



सत्यमेव जयते  
भारत सरकार  
Government of India  
विद्युत मंत्रालय  
Ministry of Power  
पूर्वी क्षेत्रीय विद्युत समिति

**Eastern Regional Power Committee**  
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सं. /NO. ERPC/Op/SCADA/2024/ 289

दिनांक/DATE: 15.05.2024

सेवा में/To,

संलग्न सूची के अनुसार/As per list enclosed.

**विषय: 24.04.2024 (बुधवार) को आयोजित ईआरपीसी की 14वीं TeST (Telecommunication, SCADA & Telemetry) उप-समिति की बैठक का कार्यवृत्त**

**Sub: Minutes of 14<sup>th</sup> TeST (Telecommunication, SCADA & Telemetry) Sub-Committee Meeting of ERPC held on 24.04.2024(Wednesday)**

Please find enclosed **Minutes of 14<sup>th</sup> Telecommunication, SCADA & Telemetry (TeST) sub-committee meeting of ERPC** held on **24.04.2024(Wednesday)** physically at ERPC Conference Hall, Kolkata at 10:30 hrs for your kind information and necessary action. The same is also available at ERPC website ([www.erpc.gov.in](http://www.erpc.gov.in)).

कृपया अपनी जानकारी और आवश्यक कार्रवाई के लिए **24.04.2024 (बुधवार) को ईआरपीसी कॉन्फ्रेंस हॉल, कोलकाता में 10:30 बजे आयोजित ईआरपीसी की 14वीं Telecommunication, SCADA & Telemetry (TeST) उप-समिति की बैठक के संलग्न कार्यवृत्त** देखें। यह ईआरपीसी वेबसाइट ([www.erpc.gov.in](http://www.erpc.gov.in)) पर भी उपलब्ध है।

टिप्पणियाँ, यदि कोई हों, कृपया यथाशीघ्र इस कार्यालय को अग्रेषित करें।

Observations, if any, may please be forwarded to this office at the earliest.

इसे सदस्य सचिव के अनुमोदन से जारी किया जाता है।

This issues with the approval of Member Secretary.

(S.Kejriwal)

SE(Operation)

एसई (ऑपरेशन)

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**MINUTES**  
**OF**  
**14<sup>th</sup> TeST MEETING**

**Date: 24.04.2024**

**Eastern Regional Power Committee**

**14, Golf Club Road, Tollygunge**

**Kolkata: 700033**

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# **EASTERN REGIONAL POWER COMMITTEE**

**MINUTES OF 14<sup>th</sup> TeST MEETING HELD ON 24.04.2024(WEDNESDAY) AT 10:30 HRS**

Member Secretary, ERPC chaired the **14th ER TeST MEETING** and welcomed all the participants.

List of participants is enclosed at **Annexure A**.

## **1. PART-A: CONFIRMATION OF MINUTES**

### **1.1. Confirmation of Minutes of 13<sup>th</sup> TeST Meeting held on 13<sup>th</sup> March 2023 physically at ERPC Conference Hall, Kolkata**

The minutes of 13th TeST Sub-Committee meeting held on 13.03.2023 was circulated vide letter dated 10.04.2023.

Members may confirm the minutes of 13<sup>th</sup> TeST meeting.

#### **Deliberation in the meeting**

Members confirmed the minutes of 13th TeST Sub-Committee meeting.

## **2. PART-B: ITEMS FOR DISCUSSION/UPDATE**

### **2.1 Availability of Communication System: ERPC**

CERC vide order dated 19.01.2024 had approved the “Guidelines on Availability of Communication System” (**Annexure-B.2.1**) under the Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017

Members may discuss.

#### **Deliberation in the meeting**

ERPC representative delivered a lucid presentation outlining facts as follows:

- *Scope and applicability of Guidelines on Availability of Communication System prepared by NPC and approved by Hon’ble CERC. (**Annexure-B.2.1**)*
- *The said guidelines are applicable for both ISTS as well as STU communication networks (till relevant regulations on Communication is framed by State Electricity Regulatory Commission).*
- *Consideration of outage duration of communication channels along with methodology of communication system availability.*
- *CTU needs to furnish details of communication channels including redundant channels computation of availability of the communication system by ERPC. However, total number of communication channels to be considered is not explicitly mentioned.*



CTU stated:

- A representation has been submitted to CERC regarding Communication system availability highlighting some issues.
- Modalities of sharing details of communication channels with respective RLDCs is still under discussion.

ERLDC submitted:

All communication channels should be considered for computation of communication system availability.

**TeST decision:**

Based on the outcome of representation of CTU before CERC, the availability computation of communication system shall commence.

**2.2 Communication Audit of Substations: ERPC**

Final Standard Operating procedure (SOP) for Communication audit of Substations has been prepared in compliance to Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017.

This SOP for communication audit of substations is finalized to maintain uniformity at the national level.

The Audit shall be conducted in two phases:

1. **Scrutiny of information:** In first phase scrutiny of the reports, documents etc. shall be done.
2. **Physical verification:** In the second phase physical verification shall be carried out.

The Audit would include but not limited to the following aspects:

- a. Availability of communication channels. The outage reason needs to be clearly specified whether it is on account of the concerned entity or on account of any other entity, force majeure etc. The list of communication channels would be finalized by Communication System Sub Group in consultation with other stakeholders.
- b. Availability of terminal equipment. The outage reason needs to be clearly specified whether it is on account of the concerned entity or on account of any other entity, force majeure etc. The list of terminal equipment would be finalized by Communication System Sub Group. Part outage like failure of specific cards etc. would also be furnished along-with reasons.
- c. Availability of Auxiliary System e.g. Battery Charger, Battery bank, sufficient cooling equipment etc.
- d. Compliance of CERC and CEA Regulations and the procedures under these Regulations.
- e. Completion of periodic testing of the communication system in accordance with procedure for maintenance and testing prepared by CTU.
- f. Audit of all newly commissioned communication equipment within six months of its commissioning.
- g. Completion of 3rd party Cyber Security Audits.

- h. Network traffic w.r.t capacity.
- i. Spare availability, replenishment etc.
- j. Any other parameters as agreed by the Communication Sub Group.

Detailed SOP of Communication Audit along with format for collecting the details of Communication channels/links and Equipment and Audit Checklist attached at **Annexure-B.2.2**

Members may discuss.

### **Deliberation in the meeting**

#### **TeST decision:**

- *TeST committee suggested all constituents for perusal of Final Standard Operating procedure (SOP) for Communication audit of Substations , prepared in compliance to Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017.*
- *Nominations for formation of Audit committee have been received from all constituents except WBSETCL and Sikkim SLDC. So WBSETCL and Sikkim SLDC were advised to submit their nominations at the earliest.*
- *After submission of nominations from all constituents, a formal letter shall be issued from ERPC regarding formation of Communication Audit Committee of Eastern region and thereafter audit shall be carried out as per SOP( **Annexure-B.2.2**)*

### **2.3 Communication System Outage Planning: ERPC**

As per Regulation 7.3 of Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017:

#### **Quote:**

*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**

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.

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 Web Portal named as “Communication System Outage Planning Portal” shall be developed by respective RLDCs. Log-in credentials shall be provided to all the ISTS connected entities/concerned entities.
  - 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.
  - 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.

Detailed SOP of Communication System Outage Planning attached at **Annexure-B.2.3**

Members may discuss.

### **Deliberation in the meeting**

#### ***TeST decision:***

- *TeST committee opined in favour of commencing Communication outage planning meeting for eastern region from July 2024.*
- *Communication outage planning meeting shall thereafter be conducted on monthly basis for approval of proposed outages of the Communication links and equipment.*

*SOP of Communication System Outage Planning attached at **Annexure-B.2.3** for perusal of all concerned stakeholders.*

## **2.4 Committee to formulate comprehensive guidelines for the usage and sharing of optical fibres(OPGW) for power system applications: CEA**

It has been observed that the following conflicts in respect of OPGW fiber infrastructure have started cropping up with expansion of transmission & associated OPGW infrastructure along with the multiple entities owning and operating such assets; and also own the flexibility to undertake other business for optimum utilization of its transmission assets:

- (i) Conflict in respect of sharing of fibers between multiple entities.
- (ii) Conflict in respect of fiber counts that can be used on commercial basis.
- (iii) Conflict in respect of fiber counts to be allocated for different power system applications/services.

Accordingly, a Committee has been constituted under the chairmanship of Member (Power System), CEA tasked with formulating comprehensive guidelines for the usage and sharing of optical fibers (OPGW) for power system applications.

The Composition of the Committee is as follows:

1. Member (Power System) (Chair) ,CEA
2. Chief Engineer(PCD), CEA

3. Chief Engineer, NPC
4. Chief Engineer ET & I, CEA
5. Member Secretary, RPCs
6. Executive Director, CTU
7. Executive Director, Grid India
8. Executive Director, Powergrid
9. Representative of Electric Transmission Association - 2 TSPs ETA
10. Representative (at the level of Chief Engineer or equivalent)
  - Northern Region: UPPTCL, RVPNL
  - Western Region: GETCO, MPPTCL
  - Southern Region: KSEBL, TANTRANSCO
  - Eastern Region: WBSETCL, OPTCL
  - North Eastern Region: AEGC

The Chair may co-opt more members if deemed necessary.

The Terms of Reference (ToR) of the Committee shall be as follows:

1. **Scope and Purpose:** Define the need to develop guidelines that address the unique requirements and challenges associated with the sharing of OPGW fibers among CTU, STUs, and Private Transmission Licensees.
2. **Allocation Requirements:** Define/determine the number of fibers required for catering to varied applications/services for grid management such as data, speech, protection etc., including minimum spare fibers to be earmarked for grid applications/requirements.
3. **Sharing Scenarios:** Analyse the scenarios wherein the spare fibers in the OPGW laid by an entity is to be shared amongst several entities (CTU, STU, TSPs) to facilitate real time grid monitoring. Formulating the uniform mechanism governing the access, usage, or other aspects of the shared fibers in following scenarios:

(i) Sharing of OPGW laid under ULDC scheme on the ISTS lines. (ii) Sharing of OPGW laid under ULDC scheme on the Intra-State lines. (iii) Sharing of OPGW laid by STUs on the intra State lines. (iv) Sharing of OPGW laid by CTU/Powergrid on the Intra State lines. (v) Sharing of OPGW on the ISTS lines laid by TSPs under TBCB and RTM projects.

Identify and define the role and responsibilities of Centre, State, and Private Transmission Licensees in the sharing of OPGW fibers.

4. Investigate the integration of Fiber Optic Terminal Equipment (FOTE) for differential protection in accordance with the C37.94 protocol and bring out recommendations.

5. Define the uniform mechanism of routing of OPGW fibers in case of LILO taken up on any transmission line.
6. Recommend the scenarios/limit of OPGW fibers beyond which it can be utilized for other commercial purposes.
7. Formulate recommendations for seamless adoption of these guidelines.

Communication from CEA in this regard attached at **Annexure B.2.4**

Members may discuss.

**Deliberation in the meeting**

*WBSETCL and OPTCL representatives affirmed that nomination of members for constitution of “Committee on optimal usage and sharing of optical fibres(OPGW)” has already been communicated to CEA.*

**TeST decision:**

*TeST committee acknowledged the same.*

**2.5 Revised Scheme on requirement of Additional FOTE at various ISTS nodes in ER due to exhaustion of existing capacity: CTU**

S. No.	Items	Details
1.	Scope of the scheme	Requirement of additional FOTE for upgradation of capacity(bandwidth) at various Eastern region stations due to exhaustion of existing capacity at these stations is as follows:  a)Thirteen(13) numbers of FOTE STM-64 along with amplifiers as required as per <b>Appendix I</b> .  b) Dismantling of 4 nos. of STM-16 equipment freed after conversion of STM-16 equipment to STM-64 equipment and their transportation, installation, configuration, commissioning, and integration of the same equipment at STM-4 location for the upgradation of capacity of these stations as per <b>Appendix I</b> .
2.	Depiction of the scheme on FO Map	NA
3.	Objective / Justification	In Eastern region, the communication network has STM-16 link capacity at most of the places, however at few links/nodes have STM-4 or lesser capacity. It has been observed that for the few links /nodes, the capacity has been utilised for more than 75 percent. The detail of such nodes/links was intimated by POWERGRID (enclosed as <b>Annexure-B.2.5.1</b> ) which are having congestion in terms of

		<p>traffic/bandwidth so that planning for capacity enhancement of the node/link may be done.</p> <p><b>4th Communication Planning meeting (CPM) deliberation:</b> CEA suggested that the upgradation of capacity may be taken up considering change of technology to MPLS. CTUIL welcomed the suggestion and stated that the MPLS implementation shall take longer time in view of committee report and subsequent approvals. In view of this, out of the above links provided by POWERGRID only links with congestion of approximately 90% and above &amp; few other important stations shall be taken up on priority for upgradation.</p> <p>Accordingly, the list of nodes in ER with capacity utilisation of approximately 90% and above &amp; few other important stations is enclosed as Appendix-I.</p> <p>As per list, capacity upgradation of four numbers of STM-4 FOTE(Fiber Optic Terminal Equipment) to STM-16 FOTE and thirteen nos. of STM-16 FOTE to STM-64 FOTE is required.</p>
4	Estimated Cost	<b>Rs. 9.78 crores (approx.) (Nine crores &amp; Seventy Eight lakhs only)</b>
5.	Implementation time frame	12 months from date of allocation.
6.	Implementation mode	To be implemented by POWERGRID in RTM mode.
7.	Deliberations	<p>The proposed scheme was deliberated in the 3<sup>rd</sup> and 4<sup>th</sup> Communication Planning meeting (CPM) (<b>Annexure B.2.5.2</b> attached for the MoM of 4<sup>th</sup> CPM) of CTUIL held on 26.12.2022 &amp; 27.07.2023 respectively.</p> <p>POWERGRID informed that for existing FOTE capacity cannot be upgraded by upgradation of cards and new FOTE are required at all these locations.</p> <p>ERPC reviewed the scheme in 51<sup>st</sup> ERPC meeting held on 12.01.2024(MoM attached as <b>Annexure B.2.5.3</b>) as follows:</p> <p>i) ERPC approved the conversion of 13 nos. STM 16 FOTE to STM 64 FOTE.</p> <p>ii) Advised POWERGRID to explore the feasibility of reusing the surplus STM16 equipment (13 units post STM16 to</p>

		<p>STM64 conversion) for the conversion of STM4 to STM16 and update the same in the next TeST Meeting of ERPC.</p> <p>POWERGRID informed vide email dtd. 21.02.2024 that they will utilize four no. of STM16 equipment freed from STM16 to STM64 upgradation as mentioned above for capacity upgradation of four no of STM-4. Also, estimated cost for dismantling of STM-16 equipment from existing location and transportation, installation, configuration, integration &amp; commissioning of the same equipment to STM-4 location is Rs 4 lakhs per site.</p> <p>Further, POWERGRID requested in 5th CPM of ER that the time frame for implementation which has been taken as six months in the scheme may be changed to twelve months as the scheme implementation is not feasible in six months considering that STM-64 equipment are being deployed first time in Eastern region and tendering, testing, Installation, commissioning shall take time. Further, scheme involve dismantling of existing equipment and transportation to new location which shall also take considerable time in implementation. POWERGRID also suggested that nine(9) no. STM-16 FOTE left spare after conversion/upgradation of STM-4 and STM-16 FOTEs may be used for O&amp;M purpose and meeting directions for any new upcoming stations.</p> <p>Accordingly, scope of the scheme is modified as follows:</p> <p>i) Conversion of 13 nos. STM-16 FOTE to STM-64 FOTE as per enclosed Appendix I.</p> <p>ii) The conversion of STM-4 FOTE to STM-16 FOTE by utilizing four nos. FOTEs freed from upgradation of STM-16 FOTE to STM-64 FOTE.</p> <p>iii) Cost Estimate: Rs. 9.78 crores (approx.) (Nine crores &amp; Seventy Eight lakhs only);</p> <p>Implementation time frame: 12 months from date of allocation This revised scheme post ERPC review shall be put up to NCT for approval.</p>
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This scheme has been sent to ERPC for review vide email dated 01.04.2024.

**Appendix-I**

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

CTU may update. Members may discuss.

### **Deliberation in the meeting**

*CTU stated that the proposed scheme has been revised as per deliberation in 51<sup>st</sup> ERPC meeting held on 12.01.2024. The revised scope of scheme shall be as follows:*

*i) Conversion of 13 nos. STM-16 FOTE to STM-64 FOTE.*



ii) The conversion of STM-4 FOTE to STM-16 FOTE by utilizing four nos. FOTEs freed from upgradation of STM-16 FOTE to STM-64 FOTE.

iii) Cost Estimate: Rs. 9.78 crores (approx.) (Nine crores & Seventy Eight lakhs only);

Implementation time frame: 12 months from date of allocation.

It was also suggested that POWERGRID may utilize Nine no. STM-16 FOTE which shall be left spare, after conversion/upgradation of STM-4 and STM-16 FOTEs, for O&M purpose, providing redundancy in network and also for meeting requirements for any upcoming stations.

POWERGRID ER-II submitted:

- The remaining STM 16 equipment after upgradation to STM -64 shall be utilized as O&M spare for Central Sector Nodes, considering that OEM has declared end of product availability and end of inventory for 7025 and 7080 series equipment.
- Since, at present most of the Central Sector nodes in Eastern Region are having 7025 and 7080 equipment, the spare STM-16 equipment may be utilized to attend break down/ maintenance/inventory for cannibalization, etc.

