सत्यमेव जयते
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
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सं. /NO. ERPC/Op/SCADA/2024/ 811 **दिनांक/DATE: 09.08.2024**

सेवा में/To,

संलग्न सूची के अनुसार/As per list enclosed.

विषय: 02.08.2024 (शुक्रवार) को आयोजित ईआरपीसी की 15वीं TeST (Telecommunication, SCADA & Telemetry) उप-समिति की बैठक का कार्यवृत्त
Sub: Minutes of 15th TeST (Telecommunication, SCADA & Telemetry)Sub-Committee Meeting of ERPC held on 02.08.2024 (Friday)

Please find enclosed **Minutes of 15th Telecommunication, SCADA & Telemetry (TeST) sub-committee meeting of ERPC** held on **02.08.2024 (Friday) physically** at **ERPC Conference Hall, Kolkata** at 10:30 hrs for your kind information and necessary action. The same is also available at ERPC website (www.erpc.gov.in).

कृपया अपनी जानकारी और आवश्यक कार्रवाई के लिए **02.08.2024 (शुक्रवार)** को **ईआरपीसी कॉन्फ्रेंस हॉल, कोलकाता** में 10:30 बजे आयोजित ईआरपीसी की **15वीं Telecommunication, SCADA & Telemetry (TeST) उप-समिति** की **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.

09/08/2024

(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)
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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)
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21. AGM (OPERATION), MAITHON POWER LTD, DHANBAD (FAX: 08860004758)
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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)
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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)
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16. कार्यकारी निदेशक, पावरग्रिड, ओडिशा प्रोजेक्ट्स, शहीद नगर, भुवनेश्वर - 751 007
17. कार्यकारी निदेशक (ओ एंड एम), एनएचपीसी, फरीदाबाद (फैक्स नंबर:0129-2272413)
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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)
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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

MINUTES

OF

15th TeST MEETING

Date: 02.08.2024

Eastern Regional Power Committee

14, Golf Club Road, Tollygunge

Kolkata: 700033

Contents

EASTERN REGIONAL POWER COMMITTEE

MINUTES OF 15th TeST MEETING HELD ON 02.08.2024(FRIDAY) AT 10:30 HRS

- *Member Secretary , ERPC chaired the 15th TeST meeting. At the outset, all participants were cordially welcomed and enquired of their specific roles in Communication system of Eastern region.*
- *CTU apprised:*
- ✓ *Role of CTU and RPC in communication planning at regional level.*
- ✓ *Resource disjoint and redundancy of communication network for route diversity in line with CERC and CEA guidelines.*
- ✓ *Comprehensive studies(POC) on interoperability between SDH technology and MPLS as well as among different OEMs of various versions of MPLS(i.e MPLS –TP and MPLS-IP) is currently being carried out before adoption of new technology in ISTS network.*
- *ERLDC underlined the following:*
- ✓ *Apart from network visualization, system study related features are also getting incorporated in upcoming SCADA/EMS system to be implemented shortly.*
- ✓ *Requirement of dedicated manpower at each SLDC for optimal utilization of new SCADA features.*
- ✓ *Significance of root cause analysis in event of major communication outages to evade frequent recurrence.*
- *TeST sub-committee suggested nomination of one regional coordinator on behalf of NTPC to seamlessly deal with all communication related issues of NTPC generating stations.(**Action:**NTPC)*
- *TeST sub-committee advised CTU to carry out the studies on applicability of MPLS technology in a time bound manner.(**Action:** CTU)*

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.

Deliberation in the meeting

Members confirmed the Minutes of 14th TeST sub-committee 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**.
- 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.

Deliberation in the meeting

CTU apprised:

- ✓ *Basic architecture and tentative modalities for supply & installation of Firewall at POWERGRID sub-stations*
- ✓ *In recent 48th COM-SR meeting, SRPC has opined to place this agenda in NPC.*

POWERGRID also suggested that this agenda may be taken up in NPC forum for discussion.

TeST decision:

- *TeST committee opined that detailed methodology of the scheme for supply and installation of firewall at the existing substations of Powergrid may be devised in line with yet to be finalized CEA regulations on cyber security.*
- *TeST committee referred the issue to NPC forum for further deliberation.*

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.

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.

Deliberation in the meeting

- *POWERGRID apprised:*
- ✓ *Upgraded RTU at Bahrampur station not being integrated to ERLDC, the POC could not be carried out at Bahrampur as advised in 14th TeST meeting. Instead, POC at Gangtok S/S has been planned.*
- ✓ *POC for RTU based Gangtok S/s is under process and its report will be submitted in a week time.*
- ✓ *New Ranchi S/S,being a SAS based station, shall also be tested for POC in upcoming two weeks.*
- ✓ *Scope of POC shall include all SCADA based applications .*
- ✓ *No additional cost implications shall be involved in carrying out this POC.*
- *ERLDC emphasized that similar POC should also be taken up for PMU, VOIP, AGC etc..*

TeST decision:

- ✓ *Powergrid was advised to carry out POC at Gangtok (RTU based station) and New Ranchi (SAS based station) within a week.*
- ✓ *POWERGRID and ERLDC were advised to submit POC reports in a week time so that the scheme may be further put up for approval in the next TeST meeting.*

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 F OTE: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.

