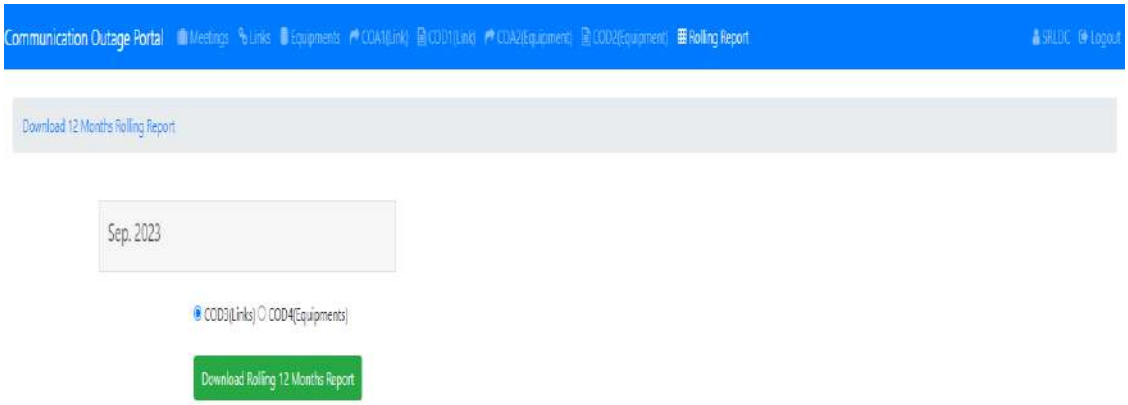
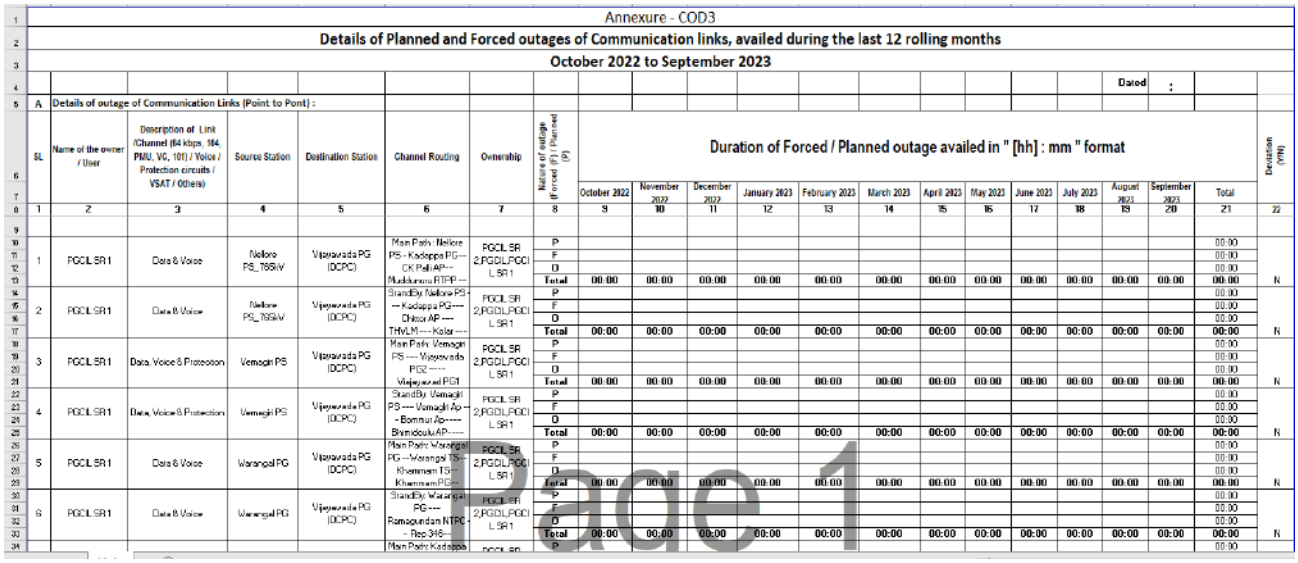


Figure 30 Rolling Report - 12 Months Outage Time download option



Annexure - COD3

Details of Planned and Forced outages of Communication links, availed during the last 12 rolling months

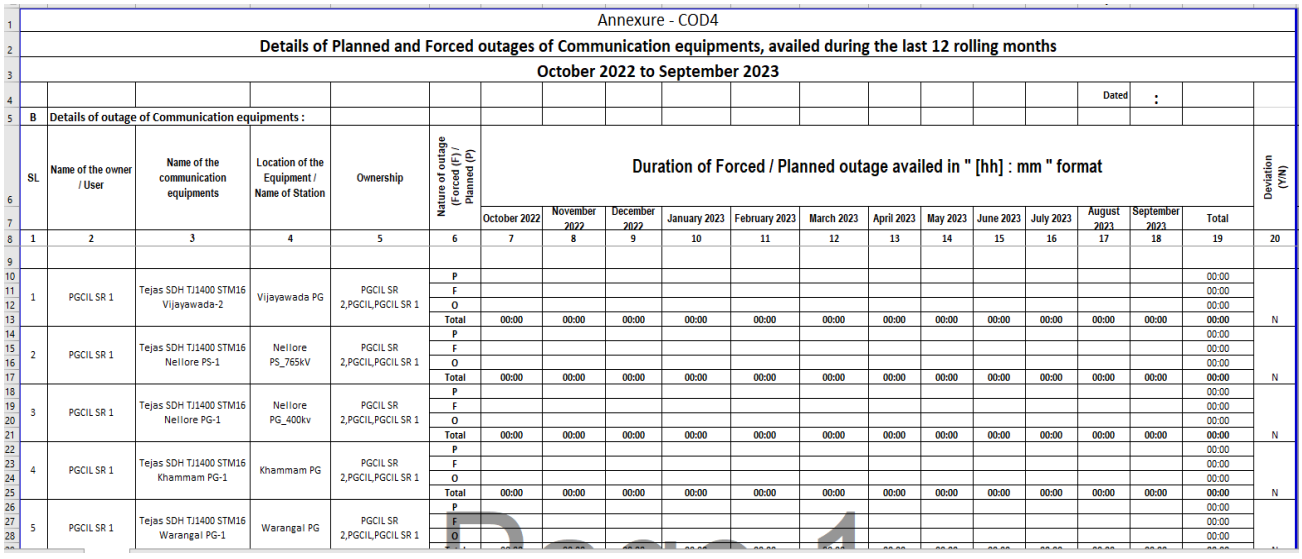
October 2022 to September 2023

Dated :

A Details of outage of Communication Links (Point to Pont) :

SL	Name of the owner / User	Description of Link /Channel (64 kbps, 164, PMU, VC, 101) / Voice / Protection circuits / VSAT / Others)	Source Station	Destination Station	Channel Routing	Ownership	Nature of outage (Forced (F) / Planned (P))	Duration of Forced / Planned outage availed in " [hh] : mm " format												Deviation (Y/N)
								October 2022	November 2022	December 2022	January 2023	February 2023	March 2023	April 2023	May 2023	June 2023	July 2023	August 2023	September 2023	Total	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	PGCIL SR1	Data & Voice	Nellore PS_765kV	Vijayawada PG (DCPC)	Main Path: Nellore PS - Kadappa PG--- CK Pall AP--- Muddunuru PGR ---	PGCIL SR 2,PGCIL,PGCIL SR1	P													00:00	
							F													00:00	
							O													00:00	
							Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
2	PGCIL SR1	Data & Voice	Nellore PS_765kV	Vijayawada PG (DCPC)	StandBy: Nellore PS --- Kadappa PG---- Chittor AP ---- THVLM ---- Kolar ----	PGCIL SR 2,PGCIL,PGCIL SR1	P													00:00	
							F													00:00	
							O													00:00	
							Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
3	PGCIL SR1	Data, Voice & Protection	Vemagiri PS	Vijayawada PG (DCPC)	Main Path: Vemagiri PS ---- Vijayawada PG2 ----- Vijayawada PG1	PGCIL SR 2,PGCIL,PGCIL SR1	P													00:00	
							F													00:00	
							O													00:00	
							Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
4	PGCIL SR1	Data, Voice & Protection	Vemagiri PS	Vijayawada PG (DCPC)	StandBy: Vemagiri PS --- Vemagiri Ap --- Bommur Ap----- Bhimavaram AP ----	PGCIL SR 2,PGCIL,PGCIL SR1	P													00:00	
							F													00:00	
							O													00:00	
							Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
5	PGCIL SR1	Data & Voice	Warangal PG	Vijayawada PG (DCPC)	Main Path: Warangal PG --Warangal TS--- Khammam TS--- Khammam PG---	PGCIL SR 2,PGCIL,PGCIL SR1	P													00:00	
							F													00:00	
							O													00:00	
							Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
6	PGCIL SR1	Data & Voice	Warangal PG	Vijayawada PG (DCPC)	StandBy: Warangal PG --- Ramagundam NTPC - Rec 346---	PGCIL SR 2,PGCIL,PGCIL SR1	P													00:00	
							F													00:00	
							O													00:00	
							Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
					Main Path: Kadappa	PGCIL SR	P													00:00	

Figure 31 Sample COD3 Links Generated Report



Annexure - COD4

Details of Planned and Forced outages of Communication equipments, availed during the last 12 rolling months

