AGENDA

FOR

15th TeST MEETING

Date: 02.08.2024

Eastern Regional Power Committee

14, Golf Club Road, Tollygunge

Kolkata: 700033

Contents

EASTERN REGIONAL POWER COMMITTEE

AGENDA FOR 15th TeST MEETING TO BE HELD ON 02.08.2024(FRIDAY) AT 10:30 HRS

1. PART-A: CONFIRMATION OF MINUTES

1.1. Confirmation of Minutes of 14th TeST Meeting held on 24th April 2024 physically at ERPC Conference Hall, Kolkata

The minutes of 14th TeST Sub-Committee meeting held on 24.04.2024 was circulated vide letter dated 15.05.2024.

Members may confirm the minutes of 14th TeST meeting.

2. PART-B: ITEMS FOR DISCUSSION/UPDATE

2.1 Supply & Installation of Firewall for POWERGRID sub-stations (RTM & TBCB).: CTU

- POWERGRID has informed that in the existing **273** nos. of Substations of POWERGRID, Firewall is not available for electronic security perimeter as per **CEA (Cyber Security Guidelines), 2021.**
- A meeting was conducted on 28.11.2023 (MoM attached as **Annexure B.2.1.1**) among CTU, POWERGRID, CEA, NRPC & Grid-India to finalize the firewall architecture. Finalized architecture is given at **Annexure-B.2.1.2**.
- Later on, a committee was formed under the Chairmanship of **CE (Cyber Security Division), CEA** in line with the minutes of meeting dtd. 12.04.24 convened by CEA and chaired by **Member, Power System** (committee formation letter is attached at **Annexure-B.2.**). Later,**CEA** vide letter dtd. 25.06.2024 (attached at **Annexure-B.2.1.3**) communicated that utilities are required to comply the CEA (Cyber Security Guidelines), 2021 and deploy Intrusion Prevention and Intrusion Detection System. **Further, as Cyber Security Regulations of CEA are in advanced stage so there is no necessity for constitution of aforesaid committee.**
- POWERGRID has communicated to CTU that Firewall installation at existing substations involved a huge amount which cannot be covered through O&M expenses, therefore a scheme / Project may be prepared for supply and installation of Firewalls at the existing substations of POWERGRID.
- They further informed that, the Firewall shall be having electrical ethernet interfaces/ports and placed between FOTE & Communication Gateways. All ethernet based applications shall be terminated in the firewall ports directly (e.g. PMU, AMR, VOIP, SAS/SCADA etc.) before mapping into communication equipment for further optical transmission. There shall also be Main and Backup Centralized Management Console (CMC) required along with remote console at Regional level to manage these firewalls. The CMC will seamlessly integrate existing firewall (if any) and upcoming firewalls of different makes.

- POWERGRID has provided a list of substations where Firewall needs to be installed for Eastern region which is at **Annexure-B.2.1.4**. Breakup of **RTM/ TBCB** substation is given below:

Region	POWERGRID RTM S/S	POWERGRID TBCB S/S
ER	44	05
Total: 49		

- For the **RTM** substations, expenditure of firewall installation can be booked in **Add CAP** or a new scheme may be prepared. For the **TBCB** substations, expenses can be booked under change in law as **CERC order on petition no. 94/MP/2021.**
- Deliberation in this regard is required from the Forum for methodology and preparation of scheme for supply and installation of firewall at the existing substation of POWERGRID in view of **CEA Cyber Security Guidelines 2021** & upcoming CEA regulations on cyber security.

CTU may update. Members may discuss.

2.2 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.
- 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.2.2.1 and B.2.2.2**

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 back up RLDC
2	ER-2	0	03		
3	Odisha	0	00		
Total qty reqd.		0	04		

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: 4x1.5 cr = 6 cr

c)Cost of one ethernet card:1.25 lacs

d)Cost of required 20 Nos. ethernet card:20x 1.25lacs=25 lacs

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

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.

This agenda was also discussed in 14th ERTeST meeting held on 24.04.2024.

14th ER 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 Bahrampur station.
- After successful completion of POC, CTU was advised to put up the agenda in upcoming TeST/OCC meeting of ERPC for further deliberation.

CTU may explain POWERGRID/ERLDC may update on the status of POC for further proceedings. Members may deliberate.

2.3 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 POWERGID/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	Alipurdwar	STM 4 FOTE:1 No.	0	Already planned under Bhutan scheme
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.
- The agenda was discussed in 14ᵗʰ ERTeST meeting.
- **As per 14ᵗʰ TeST deliberation:**

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**:

a) It was suggested that redundancy shall be planned as per criticality of nodes to ensure optimum utilization of resources.

b) 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.

c) 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.

d) Scheme for SPOF shall be put up by CTU after incorporating the requirement provided by ERLDC, SLDCs and POWERGRID.

As per JUSNL, details of requirement of redundant FOTE for SLDC, Jharkhand as per criticality of SPOF nodes as follows:

Sr. No.	SPOF node	Existing FOTE availability and capacity	Additional FOTE Requirement/Capacity	Remark
1	SLDC, Ranchi	STM 16 FOTE:1 No.	STM 16 FOTE:1 No.	
2	Dumka 220 kV	STM 04 FOTE:1 No	STM 04 FOTE:1 No	
3	Ranchi, Namkum (PG) 400 KV	-	STM 16 FOTE:1 No.	Jharkhand needs its own FOTE at the site.

CTU may update & other constituents may also provide their inputs as per 14th TeST decision. Members may discuss.

2.4   Commencement of Audit of Communication systems installed at ISTS/SLDC stations :ERLDC

- As per **Clause 10** of **Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017** – "The RPC Secretariat shall conduct a performance audit of communication system annually as per the procedure finalized in the forum of the concerned RPC. Based on the audit report. RPC Secretariat shall issue necessary instructions to all stakeholders to comply with the audit requirements within the time stipulated by the RPC Secretariat."
- The Communication Audit Committee of Eastern Region vide ERPC order dated 15.05.2024 has been formed based on the provision of Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017.
- Special meeting of TeST sub-committee of ERPC, convened via virtual mode on 28th May 2024(MOM at **Annexure – B.2.4.1)** in which, SOP finalized by NPC for communication audit of substations was discussed (attached in **Annexure – B.2.4.2**). Thereafter, format for sharing of details pertaining to Communication audit was circulated to all constituents. It was recorded that by 25th June 2024 details pertaining to Communication audit will be submitted to ERPC in prescribed format**. However, still many utilities are yet to submit the details in proper format.** Hence, it is requested to all utilities to submit the details pertaining to Communication audit in prescribed format at earliest.

- ERLDC has identified some critical stations for audit of communication system and physical inspection in view of performance of the communication network. List of proposed stations for carrying out communication Audit as discussed in is enclosed below.

Sl. No.	Station Name	Ownership
01	Subhasgram	POWERGRID ER - II
02	Durgapur	POWERGRID ER - II
03	Maithon	POWERGRID ER - II
04	Rourkela	Orisha Projects
05	Bhubaneshwar SLDC	OPTCL
06	Maithon SLDC	DVC

ERLDC/ERPC may update. Members may discuss.

2.5 Communication System Outage Planning: ERLDC

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

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.

- 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.2.5**
- Special meeting of TeST sub-committee of ERPC, convened via virtual mode on 28th May 2024 in which it was decided that by 25th June 2024 details pertaining to outage planning

will be submitted to ERPC in prescribed format. However, still many utilities are yet to submit the details.

◆ As per Communication system outage planning SOP provision, Monthly Communication system Outage planning meeting needs to be conducted in current month for approval of planned outage of communication equipment's and links in next month.

◆ Hence, it is proposed to start outage planning for Communication system in line with provisions of **Communication system regulations, 2017** and w.e.f **August 2024**.

Members may discuss.

2.6 Follow-up on 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.

14th 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.

3. 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.

In this regard, ERLDC had communicated with all constituents as per TeST forum discussion but received MAC/ IP addressing details of equipment from only some of the ER constituents, which is under scrutiny. Still many constituents are yet to provide details especially SLDC/ISGS/IPP. Hence it is requested to furnish the same at the earliest.

ERLDC may update.Members may deliberate.

2.7 Network issue occurred in AMR WAN Intranet causing serious issue in SEM data availability: POWERGRID ER-II

Date	Observation	Impact	Action Taken

18-Dec-2023 to 22 Dec-23	AMR communication has been stopped due to LAN issue. High ping latency observed.	All AMR sites stops sending data as the LAN/WAN intranet Network was in non-working condition.	Network team disabled all LAN Nodes. To get the ERLDC SEM data, one by one Nodes was made enabled. Necessary data was collected. Few of the nodes were kept disconnected(after SEM data collection). A suspected mac ID (Cisco make) was identified by Network team that caused the broadcast issue.
25-Dec-2023 to 29-Dec-2023	System was normal	No impact, AMR normal operations resumed.	On 25th and 26th Dec'23, except WB node(which was disabled), all other SEM data available in AMR. On 27th WB was enabled and data was collected. 100% locations were communicating normally for next 2 days .
01-Jan-2024 to 03-Jan-2023	Again the latency issue was observed on 1st Jan'24.	All AMR sites stops sending data as the LAN/WAN intranet Network was in non-working condition.	Again, all nodes were made DOWN and then UP one by one. For PG+Generating, DVC,OPTCL,JH communication was normal. SEM Data collected. After Bihar node (Fatua and connected locations) was enabled, latency was observed again. The Cisco make mac resurfaced again. Once Bihar+ JH node was disabled no high latency

| | | | | observed and data collection resumed. |
| | | | | |

- ◆ From all above 3 incidents it is evident (and as confirmed by Network Management team) that the identified MAC (Cisco make) is causing the issue. However, due to non-availability of required technology of pinpointing the mac location, it is not exactly identified from which device and particular location the broadcast is taking place.
- ◆ For existing AMR architecture, there is no device of Cisco make connected anywhere in the substation level, other than at ERLDC data center. After isolating some of the data nodes the AMR system is running correctly, therefore, it is evident that the latency issue is not originating from ERLDC data center systems. It was also observed that no latency issue occurred while only central sectors (PG,DVC,Generating) were UP.
- ◆ Additionally the DCU devices present at substations, do not have the capability to broadcast data as it only transmits data, through SDH at substation, from the SEMs connected to it , unless any other device (most likely Network Devices / Computers) is connected to the same SDH. However, that is not under the purview of M/S TCS or AMR architecture. It is suspected that the issue is getting triggered by some external system, which is sometimes getting connected with the same WAN/Intranet where AMR is also connected. As the WAN/Intranet being monitored/controlled by Network team (not by M/S TCS Team), therefore this problem can be tracked with the help of the competent team.
- ◆ Due to network latency issue, the AMR data availability was highly impacted.
- ◆ On 4th & 05th Jan, All nodes were gradually enabled and data collected. Only WBSETCL nodes are disabled after AMR data collection. No network latency being observed till now for rest of the sites.

POWERGRID ER-II may explain. Members may discuss.

2.8 Integration of missing communication nodes in UNMS: ERLDC

It is observed that few 765/400 KV ISTS communication nodes of ER are not integrated in UNMS system. As a result, we are unable to monitor the status of those missing nodes and during outage of SCADA data & voice, it is leading to delay in the restoration of the SCADA data. Total no. of 765/400 KV nodes integrated in ER is **122** in **UNMS**. The list of missing 765 /400KV nodes for Integration in UNMS – ER is given below.

The list of **765 /400KV** nodes missing for Integration in UNMS – ER.		
SL NO.	STATION NAME	Concerned Utility / PG Region
1	DARLIPALLI_765	NTPC / POWERGRID Orissa Projects
2	CHANDAUTI_400	POWERGRID ER -I
3	SEL_400	STERLITE / POWERGRID Orissa Projects
4	DHANBAD NKTL_400	NKTL / PG ER -I
5	JSPL_400	JSPL / POWERGRID Orissa Projects
6	DIKCHU_400	DIKCHU / POWERGRID ER -II

7	JITPL_400	JITPL / POWERGRID Orissa Projects
8	IND BHARAT_400	Ind Bharat / POWERGRID Orissa Projects
9	Darbhanga_400	DMTCL / POWERGRID ER -I
10	GMR_400	GMR / POWERGRID Orissa Projects

Respective utilities may update.Members may deliberate.

2.9   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

- After commissioning of OPGW link, request for issuance of Trial run certificate for OPGW link along with terminal equipment is done by POWERGRID to ERLDC. It may be noted that approval of said OPGW link was taken by POWERGRID in ERPC forum only for the individual OPGW link Length.

- In this regard, to facilitate smooth issuance of Trial run certificate 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 POWERGRID / constituents while applying for trial run certificate in future.

14th 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.

ERLDC may update. Members may discuss.

2.10 Non availability of SCADA in Eastern region: ERLDC

- SCADA/EMS system has been installed at SLDC and RLDC and real time operators are performing grid management activities based on real time SCADA data. Further, State Estimation (SE) application and real time contingency analysis (RTCA) application in SCADA/EMS system also utilizes these data for decision making.

- However, 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. SLDC wise list of substations are tabulated below. Presently substations with voltage level 220 kV and above are considered. However, as per requirement ERLDC further also needs to be integrate 132 kV substations for enhanced monitoring as well good data availability for SE/RTCA functioning.

Table: Area wise no of stations without data telemetry as on 25-07-2024.