Deliberation in the meeting

CTU submitted :

- ✓ *For MPLS roll out, PoC is being taken up by joint coordination committee (JCC) and only after successful PoC and committee report, there will be phase wise replacement of SDH technology with MPLS technology.*
- ✓ *Cost implications for this scheme shall be addressed as per execution in RTM mode.*
- ✓ *These SPOF nodes have been identified upon critical analysis of regional FO map and data received from Powergrid or concerned utilities.*
- ✓ *In this scheme, redundancy has been planned considering Single point of failure(SPOF) for multiple nodes of Eastern region.*

ERLDC submitted:

- ✓ *The redundancy may be planned for the entire ISTS backbone(including all links and nodes) rather than only SPOF nodes.*

- ✓ *The basis on which the above SPOF nodes have been selected and how deployment of additional FOTE at isolated or random nodes will serve the purpose of resource disjoint was enquired.*
- ✓ *Further the scheme was suggested to be implemented on link wise and not node basis.*

POWERGRID informed:

- ✓ *At Kasba node there is no requirement for additional FOTE.*
- ✓ *At 400kV Ranchi S/S two FOTEs are already available.*
- ➢ *Inputs of various state constituents for their requirement is as follows:*
- ✓ *SLDC Bihar representative mentioned that there is no requirement of additional FOTE at SLDC Bihar.*
- ✓ *OPTCL representative apprised that one FOTE is required at each of the nodes SLDC Odisha-Chandka-Mendhasal-Meramundali for purpose of ISTS communication.*
- ✓ *Sikkim SLDC representative was not present in meeting hence they may provide their requirement in a week time.*
- ✓ *WB SLDC representative informed that between ERLDC and Kasba node there are 10 to 12 intra-state nodes the requirement at which shall be provided in a week time.*

- ➢ *CTU stated that for the requirements provided by JUSNL:*
- ✓ *220kV Dumka S/S is a state node and hence its requirement for additional FOTE may be included in some state scheme by STU.*
- ✓ *However,requirement for SLDC Ranchi will be considered in this scheme.*

TeST decision:

- *The scheme may be planned keeping in view of the proposed MPLS technology in Power sector to optimize resource utilization.*
- *TeST committee advised CTU to convene a special meeting comprising Powergrid,ERLDC and respective states for finalizing individual requirement i.r.o SPOF nodes.*
- *CTU was advised to submit the scheme in next TCC/ERPC forum for review after finalizing requirement of all entities.*

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.

Deliberation in the meeting

TeST decision:

- *WBSETCL, Powergrid Odisha and DVC were advised to furnish relevant details (links,equipment,etc) of portions of their communication systems being utilized in ISTS communication as per specified format(**Annex-B.2.4).**Nodewise or stationwise details have to be shared at the earliest for purpose of scrutiny as per SOP on Communication audit.*
- *TeST committee opined in favour of immediate commencement of Communication audit(via physical mode) in accordance with CERC regulations on ISTS communication.*
- *TeST committee consented to the proposal of ERLDC for carrying out Communication audit at above mentioned stations in a phased manner.*

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.

Deliberation in the meeting

TeST decision:

- *Consequent to non-receipt of any requisition for planned outage of communication links or equipment, TeST committee inferred that no such planned outage shall be availed by respective ER utilities in the month of August 2024.In case any planned outage is still availed by any ER constituent, then that shall be accounted as deviation from the approved schedule of communication outage.*
- *All constituents were advised to furnish details of links/equipment outage (if any) planned in a particular month latest by 2nd week of the preceding month for necessary approval in Communication System Outage Planning meeting.The meeting shall be convened on the basis of requisition for planned outage received from respective constituents.*

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 to be noted 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 it was not possible to handle legitimate data and voice, hence data stopped reporting at ERLDC. The system was restored only after restarting all the equipment of 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 to 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.

Deliberation in the meeting

- *ERLDC submitted :*
  - ✓ *POWERGRID, ER-II has submitted the IP/MAC address for the SAS and AMR for the most of substations, but they are yet to submit details for PMU, VOIP and NMS & UNMS system etc.*
  - ✓ *However, others like POWERGRID(ER1), SLDCs, NTPC, IPPs are yet to submit any of the sought details.*

- *CTU apprised:*
  System study is already being carried out on long term basis to put up schemes related to various system constraints like congestion, redundancy at AGC and SPOF nodes, laying of OPGW etc. for strengthening the communication network and evading any telemetry outage.