October 2022 to September 2023

Dated :

B Details of outage of Communication equipments :

SL	Name of the owner / User	Name of the communication equipments	Location of the Equipment / Name of Station	Ownership	Nature of outage (Forced (F) / Planned (P))	Duration of Forced / Planned outage availed in " [hh] : mm " format												Deviation (Y/N)
						October 2022	November 2022	December 2022	January 2023	February 2023	March 2023	April 2023	May 2023	June 2023	July 2023	August 2023	September 2023	Total	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	PGCIL SR 1	Tejas SDH TJ1400 STM16 Vijayawada-2	Vijayawada PG	PGCIL SR 2,PGCIL,PGCIL SR 1	P													00:00	
					F													00:00	
					O													00:00	
					Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
2	PGCIL SR 1	Tejas SDH TJ1400 STM16 Nellore PS-1	Nellore PS_765kV	PGCIL SR 2,PGCIL,PGCIL SR 1	P													00:00	
					F													00:00	
					O													00:00	
					Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
3	PGCIL SR 1	Tejas SDH TJ1400 STM16 Nellore PG-1	Nellore PG_400kv	PGCIL SR 2,PGCIL,PGCIL SR 1	P													00:00	
					F													00:00	
					O													00:00	
					Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
4	PGCIL SR 1	Tejas SDH TJ1400 STM16 Khammam PG-1	Khammam PG	PGCIL SR 2,PGCIL,PGCIL SR 1	P													00:00	
					F													00:00	
					O													00:00	
					Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
5	PGCIL SR 1	Tejas SDH TJ1400 STM16 Warangal PG-1	Warangal PG	PGCIL SR 2,PGCIL,PGCIL SR 1	P													00:00	
					F													00:00	
					O													00:00	

Figure 32 Sample COD4 Links Generated Report

CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

PREAMBLE

File No. L-1/210/2016/CERC Dated: 15th May 2017

The Central Commission has been assigned the function to regulate inter-State transmission of electricity and to specify the Grid Code having regard to Grid standard under clause (c) and (h) of sub-section (1) of Section 79 of the Electricity Act, 2003. Communication system forms the backbone of the inter-State transmission of electricity and smooth operation of the power system. Keeping in view the importance of the communication system in a vast meshed network at the National, Regional and State level in India, a need has been felt to specify the regulations regarding Communication System for inter-State transmission of electricity., The purpose of the regulations is to lay down the rules, guidelines and standards to be followed by various persons and participants in the system for continuous availability of data for system operation and control including market operations. Further, the regulations deal with the 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.

NOTIFICATION

In exercise of the powers conferred under Section 178 of the Electricity Act, 2003 (36 of 2003), read with clause (c) and (h) of sub-section (1) of Section 79 and all other powers enabling it in this behalf, the Central Electricity Regulatory Commission makes the following regulations, namely:

1. SHORT TITLE AND COMMENCEMENT:

(i) These regulations may be called the Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017.

(ii) These regulations shall come into force w.e.f. 1.7.2017.

2. DEFINITIONS AND INTERPRETATIONS:

(i) In these regulations, unless the context otherwise requires, -

a) "Act" means the Electricity Act, 2003 (36 of 2003) as amended from time to time;

b) "Ancillary Services" means in relation to power system (or grid) operation, the services necessary to support the power system (or grid) operation in maintaining power quality, reliability and security of the grid e.g. active power support for load following, reactive power support, black start, etc.;

c) “Associated communication system” means a communication system associated with a project set up for exchange of voice/video data with load despatch centre as per Grid Code.

d) “Commission” means the Central Electricity Regulatory Commission referred to in sub-section (1) of Section 76 of the Act;

e) "Central Transmission Utility” means any Government Company which the Central Government may notify under sub-section (1) of Section 38 of the Act;

f) “Communication Channel” means a dedicated virtual path configured from one users’ node to another user’s node, either directly or through intermediary node(s) to facilitate voice, video and data communication and tele-protection system.

g) “Communication network” means an interconnection of communication nodes through a combination of media, either directly or through intermediary node(s);

h) “Communication system” is a collection of individual communication networks, communication media, relaying stations, tributary stations, terminal equipment usually capable of inter-connection and inter-operation to form an integrated communication backbone for power sector. It also includes existing communication system of Inter State Transmission System, Satellite and Radio Communication System and their auxiliary power supply system, etc. used for regulation of inter-State and intra-State transmission of electricity;

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.

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.

k) "Forecasting Service Provider (FSP)" means a service provider who provides forecast related to weather/Renewable Energy Resources and Demand for use of Users.

l) “Generating station” means a generating station as defined in Section 2 (30) of the Act.

m) “Grid Code” means the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010 as amended from time to time or subsequent re-enactment thereof.

n) "Inter-State transmission system" means the ISTS as defined in Section 2 (36) of the Act.

o) “Meter” means a device suitable for measuring, indicating and recording consumption of electricity or any other quantity related with electrical system and shall include, wherever applicable, other equipments such as Current Transformers

(CT), Voltage Transformer (VT) or Capacitor Voltage Transformer (CVT) with necessary wiring and accessories.

p) "National Load Despatch Centre" means the centre established under sub-section (1) of Section 26 of the Act;.

q) "PMU (Phasor Measurement Unit)" means a device which provides phasor information (both magnitude and phase angle) for one or more phases of AC voltage or current waveforms in real time.

r) "Real time operation" means action to be taken at a given time at which information about the electricity system is made available to the concerned Load Despatch Centre;

s) "Real time data" denotes information relating to current operating state of power system in accordance with system operation and control requirements.

t) "Regional Load Despatch Centre" means the Centre established under sub-section (1) of Section 27 of the Act;

u) "Remote Terminal Units" (RTU) means a device suitable for measuring, recording and storing the consumption of electricity or any other quantity related with electrical system and status of the equipment in real time basis and exchanging such information with the data acquisition system for display and control and shall include, wherever applicable, other equipments such as transducers, relays with necessary wiring and accessories.

v) "Renewable Energy Management Centres" means the centres being established in India to enable forecasting, scheduling and monitoring of renewable energy generation.

w) "State Load Despatch Centre (SLDC)" means the centre established under sub-section (1) of Section 31 of the Act;

x) "State Transmission Utility" means the board or the Government Company as specified by the State Government under sub -section (1) of Section 39 of the Act;

y) "Supervisory/system control and data acquisition (SCADA)" means a system of remote control and telemetry used to monitor and control the transmission system;

z) "system operation function" includes monitoring of grid operations, supervision and control over the Inter-State Transmission System, real time operations for grid control and dispatch, system restoration following grid disturbances, compiling and furnishing data pertaining to system operation, congestion management, black start coordination and any other function(s) assigned to the RLDC under the Act or any regulations and orders of the Commission;

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.

ab) "Wide band Node" means wide bandwidth data transmission data with an ability to simultaneously transport multiple signals and traffic types.

3. Save as aforesaid and unless repugnant to the context or the subject-matter otherwise requires, words and expressions used in these regulations and not defined, but defined in the Act, or the Grid Code or any other regulations of this Commission shall have the meanings assigned to them respectively in the Act or the Grid Code or any other regulations.

GENERAL

INTRODUCTION

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.

5. SCOPE and APPLICABILITY:

(i) These regulations shall apply to the communication infrastructure to be used for data communication and tele -protection for the power system at National, Regional and inter-State level and shall also include the power system at the State level till appropriate regulation on Communication is framed by the respective State Electricity Regulatory Commissions.

(ii) All Users, SLDCs, RLDCs, NLDC, CEA, CTU, STUs, RPCs, REMC, FSP and Power Exchanges shall abide by the principles and procedure as applicable to them in accordance with these regulations.

6. NODAL AGENCY:

(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.

(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.

(iii) The nodal agency for ensuring integration of communication system at regional level with SCADA, WAMS, Video Conferencing Systems(VCS), Automatic Meter Reading(AMR), EPABX, Tele-protection system shall be respective RLDC for ISGS,

ISTS and SLDCs; and respective SLDC for State Generating Stations, distribution companies, Intra-State entities, intra-State transmission system, etc.

7. ROLE AND RESPONSIBILITIES OF VARIOUS ORGANIZATIONS AND THEIR LINKAGES:

7.1 Role of Central Electricity Authority (CEA)

(i) 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.

(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.

(iii) CEA shall constitute and notify a Standing Committee for Communication System in Power Sector. The Standing Committee shall be responsible to:

a. prepare perspective plan for communication duly considering optimal utilization of transmission assets for communication purposes having regards to the transmission planning carried out by CEA through Standing Committee on Power System Planning.

b. carry out periodic review of the perspective plan.

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.

7.2 Role of CTU

(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.

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

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

(iv) The CTU shall integrate communication planning with transmission and generation project planning in a comprehensive manner.

(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.

(vi) The 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.

(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.

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

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

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

7.3 Role of National Power Committee (NPC) and Regional Power Committee (RPC):

(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.

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

(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.

(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.

7.4 Role of NLDC:

(i) The National Load Despatch Centre (NLDC) shall be responsible for preparation and issuance 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.

(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.

7.5 Role of RLDCs:

(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.

(ii) The Regional Load Despatch Centre (RLDC) shall collect and furnish data related to Communication System of various users, CTU, RLDC, STU and SLDC to RPCs.