**TeST decision:**

- TeST committee accepted the proposal of CTU and POWERGRID ER-II for optimal utilization of remaining 9 no.s of STM-16 after conversion of STM-16 to STM-64 as well as from STM-4 to STM-16.
- Powergrid was requested to execute the work within 9 months from approval of competent authority.
- TeST committee further referred the “revised scheme on additional FOTE requirement at ISTS nodes of ER” to TCC/ERPC meeting for concurrence.

**2.6 Dual reporting of RTU, PMU, VOIP, AGC etc applications on dual channel to RLDC and Back up RLDC: CTU**

Presently, all the data channels and voice channels are reporting in main and backup mode with a main channel to RLDC and protection channel to Backup RLDC. It is suggested by ERLDC & WRLDC that for increase of redundancy in the system both main and protection channels should report to RLDCs as well as back up to RLDCs in dual mode considering the criticality of real grid operations by the ERLDC.

For discussing the same meetings were held among POWERGRID, Grid-India, CTU and CEA on dated 09/05/23 and 27/06/23. Now as per discussion in meeting, POWERGRID had to provide the region wise data of additional requirement for equipment/card/port etc in respective FOTE/Gateway/RTU for the implementation of dual redundancy within 21 days.

*Deliberations in 4th CPM:*

POWERGRID has to provide the required data for Eastern Region to CTU. POWERGRID stated that they are compiling this data as SAS gateways upgradation which are upgradable and SAS gateway for replacement which are not upgradable. Similarly, new procurement of RTUs shall be done where the RTU have lived their life and addition procurement of RTUs where the RTU ports are insufficient. ERLDC stated that where SAS gateways are

malfunctioning with expansion of ports, POWERGRID shall discuss with OEM to resolve the same. POWERGRID to submit the requisite data within a week.

POWERGRID CC AM dept. and POWERGRID GA & C dept. have provided the required data pertaining to SAS/RTU and FOTE respectively as per attached **Annexure B.2.6.1 and B.2.6.2**

*Deliberation in 5th CPM:*

CTU asked if there is any requirement pertaining to new FOTE and FOTE ethernet card at New Jeerat and Mednipur S/s.

POWERGRID informed that at New Jeerat and Mednipur S/s there is no requirement pertaining to new FOTE and FOTE ethernet card.

CTU asked POWERGRID to provide the existing SAS architecture for finalisation of the scheme. POWERGRID agreed to provide the same.

ERLDC stated that it is understood that the requirement of the dual channel was put up for only upcoming S/s and for the existing S/s the life of existing RTU/SAS may be evaluated and then further deliberation may be done for provisioning of dual channel for existing S/s. ERLDC further suggested that dual redundancy for existing system may be implemented by utilizing existing resources and in case any upgradation is required that can be done only after completion of useful life of existing SAS, RTU,FOTE etc.

CTU clarified that scheme was prepared as per requirement of NLDC and all RLDCs.For new ISTS schemes, CTU is already proposing for the provision for dual channel reporting of various communication applications in the RfPs. CTU further stated that the said scheme is put up for dual redundancy of the existing system which was also agreed by RLDCs and NLDC.For the requirement of existing system,POWERGRID has reviewed and provided the BoQ with tentative cost details.

CTU also mentioned that similar schemes for other regions are also being taken up for RPC review.CTU suggested the forum that the requirements provided for the scheme shall also be discussed with NLDC and RLDCs and may be reviewed in the next meeting.

ERPC stated that for the existing S/s the life of existing RTU/SAS may be evaluated for provisioning of dual channel for existing S/s.

In the meeting held on 16.04.2024 among CTU, CEA and all RLDCs, it was agreed that for existing S/s also the requirement of dual channel for various communication channels may be planned.

**Based on the data provided by POWERGRID AM and GA & C, requirement in ER is as follows:**

Sr. No.	Region	RTU reqd. (in no.)	SAS reqd. (in no.)	FOTE reqd. (in no.)	Ethernet card reqd. (in no.)
1	ER-1	0	01	Nil	20 Nos. including main and
2	ER-2	0	03		

3	Odisha	0	00		back up
<b>Total qty reqd.</b>		<b>0</b>	<b>04</b>		RLDC

Cost estimate for the scheme as provided by POWERGRID is as follows:

a) Cost of one new SAS: 1.5 cr

b) Cost of total four new SAS required:  $4 \times 1.5 \text{ cr} = 6 \text{ cr}$

c) Cost of one ethernet card: 1.25 lacs

d) Cost of required 20 Nos. ethernet card:  $20 \times 1.25 \text{ lacs} = 25 \text{ lacs}$

Total cost estimate for the scheme (b+d): 6.25 cr

CTU may update. Members may deliberate.

### **Deliberation in the meeting**

*CTU representative submitted :*

- *At present one channel is reporting to main RLDC and another channel to back up RLDC, thus providing 1+1 redundancy. NLDC has requested for dual redundancy vide their letter to POWERGRID. ERLDC, WRLDC and other RLDCs has also raised the 2+2 redundancy i.e one main and its back up channel to main RLDC and another one main and its back up channel to back up RLDC. 2+2 redundancy for upcoming system has already been ensured by incorporating the same in all new RfPs after discussion with CEA.*
- *For existing system, CTU has collected the data from POWERGRID. The data for other TBCB TSPs is being collected.*
- *A joint meeting of all the RLDCs, CEA was convened on 16/04/24 in view of the MoM of 5<sup>th</sup> CPM (Communication Planning Meeting) of CTU in which ERLDC stated that dual redundancy for existing system may be implemented by utilizing existing resources and in case any upgradation is required that can be done only after completion of useful life of existing SAS, RTU, FOTE etc. In this meeting all the RLDCs unanimously pitched in favour of the dual redundancy of the existing system.*

*ERLDC stated:*

- *Their existing SCADA may not support dual redundancy and thus proof of concept (PoC) is required before further advancing in scheme.*
- *Their SCADA is different from other RLDCs SCADA and they need PoC to ensure that their SCADA shall support dual redundancy.*

*CTU stated that no such requirement has been raised by other RLDCs and at present AGC stations are also operating under 2+2 redundancy. It is pertinent to mention that at present many stations are operational in 2+1 redundancy configuration as informed during different dual redundancy meetings conducted by CTU.*

*POWERGRID stated that they will provide 2+2 channels in their upcoming SAS stations and ERLDC can test dual redundancy in their system.*

**TeST decision:**

- TeST committee advised Powergrid to carry out POC on pilot basis for dual reporting via SCADA to ERLDC ( main and backup). Powergrid agreed to carry out the POC at Bahrapur station.
- After successful completion of POC, CTU was advised to put up the agenda in upcoming TeST/OCC meeting of ERPC for further deliberation.

**2.7 Compliance for Resource disjoint as per CEA manual of communication planning for power system operation dtd 31.03.2022: CTU**

As per CEA manual of communication planning for power system operation dtd 31.03.2022, to ensure redundancy with route diversity, the working path and protection path should be resource disjoint. There may exist Single Points of Failure (SPOF) in network where multiple links are aggregating to single node and failure of such node may result in failure of multiple nodes and thus the Grid visibility. Such nodes in ISTS communication network may be identified and intimated by POWERGRID/Grid-India which are SPOF. The redundancy and resource disjoint of such links is to be further ensured considering their criticality in system.

This agenda was discussed in 3rd Communication planning meeting (CPM) of CTUIL wherein, CTUIL requested POSOCO/POWERGRID to furnish such nodes based on the records/reports where data of multiple nodes have gone offline simultaneously.

CTU has identified some of the nodes as SPOF based on study of ER map as per table mentioned below:

Sr. No.	SPOF node	Existing FOTE availability and capacity	Additional FOTE Requirement/Capacity	Remark
1	Baripada	STM 4 FOTE:1 No.	STM 16 FOTE:1 No.	
2	Angul	STM 4 FOTE:1 No.	STM 16 FOTE:1 No.	
3	New Ranchi 765kV	STM 4 FOTE:1 No.	STM 16 FOTE:1 No.	
4	Jamshedpur	STM 16 FOTE:1 No.	STM 16 FOTE:1 No.	
5	Gaya 765kV	STM 4 FOTE:1 No.	0	Additional equipment under congestion scheme is also being planned.

6	Patna	STM 16 FOTE:1 No.	STM 16 FOTE:1 No.	
7	Biharsharif	STM 16 FOTE:1 No.	STM 16 FOTE:1 No.	
8	Kahalgaon	STM 16 FOTE:1 No.	0	Additional equipment under congestion scheme is also being planned.
9	Farakka	STM 16 FOTE:2 No.	0	Additional equipment under congestion scheme is also being planned.
10	New Purnea	STM 16 FOTE:1 No.	0	Additional equipment under congestion scheme is also being planned.
11	Kishenganj	STM 16 FOTE:1 No.  STM 4 FOTE:1 No.	0	Additional equipment under congestion scheme is also being planned.
12	Binaguri	STM 16 FOTE:1 No.  STM 4 FOTE:2 No.	0	Additional equipment under congestion scheme is also being planned.
13	Alipurduwar	STM 4 FOTE:1 No.	STM 16 FOTE:1 No.	
14	Rangpo	STM 4 FOTE:3 No.	0	3 Nos. STM 4 FOTE is existing.
15	Sasaram	STM 16 FOTE:1 No.	0	Additional equipment under congestion scheme is also being planned.
16	Meramundali			OPTCL S/s. Whether any FOTE is installed by

				POWERGRID for ULDC.
17	Gangtok	STM 4 FOTE:2 No.	0	2 Nos. STM 4 FOTE is existing.
18	ERLDC	STM 16 FOTE:1 No.	0	Additional equipment under congestion scheme is also being planned.
19	Odisha SLDC			Data to be provided by POWERGRID/SLDC
20	Bihar SLDC			Data to be provided by POWERGRID/SLDC
21	Jharkhand SLDC			Data to be provided by POWERGRID/SLDC
22	Sikkim SLDC			Data to be provided by POWERGRID/SLDC
22	WB SLDC			Data to be provided by POWERGRID/SLDC

POWERGRID/ERLDC/STU may further suggest modification/addition of nodes as SPOF in above list. After deliberation among members additional FOTE shall be planned at SPOF locations for redundancy purpose. Repeater requirements, any other requirement for removal of SPOF may also be suggested by members.

CTU may update. Members may discuss.

#### **Deliberation in the meeting**

*CTU explained the forum:*

- *After studying the Eastern region Communication network, twenty two no. of SPOF nodes have been identified as mentioned above.*
- *Outage of any of these SPOF nodes shall cause outage of data of multiple nodes. So, apart from OPGW redundancy, FOTE level redundancy is also required.*
- *However, out of twenty two nodes, 10 no. of nodes already have dual FOTEs.*

ERLDC stated that they have proposed dual FOTE for all ISTS nodes and underscored the need of detailed study to ascertain the suitability of additional FOTE at identified SPOF nodes of ER.

**TeST decision:**

- It was suggested that redundancy shall be planned as per criticality of nodes to ensure optimum utilization of resources.
- For SLDC locations i.e Odisha, Bihar, Jharkhand, DVC, Sikkim, West Bengal requirement of redundant FOTE has to be provided by respective SLDCs in a week time.
- POWERGRID and ERLDC were advised to suggest further addition of SPOF nodes after study/ operational feedback of ER ISTS communication network in a week time.
- Scheme for SPOF shall be put up by CTU after incorporating the requirement provided by ERLDC, SLDCs and POWERGRID.

**2.8 Replacement of old OPGW on following 10 Communication links in Eastern Region:CTU**

- i. 400kV Prayagraj(Allahabad)–Sasaram(Length: 214.42 km)
- ii. 400kV Farakka –Jeerat (Length: 236.85 km)
- iii. 400kV Jeypore-Indravati (Length: 74.99 km)
- iv. 400kV Indravati-Rengali (Length: 352.69 km)
- v. 400kV Rengali-Talcher (Length: 24.63 km)
- vi. 400kV Durgapur-Farakka (Length: 149.48 km)
- vii. 400kV Farakka-Malda (Length: 42.14 km)
- viii. 400kV Malda-Binaguri (Length: 210.94 km)
- ix. 400kV Binagauri-Bongaigaon (Length: 103.75 km OPGW +6.75 km UGFO)
- x. 400kV Farakka-Kahalgaon (Length: 94.41 km)

OPGW on above mentioned lines have been installed & commissioned by POWERGRID telecom dept (PDT). These links mentioned at (a) to (j) are also catering to ULDC operation. This agenda was put up by POWERGRID in 5th CPM wherein POWERGRID stated the following:

Useful life of these links of 15 years is completed.

The link condition is deteriorating now and condition is declining. Optical Attenuation has increased beyond the design limits. Details compiled in the table below:

S.N.	Description	Link Length (km)	Design Attenuation (dB)	Actual Attenuation (dB)	YoC	Remark
1	400kV Prayagraj – Sasaram	214.42	53.61	71.82 ↑ (+18.21)	2004	

2	400kV Farakka – Jeerat	236.85	59.21	73.43 ↑ (+14.62)	2004	
3	400kV Jeypore-Indravati	74.99	18.75	24.01 ↑ (+5.26)	2005	OPGW replacement not required as per 5 <sup>th</sup> CPM deliberation
4	400kV Indravati-Rengali-Talcher	377.31	94.33	122.22 ↑ (+27.89)	2005	
5	400kV Durgapur-Farakka	149.48	37.37	56.16 ↑ (+18.79)	2004	OPGW replacement not required as per 5 <sup>th</sup> CPM deliberation
6	400kV Farakka-Malda	42.14	10.54	20.40 ↑ (+18.79)	2004	
7	400kV Malda-Binaguri	217.69	52.73	75.10 ↑ (+22.37)	2004	
8	400kV Binagauri-Bongaigaon	103.75	25.94	78.94 ↑ (+53)	2004	
9	400kV Farakka-Kahalgaon	94.47	23.60	30.85 ↑ (+7.25)	2004	OPGW replacement not required as per 5 <sup>th</sup> CPM deliberation
	<b>Total=</b>	1504.29 km				

- (i) These links are being utilised for sensitive and critical grid management data to RLDC/NLDC from sub-stations and SLDCs. In view of above, there is need for replacement of the above old OPGW links with new OPGW. Link wise Loss Reports are enclosed in **Annexure-B.2.8.1**
- (ii) POWERGRID is making regular efforts to maintain availability of these links. Any outage will most likely have an immense impact on grid management capabilities as these links are very important and backbone original ULDC network established for grid operation.

However, POWERGRID suggested that for better grid operation all these fibers may be laid under ISTS. The estimated Cost of replacement of old OPGW in above links except links in



table at Sr. No. 3,5,9 (including FOTE) for 1185.35 kms is approx. Rs 59.27 Crores on prorata basis. However, as per deliberation in 5<sup>th</sup> CPM, the OTDR report and UNMS incorporation for the links mentioned above is to be provided by POWERGRID. The requirement of terminal equipment for the links can be assessed based on existing FOTE useful life. Hence, the detail of FOTE (Make,model,year of incorporation, capacity etc.) may also be furnished by POWERGRID for incorporating in the scheme.

*Deliberation in 5<sup>th</sup> CPM:*

Following points were deliberated regarding this scheme:

a)It was suggested that all the links mentioned in above list apart from 400kV Durgapur Farakka may also be checked such that they have not been taken up for replacement in any other ongoing/upcoming projects.

POWERGRID confirmed that except 400kV Durgapur-Farakka link, other links as mentioned above are not considered in any other project and may be taken up for replacement.

b)CTU further suggested that links mentioned at Sr. No. 3 and 9 i.e. 400kV Jeypore-Indravati and 400kV Farakka-Kahalgaoon in the table above may be dropped for replacement now as the increase in attenuation is not very high and limited to 5-7 dB only. All members agreed for the same.

c)CTU stated that the scheme shall be taken up as a new scheme for laying of OPGW on the above mentioned links rather than replacement of OPGW as the existing OPGW was laid under PDT project and not under the ISTS scheme. Further after implementation of the above scheme, the shared usage of the existing PowerTel links for ISTS purpose shall be discontinued and PowerTel usage for the new ISTS OPGW links, if any, shall be governed by CERC norms.

POWERGRID agreed with the same.

d)The OTDR report and UNMS incorporation for the links mentioned above may also be provided by POWERGRID. The requirement of terminal equipment for the links can be assessed based on existing FOTE useful life. Hence, the detail of FOTE (Make,model,year of incorporation, capacity etc.) may also be furnished for incorporating in the scheme. POWERGRID agreed with same.

The OTDR report for some links and details of FOTE(attached as **Annexure B.2.8.2**) for the above mentioned links have been provided by POWERGRID through email dtd. 15.04.2024 and 17.04.2024 respectively.

CTU may update.Members may deliberate.

**Deliberation in the meeting**

*CTU stated:*

- *POWERGRID has submitted requirement of replacement of old OPGW on ten nos. of communication links as mentioned above.However as per 5<sup>th</sup> CPM deliberation, requirement for three no.s of OPGW links has been deleted.*

- OPGW on above mentioned lines have been installed & commissioned by POWERGRID telecom dept (PDT).
- These links are also catering to ULDC operation. However the OPGW on these lines shall be laid as new OPGW as earlier OPGW was not laid under ISTS/ULDC project.