- *WBSETCL updated:*

Collection of MAC details is under progress and same shall be shared with ERLDC at the earliest.

➢ *BSPTCL informed:*

✓ *Difficulty is faced in seeking the sought details from various Renewable generators in the sate which has caused inevitable delay.*

✓ *The required MAC details can easily be obtained with active cooperation from M/S Chemtrols.*

TeST decision:

- *Test committee opined in favor of maintaining a centralized database at ERLDC with collation of IP/MAC details for all end user equipment of respective utilities.*
- *Test committee directed all the utilities to furnish the IP/MAC address details as sought within a month in line with MOM of 14th TeST meeting. This will aid in early detection of issues in the communication network of Eastern region and early restoration thus improving overall reliability and availability.*
- *Moreover, Test committee advised CTU and POWERGRID to study and implement required L3 segmentation as long-term perspective to avoid recurrence of such issue in the future.*

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.

Deliberation in the meeting

- *West Bengal SLDC informed:*
  - ✓ *It is suspected that WB Communication network got down whenever AMR link is in operation, hence same link is disconnected from WB network.*
  - ✓ *As of now, AMR data is shared with ERLDC manually for commercial accounting purpose.*
- *POWERGRID submitted :*
- ✓ *The same system is in operation since last 2-3 years and no such issue happened earlier and also MAC ID (CISCO Make) is not present in any AMR network.*
- ✓ *It was proposed to provide a separate port at ERLDC for WB AMR link and other state AMR link will be disconnected during that period of data collection (normally 1 day every week). This will be interim/immediate solution, however permanent solution was proposed by TCS team.*
- *M/S TCS proposed for segmentation of entire AMR system with setting up Layer-3 Switch/Router at each State (Centralised location) to deal with this menace. POWERGRID/States has to re-configure their network for the proposed segmentation. Proposed architecture enclosed at **Annexure B.2.7***
- *POWERGRID further updated that necessary commercial implications may be given after approval of the above scheme.*

TeST decision:

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

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

POWERGRID ER-II and respective utilities may update.Members may deliberate.

Deliberation in the meeting

- *POWERGRID ER-II submitted:*

✓ *All IPPs/ISTS/ISGS have been communicated for extension of management port upto nearest PG node for integration with UNMS system. If required, concerned OEM may also be contacted by respective IPPs/ISTS/ISGS.*

TeST decision:

- *All the concerned IPPs/ ISGS were directed to extend necessary management port to the nearest ISTS node for integrating the said nodes in UNMS system.*
- *POWERGRID ER-II was advised:*

✓ *To regularly follow up with said IPPs/ISGS for integration of said nodes with UNMS system and said nodes should be integrated within a month.*

✓ *To complete integration of Chandauti and other PG nodes within a month.*

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.

Deliberation in the meeting

➢ *POWERGRID ER-II informed:*

OPGW links (length details) alongwith terminal equipment is generally mentioned during approval of any scheme and specific quantity of equipments is not mentioned as it may change during survey & BOQ finalisation or in case of presence of existing equipments.

TeST decision:

- *POWERGRID was directed to include the BOQ of end equipment viz DCPS, FOTE etc while taking the approval for OPGW links.Powergrid agreed to the same.*
- *POWERGRID was advised to give intimation in any TEST meeting after finalisation of the specific quantity/BOQ for future schemes which will be approved in upcoming ERPC/NPC.*
- *Further, for ongoing approved projects, POWERGRID was advised to furnish details of end user equipment,such as, Job completion certificate, equipment make and serial no.,etc for prior to submission of request for ToC. Later details of all such issued TOCs shall be included in subsequent TeST meetings for information to the TeST committee.*

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.

Deliberation in the meeting

❖ *Update from respective states and relevant TeST decisions are summarized as follows:*

BSPTCL

SL No.	*S/S Name*	*Last Reported*	*Informed by BSPTCL during the meeting*
1	*FATUHA_220*	*27-02-2024, Bus and Feeder Data are not reporting*	*Not reporting due to Node issue of RTU*
2	*BEGUSARAI_220*	*16-05-2024, Bus and Feeder Data are not reporting*	*Reporting- Status all reporting – Analog data partially reporting. Issue of communication cable which is rectifying at the field end*
3	*SONENAGAR_NEW_220*	*27-01-2024, Bus and Status Points are not reporting*	*Bus and Status Points are now reporting at Bihar SLDC*
4	*MUSAHARI_220*	*23-04-2024*	*Partial data were being reported at Bihar SLDC.*
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*	

- *BSPTCL was directed to take action to restore full data availability (all analog as well as status points) of above mentioned S/S at the earliest.*

JUSNL

✓ *It is intimated by JUSNL that data from Burmu substation will be available within 2 months. However , some more time will be required to make data available from other S/Ss as their communication system is under process.*

- *JUSNL was requested to expedite the process and share updated status to ERPC and ERLDC.*