SLDC Responsible for data integration	No of SS/GS without data Telemetry
BSPTCL	08
JUSNL	10
OPTCL	06

WBSETCL	**06**	
DVC	00	
SIKKIM	00	

Details of stations, which are not reporting or yet to be integrated at SLDC is provide below as per SLDC bifurcation:

Table: Non availability of SCADA Data Telemetry of Bihar Substations

SL No.	BSPTCL	Last Reported
1	FATUHA_220	27-02-2024, Bus and Feeder Data are not reporting
2	BEGUSARAI_220	16-05-2024, Bus and Feeder Data are not reporting
3	SONENAGAR_NEW_220	27-01-2024, Bus and Status Points are no reporting
4	MUSAHARI_220	23-04-2024
5	LAUKAHI_220	15-04-2024
6	JAMALPUR_BGCL_220	05-05-2024
7	KARMNASA_NEW_220	08-09-2023
8	GARAUL_220	08-07-2024

Table: Non availability of SCADA Data Telemetry of Jharkhand Substations

SL No.	JUSNL	Last Reported
1	BURMU_220	INTEGRATION ISSUE
2	CHATRA_220	16-01-2024
3	GIRIDIH_220	INTEGRATION ISSUE
4	GODDA_220	11-01-2023
5	JASIDIH_220	01-06-2023
6	GARHWANEW_220	28-02-2022
7	SMARTCITY_220	27-02-2023
8	DUMKA_220	22-05-2023
9	GOVINDPUR_220	19-02-2022
10	CHAIBASA_220	25-10-2022

Table: Non availability of SCADA Data Telemetry of Odisha Substations

SL No.	OPTCL	Last Reported
1	NALCO_220	21-04-2023
2	BALASORE_220	26-01-2024, Bus & Status Points Data Suspected
3	ESSAR_220	10-11-2021
4	EMAMI_220	01-11-2021

5	IOCL_220	01-11-2021
6	TELCO_220	INTEGRATION ISSUE

Table: Non availability of SCADA Data Telemetry of West Bengal Substations

SL No.	WBSETCL	Last Reported
1	TLDP4_220	28-08-2023
2	TLDP3_220	18-05-2024
3	KLC_Bantala_220	16-07-2022
4	NewCoshipur_220(CESC)	26-02-2024
5	GAZOLE_220	28-08-2023
6	BARUIPUR_220	14-11-2023

Looking at above aspects, SLDCs may kindly provide a firm timeline for restoration of data from these 220 kV Substations.

ERLDC may explain and BSPTCL, JUSNL, OPTCL, WBSETCL may update. Members may deliberate.

2.11   Non-reporting of PMUs: ERLDC

- PMU data are used at ERLDC for real-time monitoring as well as post-facto analysis of faults and other events. At present, 15 number of physical PMUs from multiple central sector stations are not reporting to ERLDC. Respective Utilities has been informed over mail and other communication about these issues.
- List of non-reporting Central Sector PMUs are tabulated below:.

PMU ID	PMU Address	Station	Station ID	Feeder(s)	Issue	Last reported on
5217-5219	ER1PURNW_PGPM04	Purnea New	PURNW_PG	400MALDA_PG1 and 2	Waiting for configuration frame	09-04-2024
5663-5664	ER2FARAK_PGPM06	Farakka	FARAK_PG	400BAHAR_PG1	Waiting for configuration frame	20-08-2023
5666-5667	ER2FARAK_PGPM07	Farakka	FARAK_PG	400BAHAR_PG2	Waiting for configuration frame	20-08-2023
5675-5676	ER1KISHN_PGPM05	Kishanganj	KISHN_PG	400DARBH_PG1	Waiting for configuration frame	23-02-2024
5678-5679	ER1KISHN_PGPM06	Kishanganj	KISHN_PG	400DARBH_PG2	Waiting for configuration frame	23-02-2024
5762-5763	ER1DARBH_PGPM01	Darbhanga	DARBH_PG	400SITAM_PG2	Waiting for configuration frame	16-05-2024
5765-5766	ER1DARBH_PGPM02	Darbhanga	DARBH_PG	400SITAM_PG1	Waiting for configuration frame	16-05-2024
5768-5769	ER1SITAM_PGPM01	Sitamarhi	SITAM_PG	400MOTIH_PG2	Waiting for configuration frame	16-05-2024
5771-5772	ER1SITAM_PGPM02	Sitamarhi	SITAM_PG	400MOTIH_PG1	Waiting for configuration frame	16-05-2024

5774-5775	ER1SITAM_PGPM03	Sitamarhi	SITAM_PG	400DARBH_PG2	Waiting for configuration frame	16-05-2024
5777-5778	ER1SITAM_PGPM04	Sitamarhi	SITAM_PG	400DARBH_PG1	Waiting for configuration frame	16-05-2024
5226-5228	ER1KAHAL_NTPM01	Kahalgaon	KAHAL_NT	400LAKHI_PG1 and 2	GPS lock and time-stamp issue	>1 year
5229-5231	ER1KAHAL_NTPM02	Kahalgaon	KAHAL_NT	400BANKA_PG1 and 2	GPS lock and time-stamp issue	>1 year
5232-5234	ER1KAHAL_NTPM03	Kahalgaon	KAHAL_NT	400FARAK_PG3 and 4	GPS lock and time-stamp issue	>1 year
5780-5781	ER1DHANB_PGPM01	Dhanbad	DHANB_PG	400RANCH_PG1	GPS lock and time-stamp issue	21-03-2024

ERLDC may explain. POWERGRID, NTPC, DMTCL and PMTL may update.

2.12 UFR integration in SCADA: ERLDC

◆ UFR Feeders real time monitoring has been discussed in NPC as well as various forum of ERPC. Further, with new IEGC 2023 the same has been mandated as quoted below:

◆ *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. RLDC shall inform SLDCs as well as the concerned RPC on a quarterly basis, durations during the quarter when the combined load in MW of these feeders was below the level considered while designing the UFR scheme by the RPC. SLDC shall take corrective measures within a reasonable period and inform the respective RLDC and RPC, failing which suitable action may be initiated by the respective RPC."*

◆ In view of the same, ERLDC in coordination with SLDCs has been able to achieve good data availability and continuously following up with SLDC for 100% Integration. Present status of UFR telemetered data reporting from various SLDCs is provided below.

SCADA data availability (Feeder number wise) for UFR dated 25/07/2024

	Total No of Feeders	No of Feeders, which are YET TO BE INTEGRATED in ICCP	No of feeders, for which SCADA data is NOT UPDATING	No of feeders, for which SCADA data is UPDATING	Percentage Availability
BSPTCL	33	2	28	3	9%
DVC	26	3	2	21	81%
JUSNL	18	0	9	9	50%
OPTCL	59	3	3	53	90%
WB & CESC	137	81	13	43	31%
Total ER	273	89	55	129	47%

SCADA DATA AVAILABILITY

(Legend:)
- No of Feeders, which are YET TO BE INTEGRATED in ICCP
- No of feeders, for which SCADA data is NOT UPDATING
- No of feeders, for which SCADA data is UPDATING
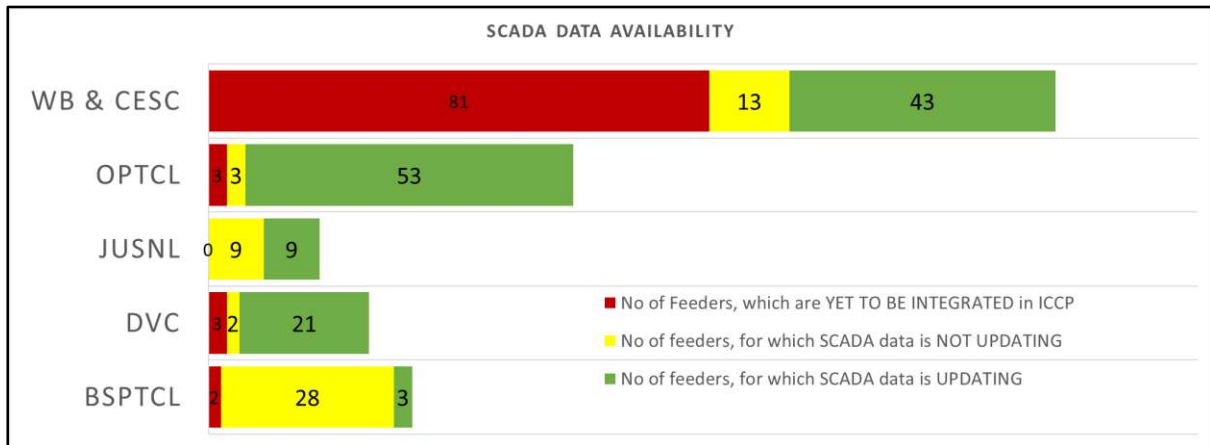
- List of UFR feeders whose MW data are not available are shown in **Annexure B.2.12**
- In view of 14th NPC meeting on 05.02.2024, required quantum in each stage of UFLS has to be enhanced with increase in demand and energy consumption. Based on which a special meeting was organised by ERPC on 10.07.2024(Wednesday). **Following major decisions have been taken by the forum and recorded in MoM of this special meeting of ERPC relevant towards SCADA based monitoring of UFLS scheme:**

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

2. All SLDCs were advised to share the identified feeders list for revised load relief quantum within a month. The status shall be reviewed in monthly OCC meetings. (Action: All SLDCs and DISCOMs)

3. All SLDCs were urged to expedite and ensure SCADA visibility of existing as well as newly identified feeders under AUFLS for effective supervision of load relief quantum. (Action: Communication dept. of All SLDCs and state TRANSCOs)

In regard to SCADA monitoring and integration based on above decision, following aspects are required for discussion during Test Meeting of ERPC:

1. SLDCs to inform ERPC/ERLDC when the existing stage III and IV feeders are expected to be converted to stage I and II UFR identified feeders (if not already done). Accordingly, ERLDC will update its SCADA based UFR monitoring tool.

2. List of newly identified feeders for UFR to be communicated to ERPC/ERLDC along with availability of SCADA data. In case SCADA data are not available, anticipated timelines for making availability of the SCADA Data may be communicated for applicable feeders.

3. Status update on existing feeders where SCADA data are not available with firm timeline for availability of data for proper monitoring.

- It is emphasized that on a quarterly basis RLDC is required to analyze the duration during which the combined load in MW of UFR feeders is below the level considered while designing the UFR scheme by the RPC. This is to ensure that sufficient loads are there during all times for ensuring this adequate relief from this defence scheme for maintaining grid security.

All concerned Constituents may update. Members may deliberate.

2.13 Agenda by DVC
2.13.1 Status of SCADA upgradation

- Any official information was not shared by PGCIL after the last meeting which was held on 10.08.2023.
- Deployment of single point of contact from PGCIL ER and Corporate both for immediate communication related to SCADA upgradation project.

2.13.2 Preventive maintenance of ORANGE Exchange and status of AMC

- Any preventive maintenance was not conducted in last year in DVC.
- Shortage of manpower under AMC at SLDC, Howrah. Only one person has been engaged at SLDC Howrah instead of two since 19.06.2024 – As per existing SCADA AMC contract with Chemtrols, they have to depute two persons at Howrah and one person at Maithon.
- But presently only one person is being deputed at Howrah. It is reported several times to Chemtrols but they are not doing the official fulfilment.

2.13.3 Long outage of UPS at DVC SLDC

One UPS still remains out of order since August 2023 at DVC SLDC(Howrah).

2.13.4 Malfunctioning of Web server

- Web Server is not working due to some malfunction of DRS server at Maithon from 19.06.2024.
- As a result of that DVC generation summary which was being shared within DVC network by utilizing web server can not be possible at this moment.

2.13.5 Non-availability of VPS

Two quadrants of VPS have become out of service at Maithon.

DVC may update. Members may discuss.

2.14 AMC of various communication system equipment's of ISGS, IPP: ERLDC

- It is observed that AMC of communication system equipment's at various nodes of ISGS/IPP (such as DMTCL, NKTPP etc.) are not there, which is leading to delay in restoration of SCADA data and voice during outage.
- Hence a mechanism/process needs to be developed for monitoring of AMC of communication system equipment's in ER to ensure strengthening of redundancy and to minimize outage time of SCADA data and voice.

ERLDC may explain.Members may update.

2.15 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.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.

ERLDC may explain and NTPC may update.Members may deliberate.

2.16 Replacement of old RTUs with Up-gradation in Eastern Region(Central sector stations): 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. Further, in **39th ERPC** meeting project on 'Upgradation of SCADA/RTUs/SAS in Central Sector stations and strengthening of OPGW network in Eastern Region' was approved. In this, **36 substations** of POWERGRID have been included for RTU/SAS upgradation work for dual reporting to both Main ERLDC & Backup ERLDC over IEC 60870-5-104 Protocol. In this, **16 substations** are of ER-1, **9** of ER-2 and **11** of Orissa projects. The contract for replacement/up-gradation of old RTUs in Eastern Region was awarded subsequently by POWERGRID on **31st December 2020.**
- **As pe the information received from POWERGRID, out of total 36 substations, work has been completed for 19 substations (11 substations of ER-1, 3 substations of ER-2 and 5 Substations of Orissa projects).**
- POWERGRID may kindly update on the progress and substation wise anticipated completion schedule may be shared for remaining substations.
- RTU/SAS Upgradation/Replacement Status attached in **Annexure-B.2.16**

ERLDC and POWERGRID may update. Members may deliberate.

2.17 Restoration of RTU / SAS SCADA to MCC ERLDC or BCC ERLDC: ERLDC

- Some of RTU/SAS data are reporting only to MCC ERLDC or BCC ERLDC mainly due to issues in the local station LAN as learned from various communications over phone with concerned.
- 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.
- Updated List of ER stations where RTU / SAS data are reporting only to MCC ERLDC or BCC ERLDC is enclosed in **Annexure – B.2.17**.

ERLDC may update. Members may deliberate.

2.18 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 and shares it with all associated utilities and SLDCs. This is for improvement of SCADA data accuracy and to minimize error. This helps in real time decision support tool for deviation management and ensuring grid reliability.
- One example based on 24 June 2024 to 30 June 2024 data analysis for 765 kV New Ranchi-Dharamjaigad 2 circuit is provided below in tabular form where the analysis of SEM Vs SCADA revealed that New Ranchi end SCADA data need to be checked as showing high % error. Associated plots for the same is attached at **Annexure B.2.18.**

Table: SCADA Vs SEM Error Analysis for 765 kV New Ranchi-Dharamjaigad 2

Comparison	Error	Remarks
SEM vs SCADA data comparison at New Ranchi End	8.05 %	

SEM vs SCADA data comparison at Dharamjaigarh End	2.63 %	Based on the analysis of error, New Ranchi end SCADA data need to be checked as showing high percentage of error.
SCADA (New Ranchi) vs SCADA(Dharamjaigarh) data comparison	13.91%	
SEM(New Ranchi) vs SEM(Dharamjaigarh) data comparison	1.38%	

- Similar analysis based on weekly data have been shared with respective ISTS/ISGS and States for checking and correction.

ERLDC may explain. Members may update.

2.19 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.
- As per the minutes of 14th Test Meeting (Sl No. 2.35): "*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.*"
- Further **IEGC 2023, Clause 11.3** states that "*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.*"
- However, real time monitoring cross border power exchange is affected due to non reporting of SCADA data of the cited stations. BSPTCL and Bihar SLDC may share the present status/progress regarding corrective action for the data availability at ERLDC.