POWERGRID stated that the length of three nos. of lines needs to be modified as follows:

S.N.	Description	Actual Link Length (km)	Old Link Length (km)	Design Attenuation (dB)	Actual Attenuation (dB)	YoC
1	400kV Prayagraj – Sasaram	214.42	214.42	53.61	71.82 ↑ (+18.21)	2004
2	400kV Farakka – Sagardighi-II & 400KV Sagardighi-Jeerat-I	304 (84.71+219.45)	236.85	59.21	73.43 ↑ (+14.62)	2004
3	400kV Indravati-Rengali-Talcher	377.31	377.31	94.33	122.22 ↑ (+27.89)	2005
4	400kV Farakka-Malda	42.14	42.14	10.54	20.40 ↑ (+18.79)	2004
5	400kV Malda-Purnea & 400kV Purnea-Binaguri	367.34 (176.89+190.47)	217.69	52.73	75.10 ↑ (+22.37)	2004
6	400kV Binaguri-Bongaigaon	239.81	103.75	25.94	78.94 ↑ (+53)	2004
	<b>Total=</b>	1545.01 Km	1185.35 km			

**TeST decision:**

- POWERGRID was advised to provide date of commissioning of LILO portion, OTDR reports along with FOTE details.

- *The issue was referred to CCM for further deliberation.*

## **2.9 Approval of Procedure/guidelines by CERC: CTU**

The following procedures/guidelines have been approved by CERC and these may be followed by constituents members for healthy communication system.

a) 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.

b) “Procedure on Maintenance and testing of Communication System” under the Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017.

c) Guidelines on “Availability of Communication System” under the Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017.

Members may note.

### **Deliberation in the meeting**

*CTU stated that the above Procedures/Guidelines have been notified by CERC. However, CTU has put up their representation to CERC for few modifications in above mentioned procedures/guidelines.*

### **TeST decision:**

*TeST committee noted the relevant CERC guidelines and advised all constituents to share their respective views on the same (if any) to Hon’ble CERC, thereafter implement the CERC approved procedures/guidelines in their communication systems.*

## **2.10 Inputs from Grid-India/ STUs to finalize scope/BoQ for VOIP Hotline exchange: CTU**

1. Hot Line Speech Communication System (VOIP based PABX system) was implemented in 2016 by POWERGRID in all five regions after grid disturbance in 2012 where grid operators faced problem of fast communication due to unavailability of dedicated speech communication PAN India between NLDC, RLDCs, SLDCs, important state and ISTS substations and generators. The said PABX was implemented by M/s Orange through Alcatel Lucent as OEM.

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

3. AMC of the same was extended and approved in the 67th NRPC for further 2 years upto July’25 with financial implication and shall be booked in ULDC O&M charges as per the CERC norms. After July’25 there is no support shall be extended by Alcatel (OEM).

4. In 67th NRPC Meeting, MS, NRPC advised CTU to plan upgradation/ new system and implementation of existing Hot line speech communication or new EPABX system timely in view of expiration of AMC in July'25.

5. It is understood that during the execution of the said project, RPCs approval was sought in all regions and cost of the project was booked in the ongoing Communication System packages of the respective regions. So, it is understood that useful life of hotline speech communication is 15 years per CERC tariff regulation.

6. In the 23rd TeST meeting NRPC advised CTU to take up the planning and approval process parallelly as POWERGRID shall file petition to CERC in 2024 for revised depreciation. It was deliberated that as the AMC extension has been approved by POWERGRID for 2 years, meanwhile CERC order will be pursued during this time. CTU also requested that POWERGRID shall provide a copy of petition for which POWERGRID agreed.

7. In view of above CTU is planning a new EPABX system which shall replace the existing system within 2 years.

8. CTU has discussed the requirement with various VOIP Exchange suppliers and proposed VOIP System Architecture is attached at **Appendix-II**. Salient features of proposed VOIP system are given below:

(i) Server based architecture

(ii) Multiple level of redundancy in compared to present system e.g. If RLDC exchange failed complete load shall be transferred to backup RLDC. If both Main & Backup RLDC failed NLDC server can take complete load. At state level Main & Backup Server are proposed main and backup SLDC. If main SLDC server failed, backup will take entire load if both main & backup SLDC failed complete load shifted to RLDC servers.

(iii) For cost optimization main and backup servers works in dual mode as main as well as backup of backup RLDC servers vice-versa

(iv) NMS for adding/ deleting users shall be provided at RLDC/ SLDC levels

(v) Operator console shall be provided to manage calls at RLDC/SLDC

(vi) Call recording features shall be provided at RLDC & SLDC level

(vii) VOIP, Digital, Analog, Four Wire E&M (at PLCC) locations are considered

(viii) Video Phones at RLDC/ SLDC for Senior officials

(ix) Trunk lines for outside calling, recurring tariff of trunk lines to be borne by respective utilities

(x) Sufficient numbers of licenses to cater future RE/ ISTS/ ISGS/ IPP locations and STU substations locations.

9. A presentation is also arranged by prospective OEM of VOIP M/s Coral in the meeting.

10. To finalize the BoQ & Scope following inputs are required from RLDC/ Grid-India and STUs no. of subscribers/locations:format

Exchange	No of phones (VOIP)-BASIC		No of phones (VOIP) - ADVANCE VIDEO	SIP TRUNK (BSNL/JIO ETC)	PRI Line (BSNL/Airtel etc.)	CO/Trunk Line (BSNL/Airtel etc.)	Radio Interface Port	Digital phones with one touch dial	Analog Phones	Voice Recorder (for 6 months storage)	
	Local	Remote	Local	Remote					2W	4W E&M (PLCC)	
NLDC											
RLDC											
SLDC											
Frequency of voice recording backup											Daily/Weekly/Monthly

Note: For the existing VOIP exchange data is enclosed as **Annexure B.2.10**

11. Location for ERLDC, Backup ERLDC, SLDC, backup SLDCs as mentioned below are to be confirmed:

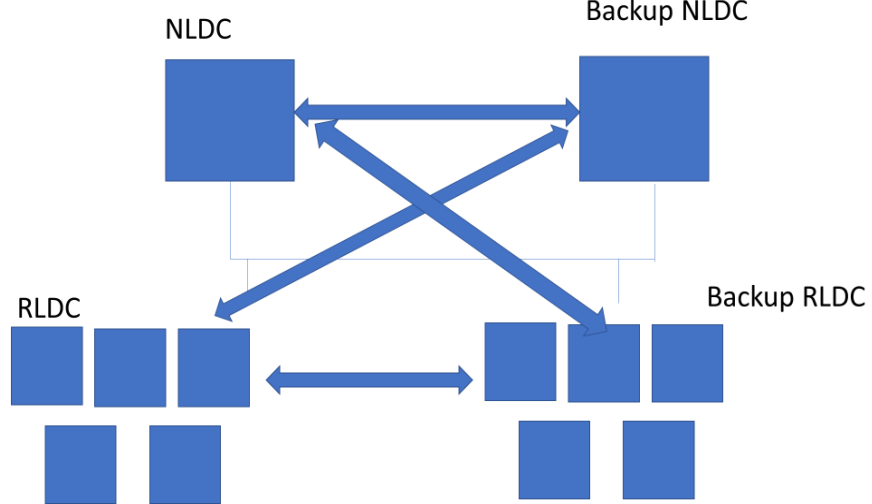
Sr No.	Main CC Location	Backup CC location
1	Backup ERLDC	
2	SLDC, Bhubaneswar(Odisha)	
3	SLDC,Ranchi(jharkhand)	
4	SLDC,Kolkata (West Bengal)	
5	SLDC,Patna(Bihar)	
6	SLDC,Gangtok(Sikkim)	

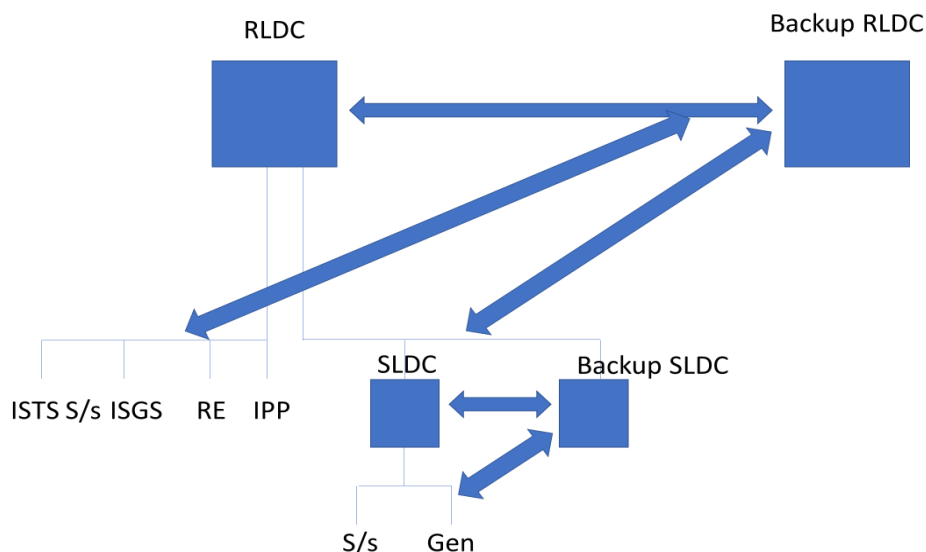
12. Location of Remote locations

13. Proposal to be discussed in the all 5 regions and combined proposals may be prepared after taking inputs from all regions and cost estimates.

**Appendix-II**

Proposed VOIP PABX Architecture





CTU may update. Members may deliberate.

**Deliberation in the meeting**

CTU stated the following:

- A new EPABX system is being planned by CTU which shall replace the existing system within 2 years.
- Salient features of proposed VOIP System Architecture as mentioned in agenda were discussed. Proposed VOIP exchange has server based architecture with multiple level redundancy at RLDC, NLDC and SLDC level.
- It was also intimated that a presentation is also arranged by one of prospective OEMs of VOIP in a week time wherein members can further clarify their relevant queries.

**TeST decision:**

- To aid in planning and finalization of scope/BoQ for VOIP Hotline exchange, TeST committee advised submission following data considering existing requirements and also the future requirement for at least next seven(7) to ten(10) years by all the constituents i.e STU, ERLDC etc.:

Exchange	No of phones (VOIP)-BASIC	No of phones (VOIP) - ADVANCED VIDEO	SIP TRUNK (BSNL/JIO ETC)	PRI Line (BSNL/Airtel etc.)	CO/Trunk Line (BSNL/Airtel etc.)	Radio Interface Port	Digital phones with one touch dial	Analog Phones	Voice Recorder (for 6 months storage)
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	Local	Remote	Local	Remote						2W	4W E& M (PL CC)	
NLDC												
RLDC												
SLDC												
Frequency of voice recording backup												Daily/ Weekly/M onthly

For the existing VOIP exchange data is enclosed as **Annexure B.2.10**

### 2.11 Scheme for Connectivity for redundant path for Teesta III plant: CTU

S. No.	Items	Details
1.	Scope of the scheme	Laying of OPGW with required terminal equipments from Teesta III to LILO point(15.87km) to establish 400kV Teesta III-Rangpo#1link.Presently Teesta III-Rangpo#1line is LILOed at Dikchu HEP.
2.	Depiction of the scheme on FO Map	As per diagram below in <b>Appendix III.</b>
3.	Objective / Justification	<p>Presently, Teesta III is connected through Teesta III - Rangpo PLCC link.</p> <p>First Fibre path for Teesta III is under implementation through Teesta III-Rangpo ckt 2 under ER-Additional Requirement Project.</p> <p>The ckt 1 of Teesta-III-Rangpo line is LILOed at Dikchu HEP. The OPGW on Dikchu HEP -Rangpo portion is already planned for Teesta III – Rangpo ckt 1.</p> <p>Thus, the Redundant Fibre path for Teesta-III was planned by laying of OPGW on Teesta III- Dikchu HEP portion (approx. 26km line length) of Teesta III – Rangpo ckt1. This agenda was discussed in 12<sup>th</sup> ERPC TeST and approved in 47<sup>th</sup> ERPC dated 25/11/22 &amp; 49<sup>th</sup> ERPC 24/03/23 with cost estimate of Rs 1.167 crores.</p> <p>However, as per MoM dtd 18.07.2023(attached as <b>Annexure B.2.11.1</b>) regarding scheduling of power from Dikchu HEP in Sikkim under GNA regulation 2022, it is</p>

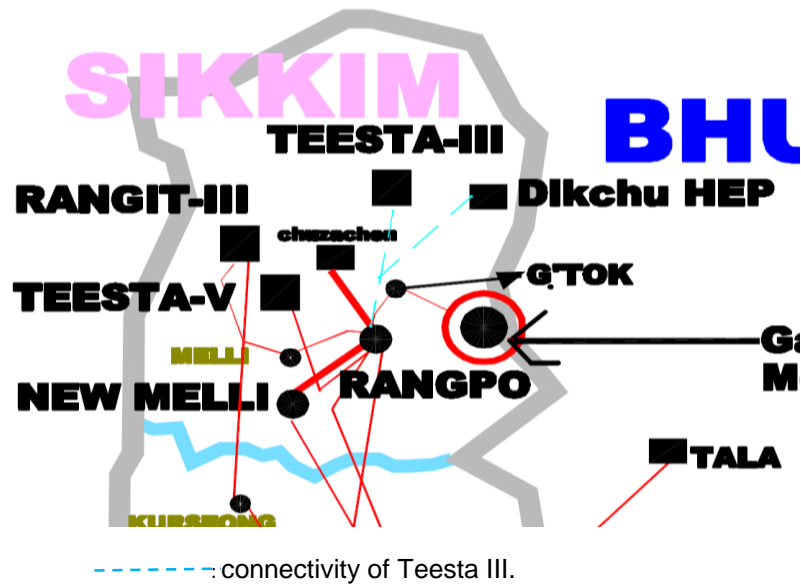


		<p>understood that connectivity of Dikchu HEP with ISTS is an interim arrangement and shall be eliminated on readiness of intra state transmission system (expected by 29<sup>th</sup> Feb 24 as per 24<sup>th</sup> CMETS-ER MoM dated 31<sup>st</sup> Oct 23).</p> <p>Accordingly, the connectivity of OPGW for protection path of Teesta III is being revised. Now, OPGW is proposed on Teesta III to LILO point for Dikchu HEP (15.87 km) on Teesta III-Rangpo ckt 1. The revised diagram for the scheme is enclosed in <b>Appendix III</b>.</p> <p>In the 4<sup>th</sup> CPM of ER dated 27/07/23, POWERGRID stated that they are already implementing the scheme for OPGW laying from Rangpo to Dikchu HEP. They further stated that suggestion of removal of Dikchu HEP to LILO point Transmission line by Dec 2023 will hamper the DOCO and recovery of the investment made for this scheme. ERLDC stated that they will also look up into the matter and revert.</p> <p>In the 51<sup>st</sup> ERPC meeting held on 12.01.2024, ERPC gave the decision as follows:</p> <ul style="list-style-type: none"> <li>i. The scheme for the revised connectivity of the redundant path of Teesta-III is accorded for in principle approval.</li> <li>ii. CTU was directed to provide a cost estimate for the revised scheme in the next CCM Meeting of ERPC.</li> </ul> <p>Accordingly, the scheme with cost estimate is proposed in ERPC CCM meeting.</p>
4.	Estimated Cost	Rs. 1,12,36,000/- (approx.) (One crore Twelve Lakhs Thirty Six Thousands only)
5.	Implementation time frame	18 months from date of allocation.
6.	Implementation mode and agency	<p>Line Ownership of the proposed section for OPGW laying in the instant scheme is with TPTL.</p> <p>To be implemented by POWERGRID in RTM mode.</p>
7.	Deliberations	<p>The Redundant Fibre path for Teesta-III was planned by laying of OPGW on Teesta III- Dikchu HEP portion (approx. 26km line length) of Teesta III – Rangpo ckt1. This agenda was discussed in 12<sup>th</sup> ERPC TeST and approved in 47<sup>th</sup> ERPC dated 25/11/22(MoM attached as <b>Annexure B.2.11.2</b>) &amp; 49<sup>th</sup> ERPC 24/03/23 with cost estimate of Rs 1.167 crores.</p>

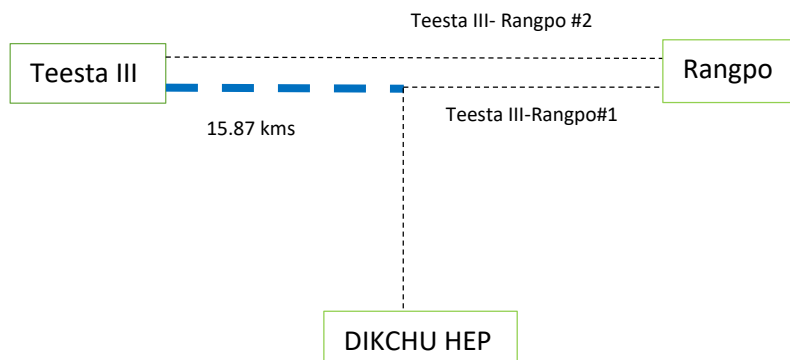
		<p>However, as per MoM dtd 18.07.2023(attached as <b>Annexure B.2.11.3</b>) regarding scheduling of power from Dikchu HEP in Sikkim under GNA regulation 2022, it is understood that connectivity of Dikchu HEP with ISTS is an interim arrangement and shall be eliminated on readiness of intra state transmission system (expected by 29<sup>th</sup> Feb 24 as per 24<sup>th</sup> CMETS-ER MoM dated 31<sup>st</sup> Oct 23).</p> <p>Considering the same, this scheme was then further deliberated in the 4th Communication Planning meeting (CPM) (<b>Annexure B.2.11.4</b> attached for the MoM of 4<sup>th</sup> CPM) of CTUIL held on 27.07.2023.</p> <p>Accordingly, the scheme was revised and OPGW laying is proposed on Teesta III to LILO point for Dikchu HEP (15.87 km) on Teesta III-Rangpo ckt 1. The revised scheme was deliberated in 51<sup>st</sup> ERPC meeting held on 12.01.2024.</p> <p>In the 51st ERPC meeting held on 12.01.2024, ERPC gave the decision as follows:(MoM attached as <b>Annexure B.2.11.5</b>)</p> <ol style="list-style-type: none"> <li>i. The scheme for the revised connectivity of the redundant path of Teesta-III is accorded for in principle approval.</li> <li>ii. CTU was directed to provide a cost estimate for the revised scheme in the next CCM Meeting of ERPC.</li> </ol> <p>As directed in 51st ERPC meeting, the revised scheme with cost estimate is being put up for CCM committee of ERPC for review.</p> <p>This scheme after CCM committee review shall be put up to NCT for approval.</p>
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**Appendix III**

**Redundant path Connectivity of Teesta III**



**Schematic diagram of FO connectivity of Teesta III**



**Legends:**

- : under this proposed scheme
- : OPGW proposed under different scheme

CTU may update.Members may deliberate.