OPTCL

SL No.	***S/S Name***	***Last Reported***	***Informed by OPTCL during the meeting***
1	*NALCO_220*	*21-04-2023*	*Earlier it was reporting in 101 protocol. NALCO is in the process of data transmission over IEC 104 protocol . 11 KM of OPGW link is already established. It will be completed within 3 months*
2	*BALASORE_ 220*	*26-01-2024, Bus & Status Points Data Suspected*	*All data of 220KV Balasore SAS are available at SLDC with good quality. ICCP database is to be verified at ERLDC end.*
3	*ESSAR_220*	*10-11-2021*	*RTU upgradation for data transmission over IEC 104 is under process. This matter has been already taken up with M/s Essar.*
4	*EMAMI_220*	*01-11-2021*	*Letter from CGM (Tel), OPTCL & SLDC has already been issued to EMAMI for rectification of data link to SLDC. EMAMI yet to respond.*
5	*IOCL_220*	*01-11-2021*	*Because of obsoletion of PLCC equipment, IOCL has already been given BOQ to migrate to 104 communication. Their response is awaited*
6	*TELCO_220*	*INTEGRATION ISSUE*	*220KV Telkoi SAS has been failed since dt 17.06.2023 due to GE SAS gateway issue. This matter has-been already taken up with M/s-GE*

- *OPTCL was advised to take action to restore full data availability (all analog as well as status points) of above mentioned S/S at the earliest.*

WBSETCL

SL No.	***S/S Name***	***Last Reported***	***Informed by WBSETCL during the meeting***
1	*TLDP4_220*	*28-08-2023*	*To be restored within 3 months*
2	*TLDP3_220*	*18-05-2024*	*Reporting at SLDC level*

3	*KLC_Bantala_220*	*16-07-2022*	
4	*NewCoshipur_220(CESC)*	*26-02-2024*	
5	*GAZOLE_220*	*28-08-2023*	*To be restored within 3 months*
6	*BARUIPUR_220*	*14-11-2023*	*To be restored within 3 months*

- *WBSETCL was advised to take prompt action for restoring data availability of TLDP4, Gazole & Barupur.*

✓ *ERLDC informed that data were not being reported for TLDP3, KLC_Bantala & New Coshipur. ERLDC further requested to take action so that full data of all S/S may be made available at ERLDC.*

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.

Deliberation in the meeting

➢ *POWERGRID informed:*

- *Regarding difficulty in entry at NTPC stations.*
- *Faulty GPS clock could not be taken out from NTPC Kahalgaon last time due to inadequate support from NTPC.*

TeST decision:

- *NTPC and PGCIL were advised to collaborate and resolve the issues at the earliest for Farakka and Kahalgaon substations to make data available from these PMUs.*
- *POWERGRID was advised that as per NTPC security process (along with details of visit of engineer and equipment) necessary intimation to be given in advance complying with requirements to get access for doing maintenance activities associated with restoration of PMU data.NTPC was advised to extend full co-operation in this activity and ensure taking out of faulty material from the plant for repair purpose.*
- *POWERGRID was further instructed to check the issues at other respective substations to ensure PMU data availability.*
- *ERLDC was directed to communicate with NKTL & DMTCL for PMU Data restoration works in co-ordination with POWERGRID.*

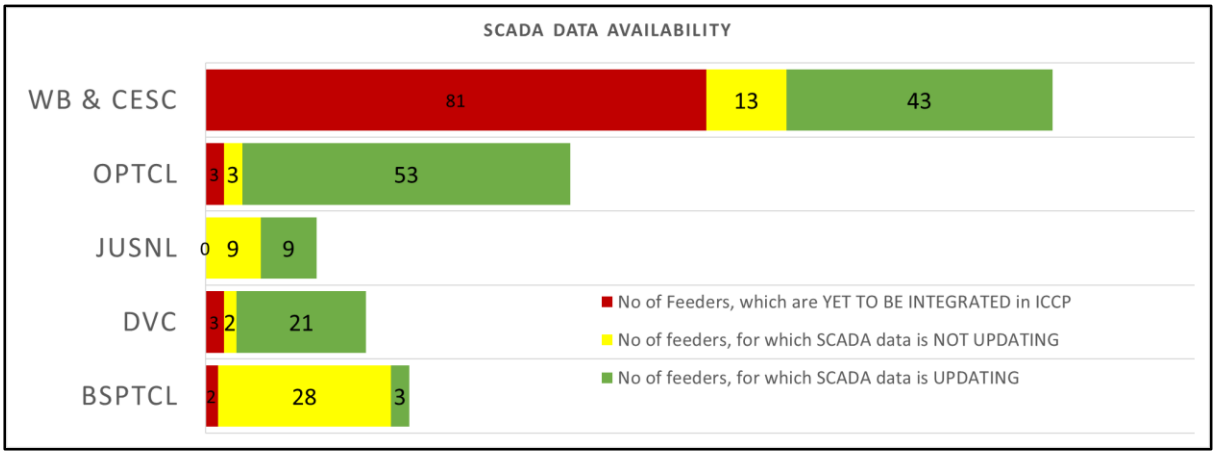
2.12 UFR integration in SCADA: ERLDC

- 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%



- 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.

