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

सत्यमेव जयते

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NO. ERPC/Op/SCADA/2022/ 1202 **DATE: 20.12.2022**

To,

As per list enclosed.

Sub: Minutes of 12th Telecommunication, SCADA and Telemetry (TeST) Sub-Committee Meeting held in physical mode on 09.11.2022 (Wednesday) at ERPC Conference Hall, Kolkata- reg.

Sir,

Please find the minutes of the **12th TeST** meeting of ERPC held **in physical mode on 09.11.2022 (Wednesday) at ERPC Conference Hall, Kolkata** available at ERPC website (**http://www.erpc.gov.in/**).

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

Regards,

Yours faithfully,

अलौकिक 20.XII.22

(A.De)

Executive Engineer (Operation)

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MINUTES
OF
12th TeST MEETING

Date: 20.12.2022

Eastern Regional Power Committee
14, Golf Club Road,
Tollygunge Kolkata: 700033

EASTERN REGIONAL POWER COMMITTEE

MINUTES OF 12th TeST MEETING HELD ON 09.11.2022(WEDNESDAY) AT 10:30 HRS

PART – A

Member Secretary, ERPC chaired the meeting. The list of participants is enclosed at ***Annexure A.***

ERLDC representative made a brief presentation on SCADA and cyber security. Presentation is attached at ***Annexure B.***

ITEM NO. A.1: Confirmation of Minutes of 11th TeST Meeting held on 8th April 2022 through MS Teams online platform.

The minutes of 11th Telecommunication, SCADA and Telemetry Sub-Committee meeting held on 08.04.2022 circulated vide letter dated 09.05.2022.

Members may confirm the minutes of 11th TeST meeting.

Deliberation in the meeting

Members confirmed the minutes of 11th TeST Meeting.

PART B: ITEMS FOR DISCUSSION

ITEM NO. B.1: Connectivity of radial nodes to redundant path in eastern region: CTU

As per the CEA communication planning manual clause 4.1.2 the radial ISTS nodes are required to be connected through redundant paths. In this regard CTUIL has prepared the list of nodes/ stations/generating stations, which are on radial fibre connectivity or on single communication path (PLCC/Leased line etc.) based on network study and feedback received from ERLDC, as under:

S. No.	Station Name	Paths
i	Daltonganj(PG)	Single fiber path
ii	Teesta V(NHPC)	Single fiber path
iii	RLDC Kolkata	Single fiber path
iv	Nabinagar I (BRBCL)	PLCC

A) Daltonganj (PG)

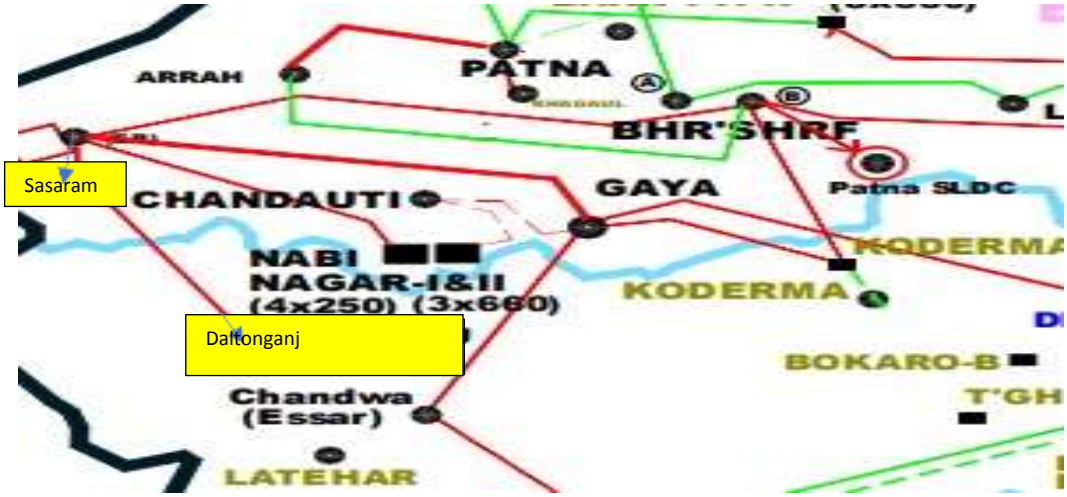
Daltonganj is connected with single fiber path through Daltonganj-Sasaram link at present.

Second path connectivity is to be planned by utilizing the state network of Daltonganj to Latehar line.

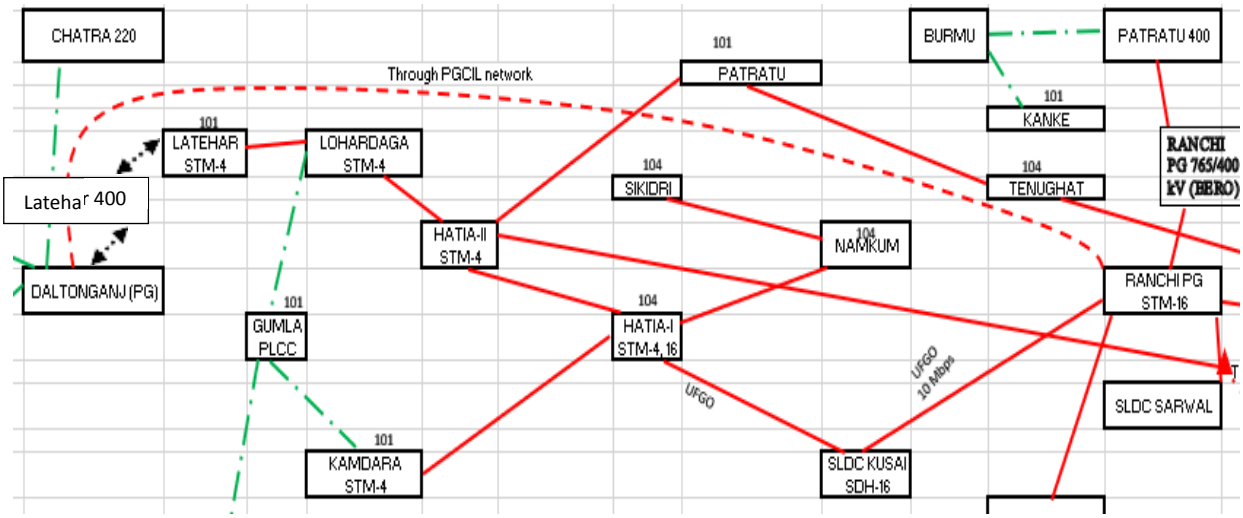
Powergrid/ERLDC stated that OPGW laying from Daltonganj (PG) to Latehar(PG) (400kV) is under implementation. However, OPGW connectivity from Latehar(PG) (400kV) to Latehar(132kV) need

to be confirmed from JUSNL. Further, OPGW connectivity from Latehar (132kV) to Ranchi via state links Hatia-II – Hatia-I – SLDC – Ranchi PG already exists and may be utilized for redundant path for Daltonganj(PG)

Connectivity of Daltonganj in FO map



Proposed FO connectivity of Daltonganj through JUSNL network



: existing OPGW

: Proposed connectivity of Daltonganj through JUSNL network.

Members may discuss.

Deliberation in the meeting

CTU representative informed that at present, Daltonganj is connected with single fiber path through Daltonganj-Sasaram link. In order to develop redundancy for Daltongunj node, second

path connectivity is to be planned by utilizing the state network of Daltonganj to Latehar line.

Representative of Powergrid informed that OPGW laying from 400kV Daltonganj (PG) to 400kV Latehar(PG) has been implemented.

On query, JUSNL representative submitted that OPGW installation work for 400kV Latehar(PG) to 132 kV Latehar had been assigned to Powergrid and status of OPGW installation may be updated by Powergrid.

Powergrid representative apprised the forum that they are facing issue in OPGW installation of 400kV Latehar(PG) to132 kV Latehar at crossing of Lathear- Lohardaga for which shutdown of Lathear- Lohardaga is required for 48 hours. Since Lohardaga is single source for Lathehar, shutdown of Lathear- Lohardaga will result in total power failure at Latehar. Hence, shutdown is not allowed and OPGW installation work is getting delayed.

After commissioning of Latehar PG to Latehar 132kv JUSNL link, it shall also be utilized for redundant path for Daltonganj(PG), Latehar(400) via Latehar 132kv to Ranchi using state links Lathear- Lohardaga-Hatia-II – Hatia-I – SLDC – Ranchi PG. JUSNL and POWERGRID agreed for the same.

TeST committee referred the issue to 197th OCC meeting.

B) 400kV Teesta V(NHPC):

Teesta V is connected with single fiber path through Teesta V -Rangpo link at present.

FO connectivity of Teesta V

It can be understood that there is no alternate transmission line present for OPGW connectivity of Teesta V on redundant path. Hence, VSAT implementation is the most suitable alternative connectivity for Teesta V node.

It is mentioned here that several locations are operational on VSAT link for data communication in NER. Further, latency for PMU data transmission and AGC shall also be deliberated.

Further, at ERLDC, location of VSAT installation may be finalized by Powergrid in consultation

with ERLDC.

Members may discuss.

Deliberation in the meeting

CTU representative informed that at present Teesta V is connected with single fiber path through Teesta V -Rangpo link. In order to increase redundancy for Teesta V node, VSAT implementation is suggested at Teesta V as there is no alternate path present for OPGW connectivity of Teesta V. He further added that similar practice is followed in NER also for some stations.

MS ERPC said that implementation of VSAT is not recommended as per cyber security guideline so it will be better to install second OPGW link on same path.

Powergrid representative informed that PMU, AGC etc. are not supported by VSAT so it is not recommended so second peak can be utilized for installing second OPGW link on same path

Further, CTU representative submitted that resource disjoint criteria are not fulfilled in case second link is implemented on single tower.

TeST committee suggested that CTU may coordinate with CEA to develop methodology/ standards to be followed for such cases in developing redundancy of communication for a particular node if alternate path is not present for that node.

C) ERLDC Kolkata

ERLDC Kolkata is connected to Kasba through telecom fiber link and ULDC fiber link. There are two different links however Kasba is a single point of connectivity. In case Kasba node is down, data to ERLDC will be lost. So, alternative connectivity to ERLDC independent of Kasba node needs to be explored.

For this alternative connectivity, below mentioned points may be considered:

Presently, there is one backbone connectivity path for ERLDC Kolkata which is as follows: Farakka to Jeerat(old) to Kasba to ERLDC Kolkata.

ERLDC informed CTUIL that CESC has agreed to spare one pair of fiber from Subhashgram(PG) to Yadavpur(CESC) S/s. However, as per practice, for ULDC purpose atleast 3 pair of fibers are required. This path from Subhashgram(PG) to Yadavpur S/s is a combination of overhead and underground fiber. For further connectivity, underground fiber cable may be laid between Yadavpur S/s to ERLDC Kolkata (dist approx. 200 mtrs).

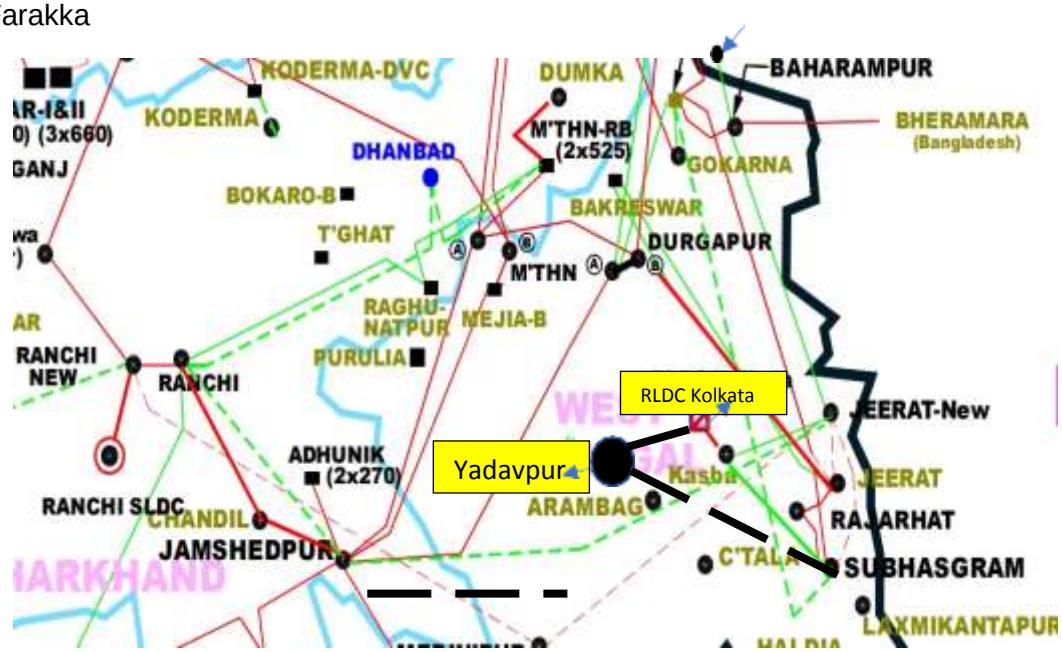
Connectivity and equipment/ports/direction availability may be checked at ERLDC and Subhashgram(PG) ends by Powergrid for this suggested redundant path by ERLDC.

For resource disjoint purpose, an additional FOTE with additional DCPS may be also installed at Kasba node. For this space availability may be ascertained by Powergrid at Kasba end.

FO connectivity of RLDC Kolkata

Farakka

:



Proposed FO connectivity of RLDC Kolkata

Members may discuss.

Deliberation in the meeting

CTU representative informed that at present there is one backbone connectivity path for ERLDC Kolkata which is Farakka to Jeerat(old) to Kasba to ERLDC Kolkata.

ERLDC representative informed that CESC had agreed to spare one pair of fiber from Subhashgram (PG) to Jadavpur(CESC) S/s so for further connectivity, underground fiber cable may be laid between Jadavpur S/s to ERLDC Kolkata so that redundant path can be created for ERLDC.

Powergrid representative informed that work is being planned taking into account request by CESC for providing redundant power supply at Subhasgram in lieu of 02 no.s fiber.

TeST committee advised Powergrid to resolve issues with CESC bilaterally and commission underground cable from Jadavpur S/s to ERLDC Kolkata at earliest.

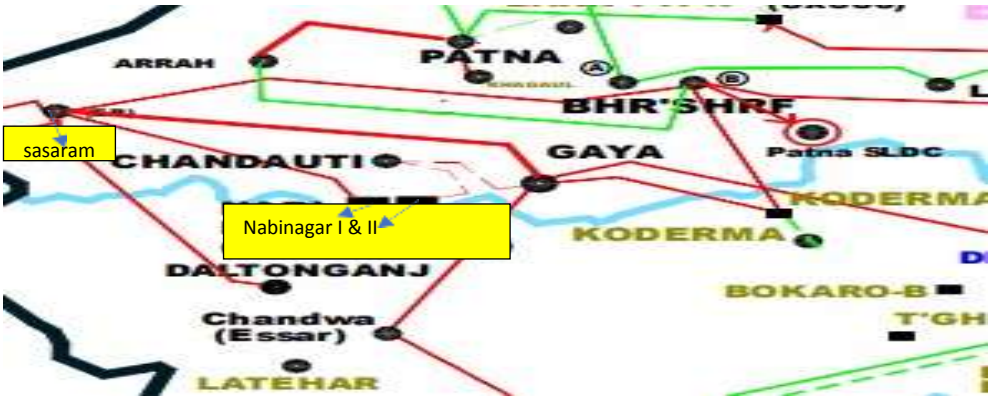
TeST committee opined that as alternate path is going to be implemented for ERLDC, so there is no need for implementation additional FOTE with additional DCPS at Kasba node.

Representative of CTU further suggested an additional path for ERLDC that is not connected with Farraka. Powergrid representative submitted that ERLDC can be connected to Jamshedpur via ERLDC- New Jeerat – Medinipur – Jamshedpur after commissioning of Medinipur- New Jeerat link. Powergrid representative further added that another project is under progress in which Durgapur will be connected to ERLDC via ERLDC- Subhasgram- Sagardighi- Durgapur.

D) Nabinagar I (BRBCL)

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

FO connectivity of Nabinagar I



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

Nabinagar II(NTPC) may update. Members may discuss.

Deliberation in the meeting

CTU representative informed that at present fiber optic link of Nabinagar I(BRBCL)-Sasaram is under implementation. He further added that in order to improve redundancy at Nabinagar I(BRBCL), NTPC may implement line connecting Nabinagar I & II.CTU representative further added that as per communication made with NTPC, NTPC is implementing agency for line connecting Nabinagar I & II and they had awarded contract to BHEL for the same however several ROW issues are being faced consequently work is getting delayed.

NTPC representative was not available in the meeting. NTPC vide email dated 09/11/2022 communicated to ERPC that job is held up due to land acquisition issue for which help is being taken from local government however issue is yet to be resolved.

TeST committee advised ERLDC to share status of line with CTU and ERPC after coordination CEA.

ITEM NO. B.2: Additional FOTE at AGC locations: CTU

Additional FOTE at all AGC operated generating stations in eastern region is required in view of resource disjoint and criticality of AGC operation for grid operation purpose.

Further, at many locations redundant ethernet ports are not available as per NLDC requirement. The requirement of NLDC is as follows:

- 1+1 Ethernet port for main NLDC.
- 1+1 Ethernet ports are for backup NLDC.

Locations are listed as below:

1)Barh-2 2) MPL 3) Kahalgaon-2 4) Teesta-V 5) Rangit 6) NPGCL 7) Farakka-II 8) Farakka-III 9) MTPS Stage-II 10) Talcher-II 11) Talcher-I 12) Barh-1

Powergrid may provide details of existing FOTE and requirement of additional ports/cards/FOTE at these AGC locations in view of above.

Members may discuss.

Deliberation in the meeting

CTU representative informed that in view of resource disjoint and criticality of AGC operation for grid operation purpose, additional FOTE need to be present at all AGC operated generating stations. He further informed that it had been observed that at many stations, redundant ethernet ports are not available as per NLDC requirement i.e. 1+1 Ethernet port for main NLDC and 1+1 Ethernet ports are for backup NLDC.

Powergrid representative informed that at Farakka, 3 FOTE is available and 4th FOTE is under supply stage and at all other generating stations mentioned in list, single FOTE is available.

TeST committee advised Powergrid to share details of existing FOTE and requirement of additional ports/cards/FOTE at these AGC locations to CTU.

ITEM NO. B.3: Connectivity of STU node on fibre in view of AMR: CTU

The meter readings from several locations (mostly STU nodes) in each region are intermittent and having communication issues as the meters at the state nodes are not having secure & reliable communication links and are operational on public domain communication links like GPRS.CTUIL requested ERLDC to furnish the list of such identified nodes so as to propose the connectivity of such nodes on captive OPGW network for receiving the data successfully.

Members may discuss.

Deliberation in the meeting

CTU representative informed that it had been observed that in several locations, link is operational on public domain communication link like GPRS which are not secure and reliable. List of such nodes for Eastern Region as prepared by NLDC is attached at ***Annexure B3****. He requested concerned utilities to provide update on these nodes regarding connectivity of such nodes on captive OPGW network for receiving the data successfully.*

OPTCL informed that OPGW connectivity as already present at GMR, Bangriposhi, Indrawati, Mendhasal, Sadeipali, OPGC, Sterllite, Balimela etc.

West Bengal representative informed that OPGW connectivity as already present in almost every node provided in list.

DVC representative informed that OPGW connectivity as already present in almost every node provided in list.

JUSNL representative informed that status of OPGW connectivity of mentioned nodes will be shared to CTU.

TeST committee advised all utilities to share status regarding OPGW connectivity of mentioned nodes to CTU at earliest.

ITEM NO. B.4: Redundant communication path for Teesta III node for connectivity to ISTS communication network

In line with MoP office order no. 15/03/2017-Trans-Pt (1) dated 09.03.2022 regarding "Guidelines on Planning of Communication System for Inter-State Transmission System (ISTS)-reg", as per clause 5 for Category (B) Communication Schemes/Packages proposed by CTUIL for upgradation/modification of existing ISTS Communication System shall be put up to RPC for their views. RPC needs to provide their views on the Schemes/Packages proposed by CTUIL within 45 days of receipt of the proposal from CTUIL.

The detailed scheme is attached at **Annexure B4.**

Members may discuss/comment.

Deliberation in the meeting

CTU representative informed that at present condition, Teesta III is connected through Teesta III – Rangpo PLCC link. First fiber path is under implementation through Teesta III – Rangpo -2. He further added that since Teesta III – Rangpo -1 is liloed at Dikchu, redundant path for Teesta III connectivity may be planned through LILO of Teesta III – Rangpo -1 for which OPGW installation is required for Teesta III – Dikchu portion having length of approximately 26 km for which approval is required.