ERLDC may explain and BSPTCL may update. Members may deliberate.

2.20 SCADA Data Non-availability of 400/220 kV Darbhanga Substation : ERLDC
DMTCL and ATIL have shared their end root cause analysis vide email communication dtd. 5th July 2024. (Shared as Annexure 2.6). DMTCL has requested PGCIL to share their respective end RCA vide email communication dated 27th June 2024 and 5th July 2024.

ERLDC may update. Members may deliberate.

2.21 Ensuring Real-Time Data Telemetry for New/Modified Transmission and Generation Elements with ERLDC for Real time operation and SCADA/EMS Decision support tools functioning: ERLDC

- In the fiscal year **2024-25**, numerous requests have been received at ERLDC from ISTS-connected users and users under SLDC control for the integration of new or modified transmission and generation elements. However, these requests often lack ensured real-time data telemetry prior to first-time charging. Users are then providing undertakings from

their management stating that real-time data telemetry will be made available within a time-bound manner.

- ◆ ERLDC, **based on undertaking**, has allowed charging of such elements looking at impact on overall reliable grid operation and security of supply. Despite this, provided timelines in the undertaking are not being adhered to, causing significant delays. **These delays are impacting real-time operations, state estimation accuracy, and the effectiveness of the real-time contingency analysis tool within the SCADA/EMS system** at the ERLDC level.
- ◆ A list of applications received in year 2024-25 where charging has been allowed based on undertaking for data and telemetry is provided below where undertaking timelines have not been adhered to.

Applicant	FTC Application	Substation Name/Element Name	Date mentioned for compliance in Undertaking	Compliance Status
Indian Railway	Main Bays of Pusauli(PG)to Durgawati(DFCCIL)	220 kV Durgawati	SCADA (30-10-2023)	No
NTPC Barh	Startup power of 54.4 MW for Unit#3(Stage-1) NTPC Barh(660MW) through ST-3	NTPC Barh (ST-3)	SCADA (24-05-2024)	No
SLDC Bihar	Charging of 132 kV DMTCL (Motihari)-Motihari D/C tr. line after restoration of fallen and damaged towers at loc 122,123,124.	132 kV Motihari (BSPTCL)	SCADA (18.06.2024)	No
SLDC Ranchi	FTC of LILO 132KV Sonenagar-Nabinagar-Nagaruntari TL at GSS Nabinagar	132 kV Nagaruntari (JUSNL)	SCADA (02.07.2024) and VOIP (04.12.2024)	No

SLDCs, must ensure the integration of SCADA and telemetry for real-time data for grid operations at SLDC and RLDC levels as required.

- IEGC Clauses 8.2.3, 8.2.4, 11.1, 11.3
- CERC (Communication System for Inter-State Transmission of Electricity) Regulations 2017, Clause 7.8.i
- CEA (Technical Standards for Connectivity to the Grid) Regulations 2007, Clauses 6.3 and 6.5
- CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations 2022, Clauses 10.1.b, 40.1.c.i & ii, 43.4
- IEGC Clause 33.2, which mandates reliable and accurate real-time data for successful state estimation and real-time contingency analysis through the SCADA/EMS system at RLDC and SLDC levels.
  In view of the above, following actions points are envisaged by all users within ERLDC and SLDCs control areas:

- All users within the ERLDC control areas and Eastern Region State Control areas must prioritize the successful installation and integration of all communication systems, channels, and interfaces with the ERLDC/SLDC SCADA system before charging any new elements.
- Significant **lead time** should be provided for integration and checking of real time data availability at ERLDC level.
- Further, practice of allowing **charging based on undertakings** should be **discouraged** and communicated to all users within the State control areas so that they can take up the same during project implementation phase and their timely completion.
- Members may discuss these issues and the necessary steps to ensure compliance with improvement in real-time operations.

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

- The Representative of ERLDC apprised the forum that as per IEGC,2023 regulations all the generating stations & transmission licensees, must integrate SCADA & telemetry for real-time data for grid operations.
- He further mentioned that despite repeated follow-ups many users have not integrated their Data telemetry system & also data is not received at ERLDC in some cases where Users have already integrated their System with SCADA.

OCC Decision

OCC referred the matter to TeST meeting of ERPC for further deliberation.

ERLDC may update. Members may discuss.

2.22 SCADA/EMS upgradation package: ERLDC
- Upgradation of SCADA/EMS System under ULDC Phase III was taken up by POWERGRID. As reported, NIT for the same was floated on **18th July 2023**. OBD-1 was opened on **1st Nov 2023** and OBD-II was on 15 May and 27 May 2024. The package is to be approved by the committee of award (COA, POWERGRID) on **26th July 2024** and placement of award is expected by **first half of Aug 2024**.
- Considering the gravity of the AMC extension of the SCADA/EMS package POWERGRID may expedite the award process.

ERLDC and POWERGRID may update. Members may deliberate.

2.23 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 "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 and SLDCs may update. Members may deliberate.

2.24 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.

BSPTCL has already implemented SOC. All other SLDCs are requested to expedite the process for SOC Implementation.

ERLDC may explain. SLDCs may update.

2.25 Training to RLDCs including stakeholders on communication system: ERLDC

Training on communication system is required to be imparted to employees of RLDC/SLDC and other stake holders regarding various makes of communication system equipment's from OEM like Tejas, ECI, Coriant, ABB, RAD etc. as well as on cyber security for communication system & VOIP system etc. for proper planning, maintenance to enhance availability, reliability and security of data and voice to ERLDC.

ERLDC may explain. Powergrid may update.

****

Annexure B.2.1.1

Minutes of the Meeting held on 28.11.2023 among CTU, POWERGRID, Grid-India, CEA, NRPC to discuss Firewall requirement at POWERGRID Substations and Firewall architecture proposed by POWERGRID

1. A meeting was held among CTU, POWERGRID, Grid-India, CEA, NRPC on 28.11.2023 on virtual mode to discuss Firewall requirement at POWERGRID Substations and Firewall architecture proposed by POWERGRID. List of Participants is attached at **Annexure-I.**

2. At the outset, Sr. GM (CTU) welcomed all the participants in the meeting and started the meeting. Sr. GM (CTU) asked CM (CTU) to give a brief on the meeting agenda and background.

3. CM (CTU) gave a brief presentation on the meeting agenda and background, same is attached at **Annexure-II.** He explained that at present around 271 nos. of existing stations of POWERGRID does not have firewall installed for the protection of ISTS communication system. To protect ISTS communication system, firewall in High Availability (HA) mode may be installed at these substations. For installation of these firewalls a scheme shall be prepared by CTU based on the inputs provided by POWERGRID, Grid-India and CEA. The same shall be put up to the RPC for their review as per MoP guidelines and finally shall be put up for approval in NCT. The scheme shall be planned and implemented on regional basis.

4. Further a Centralized Management Console (CMC) is also proposed region wise with main and backup architecture to manage these firewalls, defining updates for Intrusion Prevention System and Intrusion Detection System.

   CTU further stated that for all the new substations in TBCB they are proposing and providing firewall specifications in the RFPs. This is also being done for generators/ bulk consumer while providing connectivity to the ISTS system.

5. CTU stated that this issue was being discussed from a long time as CEA cybersecurity guidelines mention that the utilities shall provide the desired cyber security measures of their own. However, POWERGRID stated that since they have ISTS assets, these security measures need to be discussed with all stakeholders and RPCs. CTU requested POWERGRID to present their proposed firewall architecture.

6. POWERGRID presented the architecture which is attached at **Annexure-III**. It was deliberated that changes in existing IP addresses and network may take huge investment and many other issues may arise due to this and result in an unstable system. POWERGRID stated that the proposed Firewall architecture is in bridge mode so that there is no need to change the present IP addressing scheme and network changes due to involvement of these firewalls. Further along with firewall L2 switches are proposed to keep L2 VLANs also operated in the present system.

There are type 5 type of application that has been reported, and these are being terminated on the Ethernet port of SDH so applications have been configured with IP address. However, the Gateway for these applications shall be provided at RLDC end.

POWERGRID further stated that firewall will have minimum 8x1G port and 4x10G ports shall be sufficient to fulfil the current and the future requirements with dedicated separate management port based on the input interface requirement. L2 layered switches shall be provided with 24 nos. of ethernet ports. POWERGRID also stated that if number of ports increase the cost of firewall increases abruptly despite of same through put.

7. CTU asked RLDC to provide their inputs as they are the users for all the applications e.g. SCADA, VOIP, AMR, PMU. Grid-India stated that AGC is not applicable at POWERGRID stations, POWERGRID stated that this is a generalized architecture which is showing all applications that needs to be terminated through Firewall like AGC and AMR. CTU enquired POWERGRID whether NTPC, NHPC, NPCIL etc the central sector stations, shall install firewall at their locations or POWERGRID to provide on their behalf, as communication system in these stations is installed and maintained by POWERGRID.

8. POWERGRID said that they can implement the project for POWERGID stations for ISGS stations provided review & approval by RPC/NCT. Further he stated that at new generating stations NTPC is installing FOTE at their own cost. Grid-India stated that in NTPC stations FOTE is being installed by POWERGRID under ULDC scheme.

9. CTU stated that if SW1 fails, all the services shall get disrupted, Grid-India also suggested that Switch 1 and 2 should be on Criss cross architecture so that there is no interruptions of services if one switch goes down. POWERGRID said that they will update the architecture before final proposal. Grid-India also stated that as per new 2+2 channels architecture in the diagram shall be shown as one channel to main RLDC and another channel to backup RLDC.

10. ERLDC stated that there is no need of firewall as there is no IT system involved, POWERGRID replied that if Firewall is not provided than opening a single port is equivalent to opening of 65000 ports which may become vulnerable.

11. Grid-India stated that protecting only POWERGRID stations is not the holistic solution we should involve all the STU and utilities at RPC level, CTU stated that they are mandated for planning for ISTS system however for STU deliberations may be done in the upcoming RPC meetings.

12. WRLDC stated that let the proposal may be put up for another aspect of holistic way, in a single meeting this cannot be concluded.

13. All members agreed that a POC can be done before final formulation of the scheme. POWERGRID stated that they shall take up the POC parallel. Grid- India stated that the POC can be done in all the regions for better results. POWERGRID stated that this has financial implications as in one Region OEM may do POC at their cost but five regions

this has to be discussed with OEMs. Members suggested that POC proposal may be put up in RPC forums so that decision may be taken.

14. CTU enquired about various firewall which are procured under TBCB projects of POWERGRID can be configured in the single CMC provided by POWERGRID. POWERGRID stated it is not possible to integrate other make firewall on the same CMC. Moreover, firewall of different regions and utilities are not possible to be integrated due to OEM restrictions.

15. CTU enquired about encryption possibility and MPLS suitability, POWERGRID stated that using open-source encryption protocol encryption can be done without changing anything at RLDC end, further same firewalls are suitable for MPLS also.

16. CEA stated that they don't have any additional observation but before finalization of architecture they should be communicated. CTU/POWERGRID agreed for the same.

17. Following was concluded in the meeting:
    (i)   POWERGRID shall revise the architecture and switch layout.
    (ii)   Main & Backup RLDC channel shall also be shown in the architecture.
    (iii)   A pilot project (POC) to be done before formulation of the scheme. CTU shall put the same for RPC review.
    (iv)   Funding modalities of the scheme for all ISTS/ISGS stations etc. also need to be deliberated at RPC.
    (v)   Deliberation of a similar scheme is also required at RPC for STUs and other Private ISTS licensees.

Meeting ended with vote of thanks.

List of participants

CTUIL		
1.	Sh. H.S. Kaushal	Sr. GM
2.	Sh. S. K. Gupta	Sr. DGM
3.	Sh. T. P. Verma	Ch. Manager
4.	Sh. Kaushal Suman	Manager
Power-CSIRTs, CEA		
1.	Mukesh Kumar	
2.	L K S Rathour	
POWERGRID		
1.	D. Murali Krishna	Sr. DGM
2.	Dr. Sajal Sarkar	Chief Manager
3.	Gaurav Awal	Chief manager
Grid-India/ERLDC		
1.	L. Murali Krishna	Sr. DGM
2.	Ayush Raj	
3.	Biswajit Mondal	Chief Manager
4.	Rishav Kumar	
Grid-India/WRLDC		
1.	Sh. S.K. Saha	G.M. , WRLDC
Grid-India/NRLDC		
1.	Sh. Ankur Gulati	DGM, NRLDC
Grid-India		
1	Harish Rathour	GM
2	Rajkumar	
3	Abdullah Siddique	
NRPC		
1.	Priyanka Patel	Manager
AEGCL		
1.	Arup Sarmah	

Firewall for existing POWERGRID S/s

1. At present no firewall are installed at 271 existing S/s of POWERGRID (including 12 nos. S/s of SPV) for ISTS communication. Firewall are only installed for NTAMC network at substations. Present Substation architecture attached at Fig-1.

2. For the new ISTS S/s CTU is providing Firewall requirement & specifications in the RFP of TBCB projects

3. For RE Generators and Bulk consumer those connectivity is given through ISTS network, CTU is also providing Firewall requirement

4. To protect existing substations and ISTS communication system from any cyber attack/ threat it is proposed that firewall may be installed in HA mode (dual redundancy) at these 271 nos. substations

5. Firewall placement is given in the proposed diagram at Fig-2, where firewall is to be placed between SAS gateway and FOTE of ISTS network.

6. A Centralized Management Console (CMC) is also proposed to manage these firewalls at regional level

7. There will be Main and Backup CMC and remote console at every Region to manage the firewalls

Region-wise Breakup of Firewall

NR	WR	ER	SR	NER
89	52	49	58	23

In line with the MoP Guideline of **Planning of Communication System for Inter-State Transmission System (ISTS) of dated 09.03.2022, Category-B** includes standalone project such as Cyber Security.