(iii) RLDCs shall provide operational feedback to CTU.

7.6 Role of SLDCs:

(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.

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

7.7 Role of STUs

(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.

(ii) The STU shall also plan redundant communication system up to the nearest Inter-State Transmission System wideband communication node for integration with the inter-State communication system at appropriate nodes.

(iii) The STU shall discharge all functions of planning related to the State backbone communication system in consultation with Central Transmission Utility, State Government, generating companies and distribution companies in the State.

(iv) The STU shall also provide access to its wideband Network for grid management by all users.

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

7.8 Role of Users:

(i) The 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 centres and shall be responsible for successful integration with the communication system provided by CTU or STU for data communication as per guidelines issued by NLDC.

(ii) Users may utilize the available transmission infrastructure for establishing communication up to nearest wideband node for meeting communication requirements from their stations to concerned control centres.

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

8. BOUNDARY OF THE COMMUNICATION SYSTEM

8.1 ISTS Communication system

(i) NLDC

(ii) RLDCs

(iii) SLDCs (ISTS interconnection)

(iv) ISTS sub-stations of transmission licensee

(v) ISGS, Central Generating Stations, Solar generation plants/ solar parks and wind generation pooling stations connected to ISTS as required.

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

9. PERIODIC TESTING OF THE COMMUNICATION SYSTEM:

(i) All users that have provided the communication systems shall facilitate for periodic testing of the communication system in accordance with procedure for maintenance and testing to be prepared by CTU within 60 days of notification of Regulations and approved by Commission.

(ii) Testing process for communication network security should also be included even for third party system if exists in accordance with procedure for maintenance and testing to be prepared by CTU and approved by Commission.

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.

11. FAULT REPORTING:

(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.

(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.

12. COMMUNICATION SYSTEM AVAILABILITY:

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%.

13. Cyber Security:

(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.

(ii) NLDC, shall monitor case of cyber security incidences and discuss them at RPC level and take necessary action as deemed fit.

(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.

14. Guidelines or Procedures to be issued by different entities under these Regulations

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.

14.2 All the entities shall post the draft Guidelines/ Procedure on its website and invite comments from the general public and stakeholders and finalise the guidelines after considering the comments received from them. The entities, while seeking approval of the Commission, shall submit a statement indicating its views on the comments received from the general public and stakeholders.

15. Dispute resolution:

In case of any dispute in giving effect to these regulations, the affected party may approach the Commission with a proper application in accordance with Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999 as amended from time to time.

16. Power to Relax:

The Commission may by general or special order, for reasons to be recorded in writing, and after giving an opportunity of hearing to the parties likely to be

affected by grant of relaxation, may relax any of the provisions of these regulations on its own motion or on an application made before it by an interested person.

17. Power to Remove Difficulty:

If any difficulty arises in giving effect to the provisions of these regulations, the Commission may, by order, make such provision not inconsistent 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.

sd/-
(Sanoj Kumar Jha)
Secretary

CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

No.- L-1/210/2016/CERC

CORAM:

Shri Jishnu Barua, Chairperson
Shri I. S. Jha, Member
Shri Arun Goyal, Member
Shri P. K. Singh, Member

Date of Order: 19th January, 2024

In the matter of:

Approval of Procedure on "Centralized supervision for quick fault detection and restoration" under the Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017.

Order

The Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017 (hereinafter referred to as the 'Communication Regulations') were published on 29.05.2017 in the Gazette of India Extraordinary (Part-III, Section-4, No. 218).

2. Regulation 7.2 of the Communication Regulations requires CTU to prepare a Procedure on "Centralized supervision for quick fault detection and restoration" in consultation with the stakeholders and submit the same for approval of the Commission.

3. Accordingly, CTU, vide its letters dated 1.9.2017, 28.10.2021 and 18.5.2023, submitted the Procedure on "Centralized supervision for quick fault detection and restoration" after stakeholder consultation for approval of the Commission.

4. The Commission has examined the Procedure submitted by CTU, and after incorporating suitable changes, the Commission hereby approves the Procedure on “Centralized supervision for quick fault detection and restoration”, which is enclosed as an Annexure to this Order.

Sd/-	**Sd/-**	**Sd/-**	**Sd/-**
(P. K. Singh)	**(Arun Goyal)**	**(I. S. Jha)**	**(Jishnu Barua)**
Member	**Member**	**Member**	**Chairperson**

Annexure

PROCEDURE ON CENTRALIZED SUPERVISION FOR QUICK FAULT DETECTION AND RESTORATION OF COMMUNICATION SYSTEM

Prepared in Compliance

To

Central Electricity Regulatory Commission

(Communication System for inter-State transmission of electricity) Regulations, 2017

January, 2024

Abbreviation

ASON	Automatically Switched Optical Network
CMC	Centralized Management Console
DCPS	DC Power Supply
DER	Daily Exception Report
EMS	Element Monitoring System
FSP	Forecasting Service Provider
MPLS	Multi-Protocol Label Switching
NE	Network Element
NMT	Network Monitoring Team
OTN	Optical Transport Network
PDH	Plesiochronous Digital Hierarchy
PIU	Power Interface Unit
PTN	Packet Transport Network
RCA	Root Cause Analysis
SDH	Synchronous Digital Hierarchy
CNMS	Centralized Network Management System
VSAT	Very Small Aperture Terminal

1. Background

This Procedure is issued in compliance to the Regulation 7.2 of the Central Electricity Regulatory Commission (Communication System for inter-State Transmission of electricity) Regulations, 2017 (hereinafter referred to as "the Communication Regulations").

2. Objective

2.1 To lay down Procedure on "Centralized supervision for quick fault detection and restoration" and coordinated operation amongst the concerned users of the interconnected communication systems.

3. Applicability

3.1 This Procedure shall be applicable to the following:

(i) The Communication System Infrastructure of Inter-State transmission system and Intra-State transmission system, till appropriate regulation on Communication is framed by the respective State Electricity Regulatory Commission, being used for communication purpose for Power System Operation at National, Regional, Inter-State & Intra-State level.

(ii) All Users as defined under Regulation 2(i)(aa) of the Communication Regulations (such as Generating Company including Captive Generating Plants, RE Generator, ISTS & Intra-State Transmission Licensee, Distribution Licensee, Bulk consumer whose electrical system is connected to the ISTS or the Intra-State Transmission system), SLDCs, RLDCs, NLDC, CTU, STUs, RPCs, REMCs, FSP and Power Exchanges shall abide by the principles and procedure as applicable to them in accordance with this Procedure.

4. Communication System

The definition of the communication system shall be as per the Communication Regulations.

In order to implement this Procedure, the Communication System has been categorized as following:

(i) Communication System of Inter-State Transmission System.

(ii) Communication System of Intra-State Transmission System.

(iii) Communication System of Cross Border Interconnections.

5. State of The Art System for Centralized Supervision & Monitoring System (CSMS):

In line with the Communication Regulations, for Centralized Supervision for Quick Fault Detection and Restoration, a Centralized Network Management System (CNMS) consisting of necessary Hardware and Software, shall be implemented on National and Regional level by CTU. The CNMS shall be integrated with the existing network management system (NMS) of other users in power system and standalone network elements, which are not being monitored on network management system within its jurisdiction on national and regional basis.

All Users/Owners shall provide necessary support to interface their network management system or network element with CNMS to fully comply the functionalities as mentioned below (in para 5.1) in accordance with the CEA (Technical Standards for Communication System in Power System Operations) Regulations 2020 (hereinafter referred to as "CEA Technical Standards for Communication System").

5.1 Broad Features of the Centralized Supervision and Monitoring System (CSMS):

5.1.1 The CSMS shall provide centralized supervision and monitoring of the communication networks in accordance with the CEA Technical Standards for Communication System.

5.1.2 The CSMS shall be in main and back-up control centre architecture with centralised database and twenty-four hours operations & maintenance on all days.

5.1.3 The Network Management System shall have displays for audio-visual alarm generation and logging facility to facilitate the operator for quick fault detection.

5.1.4 The NMS shall facilitate access to the communication equipment for configuration and fault restoration as well as to facilitate monitoring the performance and alarms of

the communication system element.

5.1.5 The CSMS shall have capability of integration with technologies in line with the CEA Technical Standards for Communication System. The communication equipment installed shall be interoperable, so as to allow seamless integration between different vendors.

5.1.6 The NMS shall have features to store necessary information and facility to generate report on communication system availability of major equipments as well as the data channels on daily /weekly /monthly /annual basis, as applicable.

5.1.7 For very small aperture terminal communication, network management system (NMS) shall have facility of maintaining link availability status along with signal strength of the nodes.

5.1.8 For very small aperture terminal communication, redundant configuration shall be enabled in network management system

5.2 Cyber Security

5.2.1 The Communication infrastructure shall be planned and designed to address the network security needs as per Grid Code Regulations, CEA Technical Standards for Communication System, CEA (Cyber Security in Power Sector) Guidelines 2021 and any such regulations issued from time to time, by an appropriate authority.

5.2.2 NLDC, shall monitor case of cyber security incidences and discuss them at RPC level and take necessary action as deemed fit.

5.2.3 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.