Regarding Dikchu– Rangpo portion, he informed that OPGW had been already approved.

TeST committee agreed with the proposal and referred it to 47th TCC-ERPC for further approval.

ITEM NO. B.5: Implementation of ULDC SCADA Phase-III by Powergrid

Powergrid ER-I vide email dated 04/11/2022 submitted the following:

In the 45th ERPC meeting, implementation of Upgradation of ULDC SCADA System (Phase-III) by Powergrid for all the constituents in Eastern Region except Jharkhand (JUSNL) was approved. It was also decided that Powergrid will fund the project and the cost will be recovered through tariff as determined by CERC. The scheme shall become part of existing ULDC agreement.

Based on the meeting held between Powergrid & POSOCO dtd 08.09.2022, it was decided that Powergrid will be implementing the ULDC Phase-III SCADA/EMS upgradation project for entire Eastern Region including ERLDC.

Subsequently confirmation is required from Jharkhand SLDC (JUSNL) for:

a) Inclusion of JUSNL in the ULDC Ph-III SCADA/EMS upgradation project by Powergrid.
b) Confirmation regarding execution of the project on tariff mode as approved for other constituents.

Powergrid ER- II had added the following:

Based on the meeting held between Powergrid & POSOCO on 08.09.2022 it had been decided that the ULDC Phase-III SCADA/EMS upgradation project for entire Eastern Region including ERLDC shall be taken up by Powergrid. The mode of implementation of the project for ERLDC part to be followed by Powergrid was decided to be through consultancy basis and that it was further decided that 10% consultancy fee shall be charged for the same from ERLDC.

Therefore, confirmation is sought that the Upgradation Project of SCADA/EMS System (Phase-III) for ERLDC, shall be done by Powergrid on consultancy basis by charging 10% consultancy fee from ERLDC.

Minutes of meeting held between Powergrid and POSOCO on 08.09.2022 is attached at **Annexure B5.**

Members may discuss.

Deliberation in the meeting

JUSNL representative informed that board meeting of JUSNL is scheduled on 09/11/2022 where this agenda will be discussed regarding inclusion of JUSNL in the ULDC Ph-III SCADA/EMS upgradation project by Powergrid subsequently deliberation held in meeting will be shared to ERPC/ERLDC.

TeST committee referred agenda to 47th TCC/ERPC Meeting.

ITEM NO. B.6: Draft Procedure on Monthly Outage Planning for Communication Systems of Eastern Region

As stated, vide clause 10 of Central Electricity Authority (Technical Standards for Communication System in Power System Operations) Regulations, 2020, "*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". It is to ensure reliable speech and data communication systems on path diversified data links and data exchange /supervision / control of the grid by the NLDC, RLDC and SLDC in accordance with CERC (Communication System for Inter-State Transmission of Electricity) Regulations, 2017 and CEA (Technical Standards for Communication System in Power System Operations) Regulations, 2020.

In line with the above cited clause, ERPC has prepared a draft procedure on "Monthly Outage Planning of Communication System of Eastern Region".

The Constituents / Owners / Users of the communication equipment/links are requested to go through the attached procedure **(Annexure-B6.1)** and formats **(Annexure-B6.2)** and to suggest for improvement / modification of the procedure and formats, if any, by 25.06.2021 so that the final procedure and formats can be circulated to all Constituents / Owners / Users of the communication equipments/links.

In 9thTeST Meeting, ERLDC and Powergrid representatives informed that they would provide their observations on the draft procedure by 25.06.2021.

Test Committee advised all utilities to provide their observations to ERPC latest by 25.06.2021 so that the procedure can be finalized.

In 10th TeST Meeting, ERLDC representative submitted that it would be better if the constituents can provide list of all communication equipment/ link so that outage planning for communication equipment/links can be done in an efficient way.

TeST Committee advised ERLDC to share a format to all the concerned utilities so that requisite require details can be shared by them by the end of November'2021.

Powergrid representative submitted that as per the procedure on monthly outage planning for communication system, it is mentioned that RTU, CMU cards, Battery Bank, DTPC, DCPC, EPABX details are also required for outage planning, however, these are SCADA related equipment and may not be counted as communication equipment/link so their details need not be required for monthly outage planning.

ERPC advised Powergrid to provide their observations to ERPC at the earliest.

TeST Committee advised all concerned utilities to share requisite details to ERPC/ELDC in the format shared by ERLDC.

In 11th TeST Meeting, ERLDC representative informed that requisite details had not been received till date from any constituents.

Powergrid representative submitted that as per the procedure on monthly outage planning for communication system, it is mentioned that RTU, CMU cards, Battery Bank, DTPC, DCPC, EPABX details are also required for outage planning, however, these are SCADA related equipment and may not be counted as communication equipment/link so their details need not be required for monthly outage planning.

On query, CTU representative clarified that if battery bank is linked with communication equipment and outage is resulted due to failure of battery bank then it may be considered for monthly outage planning. However, RTU, SAS etc are SCADA related equipment and these may not be considered for monthly communication outage planning. He further submitted that irrespective of outage of particular communication equipment, outage planning is to be considered if there is complete outage and data do not report to SLDCs/RLDC as it may be possible that particular equipment like battery bank is down however data is responding to SLDCs/RLDC through alternate way.

ERPC representative informed that these details are required for monthly outage planning not for communication availability calculation. He further informed that meeting would be held on monthly basis to plan outage for communication system.

Members may update.

Deliberation in the meeting

ERPC representative informed that monthly outage planning for communication system is divided in two parts where in first part monthly outage planning for links is discussed while in second part/list monthly outage planning for equipment is discussed. He further added that outage of battery bank, DTPC, DCPC etc may be discussed in the outage planning of equipment.

MS ERPC opined that there should be a uniform format for monthly outage planning across all the RPCs. Also, the list of equipment for outage planning needs to be standardized. for equipment. He further suggested that a special meeting may be convened in this regard so that outage planning meeting for communication system can be started at the earliest.

ITEM NO. B.7: Periodic Audit for Communication system in line with CERC regulation and Guidelines

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

Accordingly an audit procedure was prepared by ERPC and in 43rd TCC Meeting, TCC accepted the procedure for periodic audit for communication system.

In 9thTeST Meeting, TeST Committee advised ERLDC to share the formats to all the concerned utilities so that they can submit the requisite details for initiation of Phase –I of Audit i.e., scrutiny of information. All utilities are advised to furnish the detailed information to ERPC and ERLDC at the earliest.

Also, ERPC Secretariat should constitute a Communication System Audit Sub-Group comprising one member each from ERPC, ERLDC, CEA and One of the Eastern Region SLDCs who will scrutinize all the information received and identify the nodes for physical inspection. TeST Committee advised SLDC Bihar (chosen alphabetically), ERLDC and ERPC to nominate one person each from their respective organizations for this Phase-I of Audit.

For Phase-II of Audit, ERPC Secretariat would constitute the Audit committees for various utilities based on the recommendations of the sub-group and the nodes for physical inspection. The audit should be carried out in a planned manner by a team of three auditors.

Further TeST Committee advised all the utilities to follow the guidelines for utilization of Inter-state OPGW network to prevent any interruption in the availability of services.

In 10th TeST Meeting, TeST Committee suggested that Powergrid may be included as a part of Communication System Audit Sub-Group for Phase-I of audit. TeST Committee further opined that consultation from CEA can be taken, if required. TeST Committee advised SLDC Bihar (chosen alphabetically), ERLDC, ERPC and Powergrid to nominate one person each from their respective organizations for this Phase-I of Audit.

In 11th TeST Meeting, TeST committee advised concerned utilities to furnish the requisite details to ERPC and ERLDC as per given format by April 2022.

BSPTCL representative informed that details would be shared by April 2022.

Powergrid representative informed that details would be shared by April 2022.

DVC representative requested ERLDC to provide format for which ERLDC replied that they would share format to all utilities once again.

TeST committee informed that Phase-I of audit would be started once the details are received from all utilities.

Members may update/discuss.

Deliberation in the meeting

TeST committee informed that Phase-I of audit would be started once the details are received from all utilities.

ITEM NO. B.8: Telemetry outage of Farakka STPS: ERLDC

Farakka STPS has upgraded their old RTU to report it over IEC 104 protocol during the month of April-2021. On completion of upgradation of the said RTU, most of the data from Farakka STPS were not updating at ERLDC. Even after continuous persuasion with Farakka STPS, around 50 nos. of digital and 25 nos. of Analog data are yet to be reported at ERLDC. Telemetry of 4 nos. line bays namely Rajarhat, New Purnea, Berhampur I & II (owned and maintained by Powergrid) are reporting on temporary arrangements for MW value only, balance analog and digital data are not reporting.

Further the Real Time Telemetry for Farakka STPS is highly intermittent in nature and this issue is persisting since long. NTPC Farakka had been requested repeatedly but the matter is yet to be resolved.

NTPC may update.

Deliberation in the meeting

NTPC representative was not available in the meeting.

ERPC representative informed that as per communication received from NTPC vide email dated 09/11/2022, action for procurement of upgradation package had been initiated and it will take 6 months for procurement and installation.

MS ERPC stressed upon the fact that since Farakka is an important substation, intermittent data reporting for Farakka S/s is a critical issue from reliability of Eastern Region grid point of view and it is being delayed since a long time.

TeST Committee referred the issue to 197th OCC Meeting.

ITEM NO. B.9: Replacement /Upgradation of old RTUs in eastern region: ERLDC

The report on "Replacement/up-gradation of old RTUs in Eastern Region" for Real Time data transfer to ERLDC Main and Back-up Control Center over IEC104 protocol was approved by ERPC in 36th ERPC meeting held at Bhubaneswar on 14th September 2017.
The contract for replacement/up-gradation of old RTUs in Eastern Region was awarded subsequently to Powergrid on 31st December, 2020.
As per the reference of Minutes of Meeting of 8th TeST Meeting of ERPC attached at **Annexure B9.1,** Powergrid had agreed to replace the old RTUs on priority basis as per the list submitted by ERLDC. However, few old S-900 RTUs mentioned in the priority list (like Jamshedpur, Bihar Shariff, Muzaffarpur etc.) had not been replaced yet.
The Real time Grid Operation at ERLDC is getting adversely affected on account of frequent failure of SCADA data from above mentioned old S-900 RTUs which had completed their life span. Apart from this, it had been observed that the poor maintenance of the these old RTUs is affecting the availability of Telemetry.

Please find below required details:

Total number of S/s where SAS upgradation to be done: 22. List is attached at **Annexure B9.2.**

Total number of S/s where SAS upgradation completed:7

Total number of S/s where RTUs to be replaced:17. List is attached at **Annexure B9.3.**

Powergrid may update.

Deliberation in the meeting

Powergrid representative informed that due to covid pandemic, upgradation work got delayed; however, upgradation work of SAS had been already completed at various substations and pending SAS upgradation work will be completed by March 2023. Regarding RTU upgradation, he informed that supply of new RTUs would be done for all substations by Dec 2022 and commissioning at all substations would be completed by June 2023.

MS, ERPC advised Powergrid to expedite the process and complete work by March 2023.

TeST committee advised Powergrid to complete the upgradation work of SAS by March 2023 and upgradation work of RTU by June 2023.

ITEM NO. B.10: Intermittent telemetry data from Rangit HPS: ERLDC

Rangit HPS had upgraded their old RTU to report it over IEC 104 protocol. On completion of upgradation of the said RTU, most of the feeder side data from Rangit HPS were not updating at ERLDC. After continuous effort with Rangit HPS, most of the telemetry data had been restored.

Further the Real Time Telemetry for Rangit HPS is highly intermittent in nature. Most of the time, data is getting stuck and not reporting to ERLDC.

NHPC may update.

Deliberation in the meeting

ERLDC representative informed that real time telemetry for Rangit HPS is highly intermittent in nature. It is observed that most of the time, data is getting stuck and not reporting to ERLDC.

NHPC representative was not available in the meeting.

TeST committee referred the agenda to 197th OCC Meeting.

ITEM NO. B.11: Intermittent telemetry data from 400 kV Motihari: ERLDC

Real Time Telemetry for 400 kV Motihari is highly intermittent in nature. Most of the time data is getting stuck and not reporting to ERLDC.

DMTCL may update.

Deliberation in the meeting

ERLDC representative informed that real time telemetry for 400 kV Motihari is highly intermittent in nature. It is observed that most of the time, data is getting stuck and not reporting to ERLDC.

DMTCL representative was not available in the meeting.

ERLDC representative requested ERPC to give separate communication to DMTCL so that the matter can be resolved soon.

TeST committee referred the agenda to 197th OCC Meeting for fruitful discussion.

ITEM NO. B.12: Deviation in SCADA vs SEM data: ERLDC

It is observed that tie-lines data of SCADA system has more than 5 % error while comparing with SEM meter data every week.

Below mentioned feeders are having erroneous SCADA data while comparing with SEM since long.

a. 220 kV Ramchandrapur – Jamshedpur - 3
b. 220 kV Rengali SS – Rengali (PG) – 1&2
c. 400 kV Muzaffarpur – Dhalkebar
d. 220 kV Purnea – Khagaria.

Concerned utilities may update.

Deliberation in the meeting

ERLDC representative informed that as per guideline, SCADA data and SEM data comparison is done every week and it is noticed that above mentioned feeders have erroneous SCADA since long. It is observed that around 7-8% error is present for these feeders while comparing SEM data with SCADA data.

Regrading 220 kV Ramchandrapur – Jamshedpur – 3, JUSNL representative informed that CT ratio issue was present at Ramchandrapur end which might had caused the deviation; however, it had been rectified. ERLDC representative submitted that the error is persisting.

TeST committee advised JUSNL to investigate reason behind erroneous SCADA data while comparing with SEM at Ramchandrapur end and submit report to ERPC/ERLDC. TeST Committee further advised JUSNL to take corrective measure so that the issue can be resolved.

For 220 kV Rengali SS – Rengali (PG) – 1&2, OPTCL representative informed that new RTU had been commissioned at Rengali end and Panel data is matching with switchyard data. ERLDC representative informed that around 8% error is present for this feeder while comparing SEM data with SCADA data.

TeST committee advised OPTCL to investigate reason behind erroneous SCADA data while comparing with SEM at Rengali end and submit report to ERPC/ERLDC. TeST Committee further advised OPTCL to take corrective measure so that the issue can be resolved.

For 400 kV Muzaffarpur – Dhalkebar and 220 kV Purnea – Khagaria., Powergrid representative informed that error might had been observed due to old transducer present in RTU at mentioned ends which will be replaced soon, and it is expected that no error will be there after replacement work of transducer.

ITEM NO. B.13: Status of procurement of new DCPS for ERLDC: ERLDC

Current DCPS at ERLDC was installed in ULDC phase – I nearly 17 years back, and it could not cater the present load at ERLDC in 1+1 mode hence replacement of the same needs to be done on priority basis. Same had been intimated to PG in the month of June 2022.

Powergrid may update.

Deliberation in the meeting

ERLDC representative informed that the existing DCPS at ERLDC was installed in ULDC phase – I i.e., nearly 17 years back and it is unable to cater the present load at ERLDC in 1+1 mode hence replacement of the same needs to be done on priority basis. He further added that at present DCPS of 40 A + 40 A is present however present load at ERLDC is around 50 A and considering load growth for next 15 years, it is proposed to install DCPS of 100 A + 100 A capacity so that no issue can be observed for next 15 year.

Powergrid representative informed that procurement of DCPS is under approval stage and it will be installed by May 2023.

MS ERPC advised Powergrid to place order through GeM portal if possible and install DCPS by March 2023.

TeST committee agreed for the same and advised Powergrid to expedite the procurement of DCPS and install DCPS at ERLDC by March 2023.

ITEM NO. B.14: Dual reporting of RTU, PMU, VOIP, AGC etc. applications on dual channel to ERLDC and Back up ERLDC: ERLDC

Presently all the data channels and voice channels are reporting to ERLDC on a single channel to

ERLDC/Back ERLDC. It is proposed that in order to increase redundancy in the system considering the criticality of real grid operations by the ERLDC all channels should report to ERLDC/Back up ERLDC in dual mode.

Members may discuss.

Deliberation in the meeting

ERLDC representative informed that data channels and voice channels are reporting to ERLDC on a single channel to ERLDC/Backup ERLDC. It is proposed that in order to increase redundancy in the communication system and considering the criticality of real grid operations by the ERLDC all channels should report to ERLDC/Back up ERLDC in dual mode.

Powergrid representative informed that back up path has already been implemented in order to improve redundancy of data for main path. He further added that in order to implement alternate channel for both main and backup path, port availability is also required at end equipment like RTU, PMU etc; however, at present ports are not available at this equipment and this equipment need to be replaced for which approval is required from forum of communication planning.

TeST committee advised ERLDC to place this agenda in next meeting of communication planning.

TeST committee further advised CTU to coordinate with NLDC and CEA in order to design the communication system so that dual channel for main and back up path can be developed if required and standards may be presented in next meeting of communication planning.

ITEM NO. B.15: Commissioning of tie line FO links and integration of intra state tie lines with existing communication system: ERLDC

It is advised by ERLDC that by integrating some of tie-line FO links b/w states with existing communication system a ring network b/w states can be formed that will increase redundancy in the system. Please find below details of these lines-

OPTCL- Jharkhand

a. Joda-Ramachandrapur

Jharkhand- DVC

a. Patratu-Patratu

Bihar- Jharkhand

a. Tenughat- Biharshariff

Members may discuss.

Deliberation in the meeting

ERLDC representative informed that by integrating tie FO links between states, ring network b/w states can be formed which in turn will increase redundancy in the communication system.

For providing tie link between Jharkhand -OPTCL, Powergrid informed that commissioning of Joda-Ramachandrapur link is in progress and link would be completed by March 2023.

For providing tie link between Jharkhand -DVC, DVC informed that proposal for implementing Joda-Jamshedpur had been already been placed before TeST Meeting. So, there may not be any need for implementing Patratu- Patratu.

For providing tie link between Bihar and Jharkhand, TeST committee enquired whether any other link can be proposed except Tenughat- Biharshariff for which Powergrid representative informed that Lalmatia- Kahalgaon tie link can be implemented to provide redundancy between Bihar - Jharkhand communication system. TeST committee advised concerned utility to explore possibility of Lalmatia-Kahalgaon in order to improve redundancy of Bihar- Jharkhand communication system.

Regarding tie link between West Bengal and Jharkhand, TeST committee advised concerned utility to explore possibility of Chandil – Santaldih link to improve redundancy of WB- Jharkhand communication system.

ITEM NO. B.16: Periodic testing of FO links of ERLDC: ERLDC

Periodic testing and maintenance of FO links at ERLDC is most important to check the healthiness of fibers in order to take corrective action immediately if required.

Members may discuss.

Deliberation in the meeting

ERLDC representative informed that it is observed that in almost every case testing of FO links is done once any issue is reported however it will be better if periodic testing of FO links is done by Powergrid so that issues related to data reporting due to damage in FO link can be avoided. He further added that preventive maintenance of FO links needs to be done instead of breakdown maintenance.

Powergrid representative submitted that issue of data reporting at ERLDC through Kasba had been already considered and alternate path is already planned for improving redundancy of links so that no data loss is reported at ERLDC. He further added that there is no necessity to test FO links on periodic basis. He apprised the forum that already engineers from Powergrid are deputed at ERLDC in order to provide service when any issue is observed with respect to data reporting at ERLDC due to link failure.

MS ERPC opined that visit of server room on periodic basis for monitoring link status is required. He further added that there is no need for periodic testing of FO links.

ITEM NO. B.17: Frequent failure of VOIP exchange/ voice communication at ERLDC: ERLDC

In the last few months, it was observed that VOIP exchange at ERLDC was down around 6 to 7 times in odd hours and restoration of same was done only after long hours.
Hence it is proposed that, additional voice communication channel need to be configured and integrated with NLDC VOIP exchange from all ISTS and SLDC in 1+1 mode configuration with NLDC /ERLDC.

Members may discuss.

Deliberation in the meeting

ERLDC representative informed that for last few months it has been observed that VOIP exchange at

ERLDC was down around 6 to 7 times in odd hours and restoration of the same took long hours. It is proposed that additional voice communication channel need to be configured and integrated with NLDC VOIP exchange from all ISTS and SLDC in 1+1 mode configuration with NLDC /ERLDC.

MS ERPC suggested CTU to look into the matter of repeated failures of VOIP exchange of ERLDC in co-ordination with POWERGRID and ERLDC and if required make standard format regarding backup of communication equipment need to be configured at SLDC/ERLDC/NLDCs etc in accordance with their necessity.