Under Category-B Firewall scheme can be prepared and put up for approval from NCT

Present Substation Architecture Fig-1

Proposed Firewall Placement Fig-2

IEC 60870-5-104 data

Firewall Proposed

FOTE
(SDH Eq)

HMI   DR/Engg PC   SAS Server-1   SAS Server-2

Gateway-1   Gateway-2   GPS Clock

Substation Ethernet Sw   Substation Ethernet Sw

Encryption Proposed (TBD)
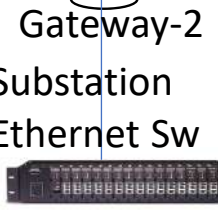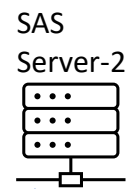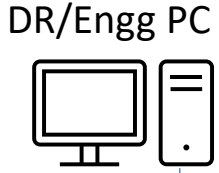
IEC 61850
Substation LAN (station bus)

Substation Level

SLDC/RLDC

Bay Level

| Bay Ethernet SW | Bay Ethernet SW | Bay Ethernet SW |

Protection IED   Protection IED   Protection IED

Control IED   Control IED   Control IED

Points to be discussed

1. Proposed draft Firewall Architecture by POWERGRID
2. Firewall Placement at existing POWERGRID Sub-Stations
3. Methodology of procurement and installation
4. Requirement of any modifications / changes at RLDC end
5. Requirement of CMC (Centralized Management Console)
6. Any Other Point

Architecture for Firewall at POWERGRID Substation

Current Network Architecture
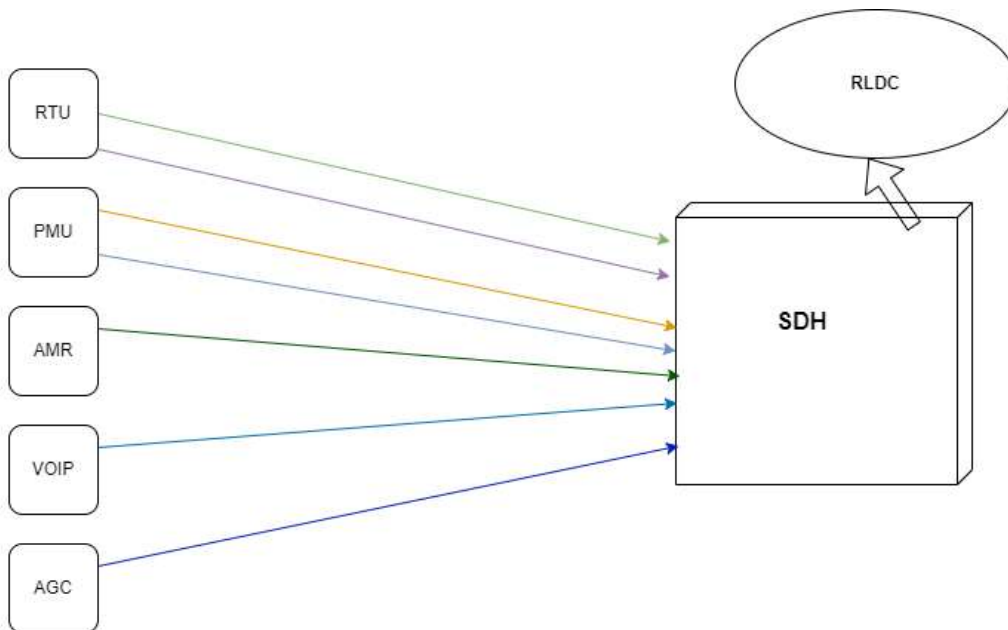
- There are total five services with seven connections terminated with SDH
- The connectivity in between services and SDH are on layer 2 of TCP/IP.
- Services are configured with IP addresses however the gateways of each services are defined at RLDC end.
- The firewalls are hosted at RLDC end, for RTU traffic only, to filter out the traffic
- There is no firewall in between at RLDC for PMU, AMR, VOIP and AGC traiffic
- The services devices are multiple and similar setup is hosted across multiple sites hence requirement is to have access control protection via firewall with minimum impact.

Proposed Network Architecture
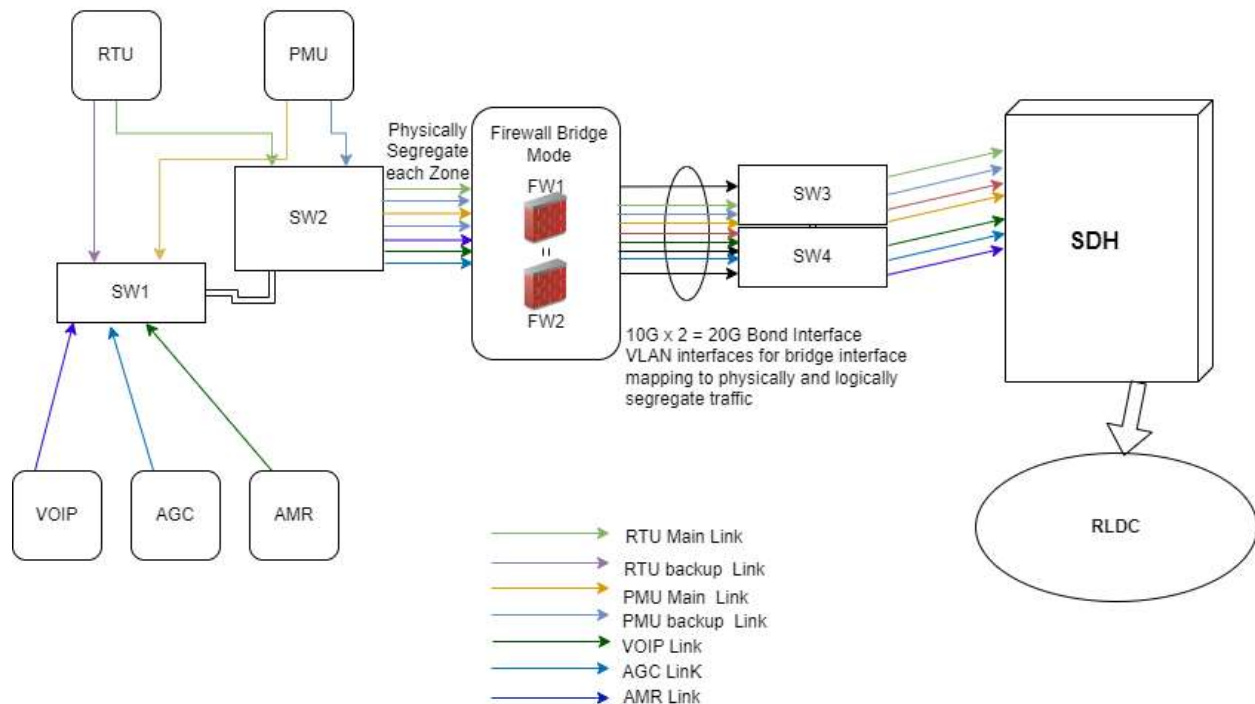
- Firewall will be deployed in HA with bridge mode with all NGTP functionalities.
- Following network zones will be created on firewall - RTU Main, RTU Backup, PMU Main, PMU backup, VOIP, AGC, AMR and one dedicated zone for Management of firewalls.
- Each Zone will be physical/logically segregated w.r.t to connectivity and data processing.
- Access control policy with IPS will be enabled to restrict and inspect the traffic.
- Dedicated Management server and Log server will be implemented at core sites and all the firewalls will be managed centrally.
- This approach may not require to change any IP address of the device.
- WAN interface of firewall will be having link aggregation to handle minimum 7 LAN interfaces.
- WAN interface Link aggregation will be created based on 10G ports to have optimal performance.
- Firewall with minimum 8 x 1G ethernet and 4 x 10G interfaces will be factored to fulfil current and future requirements with dedicated, separately management port.
- Based on interface requirement, minimum 1.5 Gbps of Next Generation Threat prevention firewall is required
- Layer-2 Managed switch with 24 ports shall be required.

AT RLDC End

Data From Various Substations on wideband Network

SDH

Sandboxing

Firewall

Firewalls in HA

Firewall

Sandboxing

RTU Data
PMU Data
VoIP Data
AMR Data
AGC Data

RTU Data
PMU Data
VoIP Data
AMR Data
AGC Data
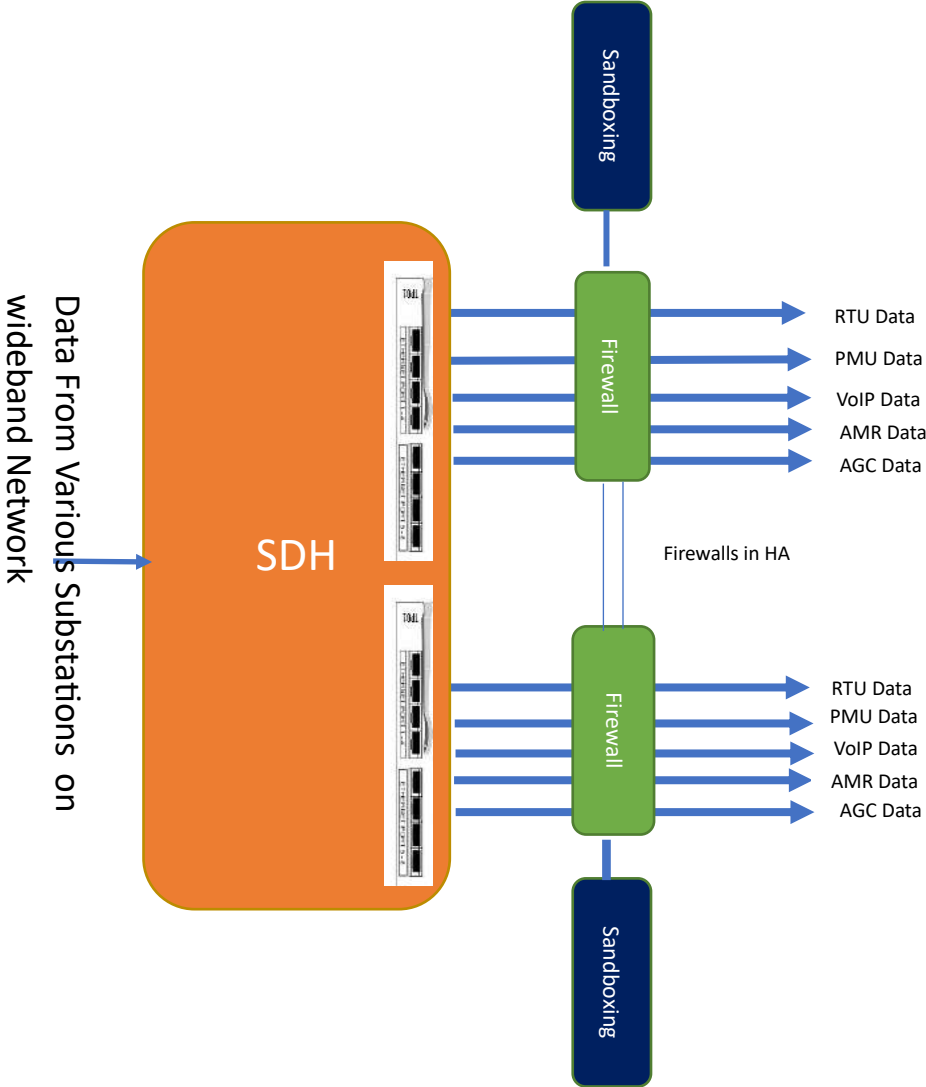
Annexure-B.2.1.2

Architecture at POWERGRID Sub Station End
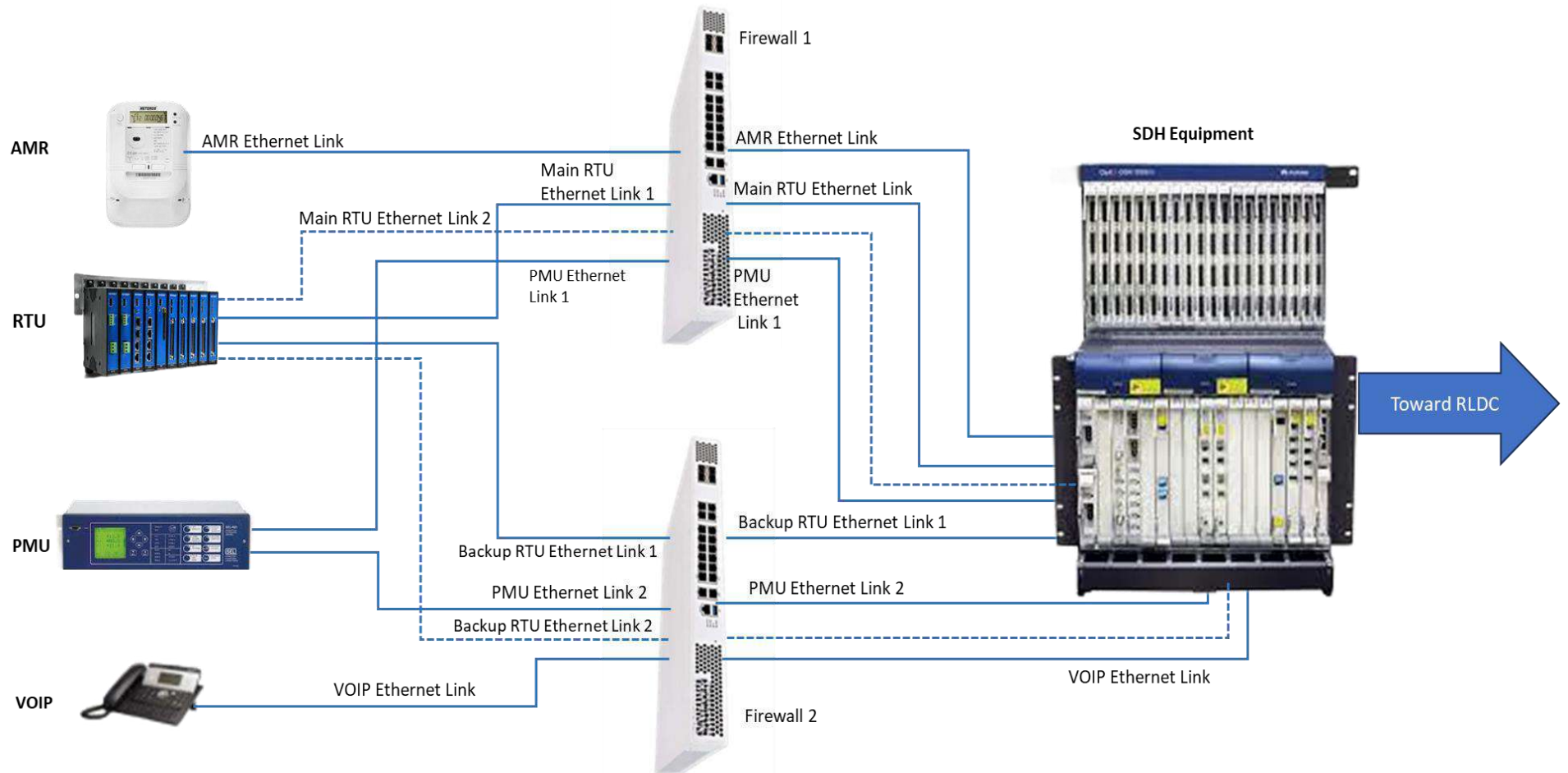
भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केंद्रीय विद्युत प्राधिकरण
Central Electricity Authority
साइबर सुरक्षा प्रभाग
Cyber Security Division

Dated: 25-06-2024

विषय : **Constitution of committee for examination and recommendation on requirement of firewall/any cyber security elements in the existing ISTS systems - reg.**

This has reference to the meeting held on 12th April, 2024 under the chairmanship of Member (Power System), CEA to discuss the issue of provisioning of Next Generation Firewall in respect of those installations where such a provision does not exist already, in Transmission Service Agreements. Finally, it was decided to constitute a committee which would examine and recommend requirement of firewall/cyber security elements in the existing ISTS system.