5.2.4 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 have adversely impact power system communications infrastructure in compliance to the CEA Technical Standards for Communication System. The cyber security program shall address the following, namely:

(a) compliance with provisions of the Information Technology Act, 2000 (21 of 2000) and National Cyber Security Policy, 2013 as amended from time to time;

(b) implementation of the National Critical Information Infrastructure Protection Centre (NCIIPC) Guidelines;

(c) implementation of guidelines and advisories issued by Computer Emergency Response Team (CERT India) and applicable Sectoral Computer Emergency Response Team (CERT); and

(d) compliance to the Central Electricity Authority (Cyber Security) Regulations, as and when they come into force.

5.3 Till the time, the CSMS system is not in place, the functions for Centralized Supervision including for quick fault detection and restoration shall be carried out as per the existing Procedure enclosed as **Appendix-I** and all the users/ owners shall facilitate CTU/STU to coordinate for the same with all requisite details on periodic manner as brought out in this procedure, as applicable.

6. Process for Implementation of Centralized Supervision and Monitoring System of Communication System:

6.1 CTU and STU shall be the nodal agency for implementation of Centralized Supervision and Monitoring System of communication system for Inter-State transmission system and Intra -State transmission system respectively.

6.2 Network Management System shall be implemented in compliance with the CEA Technical Standards for Communication System.

6.3 Control Centre shall have Centralized Supervision and Monitoring System by integrating its network management system with Network Management System of other users/ owners and standalone network elements, which are not being monitored on network management system within its jurisdiction on national and regional basis.

6.4 Users/ owners shall provide all necessary support to interface their network

management system or network element with Centralized Supervision and Monitoring System.

6.5 Centralized Supervision and Monitoring System shall be in main and back-up control centre architecture with centralized database and twenty-four hours operations & maintenance on all days.

6.6 The Users/ Owners of communication system (ISTS and Intra State)shall cooperate in exchanging information, holding review meetings during integration (as and when required), joint testing and commissioning of their communication system with Centralized Supervision and Monitoring System including Cyber Security Protection, with nodal agencies.

7. Procedure for Resource Deployment by Communication System User/Owner:

7.1 The user/owner shall be responsible for the Operation and Maintenance (O&M) of their respective Communication system and to maintain the availability of the communication system as per the Communication Regulations.

7.2 Operation and Maintenance (O&M) Personnel shall be deployed by user/owner for Operation, Monitoring and Quick Fault Restoration of communication system or any other assistance as may be required for maintaining a seamless network with desired availability. Such O&M Personnel shall be skilled/ trained in maintenance of the communication system Equipment / Optical Fibre, DCPS, Battery & PIU (Power Interface Unit) and NMS. Crew provisioning for physical restoration of FOTE & FODP etc. shall be done by the owner/ user. They should be equipped with necessary test equipment, vehicle, tool kits, laptop, mobile phones etc.

7.3 Specialized training shall be provided to the persons manning the centralized monitoring centre and to the field support staff as well as O&M Personnel deployed for maintenance of the communication system in accordance with the CEA Technical Standards for Communication.

8. Procedure for Centralized Supervision, Monitoring and Fault Reporting of Communication System

8.1 CTU shall deploy a Network Monitoring Team (NMT) at Main & Backup control centres for centralized supervision and monitoring of the communication network and shall coordinate with ISTS communication system Owner, Users, RLDC, SLDCs etc. for quick fault detection and restoration.

8.2 NLDC, RLDC & SLDC in coordination with NMT of CTU shall integrate & supervise the communication systems of ISTS, ISGS, IPP, STU, etc. for monitoring, supervision & control of Power System and adequate data availability in real time. Further RLDCs shall collect and furnish data related to communication system of various users, ISTS, ISGS, IPP, STU, SLDC, RLDC to RPCs for certifying availability of ISTS Communication System on monthly basis. RLDCs & SLDCs shall provide operational feedback to CTU & STU on quarterly basis or as applicable.

8.3 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)

8.4 Whenever any fault/abnormality is observed in the communication system by the Network Management System, it shall automatically notify to the concerned user/ owner for rectification of faults/trouble tickets within agreed time frames, which will subsequently be taken up with maintenance personnel of the concerned faulty communication system at site to take corrective action(s) for rectification of faults/trouble tickets within agreed time frames.

8.5 NMT of CTU shall inform communication system owner/ user in case of critical

alarms/ faults as per escalation matrix provided as **Annexure-I**.

8.6 NLDC, RLDC, SLDC and REMC in case of outage of telemetered data, or communication failure shall register an event through Centralized Management System, the respective owner/user shall be alarmed so that the owner /user shall ensure healthiness of its communication system. In case, outage pertains to fault in communication system of other owner, the owner/ user shall either lodge complaints through Centralized Management System or add response regarding healthiness of its network in the already raised ticket/ event rather than raising a new ticket, as applicable.

9. Procedure for Fault Restoration of Communication System

Restoration activities of the communication system are to be carried out by the owner/ user, as and when, any system related problem is reported primarily by Communication system user/ owner (and reported by NMT of CTU in different scenario), to facilitate rectification of fault and quick restoration. This shall include fault detection, repair or replacement of defective parts, restoration of services and final functional checking by the User/ Owner.

The Communication system owner/user shall identify Nodal officer (s) for their respective area/ system. Nodal officer shall be single point coordinator, responsible for co-ordination with NMT of CTU. Details of Nodal Officer (name, designation, company name, address, contact details email, mobile no. etc.) shall be provided to CTU.

9.1 Following actions shall be taken by Communication System Owner/User after receiving the fault alarm/reporting:

1. Acknowledge faults/ alarms and prioritize them for immediate correctiveactions.
2. Take corrective action by remote diagnostics & troubleshooting through their respective NMS, wherever possible.
3. Inform maintenance Personnel for detection/ attending the faults for rectification and restoration of the fault ensuring inventory availability.
4. Maintenance Personnel shall update status of maintenance/restoration work to the concerned nodal officer of communication system user/ Owner.

5. The nodal officer shall communicate NMT of CTU through Centralized Network Management System for closing the Trouble Ticket / reported fault event and details of the fault restored.
6. For fault restoration, nodal officer may also co-ordinate with NMT of CTU/ other communication owner in respect of spare inventory availability if required, for an integrated/ unified approach.

The communication network is designed with redundancy and automatic take-over of available redundant paths. However, in case the fault restoration is prolonged, the communication owner shall explore the possibility for route diversion/ re-configuration on the existing communication network in close co-ordination with NMT of CTU and concerned nodal officer. 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.

10. Roles & Responsibilities of Communication System Owner/User and CTU

10.1 Communication System Owner/ User Responsibilities:

1. Communication System Owner/ User shall follow the Communication Regulations and Standards as well as follow the guidelines issued by CEA, CTU and NLDC.

2. Users/ owners shall take necessary action for operation and maintenance of their respective interfaces and ensure their communication system availability in line with the Communication Regulations and the CEA Technical Standards for Communication System.

3. Ensure and maintain proper environment for operation of the equipment by providing power supply, Proper Earthing system and dust & rodent free environment with air-conditioned applicable to electronic system and server computers (with proper surge and short circuit protection).

4. Raise trouble ticket/ complaint to Network Monitoring Team (NMT) of CTU for unavailability of Services/ Bandwidth through Centralized Network Management

System in case fault is not located in its communication network or user/owner shall add response in the already raised ticket/ registered complaint regarding healthiness of their respective networks.

5. Provide access to the faulty site/equipment to the designated power system users as the need may be.

6. Associate & Co-ordinate with maintenance Personnel for rectification of the problem.

7. Update Network Monitoring Team (NMT) of CTU for availability of Services/Bandwidth after fault rectification through Centralized Supervision System with all fault rectification details needed for Root Cause Analysis.

8. Communication user/owner shall update status information of alarm/trouble ticket/ fault reported and maintenance work under progress in Centralized Network Management System, record all faults in the fault record sheet and summary of action taken for fault rectifications and share the detailed report as and when required by NMT of CTU.

9. Communication System Owner/ User shall provide inputs to the CTU/ STU in the prescribed formats enclosed as **Annexure-II** with this Procedure.

10.2 Responsibilities of CTU:

CTU through NMT shall discharge all functions in co-ordination with ISTS Owners/ Users, IPPs, ISGS, RLDCs, SLDCs as per followings, for Supervising & Monitoring of the communication system:

1. Supervise and coordinate for Network discovery where route diversion/ re-configuration is needed, the communication system owner/ user shall explore the possibility for route diversion on the existing facility in close co-ordination with other concerned owner(s) in case the fault restoration is prolonged. However, such rerouting shall be discontinued once the original channel is restored.

2. Supervise for Troubleshooting on a network element and its interfaces (eg. where more than one communication system owners/ users network terminates) as and when required and in coordination with Communication system owner/ user, based on the diagnostics on interfaces to locate problems in network elements.

3. Informing the communication system owner for maintenance team deployment for critical cases.

4. Supervise and coordinate for the End-to-end Communication Channel verification with the communication system owner/ user upon receipt of information regarding outage of telemetered data or communication failure (in case end to end communication channel involves multiple owner/user), the respective user shall initiate testing/checking of the communication channel in co-ordination with NLDC/RLDC/SLDC/REMCs as per the procedure in line with the diagnostic features available in the SCADA system. This is to identify the fault whether the failure is due to faulty communication channel or problem with the end equipment.