ITEM NO. B.18: Development of telephone directory for eastern region: ERLDC

All constituents are requested to give details of VOIP /two wire internal telephone nos. and public telephone no of each substation above 132 kV level for successful grid operation especially during disaster management and grid disturbance.

Members may discuss.

Deliberation in the meeting

ERLDC representative requested all constituents to give details of VOIP /two wire internal telephone nos. and public telephone no of each substation above 132 kV level for successful grid operation especially during disaster management and grid disturbance.

JUSNL representative informed that at certain substations, VOIP is not installed due to license issue for which he requested Powergrid to provide necessary help. MS ERPC advised Powergrid to provide help as required to JUSNL in order to implement VOIP /two wire internal telephone and public telephone at every substation.

ITEM NO. B.19: Replacement of GE Battery Bank -1: ERLDC

Nearly 50 cells are dead in the Battery Bank – I subsequently it is not providing sufficient back up to system, hence it needs to be replaced immediately.

M/S GE may update.

Deliberation in the meeting

Powergrid representative informed that procurement of battery bank was done last year however due to space constraints at ERLDC, it was not installed for long time and subsequently 50 cells were damaged and hence battery bank is not providing sufficient backup. He further added that communication had already been made with O&M M/S GE however they are not able to rectify it as warranty period is over. He informed that if these cells were replaced even by providing extra cost to O&M but the same issue may arise with other cells; so it will be better to install a new battery bank.

On query from MS, ERPC, Powergrid representative informed that new battery bank will cost around 34 lacs.

MS ERPC stressed upon the fact that the battery bank was procured long time back and due to its non-installment for long time, battery bank got damaged. This is in turn wastage of resources due to improper

planning and coordination by POSOCO and Powergrid. He further advised all the utilities to plan and coordinate in such a manner that these types of incidents may be avoided.

ITEM NO. B.20: Improper Support from M/S OSI, OEM of SCADA Application

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

Followings are the few lists of such critical functions:

1. BMR (bare metal recovery) on Spare server: license is required from OSI.
2. Denial of support from OSI support team when it is required to resolve OSI application related issues.
3. Restoration of Data archival in HRS application for the period w.e.f 00:00 Hrs dated 01-04-2021 to 03:00 Hrs dated 02-04-2021.

In 11th TeST Meeting, M/S OSI representative was not available the meeting.

Test committee opined that this agenda would be discussed in a separate special meeting with ERPC, ERLDC, M/S Chemtrols, M/s OSI and concerned utilities to be held on 26th April'2022 in physical mode.

In special meeting with M/S Chemtrols held on 26th April 2022, M/S OSI representative was not available in the meeting.

ERLDC representative informed that they are facing several issues with M/S OSI that are already listed; however, they are not getting any support from them.

M/S Chemtrols representative informed that as per their communication with M/S OSI, service level agreement (SLA) duly signed by POSOCO is required by M/S OSI.

ERLDC representative submitted that they do not have any issue in signing the SLA and for that M/s OSI has to visit ERLDC office at Kolkata. ERLDC further added that M/S OSI representatives have not been attending the meetings too.

Member Secretary, ERPC mentioned that a letter would be given to M/S OSI from ERPC regarding their absence in TeST Meetings and the special meeting. He further informed that strict action would be taken against M/S OSI if proper support is not provided to ERLDC by them.

ERLDC vide email dated 03/11/2022 placed additional issues with M/S OSI which are as follows-

Restoration of Data archival in HRS application for the period w.e.f 00:00 Hrs dated 01-04-2021 to 03:00 Hrs dated 02-04-2021.
Restoration of Data archival in HRS application for the period w.e.f 08:00 Hrs dated 30-05-2022 to 15:00 Hrs dated 30-05-2022.

In the last meeting held on 14.07.2022, M/S Chemtrols informed that SLA (Service Level Agreement) has been signed between ERLDC & M/s OSI and accordingly data archiving issue is escalated higher management of M/s OSI and it will be resolved by mid of August 2022 but the problem is still persisting.

M/S OSI may update.

Deliberation in the meeting

ERLDC representative informed that signed Service Level Agreement between ERLDC and M/S OSI had been already communicated to M/S OSI however resolution of issues regarding restoration of Data archival in HRS application is still pending from M/S OSI.

M/S OSI was not available in the meeting.

MS ERPC advised that M/S Chemtrols to take up this matter with M/S OSI and resolve the issue at the

earliest.

TeST committee advised ERLDC to communicate the issue to NLDC and subsequently notice can be issued from NLDC against M/S Chemtrols if the issue is not resolved in timely manner.

ITEM NO. B.21: Deletion of Jorethang HEP- Rangpo and Tashiding HEP- New Meli links approved under the project "Upgradation of SCADA/RTU/SAS in Central sector stations and strengthening of network in eastern region": Powergrid

In the 38th TCC & ERPC Meeting, as per request of ERLDC, Powergrid was entrusted to undertake the last mile connectivity work of Generating companies with nearest Powergrid S/s. Accordingly, Jorethang (DANS Energy)-Rangpo (PG) & Tashiding-New Melli (PG) links were envisaged and approved under the Project "Up-gradation of SCADA/RTUs/SAS in Central Sector stations and strengthening of OPGW network in eastern region" to be undertaken by Powergrid through tariff route. However, it is gathered that both the afore-mentioned Generating stations are connected to New Melli S/s (PG) through OPGW and data is reporting to ERLDC through wideband node. Subsequently it is proposed that delete both the links, namely, Jorethang-Rangpo (PG) & Tashiding-New Melli (PG) links may be deleted from the scope of the project.

Powergrid may explain. Members may discuss.

Deliberation in the meeting

Powergrid representative informed that as per deliberation in 38th TCC and ERPC Meeting, Jorethang (DANS Energy)-Rangpo (PG) & Tashiding-New Melli (PG) links were envisaged and approved under the Project "Up-gradation of SCADA/RTUs/SAS in Central Sector stations and strengthening of OPGW network in eastern region" to be undertaken by Powergrid through tariff route. However, at present, both generating stations are connected to New Melli S/s (PG) through OPGW and data is reporting to ERLDC through wideband node. Subsequently it is proposed that delete both the links, namely, Jorethang-Rangpo (PG) & Tashiding-New Melli (PG) links may be deleted from the scope of the project.

On query from MS ERPC regarding installation of redundant OPGW link, Powergrid representative informed that due to availability of single peak, it is not possible to install extra fiber.

TeST committee approved to delete both the links, namely, Jorethang-Rangpo (PG) & Tashiding-New Melli (PG) links from the scope of the project. TeST committee further advised Powergrid to look upon technique through which extra fiber can be installed in mentioned lines in order to improve redundancy of both links.

ITEM NO. B.22: Upgradation of OPGW network in DVC for strengthening and redundancy of communication network in DVC sector: Powergrid

DVC intends for strengthening of communication network of DVC through laying of OPGW based communication system for following major purposes:

a) In the present communication network of DVC, there are some nodes having single connectivity. For redundant connectivity, OPGW connectivity for the stations is to be established in redundant paths.
b) Strengthening of the existing communication network will enable reliable real-time data transfer for smooth grid operations.
c) OPGW connectivity is required for establishment of DTPC in some lines.

Following is the list of links where OPGW laying along with terminal equipment is proposed:

S/n	Name of Link	Voltage Level	Approx. Length(Km)
1	BokaroA-Koderma	400kV	105
2	Dhanbad-Patherdih	132kV	22
3	CTPS-Kalyaneswari LILO at RTPS	220kV	125
4	Parulia-Bardhaman	220kV	90
5	DTPS-Parulia (LILO at DSPTS) LILO part (48F)	220kV	8
6	BokaroA-Jamshedpur (DVC)	220kV	155
7	Joda-Jamshedpur(DVC)	220kV	140
8	MejiaA-Ramgarh220	220kV	155
9	BTPSA-BTPSB (UGFO)	UG	5
Total			**805**

Further details are attached at **Annexure B22.**

DVC intends to execute the implementation of OPGW laying in the above-mentioned links of total 805 Km through Powergrid.

Powergrid is agree to execute the OPGW laying in the above-mentioned links of total 805 Km on tariff route (RTM Mechanism). Estimated cost for this work will be approx. 32 Crs. Powergrid will fund the project and the cost will be recovered through tariff as decided by CERC as per earlier ULDC schemes.

Powergrid may explain. Members may discuss.

Deliberation in the meeting

DVC representative informed that as per guidelines of CTU and CEA, in order to improve redundancy of OPGW communication system, OPGW installation of above-mentioned links is proposed. He further added that Powergrid will execute OPGW installation work after approval.

Powergrid representative informed that they have agreed to execute the OPGW laying in the above-mentioned links of total 805 Km on tariff route by RTM Mechanism. He further added that estimated cost for this work will be approx. 32 Crs. Powergrid will fund the project and the cost will be recovered through tariff as decided by CERC as per earlier ULDC schemes.

CTU representative stated that ISTS links shall be reviewed from the table given above and thereafter taken up for NCT approval as per MoP guidelines dated 09thth Mar 22. Accordingly, for the ISTS line DVC may submit the proposal with all requisite details to CTU.

Considering the necessity of establishing redundant links, TeST Committee accorded the scheme.

However, for deciding financial implications/settlements etc. TeST Committee referred the issue to 47th CCM Meeting.

ITEM NO. B.23: Issue of Trial operation certificate by BSPTCL under the project "Establishment of communication system under expansion/upgradation of SCADA/EMS system at SLDCs in eastern region (BSPTCL)": Powergrid

Following 05 nos. of OPGW links were successfully commissioned under mentioned project:

S/n	Name of OPGW Link	OPGW Cable (24 F, DWSM) along with associated hardware and accessories (km)
1	MTPS-Gopalganj	100.35
2	Siwan-Gopalganj	30.12
3	Saharsa- Purnea (BH)	101.11
4	Kahalgaon(BH)-Kahalgaon(NTPC)	5.71
5	Hatidah-Lakhisarai(BH)	28.98
	Total	**266.27**

Request for issuance of trial operation certificate for these links was made to BSPTCL vide letter no ER-I/PAT/ULDC/F-19/1973 dated 14.09.2022 attached at **Annexure B23.** However, the certificate is yet to be issued by BSPTCL.

Powergrid may explain. BSPTCL may update.

Deliberation in the meeting

Powergrid representative informed that above mentioned OPGW links had been successfully commissioned and request for issuance of trial operation certificate for these links was communicated to BSPTCL vide letter no ER-I/PAT/ULDC/F-19/1973 dated 14.09.2022; however, certificate had not been issued by BSPTCL till date.

BSPTCL representative informed that communication regarding this matter had been made to field engineer and certificate would be issued by 2-3 weeks.

TeST committee advised BSPTCL to issue trial operation certificate by 20th Nov 2022.

ITEM NO. B.24: Final quantity of OPGW links executed under the project – "Package- I: Fiber optic expansion project (Additional requirement)": Powergrid

Please find below final executed quantity of links executed under project mentioned.

S/n	Name of link	Voltage level	Approved in ERPC	Link length as per ERPC approval	Actual link length executed
1	Ranchi-Maithon Right Bank	400KV	32nd ERPC	188 Km	188 Km
2	Barh-Gorakhpur	400KV	33rd ERPC	354 Km	370.768 Km
3	Patna-Kishanganj	400KV	36th ERPC	347 Km	364.018 Km

This is information to all and record in TCC/ERPC meeting.

Members may note.

Deliberation in the meeting

Members noted.

ITEM NO. B.25: Issues related to OPGW installation in Teesta III – Kishanganj Line: Powergrid

Powergrid is implementing OPGW on Teesta III-Kishanganj TL under Fiber Optic Expansion Package (Additional Requirement). Out of total 215 Km, 168 Km work has been completed however following issues are causing hindrance towards completion of the work.

A. **Non-availability of A/R in non-auto mode:** A/R permission were not provided due to high hydro season. Therefore, work is kept on hold since July 2022.

B. **ROW issues / Old compensation issues:** During erection of OPGW, work had been stopped at various locations due to ROW issues/Old compensation issues. In all locations, local villagers are demanding payment of old pending compensation or compensation for shifting of houses due to induction. ROW issues occurred till date is detailed as under:

Sl. No.	ROW Tower No.	ROW affected Drum No.	ROW creator details	ROW issue
1	Tower No. 144/1	20	**Name of the landowner:** Krishna Bahadur Manger (Mob: 7872607153) Village: Chisopani PW. PS: Jorethang PO: Jorethang Dist.: South Sikkim	Landowner claims that M/s TPTL had damaged land and cultivation during construction and a wall had been promised which hasn't been erected till date along with pending compensation issue. ****Resolved by POWERGRID****
2	Tower No. 137/0 & 138/0	19	**Name of the person:** Didn't disclose. Village: Samsibung PS: Namchi PO: Namchi. Dist.: South Sikkim	Pending Compensation Issues
3	Tower No. 126/0 & 127/0	18	**Name of the landowner:** Shyam Kumar Rai (Mob: 9609875663) Village: Kamrang PS: Namchi PO: Namchi Dist.: South Sikkim	Landowner claims house falling under corridor. Demands compensation from for shifting of same.

4	Tower No. 133/0 to 136/0	18	**Name of the landowner:** K B Rai (+5 Brothers) (Mob: 9083071127) Village: Denchung PS: Namchi PO: Namchi Dist.: South Sikkim	Landowner along with his 5 brothers are claiming compensation for houses falling under corridor.
5	Tower No. 115/0	17	**Name of the landowner:** Gajendra Chettri (Mob: 8436105960). Village: Mamley PS: Namchi PO: Namchi Dist.: South Sikkim	Boulders kept near wall of landowner which hadn't been removed. Induction related problems faced by landowner
6	Tower No. 119 to 122	16A	**1) Mani Kumar Rai (Mob: 6294716006)** Village: Lower Jaubari (Chiyadara) PS: Namchi PO: Namchi Dist.: South Sikkim	Landslides due to damage to trees and crops during construction have caused loss to villagers and locals for which compensation demand has been made for which bills prepared but payment pending till date as per landowners
7			**2) Suk Dhan Rai** Village: Lower Jaubari (Chiyadara) PS: Namchi PO: Namchi Dist.: South Sikkim	
8			**3) Aita Raj Rai** Village: Lower Jaubari (Chiyadara) PS: Namchi PO: Namchi Dist.: South Sikkim	
9			**4) Ratan Bdr. Thapa** Village: Lower Jaubari (Chiyadara) PS: Namchi PO: Namchi Dist.: South Sikkim	
10			**5) L. B Thapa** Village: Lower Jaubari (Chiyadara) PS: Namchi PO: Namchi Dist.: South Sikkim	
11			**6) San Chay Rai (Mob: 7076885910**) Village: Lower Jaubari (Chiyadara) PS: Namchi PO: Namchi Dist.: South Sikkim	
12	Tower No. 122 to 126	16B	**7) Purna Bahadur Rai (Mob: 9593739944)**	Induction related issues.

			Village: Lower Tingrithang PW PS: Namchi PO: Namchi Dist.: South Sikkim Pin: 737126	Land owner claims wires too close to house and therefore claims compensation for housing property.
13	Tower No 55 to 60	9	**8) Phal Bahadur (Mob: 8001630095/9647872113)** Village: Tumin & Kokaley P.S: Singtam P.O: Tumin Dist: East Sikkim	Previous Compensation related issues during Construction
14	Tower No 68 to 74	11	**9) Person didn't disclose name** Village: Singbel P.S: Singtam P.O: Makha Dist.: East Sikkim	
15	Tower No. 74 to 81	12	**10) Person didn't disclose name** Village: Ralap P.S: Singtam P.O: Makha Dist.: East Sikkim	
16	Tower No. 195-197/1	27B	**11) Satish Pokhrun (Mob.: 7872446069)** Village:Relling P.S: Relling Dist.: Darjeeling	Previous Compensation related issues during Construction
17	Tower No. 197/1 - 201/1	28		
18	Tower No. 201/1 - 209/1	29		

Several Meetings has been done with district administration for resolving the above issues. However, it is requested that**,** M/s TPTL (being owner of the line) may provide necessary support for resolving the ROW issue.

Powergrid may explain. TPTL may update.

Deliberation in the meeting

Powergrid representative informed that regarding OPGW installation work of Teesta III-Kishanganj TL installation work for 168 Km work had been completed out of 215 km, however several ROW issues are being faced by site engineers in remaining portion of line subsequently work had been stopped at various locations due to ROW issues/Old compensation issues. He further added that in all locations, local villagers are demanding payment of old pending compensation or compensation for shifting of houses due to induction.

TPTL representative was not available in the meeting.

ERPC representative informed that as per communication received from TPTL, no compensation is pending from their side.

TeST committee referred this agenda to 47th TCC/ERPC Meeting.

ITEM NO. B.26: Issues related to OPGW installation in 132 kV Rangpo - Chuzachen Line: Powergrid

Power Grid had been entrusted with establishing Fiber Optic network (OPGW) over 132 kV Rangpo - Chuzachen TL of EPDS, Sikkim under Eastern Region Fibre Optic Expansion Project (Additional Requirement) for smooth communication of Chuzachen HEP power generating station to Regional Load Dispatch Centre (ERLDC) at Kolkata. 132 kV Rangpo - Chuzachen TL belongs to Energy & Power Dept., Govt of Sikkim. Out of **20.727 km** of scope of work, Fiber Optic Installation of **17.912 km** had been completed as on date. However, while executing the work in village Kamarey Bhasmey, Pendam, East Sikkim stiff resistance and threatening by local villagers is faced by our site engineers.

Multiple meeting with District Authorities were held however local villagers are demanding payment of old pending compensation. The ROW issue till date is tabulated below.

S.No	Name & Contact of Landowner	Location No. details
1	Name: Ashok chettri S/o L.t. shiva lall chettri Contact.No: 9593223955	Village kamarey PW PO & PS - Rangpo, Pendam East Sikkim-737132
2	Name: Nandu kumarpradhan Contact.No: 9635686942	
3	Name: kumar chetari Contact.no: 9635664370	
4	Name: Mani Kr. Pradhan	
5	Name: Mangal Singh S/o Singh Bir Tamang	
6	Name: Tularam Sharma S/o Gauri Shankar	
7	Name: Dili Ram S/o Lt. Pushpa Lall Khatiwara	
8	Name: Dhan Maya W/o Chandra Bahadur Tamang	
9	Name: Bharat Laxuman	
10	Name: Dhiraj Sharma S/o Tika Ram Sharma	

In this regard, it is requested that**,** Energy & Power Dept., Govt of Sikkim (being owner of the line) may provide necessary support for resolving the ROW issue.

Powergrid may explain. Sikkim may update.

Deliberation in the meeting

Powergrid representative informed that regarding OPGW installation in 132 kV Rangpo - Chuzachen line, out of 20.727 km of scope of work, fiber optic installation of 17.912 km had been completed as on date. However, while executing the work in village Kamarey Bhasmey, Pendam, East Sikkim stiff resistance and threatening by local villagers is faced by site engineers subsequently multiple meeting with District Authorities were held however local villagers are demanding payment of old pending compensation.

Sikkim representative was not available in the meeting.

TeST committee referred agenda to 47th TCC/ERPC meeting.

ITEM NO. B.27: Issues related to M/S Chemtrols

A. JUSNL

1. Poor support in modification of ADMS scheme: Proper support for ADMS operation is not being provided by M/s Chemtrols. Even for the GSS reporting through 104 protocol, ADMS is not getting executed.

2. Unavailability of spare parts to attend fault at site/GSS: LDMS at most of the site is not working due to faulty SMPS. In spite of assurance given by M/s Chemtrols for rectifying the issues related to LDMS/RTU and providing spare materials by the end of November 2021, supply of spare materials is still awaited.

3. Replacement of UPS and Battery Bank: Two nos. of UPS installed at SLDC are out of order for last few months out of which single faulty UPS has been replaced on rent basis but another UPS is still in faulty condition.

JUSNL may explain. M/S Chemtrols may update.

B. DVC

Please find below list of pending issues at Back up SLDC DVC Maithon in respect of maintenance of SCADA / EMS systems till date which require to be resolved by M/s. Chemtrols in addition to earlier data reporting issues-

Sl. No.	Description of pending issue	Remarks
(1)	(2)	(3)
1.	a) One Operator console at CLD b) One Operator Console at CLD c) One RVDU at CE, Transmission, Maithon	CPU problem since 15 the october,2021. DVI port (Graphics Card) problem since 12 September 2022 DVI port (Graphics Card) Problem since 20 september,2022
2.	1 (one) No of RTU Node	One No faulty Node from Barjora S/S has been taken away on 18.03.2020 and not returned till date.