**Deliberation in the meeting**

Sikkim representative was not present in the meeting.

**TeST decision:**

TeST committee was technically convinced of implementation of redundant FO connectivity for Teesta III and referred it to CCM for necessary review of cost implications as well as recommendations.

**2.12 Redundant connectivity of Nabinagar I (BRBCL): CTU**

Presently, fiber optic link Nabinagar I-Sasaram is under implementation and this will form a radial link.

For second path for Nabinagar I, it is understood that, a Tx line with OPGW connecting Nabinagar I & II is to be implemented by Nabinagar II(NTPC).

**Deliberation held in the 12th TeST meeting:**

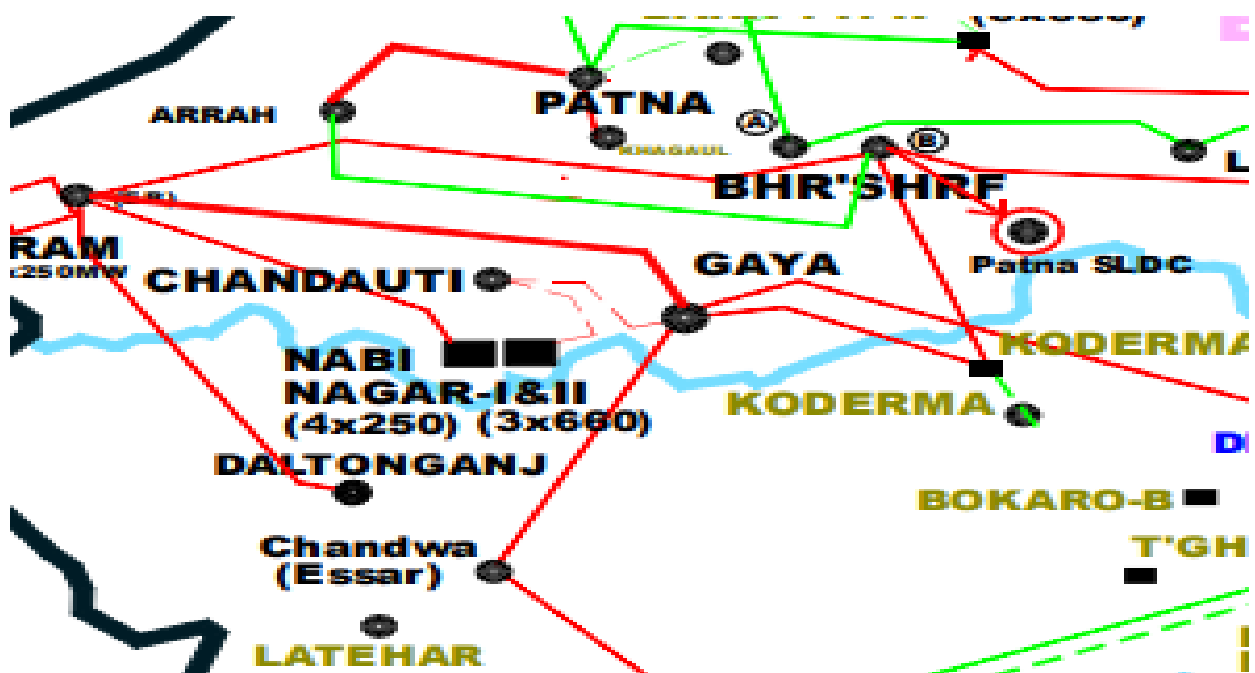
NTPC vide email dated 09/11/2022 communicated to ERPC that job is held up due to land acquisition issue for which help is being taken from local government however issue is yet to be resolved. TeST committee advised ERLDC to share status of line with CTU and ERPC after coordinating with CEA.

Nabinagar II(NTPC) may update the status of implementation. Other alternatives of the said connectivity may also be explored. The agenda was also put in 4th CPM dated 27/07/23 but could not be deliberated due to absence of NTPC.

**Deliberation in 5th CPM:**

The forum agreed to take up this agenda in the upcoming ERPC meeting.

**FO connectivity of Nabinagar I**



### **Deliberation in the meeting**

*NTPC representative was not present in the meeting. So TeST committee could not take a final call on redundant FO connectivity to Nabinagar I (BRBCL) and opined to resubmit the agenda in subsequent TeST meetings.*

### **2.13 Updating of Link Length under Project (i). Upgradation of SCADA/RTUs/SAS in Central Sector stations and Strengthening of OPGW network in Eastern Region, (ii.) Eastern Region Fibre Optic Expansion Project (Additional Requirement) & (iii). Strengthening of OPGW network in ER Grid and connectivity with other regions: Powergrid ER-II**

Projects for establishment of OPGW based communication links for increasing the redundancy of ER Communication network for data reporting at ERLDC and tele protection were approved as per following details.

<b>Name of Project</b>	<b>Approved in ERPC meeting</b>
Eastern Region Fibre Optic Expansion Project (Additional Requirement)	33rd & 27th ERPC meeting
Upgradation of SCADA/RTUs/SAS in Central Sector stations and Strengthening of OPGW network in Eastern Region	39th ERPC meeting
Strengthening of OPGW network in ER Grid and connectivity with other regions	42nd ERPC meeting

Under the above projects, the following links have been completed as per below final executed link length.

<b>Name of OPGW link</b>	<b>Project under which approval given</b>	<b>Initial approved length</b>	<b>Final Executed length (km)</b>	<b>Remark</b>
Teesta III-Kishangunj	Eastern Region Fibre Optic Expansion Project (Additional Requirement)	212 km (Main link)	242.062	After LILO of main line of Teesta III-Kishangunj TL at Rangpo (PG), OPGW being laid on main line was also LILOed at Rangpo (PG) considering that Teesta III-Kishangunj was a very long link and Rangpo (PG) could serve as Repeater station as per technical requirement of establishing long haul links. Thus due to addition of LILO portion at Rangpo, the final executed length of mentioned link increased.
Durgapur-Jamshedpur	Upgradation of SCADA/RTUs/SAS	175 km	183.635	Due to requirement of keeping loop at Joint Box locations, splicing, sagging and wastage,

Durgapur-Farakka	in Central Sector stations and Strengthening of OPGW network in Eastern Region	150 km	157.745	the final executed quantity is more than initial indicated quantity which was based on route length of transmission line.
Dikchu-Rangpo		32.67 km	32.176	As per actual site survey and final executed length.
Maithan-Durgapur	Strengthening of OPGW network in ER Grid and connectivity with other regions	128 km	74.125	Due to typographical error the length of Maithan-Durgapur TL got interchanged with Durgapur-Sagardighi link approved under same project Further, the final executed length of OPGW is slightly more than the route length of transmission line due to requirement of keeping loop at Joint Box locations, splicing, sagging and wastage, etc.
Durgapur-Sagardighi		72 km	133.572	Due to typographical error the length of Durgapur-Sagardighi TL got interchanged with Maithan-Durgapur link approved under same project Further, the final executed length of OPGW is slightly more than the route length of transmission line due to requirement of keeping loop at Joint Box locations, splicing, sagging and wastage, etc.
Farakka – Purnea	Strengthening of OPGW network in ER Grid and connectivity with other regions	160 km	179.643	Due to requirement of keeping loop at Joint Box locations, splicing, sagging and wastage, the final executed quantity is more than initial indicated quantity which was based on route length of transmission line.
Farakka-Sagardighi-Subhasgram		301 km	331.096	Since link length is very long, therefore there was technical requirement of establishing repeater station at Jeerat for such long-haul link. Further, there due to requirement of keeping loop at Joint Box locations, splicing, sagging and wastage, the final executed quantity is more than initial indicated quantity which was based on route length of transmission line.

Thus, link length of above tabulated links may be updated and approved as per actual executed length due to reasons mentioned above.

Powergrid ER-II may update. Members may discuss.

### **Deliberation in the meeting**

*Powergrid ER-II representative explained as follows:*

- *The specific reasons including addition of LILO portion in transmission lines, provisioning repeater stations due to low signal strength, splicing wastage due to loop at intermediate joint box locations etc for deviation in executed length of all OPGW links from their approved lengths in ERPC forum.*

- *It was further informed that all these nodes have already been integrated with UNMS and respective OTDR test reports have been submitted to ERLDC.*

**TeST decision:**

- *TeST committee advised Powergrid ER-II to carry out proper estimation including margin for deviation at the time of planning and approval of OPGW projects so as to minimize the difference between approved and actual executed link lengths.*
- *TeST committee technically approved the revised executed lengths of all the above OPGW links and referred it to TCC forum of ERPC for information as well as further necessary deliberation.*

**2.14 Issue of Trial run certificate for Teesta III -Kishanganj OPGW link: ERLDC**

Request from POWERGRID has been received for issue of Trial run certificate with effect from 29.02.2024 however integration of data and voice are still pending on new commissioned link. For issuance of Trial run certificate “Date of commercial operation in relation to a communication system or an element thereof shall mean the date declared by the transmission licensee from 0000 hours of which a communication system or element thereof shall be put into service after completion of the site acceptance test including transfer of voice and data to the respective control centres as certified by the respective Regional Load Despatch Centre” - as per IEGC 2023 Clause 27 (ii - d) under Communication System.

ERLDC may update. Members may discuss.

**Deliberation in the meeting**

*ERLDC representative submitted :*

*As mandated in IEGC 2023, Completion of the site acceptance test of communication system or element including transfer of voice and data to the respective control centres as certified by the respective Regional Load Despatch Centre is essential for issuance of Trial run certificate.*

*Powergrid ER-II representative informed:*

- *Teesta-III HEP ,being currently out of service owing to natural disaster, integration of voice transfer and data to control centre is not feasible as of now since RTU is stationed in Teesta-III plant premises.*
- *Live status of SDH equipment at Teesta-III, Rangpo and Kishanganj is available in UNMS that can be verified by ERLDC.*

**TeST decision:**

- *TeST committee referred the issue to TCC forum of ERPC for seeking revised approval of executed length of Teesta III -Kishanganj OPGW link.*
- *TeST committee was of the view that outage of Teesta-III HEP being attributed to natural calamity, regulations of trial run certificate can't be enforced similar to an usual case but at the same time the extant regulations need to be complied to the best possible extent.*
- *In this regard , TeST committee opined that Powergrid ER-II should submit a formal undertaking to ERLDC regarding transfer of voice and data to ERLDC via Teesta III - Kishanganj OPGW link as soon as Teesta-III HEP is reinstated to service. Once*

TCC/ERPC forum grants revised approval for executed length of Teesta III – Kishanganj link, Trial operation certificate for the same shall be issued by ERLDC based on the previously submitted undertaking by Powergrid ER-II.

Both Powergrid ER-II and ERLDC agreed to the same.

#### **2.15 Approval for BoQ of Equipment (FOTE, APS, FODP etc.) for new upcoming OPGW links under different approved schemes for smooth issue of Trial run certificate and utilization of redundancy of system optimally: ERLDC**

ERLDC may update. Members may discuss.

##### **Deliberation in the meeting**

ERLDC representative submitted :

- After installation of any OPGW link, issuance of Trial run certificate for OPGW link along with terminal equipment is requested by constituents to ERLDC while approval is taken in ERPC forum only for the individual OPGW links.
- In this regard, to facilitate smooth issuance of TOC by ERLDC, either approval of OPGW links as well as associated terminal equipment should be accorded in ERPC forum or approved BoQ with details of terminal equipment should be furnished by the constituents while applying for trial run certificate.

##### **TeST decision:**

Due to lack of consensus on obtaining approval of respective OPGW links along with Terminal equipment (FOTE, FODP, etc), the issue was referred to next TeST meeting.

#### **2.16 Integration of tie FO links between SLDC to SLDC to improve the redundancy in the system: ERLDC**

The said issue was discussed in the last few meetings, however confirmation from concerned SLDCs is awaited.

Presentation had been given in the last meeting held in May 2023 along with list of Tie line links. (List of Tie Line links has been attached in **Annexure – B.2.16**).

ERLDC may update. Members may discuss.

##### **Deliberation in the meeting**

##### **TeST decision:**

TeST committee advised concerned SLDCs to confirm status of integration for 10 no.s tie FO links from SLDC to SLDC as attached at **Annexure – B.2.16**. Concerned SLDCs were also urged to submit any views/comments regarding the same to ERLDC and ERPC at the earliest.

#### **2.17 ROW Issues related to OPGW Installation in 132kV Rangpo - Chuzachen line: Powergrid ER-II**

Power Grid had been entrusted with establishing Fiber Optic network (OPGW) over 132 kV Rangpo - Chuzachen TL of EPDS, Sikkim under Eastern Region Fibre Optic Expansion Project (Additional Requirement) for smooth communication of Chuzachen HEP power generating station to Regional Load Dispatch Centre (ERLDC) at Kolkata. The ownership of said transmission line belongs to Energy & Power Dept., Govt of Sikkim. After completing 19.327



km OPGW installation, work was again stopped in Padamchay village due to public complaint over induction problem faced between tower no. 35 and 36 of 132 kV Rangpo-Chuzachen TL due to very ground low clearance issue. Matter was taken up in 49th ERPC meeting where in Energy & Power Department, Govt. Of Sikkim was requested to resolve the issue. Further, POWERGRID had also requested intervention by Senior authority of Energy & Power Department, Govt. Of Sikkim vide letter dated 27th June 2023 to urgently resolve the issue. Matter was again highlighted in 51st TCC Meeting, wherein TCC advised ERPC secretariat to take up with Sikkim separately. However, resolution of RoW is pending till date. Since project is heavily delayed and delay reasons are not attributable to POWERGRID, forum may guide regarding short closure and modalities of recovery of investment made by POWERGRID in the mentioned link till date.

Powergrid ER-II may update. Members may discuss.

### **Deliberation in the meeting**

*Powergrid ER-II representative apprised:*

- *Till date 20.5 km out of 22 km of the said OPGW link has already been completed.*
- *Presently OPGW works on the said line is stalled owing to persistent ROW issues.*
- *Despite best efforts, the ROW issues could not be sorted out by Powergrid.*
- *Since ownership of the 132 kV Rangpo - Chuzachen line lies with Sikkim, intervention of Energy & Power Dept., Govt of Sikkim is imperative to devise any feasible resolution.*

### ***TeST decision:***

- *TeST committee suggested issuance of a formal communication to Govt of Sikkim on behalf of ERPC seeking expeditious resolution of persistent ROW issues.*
- *TeST committee thereby referred the issue to upcoming TCC/ERPC meeting for further deliberation.*

## **2.18 Deletion of Begusarai-Kusheshwarsthan OPGW link under 'Establishment of Communication System under Expansion/ Up-gradation of SCADA/EMS System at SLDCs in Eastern Region (BSTPCL): Powergrid ER-I**

POWERGRID has successfully implemented the OPGW laying work alongwith communication equipments under the project 'Establishment of Communication System under Expansion/ Up-gradation of SCADA/EMS System at SLDCs in Eastern Region (BSTPCL)'. All the links were commissioned successfully except only 1 no. link Begusarai-Kusheshwarsthan link that could not be completed due to severe ROW issues which was to be resolved by BSPTCL. Out of total 65.923 Km, around 4.6 Km OPGW was laid and the balance scope of 60 Km was requested to be short-closed/deleted from this contract.

The matter was discussed several times including 3rd TEST meeting held at ERPC, Kolkata on 20.12.2019 and BSPTCL agreed for deletion of the balance scope of works of this link. The request for deletion of this link was further communicated to BSPTCL several times through letter ER-I/PAT/ULDC/F-19/ dated 23.01.2023, ER-I/PAT/ULDC/F-19/1973 dated 14.09.2022 and ER-I/PT/ULDC/BSPTCL/PKG-2B/723 dated 06.07.2020(**Annexure B.2.18**) However, BSPTCL intimated that the line was not in service as major portion of the line was not available

due to tower collapse in flood. Copy of correspondence and relevant pages of minutes of 3rd TEST Meeting are enclosed for reference(**Annexure B.2.18**)

**Considering the above and completion of contract closing activities, it is requested for deletion of Begusarai-Kusheshwarsthan OPGW link from the scope of the subject project.**

Powergrid ER-I may update. Members may discuss.