In this regard, it is mentioned that, all the utilities in power sector are required to follow the "CEA (Cyber Security in Power Sector) Guidelines, 2021" in order to ensure cyber security for the system. The Guidelines do not specifically mention the provision of Next Generation Firewall. However, utilities are required to ensure the deployment of Intrusion Detection System and Intrusion Prevention System capable of identifying behavioural anomaly in both IT as well as their OT Systems.

Also, formulation of Cyber Security Regulations in Power Sector, is at an advanced stage. It deals exhaustively with Intrusion Detection System and Intrusion Prevention System deployment in order to ensure cyber security.

Against the aforesaid background, it is felt that there is no necessity for constitution of aforesaid committee at this stage.

(RP Pradhan)
Chief Engineer
Cyber Security Division

To,
1. Chief Engineer, PSPA-II, CEA

Annexure-B.2.1.4

01	PURNEA (**220**)	ER-I	220/132 kV	Bihar	RTM
02	BIHARSHRIFF	ER-I	400/220kV	Bihar	RTM
03	JAMSHEDPUR	ER-I	400/220kV	Jharkhand	RTM
04	SASARAM (**765 kV**)	ER-I	765/400/220/132kV	Bihar	RTM
05	SASARAM **HVDC**	ER-I	HVDC B2B	Bihar	RTM
06	NEW PURNEA	ER-I	400/220kV	Bihar	RTM
07	ARA (**220**)	ER-I	220/132 kV	Bihar	RTM
08	MUZAFFARPUR	ER-I	400/220kV	Bihar	RTM
09	PATNA	ER-I	400/220kV	Bihar	RTM
10	RANCHI	ER-I	400/220kV	Jharkhand	RTM
11	GAYA (**765 kV**)	ER-I	765/400/220 kV	Bihar	RTM
12	BANKA	ER-I	400/132 kV	Bihar	RTM
13	RANCHI (NEW) (**765 kV**)	ER-I	765/400 kV	Jharkhand	RTM
14	LAKHISARAI	ER-I	400/132 kV	Bihar	RTM
15	CHAIBASA	ER-I	400/220kV	Jharkhand	RTM
16	KISHANGANJ (**GIS**)	ER-I	400/220kV	Bihar	RTM
17	CHANDWA (**GIS**)	ER-I	400kV	Jharkhand	RTM
18	DALTONGANJ	ER-I	400/220/132 kV	Jharkhand	RTM
19	Chandauti	ER-I	400/220/132 kV	Bihar	TBCB
20	Sitamarhi	ER-I	400/220/132 kV	Bihar	TBCB
21	BIRPARA	ER-II	220/132 kV	West Bengal	RTM
22	SILIGURI (**220**)	ER-II	220/132 kV	West Bengal	RTM
23	MALDA	ER-II	400/220/132 kV	West Bengal	RTM
24	DALKHOLA (**220**)	ER-II	220kV	West Bengal	RTM
25	DURGAPUR	ER-II	400/220kV	West Bengal	RTM
26	MAITHON	ER-II	400/220kV	West Bengal	RTM
27	NEW SILIGURI	ER-II	400/220kV	West Bengal	RTM
28	GANGTOK (**132**)	ER-II	132/66 kV	sikkim	RTM
29	SUBHASHGRAM	ER-II	400/220kV	West Bengal	RTM
30	BERHAMPUR	ER-II	400/220kV	West Bengal	RTM
31	RANGPO (**GIS**)	ER-II	400/220kV	sikkim	RTM
32	NEW MELLI (**220 kV GIS**)	ER-II	220kV	sikkim	RTM
33	ALIPURDUAR **HVDC**	ER-II	HVDC	West Bengal	RTM
34	ALIPURDUAR	ER-II	400/220kV	West Bengal	RTM
35	RAJARHAT	ER-II	400/220kV	West Bengal	RTM
36	Medinipur	ER-II	765/400 kV	West Bengal	TBCB
37	INDRAVATI	ODISHA	400kV	ODISHA	RTM
38	RENGALI	ODISHA	400/220kV	ODISHA	RTM

39	JEYPORE	ODISHA	400/220kV	ODISHA	RTM
40	ROURKELA	ODISHA	400/220kV	ODISHA	RTM
41	BARIPADA	ODISHA	400/220/132 kV	ODISHA	RTM
42	BOLANGIR	ODISHA	400/220kV	ODISHA	RTM
43	KEONJHAR	ODISHA	400/220kV	ODISHA	RTM
44	TALCHER **HVDC**	ODISHA	HVDC	ODISHA	RTM
45	JHARSUGUDA **(765 kV)**	ODISHA	765/400kV	ODISHA	RTM
46	ANGUL **(765 kV)**	ODISHA	765/400kV	ODISHA	RTM
47	PANDIABILI **(GIS)**	ODISHA	400/220kV	ODISHA	RTM
48	765/400 kV Jeerut	ER-II	765/400kV	West Bengal	TBCB
49	400/220132 kV Saharsa	ER-I	400/220/132 kV	Bihar	TBCB

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
पूर्वी क्षेत्रीय विद्युत समिति
Eastern Regional Power Committee
14, गोल्फ क्लब रोड, टालीगंज, कोलकाता-700033
14 Golf Club Road, Tollygunj, Kolkata-700033

Tel. No.:033-24239651,24239658   FAX No.:033-24239652, 24239653   Web: **www.erpc.gov.in**

सं./NO. ERPC/Op/SCADA/2024/413   दिनांक/DATE: 04.06.2024

सेवा में/To,

संलग्न सूची के अनुसार/As per list enclosed.

विषय: 28.05.2024 (मंगलवार) को आयोजित ERPC की TeST उप-समिति की विशेष बैठक का कार्यवृत्त
Sub: Minutes of Special meeting of TeST sub-committee of ERPC held on 28.05.2024 (Tuesday)

Please find enclosed **Minutes of Special Meeting of Telecommunication, SCADA & Telemetry (TeST)sub-committee of ERPC** held on **28.05.2024(Tuesday)** virtually through **Microsoft Teams online meeting** platform at **16:00** hrs for your kind information and necessary action. The same is also available at ERPC website (www.erpc.gov.in).

कृपया अपनी जानकारी और आवश्यक कार्रवाई के लिए **28.05.2024 (मंगलवार)** को **16:00** बजे **माइक्रोसॉफ्ट टीम्स ऑनलाइन मीटिंग** प्लेटफॉर्म के माध्यम से आयोजित ईआरपीसी की दूरसंचार, एससीएडीए और टेलीमेट्री (टीईएसटी) उप-समिति की विशेष बैठक के संलग्न कार्यवृत्त देखें। यह ईआरपीसी वेबसाइट (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.

04/06/2024

(S.Kejriwal)
SE(Operation)
एसई (ऑपरेशन)

LIST OF ADDRESSES:

1. CHIEF ENGINEER (ULDC), BSPTCL, PATNA, (FAX NO. 0612-2504557/2504937)
2. DY. GENERAL MANAGER, (ULDC), JUSNL, RANCHI (FAX N0. -0651 -2490486/2490863)
3. CHIEF GENERAL MANAGER, (TELECOM), OPTCL, BHUBANESWAR (FAX N0.0674-2748509)
4. GENERAL MANAGER, TTPS, TALCHER, (FAX NO. 06760-243212)
5. CHIEF ENGINEER, CLD, WBSETCL, HOWRAH, (FAX NO. 033-26886232)
6. CHIEF ENGINEER, COMMUNICATION, WBSETCL, SALT LAKE (FAX NO.: 033-23591955)
7. CHIEF ENGINEER, SLDC, DVC, HOWRAH (FAX NO. 033-2688-5094)
8. ADDL.CHIEF ENGINEER, SLDC, POWER DEPT., GOVT. OF SIKKIM, GANGTOK, (FAX NO. 03592-228186/201148/202284)
9. CHIEF ENGINEER, SLDC, DVC, MAITHON
10. EXECUTIVE DIRECTOR, ERLDC, GRID-INDIA, KOLKATA, (FAX NO. 033-2423·5809)
11. GENERAL MANAGER, FSTPP, NTPC, FARAKKA, (FAX NO. 03512-224214/226085/226124)
12. GENERAL MANAGER, KhSTPP, NTPC, KAHALGAON (FAX N0.06429-226082)
13. GENERAL MANAGER, TSTPP, NTPC, TALCHER, (FAX NO. 06760-249053)
14. EXECUTIVE DIRECTOR, POWERGRID, ER-Il, KOLKATA(Fax no: 033-23572827)
15. EXECUTIVE DIRECTOR, POWERGRID, ER-I, PATNA, (FAX N0.0612-2531192)
16. EXECUTIVE DIRECTOR, POWERGRID, ODISHA PROJECTS, SAHID NAGAR, BHUBANESWAR - 751 007
17. EXECUTIVE DIRECTOR (O&M), NHPC, FARIDABAD (FAX No.:0129-2272413)
18. GENERAL MANAGER, TEESTA -V POWER STATION, NHPC, SINGTAM, EAST SIKKIM (FAX 03592 · 247377)
19. CHIEF ENGINEER, RANGIT POWER STATION, NHPC, P.O. RANGIT NAGAR, SOUTH SIKKIM (FAX N0.03595-259268)
20. PLANT HEAD, ADHUNIK POWER & NATUARAL RESOURCES, JHARKHAND (FAX NO.: 0657·6628440)
21. AGM (OPERATION), MAITHON POWER LTD, DHANBAD (FAX: 08860004758)
22. GENERAL MANAGER (O&M), NHPC LTD, FARIDABAD, FAX: 0129-2272413
23. ASSOCIATE VICE PRESIDENT, GMR KEL, BHUBANESWAR-751007. (FAX NO: 0674-2572794)
24. SHRI D. P. BHAGAVA, CHIEF CONSULTANT (O&M), TEESTA URJA LIMITED, NEW DELHI -110 001(FAX:011 -46529744)
25. SHRI BRAJESH KUMAR PANDE, PLANT HEAD, JITPL. (FAX:011 ·26139256-65)
26. CEO, SNEHA KINETIC POWER PROJECTS PVT. LTD. #31 – A, NATIONAL HIGHWAY, BEHIND SNOD BUILDING, DEORALI, GANGTOK, SIKKIM-737102.
27. PLANT HEAD, CHUZACHEN HYDRO ELECTRIC PROJECT, GATI INFRASTRUCTURE PVT LTD, LOWER BERING KARABARI, PAKYONG, EAST SIKKIM, 737106
28. ED, DANS ENERGY PVT. LTD, 5TH FLOOR, BUILDING NO.8, TOWER-C, DLF CYBER CITY, PHASE-II, GURGAON-122002.
29. GENERAL MANAGER, STPP, NTPC, BARH.
30. DY. GENERAL MANAGER (OS), NTPC, ER-LL, N-17/2, 3-5 FLOORS, OLIC BUILDING, NEAR UNION BANK, NAYAPALLI, BHUBANESWAR, ODISHA 751012.
31. ADDITIONAL GENERAL MANAGER (OS), NTPC OFFICE COMPLEX, ER1 HQ, SHASTRI NAGAR, PATNA, BIHAR 800029
32. CHIEF ENGINEER (COMMUNICATION), DVC TOWER, CIT SCHEME VII M, ULTADANGA, KOLKATA, WEST BENGAL 700067.
33. AGM (EEMG), NABINAGAR POWER GENERATING COMPANY LTD, SHIVANPUR, P.O.-ANKORHA DIST.-AURANGABAD, STATE – BIHAR PIN -824 303
34. GENERAL MANAGER, DARBHANGA-MOTIHARI TRANSMISSION COMPANY LTD.,A-26/03,MOHAN COOPERATIVE INDUSTRIAL ESTATE,MATHURA ROAD,NEW DELHI 110044.
35. AGM (EEMG) BHARTIYA RAIL BIJLEE COMPANY LIMITED, NABINAGAR, H-TYPE OFFICE PO-PIROUTA, P.S.-KHAIRA, DISTT-AURANGABAD, BIHAR-824 303,
36. DIRECTOR (OPERATION), ODISHA POWER GENERATION CORPORATION LTD. IB THERMAL POWER STATION, BANHARPALLI, DISTRICT- JHASUGUDA ODHISA—768234

37. RUDRESHA MV, MANAGING DIRECTOR, PROJECT DELIVERY, OSI DIGITAL GRID SOLUTIONS, UNIT NO. 29, LOWER GROUND FLOOR, INTERNATIONAL TECH PARK BANGALORE(ITPB), WHITEFIELD, BANGALORE 560066

38. SHRI ANISH RAJGOPAL, DIRECTOR, M/S CHEMTROLS INDUSTRIES PRIVATE LIMITED, AMAR HILL, SAKI VIHAR ROAD, POWAI, MUMBAI – 400 072

पतों की सूची:

1. मुख्य अभियंता (यूएलडीसी), बीएसपीटीसीएल, पटना, (फैक्स नं. 0612-2504557/2504937)