3.	18 nos of faulty MFT has been taken by Chemtrols but still not returned.	
4.	LDMS at 11 stations are faulty and still not repaired	1.Panchet Hydel…Inverter Problem 2. Konar ...Both Inverter & CPU problem 3.CTPS-132.....CPU problem 4.CTPS-220.....Inverter problem 5.DTPS ..... CPU problem 6.Nimiaghat.....CPU problem 7.Kumardubi.....Both Inverter & CPU problem 8.Patherdih.....CPU problem 9.Jamuria.....CPU problem 10.MTPS.....CPU problem 11.Koderma 132.....CPU problem
5	Cyber Security Audit Report	Cyber Security Audit was performed on March,22 but still Audit report is not Given.
6	One Battery Bank of UPS-1 does not have sufficient back up	3 Nos of cells have already been bypassed
7	Both UPS are not running in Parallel	If one UPS gets faulty, equipment running on this UPS , will get shut down as there is no load sharing between UPS

DVC may explain. M/S Chemtrols may update.

C. WBSETCL

Please find below list of pending issues of M/S Chemtrols:

- Report of Cyber security audit which was conducted on February 2022 is still pending
- Return of all nodes which were collected from different RTU for repairing purposes is still pending.

In Special meeting held on 26.04.2022, M/S Chemtrols representative informed that nodes taken by them would be returned by the end of June 2022 but still they had not returned them.

- Battery Bank-1 of UPS1 installed at Abhikshan Bhavan (BCC) is defective since long.

WBSETCL may explain. M/S Chemtrols may update.

Deliberation in the meeting

Regarding ADMS operation, JUSNL representative informed that new feeders need to be added in ADMS however M/S Chemtrols is yet to complete the task till date. M/S Chemtrols representative apprised the forum that in order to add extra feeders in ADMS, financial implication will be there. He further added that in case of West Bengal also, cost of adding new feeders to ADMS was provided by WBSETCL.

JUSNL representative submitted that cost for ADMS operation had been already provided so extra feeders should be added accordingly without further cost implications.

MS ERPC said that commercial issues need not be to discussed in TeST Meeting and separate meeting might be conducted in order to resolve all commercial issues related to M/S Chemtrols. He also requested all concerned utilities to issue payment in time to M/S Chemtrols without any delay.

WBSETCL representative informed that report of Cyber security audit which was conducted on February 2022 is still pending from M/S Chemtrols.

MS ERPC stressed on the fact that compliance of cyber security audit is being monitored at ministry level; so, issues related to cyber security should not be delayed, else strict action will be taken against concerned authority.

PART C: ITEMS FOR UPDATE

ITEM NO. C.1: Status of implementation of AGC for ISGS stations

In 2nd Test Meeting, NLDC informed that, as a part of pilot project of AGC, all generating stations' AGC data would be directly reporting to NLDC for first 3 years and the same would be diverted to respective RLDCs after SCADA up gradation.

NLDC informed that all generating stations must make arrangement for extending the AGC data signals to the nearest Powergrid node and Powergrid shall make available two Ethernet ports (main & its redundant) so that AGC signal from generating stations should reach to NLDC.

ERLDC suggested that firewalls should be available at both end i.e. at Generator end as well as NLDC end. NLDC informed that they have a firewall at their end in their system.

All generating stations agreed to install adequate level of firewall at their end for extending the AGC signals.

In 10thTeST Meeting members updated the status is as follows:

Sl No	Station	Status of Communication link from plant substation to PGCIL node	Status of communication system integration from unit to plant substation	Target date for implementation of AGC at plant
1	Farakka STPS - I & II	Both links established	NTPC representative informed that material has been received at Farakka. However, due to Covid-19 pandemic, ABB Engineers are unable to visit the site and therefore the commissioning of AGC is pending.	
2	Kahalgaon STPS – II	Both links established	Installed	Completed and running since Dec 2020
3	Barh STPS	Both links established	Installed	Running since August 2019
4	NPGC, Nabinagar	Links from Gaya and Patna has been established.	NPGC, Nabinagar representative informed that the material has been received but due to Covid-19 pandemic, ABB Engineers are unable to visit the site. Hence commissioning of AGC is pending. He further told that NTPC OPGW link is ready for testing. ERLDC representative informed that contact details of concerned person would be shared with NTPC to do testing of OPGW link.	
5	Maithon Power Limited	One link established. Other link, Ranchi-Maithon(RB)	Completed	

		would complete by March, 2020.		
6	Talcher STPS – I	Both links established.	Talcher STPS-I representative informed that material has been received and erection is also completed, however commissioning of AGC is pending due to difficulties faced by ABB Engineers to visit the site due to Covid-19 pandemic.	
7	Kahalgaon STPS – I	Both links established.	NTPC representative informed that they had already applied CERC for exemption. He further submitted that hydraulic units are present in Kahalgaon stage 1, so it is quite difficult to implement AGC at Kahalgaon stage – 1	
8	Nabinagar Thermal Power Project – BRBCL	Only one link Sasaram-Nabinagar OPGW installation is pending. It would take two years for completion.	Powergrid representative informed that for OPGW installation, NIT had been floated and two packages are under technical evaluation right now. In 10th TeST Meeting, Powergrid representative informed that package would be awarded by Nov 2021	
9	Darlipalli STPS	Communication established.	Darlipalli representative informed that material has been received however due to Covid-19 pandemic, ABB Engineers are unable to visit S/S and hence commissioning of AGC is pending.	
10	Teesta – V	One link established		
11	Farakka STPS – III	Link established		
12	MTPS Stage – II (Kanti)	Link established		
13	Rangit HPS	One link established		

In 10th TeST Meeting, NTPC representative was not available in the meeting.

Regarding BRBCL, Powergrid representative informed that package would be awarded by Nov 2021.

CTU representative submitted that some data are required from the utilities as per the deliberations of First Standing Committee Meeting held on 09.03.2021 which is attached at **Annexure C1.** He requested all concerned utilities to provide requisite data to CTU/CEA at earliest.

TeST Committee advised all concerned utilities to provide requisite data to CTU/CEA.

In 11th TeST Meeting, NTPC representative was not available in the meeting.

TeST Committee advised ERLDC to collect status from concerned utilities and share updated status to ERPC.

Members may update.

Deliberation in the meeting

NTPC vide email communicated that AGC had been implemented and running in following plants-

Farakka stage 1&2, Farakka stage 3, NPGC

TeST committee advised concerned utilities to share updated status along with target date to ERPC/ERLDC at earliest.

ITEM NO. C.2: Replacement of old RTU in Eastern Region for reporting of RTU / SAS to back-up Control Centre.

As per deliberations in 11thTeST Meeting, updated status is as follows-

Utility	Status	Deliberation in 11 thTeST meeting	Target
POWERGRID	Pending	Powergrid representative informed that RTUs would be arrived at site by June-July 2022. He further added that work would be completed by May- June 2023. On enquiry from Powergrid regarding RTU failure , ERLDC representative informed that except Biharsharif RTU, which had failed recently and redundancy was affected, the general availability of central sector RTUs, even though older, is quite satisfactory. POWERGRID representative assured to the committee that strict follow-up in respect to maintenance and spare-availability of RTU have been ensured for achieving nil-outage till the new RTU commissioning.	May-June 2023
Maithon Right bank (MPL)	RTU/SAS Upgraded		
NTPC, Farakka (Stage I & II)	Pending	Upgraded	
Talcher STPS	RTU Upgraded		
Kahalgaon STPS	Pending	NTPC representative was not available.	
Chuzachen HEP	Pending	Powergrid representative informed that Chuzachen –Rangpo line is under ownership of Sikkim government. He further added that while installing OPGW in said line, villagers are asking for high compensation from government as per new policy of Sikkim government 2016-17. Local police authority was also consulted regarding this matter however being sensitive area, it is taking time to resolve the issue.	June 2022
JITPL	Pending	Powergrid representative informed that team had been mobilised and work would be	October 2021

		started by 17.06.2021 and it would take around 4 months to complete the work.	
GMR	Pending	Powergrid representative informed that team had been mobilised and work would be started by 17.06.2021 and it would take around 4 months to complete the work.	October 2021
JUSNL	Pending	JUSNL representative informed that site work had been completed, however they are facing issue with communication network at certain locations. TeST committee advised JUSNL to share updated status to ERPC/ERLDC.	
OPTCL	Pending	OPTCL representative informed that out of 78 RTUs upgradation work, 16 RTUs had been upgraded. He further added that M/S ABB had stopped commissioning work due to safety issue however it is expected that work would be started again on 11th April 2022. TeST committee advised OPTCL to share updated status to ERPC/ERLDC.	Aug 2022
WBSETCL	Pending	WBSETCL representative was not available during the discussion.	
NHPC (Teesta – V &Rangit)	Pending	ERLDC representative informed that RTU upgradation had been done for Teesta – V, however they are yet to receive any information regarding the same from Rangit. NHPC representative was not present in the meeting.	
DMTCL Motihari	Pending	DMTCL representative informed that RTU upgradation work had been completed at Motihari.	OPGW not available
BRBCL Nabinagar	Pending	Test committee advised Powergrid to share status of OPGW work to ERPC/ERLDC.	OPGW not available
Teesta – III	Pending	Test committee advised Powergrid to share status of OPGW work to ERPC/ERLDC.	OPGW not available
Dikchu	Pending	Test committee advised Powergrid to share status of OPGW work to ERPC/ERLDC.	OPGW not available
Jorethang	Pending		OPGW not available
New Farakka (Stage III)	Completed	---	---
APNRL	Completed	---	---

Barh	Completed	---	---

Members may update the latest status.

Deliberation in the meeting

TeST committee advised concerned utilities to share updated status along with target date to ERPC/ERLDC at earliest.

ITEM NO. C.3: Database and Display Related issues with OPTCL

It has been observed while validating ERLDC SCADA displays as a precautionary measure for "Yaas Cyclone" that few 220kV stations (Jaypatna,Kasipur etc.) have been charged in OPTCL without SCADA data, including display & Database, integration with ERLDC. Total 67 nos. of substations under OPTCL jurisdiction have been identified which are either not integrated in OPTCL SCADA or the updated database and display is not shared with ERLDC**.** Due to poor SCADA data visualization in OPTCL area, ERLDC operators are facing difficulties in real time Grid operations.

OPTCL SCADA team is requested to please take necessary action towards integrating SCADA displays and database including real time data with ERLDC. OPTCL is also requested to integrate SCADA data prior to charging of any stations in line with IEGC clause 4.6.2.

In 9thTeST Meeting, OPTCL representative informed that database has been updated for 8 nos. of S/S. He further informed that some of stations are coming under railway stations where RTU is not available so SCADA data including display and database of those substations are not maintained by OPTCL.

On query, he told that in case of around 20 nos. of substations, new feeders have been integrated so updation of database for such substations are in process and the same would be completed within 15 days.
He submitted that some substations had been charged without SCADA integration due to delay in commissioning of ABB RTUs. OEM is having issue to visit S/S due to Covid pandemic. The issues of SCADA integration of such substations are expected to be resolved in 4 to 5 months of time.

ERLDC stated that they had not received any updated database of the 8 nos. of substations as mentioned by OPTCL.

OPTCL informed that they would share the updated database of the 8 nos. of substations within 2-3 days to ERLDC.

ED, ERLDC expressed that the onus of coordination with RTS stations in order to install RTUs lies upon SLDC Odisha so that data integration can be done for such stations too.

OPTCL representative submitted that for 50 nos. of S/S database is already available and 9 out of remaining 17 nos. of S/S have issue with OPGW link and 8 out of remaining 17 nos. of S/S do not have RTUs.

ERLDC asked OPTCL to synchronize data base of those 50 nos. of substations with ERLDC at the earliest.

TeST Committee advised OPTCL to share the updated database of 50 nos. of S/S with ERLDC within two weeks and share target plan of integrating remaining 17 S/S with ERLDC at the earliest.

In 10th TeST Meeting, ERLDC representative informed that database of 35 nos. of S/S from OPTCL had been received and it would take 3-4 weeks to complete integration work and after its validation final report would be published.

TeST Committee advised ERLDC to share list of these 35 nos. of S/S to ERPC.

OPTCL representative informed that updated status regarding 17 S/S would be shared to ERLDC and ERPC.

In 11th TeST Meeting, ERLDC representative informed that out of 67 nos. of RTUs, 14 nos. of RTUs are yet to be integrated.

TeST Committee advised ERLDC to share updated list RTUs to ERPC after taking requisite updates from OPTCL for remaining 14 nos. of RTUs.

Updated list of RTUs as received from ERLDC is attached at **Annexure C3.**

OPTCL may update.

Deliberation in the meeting

TeST committee advised OPTCL to share updated status along with target date to ERPC/ERLDC at earliest.

ITEM NO. C.4: Mapping of Feeders of Automatic under Frequency Load Shedding (AUFLS) Scheme

In 8th NPC held on 30th November 2018, it was decided that each RPC would submit the details / progress of feeder mapping to NPC secretariat on a regular basis (quarterly).

In 154th OCC, DVC informed that mapping of the UFR feeders had already been implemented in DVC system.

In 40th TCC, Bihar and Jharkhand have confirmed that mapping of the UFR feeders has been implemented.

In 155th OCC Meeting, ERLDC informed that acquiring the UFR feeder data from SLDCs to ERLDC is in process.

In 10th NPC Meeting held on 09.04.2021, it was decided that each RPC would submit the present status/progress of feeder mapping to NPC secretariat.

In 10th TeST Meeting, DVC representative informed that status of mapping of pending UFR feeders along with issue and plan of execution would be shared to ERPC/ERLDC.

West Bengal representative informed that status of mapping of pending UFR feeders would be shared to ERPC/ERLDC at the earliest.

Jharkhand representative informed that status of mapping of pending UFR feeders as per the Annexure is not updated. The updated status would be shared with ERPC/ERLDC at the earliest.

TeST Committee advised West Bengal, Odisha, DVC and Jharkhand to send the status of mapping of pending UFR feeders to ERPC and ERLDC at the earliest.

In 11th TeST Meeting, TeST Committee advised West Bengal, Odisha, DVC and Jharkhand to send the status of mapping of pending UFR feeders to ERPC and ERLDC at the earliest.

The present status of mapping of UFR feeders as available with ERLDC is given at **Annexure C4.**

Members may update.

Deliberation in the meeting

TeST committee advised concerned utilities to share updated status of mapping of UFR feeders to ERPC/ERLDC at earliest.

ITEM NO. C.5: Non availability of SCADA in Eastern Region

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

Area of Responsibility	No of station without data telemetry	No of station commissioned without data integration
OPTCL	10	08
WBSETCL	06	01
JUSNL	12	00
BSPTCL	06	00

Table: Area wise no of station without data telemetry as on 10-03-2021.

In 9thTeST Meeting, members updated status as follows:

AOR	Station level (In kV)	Current Status	Deliberation in 9thTeST meeting	Comments
WBSETCL	Dharampur 220 Kv	Yet to be integrated.	WBSETCL representative informed that M/s Schneider engineers are unable to come to Dharampur due to Covid-19 pandemic.	
	Egra 220 kV	Yet to be integrated	WBSETCL representative informed that discussion related to cost estimate is in progress with M/S Chemtrols.	
	Bantala 220kV	Not Available	WBSETCL representative informed that some technical issues of SDH are observed at Bantala.	M/s Commtel informed that data is not available due to breakdown of their equipment.
	Alipurduar 220kV	Yet to be integrated	WBSETCL representative informed that ROW issues had been resolved and communication link has been established. He further informed that commissioning work would be completed once M/S Siemens Engineer would visit the site after lockdown restriction eases.	
	Rishra 220kV	Not Available since July 2020		
	DPL TPS_WB	Not Available		

	220 kV	since Jan 2021		
JUSNL	Hatia New 220 kV	Not Available	JUSNL representative informed that issue at Hatia has been resolved.	
	Patratu 220 kV	Not available since Feb 2020	JUSNL representative informed that control room issue present at Patratu would be rectified soon.	
	Tenughat 220kV	Not available since Feb 2020	JUSNL representative informed that the work had been completed on 31st March 2021.	
	Chandil 220 kV	Not available since Sept 2019	JUSNL representative informed that PLCC installation is under progress at Chandil, Jamtara ,Garwa, Deoghar and Kendposi and the issue would be rectified by July'2021	30th July 2021
	Jamtara 132kV	Not Available		
	Garwa 132kV	Yet to be integrated		
	Deoghar 132kV	Not Available		
	Kendposi 132 kV	Not Available		
	Lalmatia 220 kV	Not Available	JUSNL representative informed that issue at Lalmatia would be rectified by June'2021.	June 2021
	Giridih 220 kV	Not Available	JUSNL representative informed that link issue is present at Giridih and would be rectified soon.	June 2021
	Godda 220 kV	Not available since Jan 2021	JUSNL representative informed that issue at Godda would be rectified by June '2021.	June 2021
	Jasidih 220 kV	Not available since August 2020	JUSNL representative informed that issue at Jasidih has already been solved.	
OPTCL	Malkangiri 220 kV	Data integration and database creation not yet done.	OPTCL representative informed that data base creation has been completed for Malkangiri, Jeypatna and Kashipur substations.	
	Jaypatna 220			
	Kasipur 220			
	Damanjodi 220		OPTCL representative informed that the issues would be resolved by Sep' 2021.	
	Cuttack 220			
	Utkal Al 220			
	Narsingpur 220kV	Station commissioned at 220kV without data telemetry	OPTCL representative informed that pending issues at Narsingpur S/S would be resolved by May' 2021	
	Bargarh 220	Station commissioned at 220kV without data telemetry	OPTCL representative informed that the issues would be resolved by Sep' 2021.	
	Paradeep 220 kV	Not available		
	Vedanta 220 kV	Not available since Nov. 2020		
BSPTCL	Gopalganj 220	No available since July 2019	BSPTCL representative informed that issue at Gopalganj has already been solved.	

	Samastipur New 220	Not available since 22-02-2021	BSPTCL representative informed that they had already informed M/S GE regarding issues at Samastipur.	
	Khagaul 220 kV	No available since Jan 2021	BSPTCL representative informed that issue at Khagaul has already been solved.	
	Motipur 220 kV	No available since 05-03-2021	BSPTCL representative informed that they had already informed M/S GE regarding issues at Motipur.	
	Laukhai 220 kV	No available since 13-02-2021	BSPTCL representative informed that they had already informed M/S GE regarding issues at at Laukhai.	
	Dumraon 220 kV	No available since 22-01-2021	BSPTCL representative informed that M/S ABB was also informed regarding issue at Dumraon and issues would be solved at the earliest.	
DMTCL	Motihari 400 kV	Not available since Sept 2019	ERLDC representative informed that work had been completed.	

In 10th TeST Meeting, ERLDC representative informed that Dharampur, Egra and Alipurduar S/S were commissioned long back however SCADA system had not been integrated at these S/S till date due to which their data are not reporting to respective state SLDCs and hence ERLDC is also not getting data through ICCP.

Regarding Alipurduar, it was informed that the work would be delayed as M/S Siemens' quotation is quite high and negotiation is under process. It was further informed that earlier RTU was commissioned however communication link was absent and after approval of communication link new order for integrating SCADA system would be placed.

Regarding Bantala, West Bengal representative informed that due to high pollution level SDH breakdown is frequently observed at Bantala because of which it is quite difficult to integrate SCADA system.

TeST Committee opined that West Bengal could try to integrate SCADA system at Bantala S/S by exploring some alternative ways, and if required, the issue can be discussed at higher level.

In 11th TeST Meeting, TeST committee advised concerned utilities to share updated status along with target date to ERPC/ERLDC at earliest.

Members may update the latest status.

Deliberation in the meeting

TeST committee advised concerned utilities to share updated status along with target date to ERPC/ERLDC at earliest.