**Deliberation in the meeting**

*Powergrid ER-I summarized the inconvenience for non-completion of Begusarai-Kusheshwarsthan OPGW link owing to persistent ROW issues.*

*BSPTCL apprised:*

- *Some portions of the said line(Begusarai-Kusheshwarsthan) have been re-routed owing to severe ROW issues.*
- *Around 15-16 towers supporting the line had collapsed during flood in 2019.*
- *Award for pending works of restoration of the line shall be placed within a month.*

***TeST decision:***

- *Considering long pending ROW issues and consequent inordinate delay in project execution, TeST committee consented to the proposal of deletion of Begusarai-Kusheshwarsthan OPGW link from scope of “Establishment of Communication System under Expansion/ Up-gradation of SCADA/EMS System at SLDCs in Eastern Region”*
- *BSPTCL was advised to carry out OPGW laying works in remaining portions of the line after construction of new towers.BSPTCL agreed for the same.*
- *The issue was also referred to upcoming TCC/ERPC meeting for information.*

**2.19 Requirement of Shutdown and Data Outage for RTU replacement/SAS Upgradation Package for Eastern Region under Upgradation of SCADA/RTUs/SAS in Central Sector Stations and strengthening of OPGW network in Eastern Region: Powergrid ER-II**

The installation & Commissioning work under RTU Replacement/SAS Upgradation Package for Eastern Region currently underway as various sites. Data outage & Shutdown of feeders during integration works is expected as detailed below.

<b>RTU Data Outage:</b>	
i) RTU Locations where replacement of old RTU is to be done with new RTU	

<ul style="list-style-type: none"> <li>a) Binaguri</li> <li>b) Maithon</li> <li>c) Subhasgram</li> <li>d) Gangtok</li> </ul>	<p>RTUs shall be replaced in phased manner. Binaguri &amp; Gangtok are targeted to be replaced within May 2024. Since these RTUs have already reached end of life, replacement of these RTUs is required on priority for which timely shutdown is crucial for wiring and adaptation works. Recently, Shutdown of 400KV-BINAGURI-NEW PURNEA-2 TL had been disallowed on 15.04.2024 (08:00 hrs to 18:00 hrs), and such denial of shutdown may lead to delay in replacement of RTUs.</p>
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Powergrid ER-II may update. Members may discuss.

### **Deliberation in the meeting**

*Powergrid ER-II informed:*

- *Denial of OCC approved shutdown of 400KV-BINAGURI-NEW PURNEA-2 by ERLDC in real time (on 15.04.2024) has led to deferment of RTU replacement works.*
- *400KV-BINAGURI-NEW PURNEA-2 along with few feeders at Gangtok shall be availed for planned shutdown in May 2024.*

**TeST decision:**

- *TeST committee advised Powergrid ER-II to resubmit such shutdown(s) sought for RTU replacement that have been denied in real time, to monthly transmission outage coordination meeting for ERPC for necessary approval.*
- *TeST committee also affirmed to give due importance to shutdowns sought for RTU replacement and henceforth requested shutdowns for RTU replacement shall be approved as far as possible based on real time grid conditions. ERLDC was also advised for the needful to the best feasible extent in this regard.*

### **2.20 Status of procurement of new DCPS for ULDC equipment housed at ERLDC - Powergrid ER-II**

In 13th TeST meeting, ERLDC had asked POWERGRID to upgrade the 48V DCPS with Battery Bank for ULDC equipment at ERLDC since the current DCPS & battery bank were very old (installed nearly 17 years back, during ULDC Phase-I) and couldn't cater to the present load at ERLDC in 1+1 mode. TeST committed had advised POWERGRID to expedite the procurement process. Accordingly, POWERGRID had procured new 48V DCPS and Battery Bank of enhanced capacity in 1+1 mode in order to cater to existing and future load and successfully commissioned the same on 26.11.2023 under the Project: Upgradation of SCADA/RTUs/SAS in Central Sector stations and Strengthening of OPGW network in Eastern Region.

Powergrid ER-II may update. Members may discuss.

### **Deliberation in the meeting**

*Powergrid ER-II representative updated the procurement of 2 battery banks of enhanced capacity along with 2 DCPS (48V) as ULDC equipment at ERLDC .*

**TeST decision:**

*TeST committee noted and acknowledged the same.*

**2.21 Redundant Auxiliary Power Supply System at Kasba Node- Powergrid ER-II**

At present, all Nodes of POWERGRID are having redundant power supply, either from ULDC DCPS or from Substation Charger. However, at Kasba Node which is critical for data reporting of all Central Sector and State sector stations at ERLDC, there was only single power supply from ULDC DCPS. Therefore, it would be beneficial to all stakeholders if a redundant power supply is made available at Kasba Node. The requirement of same was highlighted in 4th ISTS Communication Planning meeting for Eastern Region held on 27.07.2023 (virtual mode) and Grid India (ERLDC) agreed for same. At present, POWERGRID is implementing the project: Strengthening of OPGW network in Eastern Region. Therefore, considering prudence, 01 no. 48V DCPS with BB at Kasba was included within scope of above project for better redundancy of power supply for communication equipment.

Powergrid ER-II may update. Members may discuss.

**Deliberation in the meeting**

*Powergrid ER-II representative submitted that the need of redundant power supply at Kasba node was highlighted at 4th ISTS Communication Planning meeting for Eastern Region wherein it was consented to by all including ERLDC.*

**TeST decision:**

*Considering criticality of Kasba node i.r.o vital data reporting by Central as well as state sector stations to ERLDC, TeST committee technically acceded to the provision of auxiliary power supply made at Kasba by Powergrid ER-II .*

**2.22 UFR integration in SCADA: ERLDC**

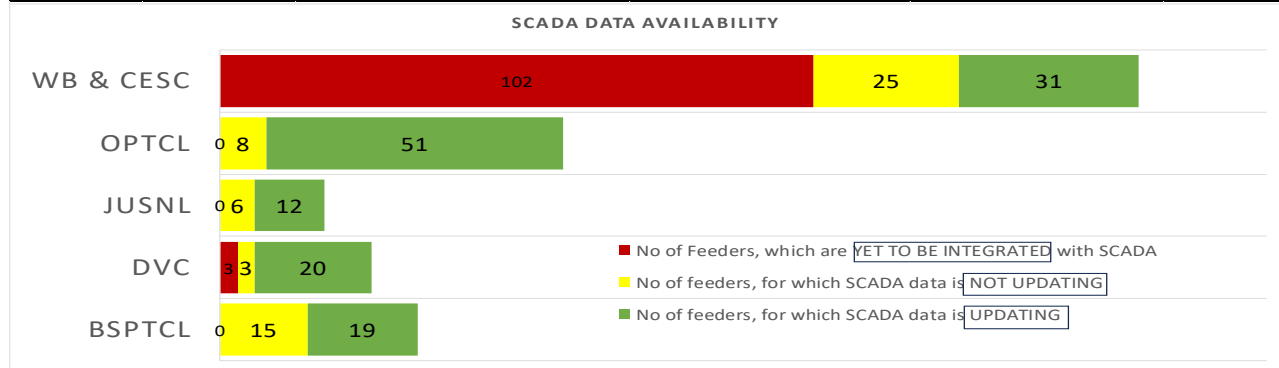
UFR Scheme & Segregation in various stages as per RPC Planning and associated Telemetry reporting status in Constituents SCADA/EMS system may be updated.

As Per IEGC , 2023, Clause 13.d

*“ SLDC shall ensure that telemetered data of feeders (MW power flow in real time and circuit breaker status) on which UFR and df/dt relays are installed is available at its control centre. SLDC shall monitor the combined load in MW of these feeders at all times. SLDC shall share the above data with the respective RLDC in real time and submit a monthly exception report to the respective RPC.”*

## SCADA data availability (Constituent wise) for UFR dated 18/04/2024

	Total No of Feeders	No of Feeders, which are <b>YET TO BE INTEGRATED</b> with SCADA	No of feeders, for which SCADA data is <b>NOT UPDATING</b>	No of feeders, for which SCADA data is <b>UPDATING</b>	Percentage Availability
BSPTCL	34	0	15	19	56%
DVC	26	3	3	20	77%
JUSNL	18	0	6	12	67%
OPTCL	59	0	8	51	86%
WB & CESC	158	102	25	31	20%
<b>Total ER</b>	<b>295</b>	<b>105</b>	<b>57</b>	<b>133</b>	<b>45%</b>



All concerned Constituents may update. Members may deliberate.

### Deliberation in the meeting

*ERLDC representative apprised:*

- UFR, being the last resort to combat rapid roll-off in grid frequency, uninterrupted reporting of UFR data is essential for vigil monitoring of UFR settings for respective utilities amid crunch demand period.
- West Bengal SLDC has the lowest availability of SCADA data for UFR followed by BSPTCL and JUSNL. OPTCL has the highest availability of SCADA data for UFR.

### **TeST decision:**

- SLDCs having lower availability of telemetered data (especially West Bengal SLDC) were advised to integrate the pending UFR feeders with SCADA in coordination with concerned DISCOMs at the earliest.
- TeST committee underscored the significance of UFR data reporting, particularly in ongoing crunch demand period, to ensure healthiness of UFR in any grid frequency roll-off event.
- All SLDCs were advised to keep display of UFR feeder data available at their end to ensure smooth monitoring and reliable telemetry as mandated in IEGC 2023.

### **2.23 Major outage i.r.o Telemetry data reporting: ERLDC**

In September 2023, there was outage of majority Telemetry data reporting at ERLDC including RTU / PMU / VOIP/ AMR & ICCP Links along with other communication at ERLDC Control Room. Incident was intimated to POWERGRID and affected partial system was restored progressively after 02 days (07.09.2023 To 09.09.23). It is bringing notice that that a similar type of incident also happened in February 2020, at that time restoration of Data & Voice took nearly 7 to 8 days.

After Preliminary investigation by vendors during restoration, it was found that Such incidents are happening mainly due to Layer-2 Traffic (Malicious Traffic/Virus/Hardware malfunction) is connected to communication system of ULDC, thereby communication system was crashed due to which unable to handle legitimate data and voice hence data was stopped reporting at ERLDC. The system was restored only after restarting all the equipment of the communication system.

In view of above ERLDC recommends for the following:  
(This may be implemented at earliest):

S. No.	Details of MAC/IP address required for	Details to be provided by	Repository of Details of MAC/IP address to be maintained by	Remarks
1	RTU/PMU/VOIP/AMR/any other equipment's connected to communication system.	POWERGRID / SLDC / IPP / ISGS	ERLDC / ERPC	Details are to be provided as per the approved format for the communication system audit report along with MAC/IP details of end user equipment. (Format is enclosed at <b>Annexure – B.2.23</b> in line with previous recommendations).

This may be implemented in due course of time:

S. No.	Proposed to act for	Technical feasibility and implementation of same	Action to be taken by	Concurrence to be given by
1	Implementation of Network segmentation by using layer 3 cards/devices at SLDC's, RLDC's to segregate various services/system of RTU/PMU/ VOIP /AMR etc. at SLDC and ERLDC to avoid cascading effect.	AMC vendor of communication system of ER.	POWERGRID	SLDC/ RLDC/ RPC

ERLDC may update. Members may deliberate.

### **Deliberation in the meeting**

*ERLDC, outlining the backdrop and consequences of major telemetry outage in September 2023, underscored the following:*

- *Data reporting in SCADA was adversely affected in this major outage but not the entire SCADA system.*
- *During such major outage in data reporting, it is experienced that immediate restoration goes beyond the scope of OEM, thus proper SOP and restoration plan in event of such outage needs to exist.*
- *It is observed that Layer-2 data traffic is more prone to encountering such major outage while on using Layer-3 devices may prevent against further propagation of malicious traffic or network malfunction.*
- *ISTS communication network was originally planned and designed for circuit switching while extant practice of packet switching (i.e Layer-2) is resulting in a cascade effect on overall communication network in occurrence of such major telemetry outage.*
- *Network segmentation was proposed so that the problem should be locally restricted.*

*CTU stated:*

*As separate channels exist for VOIP and no data mixing in SDH, the root cause for such major outage appears to persist before data reaches SDH.*

*WBSETCL apprised:*

*Backtracking from MAC address has revealed that broadcasting has occurred from CISCO switch.*

*M/S Commtel proposed:*

*AMR data may first report to concerned SLDCs and then via Layer -3 device may report to ERLDC, thus AMR can be segregated from other services mitigating the cascade impact of a major telemetry outage.*

*Powergrid ER-II submitted :*

*Consent of concerned vendor i.e M/S TCS is necessary before finalizing the proposal of AMR segregation from other services.*

**TeST decision:**

*TeST committee suggested following solutions:*

1. *All SLDCs need to furnish MAC addresses of the end user equipment to ERLDC.*
2. Short term : *Layer-3 switches may be deployed for network segmentation and segregation of AMR data, as suggested by M/S Commtel.*  
Long term: *CTU was advised to carry out comprehensive study and suggest a robust solution to save the ER communication network from major telemetry outage.*

**2.24 Telemetry outage of Farakka STPS: ERLDC**

Telemetry issues associated to Farakka STPS ( i. e unavailability of data of 65 nos. of digital and 40 nos. of Analog data) is long pending (details attached as **Annexure-B.2.24**). The matter was taken up in the 197th OCC Meeting, NTPC representative submitted that offer from M/s GE has been received. As intimated by NTPC, the contract was under awarding stage and the work was expected to be completed within soon.

NTPC may update.Members may deliberate.

### **Deliberation in the meeting**

*NTPC representative was not present in the meeting. So TeST committee could not be updated of tentative restoration of telemetry data availability from NTPC Farakka STPS.*

#### **TeST decision:**

*TeST Committee advised NTPC for intimating ERPC and ERLDC at earliest of the action plan for resolution of long pending telemetry outage i.r.o Farakka STPS.*

### **2.25 Integration of AMR data on PLCC for which Fibre connectivity is not available: ERLDC**

AMR data of a few locations in Eastern region are not integrated on OPGW Link. The said issue was discussed in the last 5th communication planning meeting of Eastern region for exploration of integration of said AMR data on PLCC links where OPGW Link is not available. In the said meeting POWERGRID GN&C, CC Team intimated that AMR data is under control of regional AM dept, hence said issue may be discussed in Test Meeting along with ULDC & AM dept POWERGRID.

Hence it is proposed to carry out testing and study of feasibility of integration of AMR data on PLCC on Pilot basis by the team ERPC, ERLDC and POWERGRID.

#### **List of such stations is enclosed at Annexure-B.2.25**

ERLDC may update. Members may deliberate.

### **Deliberation in the meeting**

*GRIDCO representative affirmed of completion of pending OPGW works in next 6 months.*

*Jharkhand representative affirmed:*

*For locations like Garhwa, Deogarh and others (as per **Annexure-B.2.25**): OPGW connectivity to be completed within 6-8 months. Works Contract has already been awarded and presently site survey is under progress.*

*Representatives from Sikkim, NTPC and IPPs were not present in the meeting.*

#### **TeST decision:**

- *TeST committee advised JUSNL and GRIDCO to expedite completion of pending OPGW works for smooth integration of AMR data.*
- *Sikkim, NTPC and concerned IPPs (as per **Annexure-B.2.25**) were also advised to ensure integration of AMR data.*
- *TeST Committee advised Powergrid to carry out feasibility study on Pilot basis for integration of AMR data on PLCC at any suitable location. Powergrid disagreed to the same as the stations don't belong to Powergrid. Thereafter TeST Committee ruled out this possibility.*

### **2.26 Non - reporting of RTU / SAS data to MCC ERLDC or BCC ERLDC: ERLDC**

Some of RTU / SAS data are reporting only to MCC ERLDC or BCC ERLDC (List is enclosed at **Annexure-B.2.26**) mainly due to issues in the Local station LAN as learned from various communication over phone.



Due to which whenever Back up/Main link is down the entire said data is not available at ERLDC. Hence the concerned may investigate said issue to restore the same at the earliest please. (List of Non - reporting of RTU / SAS data to MCC ERLDC or BCC ERLDC is attached in **Annexure –B.2.26** separately).

ERLDC may update. Members may deliberate.