2. डीवाई. महाप्रबंधक, (यूएलडीसी), जेयूएसएनएल, रांची (फैक्स नंबर -0651 -2490486/2490863)

3. मुख्य महाप्रबंधक, (दूरसंचार), ओपीटीसीएल, भुवनेश्वर (फैक्स N0.0674-2748509)

4. महाप्रबंधक, टीटीपीएस, तालचेर, (फैक्स नंबर 06760-243212)

5. मुख्य अभियंता, सीएलडी, डब्ल्यूबीएसईटीसीएल, हावड़ा, (फैक्स नंबर 033-26886232)

6. मुख्य अभियंता, संचार, डब्ल्यूबीएसईटीसीएल, साल्ट लेक (फैक्स नं.: 033-23591955)

7. मुख्य अभियंता, एसएलडीसी, डीवीसी, हावड़ा (फैक्स नंबर 033-2688-5094)

8. अपर मुख्य अभियंता, एसएलडीसी, विद्युत विभाग, शासन। सिक्किम, गंगटोक, (फैक्स नंबर 03592-228186/201148/202284)

9. मुख्य अभियंता, एसएलडीसी, डीवीसी, मैथन

10. कार्यकारी निदेशक, ईआरएलडीसी, पोसोको, कोलकाता, (फैक्स नंबर 033-2423·5809)

11. महाप्रबंधक, एफएसटीपीपी, एनटीपीसी, फरक्का, (फैक्स नंबर 03512-224214/226085/226124)

12. महाप्रबंधक, खएसटीपीपी, एनटीपीसी, कहलगांव (फैक्स नंबर 0.06429-226082)

13. महाप्रबंधक, टीएसटीपीपी, एनटीपीसी, तालचेर, (फैक्स नंबर 06760-249053)

14. कार्यकारी निदेशक, पावरग्रिड, ईआर-II, कोलकाता (फैक्स नंबर: 033-23572827)

15. कार्यकारी निदेशक, पावर ग्रिड, ईआर-एल, पटना, (फैक्स N0.0612-2531192)

16. कार्यकारी निदेशक, पावरग्रिड, ओडिशा प्रोजेक्ट्स, शहीद नगर, भुवनेश्वर - 751 007

17. कार्यकारी निदेशक (ओ एंड एम), एनएचपीसी, फरीदाबाद (फैक्स नंबर:0129-2272413)

18. महाप्रबंधक, तीस्ता-V पावर स्टेशन, एनएचपीसी, सिंगतम, पूर्वी सिक्किम (फैक्स 03592 · 247377)

19. मुख्य अभियंता, रंगीत पावर स्टेशन, एनएचपीसी, पी.ओ. रंगीत नगर, दक्षिण सिक्किम (फैक्स नंबर 03595-259268)

20. प्लांट हेड, आधुनिक पावर एवं नेचुरल रिसोर्सेज, झारखंड (फैक्स नं.: 0657·6628440)।

21. एजीएम (ऑपरेशन), मैथन पावर लिमिटेड, धनबाद (फैक्स: 08860004758)

22. महाप्रबंधक (ओ एंड एम), एनएचपीसी लिमिटेड, फरीदाबाद, फैक्स: 0129-2272413

23. एसोसिएट वाइस प्रेसिडेंट, जीएमआर केईएल, भुवनेश्वर-751007। (फैक्स नंबर: 0674-2572794)

24. श्री डी. पी. भागवा, मुख्य सलाहकार (ओ एंड एम), तीस्ता ऊर्जा लिमिटेड, नई दिल्ली -110 001 (फैक्स:011 -46529744)

25. श्री ब्रजेश कुमार पांडे, प्लांट हेड, जीतपीएल। (फैक्स:011·26139256-65)

26. सीईओ, स्नेहा काइनेटिक पावर प्रोजेक्ट्स प्राइवेट लिमिटेड। लिमिटेड #31 - ए, राष्ट्रीय राजमार्ग, स्नोड बिल्डिंग के पीछे, देवराली, गंगटोक, सिक्किम-737102।

27. प्लांट हेड, चुजाचेन हाइड्रो इलेक्ट्रिक प्रोजेक्ट, गति इंफ्रास्ट्रक्चर प्राइवेट लिमिटेड, लोअर बेरिंग कराबारी, पाकयोंग, ईस्ट सिक्किम, 737106

28. ईडी, डान्स एनर्जी प्रा. लिमिटेड, 5वीं मंजिल, बिल्डिंग नंबर 8, टावर-सी, डीएलएफ साइबर सिटी, चरण-2, गुड़गांव-122002।

29. महाप्रबंधक, एसटीपीपी, एनटीपीसी, बाढ़।

30. डीवाई. महाप्रबंधक (ओएस), एनटीपीसी, ईआर-एलएल, एन-17/2, 3-5 मंजिल, ओलिक बिल्डिंग, यूनियन बैंक के पास, नयापल्ली, भुवनेश्वर, ओडिशा 751012।

अपर महाप्रबंधक (ओएस), एनटीपीसी कार्यालय परिसर, ईआर1 मुख्यालय, शास्त्री नगर, पटना, बिहार 800029

32. मुख्य अभियंता (संचार), डीवीसी टावर, सीआईटी स्कीम VII एम, उल्टाडांगा, कोलकाता, पश्चिम बंगाल 700067।

33. एजीएम (ईईएमजी), नबीनगर पावर जनरेटिंग कंपनी लिमिटेड, शिवानपुर, पो.-अंकोढ़ा जिला-औरंगाबाद, राज्य-बिहार पिन -824 303

34. महाप्रबंधक, दरभंगा-मोतिहारी ट्रांसमिशन कंपनी लिमिटेड, ए-26/03, मोहन सहकारी औद्योगिक एस्टेट, मथुरा रोड, नई दिल्ली 110044।

35. एजीएम (ईईएमजी) भारतीय रेल बिजली कंपनी लिमिटेड, नबीनगर, एच-टाइप ऑफिस पो-पिरौटा, पी.एस.-खैरा, जिला-औरंगाबाद, बिहार-824 303,

36. निदेशक (संचालन), ओडिशा पावर जेनरेशन कॉर्पोरेशन लिमिटेड। आईबी थर्मल पावर स्टेशन, बनहरपल्ली, जिला-झासुगुड़ा ओडिशा-768234

37. रुद्रेश एमवी, प्रबंध निदेशक, परियोजना वितरण, ओएसआई डिजिटल ग्रिड समाधान, यूनिट नं। 29, निचला भूतल, इंटरनेशनल टेक पार्क बैंगलोर (आईटीपीबी), व्हाइटफील्ड, बैंगलोर 560066

38. श्री अनीश राजगोपाल, निदेशक, मेसर्स केमट्रोल्स इंडस्ट्रीज प्राइवेट लिमिटेड, अमर हिल, साकी विहार रोड, पवई, मुंबई - 400 072

ERPC: Kolkata

Minutes of Special meeting of TeST sub-committee of ERPC dated 28.05.2024

The meeting was held under the chairmanship of **Member Secretary ERPC**.

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

1. **Finalizing operational modalities of Communication Audit in Eastern region.**
   - ➢ *ERLDC put up a concise presentation highlighting salient features of the Communication Audit procedure. (**Annexure D**)*
   - ➢ *Upon detailed deliberation and consequent to feedback from the participants in the meeting, following modalities have been agreed:*
   - ○ *Communication Audit shall be carried out in following two phases:*
     - • *Scrutiny of information*
     - • *Physical verification*

   - ○ *All ER states along with Powergrid need to furnish the details of Communication Channels and Equipment by 25th June 2024 as per format enclosed. (**Annexure B**)*

   - ○ *Initially all states need to furnish details pertaining to the part of intra-state communication network being utilized for ISTS communication and respective SLDCs shall be the nodal agency in this regard. Later similar details may also be needed i.r.o. any intra-state node (not directly connected to ISTS communication) based on criticality as and when decided by the Communication Audit Sub-Group.*

   - ○ *For purpose of scrutiny of information submitted by states as well as ISTS entity, recently operationalized ER-UNMS project shall be leveraged to the maximum possible extent by the Communication Audit Committee. This shall aid in making the first phase of audit streamlined and convenient.*

   - ○ *On completion of scrutiny of documents, thereafter physical audit shall be carried out at critical nodes whose criticality shall be unanimously affirmed by the Communication Audit Committee.*

   - ○ *For physical Audit, a team of 3 members shall be formed on recommendation of the Communication Audit Committee excluding member from Auditee entity and Audit plan shall be prepared by ERPC.*

   - ➢ *The modalities may be reviewed from time to time by TeST sub-committee of ERPC based on recommendation of Communication Audit Committee. Till then, all other modalities shall be as per SOP on communication Audit circulated by NPC (**Annexure C**) and other Terms of Reference of the Communication Audit Committee shall remain unaltered as per letter dated 15.05.2024 from ERPC regarding constitution of the Audit Committee.*

2. Communication Outage planning in Eastern region.

> *ERLDC delivered a lucid presentation outlining key aspects of the Communication Outage planning procedure (**Annexure D**).*
> *Subsequent to detailed deliberation and inputs from the participants in the meeting, following modalities have been agreed:*

o *All ER entities shall submit details of availing probable outage of communication links as well as equipment within scope of the outage procedure as per format enclosed (**Annexure E**) by **25th June 2024.**These details shall correspond to the outages to be availed in for the month of July 2024.*

o *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. Confirmation of approval/rejection will be provided on D-2 basis by RLDCs in consultation with respective RPCs considering 24hrs processing window.*

o *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.*

o *Communication outage planning meeting of ER shall commence from **July 2024** for planned outages to be availed in **August 2024**.*

o *All communications regarding Communication outages shall be done to erldccomm@grid-india.in with a copy to erpcscada@gmail.com and eeop.erpc@gov.in.*

o *The modalities may be reviewed from time to time by TeST sub-committee of ERPC based on operational feedback. Till then, all other modalities shall be as per SOP on communication Outage planning circulated by NPC (**Annexure F**).*

****

Annexure A

List of Participants				
Name	**First Join**	**Last Leave**	**In-Meeting Duration**	**Role**
ERPC Kolkata	5/28/24, 4:11:	5/28/24, 5:55:17	1h 43m 27s	Organizer
BSPTCL (Unverified)	5/28/24, 4:11:	5/28/24, 4:12:31	32s	Presenter
Sr.GM(Telecom) OPTCL (Unverified)	5/28/24, 4:12:	5/28/24, 5:54:57	1h 42m 38s	Presenter
BSPTCL (Unverified)	5/28/24, 4:28:	5/28/24, 5:55:00	1h 26m 36s	Presenter
PRADHAN SOREN (External)	5/28/24, 4:28:	5/28/24, 5:55:02	1h 26m 38s	Presenter
Kaushal Suman {कौशल सुमन} (External)	5/28/24, 4:30:	5/28/24, 5:54:55	1h 24m 27s	Presenter
Roshan Jaiswal (External)	5/28/24, 4:30:	5/28/24, 5:54:56	1h 24m 10s	Presenter
SHAMBHU DAS (External)	5/28/24, 4:31:	5/28/24, 5:48:51	1h 17m 41s	Presenter
RAJESH KUMAR (External)	5/28/24, 4:31:	5/28/24, 5:54:59	1h 23m 28s	Presenter
SE, ERPC (Unverified)	5/28/24, 4:31:	5/28/24, 5:54:53	1h 23m 3s	Presenter
L. Muralikrishna, , Grid-india (Guest) (Unverified)	5/28/24, 4:33:	5/28/24, 5:55:03	1h 21m 53s	Presenter
SLDC, Ranchi (Unverified)	5/28/24, 4:33:	5/28/24, 5:55:17	1h 22m 6s	Presenter
HASIBUR RAHMAN (Unverified)	5/28/24, 4:33:	5/28/24, 5:54:56	1h 21m 38s	Presenter
BIDYUT BISWAS (External)	5/28/24, 4:33:	5/28/24, 5:55:17	1h 21m 19s	Presenter
Raj Protim Kundu (External)	5/28/24, 4:33:	5/28/24, 5:55:17	1h 21m 19s	Presenter
Amit Chowdhury(ERLDC) (Unverified)	5/28/24, 4:34:	5/28/24, 5:49:50	1h 15m 50s	Presenter
Chandan kumar (External)	5/28/24, 4:35:	5/28/24, 5:55:17	1h 20m 15s	Presenter
Santanu Rudrapal {सान्तनू रूद्रपाल} (External)	5/28/24, 4:35:	5/28/24, 5:54:52	1h 19m 27s	Presenter
Kashif Bakht Muhammad Nabi {काशिफ बख्त मुहम्म	5/28/24, 4:36:	5/28/24, 5:55:17	1h 18m 26s	Presenter
sweta (Unverified)	5/28/24, 4:36:	5/28/24, 5:55:17	1h 18m 18s	Presenter
P.Maiti (Unverified)	5/28/24, 4:38:	5/28/24, 5:55:17	1h 16m 54s	Presenter
Rahul Kumar Shakya {} (External)	5/28/24, 4:39:	5/28/24, 5:55:17	1h 15m 40s	Presenter
Tanay CTUIL (Unverified)	5/28/24, 4:39:	5/28/24, 5:55:01	1h 15m 8s	Presenter
N S MONDAL (Guest) (Unverified)	5/28/24, 4:41:	5/28/24, 5:43:53	1h 2m 15s	Presenter
Mamidi Prasad {मामिडी प्रसाद} (External)	5/28/24, 4:43:	5/28/24, 5:55:17	1h 11m 50s	Presenter
Sangita CTUIL (Unverified)	5/28/24, 4:44:	5/28/24, 5:55:17	1h 10m 57s	Presenter
ASHUTOSH KUMAR (External)	5/28/24, 4:45:	5/28/24, 5:55:17	1h 10m 9s	Presenter
PARTHA HAZRA (Unverified)	5/28/24, 4:47:	5/28/24, 5:31:40	44m 10s	Presenter
CHANDAN (External)	5/28/24, 4:49:	5/28/24, 5:38:36	49m 17s	Presenter
SLDC Ranchi (Unverified)	5/28/24, 4:53:	5/28/24, 5:41:37	48m 37s	Presenter
Nutan Mishra {नूतन मिश्रा} (External)	5/28/24, 5:08:	5/28/24, 5:55:17	46m 19s	Presenter

Annexure 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:

<u>I. SDH Equipment</u>

(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

If Yes, how is it being done?