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Annexure A

Participants in 12th TeST Sub - Committee Meeting of ERPC

Venue: ERPC Conference Hall, Kolkata | Time: 10:30 Hrs. | Date: 09.11.2022 (Wednesday)

Sl. No.	Name	Designation	Organisation	Contact No.	E-mail Id	Signature
1	N S Mondal	Member Secretary	ERPC	9958389967	mserpc-power@nic.in	
2	R Sutradhar	Executive Director	ERLDC	9436302714	rajibsutradhar@posoco.in	
3	Amarish Mallick	CGM	ERLDC	9436302720	amarish.mallick@posoco.in	
4	M. Viswanadh	Sr. DGM.	ERLDC	9433041871	mviswanadh@posoco.in	
5	D. Biswas.	DGM	ERLDC	9434740041	dbiswas@posoco.in	
6	G. MURALI KRISHNA	Sr. DGM	ERLDC	9831337927	Imuralikrishna@posoco.in	
7	ANJAN KR. DAS	GM, ULDC	POWERGRID	9434740029	anjandas@powergrid.in	
8	SANTANU RUDRAPAL	CM(ULDC), ER-I	POWERGRID	9434735848	Santanu.rudrapal@powergrid.in	
9	Bidyut Biswas	SDE(Comm.), DVC	DVC	9735327563	bidyut.biswas@dvc.gov.in	
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11	Shambhu Das	SE(Comm.), SLDC	DVC	7980161164	shambhu.das@dvcgov.in	
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14	SHIVAJI DEWANJEE.	Asso. V. P.	CHEMTROLS	9748704685	shivaji.dewanjee@chemtrols.com	
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16	ROSHAN JAISWAL	Engineer	ERLDC	9007184529	Roshanjaiswal@posoco.in	
17	Amit Chowdhury	Dy. Manager	ERLDC	8944834926	akchoudhury@posoco.in	
18	Pribeek Agrawal	Engineer	ERLDC	9903071710	bibek@posoco.in	
19	Kaushal Suman	Mgr	CTU	7042398702	K.suman@powergrid.in	
20	Shiv Kr Gupta	DGM	CTU	7004749779	SHIVKUMAR@POWERGRID.IN	

Participants in 12th TeST Sub - Committee Meeting of ERPC

Venue: ERPC Conference Hall, Kolkata | Time: 10:30 Hrs. | Date: 09.11.2022 (Wednesday)

Sl. No.	Name	Designation	Organisation	Contact No.	E-mail Id	Signature
21	P. K. Nayak	GM, Telcom	OPTCL	9438907502	tel.pknayak@optcl.co.in	9.11.22
22	P. K. Beura.	DGM, SLDC	SLDC, ODISHA.	9438907472	tel.pkbeura@sldcorissa.org.in	P. K Beura 9/11/22.
23	B. MADHU	Addl C.E	WBSETCL	9163550747	biswajit_madhu@yahoo.co.in	09/11/22
24	Rimil Topno	Sr. Manager(SCADA)	JUSNL	9835715518	uldc.jusnl@gmail.com	09/11/22
25	Anupam Kamal	E.E.E, ULDC	BSPTCL	7979947143	anukamal25@gmail.com	09.11.22
26	Anjali Kumari	A.Ex.E., ULDC	BSPTCL	9262691838	uldc.dept@bsptcl.bihar.gov.in.	Anjali 09/11/22.
27	Kumar Satyam	AD(II)	ERPC	7355225072	Satyam.2435@gov.in	Kumar Satyam 9/11/22
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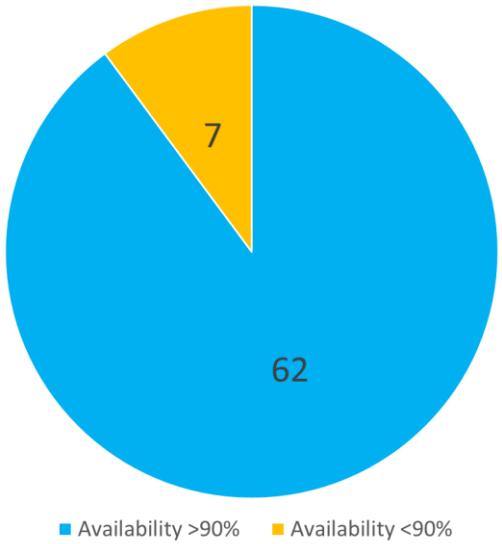
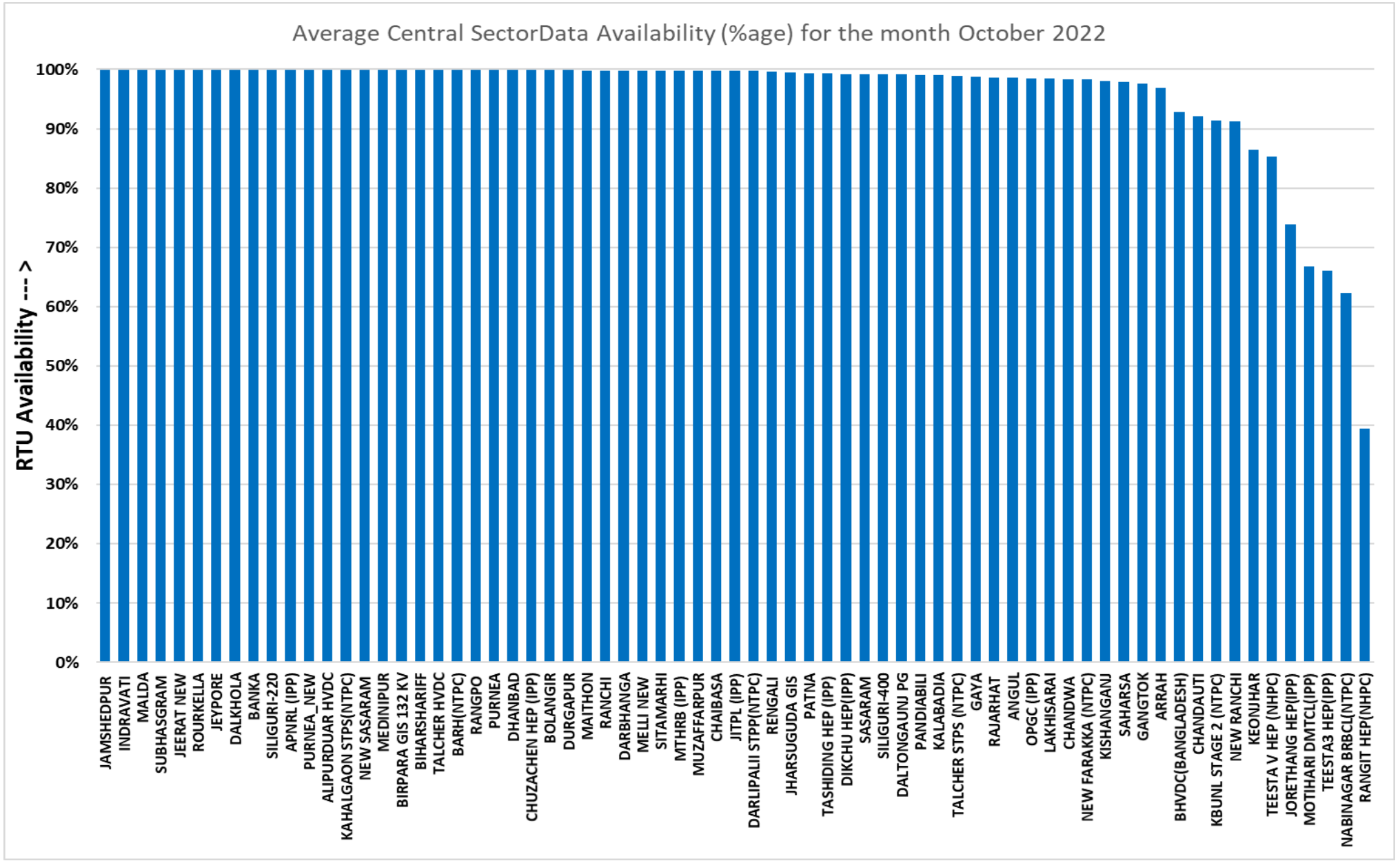
Annexure B

12th TeST Meeting (SCADA Presentation)

SCADA data availability for the month October 2022





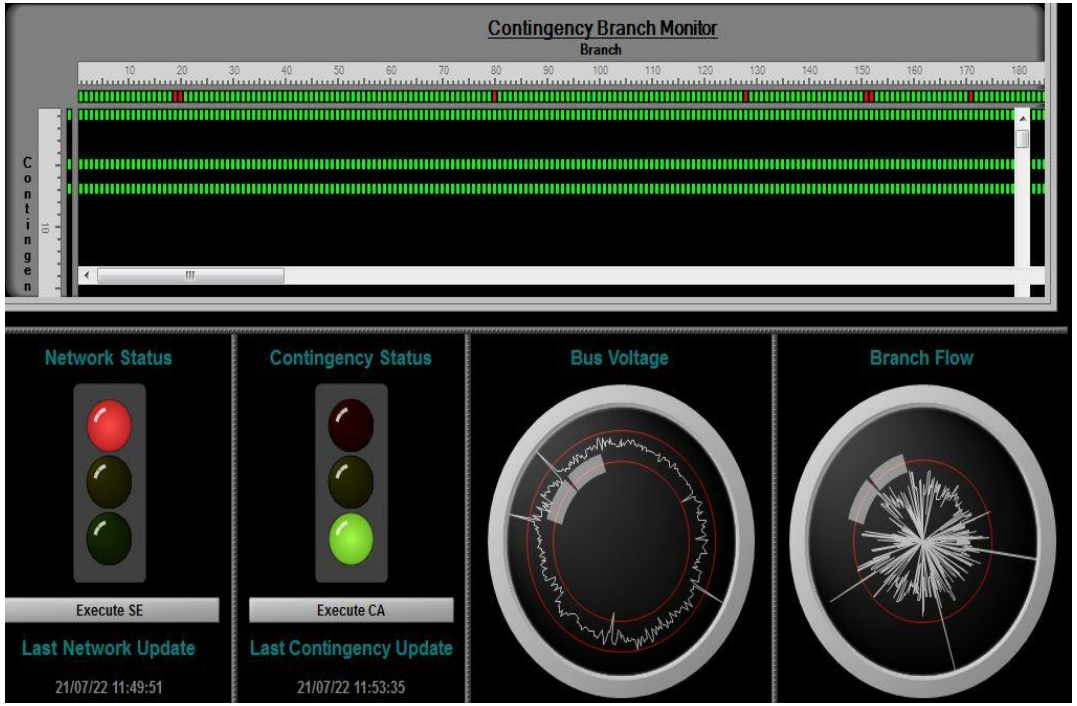
SCADA data availability (% age) for the month October 2022

Location	31-10-2022	30-10-2022	29-10-2022	28-10-2022	27-10-2022	26-10-2022	25-10-2022	24-10-2022	23-10-2022	22-10-2022	21-10-2022	20-10-2022	19-10-2022	18-10-2022	17-10-2022	16-10-2022	15-10-2022	14-10-2022	13-10-2022	12-10-2022	11-10-2022	10-10-2022	09-10-2022	08-10-2022	07-10-2022	06-10-2022	05-10-2022	04-10-2022	03-10-2022	02-10-2022	01-10-2022
RANGIT HEP(NHPC)	50%	51%	48%	48%	20%	0%	0%	0%	0%	28%	47%	37%	48%	48%	47%	47%	43%	44%	37%	59%	46%	48%	49%	48%	46%	48%	47%	46%	49%	45%	48%
NABINAGAR BRBCL(NTPC)	58%	50%	41%	54%	85%	61%	54%	72%	67%	82%	91%	90%	88%	81%	70%	46%	61%	54%	72%	76%	67%	63%	56%	50%	62%	33%	22%	39%	58%	56%	75%
TEESTA3 HEP(IPP)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	54%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	94%	100%	100%	100%	100%	100%	100%
MOTIHARI DMTCL(IPP)	0%	0%	0%	49%	85%	91%	89%	87%	88%	88%	87%	89%	87%	87%	86%	85%	85%	25%	0%	0%	21%	85%	86%	84%	86%	85%	84%	85%	88%	86%	71%
JORETHANG HEP(IPP)	0%	0%	0%	44%	85%	89%	87%	83%	82%	83%	85%	83%	89%	80%	82%	83%	83%	84%	85%	84%	70%	80%	84%	83%	84%	83%	85%	84%	83%	83%	83%
TEESTA V HEP (NHPC)	56%	0%	52%	100%	34%	89%	25%	4%	100%	100%	100%	100%	100%	82%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
KEONJHAR	76%	79%	85%	95%	75%	90%	74%	84%	78%	87%	75%	78%	90%	89%	85%	95%	93%	97%	98%	97%	90%	82%	92%	89%	93%	87%	92%	84%	78%	86%	88%
NEW RANCHI	100%	100%	100%	100%	95%	99%	100%	100%	100%	91%	88%	91%	89%	88%	88%	92%	89%	85%	88%	88%	75%	91%	88%	89%	88%	89%	87%	87%	89%	87%	89%
KBUNL STAGE 2 (NTPC)	97%	99%	98%	90%	84%	90%	94%	93%	93%	93%	89%	88%	93%	89%	93%	94%	92%	87%	92%	86%	93%	85%	90%	88%	87%	89%	97%	93%	95%	95%	90%
CHANDAUTI	100%	87%	87%	100%	73%	99%	98%	100%	100%	100%	87%	65%	87%	78%	87%	88%	89%	100%	100%	100%	98%	100%	75%	79%	100%	100%	87%	100%	100%	100%	93%
BHVDC(BANGLADESH)	93%	92%	94%	92%	94%	93%	93%	94%	93%	96%	92%	93%	92%	93%	92%	94%	92%	94%	93%	93%	92%	92%	93%	93%	93%	92%	93%	94%	89%	92%	93%
ARRAH	97%	97%	96%	97%	97%	97%	98%	97%	97%	97%	97%	97%	98%	97%	98%	97%	97%	97%	96%	97%	97%	97%	96%	97%	97%	97%	96%	96%	97%	98%	97%
GANGTOK	97%	97%	97%	98%	98%	97%	97%	97%	98%	98%	98%	98%	97%	98%	98%	97%	97%	98%	97%	97%	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%
SAHARSA	100%	100%	98%	100%	64%	91%	100%	100%	100%	96%	100%	100%	100%	100%	98%	100%	100%	98%	100%	100%	99%	97%	100%	100%	100%	97%	100%	100%	100%	100%	98%
KISHANGANJ	100%	100%	100%	100%	65%	92%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	84%
NEW FARAKKA (NTPC)	100%	100%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	60%	92%	99%	100%	99%	100%	100%	100%	100%	100%	100%	100%	99%	100%	100%	100%	100%	100%	100%
CHANDWA	98%	100%	99%	99%	99%	98%	99%	99%	99%	98%	99%	98%	99%	95%	97%	99%	99%	96%	99%	99%	99%	95%	99%	99%	99%	95%	98%	99%	99%	99%	100%
LAKHISARAI	100%	100%	100%	100%	55%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
OPGC (IPP)	100%	100%	100%	100%	100%	99%	100%	100%	100%	100%	100%	88%	100%	100%	100%	100%	100%	99%	90%	81%	100%	100%	100%	99%	100%	100%	100%	100%	100%	100%	100%
ANGUL	100%	100%	100%	100%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99%	90%	76%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99%
RAJARHAT	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	79%	80%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
GAYA	100%	100%	100%	100%	95%	100%	100%	100%	100%	100%	100%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	97%	100%	100%	100%	100%	100%	100%	74%	100%	98%
TALCHER STPS (NTPC)	100%	100%	99%	100%	100%	99%	100%	100%	100%	99%	100%	100%	100%	99%	100%	100%	100%	100%	90%	82%	100%	99%	100%	100%	100%	99%	100%	100%	100%	100%	99%
KALABADIA	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%
PANDIABILI	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	90%	83%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
DALTONGAUNJ PG	100%	100%	98%	100%	99%	96%	95%	100%	100%	98%	100%	99%	97%	97%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
SILIGURI-400	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	100%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%
SASARAM	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99%	100%	100%	99%	83%	100%	100%	100%	100%	96%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
DIKCHU HEP(IPP)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	78%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Confidence Building on State Estimation Data

- In order to build confidence on state estimation data, one complete shift ran on State Estimator data.

Actual(SCADA) Flow the elemet going for S/D just prior to S/D	EMS(RTCA)Flow the elemet going for S/D prior to S/D	Name of Elements which are going to be affected	Actual(SCADA) Flow on the effcetd eelments				EMS(RTCA) Flow on the effected eelments		Time of Study	Time of Actual S/D	Remarks
			Pre S/D	Time	Post S/D	Time	Pre S/D	Post S/D			
463	419	400KV-Dikchu-TEESTA-III-1	524	09:12	988	09:14	543	1002	07:55	09:14	Close Match
222	243	400KV-MAITHON-MAITHON RB-2	222	08:35	397	08:39	243	452	07:38	08:39	Close Match
		400kV Maithon RB-Dhanbad-1	244		268		196	213			
		400kV Maithon RB-Dhanbad-2	244		268		196	213			
233	161	400kV Arambagh-Bakreshwar	233	07:10	316	07:14	218	296	05:30	07:14	Close Match
		400/220kV 315 MVA ICT-1 at Bakreshwar	1.3		35		3	45			
		400/220kV 315 MVA ICT-2 at Bakreshwar	1.2		35		3	45			
17	19	400KV/220KV 315 MVA ICT 1 AT INDRAVATI.	17	10:03	30	10:07	19	30	07:50	10:07	Close Match

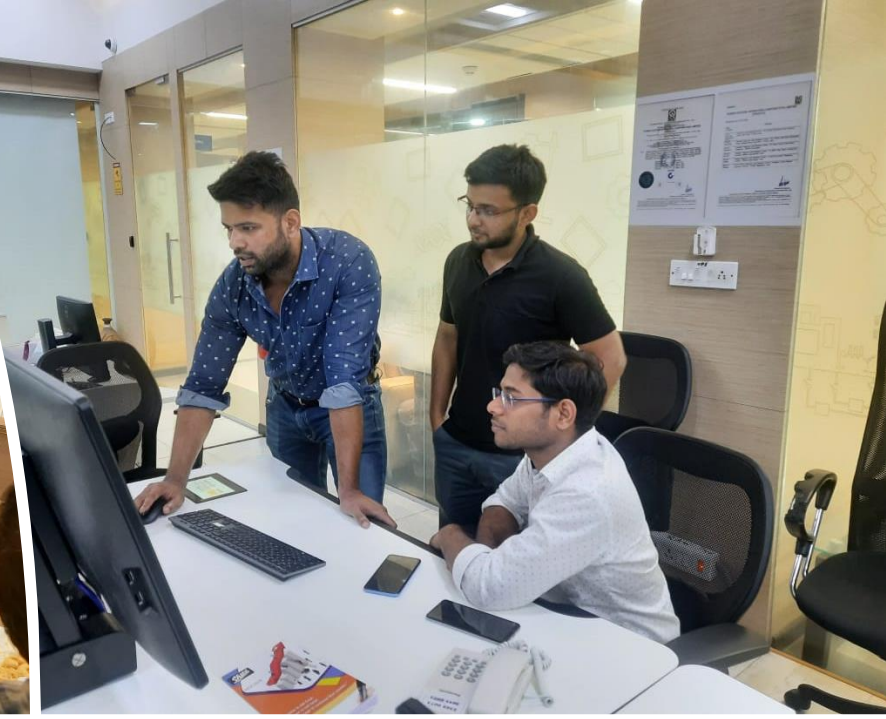


Utilization of RTCA

- RTSD desk at ERLDC runs RTCA before every shutdown. Sample of RTCA performance are tabulated below:

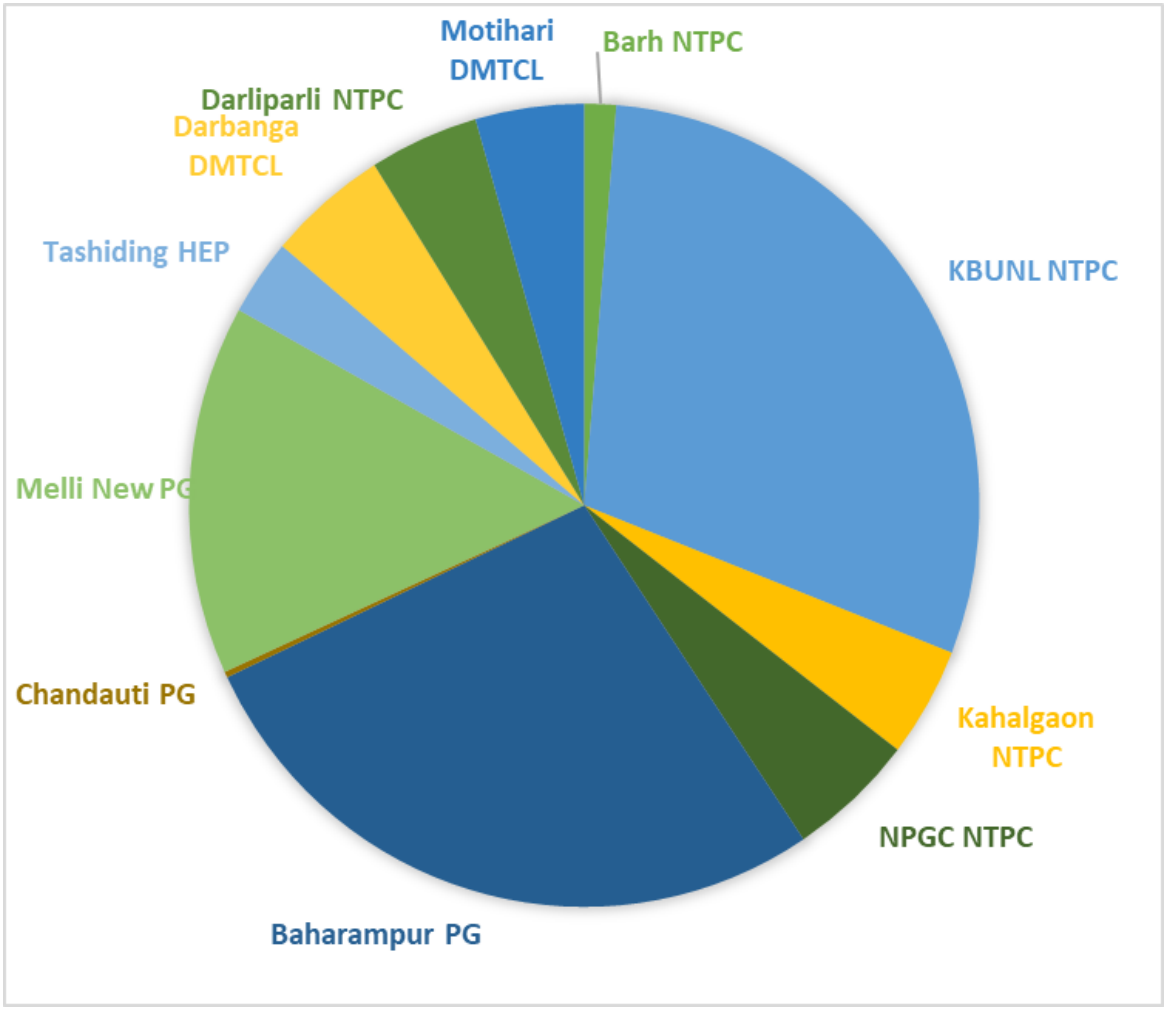
DTS Training

- SCADA Team frequently conducts DTS Training for the executives of SO,MO and SL .
- Various case studies associated to Real Time Power System Operation designed & Demonstrated.