### **Deliberation in the meeting**

*Powergrid ER-II updated:*

*Link availability at Malda station has now been restored. Main link was down at Malda station owing to SAS upgradation works.*

*Link status at Bahrapur and Rajarhat stations shall be checked and restored at earliest.*

*Powergrid ER-I affirmed of early restoration of data availability from Chandauti, Sahasra and Chaibasa stations to ERLDC.*

*NTPC representative was not present in the meeting.*

### **TeST decision:**

- *Powergrid along with other concerned constituents were advised for early restoration to ensure availability of RTU/SAS main as well as standby links.(as per **Annexure – B.2.26**)*
- *TeST committee advised ERLDC to issue formal communication to NTPC in this regard with copy to ERPC.*

## **2.27 Agenda by DVC**

### **2.27.1 Upgradation Plan for Hot Line Communication (ORANGE EPABX)**

#### **Deliberation in the meeting**

- *TeST committee apprised DVC that CTU is planning for a new EPABX system that is supposed to replace the existing system in next 2 years.*
- *TeST committee also suggested DVC for attending special meeting to be convened by CTU tentatively on 02.05.2024 to be updated of the scope, structure and modalities of newly planned VOIP exchange.*

### **2.27.2 Reconciliation of materials, with M/s. Chemtrols, during SCADA AMC period for closing the AMC Contract.**

#### **Deliberation in the meeting**

*DVC apprised:*

- *Closure of SCADA AMC is getting delayed owing to pending reconciliation of materials by M/s. Chemtrols.*
- *Around 6 faulty SMPS which had been taken for repair along with some workstation SMPS of DVC which were with M/S Chemtrols for space constraints at DVC end, need to be returned to proceed for closure of AMC.*

*M/S Chemtrols submitted :*

*As per terms and conditions of contract, spares for RTU nodes of DVC belong to M/S Chemtrols.*

**TeST decision:**

*TeST Committee advised M/S Chemtrols to sort out the bilateral issue of reconciliation of materials with DVC by end of May 2024 for expediting closure of AMC.*

**2.27.3 Laying of OPGW in DVC Sector**

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

Upon approval in the 47th ERPC meeting held on 25.11.2022 and subsequent consent letter of DVC dated 5.1.2023, PGCIL was assigned for laying of OPGW in above-mentioned lines. Due to delay in finalisation of Contract by PGCIL and subsequent approval from CEA for Renovation & Augmentation of DVC's T&D System, DVC decided to lay OPGW on above-mentioned lines by itself. DVC had withdrawn its consent from PGCIL through letter dated 04.03.2024.

This may please be approved by TeST Committee.

DVC may update. Members may discuss.

**Deliberation in the meeting**

**TeST decision:**

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

**2.28 Replacement of UPS and Battery Bank: JUSNL**

Two nos. of UPS of 40 kVA installed under the SCADA/ EMS project is in non-working condition since 01 (one) year.

However, M/s Chemtrols has, installed one 60kVA UPS with SMF Battery Bank (12V/65AH, Qty. 40 Nos.) on rent basis. Through their e-mail dated 28.01.2022, M/s Chemtrols assured that the system shall provide minimum 04 hrs backup. But, the performance is not satisfactory as it provides back up for hardly 1.5 hrs only even after replacement of almost all the cells of the battery bank.

Furthermore, if this UPS gets breakdown, SCADA/ EMS system will become idle. So, redundancy for UPS may be ensured.

JUSNL may update. Members may deliberate.

### **Deliberation in the meeting**

*JUSNL representative submitted:*

- *Issue of non-functional UPS installed under SCDA/EMS project was explained.*
- *Further the existing battery bank is capable of providing backup of only 1.5 hrs despite after replacement of all constituent cells.*

*M/S Chemtrols informed:*

- *Battery bank was replaced by them during the contract period. Now it is no more in the scope of contract.*
- *For availing 6 hours backup, new battery bank needs to be purchased by JUSNL.*

### ***TeST decision:***

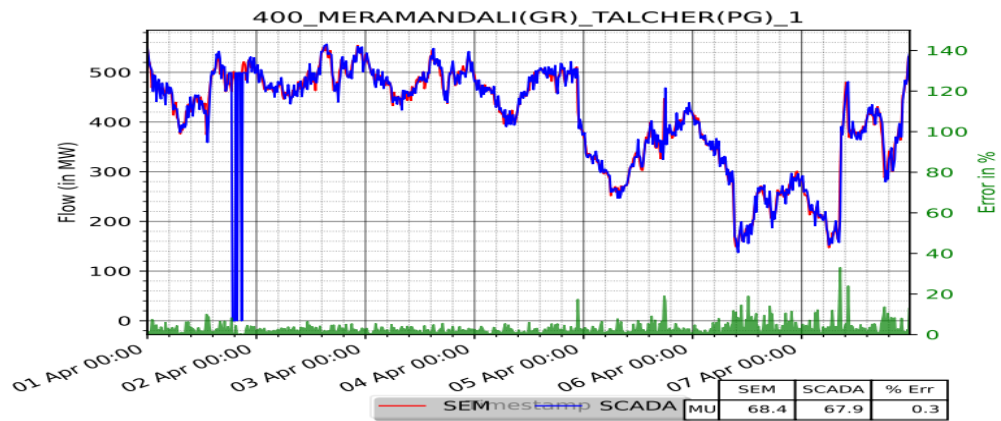
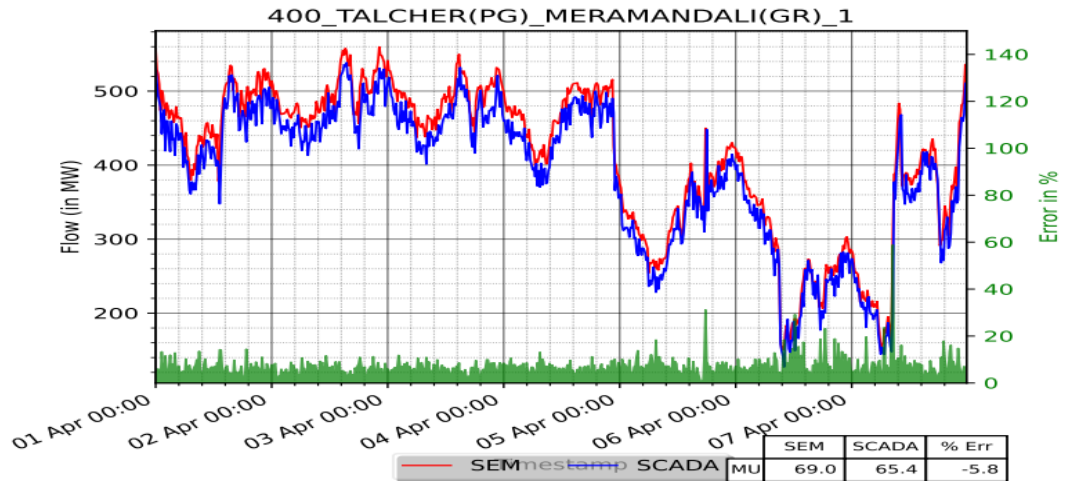
*Considering the criticality of power supply for uninterrupted service of SCDA/EMS system, TeST Committee advised M/S Chemtrols to ensure supply of spare UPS to JUSNL latest by July 2024.*

### **2.29 Deviation in SCADA Vs SEM data: ERLDC**

ERLDC publishes deviation in tie-lines data of SCADA system while comparing with SEM meter data every week.

Below mentioned feeder is having erroneous SCADA data at NTPC end while comparing with SEM for a long duration till date.

## **400 TALCHER(PG) MERAMANDALI(GR) 1**



Plot: SEM vs SCADA data comparison at Odisha end

NTPC and ERLDC may update. Members may deliberate.

**Deliberation in the meeting**

ERLDC displayed the mismatch between SCADA vs SEM data along with its daywise variation taking instance of 400 kV Talcher-Meramandali line.

It was apprised that the mismatch between SCADA and SEM often shoots upto 8-10 %.

NTPC representative was not present in the meeting.

**TeST decision:**

Considering the significant commercial implications of SCADA vs SEM mismatch, all SLDCs and GENCOs were advised to closely monitor the deviation in SCADA and SEM meter readings at their end. In case of large deviation the same may be put up in TeST/OCC forum for feasible solution.

### 2.30 Non availability of SCADA in Eastern region: ERLDC

SCADA/EMS system has been installed at SLDC and RLDC and real time operator are performing grid management activity based on real time data available with this SCADA system. But, it is observed that several important stations under SLDC jurisdiction in Eastern Region are not reporting to respective SLDCs (as shown in table below) and hence ERLDC is also not getting data through ICCP.

AOR	No of SS/GS without data Telemetry
BSPTCL	06
JUSNL	09
OPTCL	06
WBSETCL	03
DVC	00
SIKKIM	00

Table: Area wise no of station without data telemetry as on 18-04-2024.

Details of stations, which are not reporting or yet to be integrated at SLDC is shown below:

#### **Non availability of Telemetry of Bihar**

SL No.	BSPTCL	Last Reported
1	KISHANGANJ_NEW_220	25-08-2023
2	SAMASTIPUR_NEW_220	13-09-2023
3	SONENAGAR_NEW_220	27-01-2024
4	KBUNL_STG1_220	31-03-2023
5	MOKAMA_BGCL_220	INTEGRATION ISSUE
6	JAMALPUR_BGCL_220	30-03-2024

Team ERLDC Visited SLDC Patna ,on 12.03.24 & 13.03.24 to carry our discussions on various points such as unavailability of data telemetry, UFR integration status , Cyber Security aspects in OT network etc.

During the visit it was learnt that the Telemetry issues are being taken up by the SLDC Team and it will be resolved soon.

#### **Non availability Telemetry of Jharkhand**

SL No.	JUSNL	Last Reported
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1	PATRATU_220	16-12-2023
2	BURMU_220	INTEGRATION ISSUE
3	CHATRA_220	11-01-2024
4	GIRIDIH_220	INTEGRATION ISSUE
5	GODDA_220	11-01-2023
6	JASIDIH_220	08-02-2024
7	GARHWA_220	25-06-2023
8	SMARTCITY	27-02-2023

***Non availability telemetry of Odisha***

SL No.	OPTCL	Last Reported
1	NALCO_220	21-04-2023
2	ROHIT_220	28-03-2022
3	LAPANGA_400/220	HIGHLY INTERMITENT
4	EMAMI_220	07-09-2023
5	TATA_GR_220	16-03-2019
6	TELCO_220	INTEGRATION ISSUE

***Non availability telemetry of West Bengal***

SL No.	WBSETCL	Last Reported
1	TLDP4_220	28-08-2023
2	DHARAMPUR_220	28-08-2023
3	BARUIPUR_220	28-08-2023

Team ERLDC Visited SLDC , Howrah, on 08.04.24 to carry our discussions on various points such as unavailability of data telemetry, UFR integration status , Cyber Security aspects in OT network etc.

It was learnt that the Real Time telemetry of TLDP4,Dharampur & Baruipur was stopped reporting to SLDC, Howrah due to identified issues at the site end and SCADA Team at SLDC was taking up the matter.

BSPTCL,JUSNL, OPTCL, WBSETCL may update. Members may deliberate.

### Deliberation in the meeting

BSPTCL representative submitted :

SL No.	BSPTCL	Last Reported	STATUS/TENTATIVE RESTORATION
1	KISHANGANJ_NEW_220	25-08-2023	To be restored within 15 days
2	SAMASTIPUR_NEW_220	13-09-2023	To be restored within 15 days
3	SONENAGAR_NEW_220	27-01-2024	Hardware and software issues. Replacement works under progress.
4	KBUNL_STG1_220	31-03-2023	KBUNL_STG1 has been decommissioned, so no need of data reporting
5	MOKAMA_BGCL_220	INTEGRATION ISSUE	Issue resolved and data reporting to ERLDC
6	JAMALPUR_BGCL_220	30-03-2024	Data already reporting to SLDC Bihar and shall be reporting to ERLDC very shortly.

OPTCL submitted :

SL No.	OPTCL	Last Reported	STATUS/TENTATIVE RESTORATION
1	NALCO_220	21-04-2023	To be restored within 1-2 months
2	ROHIT_220	28-03-2022	To be restored within 6 months
3	LAPANGA_400/220	HIGHLY INTERMITENT	SAS gateway issue.No RTU present.Gateways to be upgraded under STAMS project.
4	EMAMI_220	07-09-2023	Letter issued by SLDC Odisha to EMAMI for data integration.
5	TATA_GR_220	16-03-2019	No OPGW connectivity . Letter has been issued by OPTCL to TATA for data integration via

			<i>fibre. Meanwhile data reporting via GPRS is explored.</i>
6	TELCO_220	INTEGRATION ISSUE	<i>SAS gateway issue. Gateways to be upgraded under STAMS project.</i>

*JUSNL informed:*

<b>SL No.</b>	<b>JUSNL</b>	<b>Last Reported</b>	<b>STATUS/TENTATIVE RESTORATION</b>
1	PATRATU_220	16-12-2023	<i>220 kV dismantled and converted to 400 kV site. Data is now reporting from 400 kV location</i>
2	BURMU_220	INTEGRATION ISSUE	<i>End equipment problem.</i>
3	CHATRA_220	11-01-2024	<i>OPGW connectivity to be completed in 6 months</i>
4	GIRIDIH_220	INTEGRATION ISSUE	<i>End equipment problem.</i>
5	GODDA_220	11-01-2023	<i>SAS issue.</i>
6	JASIDIH_220	08-02-2024	<i>OPGW connectivity to be completed in 6 months</i>
7	GARHWA_220	25-06-2023	<i>OPGW connectivity to be completed in 6 months</i>
8	SMARTCITY	27-02-2023	<i>Not yet handed over to JUSNL by Govt of Jharkhand, so connectivity could not be ensured yet.</i>



WBSETCL apprised:

SL No.	WBSETCL	Last Reported	STATUS/TENTATIVE RESTORATION
1	TLDP4_220	28-08-2023	RTU issue. Letter has been issued to the concerned by WB SLDC seeking early resolution.
2	DHARAMPUR_220	28-08-2023	Data is now reporting.
3	BARUIPUR_220	28-08-2023	SAS issue, which shall be resolved in 6 months.

**TeST decision:**

- All concerned SLDCs and STUs were advised to resolve the persistent issues at their respective locations at the earliest to ensure uninterrupted availability of SCADA data.
- ERLDC was advised for close monitoring on telemetry data availability from above mentioned locations of intra-state communication network.

**2.31 Replacement / Up-gradation of old RTUs in Eastern Region: ERLDC**

The report on “Replacement/up-gradation of old RTUs in Eastern Region” for Real Time data transfer to ERLDC Main and Back-up Control Center over IEC104 protocol was approved by ERPC in 36th ERPC meeting held at Bhubaneswar on 14th September 2017.

The contract for replacement/up-gradation of old RTUs in Eastern Region is awarded subsequently by POWERGRID on 31st December 2020.

POWERGRID agreed to replace the old RTUs on priority basis as per the list submitted by ERLDC

The Old S-900 RTUs mentioned in the priority list (like Jamshedpur, Bihar Shariff, Muzaffarpur etc.) have not been replaced yet.

The Real time Grid Operation at ERLDC is getting adversely affected on account of frequent failure of SCADA data from above mentioned old S-900 RTUs which were installed in the ULDC Phase-I (2005) and have completed their life span. Apart from that many a times, it has been observed that the poor maintenance of these old RTUs is affecting the availability of Telemetry.

RTU/SAS Upgradation/Replacement Status attached in **Annexure-B.2.31**

ERLDC and POWERGRID may update. Members may deliberate.

**Deliberation in the meeting**

**TeST decision:**

TeST committee advised Powergrid to expedite replacement of all old RTUs at the locations as per **Annexure-B.2.31**. The replacement of RTUs, already having completed their useful life, must be taken up on priority to ensure reliable and uninterrupted availability of SCADA data at ERLDC thereby aiding in smooth real time grid operation.

### 2.32 SCADA/EMS upgradation package: ERLDC

Upgradation of SCADA/EMS System under ULDC Phase III is being taken up by POWERGRID. As reported, NIT for the same has been floated July 2023. Stage - I discussion with System Integrators already completed and revised technical Specifications already approved by POWERGRID authority. Financial bid submission for the work is under process. Placement of award is expected by May 2024.

Considering the gravity of the AMC extension of the SCADA/EMS package POWERGRID may update the status.

ERLDC and POWERGRID may update. Members may deliberate.

#### **Deliberation in the meeting**

*Powergrid ER-II representative apprised:*

- *Technical evaluation of the tender for “Upgradation of SCADA/EMS System under ULDC Phase III” has been completed.*
- *Financial bid shall be opened on 08.05.2024.*
- *Owing to prevailing Model Code of Conduct (MCC) for General Election 2024, award of contract shall be done once the General election 2024 is concluded.*

#### **TeST decision:**

- *TeST committee advised Powergrid for adhering to the submitted timelines and to expedite other post-financial bid opening formalities of tender processing so that the LOA for SCADA/EMS upgradation can be placed immediately after conclusion of General election 2024.*
- *ERLDC was advised to closely monitor the upgradation of SCADA/EMS system.*

### 2.33 SCADA OS upgradation: ERLDC

As per recommendation by Ministry of Power on 20th April 2022 and as per clause no 3 g (ii) of the Minutes of Meeting dated 09th May 2022 (enclosed as Annexure-III) “Legacy OT System should be upgraded by July 2022 Accordingly, ERLDC has upgraded its OS in SCADA desktops to Windows 10 Pro in 2022.

All the SLDCs are requested to upgrade the OS in their SCADA systems to the latest version.

ERLDC may explain. Members may update.

#### **Deliberation in the meeting**

#### **TeST decision:**

*TeST committee advised all SLDCs to upgrade the OS in their respective SCADA systems to latest version to ensure uninterrupted reporting of data.*

### 2.34 Improper Support from M/S OSI, OEM OF SCADA Application: ERLDC

ERLDC SCADA/EMS system was installed in Eastern Region and OSI Monarch application is being used as core SCADA/EMS applications. In ERLDC SCADA/EMS system, several functionalities of SCADA/EMS system like DTS, STLF etc are not functioning properly for which support is required from OEM i.e. OSI.

Further M/S Chemtrols to ensure availability of back to back support from OEM regarding SCADA/EMS System in Eastern Region.

ERLDC and M/S Chemtrols may update. Members may deliberate.