Illustration:

In case outage pertains to fault in communication system, the users shall examine their NMS for trouble shooting of the failure. If fault pertains to communication system of other user/ owner, the user/ owner shall lodge fresh complaints or shall add response regarding healthiness of its own network in the already raised ticket/ complaint and would alert the other communication system owner(s) for quick fault restoration. In case fault does not pertain to communication system, the NMT of CTU in coordination with user(s) shall take up with the relevant stakeholder/utility.

5. CTU through NMT shall view end to end network or system of the affected section in Centralized Supervision System and supervise & monitor the same for quick restoration of the communication system.

6. CTU through NMT shall escalate the critical alarms/ events etc. as per agreed escalation matrix in case of critical scenario involving more than one

communication system owner/ user. Typical Escalation Matrix shall be submitted by Communication System Owner/ Users in the specified format enclosed as **Annexure-I**.

7. CTU through NMT shall undertake the routine maintenance activities of Centralized NMS and create data backup of the Centralized NMS on daily basis.

8. CTU through NMT shall prepare and publish the report (as given below) on its website;

	Activity	**Frequency**
1	Communication Network operations (Daily Exception Report etc) / Fault status	Daily
2	Communication Network utilization reports	Quarterly
3	MIS report	Monthly
4	Analytics/Predictive Report	Quarterly
5	Availability Report	Monthly

11. Revision of Procedure

11.1 As and when required, this Procedure shall be reviewed and revised by CTU with the approval of the Commission.

Annexure-I

Typical Escalation Matrix

Technical Support Desk Owner/User Name:

Email:

TELEPHONE:

Complaint /Trouble Ticket send email: abc@xyz.com

Escalation Level	Personnel Detail	Remarks
Level A	**XEN/ Alternate Executive ABC** Office: Contact:Email:	To open trouble ticket send email to: abc@xyz.com
Level B	**SE Xxxxxxxx**Office: Contact: Email:	
Level C	**CE Xxxxxxxx**Office: Contact: Email:	
Level D	**Director/MDXxxxxxxx** Office: Contact: Email:	

Escalation Procedure

The escalation level shall be guided based on the severity level (I, II, III, IV) and specified timeline with respect to initial call as specified in the prevailing AMC contract.

Annexure-II

Table-I: Data to be furnished by ISTS Users

Sl. No.	Data/ Information to be submitted	Periodicity of Data submission	Submitted by Entity (as applicable from para 10.1)
1	System Availability Report ● Downtime Report of Link ● Downtime Report of Communication System Components	Monthly (7th day of each billing month)	Communication System Owner/ User
2	Channel Availability Report ● Downtime Report of Link ● Downtime Report of Communication System Components	Monthly (7th day of each billing month)	Communication System Owner/ User
3	Bandwidth Utilization Report vis-å-vis Services	Monthly (7th dayof each billing month)	Communication Syste mOwner/ User
4	Non-Reporting/ Intermittency ofDATA	Monthly (7th dayof each billing month)	NLDC/ RLDC/ SLDC
5	Cyber Security Incident	(within 24 hrs/ asper Cyber Security Guidelines of CEA)	Communication System Owner/ User/REMC/ SLDC/RLDC/ NLDC
6	New Element (Communication System Component) Integration/ Replacement Report/ New Service Provisioning	Monthly (7th day of each month) & within 24 hrs	Communication System Owner/ User/NLDC/RLDC/SLDC/ RE MCs

7	Maintenance Compliance Report	Quarterly	Communication System Owner/ User
8	Performance Audit Report	Annually	Communication System Owner/ User
9	Cyber Security Audit Report	Annually (As per CEA approved guidelines)	Communication System Owner/ User

Formats for DATA Input by ISTS User/OwnerISTS Communication System

Communication System Owner/ User/ Company Name:

System Availability Report **Format-1A**

Sl. No.	Link Name	Link Id	Date Downtime	Date Uptime	Total down Hrs.	Remarks
1						
2						
3						

Link Downtime Report **Format-1B**

Sl. No.	Link Name	Link Id	Date Downtime	Date & Uptime	Total down Hrs.	Remarks
1						
2						
3						

Communication System Component Downtime Report **Format-1C**

No.	Communication System Component Name	Communication System Component Id	Date & Downtime	Date & Uptime	Total down	Remarks
1						
2						
3						

Channel Availability Report **Format-2A**

No.	User (Stn) Node Name	User (Stn/ Control Centre) Node Name	Date Downtime	Date Uptime	Total down Hrs.	Remarks
1						
2						
3						

Channel vs. Link Availability Report **Format-2B**

No.	Channel Id	Details of links				
		Link Name	Date Downtime	Date Uptime	Total down Hrs.	Remarks
1						
2						
3						

Cyber Security Incident Report **Format-3**

Sl. No.	Cyber Security Incident detail	Component Id where Cyber Security breach happened	Time of Security Breach/ Isolation of system	Time of correction/ take back of Comm. System	Total downtime Hrs.
1					
2					
3					

Maintenance Compliance Report **Format-4**

Sl. No.	Communication System Component Name	Component Id	Date of Maintenance	Details of Maintenance Performed	Remark
1					
2					
3					

Designed and Approved Service vs Bandwidth Utilization report **Format-5**

	Services	Application			Bandwidth Utilization	Remark
			From	To		
1	Ethernet	RTU Data			10 Mbps	
		PMU Data			40 Mbps	
		Meter Data				
2	VLAN	ICCP data			100 Mbps	
		PDC to PDC Data				
		Video Conferencing				
3	P to P	PDC to PDC Data				
4	El	Protection Links				
		RTU Data				

Existing Procedure for Supervision & Fault Restoration of ISTS Communication System

(Manual entry of event/fault & It's restoration time- noted down from NMSsystem- into Log Book/ Register entry at Regional/ State level)

At present, different makes of communication equipment are deployed in various regions. These communication equipments are based on standard SDH technology, however the Network Monitoring System (NMS) software (hosted on a PC with limited feature & computational efficiency) of these equipment is proprietary and is different for different OEMs. Accordingly, we have multiple NMSs, each NMS corresponding to a set of communication equipment of specific make. In general, the NMS provided by all OEMs have five functional areas of network management mentioned as under:

1. **Fault Management**: Fault management is the process to identify and fix any errors in the system. There is provision of many alarms that can be distinguished based on faults. Alarms can be classified as Critical, Major & Minor. When any event / fault happens, alarm flashes and is acknowledged and the timing is noted in the register/ log book and subsequently NMT team is informed over phone/message, subsequently they go to site, restores the fault and then informs the up time, same is also shown in NMS system, and that restoration time is noted in log book/ register again. Thus report for link downtime summation & calculations for that particular NMS & its managed nodes/ NEs/ FOTE are calculated.
2. **Configuration Management:** This is the process to monitor and maintain devices and network configurations. NMT (Network Monitoring Team) can create new channels as per requirement. Addition of New NE (Network Equipment), deletion of NE can be done with NMS.
3. **Performance Management:** In this process various data channel (E1, Ethernet, 64 Kbps) performance is measured with defined parameters.
4. **Security Management:** A user can access NMS only if he/she is having user id & password. Administrator has privilege to give certain permissions to any users.
5. **Accounting Management:** Administrator can create multiples user accounts based on requirement. Administrator has privilege to add/delete accounts.

The multiple NMSs in various regions are monitored by placing all the NMSs in a region at one place, which is generally at RLDC. The region wise NMSs (typically)details are as under:

Region	Sl. No.	NMS Make	Model
NR	1	Fujitsu (SDH)	SUN Altra 60
	2	Nokia (PDH)	Netviewer Version 10.1 EP2
	3	Fibrehome (SDH, PDH & DACS)	OTNM 2000-V2.0R5
	4	TEJAS (SDH)	TJ5100 version 4.4, TJ5100 version 7.5
	5	Valiant (PDH)	VCL-MX version 5.7,

			VCL-MX version 6
	6	ECI (SDH, PDH)	EMS-APT version 4.0.20
	7	FIBCOM (SDH)	FIBCOM 6300NM
	8	ABB (SDH)	FOX515H FOXVIEW
ER	1	Coriant (SDH)	Coriant 14.1 12.45.0
	2	Loop (PDH)	Loop Version: V2.08.00.07
	3	ECI (SDH) s	EMS-APT version 4.0.20
	4	FIBCOM (SDH)	FIBCOM 6300NM
SR	1	Tejas (SDH)	TJ1500 Ver 6.1
	2	Valiant(PDH)	VCL-MX version 5.7
WR	1	Tejas (SDH)	TJ1500 Ver 6.1
	2	Valiant(PDH)	VCL-MX version 5.7
	3	ECI (SDH)	EMS-APT version 4.0.20
		FIBCOM (SDH	FIBCOM 6300NM
	4	Loop (PDH)	Loop Version: V2.08.00.07
NER	1	ECI (SDH & PDH)	EMS-APT Version 4.0.20
	2	FIBCOM (SDH)	FIBCOM 6300NM 3.6.08
	3	Valiant (PDH)	VCL MX Version 6
	4	Siemens (SDH)	ENMS V4.50.014
	5	ABB (PDH)	UCST-FOX 515
	6	Loop (PDH)	Loop Version: V2.08.00.07
	7	TEJAS (SDH)	TJ1500 Ver 6.1

From the above table it is evident that there are multiple make NMSs , in Northern, Eastern, Southern, Western, and North Eastern regions respectively. Event/ Faults timing are manually noted from NMS systems and are written down in register/ Log book for report/log generation and this is being followed as present practice for calculating Link/ Channel downtime, communication system availability & its performance. These log books / Registers are maintained by the vendor/ owners at Regional/ State Level Control Centers (typically at RLDCs/ SLDCs) where multiple NMSs are hosted.