Installation of Firewall at sites & its impact on OT Security

Sl No	Server IP	RTU/SAS Locations	Percentage
1	172.16.1.37	Barh NTPC	1.296%
2	172.16.1.128	KBUNL NTPC	29.687%
3	172.16.1.14	Kahalgaon NTPC	4.438%
4	172.16.1.73	NPGC NTPC	5.217%
5	172.16.1.30	Baharampur PG	27.315%
6	172.16.1.75	Chandauti PG	0.235%
7	172.16.1.59	Melli New PG	14.898%
8	172.16.1.89	Tashiding HEP	3.083%
9	172.16.1.131	Darbanga DMTCL	4.925%
10	172.16.1.132	Darliparli NTPC	4.469%
11	172.16.1.54	Motihari DMTCL	4.438%

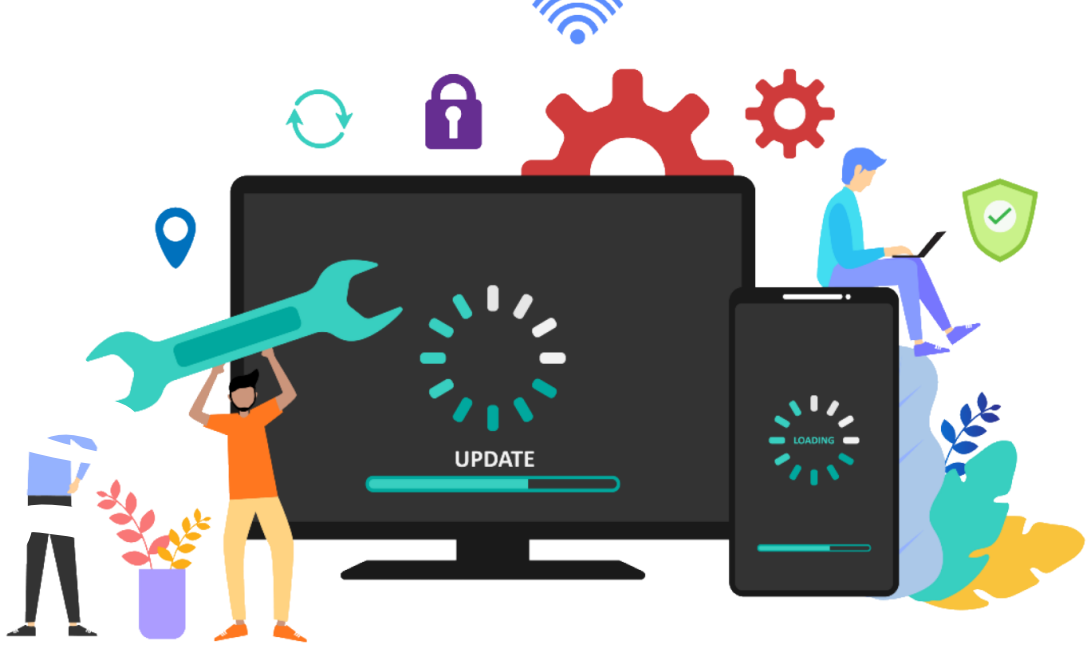


OS Upgradation

- *ERLDC has successfully upgraded the Operating system of all the Workstations from Windows 7 to Windows 10 in compliance WITH THE Mop guidelines.*

SAS Up-gradation

- Rangit
- New Melli
- Farakka
- Talcher
- Patna
- Jharsuguda
- Birpara
- APNRL
- Teesta 5
- New Ranchi
- Angul
- Tashiding
- Jorethang
- Chaibasa
- Kahalgaon



THANK YOU

OCATIONS WHERE INTERFACE ENERGY METERS ARE INSTALLED BY CTU

ANNEXURE B3

Sl.No	Region Name	Utility Name	Substation Name	Number of Meters	Fiber optic Communication available at S/S (Yes-Dual path/Yes Single Path/NA)	Automatic Meter Reading(AMR) Data available(Yes/No)	AMR Comminication through Fiber optic /GPRS/NA	CTU Observation
1	ERLDC	BIHAR	KAHALGAON(KAH)	2	NA	YES	GPRS	
2	ERLDC	BIHAR	KHIZIRSARAI	2	NA	YES	GPRS	
3	ERLDC	BIHAR	LAUKAHI	2	NA	YES	GPRS	
4	ERLDC	BIHAR	MOTIPUR	2	NA	YES	GPRS	
5	ERLDC	BIHAR	NEW PUSAULI(NPS)	2	NA	YES	GPRS	
6	ERLDC	BIHAR	PURNEA(PUR)	3	NA	YES	GPRS	
7	ERLDC	BIHAR	RAXAUL	2	NA	YES	GPRS	
8	ERLDC	CESC	EMSS(EMS)	2	NA	YES	GPRS	
9	ERLDC	CESC	HALDIA(HAL)	2	NA	YES	GPRS	
10	ERLDC	WEST BENGAL	JEERAT(JRT)	3	NA	YES	GPRS	
11	ERLDC	WEST BENGAL	KALIMPONG(KLM)	1	NA	YES	GPRS	
12	ERLDC	WEST BENGAL	KURSEONG(KSG)	2	NA	YES	GPRS	
13	ERLDC	WEST BENGAL	RAMMAM(RMM)	1	NA	YES	GPRS	State nodes (CEA may take up with states for verification of FO connectivity)
14	ERLDC	WEST BENGAL	SAGARDIGHI(SAG)	5	NA	YES	GPRS	
15	ERLDC	WEST BENGAL	SANTALDIH(SNT)	1	NA	YES	GPRS	
16	ERLDC	JHARKHAND	CHANDIL(CHN)	4	NA	YES	GPRS	
17	ERLDC	JHARKHAND	DALTONGANJ	2	NA	YES	GPRS	
18	ERLDC	JHARKHAND	DEOGARH(DEO)	1	NA	YES	GPRS	
19	ERLDC	JHARKHAND	DUMKA(DUM)	2	NA	YES	GPRS	
20	ERLDC	JHARKHAND	GARWA(GAR)	1	NA	YES	GPRS	
21	ERLDC	JHARKHAND	JAMTARA(JMT)	1	NA	YES	GPRS	
22	ERLDC	JHARKHAND	JAPLA(JAP)	1	NA	YES	GPRS	
23	ERLDC	JHARKHAND	KENDOPOS(KEN)	2	NA	YES	GPRS	
24	ERLDC	JHARKHAND	NAGARUNTARI	2	NA	YES	GPRS	
25	ERLDC	JHARKHAND	PATRATU(PTJ)	3	NA	YES	GPRS	
26	ERLDC	GRIDCO	BANGRIPOSHI	1	NA	YES	GPRS	
27	ERLDC	GRIDCO	GMR(GMR)	7	NA	YES	GPRS	OPGW work is in progress
28	ERLDC	GRIDCO	INDRAVATI(IND)	1	NA	YES	**GPRS**	ISTS wideband Node with FO
29	ERLDC	GRIDCO	JINDAL(JIN)	1	NA	YES	GPRS	
30	ERLDC	GRIDCO	MENDHASAL(MEN)	2	NA	YES	GPRS	
31	ERLDC	GRIDCO	SADEIPALI	1	NA	YES	GPRS	
32	ERLDC	GRIDCO	OPGC	10	NA	YES	GPRS	
33	ERLDC	GRIDCO	STERLITE(SEL)	6	NA	YES	GPRS	
34	ERLDC	GRIDCO	STERLITE(SEL)	4	NA	YES	GPRS	
35	ERLDC	GRIDCO	STERLITE(SEL)	4	NA	YES	GPRS	State nodes (CEA may take up with states for verification of FO connectivity)
36	ERLDC	SIKKIM	MELLI(MEL)	1	NA	YES	GPRS	
37	ERLDC	SIKKIM	RAVANGLA(RAV)	1	NA	YES	GPRS	
38	ERLDC	DVC	TISCO(TIS)	2	NA	YES	GPRS	DVC wideband node connected to ISTS wideband Network
39	ERLDC	NTPC	DARLIPALLI	4	NA	YES	GPRS	ISTS wideband Node with FO
40	ERLDC	NTPC	NABINAGAR	8	NA	YES	GPRS	ISTS wideband Node with FO
41	ERLDC	NTPC	TALCHER SOLAR(TLS)	6	NA	YES	GPRS	ISTS wideband Node with FO
42	ERLDC	NTPC	TALCHER SOLAR(TLS)	6	NA	YES	GPRS	ISTS wideband Node with FO
43	ERLDC	IPP	ADHUNIK(APNRL)	2	NA	YES	GPRS	Connected through Underground cable
44	ERLDC	IPP	ADHUNIK(APNRL)	2	NA	YES	GPRS	
45	ERLDC	IPP	CHUZACHEN(CZN)	7	NA	YES	GPRS	OPGW work is in progress
46	ERLDC	IPP	JINDAL	4	NA	YES	GPRS	OPGW work is in progress
47	ERLDC	IPP	MAITHON POWER LTD (MRB)	10	NA	YES	GPRS	ISTS wideband Node with FO
48	ERLDC	IPP	MAITHON POWER LTD (MRB)	2	NA	YES	GPRS	ISTS wideband Node with FO
49	ERLDC	IPP	DIKCHU	4	NA	YES	GPRS	OPGW is in plan

50	ERLDC	IPP	DIKCHU	5	NA	YES	GPRS	OPGW is in plan
51	ERLDC	IPP	JORTHANG	6	NA	YES	GPRS	OPGW is in plan
52	ERLDC	POWERGRID	GAYA(GYA)	7	NA	YES	GPRS	ISTS wideband Node with FO
53	ERLDC	POWERGRID	PURNEA(PRN)	13	NA	YES	GPRS	ISTS wideband Node with FO
54	ERLDC	POWERGRID	PUSAULI	4	NA	YES	GPRS	ISTS wideband Node with FO
55	ERLDC	DMTCL	DARBHANGA	5	NA	YES	GPRS	State nodes (CEA may take up with states for verification of FO connectivity)
56	ERLDC	DMTCL	DARBHANGA	9	NA	YES	GPRS	
57	ERLDC	DMTCL	MOTIHARI	7	NA	YES	GPRS	
58	ERLDC	DMTCL	MOTIHARI	8	NA	YES	GPRS	
59	ERLDC	BIHAR	BARSOI	1	NA	NO	NA	
60	ERLDC	BIHAR	DUMRAON NEW	2	NA	NO	NA	
61	ERLDC	BIHAR	NAUBATPUR	4	NA	NO	NA	
62	ERLDC	JHARKHAND	GOELKERA	1	NA	NO	NA	
63	ERLDC	GRIDCO	BALIMELA	2	NA	NO	NA	
64	ERLDC	GRIDCO	BHOGRAI	1	NA	NO	NA	
65	ERLDC	GRIDCO	DULANGA CMP	2	NA	NO	NA	
66	ERLDC	GRIDCO	KEONJHAR	2	NA	NO	NA	
67	ERLDC	SIKKIM	GYALSHING(SIKKIM)	1	NA	NO	NA	
68	ERLDC	SIKKIM	SAGHBARI	2	NA	NO	NA	
69	ERLDC	IPP	RONGNICHU	5	NA	NO	NA	OPGW is in plan
70	ERLDC	IPP	TASHIDING	6	NA	NO	NA	OPGW is in plan
71	ERLDC	IPP	TEESTA-III	10	NA	NO	NA	OPGW work is in progress

DUAL PATH	SINGLE PATH	NA
0	161	71

Annexure B4

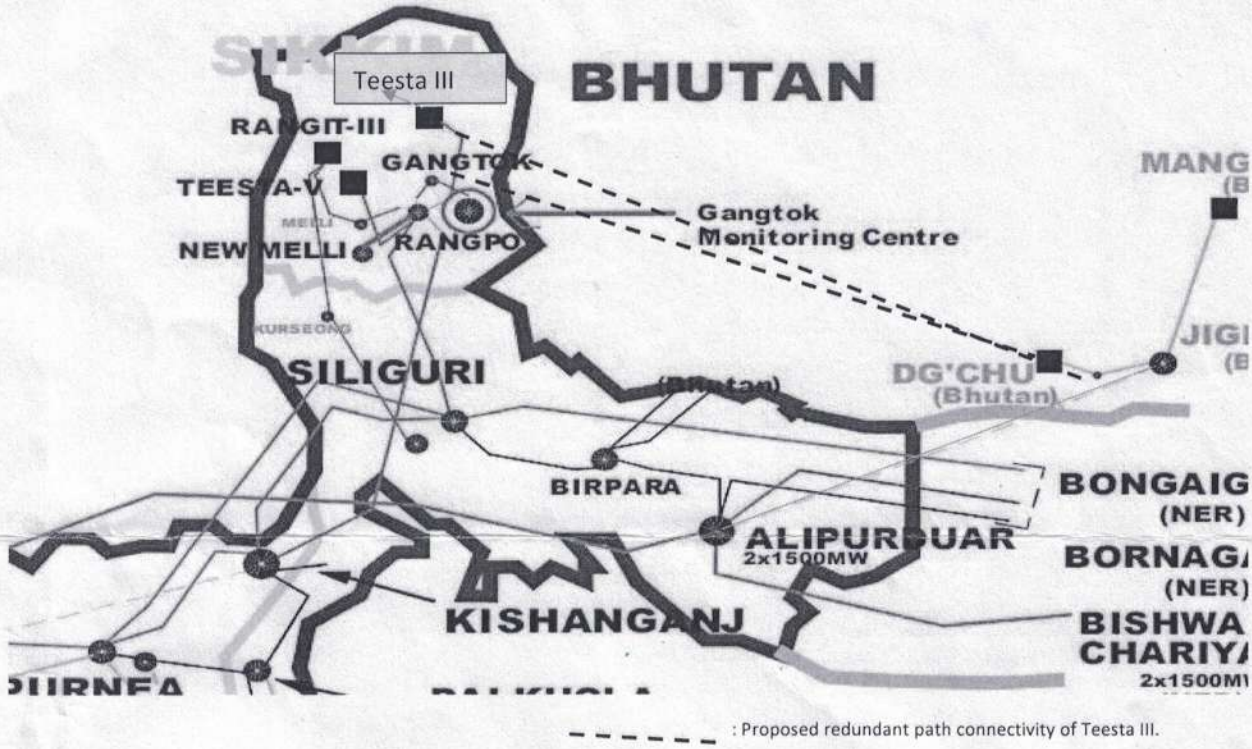
Connectivity of Teesta III to ISTS Fibre communication network

S. No.	Items	Details
1.	Name of Scheme	Connectivity of Teesta III(Teesta Urja Ltd.) to ISTS communication network
2.	Scope of the scheme	The OPGW installation on Teesta III- Dg'chu portion (approx. 26 kms line length) of 400kV Teesta III – Rangpo#2(TPTL line).
3.	Depiction of the scheme on FO Map	**Exhibit-I**
4.	Objective / Justification	Presently, Teesta III is connected through Teesta III - Rangpo PLCC link. First Fiber path is under implementation through Teesta III-Rangpo circuit#1. Teests-III-Rangpo#2 is LILOed at Dg'chu. The Redundant Fiber path for Teesta-III may be planned through LILO of Teesta III-Rangpo #2. For redundant fiber path, OPGW may be laid on Teesta III- Dg'chu portion (approx. 26 kms line length) of Teesta III – Rangpo#2. OPGW is already planned on Dg'chu -Rangpo portion of Teesta III – Rangpo#2.
5.	Estimated Cost	Rs. 1.167 Crore (approx.)
6.	Implementation time frame	21 months from Gazette notification.

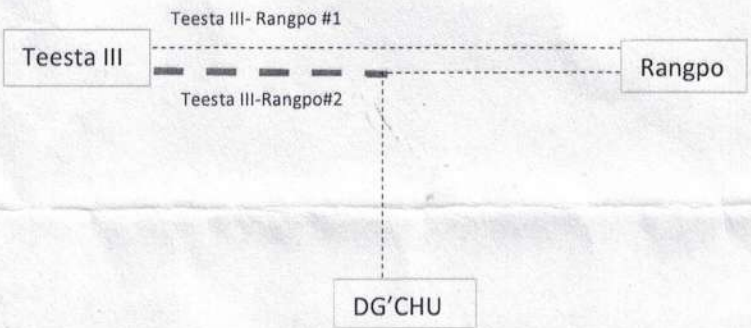
24.8.2022
Kaushal Suman
Manager, CTUIL

Exhibit-I

FO connectivity of Teesta III in Map



Schematic diagram of FO connectivity of Teesta III



Legend:

: Present scope

:Planned

Suman
24.08.2022
Kaushal Suman
Mgr, CTUIL

'Upcoming Replacement/Upgradation of SCADA/EMS System' – Minutes of Meeting between POWERGRID and POSOCO

Venue: Corporate Center (Gurgaon). POWERGRID
Date : 08 Sep 2022
Time : 03:00 PM

A meeting was held between CMD, POWERGRID and CMD, POSOCO along with the team members to discuss upcoming replacement/upgradation of SCADA/EMS.

The list of participants is attached at **Annex – I.**

1. **Upgradation/replacement of SCADA/EMS system at various RLDCs:** Considering the expiry of existing AMC of SCADA/EMS system by 2025, the awarding process for the upgradation of all LDCs need to be expedited. During the meeting, different type of implementation models like TOTEX, ownership of projects, segregation of implementation and coordination of tendering process etc. were discussed and following are the broad points agreed upon:

   a. **Support Service:** Considering the present support service problems faced at the control centres, cyber security concerns, replacement/upgraded items handling, suitable provisions should be incorporated in TS/Contract documents.

   b. **One Region – One Tender:** There will be one tender for all states in a Region. As discussed, NR & ER will be taken up by POWERGRID while SR & WR will be taken up by POSOCO. NER is yet to decide and will be decided subsequently.

   c. **Mode of Implementation:** POWERGRID shall be implementing NR & ER through tariff mode and POSOCO shall be implementing SR & WR through funding by the respective utilities. For, NRLDC and ERLDC, the implementation will be done by POWERGRID on consultancy basis. It was discussed and decided that 10% consultancy fee shall be charged for the same.
      i. In case the tendering process for Jharkhand and Himachal Pradesh (HP) will be taken up by POWERGRID, the utilities to agree for implementation through tariff mode. POSOCO shall pursue with both utilities for the same. If HP and/or Jharkhand arrange self-funding, POWERGRID shall execute their works on consultancy basis with 10% consultancy charges.

   d. **Uniformity of Tender Document and other documents:** To ensure uniformity and ease of implementation, technical specification and QR shall be jointly finalized and adopted by both the organization. The commercial clauses, GCC & SCC etc. shall be as per respective organization who is doing procurement i.e POWERGRID/POSOCO. Post finalization of these documents, the tendering and other post award activities including signing of MoU with the respective states, shall be handled by POWERGRID and POSOCO respectively for their respective Regions.

   e. **Staggered tendering approach:** It was agreed to have around 4 weeks between floating of tenders for respective region. The indicative staggered tendering will be NR (POWERGRID) → SR (POSOCO) → ER (POWERGRID) → WR (POSOCO) → NER (to be decided).

f. **Make in India:** Both POWERGRID and POSOCO shall approach MoP/DoT individually for the exemption from Make in India (MII) clause related to exemption of procurement of EMS/SCADA and cyber security equipment.