Deliberation in the meeting

➢ *ERLDC submitted :*

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 always available for ensuring adequate relief under this defence scheme for maintaining grid security.To serve this purpose SCADA data availability from all UFR feeders is essential.

❖ *Update on feeder wise integration or data reporting status in SCADA and TeST decision i.r.o individual states is elaborated as follows:*

BSPTCL

SL. No.	***NAME OF STATION***	***Informed by BSPTCL during the meeting***
1	*132/33 KV Bari Pahari (Bihar Sharif)*	*Data are reporting to Bihar SLDC*
2	*132/33 KV Harnaut*	*GSS is reporting- Status of Harnaut is reporting- Analog of Harnaut is not reporting. Making needful arrangements to rectify the same as AMC of RTU is over.*
3	*132/33 KV Purnea*	*AMC renewal issue; Not integrated to Bihar SLDC*
4	*132/33 KV Rajgir*	*AMC renewal issue; Not integrated to Bihar SLDC*
5	*220/132/33 KV Fatuha grid*	*Not reporting due to Node issue of RTU. Making needful arrangements to rectify the same as AMC of RTU is over*
6	*220/132/33 KV Sampatchak*	
7	*132/33 KV Barh*	*Status reporting. MFM Issue of Barh-2 line. Making needful arrangements to rectify the same as AMC of RTU is over.*

8	*132/33 KV Mithapur grid*	*Pesu- V feeder data is Integrated. Data is reporting except circuit breaker. Rectification at the filed end shall be arranging. Data Not Reporting of Pesu-II & IV feeders. Making needful arrangements to rectify the same as AMC of RTU is over*
9	*132/33 KV Katra*	*Status reporting. MFM Issue. Making needful arrangements to rectify the same as AMC of RTU is over.*
10	*132/33 KV Gaighat grid*	*Data of station is not reporting since 01/01/2024. Making needful arrangements to check the issue at field end.*

- ✓ *BSPTCL informed that the new UFR feeders are already identified, and list will be shared with ERPC/ ERLDC shortly.*
- ✓ *BSPTCL was advised to expedite the process so that data of the UFR feeders can be made available at the earliest.*

JUSNL

- ✓ *JUSNL informed that all S/S except Kamdara are being reported through GPRS. Around 1 year will be required to make data available at these substations.*
- ✓ *JUSNL was instructed to expedite the process so that data of the UFR feeders can be made available at the earliest.*
- ✓ *JUSNL is further advised to select the S/S having better data connectivity for UFR stage 1 & 2.*

DVC

SL. No.	***NAME OF STATION***	***Informed by DVC during the meeting***
1	*HAZARIBAGH*	*Data integration issues.*
2	*RAMGARH*	*Manually updated at SLDC level.*

- ✓ *DVC was directed to expedite the process so that data of the UFR feeders can be made available at the earliest.*

OPTCL

SL. No.	***NAME OF STATION***	***Informed by OPTCL during the meeting***
1	*Sunabeda*	*SAS upgradation work is going on & will be completed within one month*
2	*Jajpur Road*	*SAS Issues & intimated to O & M wing of OPTCL to take up the matter.*

- ✓ *OPTCL was advised to expedite the process so that data of the UFR feeders can be made available at the earliest.*

WBSETCL

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

SL. No.	NAME OF STATION	Informed by WBSETCL during the meeting
1	ULUBERIA	There were MFT related issues which are solved. Data are being reported at SLDC level.
2	KAKDWEEP	33KV KAKDWEEP-2 & 33KV RADHANAGAR-2 have MFT issus. Likely to be solved by August-2024. Other feeders are being reported at SLDC level
3	JANGIPARA	RTU Maintenance (MFT or Cable issue) required , Integrated in WB SCADA. Likely to be solved by August 2024
4	DARJEELING	Likely to be solved by August 2024
5	Siliguri	Likely to be solved by August 2024

S/S where RTU is not available.

SL. No.	NAME OF STATION	Informed by WBSETCL during the meeting
1	NBU	Likely to be solved in 6 months
2	GANGARAMPUR	
3	LAKHIKANTAPUR	
4	DOMJUR	
5	Malda	
6	LILUAH	
7	SALTLAKE AIS	
8	O.BISHNUPUR	
9	NJP	
10	RISHRA	

✓ *It was informed by WBSETCL that data from approx. 50 % of the UFR feeders (having M/S Chemtrols RTU) will be made available at the earliest by changing their MFT.*

TeST decision:

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

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.

Deliberation in the meeting

Update on SCADA upgradation is provided at item no:2.23.