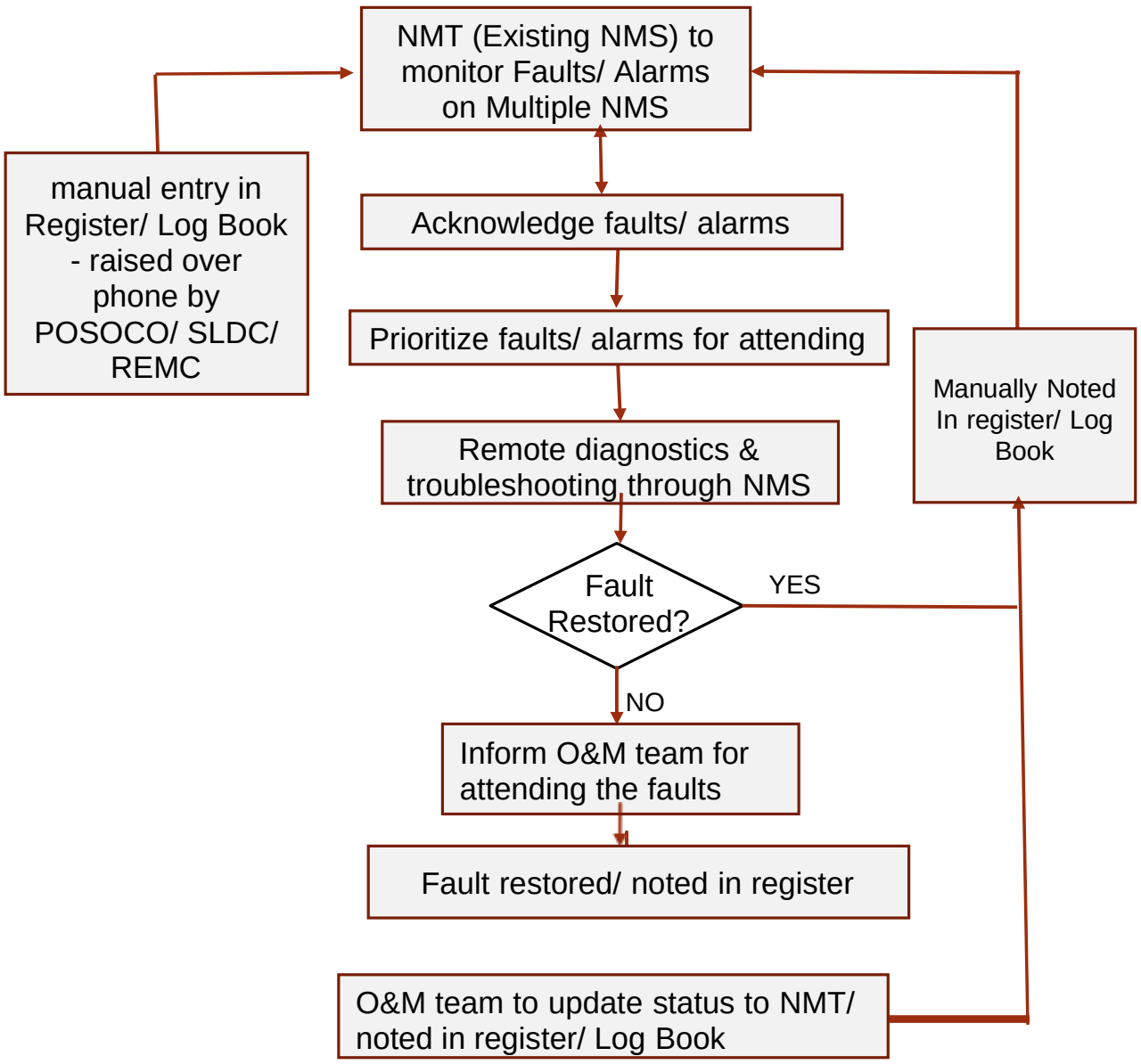
These NMSs for ISTS systems are centrally located at the respective RLDC/Regional Headquarter of POWERGRID and are being monitored by POWERGRID/ OEM teams called as Network Monitoring Team (NMT). These teams are monitoring their respective NMSs at the central location physically during office hours only.

On occurrence of a fault depicted on NMS, the NMT teams first try to diagnose and troubleshoot the fault remotely through NMS. In case the fault is still persistent, then NMT calls their maintenance team deployed in the field to attend and rectify the fault. Once the fault is rectified, the alarm or flag at the NMS is reset and the NMT confirms their maintenance team.

Besides above, there are communication equipment which are of different make other than the available NMSs in the region and are not being captured by the NMS. Faults occurring at such equipment nodes are being attended locally by maintenance

team with the help of local craft terminal (LCT). The LCTs are connected with the communication equipment and the fault is diagnosed and resolved with the help of proprietary software.

Flow chart of Existing Procedure for Supervision & Fault Restoration



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: CTU/UNMS/NMT/2024/01 **Date:** 28.03.2024

To,
Executive Director (GA&C),
Power Grid Corporation of India Limited
Plot No.2, Sector 29
Gurgaon-122001

Kind Attn: Mr. Doman Yadav,

Sub: Deployment of POWERGRID as Network Monitoring Team (NMT) for Regional & National UNMS scheme for ISTS communication network.

Sir,

The UNMS projects in NR, ER & NER regions have been implemented by POWERGRID in RTM mode after approval from respective RPCs. In similar manner, UNMS project for SR is under implementation and UNMS project for WR has been tendered by POWERGRID.

As per clause 8.1 of procedure on "Centralized supervision for quick fault detection and restoration" notified by CERC on 19.01.2024, CTU shall deploy a Network Monitoring Team (NMT) at Main & Backup control centers for centralized supervision and monitoring of the communication network.

As per contractual conditions, there is a provision of 1 year warranty after commissioning & 6 years AMC thereafter. Accordingly, POWERGRID shall be discharging the functions of Network Monitoring Team (NMT) for all Regional & National UNMS/ CSMS, as and when the respective system is commissioned, as per CERC procedures on "Centralized supervision for quick fault detection and restoration" and "Maintenance & Testing of Communication System".

Two nodal officers each for Main & Backup UNMS control centre in NR, ER & NER regions may please be nominated by return communication.

Thanking you,

Yours faithfully,

(Atul Kumar Agarwal) 28/3/24
CGM (CTUIL)

Encls: CERC procedures A/a

Minutes of Meeting

Review Meeting on OPGW installed on HPSEBL transmission network in Package-1(a)

Venue: VC & Physical at Shimla (Hybrid)

Date& Time:26.09.2024 (16:00 Hrs)

POWERGRID	HPSEBL
Sh. Shafat Ahmed Wani, Sr. GM, AM	Er. Mandeep Singh, Chief Engineer (Sys.Op)
Sh. Jagat Ram, GM, AM	Er. Chet Ram Sharma, Sr. executive Engineer
Sh. Vivek Sundriyal, DGM(AM/ULDC)	Er. Khoob Ram Sharma, Assistant Executive Engineer, PR&ALDC
Sh. Harish Kumar, Chief Manager (ULDC)	
Ms. Sampadha, Asst. Manager (ULDC)	

A review meeting was held on 26.09.2024 regarding ongoing installation & commissioning works for OPGW on HPSEBL transmission lines under Package 1(a). The meeting Chaired by the Chief Engineer (Sys.Op.) with welcome of all participants. The following participants were present. PGCIL's officers from NR-II Jammu joined the Meeting virtually.

The main points discussed are as below: -

1). M/s HPSEBL has emphasized early completion of ongoing OPGW installation works on 220 KV Bhaba- Kashang line which was restarted on 16.09.2024. The main reason was shortage of workable period before heavy snowfall in area.

In response, M/s PGCIL has assured completion of work by end of Oct 2024.It is also agreed to share weekly progress reports for monitoring purpose.

2). M/s PGCIL has requested to provide status of Shutdown of 66 KV Gumma-Jutog line which is required for installation & commissioning works for OPGW. This is probably last line of complete package 1(a) for which work is pending due to multiple reasons mentioned in earlier meetings.

In response, M/s HPSEBL has replied that Shutdown is only possible after commissioning

of alternate Transmission line (66 KV Pragatinagar- Hulli) as 66Kv Jutog- Gumma very old line, being used for water supply lifting of schemes of Shimla City& Suburban area and continuous shutdown is not possible for laying of OPGW. The timeline for 66 KV Pragatinagar- Hulli is expected to be completed up to June 2025.

PGCIL has requested M/s HPSEBL to Shift OPGW laying work on 66 KV Gumma-Jutog from package-1(a) to other upcoming projects under ULDC so that Package 1(a) can be completed with completion of ongoing 220 KV Bhaba- Kashang line OPGW works.

Finally, M/s HPSEBL has agreed to Shift work of 66 KV Gumma-Jutog to other upcoming projects under ULDC.