**Deliberation in the meeting**

*M/S Chemtrols assured to extend necessary support for SCADA/EMS system on behalf of M/S OSI.*

**2.35 SCADA Integration & Reporting Status of Transnational Tie Lines with Nepal: ERLDC**

SCADA data reporting in respect of 132 KV Kataiya-Duhabi Feeder ,132 KV Ramnagar-Valmikinagar Surajpura Feeder is not available at ERLDC .

ERLDC and BSPTCL may update. Members may deliberate.

**Deliberation in the meeting**

*BSPTCL representative apprised:*

*SCADA data reporting in respect of 132 KV Kataiya-Duhabi Feeder is hampered owing to RTU malfunctioning while there is issue with PLCC i.r.o 132 KV Ramnagar-Valmikinagar Surajpura Feeder.*

***TeST decision:***

*TeST committee advised BSPTCL to resolve the persistent issues at the earliest (within 15 days) to ensure reliable reporting of important Trans-national tie lines with Nepal in SCADA.*

**2.36 Availing PSDF for SCADA/EMS upgradation: Sikkim SLDC**

Sikkim shall avail 100% PSDF grant for the Unified SCADA/EMS Phase-III Up gradation as per the latest notification of providing 100% Assistance to NER including 6+1 AMC.

Relevant letter from NLDC attached at **Annexure B.2.36**

Sikkim SLDC may update. Members may deliberate.

**Deliberation in the meeting**

*Sikkim representative was not present in the meeting. So TeST committee deferred the agenda to be put up in subsequent TeST meetings.*

**2.37 Cyber security of communication system: ERLDC**

Cyber security of communication system along with end user equipment RTU, PMU, VOIP, AMR etc. needs to be complied with as per regulatory requirements. In the special meeting of communication system (held in May 23) said issue was intimated to all concerned constituents. Now concerned may update the status on said issue.

ERLDC may explain. Members may update.

**Deliberation in the meeting**

***TeST decision:***

- *TeST committee opined in favor of inclusion of communication system as an integral part of cybersecurity audits carried out by respective utilities.*

- *TeST committee advised all concerned constituents to ensure cybersecurity compliance of communication system along with end user equipment as per extant regulatory requirements and also to share the updated status regarding the same.*

### **2.38 Cyber Security Audit: JUSNL**

The compliance report of Cyber Security Audit conducted during March' 2023 has not been submitted to SCADA, SLDC till date. Requests for the same has been made to M/s Chemtrols. However, the compliance report is still awaited.

JUSNL may update. Members may deliberate.

#### **Deliberation in the meeting**

*JUSNL representative confirmed the recent submission of Cyber Security audit compliance report by M/S Chemtrols.*

### **2.39 SOC Implementation at SLDCs: ERLDC**

As per Information Technology (Information Security Practices and Procedures for Protected System) Rules, 2018, all constituents whose assets have been declared as CII/protected systems need to implement SOC.

Bihar has already floated tender for SOC Implementation. All other SLDCs are requested to expedite the process for SOC Implementation.

ERLDC may explain. Members may update.

#### **Deliberation in the meeting**

##### ***TeST decision:***

- *TeST committee advised all SLDCs to expedite implementation of SOC in line with Information Technology rules 2018.*
- *Update on SOC implementation may be periodically shared with ERLDC and ERPC by concerned SLDCs.*

\*\*\*\*\*

**Participants in 14th TeST Sub - Committee Meeting of ERPC**

**Annex A**

Venue: ERPC Conference Hall, Kolkata

Time: 10:30 Hrs.

Date: 24.04.2024 (Wednesday)

Sl. No.	Name	Designation	Organisation	Contact No.	E-mail Id	Signature
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6	Shw K. Gupta	Sr. DGM	CTUCL	7007496879	shrikumar@powergrid.in	
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11	RAJ PRATIM	Ch. Mgr.	ERLDC	990332959	rajpratim@grid-india.in	
12	Shri. Anil Kumar	3rd In-charge / Engineer	ERLDC	9007184589	Shashanjaiswal@grid-india.in	
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14	Agniva Chatterjee	Asst. Director	ERPC	8100301502	agniva cea@gov.in	
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22	Amit Raj	Electrical Executive Engineer	BSP TCL	9262656705	amitvr@gmail.com	

**Participants in 14th TeST Sub - Committee Meeting of ERPC**

Venue: ERPC Conference Hall, Kolkata

Time: 10:30 Hrs.

Date: 24.04.2024 (Wednesday)

Sl. No.	Name	Designation	Organisation	Contact No.	E-mail Id	Signature
23	B. MADHU	Add C.E Com <sup>r</sup>	WBSETCL	9434910078	howrahcom@gmail.com	
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## **Annexure B.2.1**

### **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: 19<sup>th</sup> January, 2024**

**In the matter of:**

Approval of “Guidelines on Availability of Communication System” 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 7.3 of the Communication Regulations requires NPC to prepare Guidelines on “Availability of Communication System” in consultation with the stakeholders and submit the same for approval of the Commission.
3. Accordingly, NPC has submitted the “Guidelines on Availability of Communication System”, after stakeholder consultation, for approval of the Commission.

4. The Commission has examined the Guidelines submitted by NPC, and after incorporating suitable changes, the Commission hereby approves the “Guidelines on Availability of Communication System” which are enclosed as an Annexure to this Order.

<b>Sd/-</b>	<b>Sd/-</b>	<b>Sd/-</b>	<b>Sd/-</b>
<b>(P. K. Singh)</b>	<b>(Arun Goyal)</b>	<b>(I. S. Jha)</b>	<b>(Jishnu Barua)</b>
<b>Member</b>	<b>Member</b>	<b>Member</b>	<b>Chairperson</b>



**GUIDELINES  
ON  
AVAILABILITY OF COMMUNICATION SYSTEMS**

*Prepared in Compliance*

*To*

*Central Electricity Regulatory Commission*

*(Communication System for inter-State transmission of electricity)*

*Regulations, 2017*

January 2024

## **GUIDELINES ON AVAILABILITY OF COMMUNICATION SYSTEM**

### **1. INTRODUCTION:**

1.1 As per Regulation 7.3 of the Central Electricity Regulatory Commission (Communication System for inter-State transmission of Electricity), Regulations, 2017, National Power Committee (NPC) has been entrusted to prepare Guidelines on Availability of Communication System in consultation with RPCs, RLDCs, CTU and other stakeholders. Accordingly, these Guidelines have been prepared for determining Availability of Communication System.

1.2 The relevant provisions in the Central Electricity Authority (Technical Standards for Connectivity to the Grid), Regulations, 2007, CEA (Technical Standards for Communication System in Power System Operations) Regulations, 2020 and CERC (Indian Electricity Grid Code) Regulations, 2023 in respect of Communication System are as follows:

1.2.1 **Regulation 6(3) of the CEA (Technical Standards for Connectivity to the Grid)** stipulates that *'the requester and user shall provide necessary facilities for voice and data communication and transfer of online operational data, such as voltage, frequency, line flows and status of breaker and isolator position and other parameters as prescribed by the appropriate load dispatch centre.'*

1.2.2 **Regulation 5(1) of the CEA (Technical Standards for Communication System in Power System Operations) Regulations, 2020** stipulates that user shall be capable of transmitting all operational data as required by appropriate control centre.

1.2.3 **Regulation 11 of the Indian Electricity Grid Code (IEGC) 2023 stipulates as follows:**

*"11. DATA AND COMMUNICATION FACILITIES (1) Reliable speech and data communication systems shall be provided to facilitate necessary communication, data exchange, supervision and control of the grid by the NLDC, RLDC and SLDC in accordance with the CERC (Communication System for inter-State Transmission of Electricity) Regulations, 2017 and the CEA Technical Standards for Communication.*

*(2) The associated communication system to facilitate data flow up to appropriate data collection point on CTU system including inter-operability requirements shall also be established by the concerned user as specified by CTU in the Connectivity Agreement.*

*(3) All users, STU and participating entities in case of cross-border trade shall provide, in coordination with CTU, the required facilities at their respective ends as specified in the connectivity agreement. The communication system along with data links provided for speech and real time data communication shall be monitored in real time by all users, CTU, STU, SLDC and RLDC to ensure high reliability of the communication links.”*

## **2. DEFINITION:**

2.1 Words and expressions used in these guidelines shall have the same meaning assigned in the Electricity Act, Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulation ,2007, CEA (Technical Standards for Communication System in Power System Operation) Regulations, 2020, CERC (Communication System for Inter-State transmission of Electricity), Regulations, 2017 and Indian Electricity Grid Code Regulations, 2023 and amendments thereof.

2.2 Other words have been explained as per the context in these Guidelines.

## **3. SCOPE AND APPLICABILITY:**

3.1 As per Regulation 5 (i) of the CERC (Communication System for inter-State transmission of Electricity), Regulations, 2017, *“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.”*

3.2 Accordingly, these guidelines shall be applicable to the CTU for the Communication System Infrastructure of inter-State Transmission System. The guidelines shall also be applicable to STU for the Communication System Infrastructure of intra-State Transmission System, till appropriate regulation on Communication is framed by the respective State Electricity Regulatory Commission.

3.3 The CTU (or STU as the case may be) shall have back to back co-ordination/agreement with transmission licensees, generators, dedicated transmission line owners, bulk consumers and concerned entities for providing power system communication on their network.

### **3.4 Responsibility of CTU and STU:**

- a) CTU (or STU as the case may be) shall be responsible for submission of the details of communication channels including the redundant channels configured for use of voice / data / video exchange, protection, Tele-protection / SPS to respective RLDC (SLDC as the case may be) on monthly basis incorporating the details of new channels configured during previous month. The total number of communication channels (N) is based on the requirement of RLDCs/NLDC and the same would be decided in consultation with respective RPCs/NPC.
- b) CTU (or STU as the case may be) shall be responsible for submission of the performance/availability of configured channels of the previous month to respective RLDCs for verification by RLDCs and onward submission to respective RPC for computation of availability of the communication system for previous month.
- c) CTU (or STU as the case may be) shall submit availability reports of configured channel including the redundant channels in format prescribed by RLDC/RPC, generated from the centralized NMS. The availability report of the call logging facility (with time stamp) may be provided till commissioning of centralized NMS for availability computation.

### **4. TREATMENT OF COMMUNICATION SYSTEM OUTAGES:**

- 4.1 Outage time of communication system elements (i.e. channels) due to acts of God and force majeure events beyond the control of the communication provider shall be considered deemed available. However, onus of satisfying the Member Secretary, RPC that element outage was due to aforesaid events shall rest with the communication provider.
- 4.2 Any outage of duration more than one (01) minute in a time-block shall be considered as not available for the whole time-block. Any outage of duration less than or equal to one (01) minute in a time-block shall be treated as deemed available provided such outages are not more than ten (10) times in a day.

Illustration: If a channel is out for a duration less than or equal to one (01) minute in a time-block, and such outages are more than ten (10) times in a day, all the time-blocks with such outages shall be treated as not available.

4.3 All other outages not covered under 4.1 and 4.2 shall be considered as not available during the whole block for the computation of channel availability.

**5. METHODOLOGY FOR COMPUTATION OF AVAILABILITY OF COMMUNICATION SYSTEM:**

5.1 Availability of Communication System ( $A_{CS}$ ) shall be calculated as under:

$$A_{CS} = \frac{\sum_{i=1}^N A_i}{N}$$

Where -  $N$  is total number of communication channels as specified in 3.4(a) above.

-  $A_i$  is Availability of  $i^{th}$  Channel which shall be calculated as given in 5.2 below.

5.2 Availability of  $i^{th}$  Channel ( $A_i$ ) shall be arrived as under:

$$A_i = \frac{B_T - B_{Ni}}{B_T} \times 100$$

Where  $B_T$  is Total number of time-blocks in a month

$B_{Ni}$  is the total number of time-blocks, in which  $i^{th}$  channel was not available after considering deemed availability status of 4.1 & 4.2 above.

$$B_{Ni} = B_{ANi} - B_{Gi} - B_{LTTi}$$

Where-  $B_{ANi}$  is absolute number of time-blocks in which the  $i^{th}$  channel was 'not available' on account of any reason.

-  $B_{Gi}$  is Number of time-blocks out of  $B_{ANi}$ , in which  $i^{th}$  channel was 'not available' on account of act of God as specified in 4.1 above.

-  $B_{LTTi}$  is Number of time-blocks out of  $B_{ANi}$ , in which  $i^{th}$  channel was 'not available' for a duration less than or equal to one (01) minute in a time-block and not more than ten (10) times in a day as specified in 4.2 above.

***Illustrations:***

**Case1:** If there are 2880 time-blocks ( $B_T$ ) in a month, and a particular channel is not available for a total of 70 time-blocks; and out of this, the above mentioned channel was not available for 20 ( $B_{Gi}$ ) time-blocks due to act of God, six (06) time-blocks for less than one (01) minute ( $B_{LTTi}$ ), then  $B_{ANi}=70$ ,  $B_{LTTi}=06$ ,  $B_{Ni} = 70-20-06 = 44$ , and  $A_i = (2880-44)/2880 = 98.47\%$

**Case 2:** If there are 2880 time-blocks ( $B_T$ ) in a month, and a particular channel is not available for a total of 70 time-blocks; and out of this, the above mentioned channel was not

available for 20 ( $B_{Gi}$ ) time-blocks due to act of God, 11 time-blocks for less than 1 minute, then  $B_{ANi}=70$ ,  $B_{LTTi} = 0$ ,  $B_{Ni}=70-20-0=50$ , and  $A_i = (2880-50)/2880 = 98.26\%$ .

## **6. Revision of these Guidelines**

6.1 As and when required, these Guidelines shall be reviewed and revised by NPC with the approval of the Commission.

\*\*\*

## **Annexure B.2.2**

### **Final Standard Operating Procedure (SOP) for Communication audit of Substations**

1. This procedure has been prepared in compliance to Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017. As per clause 10 of the Regulation, RPC shall conduct annual audit of the communication system annually as per the procedure finalized in the forum of the concerned RPC. However, this SOP for communication audit of substations is finalized to maintain uniformity at the national level. It also mandates that RPC Secretariat shall issue necessary instructions to all stakeholders to comply with the audit requirements within the time stipulated by the RPC Secretariat based on the audit report. An Annual Report on the audit carried out by respective RPC is to be submitted to the Commission within one month of closing of the financial year.
2. The Audit would be conducted in two phases. In first phase scrutiny of the reports, documents etc. In the second phase physical verification shall be carried out.
3. Each User/entity, using inter-state transmission or the intra-state transmission incidental to inter-state, shall submit the detailed report to RPC Secretariat and RLDC, as per prescribed format on yearly basis. The detailed report shall be submitted by the April end of the respective year. This report shall be considered as self-certificate regarding availability and healthiness of the Communication system of respective user/entity.
4. In respect of intra-state users/entities, SLDC shall submit detailed reports yearly by the April end of the respective year, to RPC Secretariat and RLDC.
5. Outage report of all the channels (including Network Management System, PLCC etc) report for a month shall be submitted by the Users/entities to RLDC and respective SLDCs, on monthly basis, by 7th day of the next month. RLDC and SLDCs after verifying the NMS data shall submit report to RPC Secretariat by 15th day.
6. All users/entities and Control Centers shall get the third-party cyber security audits done from a Cert-in certified vendor in compliance of CEA (Cyber Security in Power Sector) Guidelines,2021. The detailed report of the Cyber Security Audit shall be submitted by 15th April for the previous financial Year.
7. RPC Secretariat may ask any other information required for Audit of the communication system in addition to these periodic reports.

#### **Phase-I Audit: Scrutiny of the Information**

8. A Communication System Audit Sub-Group comprising one member each from RPC, RLDC, PowerGrid and One of the respective Region SLDCs shall be constituted by RPC Secretariat with the approval of Member Secretary, RPC. The sub-group may co-opt any other member from any organization for facilitating the activities of the sub-group. Further, consultation from CEA may be taken, if required. The Audit team shall be formed excluding the member for the Organization/Utility whose system is to be audited.
9. The Communication System Audit Sub-group shall scrutinize the information received in RPC Secretariat. The Sub-group may also ask any additional information necessary for its activities. All the users/entities, RLDC, SLDCs shall provide the information to the sub-group on priority within the stipulated time period.
10. The sub-group shall also identify the nodes for physical inspection based on the criticality of the node in view of performance of the communication network or based on the deficiencies observed in the communication system.
11. The Audit would include but not limited to following aspects:
  - a. Availability of communication channels. The outage reason needs to be clearly specified whether it is on account of the concerned entity or on account of any other entity, force majeure etc. The list of communication channels would be finalized by Communication System Sub Group in consultation with other stakeholders.
  - b. Availability of terminal equipment. The outage reason needs to be clearly specified whether it is on account of the concerned entity or on account of any other entity, force majeure etc. The list of terminal equipment would be finalized by Communication System Sub Group. Part outage like failure of specific cards etc. would also be furnished along-with reasons.
  - c. Availability of Auxiliary System e.g. Battery Charger, Battery bank, sufficient cooling equipment etc.
  - d. Compliance of CERC and CEA Regulations and the procedures under these Regulations.
  - e. Completion of periodic testing of the communication system in accordance with procedure for maintenance and testing prepared by CTU.
  - f. Audit of all newly commissioned communication equipment within six months of its commissioning.
  - g. Completion of 3rd party Cyber Security Audits.
  - h. Network traffic w.r.t capacity.
  - i. Spare availability, replenishment etc.
  - j. Any other parameters as agreed by the Communication Sub Group.