(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

If Yes, how is it being done?

(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)

		(iii)	(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

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**   :

Source	Commissioning Date	Battery Back up (Hour)	Battery capacity (AH)	Supply Voltage (V)	Healthiness of Battery (Yes / No)	Make of Charger	Charger Capacity (A)	Periodicity of Maintenance Schedule	Date of Last 2 Actual Maintenance carried out	Remarks
1										
2										

(2)   Conformation to Compliance of CEA Standards :

V.   Healthiness of Earthing of each equipment:

Sl	Equipment	Status on Healthiness of Earthing

VI.   Details of Voice communication available between Sub-station and Control Centre:

Sl	Voice communication (Sub-station - Control Centre)	Status on Healthiness of Voice communication	Healthiness of air-conditioning of communication room as per OEM recommendation

VII.   PLCC Details:

Number of Panels	Make and Model	Direction	Frequency (Tx & Rx) KHz	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			

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 : ____ Seconds
for SCADA
(ii) Time delay in seconds from Control Centre : ____ Seconds
for WAMS

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 : _____ ms
failure of one path

XII. Any other information :

Annexure – B.2.4.2.

Revised 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 subgroup 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 Subgroup 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 **<u>Annexure-I</u>** 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.

***

Annexure-B.2.5

Revised Final Standard Operating Procedure (SoP) for Communication System Outage Planning

1. As per the following CEA and CERC Regulations, the Communication Outage for the Region shall be carried out by RPC Secretariat:

   a) Regulation 7.3 of Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017 stipulates as below:

   Quote:

   > *7.3 Role of National Power Committee (NPC) and Regional Power Committee (RPC):*
   >
   > *…………………*
   >
   > *(iv) The RPC Secretariat shall be responsible for outage planning for communication system in its region. RPC Secretariat shall process outage planning such that uninterrupted communication system is ensured.*
   >
   > *……………………*

   Unquote

   b) Regulation 10 Central Electricity Authority (Technical Standards for Communication System in Power System Operations) Regulations, 2020 notified on 27.02.2020 envisages as below:

   Quote:

   > *10. Outage Planning: Monthly outage shall be planned and got approved by the owner of communication equipment in the concerned regional power committee, as per detailed procedure finalized by the respective regional power committee.*

   Unquote

2. A Communication System Outage Planning Sub-Group/ TeST Sub Committee shall be formed in each region constituting the members from all the entities connected to ISTS including all CGS, ISGS, REGs/SPPDs/SPDs, STUs, SLDCs etc., of the respective Region, RLDC/Grid-India, PGCIL, CTUIL, Private Transmission licensees in respective region & RPC secretariat. The sub-group/ Sub Committee may co-opt any other member from any organization for facilitating the activities of the sub-group/ Sub Committee.

3. Communication System Outage Planning will be limited to the following systems:

   (i)   ISTS Communication System including ISGS

   (ii) Intra-state Communication System being utilized for ISTS Communication

   (iii) ICCP links between Main & Backup RLDCs, Main & Backup SLDCs & Main & Backup NLDCs.

   (iv) Inter-regional AGC links.

       (v)   Any other system agreed by the sub-group.

4. Communication Equipment/link within the scope of the Procedure would include :

       (i)   Optic Fibre links
       (ii)   Any other link being used for ISTS communication
       (iii)   ICCP links between Main & Backup RLDCs, Main & Backup SLDCs & Main & Backup NLDC
       (iv)   VC links between LDCs
       (v)   Inter-regional AGC links
       (vi)   SPS Links
       (vii) Tele-Protection
       (viii) AMR
       (ix)   PMU
       (x)   SDH & PDH
       (xi)   DCPC
       (xii) RTU & its CMU cards
       (xiii) DTPCs
       (xiv) Battery Banks and Charging Equipment
       (xv) EPABX
       (xvi) Any other equipment/link agreed by the sub-group

5. A Web Portal named as "Communication System Outage Planning Portal" shall be developed by respective RLDCs or a module for communication system outage planning shall be provided in the U-NMS. Log-in credentials shall be provided to all the ISTS connected entities/concerned entities.

6. Entities/Users/Owners shall add their communication links and the equipment to the Web Portal as soon as they are commissioned. The same has to be furnished to RPC Secretariat /RLDCs.

7. Entities/Users/Owners of the communication equipment shall upload the outage proposals of communication links and the equipment (in the prescribed format only) to be availed during subsequent month by 7th/8th of every month in the Web Portal.

8. RPC Secretariat consolidates the list of outage proposals received from various Entities/Users/Owners of the communication links and equipment by downloading from the Web portal and circulate the same among all the respective region entities by 15th of every month. Communication outages affecting other regions would be coordinated by respective RLDC through NLDC.

9. Communication System Outage Planning (CSOP) meeting shall be conducted during the third week of every month normally (preferably through VC) to discuss and approve the proposed outages of communication links and equipment.

10. The approved outages of Communication links and equipment in the CSOP meeting shall be published in the RPC website and respective RPCs Communication Outage Portal within 3 days from the date of CSOP meeting.

11. Outage of the approved communication links and equipment shall be availed by the respective owner /entities after confirming the same with RLDC on D-3 basis.

12. In case of any emergency outage requirement of communication links and equipment, Entities/Users/Owners may directly apply to respective RLDC with intimation to respective RPCs on D-2 basis. Confirmation of approval/rejection will be provided on D-1 basis by RLDCs in consultation with respective RPCs considering 24hrs processing window.

13. Entities/Users/Owners shall take the code from the respective RLDC before availing the planned outage of the communication links & equipment and before restoration of the same.

14. Entities/Users/Owners of the communication links and equipment shall submit the deviation report for the approved outages (approved dates & approved period) availed during the previous month and the report on planned / forced / other outage of communication links / equipment by 10th of the month to RPC Secretariat as per the format at **Annexure-I** .

15. In the monthly CSOP meetings, communication links and equipment whose outage duration (Planned / Forced / Others) more than 48 hours for the last 12 months of rolling period shall be deliberated for the measures to be taken in future for the better outage management. The date deviations and non-availing the outages that were approved in the previous CSOP meetings shall also be deliberated in the CSOP meetings.

Note: The manual for implementation of Communication System Outage Planning through web portal received from SRPC is attached at **Annexure-II** for ready reference.

***

Annexure: DCOA-I

Outage Deviation Report : List of outages of Communication Links, availed / deviated during the month of June, 2021

Dated :

A Details of Communication Links (Point to Point) availed :

SL	Name of Requesting Agency	Description of Link	Source	Destination	Channel Routing	Ownership	Reason for availing outage with the details of equipment attended	Approved Start Date : Time [dd-mm-yy<>hh:mm]	Approved End Date : Time [dd-mm-yy<>hh:mm]	Approved Outage Hours	Outage availed Start Date : Time [dd-mm-yy<>hh:mm]	Outage availed End Date : Time [dd-mm-yy<>hh:mm]	Total hours of outage availed now	Deviation ? (Y/N)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Example	Back up Control Center (BCC) : Data	KAYATHAR 230 kV SS	MADURAI LDC	Data will be availble through	TANTRANSCO	Shifting of FODB panel at Kayathar 230 KV SS	10-Mar-2021 09:00	10-Mar-2021 18:00	09:00	10-Mar-2021 14:07	10-Mar-2021 17:30	03:23	N

Annexure: DCOA-II

Outage Deviation Report : List of outages of Communication Equipment availed / deviated during the month of June, 2021

Dated :   0:00

B   Details of Communication Equipment availed :

SL	Name of Requesting Agency	Name of the communication equipment	Location of the Equipment / Name of Station	Name of the Link/Channel/Path / directions affected	Alternate Channel/Path available ? (Furnish details)	Ownership	Reason for availing outage with the details of faults	Approved Start Date : Time [dd-mm-yy<>hh:mm]	Approved End Date : Time [dd-mm-yy<>hh:mm]	Approved Outage Hours	Outage availed Start Date : Time [dd-mm-yy<>hh:mm]	Outage availed End Date : Time[dd-mm-yy<>hh:mm]	Total hours of outage availed now	Deviation ? (Y/N)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Example	DC Charger -2, Amararaja, 48v,	Edamon	Nil	Nil	KSEBL	Monthly maintenance. No interruption as alternate chargers available	16/Mar/21, 11:00	16/Mar/21, 16:00	05:00	16/Mar/21, 10:30	16/Mar/21, 16:00	05:30	Y

Annexure B.2.12

List of UFR feeders whose MW data are not available

1. Bihar SLDC

Total feeders :	33
MW not reporting at ERLDC (no of feeders):	**30**

Stage 1:

SL. No.	NAME OF GRID	CONNECTED 33 KV FEEDER	Remarks
1	132/33 KV Bari Pahari (Bihar Sharif)	Baripahari 1	Data not updating since 12th July 2024
2		Baripahari 2	
3		Sohsarai	
4		Noorsarai	
5		Asthama	
6	132/33 KV Harnaut	Harnaut	Not reporting to SLDC
7	132/33 KV Purnea	Maranga	AMC renewal issue
8		Madhubani	
9	132/33 KV Rajgir	Silao (Yet to be integrated)	

Stage 2:

SL. No.	NAME OF GRID	CONNECTED 33 KV FEEDER	Remarks
1	220/132/33 KV Fatuha grid	Fatuha	Intermittent
2		Dina Iron	
3	132/33 KV Harnaut	Charan 2	Data not updating since 12th July 2024
4	220/132/33 KV Sampatchak	Bahadurpur	Data not updating since 08th July 2024
5		Samptchak	
6	220/132/33 KV Sampatchak	KudaNawada	
7	132/33 KV Barh	Barh 2	Issue with Transducer

Stage 3:

SL. No.	NAME OF GRID	CONNECTED 33 KV FEEDER	Remarks
1	132/33 KV Mithapur grid	PESU 5 (Yet to be integrated)	ICCP mismatch
2		PESU II & IV	Issue with Transducer
3	220/132/33 KV Fatuha grid	Katra	Intermittent
4		Meena Bazar	

SL. No.	NAME OF GRID	CONNECTED 33 KV FEEDER	Remarks
5	132/33 KV Katra	Sabalpur	Data not updating since 20th June 2024
6		Karmalichak	
7		Ashoknagar	
8		Kankarbagh	

Stage 4:

SL. No.	NAME OF GRID	CONNECTED 33 KV FEEDER	Remarks
1	132/33 KV Gaighat grid	Saidpur	RTU issue
2		City Feeder	
3	132/33 KV Bari Pahari (Bihar Sharif)	Ramchandrapur	Data not updating since 12th July 2024
4	132/33 KV Harnaut	Kalyanbigha	Not reporting to SLDC
5	132/33 KV Katra	Pahari	Data not updating since 20th June 2024
6	132/33 KV Barh	Pandarak	Data not updating since 12th July 2024

2. Jharkhand SLDC

Total feeder: 18

MW not reporting at ERLDC (no of feeders):   9

Stage 1:

SL. No.	NAME OF GRID	CONNECTED FEEDER	Remarks
1	Kamdara	Kamdara	RTU issue
2	Gumla	Gumla	Link issue
3	Deoghar	Sarath	Link issue

Stage 2:

SL. No.	NAME OF GRID	CONNECTED FEEDER	Remarks
1	Garhwa	Ranka	Link issue
2	Garhwa	Bhawnathpur	Link issue
3	Deoghar	Baidyanathpur	Link issue

Stage 3:

SL. No.	NAME OF GRID	CONNECTED FEEDER	Remarks
1	Adityapur	Adityapur 1	Intermittent
2	Japla	Japla	Intermittent

Stage 4:

SL. No.	NAME OF GRID	CONNECTED FEEDER	Remarks
1	Adityapur	Adityapur 2	Intermittent

3. DVC SLDC

Total feeder: 26

MW not reporting at ERLDC (no of feeders): 5

Stage 3:

SL. No.	NAME OF GRID	CONNECTED FEEDER	Remarks
1	HAZARIBAGH	HAZARIBAGH #3	
2	HAZARIBAGH	HAZARIBAGH #4	Yet to be integrated
3	HAZARIBAGH	HAZARIBAGH #5	

Stage 4:

SL. No.	NAME OF GRID	CONNECTED FEEDER	Remarks
1	RAMGARH	Ramgarh 1	Manually updated at DVC end
2	RAMGARH	Ramgarh 2	

4. Odisha SLDC

Total feeder: 59

MW not reporting at ERLDC (no of feeders): 6

Stage 2:

SL. No.	NAME OF GRID	CONNECTED FEEDER	Remarks
1	Sunabeda	Sunabeda Laxmipur Nandpur	SAS Issues
2	Jajpur Road	Jaipur Pannikoili	SAS Issues

Stage 3:

SL. No.	NAME OF GRID	CONNECTED FEEDER	Remarks
1	Jajpur Road	JajpurRD Kuakhia	SAS Issues

Stage 4:

SL. No.	NAME OF GRID	CONNECTED FEEDER	Remarks
1	Sunabedha	Sunabeda Nandakumar	SAS Issues
2	Jajpur Road	Jajpur Anandapur 1	SAS Issues

| | 3 | Jajpur Road | 132kV Anandapur Feeder-II | SAS Issues |

5. West Bengal SLDC

Total feeder: 137

MW not reporting at ERLDC (no of feeders): 94

Stage 1:

S/S where RTU is available, but data were not available.

SL. No.	NAME OF GRID	CONNECTED FEEDER	Remarks
1	ULUBERIA	Uluberia Banitabla	MFT issues
2		Uluberia UIGC 1	
3		Uluberia UIGC 2	
4		33KV BOROGRAM	
5		Uluberia Foodpark	
6		Uluberia Skipper	
7		Uluberia Poly park	
8		Uluberia Baganda	
9		33KV GANES COMPLEX.	
10	KAKDWEEP	1. 33KV KAKDWEEP-1.	RTU Maintenance required at Site , Not reporting to WB SLDC , Integrated in their SCADA
11		2. 33KV KAKDWEEP-2.	
12		3. 33KV KULPI-1.	
13		4. 33KV KULPI-2.	
14		5. 33KV RADHANAGAR-1.	
15		6. 33KV RADHANAGAR-2.	

S/S where RTU is not available.