The meeting ended with thanks to all the participants.

Signed by:

14/9/22

(POWERGRID)

(Y. K. Dixit)
ED (IB, BDD, SLDC)

murali krishna
14/9/22

(POSOCO)

(K Murali Krishna)
EDC (Corp. Engineering)

Annex – I:

List of Participants

POWERGRID

- Sh K Sreekant, CMD, POWERGRID
- Sh R K Tyagi, Director, Operations
- Sh Sunil Agrawal, ED, CP
- Sh Y K Dixit, ED, GA&C
- Sh B Anantha Sarma, ED, CS
- Sh K K Gupta. CGM. CS
- Dr. Sunita Chohan, CGM, LD&C
- Smt. Sruti Mishra, Sr GM, CMD Coord Cell
- Sh A K Singh, Sr GM, LD&C
- Sh Vikas Kumar, CM, CMD Coord Cell
- Sh B B Singh, CM, D(O) Cell

POSOCO

- Sh S R Narasimhan, CMD, POSOCO
- Sh Debasis De. ED. NLDC
- Sh K Murali Krishna ED, Engineering
- Sh Manoj Kumar Agrawal, CGM
- Sh Sajan George, Sr GM
- Sh Harish Kumar Rathour. GM
- Sh Rakesh Kumar, CM, CMD Cell

Annexure B6.1

Eastern Regional Power Committee, Kolkata

Draft Procedure on Monthly Outage Planning for Communication System–ER

1. Introduction:

The communication needs of the power sector have amplified significantly with the increase in the size and complexity of the grid. Communication is also a key pre-requisite for efficient monitoring, operation and control of power system. For integrated operation of the Grid, uninterrupted availability of the real time data of various Power System elements assumes utmost importance. Hence, Communication systems plays vital role to facilitate secure, reliable and economic operation of the grid.

To facilitate the above, Central Electricity Regulatory Commission (CERC) had notified Communication System for Inter-State Transmission of Electricity, Regulations, 2017 which came in force w.e.f. 01.07.2017.

2. Regulatory Provisions with respect to Outage Planning for Communication System:

2.1 The following provisions of Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017 merit attention:

…….

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

2(i) (g) "Communication network" means an interconnection of communication nodes through a combination of media, either directly or through intermediary node(s);

2(i) (h) "Communication system" is a collection of individual communication networks, communication media, relaying stations, tributary stations, terminal equipment usually capable of inter-connection and inter-operation to form an integrated communication backbone for power sector. It also includes existing communication system of Inter State Transmission System, Satellite and Radio Communication System and their auxiliary power supply system, etc. used for regulation of inter State and intra-State transmission of electricity;

…….

9. Periodic Testing of the Communication System:

(i) All users that have provided the communication systems shall facilitate for periodic testing of the communication system in accordance with procedure for maintenance and testing to be prepared by C'[U within 60 days of notification of Regulations and approved by Commission.

(ii)Testing process for communication network security should also be included even for third party system if exists in accordance with procedure for maintenance and testing to be

prepared by CTU and approved by Commission.

2.2 The following provisions of Central Electricity Authority (Technical Standards for Communication System in Power System Operations) Regulations, 2020 notified on 27.02.2020 merit attention:

…….

7. Reliability:

(1) Total outage period shall be less than sixteen hours on monthly basis each for interface node, wideband node and communication network.

(2) The total outages in a rolling twelve months assessment period shall be less than forty-eight hours.

(3) The communication system shall be designed to ensure adequate redundancy.

…….

8. Design and planning :

…….

(5) User shall ensure centralized monitoring or management of its communication network and shall provide necessary facilities for configuration, identification of fault and generation of various reports on availability of the communication system.

(6) User shall be responsible for planning, design, implementation, secured operation and maintenance of its own communication infrastructure to be interfaced with the communication system.

…….

21. Training :

(1) Specialized training shall be provided to the persons manning the centralized monitoring center and to the field support staff to ensure quick fault detection and restoration of the communication system.

(2) Training shall be provided to the maintenance persons on all communication equipment for its operation and maintenance.

3. Objective :

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

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.

…….

3.2 Regulation 10 Central Electricity Authority (Technical Standards for Communication System in Power System Operations) Regulations, 2020 notified on 27.02.2020 states

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.

3.3 The objective of this Procedure on Outage Planning of communication System is to carry out outage planning for communication system in ER such that uninterrupted communication system is ensured. Monthly outage of Communication Equipment/system shall be planned by the owner of communication equipment / link in coordination with ERPC/ERLDC/SLDCs and placed in the forum of ERPC and shall be discussed for approval as per the procedure.

4. Scope and applicability:

4.1 The scope and applicability as per Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017 is given below:

…….

5. Scope and Applicability:

(i) These regulations shall apply to the communication infrastructure to be used for data communication and tele-protection for the power system at National, Regional and inter-State level and shall also include the power system at the State level till appropriate regulation on Communication is framed by the respective State Electricity Regulatory Commissions.

(ii) All Users, SLDCs, RLDCs, NLDC, CEA, CTU, STUs, RPCs, REMC, FSP and Power Exchanges shall abide by the principles and procedure as applicable to them in accordance with these regulations.

…….

4.2 The applicability as given in Central Electricity Authority (Technical Standards for Communication System in Power System Operations) Regulations, 2020 notified on 27.02.2020 is given below:

…….

3.Application:These regulations shall apply to all the users; National Load Despatch Centre, Regional Load Despatch Centres, State Load Despatch Centres, Load Despatch Centres of distribution licensee, Central Transmission Utility, State Transmission Utilities, Regional Power Committees, Renewable Energy Management Centres, forecasting service provider and power exchanges.

…….

4.3 All concerned entities stated above would coordinate with ERPC / ERLDC for outage planning of Communication System.

4.4 Communication System Outage Planning will be limited to the following system:

(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) VC links between LDCs
(v) Inter regional AGC links
(vi) Any other system agreed by the forum

4.5 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 NLDCs
(iv) SDH & PDH
(v) DCPC
(vi) RTU& its CMU cards
(vii) DTPCs
(viii) Battery Banks and Charging Equipment
(ix) EPABX
(x) Any other equipment/link agreed by the forum

Note: PLCC would not be included, if the link is not used for SCADA Data.

5. Procedure on Monthly Outage Planning of Communication System-ER:

5.1 Each concerned Entity would nominate a Nodal Officer/ Alternate Nodal Officer along-with details to the ERPC/ERLDC along-with designation, mobile number; email ID etc. Nodal Officer/ Alternate Nodal Officer would interact internally and would be single point contact for outage planning with ERPC/ERLDC.

5.2 The outage proposal of the communication equipment/links for the succeeding month shall be submitted in the prescribed format (attached as Annexure: COF-I & COF-II) to ERPC Secretariat via mail (erpcscada@gmail.com) only.

The type of services (viz. data, voice, protection etc.) being affected/ not affected may be mentioned in the format. If there is no interruption to any service, the precautions and actions (like redundant path) being taken to ensure data, voice etc availability may also be mentioned, which facilitates to avoid simultaneous outage for the same service(s). Any other communication system related issues would be addressed to this mail (erpcscada@gmail.com) only.

5.3 The proposed list of communication outages for the succeeding month shall be submitted to ERPC latest by 8th day of the current month.

5.4 Users / Owners of the communication equipments/links need to furnish their monthly outage proposal in respect of their equipments/links in the prescribed (in excel) format only. Modification of this format is not allowed. However, suggestion for improving the format is solicited. Outage proposals not in the format or through Fax/PDF etc may liable to be rejected.

5.5 RPC will consolidate the list of outage proposals received from various Users/ Owners of the communication equipments/links and publish the list by 11th of every month.

5.6 Communication outages affecting other regions would be coordinated by ERLDC through NLDC.

5.7 A meeting will be conducted every month during 2nd/3rd week of the month through VC to discuss and approve / dispose the proposed list of outages pertaining to communication links/

equipments. The date of VC will be informed during the 1st week of the month.

5.8 The VC for approving the communication outage will be termed as "Communication System Outage Planning Meeting for Eastern Region (COMER)" prefixed with the no of meeting and suffixed with the name of month for which the outages are proposed.
For example, for availing outage of communication equipments for the month of June 2021, COMER-June 2021 (1st COMER for June 2021) will be held on the middle of May, 2021.

5.9 In the VC, the system constraints pertaining to the outage of communication equipments/links, if any, shall be discussed and the outage proposals will be approved/ revised/ disposed based on the outcome arrived in the VC. Therefore, all the Users/Owners of the communication equipments/links shall attend the VC without fail including ERLDC. It is requested that the Nodal Officers who do not have VC facility may join in the nearby VC available with State SLDC / PGCIL.

5.10 The final approved list of communication equipments will be published by ERPC after 3 days from the date of VC.

5.11 In case of any emergency outage requirement of communication equipments, Users/ Owners may directly apply on D-1 basis to ERLDC via mail ID erldcscada@posoco.in.

5.12 For the outages of communication equipments/links which are approved in the VC, concerned entities shall confirm availing of approved outages of communication equipments on D-2 day to ERLDC at erldcscada@posoco.in or intimate the dropping of approved outages, if any.

5.13 The concerned entity shall give intimation to ERLDC Control room/ERLDC SCADA team before start of the work & after completion of the work.

5.14 ERLDC shall coordinate with the concerned entities that are likely to be affected by the outage of communication equipments/links.

5.15 All Users / Owners of the communication equipments/links will submit their deviation report by 10th of the month in respect of the outages of communication links/ equipments availed during the previous month as per the format attached at Annexure: DCOA-I & DCOA-II.

****

Annexure B6.2

Annexure -COF I

List of outages of Communication Links, proposed to avail during the month of June, 2021

Dated :

COMER VC Date :

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

SL	Name of Requesting Agency	Description of Link	Source	Destination	Channel Routing/Alternate channel status	Ownership/Cordinating agencies	Reason for availing outage & Precautions / actions being taken to ensure communication system availability	Outage proposed from	Outage proposed upto	Total hours of outage proposed now	Approved ? (Y/N)	RPC Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13
1	**Example**	Data/Voice, PLCC - OFC	Thirubuvanai	Pondy SCC	Thirubuvanai – Villianur 230 – Pondy SCC	PED, Puducherry	Preventive Maintenance. 110KV Thirubuvanai power flow data would be available from Villianur 230KV RTU	07-Jan-21, 10:00	07-Jan-21, 13:00	**03:00**		

Name of Communication links/channels

1. OF links

2. Any other link being used for ISTS communication

3. ICCP links

4. Any other link

Format

Annexure - COF II

List of outages of Communication Equipment, proposed to avail during the month of June, 2021

Dated :

B Details of Communication Equipment proposed : Communication VC Date :

SL	Name of Requesting Agency	Name of the communication equipment	Location of the Equipment / Name of Station	Name of the Channel / Path / directions affected	Alternate Channel / Path available (Furnish details)	Ownership/Coordinating agencies	Reason for availing outage and precautions / actions being taken to ensure communication system availability	Outage proposed from	Outage proposed upto	Total hours of outage proposed now	Approved ? (Y/N)	RPC Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13
	Example	PLCC, ABB, ETL41, TK1 SPS protection trip	Thingalore 230 kV SS	Ingur 230 kV SS	No	TANTRANSCO	Maintenance work	20-Jan-21, 10:00	20-Jan-21, 14:00	**04:00**		

Name of Communication links/channels

1. SDH & PDH

2. DCPC

3. RTU & its CMU Cards

4. DCPCs

5. Battery banks and Charging equipment

6. EPBAX

7. Any other equipment

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 throu	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 : **00:00**

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	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**

ITEM NO. B.10: Replacement of old RTU in Eastern Region for reporting of RTU / SAS to back-up Control Centre

Present status of RTU/SAS replacement / up-gradation: -

Utility	Status	Deliberation in last TeST meeting	Target
POWERGRID	Pending	*In 7th TeST Meeting, POWERGRID intimated that LOA for the old RTUs replacement project would be floated by Dec'2020.* *POWERGRID agreed to replace the old S-900 RTUs on priority basis as per the list submitted by ERLDC.*	
Maithon Right bank (MPL)	RTU/SAS Upgraded		
NTPC, Farakka (Stage I & II)	Pending		April, 2020
Talcher STPS	RTU Upgraded		
Kahalgaon STPS	Pending		February, 2020
Chuzachen HEP	Pending	*ERLDC informed that Chuzachen up - graded their RTUs for reporting it to IEC 104 but the same could not be operationalized due to non-availability of last mile fibre connectivity and in absence of standby link to ERLDC BCC.*	With the availability of OPGW between Chuzachen - Rangpo.
JITPL	Pending	*POWERGRID informed that OPGW related work at JITPL will be completed by April 2021.*	December 2020
GMR	Pending	*POWERGRID informed that OPGW related work at GMR will be completed by April 2021.*	December 2020
JUSNL	Pending	*JUSNL informed that they have already replaced the RTUs of Hatia new and Sikidri. JUSNL added that remaining RTUs would be replaced by Jan, 2021.*	October 2020
OPTCL	Pending	*OPTCL informed that out of 78 nos. of RTUs to be replaced, despatch instruction for 52 nos of RTUs has already been placed. OPTCL added that RTU replacement work would be completed by June, 2021.*	March 2021
WBSETCL	Pending		

Annexure B9.2

Status of SAS Upgradation Project at POWERGRID Eastern Region

S.N.	Name	REGION	VOLTAGE LEVEL	STATUS
1	GAYA 765kV	ER-I	765/400/220KV	SAT Done
2	Ranchi (765 kV)	ER-I	765/400KV	SAT Done
3	Chaibasa	ER-I	400/220KV	SAT Done
4	BOLANGIR	Odisha Projects	400/220KV	Under Progress
5	Angul (765 kV)	Odisha Projects	765/400KV	Under Progress
6	Jharsugda (765 kV)	Odisha Projects	765/400KV	SAT Done
7	KEONJHAR	Odisha Projects	400/220KV	Under Progress
8	Pandiabilli	Odisha Projects	400/220KV	SAT Done
9	kishenganj	ER-I	400/220KV	SAT Done
10	Talcher HVDC	ER-II	400KV	Planned
11	Chandwa	ER-I	400KV	Under Progress
12	Sasaram 765	ER-I	765/400KV	Planned
13	BANKA	ER-I	400/132 KV	Planned
14	Lakhisarai	ER-I	400/132KV	Planned
15	Behrampur	ER-II	400KV	Under Progress
16	NEW MELLI	ER-II	220 kV	Under Progress
17	Daltonganj	ER-I	400/220/11KV	Under Progress
18	SILIGURI	ER-II	200/132KV	Not yet started
19	BIRPARA	ER-II	200/132KV	SAT Done
20	Purnea	ER-I	220/132KV	Planned
21	ARA	ER-I	220/132KV	Planned
22	Rangpo	ER-II	400KV 220KV 132KV	Planned

Annexure B9.3

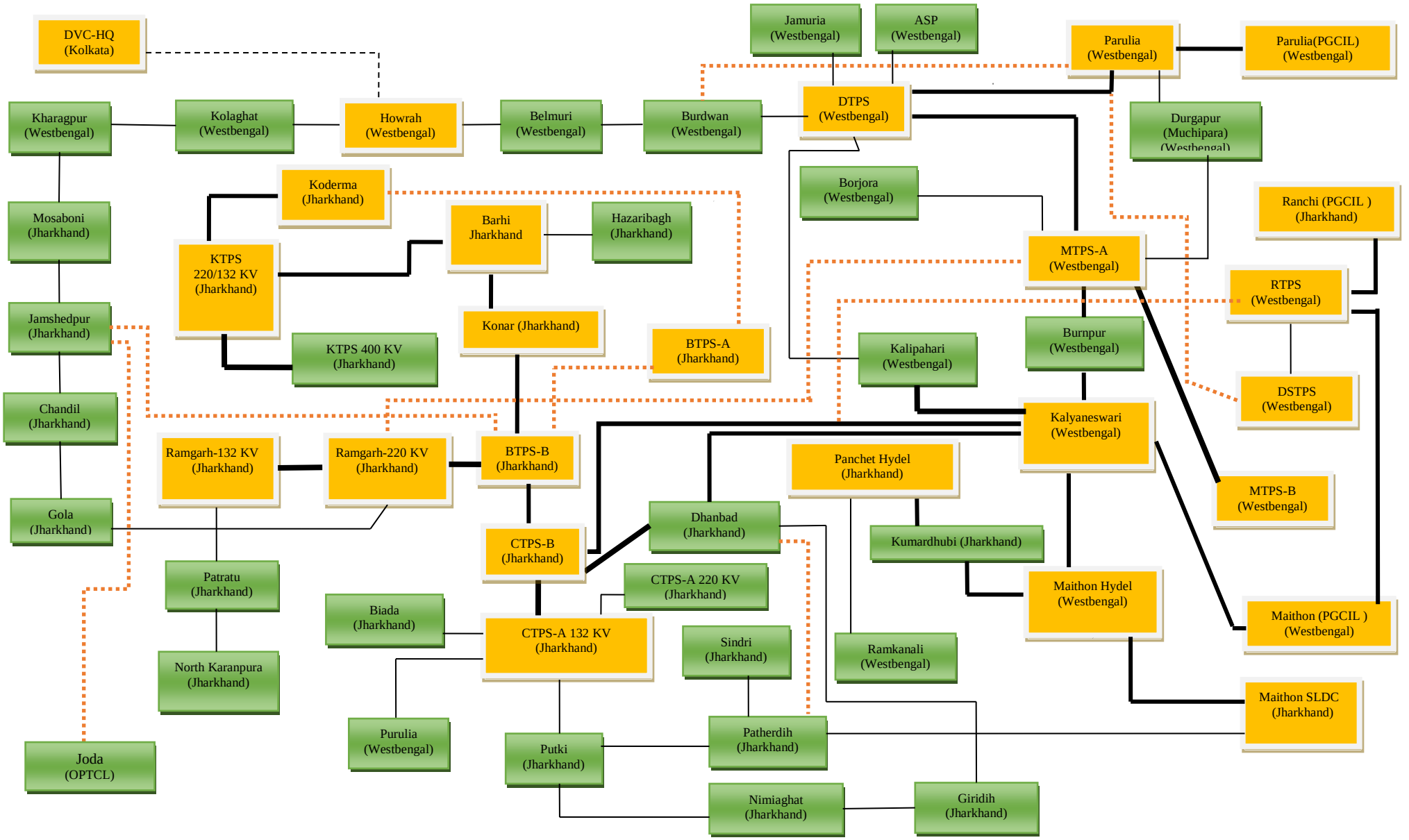
Status of RTU Replacement Project in Eastern Region			
Sl.No.	**Name of Substation**	**Region**	**Status**
1	Durgapur	ER-II	Planned
2	Malda	ER-II	Planned
3	Binaguri	ER-II	Planned
4	Subhasgram	ER-II	Planned
5	Dalkhola	ER-II	Planned
6	Ganktok	ER-II	Planned
7	Maithon	ER-II	Planned
8	Biharsharif	ER-I	Planned
9	Jamshedpur	ER-I	Planned
10	Purnea400	ER-I	Planned
11	Sasram HVDC	ER-I	Planned
12	Muzaffarpur	ER-I	Planned
13	Jeypore	Odisha Projects	Planned
14	baripada	Odisha Projects	Planned
15	Indrawati	Odisha Projects	Planned
16	Rourkela	Odisha Projects	Planned
17	Rengali	Odisha Projects	Planned

Annexure B22

Proposed List of links for OPGW laying in DVC Sector for redundancy & strengthening of communication network of DVC

S/n	Name of Link	Voltage Level	Approx. Length (Km)	Remarks
1	BokaroA-Koderma	400KV	105	Redundant connectivity for both BokaroA & Koderma
2	Dhanbad-Patherdih	132KV	22	For better redundancy of Dhanbad with SLDC, implementation of DTPC & strengthening of communication network.
3	CTPS-Kalyaneshwary LILO at RTPS	220KV	125	For redundant connectivity of RTPS & implementation of DTPC
4	Parulia-Bardhaman	220KV	90	For redundant connectivity of Parulia
5	DTPS-Parulia (LILO at DSPTS) LILO part (48F)	220KV	8	For redundant connectivity of DSTPS
6	BokaroB-Jamshedpur (DVC)	220KV	155	For better redundancy of Jamshedpur & strengthening of communication network. DVC-OPTCL connectivity.
7	Joda-Jamshedpur(DVC)	400KV	140	DVC-OPTCL connectivity, implementation of DTPC & strengthening of communication network.
8	MejiaA-Ramgarh220	220KV	155	For redundant connectivity of Ramgarh, implementation of DTPC & Strengthening of communication network.
9	BTPSA-BTPSB (UGFO)	UG	5	For redundant connectivity of BTPS-A
Total			**805**	

Proposed List of links for OPGW laying in DVC Sector for redundancy & strengthening of communication network of DVC



पावरग्रिड POWERGRID

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

Ref: ER-I/PAT/ULDC/F-19/ 1973

Date: 14.09.2022

To
Chief Engineer (System Operation)
Bihar State Power Transmission Company Ltd.
Vidyut Bhawan, Bailey Road, Patna-800021

Kind Attn: Sh. A.K. Chaudhary

Sub: Establishment of Communication System under Expansion/ Up-gradation of SCADA/EMS System at SLDCs in Eastern Region (BSTPCL and DVC): Issuance of commissioning certificate of 5 nos. OPGW links and associated equipments and short-closing of 01 no. OPGW link

Dear Sir,

As you are aware that following 05 nos. OPGW links alongwith associated equipments has been successfully commissioned. The details of 05 nos. links are enclosed and summarized below:

S/n	Name of OPGW Link	OPGW Cable (24 F, DWSM) along with associated hardware and accessories (km)	Remarks
1	MTPS-Gopalganj	100.35	Commissioning of 05 nos. links of total 266.27 Km OPGW alongwith associated equipments as per annexure-I.
2	Siwan-Gopalganj	30.12	
3	Saharsa- Purnea (BH)	101.11	
4	Kahalgaon(BH)-Kahalgaon(NTPC)	5.71	
5	Hatidah-Lakhisarai(BH)	28.98	
		266.27	

It is kindly requested to issue the trial operation certificates for above-mentioned 05 nos. links as per format enclosed for further necessary action at this end.