## **Phase-II Audit: Physical Verification**

12. Based on the Recommendations of the Communication System Audit Sub-group, Audit team shall be constituted and the physical inspection Audit plan shall be prepared by RPC Secretariat.
13. Audit team shall be formed on regional basis.
14. Audit shall be carried out in a planned manner as included in this document by a team of three members. The audit team shall comprise of one representative from the RPC Secretariat, one representative from RLDC and one representative from any of the Utilities or SLDCs of respective Region. The Audit team shall be formed excluding the member for the Organization/Utility whose system is to be Audited. The Audit team may co-opt any other member from any organization for facilitating the activities of the committee.
15. Once the plan is finalized, minimum 3 days advance notice shall be served to the concerned Auditee entity intimating the detailed plan so that availability of required testing equipment and the required documents is ensured by Auditee entity and is made available to the Audit team during the site visit.
16. Member Secretary, RPC in consultation with the Communication System Audit Sub-Group may decide on any additional nodes/locations for physical inspection if a location is very critical in view of performance of the communication network at any time of the year.
17. The Scope of the physical verification shall include but not limited to the following:
  - a. Available communication Network for its redundancy
  - b. Availability of channel redundancy for all the functions for which it is configured.
  - c. Communication equipment (hardware and software configuration) of all the nodes including repeater stations for its recommended performance.
  - d. Documentation of the configuration of the respective site and its updation.
  - e. Fibre layout / usage of fibre / Availability of dark fibre and its healthiness.
  - f. Cable Schedule and identification / tagging.
  - g. Healthiness of Auxiliary supply including the healthiness of Battery backup.
  - h. Healthiness of Earthing / Earth protection for communication system.
  - i. Availability of sufficient cooling equipment at the User's premises to maintain the stipulated temperature for the communication equipment.
  - j. Optical power level
  - k. Alternate modes of communication for speech
18. The format for collecting the details of Communication channels/links and Equipment is at **Annexure-I** and the same shall be furnished by the Auditee entity.

19. Communication Audit Checklist points are given in **Annexure-II** and the same are to be thoroughly verified by the Audit team.
20. Expenses towards Lodging, Boarding & Transportation (Excluding Air/Train Fair) between various places within the jurisdiction of Auditee entity shall be borne by respective Auditee entity. The Coordinating Officer(s) from the Auditee Utilities identified for each Team is (are) responsible for facilitating them to all the Members of respective Team.
21. Audit team shall submit report including recommendations for action on deficiencies, if any, found during the inspection, within 15 days from the date of inspection to Member Secretary, RPC. After approval of MS, RPC, the report would be communicated to the Auditee entity for compliance.

#### **Audit Compliance Monitoring**

22. Communication System Audit Sub-group would monitor the compliance of audit observations as applicable. Non-compliance of Audit Recommendations, if any, shall be put up to TCC and RPC.
23. The Annual Audit Report would be reviewed by a Communication System Sub Group at RPCs level. After considering the observations of Sub Group, RPC Secretariat shall issue necessary instructions to all stakeholders to comply with the audit requirements within the time stipulated by the RPC Secretariat based on the audit report. An Annual Report on the audit carried out by RPC would be submitted to the Commission within one month of closing of the financial year.

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<b>REGIONAL COMMUNICATION AUDIT REPORT</b>			
<b>General Information:</b>			
1	Substation Name		
2	SS Voltage level		
3	Date of commissioning of the substation	XX.XX.XXXX	
4	Region & State / Auditee	/	
5	Audit Date		
6	Name of the Utility which owns the SS		
<b>Details of Audit Team Members :</b>			
SL	Name	Designation	Organization
1			
2			
3			
4			
<b>Attached Documents, if any</b>			
SL	Name of the document	Original / Signed / Copy	
1			
2			
3			
4			
5			
6			
7			

<b>8</b>		
<b>9</b>		
<b>10</b>		
<b>11</b>		
<b>12</b>		
<b>13</b>		
<b>14</b>		
<b>15</b>		
<b>16</b>		
<b>17</b>		

**Communication Channels and Equipments Audit Format**

(A) List of channels in usage for data (64 kbps, 104, PMU, VC, 101) / Voice / Protection circuits / others:

SI	Description (64 kbps, 104, PMU, VC, 101) / Voice / Protection circuits / Others)	Source	Destination	Channel Routing	Ownership details of terminal equipment / Links
1					
2					
3					
4					
5					
6					
7					
8					

(B) List of terminal communication equipments:

SI	Name of Station	Equipment Type (SDH / PDH / Radio / VSAT / EPABX)	Make / Model	Ownership
1				
2				
3				
4				
5				
6				
7				
8				

(C) Communication System Details:

**I. SDH Equipment**

(1) Card Details:

Slot No	IP Address & Path / Direction Name	Card Details	Place a ✓ mark if on usage, else Write as "Spare"	Whether Card is healthy / Faulty ? (H / F)	Cards Redundancy available (Yes / No)	Power Supply Card / Optical Card (Yes / No)	MSP configured? (Yes / No)	Action Plan for faulty cards	Other Information, if any
1									
2									
3									
And so on									

(2) Whether equipment is time synchronized : Yes / No

<b>If Yes, how is it being done?</b>

(3) Failures during last Fin. year / since last Audit :

Particulars	Number of failures of Card / Power Supply	Reason for failures	Measures taken for rectification
Card		(i) (ii) (iii)	(i) (ii) (iii)
Power Supply		(i) (ii) (iii)	(i) (ii) (iii)

(4) Configuration of the Node:

Name of Equipment	Number of Nodes	Number of directions	Name of Directions	Number of links down, with details	Details of corrective action, if any, taken

--	--	--	--	--	--

**(5) Preventive maintenance schedule and its compliance:**

Date of Last Preventive maintenance	Maintenance carried out as per schedule? (Yes / No)	Whether all the defects have been attended? (Yes / No) Give details

**II. PDH Equipment**

**(1) Card Details :**

Slot No	IP Address	Card Details	Place a ✓ mark if on usage, else Write as "Spare"	Whether Card is healthy / Faulty ? (H / F)	Cards Redundancy available (Yes / No)	Power Supply Card / Optical Card (Yes / No)	MSP configured? (Yes / No)	Action Plan for faulty cards	Other Information, if any
1									
2									
3									
And so on									

**(2) Whether equipment is time synchronized : Yes / No**

<b>If Yes, how is it being done?</b>

**(3) Failures during last Fin. year / since last Audit :**

Particulars	Number of failures of Card / Power Supply	Reason for failures	Measures taken for rectification
Card		(i) (ii)	(i) (ii)

		<b>(iii)</b>	<b>(iii)</b>
<b>Power Supply</b>		<b>(i)</b> <b>(ii)</b> <b>(iii)</b>	<b>(i)</b> <b>(ii)</b> <b>(iii)</b>

**(4) Configuration of the Node:**

Name of Equipment	Number of Nodes	Number of directions	Name of Directions	Number of links down, with details	Details of corrective action, if any, taken

**(5) Preventive maintenance schedule and its compliance:**

Date of Last Preventive maintenance	Maintenance carried out as per schedule? (Yes / No)	Whether all the defects have been attended? (Yes / No) Give details

**III. OPGW / Optical Fibre Details**

Number of Directions	Name of Direction	No. of Pairs	No. of Fibers used	No. of spare & healthy Fibers	Unarmoured cable laid within PVC/Hume duct pipe?	Fibre Count in OPGW? Whether matching with Approach cable to FODP?	Overall Optical Fibre Path Attenuation (dB/km)	Power Received	Conformation to Compliance of CEA Standards

**IV. Healthiness of Auxiliary System:**

**(1) Details of 2 independent Power Sources :**





**VIII. Radio Communication Details:**

Number of Equipments	Make and Model	Status on Healthiness	Last preventive maintenance		Details of defects, if any, attended	Status of Availability of Spares	Conformation to Compliance of CEA Standards
			Schedule	Actual			

**IX. Data Retention** : (i) **Earliest Date of availability of data:** \_\_\_\_\_  
 (ii) **Historical data availability** : \_\_\_\_\_ days.

**X. Control Command Delay** : (i) **Time delay in seconds from Control Centre for SCADA** : \_\_\_\_\_ Seconds  
 (ii) **Time delay in seconds from Control Centre for WAMS** : \_\_\_\_\_ Seconds

**XI. Wide Band Network** : (i) **Absolute channel delay in protection applications** : \_\_\_\_\_ ms  
 (ii) **Channel delay asymmetry in protection applications** : \_\_\_\_\_ ms  
 (iii) **Switching Time delay to alternate path/route during failure of one path** : \_\_\_\_\_ ms

**XII. Any other information** :

**Audit Team Member**  
**SRPC**

**Audit Team Member**  
**Co-Ordinator**

**Audit Team Member**  
**PGCIL (Internal / External)**

**Audit Team Member**  
**State (Internal / External)**

## Communication Audit Checklist (Annexure-II)

S.No	Check list points	Expected	Actual	Reference
1	Whether OPGW is terminated properly. Down lead shall be fixed property in sufficient locations. Metallic part shall be connected to earth mat riser.	Yes		
2	Distinct approach cable shall be laid 1 Protection & Communication 2 Fibers for commercial applications Item no 1 cable shall be terminated in communication room FODP One number FODP panel shall be available in communication room			
3	Fiber Identification shall be done in FODP properly			
4	Whether End to end tests were carried out during installation and records are available (both Optical Power Source/receiver testand OTDR Test results			
5	Whether patch chords 1 Cross labelled (source/ receive) 2 Tx – Rx Marking 3 Mechanical protection is provided for patch chords laid between panels			
6	Whether separate room for communication is available with following:- 1 Air conditioning with standby A/C Unit 2 AC Distribution board with ELCB 3 Single point earthing bar which shall be connected to substation Earth mat			
7	Two sets of 48 V ( Positive Earthed) DC System shall be available with 1 Common DC Distribution board/ Panels with incoming MCB, coupler MCB , out doing MCB setc 2. Minimum 200 Ah ( 2 sets of battery) VRLA batteries are preferred to keep chargers and battery in communication room. 3. Battery Charger shall be Thyristorised/SMPS			
8	Battery Charger alarms /measurements shall be made available to SAS ( if available) It can be achieved through MOD bus or connecting analogue/ digital signals to Common BCU of SAS. If such system is not available major			

## Communication Audit Checklist (Annexure-II)

	alarms shall be alarmed in common substation annunciator			
9	2 nos of substation Data ( From RTU or SAS Gateway) shall route in different roots to Main and Standby Load Dispatch centres			
10	Kindly assure proper protection is available for AC Distribution ( ELCB, MCB, Backup fuse ),			
11	Aux Transformer neutral Earthing shall be connected to Stations earth mat ( Aux Transformers shall be installed in yard earth mat area only)			
12	Whether DG sets with AMF panels are provided for Aux AC Supply			
13	Whether 2 nos 11 kV ( or 33kV) supplies are available for Each station aux Transformer			

## Annexure B.2.3

### **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. 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 7<sup>th</sup>/8<sup>th</sup> 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 15<sup>th</sup> 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 10<sup>th</sup> 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-B.2.16

<b>S/n</b>	<b>Line name</b>	<b>Line Length</b>
01	220 KV JODA (GRIDCO)-RAMCHANDRAPUR (JSEB)	130 km
02	220 KV SANTALDIH (WBSETCL) - CHANDIL(JSEB)	98 Km
03	132 KV PATRATU (JSEB) - PATRATU (DVC) -1	6 Kms
04	132 KV LALMATIA (JSEB) - KAHALGAON (BSPHCL)	34 Km
05	220 KV JAMSHEDPUR (DVC) – JINDAL - JODA (GRIDCO)	150 Kms
06	66 KV KALIMPONG (WBSETCL) - MELLI (SIKKIM)	15 Km
07	132 KV KOLAGHAT(DVC) - KOLAGHAT (WBSETCL)	50 Meters
08	220 KV BIDHANNAGAR (WBSETCL)-WARIA(DVC)	10 Kms.
09	132 KV DALKHOLA (WBSETCL)-BAISI(BSPHCL)	46 Kms
10	132 KV RAJGIR (BSPHCL) - BARHI (DVC)	138 Kms.

### Annexure-B.2.25

List of stations for from which AMR data to be proposed to integrate on PLCC:

SNO	UTILITY NAME	SUBSTATION NAME
1	GRIDCO	JINDAL(GRIDCO)
2	IPP	CHUZACHEN(IPP)
3		JINDAL(IPP)
4		STERLITE(IPP)
5	JHARKHAND	DEOGARH(JH)
6		GARWA(JH)
7		JAMTARA(JH)
8		JAPLA(JH)
9		KENDOPOS(JH)
10		NAGARUNTARI(JH)
11	NTPC	NABINAGAR(NTPC)
12		TALCHER SOLAR(NTPC)
13	SIKKIM	DIKCHU(IPP)
14		RAVANGLA(SK)

## Annexure-B.2.26

<b>RTU / SAS Main &amp; Standby Link Status</b>				
<b>Responsible Entity</b>	<b>SI No</b>	<b>Station Name</b>	<b>Main link Availability</b>	<b>Standby link Availability</b>
POWERGRID ER - I	1	CHANDAUTI	Down	Up
POWERGRID ER - I	2	SAHARSA	Down	Up
POWERGRID ER - I	3	CHAIBASA	Up	Down
POWERGRID ER - II	4	BAHARAMPUR	Down	Up
POWERGRID ER - II	5	MALDA	Down	Up
POWERGRID ER - II	6	NEW_FARAKKA	Up	Down
POWERGRID ER - II	7	RAJARHAT	Up	Down
POWERGRID ER - Odisha Projects	8	PANDIABILI	Up	Down
NTPC	9	BARH	Up	Down
NTPC	10	TALCHER	Up	Down
NTPC	11	KBUNL	Up	Down
NTPC	12	NPGC	Up	Down
OPGC	13	OPGC	Up	Down
APNRL	14	APNRL	Up	Down
DANS ENERGY	16	TASHIDING	Down	Up
MOTIHARI	17	MOTIHARI	Up	Down
DANS ENERGY	18	RONGICHU	Up	Down
ATL	19	DHANBAD	Up	Down
NHPC	20	RANGIT	Up	Down
DANS ENERGY	21	JORETHANG	Up	Down

## Annexure B.2.31

### List of RTU/SAS PGCIL to be replaced / up-gradated

S. No	Region	Name of Substations	RTU/SAS Status	Status
1	ER-II	Durgapur*	AlstomRTU-S900	To be replaced
2	ER-II	Malda*	AlstomRTU-S900	To be replaced
3	ER-II	Binaguri*	AlstomRTU-S900	To be replaced
4	ER-II	Siliguri 220 kV	AlstomRTU-C264	To be replaced
5	ER-II	Birpara	SIEMENS make SAS	Replaced
6	ER-II	Subhasgram*	AlstomRTU-C264	To be replaced
7	ER-II	Dalkola	AlstomRTU-C264	To be replaced
8	ER-II	Gangtok	AlstomRTU-C264	To be replaced
9	ER-II	Behrampur	SIEMENS make SAS	Replaced
10	ER-II	Rangpo	SIEMENS make SAS	Replaced
11	ER-II	New Melli	SIEMENS make SAS	Replaced
12	ER-II	Maithon	AlstomRTU-S900	To be replaced
13	ER-I	Biharsharif*	AlstomRTU-S900	To be replaced
14	ER-I	Jamshedpur*	AlstomRTU-S900	To be replaced
15	ER-I	Purnea 400 kV	AlstomRTU-S900	To be replaced
16	ER-I	Purnea 220 kV	SIEMENS make SAS	Replaced
17	ER-I	Sasaram HVDC	SIEMENS make SAS	Hardware Upgraded
18	ER-I	Banka	SIEMENS make SAS	Hardware Upgraded
19	ER-I	Lakhisarai	SIEMENS make SAS	Hardware Upgraded
20	ER-I	New Ranchi	SIEMENS make SAS	Hardware Upgraded
21	ER-I	Chaibasa	SIEMENS make SAS	Hardware Upgraded
22	ER-I	Sasaram 756 kV	SIEMENS make SAS	Hardware Upgraded
23	ER-I	Arrah	SIEMENS make SAS	Replaced
24	ER-I	Muzafarpur*	AlstomRTU-S900	To be replaced
25	ER-I	Daltongunj	SIEMENS make SAS	Replaced
26	ER-I	Chandwa	SIEMENS make SAS	Replaced
27	ER-I	Gaya	SIEMENS make SAS	Replaced
28	ER-I	Kisangunj	SIEMENS make SAS	Replaced
29	ER-I	Chaibasa	SIEMENS make SAS	Replaced
30	Orisha Project	Angul	SIEMENS make SAS	Replaced
31	Orisha Project	Bolangir	SIEMENS make SAS	Replaced
32	Orisha Project	Keonjhor	SIEMENS make SAS	Replaced
33	Orisha Project	Talcher HVDC*	AlstomRTU-S900	To be replaced
34	Orisha Project	Jharsuguda SAS	SIEMENS make SAS	Replaced
35	Orisha Project	Indravati*	AlstomRTU-C264	To be replaced
36	Orisha Project	Jeypore*	AlstomRTU-S900	To be replaced
37	Orisha Project	Kalabadia*	AlstomRTU-C264	To be replaced
38	Orisha Project	Rengali*	AlstomRTU-C264	To be replaced
39	Orisha Project	Rourkela*	AlstomRTU-S900	To be replaced