3). M/s PGCIL has also requested to Formally remove other 4 transmission lines from existing Package 1(a) which were agreed earlier vide the letter HPSEBL/PR&ALDC/CSCADA-15/Vol-III/2023-2024 -2072-81 dated 21.10.2023 (attached herewith).

The same was agreed by M/s HPSEBL to be taken up in next TeST Sub Committee meeting of NRPC.

The meeting ended with vote of thanks.

For POWERGRID

हरीश कुमार / Harish Kumar
मुख्य प्रबंधक, नालागढ़ / Chief Manager, Nalagarh
पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED

For HPSEBL

Sr. Executive Engineer (Comm.)
O/o Superintending Engineer,
PR&ALDC, HPSEB Ltd.,
Totu, Shimla-11.

Annexure-XVIII

HIMACHAL PRADESH STATE ELECTRICITY BOARD LIMITED
(A State Govt. Undertaking)

CIN: U40109HP2009SGC031255
Address: SE, PR&ALDC, HPSEBL,Shimla-171011 (HP)
Phone No.: 0177-2657901, 0177-2838170 (Tele.)
Email address: ceso@hpseb.in, srxen.scada@gmail.com
Website address: www.hpseb.com, www.hpaldc.org

No. HPSEBL/PR&ALDC/SCADA-34(Vol.-I)/2019- 62-76 Dated: - 06 /04/2021

To

As per list attached

Subject: - Minutes of Meeting held on dated 26.02.2021.

Sir,

Enclosed please find herewith the minutes of meeting convened on dated 26.02.2021 in the chamber of worthy Chief Engineer (Sys. Op.), HPSEBL, Vidyut Bhawan, Shimla-4 regarding early installation of OPGW on HPSEBL Transmission Line under Package-1(a) and Package-B (Reliable Communication) for information and necessary action at your end. As the project is already delayed, an early action as per items of MoM is solicited please.

DA: - As Above.

Yours sincerely,

5/4/2021

Superintending Engineer,
PR&ALDC, HPSEB Ltd.,
Totu, Shimla11.

List of addresses

Sr. No.	Addresses
1.	Chief Engineer (Sys. Op.), HPSEBL, Vidyut Bhawan, Shimla-4.
2.	Chief Engineer, ES, HPSEBL, Anu, Hamirpur.
3.	Chief Manager, PGCIL, NR-II, Rail Head Complex, Regional Head Quarters, Grid Bhawan, Near Bahu Plaza, Jammu-180012.
4.	General Manager (Projects). HPPTCL, Shimla Bypass, Below Old MLA Quarters, Tutikandi, Panjri, Shimla-5.
5.	Superintending Engineer, Electrical System Circle, HPSEBL, Totu, Shimla-11.
6.	Superintending Engineer, Electrical System Circle, HPSEBL, Hamirpur.
7.	Sr. Executive Engineer, PLCC Division, HPSEBL, Sundarnagar, Distt. Mandi.
8.	Sr. Executive Engineer, Electrical System Division, HPSEBL, Totu, Shimla-11.
9.	Sr. Executive Engineer, Electrical System Division, HPSEBL, Kunihar.
10.	Sr. Executive Engineer, Electrical System Division, HPSEBL, Kotla
11.	Sr. Executive Engineer, Sub-LDC, HPSEBL, Hamirpur.
12.	Assistant Engineer, PLCC Sub-Division, HPSEBL, Totu, Shimla-11.
13.	Power grid Corporation of India Limited, 400/220 kV Sub-Station, Village- Reru, Nalagarh-174101.
14.	M/s Ten Dot Net Cable Pvt. Ltd., 95/15 Bose Pukur Road, Kolkata-700042.
15.	M/s APAR Industries Limited, 301, Panorama Complex, RC Dutt Road, Alkapuri, Vadodara-390007.

Minutes of Meeting held between POWERGRID NR-II, M/s TEN Dot Network Private Limited Kolkata, M/s Apar Industries Limited Vadodara and HPSEB Ltd. On dated 26.02.2021 regarding early installation of OPGW on HPSEBL Transmission Line under Pasckage-1(a) and Package-B (Reliable Communication).

The meeting held in the Chamber of CE (Sys. Op.) , Vidyutbhawan Shimla-4 & presided by the Chief Engineer (Sys. Op.). Following were present in the meeting:-

S. No. For HPSEBL

1. Er.Joginder Singh, Chief Engineer (Sys.Op).
2. Er. P.R. Bodh, SE(PR&ALDC).
3. Er. Ravinder KumarVatsi Sr.EE (PLCC). 3.
4 Er. Amit Gupta Sr. Xen. ES, Shimla.
5. Er. Khoob Ram Sharma, AE (Communication).
6 Er. Anil Rakesh Rana, JE (Telephone).
7. ErMahender Singh, JE (Telephone).

For M/S TEN Dot & M/s Apar industries

1. Sh. Parth Raval Apar Industries
2. Sh Abhishek Apar Industries

Sh. Sudhanshu Ten Dot Net

For POWERGRID

1. Sh. Furkan Ahmad Siddiqui (Chief Manager), PGCIL
2. Er. Madhu Kumar, Manager, PGCIL, Nalagarh
3. Er. Kulvinder Singh, PGCIL
4 Er. Parshant Kumar, PGCIL
5. Er. Sandeep Kumar, PGCIL

At the onset of the meeting, the Chief Engineer (Sys.Op.) welcomed all the participants. In the welcome speech CE (Sys.Op.) stressed early installation of OPGW on HPSEBL Transmission Line Under Pasckage-1(a) and Package-B (Reliable Communication).
Following issues were discussed in the meeting:-

a. Under package-I(a), as per notification of award reference No.CC-CS/439-NR-I/OFOC-3038/3/G-5/R/NOA-I/5537 dated 30.09.201,5 the project was supposed to be completed within 18 months from the date of notification i.e. 1st March 2017. As such project completion is already delayed by 3 years. OPGW stringing work on HPSEBL transmission lines had under Package-1(a) started on 09.02.2017 and as on date only about 251 KM OPGW has been laid along with terminal fittings on HPSEBL transmission network.

   HPSEBL has taken serious concern on slow pace of work carried out by M/s Ten Dot Network and POWERGRID assured to start the stringing of OPGW on pending lines of HPSEBL by the end of 1st week of March, 2021

b. The l ink wise progress on date laying of O PGW covered under P ackage-1(a) on H PSEBL transmission lines as on date is as under: -

Sr. No.	Voltage level	Name of Line	Actionproposed

1.	220 kV	Bhaba-Kashang	220 kV Bhaba-Kashang Line has total length of 39 KMs, out of that 12 KM OPGW has been laid. M/s. Ten Dot Network requested to remove the aviation globes installed on earth wire of this line so that OPGW stringing work can be started. It was decided that HPSEBL will take up the matter with HPPTCL for removal of the aviation globes installed on earth wire of 220 kV Bhaba-Kashang Line and will intimate Powergrid, thereafter for laying of OPGW by M/s. Ten Dot Network.
2.	220 kV	Bhaba-Nathpa	It was decided that M/s. APAR Industries will lay the OPGW (Subject to final confirmation given by M/s APAR's management) on 220 kV Bhaba-Nathpa (2 KM) line under ongoing PSDF scheme of HPSEBL, Hence, dropped from the scope of Package-1(a).POWERGRID stated that OPGW and hardware equipment already supplied for said links . HPSEBL agreed to take the materials as supplied
3.	132 kV	Kangoo-Bagga	132 kV Kangoo-Bagga line and 132 kV Bagga-Darlaghat line have been considered under Package-B (Reliable communication scheme) of Central Sector for replacement of 12 fibre with 24 fibre on HPSEBL transmission line which was also decided in the earlier meeting held on dated 25.11.2020 between HPSEBL, PGCIL & M/s Ten Dot Network. Hence, dropped from the scope of Package-1(a). However, on 132 kV Bagga-Kangoo line M/s. Ten Dot Network has already laid 3 Kms OPGW from LILO point to Bagga and same shall be considered in the progress of M/s. Ten Dot Network under Package-1(a). POWERGRID stated that OPGW and hardware equipment already supplied for said links . HPSEBL agreed to take the balance materials as supplied
4.	132 kV	Bagga-Darlaghat	
5.	132 kV	Bathri-Kurthla	M/s. Ten Dot Network Pvt. Ltd. Committed for immediate start of OPGW stringing work on this line. M/s. Ten Dot Network agreed that the OPGW laying work on 132 kV Bathri-Kurthla line shall start in the 3rd week of March, 2021 and will be completed in 3rd week of May, 2021 by deploying adequate man power.
6.	66 kV	Nathpa-Ghanvi	It was decided that Sr. Executive Engineer, ES