2.13.2 Preventive maintenance of ORANGE Exchange and status of AMC

- Any preventive maintenance was not conducted in last year in DVC.

Deliberation in the meeting

- *Powergrid submitted that M/S orange has been intimated to contact DVC withina a week in this regard .*
- *TeST committee advised Powergrid to ensure regular preventive maintenance henceforth for VOIP exchange by M/S Orange.*

2.13.3 Shortage of manpower under AMC at SLDC,DVC (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.

Deliberation in the meeting

- *M/S Chemtrols was absent in the meeting.*

DVC apprised that adequate manpower has now been deployed by M/S Chemtrols at DVC SLDC.

2.13.4 Long outage of UPS at DVC SLDC

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

Deliberation in the meeting

- *M/S Chemtrols was absent in the meeting.*
- *TeST committee advised M/S Chemtrols that the UPS under long outage at DVC SLDC must be reinstated to service at the earliest.*

2.13.5 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.

Deliberation in the meeting

Web server malfunctioning at Maithon has been sorted out as intimated by DVC.

2.13.6 Non-availability of VPS

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

Deliberation in the meeting

The issue with VPS has been resolved as confirmed by DVC.

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.

Deliberation in the meeting

CTUIL informed :

- ✓ *AMC is required by all utilities where communication equipment for reporting of data to ERLDC has been installed.*
- ✓ *AMC of communication system equipment at various nodes of ISGS/IPP lies with the ISGS/IPP. However, ISGS/IPPs may be enquired of how AMC of some communication equipment is missing at their end. Such equipment may be included in AMC by them so as to avoid any lapses in proper telemetry reporting to ERLDC.*
- ✓ *This also forms a part of the agreement signed by respective utilities. The RfP document for all the ISTS projects issued by CTU contains the clause which states that the maintenance of communication equipment is the responsibility of respective TSPs till the useful life of system.*

TeST decision:

All concerned utilities were directed for compliance to AMC requirement for communication equipment to reduce the downtime of real time SCADA data as well as to ensure early restoration.

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.

Deliberation in the meeting

- ➢ *ERLDC apprised:*
- ✓ *The availability of complete SCADA data from ISGS power plants like NTPC Farakka, for real time monitoring and control.*
- ✓ *Partial data availability is not only affecting the monitoring at Control Room but also amounting to violation of of IEGC clauses along with various communication regulations and standards.*
- ➢ *NTPC Farakka informed:*
- ✓ *SAS implementation is in process and will take approx. 18 months for completion.*
- ✓ *Works regarding data availability through existing equipment by changing faulty cards will be completed by December 2024.*

TeST decision:

TeST committee advised NTPC Farakka to expedite the process for early restoration for real time data telemetry to ERLDC through proper maintenance of existing System.

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.

Deliberation in the meeting

➢ *POWERGRID apprised:*

There is inordinate delay in commissioning of SAS/RTUs due to non-availability of shutdown by ERLDC citing system constraints/crunch period/non-consent by states,etc. since last 5-6 months. However, shutdown is being accorded this month and work is under progress.

TeST decision:

- *Test commmittee directed POWERGRID to expedite the upgradation works and complete the process at the earliest.*
- *POWERGRID was also advised to highlight the required shutdown requests with all relevant details for RTU/SAS upgradation works in monthly transmission outage coordination meetings.*

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.

Deliberation in the meeting

TeST decision:

TeST committee requested all the concerned utilities ((APNRL, DANS energy, MBPCL, Rangit (NHPC),KBUNL, Darlipali, NPGC, FARAKKA, Kahelgaon, Talcher(NTPC), Medinipur(PJMTL), Kishanganj(POWERGRID ER-I)) to take necessary actions for activation of both the links (i.e Main and Standby) latest within a month .

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

Deliberation in the meeting

- *ERLDC informed that based on the error between SCADA & SEM data, letters have been sent to all concerned utilities on weekly basis.*

TeST decision:

- *TeST forum commended the effort of SEM Vs SCADA comparison activities that aids in improving the accuracy of real time data telemetry for ensuring appropriate decision making during real time grid operation.*
- *All utilities were advised to take necessary action so that error between SCADA & SEM data can be minimized.*
- *Further, TeST committee opined that SEM Vs SCADA data comparison activities can also be taken-up by respective SLDCs so that if any issue is observed , the same can be flagged for correction and improving real time data telemetry.*

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.

Deliberation in the meeting

- *Bihar SLDC updated :*

The issue has been solved and SCADA data for 132 KV Kataiya-Duhabi Feeder ,132 KV Ramnagar-Valmikinagar Surajpura are already available with SLDC Bihar.The same shall be integrated with ERLDC shortly through ICCP.

TeST decision:

In view of significance of data reporting from trans-national tie-lines , BSPTCL was directed to integrate the said 132 kV feeders with ERLDC at the earliest.