SL. No.	NAME OF GRID	CONNECTED FEEDER
1	NBU	1. 33KV TCF
2		2. 33KV KHARIBARI
3		3. 33KV UJANU
4		4. 11KV DURGAMANDIR
5		5. 11KV PHASIDEWA
6		6. 11KV BAGDOGRA
7	GANGARAMPUR	1. 33KV BUNIADPUR-1
8		2. 33KV BUNIADPUR-2

SL. NO.	NAME OF GRID	CONNECTED FEEDER
9		3. 33KV SALAS.
10		4. 33KV RAMPUR.
11		5. 2 X10 MVA (33/11KV) TR#1,2
12	LAKHIKANTAPUR	1. 33KV BELIACHANDI.
13		2. 33KV PATHARPRATIM.
14		3. 33KV DEULA.
15		4. 33KV JAYNAGAR-1.
16		5. 33KV JAYNAGAR-2.
17		6. 33KV U.LAKHINARAYANPUR.
18		7. 33KV JAMTALA.

Stage 2:

S/S where RTU is not available.

SL. NO.	NAME OF GRID	CONNECTED FEEDER
1	DOMJUR	1. 33KV JANGALPUR
2		2. 33KV JALADHULAGURI
3		3. 33KV MUNSIRHAT.
4		4. 2 X 10 MVA TR#1,2
5	Malda	1. 33KV SPARE EAST-1.
6		2. 33KV MILKY.
7		3. 33KV ENGLISH BAZAR-1.
8		4. 33KV SOJAPUR.
9		5. 33KV ENGLISH BAZAR-2.
10		6. 33KV MOTHABARI.
11		7. 33KV HABIBPUR.
12		8. 33KV KALIACHAK.
13		9. 33KV NARAYANPUR-1.
14		10. 33KV NARAYANPUR-2.
15		11. 33KV MANIKCHAK.
16		12. 33KV KPS.
17		13. 33KV RABINDRABHABAN.
18		14. 33KV BALIA.

Stage 3:

S/S where RTU is not available.

SL. No.	NAME OF GRID	CONNECTED FEEDER
1	LILUAH	1. 33KV KONA.
2		2. 33KV JNP.
3		3. 33KV KTT.
4		4. 33KV MKD.
5		5. 33KV BALTIKURI-1
6		6. 33KV BALTIKURI-2
7		7. 33KV LLH-1
8		8. 33KV LLH-2
9	SALTLAKE AIS	1. 33KV M5-1.
10		2. 33KV M5-2.
11	O.BISHNUPUR	1. 33KV KOTOLPUR.
12		3. 33KV SIMLAPAL.
13		4. 33KV ONDA.
14		5. 33KV BAKADAHA.
15		7. 2X10 MVA
16		8. 33KV BANKURA
17	NJP	1. 33KV RADHABARI.
18		2. 33KV RABINADRANAGAR.
19		3. 33KV DABGRAM-1
20		4. 33KV FATAPUKUR.
21		5. 2X6.3 MVA TR#1,2(33/11KV)
22		6. 33KV TINBATTI
23		7. 33KV FULBARI IP-1
24		8. 33KV FULBARI IP-2
25		9. 33KV GAZOLDOBA
26		10. 33KV DABGRAM-2
27		11. 33KV RANINAGAR
28		12. 33KV SUBHASPALLY.

Stage 4:

S/S where RTU is available, but data were not available.

SL. No.	NAME OF GRID	CONNECTED FEEDER	Remarks
1	JANGIPARA	Jangipara Jangipara	RTU Maintenance (MFT or Cable issue) required , Integrated in WB SCADA
2		Jangipara Saikhala	
3		Jangipara Singhati	
4		Jangipara T1	
5		Jangipara T2	
6	DARJEELING	1. 33KV LEBONG.	UFR disabled
7		2. 33KV HAPPY VALLEY.	
8	Siliguri	Siliguri 2	Intermittent

S/S where RTU is not available.

SL. No.	NAME OF GRID	CONNECTED FEEDER
1	RISHRA	1. 33KV RAGHUNATHPUR.
2		2. 33KV DANKUNI-1.
3		3. 33KV DANKUNI-2
4		4. 33KV KAIKALA-1
5		5. 33KV KAIKALA-2.
6		6. 4X10 MVA TR#1,2,3,4
7		7. 33KV AJODHYA.

Annexure B.2.16

RTU/SAS Upgradation/Replacement Status

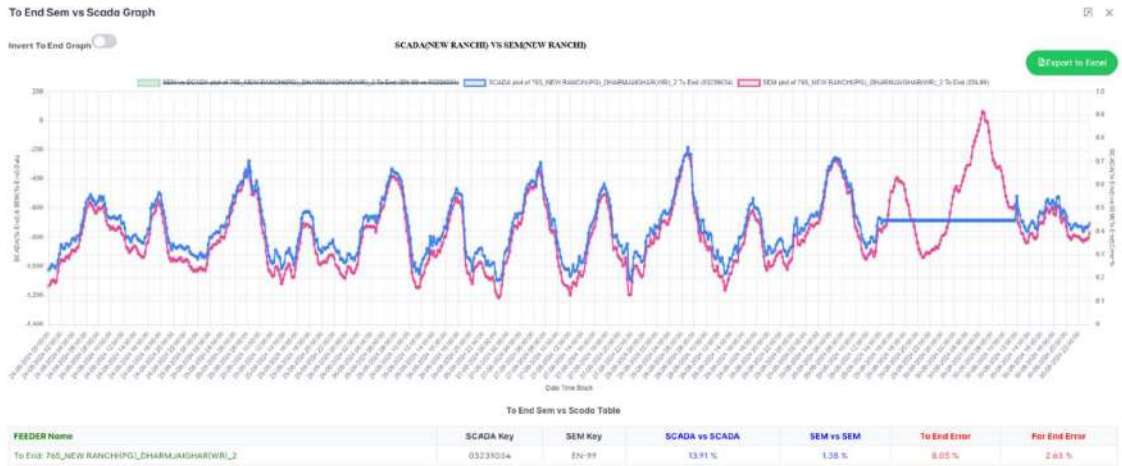| S. No	Region	Name of Substations	RTU/SAS Status	Status
1	ER-I	Biharsharif*	Siemens RTU	In progress
2	ER-I	Jamshedpur*	Siemens RTU	In progress
3	ER-I	Muzafarpur*	Siemens RTU	In progress
6	ER-I	Sasaram HVDC	Siemens RTU	In progress
4	ER-I	Purnea 400 kV	Siemens RTU	In progress
5	ER-I	Purnea 220 kV	SIEMENS make SAS	Replaced
7	ER-I	Banka	SIEMENS make SAS	Replaced
8	ER-I	Lakhisarai	SIEMENS make SAS	Replaced
9	ER-I	New Ranchi	SIEMENS make SAS	Replaced
10	ER-I	Chaibasa	SIEMENS make SAS	Replaced
11	ER-I	Sasaram 765 kV	SIEMENS make SAS	Replaced
12	ER-I	Arrah	SIEMENS make SAS	Replaced
13	ER-I	Daltongunj	SIEMENS make SAS	Replaced
14	ER-I	Chandwa	SIEMENS make SAS	Replaced
15	ER-I	Gaya	SIEMENS make SAS	Replaced
16	ER-I	Kisangunj	SIEMENS make SAS	Replaced
17	ER-II	Durgapur*	Siemens RTU	
18	ER-II	Binaguri*	Siemens RTU	In progress
19	ER-II	Subhasgram*	Siemens RTU	In progress
20	ER-II	Gangtok	Siemens RTU	Replaced
21	ER-II	Maithon	Siemens RTU	In progress
22	ER-II	Birpara	SIEMENS make SAS	Replaced
23	ER-II	Behrampur	SIEMENS make SAS	In progress
24	ER-II	Rangpo	SIEMENS make SAS	In progress
25	ER-II	New Melli	SIEMENS make SAS	Replaced
26	Orisha Project	Talcher HVDC*	Siemens RTU	
27	Orisha Project	Indravati*	Siemens RTU	In progress
28	Orisha Project	Jeypore*	Siemens RTU	In progress
29	Orisha Project	Kalabadia*	Siemens RTU	In progress
30	Orisha Project	Rengali*	Siemens RTU	In progress
31	Orisha Project	Rourkela*	Siemens RTU	
32	Orisha Project	Angul	SIEMENS make SAS	Replaced
33	Orisha Project	Bolangir	SIEMENS make SAS	Replaced
34	Orisha Project	Keonjhor	SIEMENS make SAS	Replaced
35	Orisha Project	Jharsuguda SAS	SIEMENS make SAS	Replaced
36	Orisha Project	Pandiabili	SIEMENS make SAS	Replaced

Annexure B.2.17

RTU/SAS Main & Standby Link Status

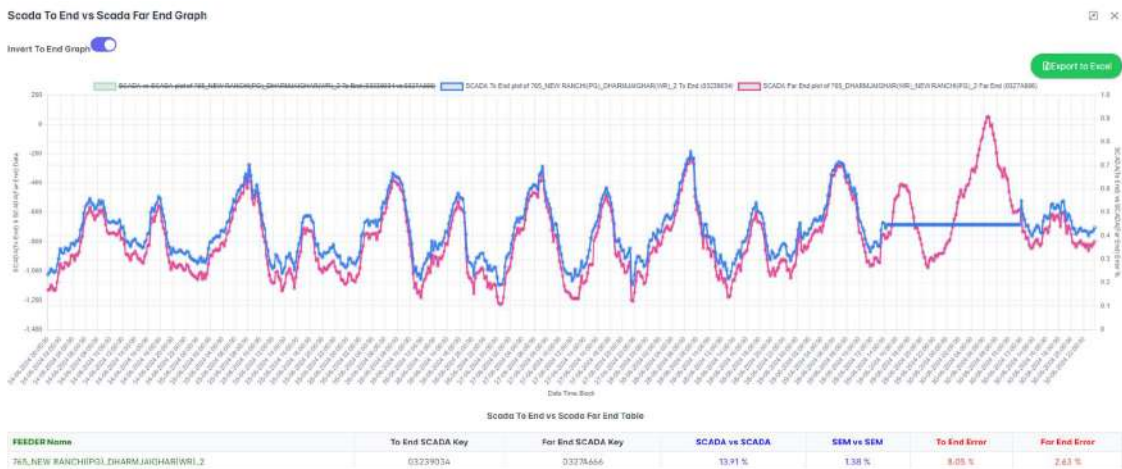| Si. No.	Resposible Entity	Station Name	Main Link Availability	Stand by Link Availability	Link Status
1	APNRL	APNRL	Up	Down	Standby link of APNRL not available since 01.06.2024
2	DANS ENERGY	TASHIDING	Up	Down	Standby link of TASHIDING not available since 01.06.2024
3	MBPCL	RONGICHU	Up	Down	Standby link of RONGICHU not available since 01.06.2024
4	NHPC	RANGIT	Up	Down	Standby link of RANGIT not available since 01.06.2024
5	NTPC	KBUNL	Up	Down	Standby link of KBUNL not available since 01.06.2024
6	NTPC	DARRLIPARLI	Up	Down	Standby link of DARRLIPARLI not available since 01.06.2024
7	NTPC	NPGC	Up	Down	Standby link of NPGC not available since 29.06.2024
8	NTPC	NEW_FARAKKA	Up	Down	Standby link of NEW_FARAKKA not available since 01.06.2024
9	NTPC	TALCHER	Up	Down	Standby link of TALCHER not available since 01.06.2024
11	NTPC	KAHALGAON	Up	Down	Standby link of KAHALGAON not available since 07.06.2024
12	PJMTL	MEDINIPUR	Up	Down	Standby link of MEDINIPUR not available since 27.07.2024
13	POWERGRID ER-I	KISHANGANJ	Up	Down	Standby links of KISHANGANJ not available since 24.06.2024

Annexure B.2.18

SCADA Vs SEM Weekly analysis plot

Name of Feeder: **765_NEW RANCHI(PG)_DHARAMJAIGARH(WR)_2**

FEEDER Name	SCADA Key	SEM Key	SCADA vs SCADA	SEM vs SEM	To End Error	Far End Error
To End: 765_NEW RANCHI(PG)_DHARMJAIGHAR(WR)_2	0323903d	EN-99	13.91 %	1.38 %	8.05 %	2.63 %

Plot: SEM vs SCADA data comparison at New Ranchi End

FEEDER Name	SCADA Key	SEM Key	SCADA vs SCADA	SEM vs SEM	To End Error	Far End Error
Far End: 765_DHARMJAIGARH(WR)_NEW RANCHI(PG)_2	0327A666	CS-04	13.91 %	1.38 %	8.05 %	2.63 %

Plot: SEM vs SCADA data comparison at Dharamjaigarh End
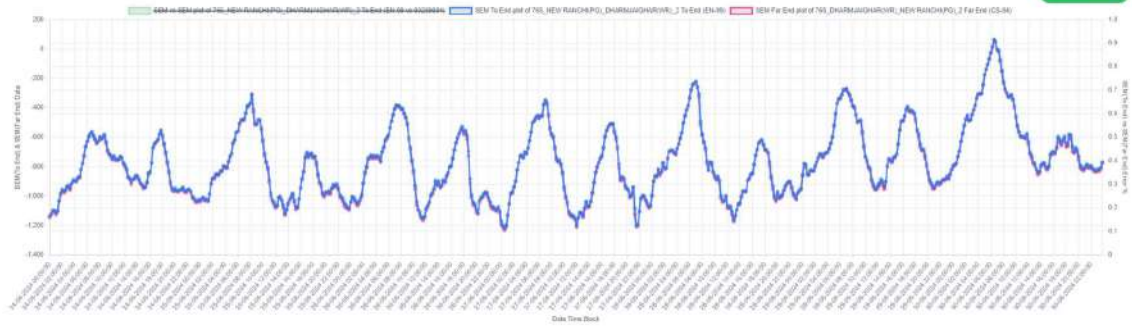
FEEDER Name	To End SCADA Key	Far End SCADA Key	SCADA vs SCADA	SEM vs SEM	To End Error	Far End Error
765_NEW RANCHI(PG)_DHARMJAIGHAR(WR)_2	0323903A	0327A666	13.91 %	1.38 %	8.05 %	2.63 %

Plot: SCADA(New Ranchi) vs SCADA(Dharamjaigarh) data comparison

Plot: SEM(New Ranchi) vs SEM(Dharamjaigarh) data comparison