			Division, Jeori (Kotla) will supply the status of strengthening of 66 kV rail pole structure on 66 kV Nathpa-Ghanvi line to SE, PR&ALDC, Totu, Shimla for further submission to the PGCIL and M/s. Ten Dot Network to start OPGW stringing work on 66 kV Nathpa-Ghanvi line.
7.	66 kV	Ghanvi-Jeori	It has been decided that joint survey will be carried out by the representatives of HPSEBL, POWERGRID and M/s. Ten Dot Network as mention hereunder. The joint survey team will ascertain whether the lines are ready for laying of OPGW. Joint survey team will comprise of the following members:- 1. Sh. Prakash of M/s. Ten Dot Network 2. Er. Rohit, JE (C) PGCIL 3. Sr. XEN, PLCC Division, Sundarnagar. 4. AE (Communication), Totu, Shimla. 5. Representative of Sr. XEN, ES Division, Kotla.
8.	66 kV	Jeori-Nogli	
9.	66 kV	Kumarsain-Nogli	It was decided that Sr. Executive Engineer, ES Division, Jeori (Kotla) will supply the status of strengthening of 66 kV rail pole structure on 66 kV Kumarsain-Nogli, Kumarsain-Gumma lines to SE, PR&ALDC, Totu, Shimla and same will be provided to the PGCIL and M/s. Ten Dot Network to start OPGW stringing work on 66 kV Kumarsain-Nogli, Kumarsain-Gumma lines.
10.	66 kV	Kumarsain-Gumma	
11.	66 kV	Gumma-Jutogh	The Sr. XEN ES Division, Totu intimated that no estimate has been prepared for strengthening of rail pole structure from Jutogh to Gumma. Matter will be taken up with ES Wing by SE(PR&ALDC).
12.	66 kV	Nogli-Samoli	M/s. Ten Dot Network agreed to start OPGW installation work on 66 kV Nogli-Samoli line by 1st week of March, 2021 with tentative date of completion as 15 th A pril, 2021. HPSEBL & PGCIL directed M/s. Ten Dot Network to deploy more teams so that stringing work can be completed within the stipulated period.
13.	66 kV	Samoli-Andhra	M/s. Ten Dot Network agreed to start OPGW installation work on 66 kV Nogli-Samoli line by 15thMarch, 2021 and tentative date of completion is

			30th March, 2021.
14.	66 kV	Gumma-Sainj	M/s. Ten Dot Ntework agreed that the OPGW stringing work on 66 kV Gumma-Sainj line will start on 5thMarch, 2021. It was further decided that if M/s. Ten Dot Network require shutdown in any portion where it is necessary, the same will be applied in advance through concerned office of ES, HPSEBL.
15.	66 kV	Sainj-Hulli	The vendor is directed to start OPGW stringing on 66 kV Sainj-Hulli line immediately after completion of laying of OPGW on 66 kV Gumma-Sainj line.

2 **Replacement of 12 fibre OPGW with 24 fibre on the HPSEBL transmission line.**

It has been given to understand thatPGCIL has placed LOA for replacement of 12 fibre OPGW installed under ULDC Phase-I with 24 fibre OPGW under reliable communication scheme (Package-B) and included the following HPSEBL lines. The deliberations made on replacement of 12 fibre with 24 fibre under reliable communication scheme (Package-B) of Central Sector on HPSEBL lines is as under: -

Sr. No.	Name of Link	Action proposed
1.	132 kV Jutogh-Kunihar-II	HPSEBL informed PGCIL that there are various vendor data running live at Jutog-Kunihar –kangoo-hamirpr -II in existing 12F OPGW link . Therefore, in case of replacement of 12fibe with 24 fibre OPGW, during OPGEW laying work whole data communication shall remain disrupted and power regulisation in the Himachal State shall get paralyzed . .It was decided to carry out replacement 12 fibre OPGW with 24 fibre on HPSEBL Transmission lines 132 kV Jutogh-KuniharCkt.-I instead of Ckt-II and 132 kV Kunihar-Kangoo S/C instead of 132 kV Kunihar-Kangoo D/C line by M/s. Apar Industries. The firm was requested to carry out detailed survey of 132 kV Jutogh-KuniharCkt-I and Kunihar-Kangoo S/C lines and submit the same to the POWERGRID so that deviation in material can be approved by PGCIL and laying of 24 fibre OPGW can be started. M/s Apar stated that Drum schedule of OPGW has already been approved by PGCIL, based on which the complete quantity of OPGW was delivered at
2.	132 kV Kunihar-Gagal (Kangoo)	
3.	132 kV Gagal (Kangoo)-Hamirpur-II	

		site in Nov'20. Now, change of scope to work on another circuit is leading to difference in the line length & already supplied drum wise OPGW on the proposed lines (132 kV Jutogh-Kunihar Ckt.-I & 132 kV Kunihar-Kangoo S/C). Hence length of the wastage of OPGW will increase with one drum (3Kms) is to be taken as spare .HPSEBL agreed to take that drum and pieces of difference lengths of OPGW alongwith associated hardware fittings & accessories on their account and M/s APAR shall receive the full payment for the above change in scope. It was also conveyed by M/S APAR that Additional 48F OPGW cable alongwith its hardware fittings will also be required to supply on which PGCIL / HPSEBL agreed. HPSEBL pointed out that as requested and applied by M/s. Apar Industries PTW stand already issued by HPSEBL. However, M/s Apar Industries has not started the work till dated. M/s APAR stated that the work could not be started because of the above mentioned change in scope which has been discussed in this meeting. In this meeting, Post clarification received from HPSEB/PGCIL on the above work, M/s Apar agreed to conduct the survey in further discussion/clarification from PGCIL and shall start laying work as the earliest possible. The exact commencement date shall however be intimated by firm shortly.

Presence of Participants

S. No.	Name of Officer	Phone Number	E-mail	Signature
1	Joginder Singh	9418376311	cesysop@gmail.com	
2	Er. P.R Barak	7807400363		
3	F.A. Siddiqui	9459598185	fasiddiqui@powergridindia.com	
4	Parth Raval	7091867633	Parth.raval@apar.com	
5	Abhishek	8511147431	abhishek.rai@apar.com	
6	Er. K.R. Sharma	7018471391	krsharma2008@gmail.com	
7	Sudhanshu	7011760342	Sudh.shu244@gmail.com	
8	Mahender Singh	82194-24998	mx 94567@gmail	
9	Er. R.N. Vatsi	9418042161	xen.PLCCsnr@gmail.com	
10	Er. Amit Gupta	9418033925	Xen, FSD Shimla/Kinnaur	
11	MADHU KUMAR.V	9442329279	vmadhukumar@powergridindia.com	28/02/2024
12	Kulvinder Singh	9805085044	kulwinder@Powergridindia.com	
13	Prashant Kumar	9582848774	prashant11@powergridindia.com	
14	Sandeep Kumar	84278-00303	sandeepkumar@powergridindia.com	
15	A.R. Rana	9418349111	ssarn7@gmail.com.	
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17				
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22				

Annexure-XIX

निदेशक / विद्युत विनियम
भाखड़ा ब्यास प्रबन्ध बोर्ड
Director / Power Regulation
Bhakra Beas Management Board
SLDC Complex, Industrial Area, Phase – I
Chandigarh - 160002.
Tel.: 0172-2652820 (Tel. FAX)
E-mail: dirpr@bbmb.nic.in

प्रेषक

निदेशक/ विद्युत विनियम

प्रेषिती

श्री एच एच शरण, ए जी एम (एल डी एंड सी),
पावर ग्रिड कॉरपोरेशन ऑफ इंडिया लिमिटेड,
5 वीं मंजिल, टॉवर -1, ईआईएल बिल्डिंग, सेक्टर 16, गुड़गांव।

क्रमांक: 6167-68 /LD-G-148 दिनांक: 26-9-17

विषय: 66 केवी एचवीपीएनएल के फीडर- 66 केवी बीबीएम जगआधरी - 66 केवी गोबिंदपुरी - 66 केवी जोरीयन पर बीबीएमबी द्वारा ओपीजीडबल्यू विछवाना।

The subject cited matter remained under continuous discussion with POWERGRID and HVPNL for providing requisite technical data of the subject cited transmission line, so that the technical approval of the OPGW to be laid can be conveyed. In this regard, Chief Engineer/Planning, HVPNL, Panchkula vide office memo no. Ch-22/406/K-284 dated 22.09.17 (copy attached as Annexure-I), had intimated that the proposal for conversion of existing 66 kV Jorian – Gobindpuri line with underground XLPE cable with higher capacity has been received from TS Wing of HVPNL, which is under consideration & the proposal shall be finalized along with connectivity of upcoming new substations 66 kV Sector 18 Jagadhari & Kheri Rangran (approved in principally) after receiving complete proposal from TS Wing of HVPNL.

उपरोक्त अनुसार आपसे अनुरोध किया जाता है कि एचवीपीएनएल की 66 केवी की बीबीएमबी जगाधरी-गोबिंदपुरी-जोरीया ट्रांसमिशन लाइन पर बीबीएमबी द्वारा ओपीजीडबल्यू लगाने की प्रावधान को हटा दिया जाए जी। इस ट्रांसमिशन लाइन के लिए FO End Equipment के प्रावधान को भी हटाने के लिए अनुरोध किया जाता है। इस संबंध में एक पुष्टिकरण की अत्यधिक सराहना की जाएगी।

यह पत्र मुख्य अभियन्ता / प्रणाली परिचालन, बी.बी.एम.बी. चण्डीगढ़ के अनुमोदन उपरांत जारी किया जाता है जी।

26/9

निदेशक/ विघुत विनियम

प्रतिलिपि : 1. जीएम (कंसल्टेंसी), एनआर -2, पावरग्रिड कार्पोरेशन ऑफ इंडिया लिमिटेड, कार्यालय ब्लॉक नंबर: ओबी - 26, ग्रिड भवन, रेल हेड कॉम्प्लेक्स, जम्मू - 180012.