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.

Deliberation in the meeting

- *Representatives from DMTCL & ATL were not present in the meeting.*
- *However, POWERGRID ER-I shared their Root cause analysis.*

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.

Deliberation in the meeting

- *ERLDC informed that SCADA data for NTPC Barh ST-3 has been validated.*

TeST decision:

- *TeST committee advised all concerned ER utilities to prioritize the successful installation and integration of all communication systems, channels, and interfaces with the ERLDC/SLDC SCADA system before charging of any new elements.*
- *Further, all the SLDCs were also directed to discourage the practice of allowing charging based on undertakings and the same must be communicated to all users within State control areas. This is to ensure timely completion of activities for real time data availability during project implementation phase itself .*

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.

Deliberation in the meeting

POWERGRID informed

- ✓ *NOA for the ULDC phase III works(states portion) has been issued on 02.08.2024*
- ✓ *Recommendation letter will be shared so that NOA for ERLDC portion shall be issued by Grid-India.*

ERLDC emphasized deployment of sufficient manpower (5-6 persons) at all SLDCs & POWERGRID for SCADA / EMS upgradation works so that the same can be implemented in its true spirit.

TeST decision:

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

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.

Deliberation in the meeting

- ➢ *Bihar, Odisha, DVC and Jharkhand SLDC informed that they have already upgraded their SCADA OS as per the requirement.*
- ➢ *WBSETCL informed that they are in process of upgrading their OS and will inform on the same by next TeST meeting.*
- ➢ *No representative from Sikkim SLDC was present during the meeting so status could not be updated.*

TeST decision:

All SLDCs whose SCADA OS upgradation is pending were directed to upgrade the same to latest version at the earliest in line with recommendations of Ministry of Power.

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.

Deliberation in the meeting

WB SLDC updated that board approval is pending for SOC implementation.

TeST decision:

All SLDCs (except Bihar) were requested to expedite the process for SOC Implementation.

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.

Deliberation in the meeting

TeST decision:

- *Test committee opined that detailed training on said equipment and cyber security for communication system is essential i.r.o RLDC/SLDCs/CTU/POWERGRID/IPPs/ISGS and other stake holders for proper planning as well as maintenance of Communication system.*
- *Accordingly Test committee advised CTU and POWERGRID to finalize schedule and make necessary arrangements for imparting comprehensive training to all stake holders on various makes of communication system equipment from OEMs like Tejas, ECI, Coriant, ABB, RAD etc. as well as on cyber security for communication system, VOIP system etc.*
- *Active participation from all stakeholders was advised and the training may be imparted in phase-wise manner.*

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Annex-A

Participants in 15th TeST Sub - Committee Meeting of ERPC

Venue: ERPC Conference Hall, Kolkata **Time: 10:30 Hrs.** **Date: 02.08.2024 (Friday)**

Sl. No.	Name	Designation	Organisation	Contact No.	E-mail Id	Signature
1	N S Mondal	Member Secretary	ERPC	9958389967	mserpc-power@nic.in	[signature]
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8	Bidyut Biswas	Manager (Comm)	DVC	9735327563	bidyut.biswas@dvc.gov.in	[signature]
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17	SOURAV BERA	PM (TCS)	TCS	9123801884	bera.sou@tcs.com	[signature]
18	Amit Chaudhary	Manager (SL)	ERLDC	8884072089	akchaudhary@grid-india.in	[signature]
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21	P. K. Nayak	DGM, Telecom	OPTCL	9437347287	pranab94@gmail.com	[signature]
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Participants in 15th TeST Sub - Committee Meeting of ERPC

Venue: ERPC Conference Hall, Kolkata **Time: 10:30 Hrs.** **Date: 02.08.2024 (Friday)**

Sl. No.	Name	Designation	Organisation	Contact No.	E-mail Id	Signature
23	Kaushal Suman	Ch. Mgr	CTUIL	7042396702	k.suman@powergrid.in	
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26	Basudeo Mahat	MANAGER	JUSNL	8051084040	BASU18MAY@gmail.com	
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Communication Channels and Equipments Audit Format

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

Sl	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:

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

(C) Communication System Details:

I. SDH Equipment

(1) Card Details:

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

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

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 for SCADA : ____ Seconds

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

XI. Wide Band Network :

(i) Absolute channel delay in protection applications : _____ ms

(ii) Channel delay asymmetry in protection applications : _____ ms

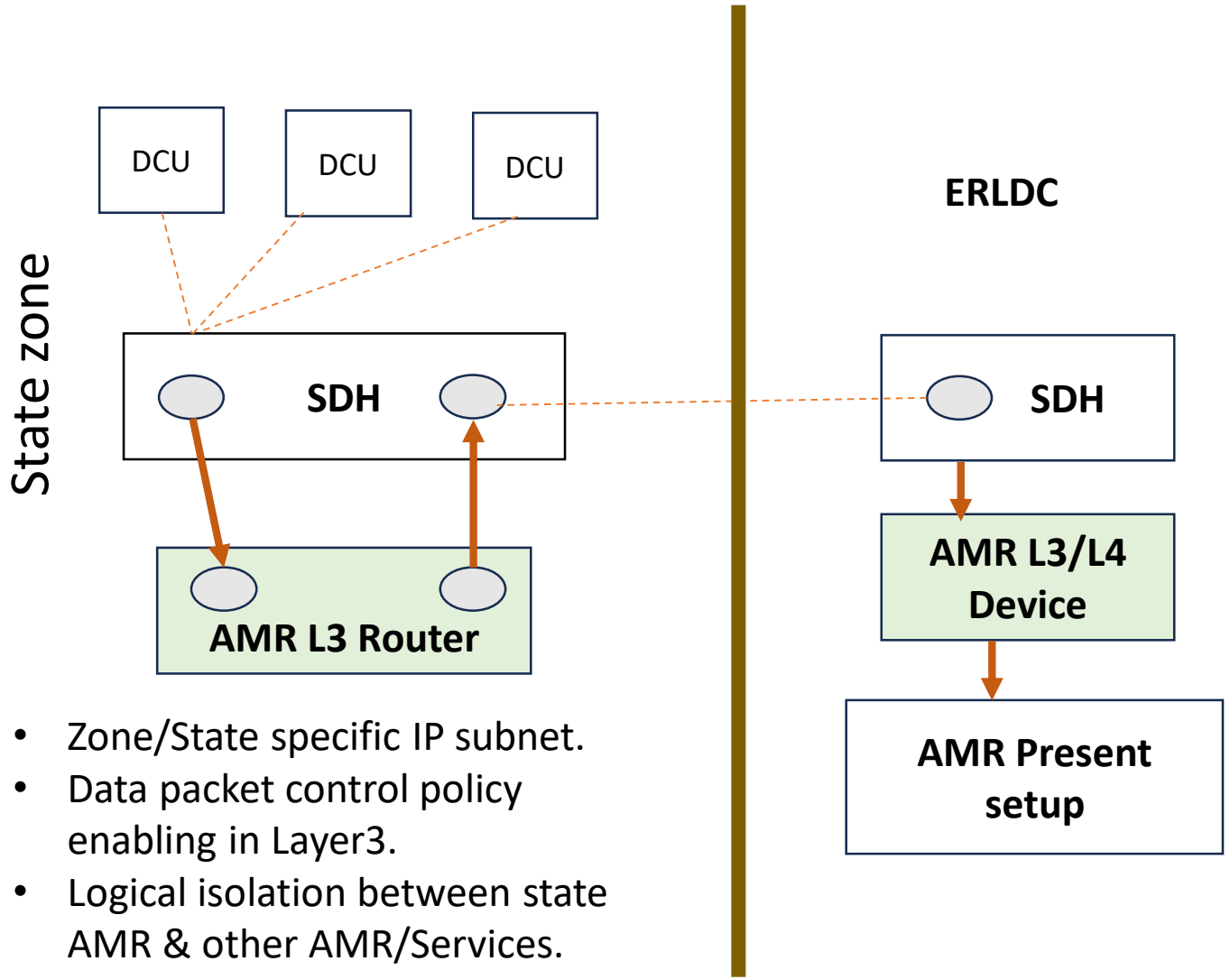
(iii) Switching Time delay to alternate path/route during failure of one path : _____ ms

XII. Any other information :

Annexure B.2.7

AMR system NW Upgradation in Layer3

Proposed Architecture



- Zone/State specific IP subnet.
- Data packet control policy enabling in Layer3.
- Logical isolation between state AMR & other AMR/Services.

- Single dropping point of AMR devices state wise.
- From state SDH to ERLDC SDH- one P2P connectivity.
- At each state Level, Layer3 device will be installed for AMR.
- Separate IP Subnet will be implemented for each state/zone.
- At ERLDC, one central Layer3/Layer4 AMR device will be installed, for central connectivity and monitoring of remote Layer3 devices.

List of Participants via online mode

Name	First Join	Last Leave	In-Meeting Duration
ERPC Kolkata	8/02/24, 10:41:5	8/02/24, 3:14:30	4h 32m 30s
Santosh Kumar {संतोष कुमार} (Exte	8/02/24, 10:59:4	8/02/24, 3:14:29	4h 14m 40s
L. Muralikrishna, Sr. DGM (Unverifi	8/02/24, 11:11:0	8/02/24, 3:14:35	4h 3m 33s
Gaurav Awal {गौरव आवल} (Externa	8/02/24, 11:18:3	8/02/24, 3:18:09	3h 59m 35s
Dr. Sanjay Kumar {डा. संजय कुमार}	8/02/24, 11:22:1	8/02/24, 3:13:41	3h 51m 24s