It is further to mention that Begusarai-Kusheshwarasthan link could not be completed due to severe ROW issues. The matter was discussed several times and BSPTCL agreed to short-close this link after completion of the work in balance pending links. Presently, work has been completed in all the links and hence it is requested to short-close Begusarai-Kusheshwarasthan OPGW link.

Thanking you

14/09/2022
केन्द्रीय निर्गम शाखा
बिहार स्टेट पावर ट्रांसमिशन कंपनी लिमिटेड
विद्युत भवन, बेली रोड, पटना-21

Yours faithfully

14.09.22
(S.K.Singh)
CGM(AM), ER-I

Enclosure:
(i) Format for issuing of Trial Operation Certificates by BSPTCL(Annex-A).
(ii) Details of links with associated equipments(Annex-I)

Annexure C1

Data to be provided to CEA/CTU as per First Standing Committee of Communication held on 09.03.2021

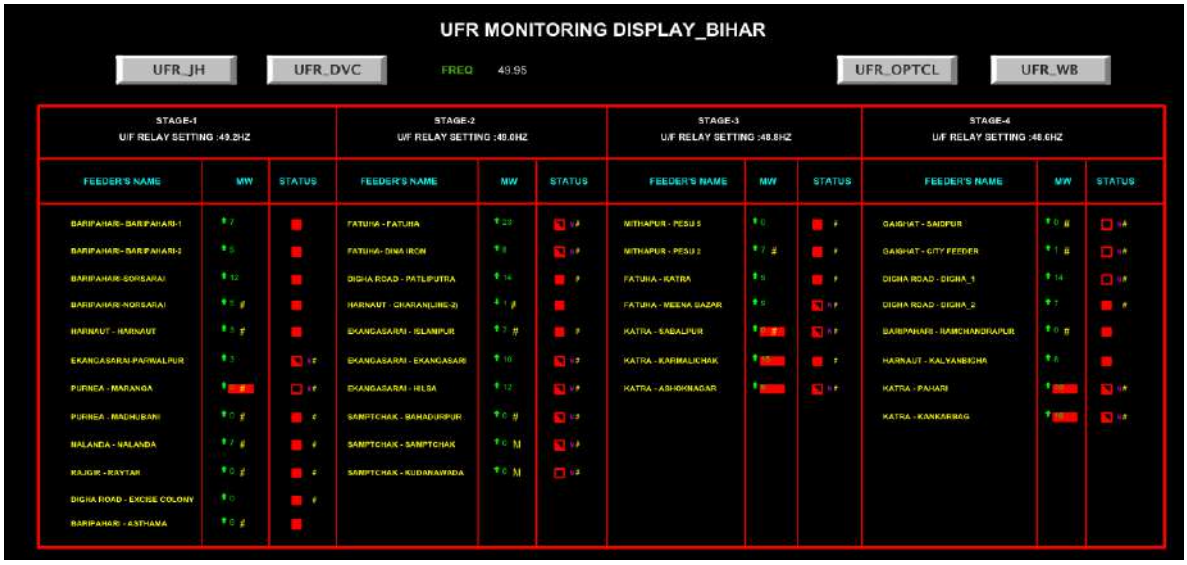
Sr. No.	Meeting Agenda Item no.	Data required as Recommended by Standing Communication Committee
1.	B.1.3 Wideband network of the communication infrastructure	State utilities shall submit Wideband network of their communication infrastructure at the earliest
2.	B.2.1 OPGW for Existing System	Central and State Sector utilities should provide the status of implementation of the OPGW laying. Transmission utilities should provide OPGW installation data, namely; name of the line, voltage level (kV), whether S/C, D/C or M/C, No. of earthwire/OPGW, length of the line (km), fibre count in the OPGW and scheme under which implementation is done/being carried out.
3.	B.2.2 Upgradation of Equipment capacity	Transmission utilities (ISTS & States) should furnish details of link bandwidth and its utilization to identify the congested links for communication equipment upgradation and better utilization of resources.
4.	B.2.3 OPGW links in intervening lines	Details of intervening lines which needs to provide 100% redundancy with route diversity should be identified.
5.	B.2.4 Dual path for Radial Nodes	LDCs/RPCs shall provide details of Central Sector and State Sector nodes with radial connectivity

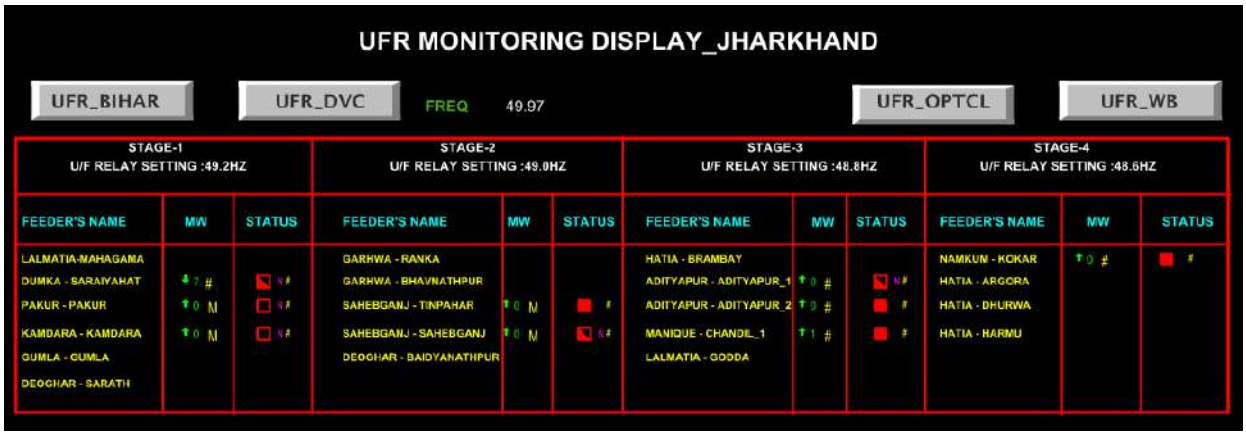
RTU INTEGRATION STATUS OF ODISHA			Annexure-C3
SL NO	**STATION**	**REMARKS BY OPTCL**	**REMARKS BY ERLDC**
1	JAYPATNA 220	DB NOT PREPARED BY OPTCL	
2	KASIPUR 220	DB NOT PREPARED BY OPTCL	
3	BALASORE 220	ALREADY SENT	Received by ERLDC
4	CUTTACK 220	ALREADY SENT	Received by ERLDC
5	BASUNDARA 220	DB NOT PREPARED BY OPTCL	
6	BUDHIPADAR 220	ALREADY SENT	Received by ERLDC
7	BIDANASI 220	ALREADY SENT	ICCP Database yet to be sent.
8	CHANDAKA B 220	ALREADY SENT	Received by ERLDC
9	ESSAR STEEL 220	ALREADY SENT	Received by ERLDC
10	IOCL 220	ALREADY SENT	Received by ERLDC
11	TATA GOPALPUR 220	DB NOT PREPARED BY OPTCL	
12	BALASORE ALLOYS 220	ALREADY SENT	Received by ERLDC
13	SAMANGARA 220	ALREADY SENT	Received by ERLDC
14	ROHIT 220	ALREADY SENT	Received by ERLDC
15	DAMANJODI 220	DB NOT PREPARED BY OPTCL	
16	MALKANGIRI 220	NOT INTEGRATED	
17	NARSINGHPUR 220	ALREADY SENT	Not yet received.
18	THERUVALI 220	ALREADY SENT	Received by ERLDC
19	BOGRAI 132	ALREADY SENT	Received by ERLDC
20	BRAJABIHARIPUR 132	DB NOT PREPARED BY OPTCL	
21	B C MOHANTY COLONY 132	ALREADY SENT	Received by ERLDC
22	CHANDBALI 132	DB NOT PREPARED BY OPTCL	
23	CHANDPUR 132	ALREADY SENT	Received by ERLDC
24	CHIKITI 132	DB NOT PREPARED BY OPTCL	
25	BETANATI 132	DB NOT PREPARED BY OPTCL	
26	DABUGAON 132	DB NOT PREPARED BY OPTCL	
27	DPCL 132	ALREADY SENT	Received by ERLDC
28	DPCL PORT 132	ALREADY SENT	Received by ERLDC
29	BIRLA TYRES 132	ALREADY SENT	Received by ERLDC
30	EMAMI 132	ALREADY SENT	Received by ERLDC
31	FACOR 132	ALREADY SENT	Received by ERLDC
32	GANJAM 132	NO NEED TO SENT	Received by ERLDC
33	**GORAKHNATH 132**	**NO OPTCL STATION IN THIS NAME**	
34	JABAMAYEE 132	ALREADY SENT	Received by ERLDC
35	**JAGANATHPUR 132**	**NO OPTCL STATION IN THIS NAME**	
36	JAGATSINGHPUR 132	ALREADY SENT	Received by ERLDC
37	KENDAPARA TSS 132	ALREADY SENT	Received by ERLDC
38	**KIPADRA TR. 132**	**NO OPTCL STATION IN THIS NAME**	
39	KONARK 132	ALREADY SENT	Received by ERLDC

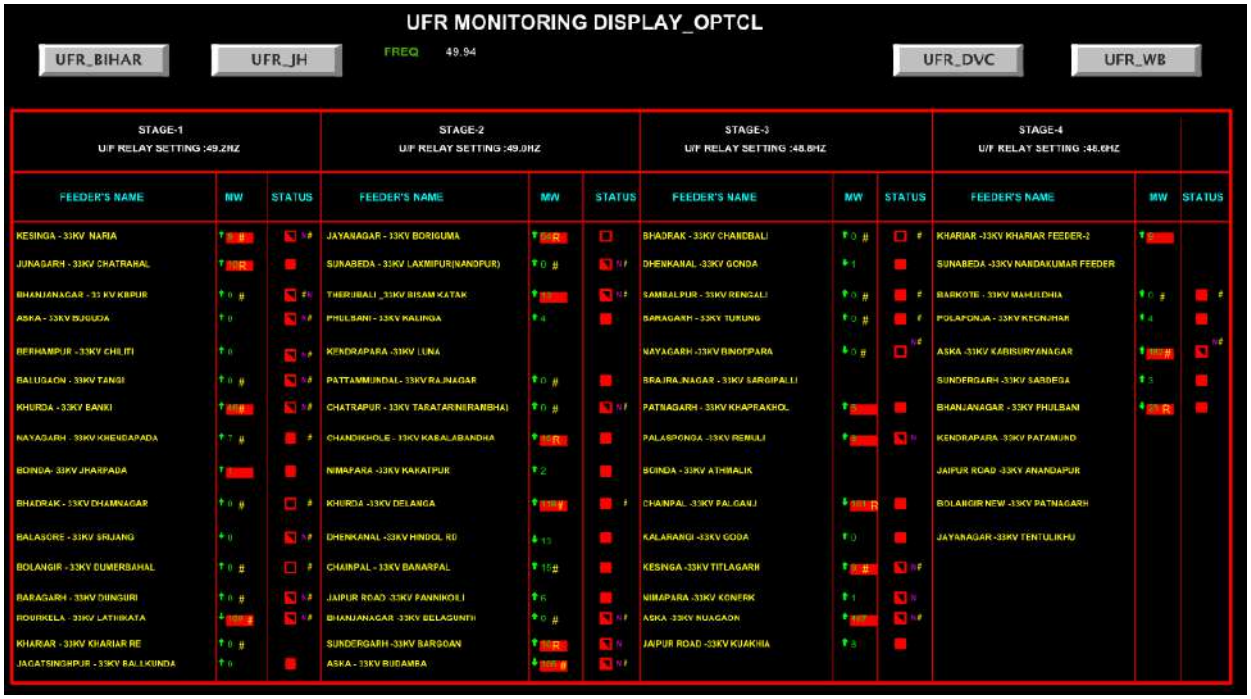
40	KSURA 132	THIS IS NOW CONVERTED INTO SAS.SOME DIGITAL STATUS HAS BEEN MODIFIED.TO BE SHARED SOON SEND YOU SOON.	
41	MASHAGHAI 132	DB NOT PREPARED BY OPTCL	
42	MESCO 132	ALREADY SENT	Received by ERLDC
43	IFFCO 132	ALREADY SENT	Received by ERLDC
44	NEW ASKA 220	ALREADY SENT	Not Received
45	OVALAR 132	DB NOT PREPARED BY OPTCL	
46	PARADEEP 220	ALREADY SENT	Received by ERLDC
47	PATTAMUNDAI 132	ALREADY SENT	Display missing
48	PPL 132	NOT REPORTING SINCE LONG STILL WE WILL SEND TO YOU SOON.	
49	PPT 132	ALREADY SENT	Received by ERLDC
50	PRATAPASAN 132	ALREADY SENT	Received by ERLDC
51	PURI 132	ALREADY SENT	Received by ERLDC
52	PURUSHOTTAMPUR 132	ALREADY SENT	Received by ERLDC
53	RAIRANGPUR 132	ALREADY SENT	Received by ERLDC
54	R.S. PUR 132	IT IS ALREADY IN ICCP POINT BUT NOT UPDATING SINCE LONG. RTU WILL BE UPGRADED VERY SOON.	
55	**RTSS 132**	**NO OPTCL STATION IN THIS NAME**	
56	SATASANKHA2 132	DB NOT PREPARED BY OPTCL	
57	S F ALLOYS 132(TSALOY)	ALREADY SENT	Not Received
58	SHAMUKA 132	ALREADY SENT	Received by ERLDC
59	**SOLARI 132**	**NO OPTCL STATION IN THIS NAME**	
60	SOMNATHPUR 132	DB NOT PREPARED BY OPTCL	
61	T KHUNTI 132	ALREADY SENT	Received by ERLDC
62	**TOMKA 132**	**NO OPTCL STATION IN THIS NAME**	
63	ARGUL 132	ALREADY SENT	Received by ERLDC
64	**BALIMUNDA 132**	**NO OPTCL STATION IN THIS NAME**	
65	UDALA 132	DB NOT PREPARED BY OPTCL	
66	UMERKOTE 132	DB NOT PREPARED BY OPTCL	
67	BAMUPAL 132	ALREADY SENT	Incomplete Database

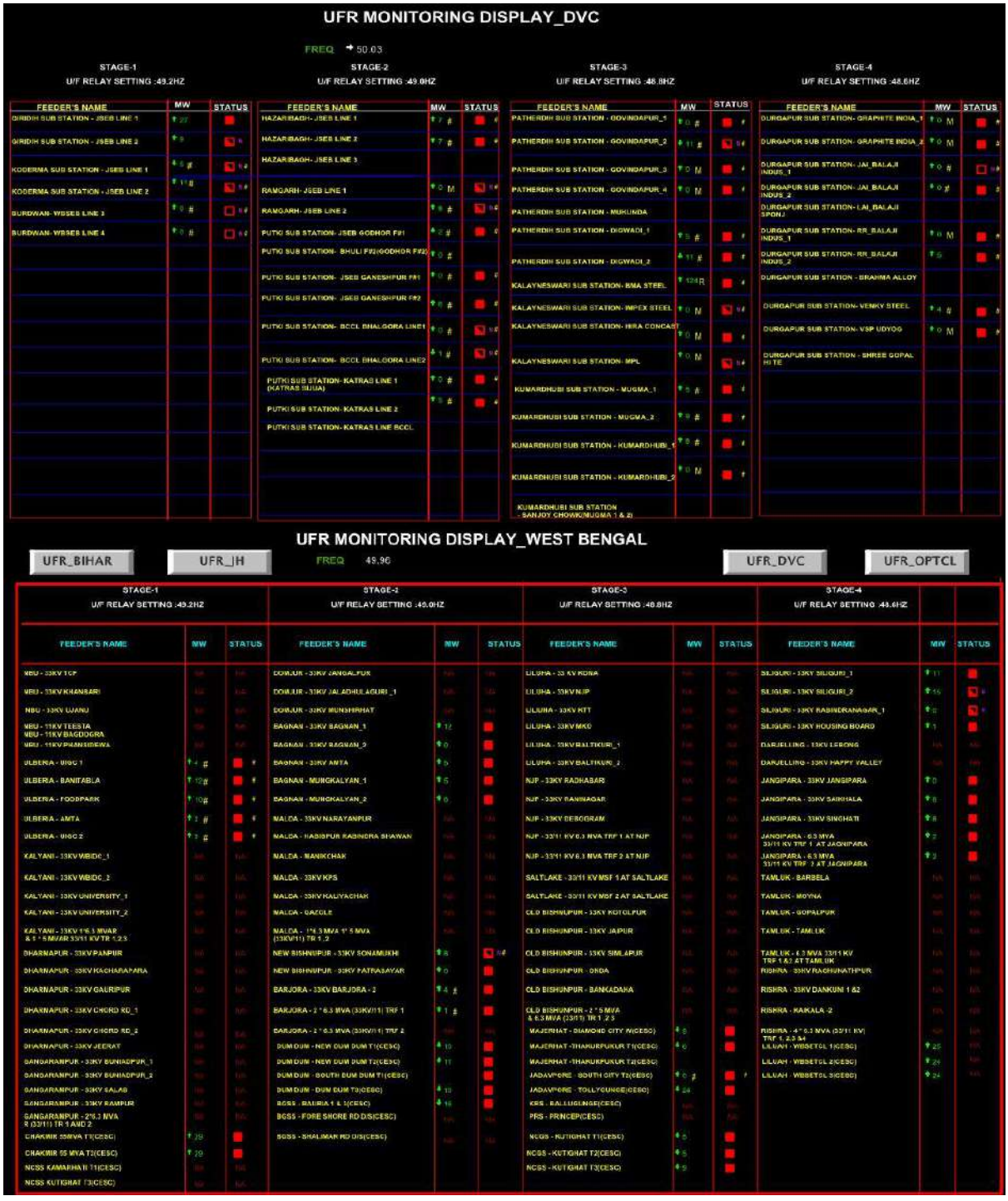
List of feeder and SCADA data integration status under AUFLS scheme of Eastern Region

Stages	Bihar		DVC		West Bengal (Including CESC)		Jharkhand		OPTCL	
	No of Feeders	SCADA data Integrated	No of Feeders	SCADA data Integrated	No of Feeders	SCADA data Integrated	No of Feeders	SCADA data Integrated	No of Feeders	SCADA data Integrated
Stage – I(49.2 HZ)	12	12	6	6	31	13	6	3	16	16
Stage – II (49.0 HZ)	10	10	14	12	26	13	5	2	16	15
Stage – III(48.8 HZ)	7	7	16	14	29	7	5	3	15	13
Stage – IV(48.6 HZ)	8	8	11	8	23	12	4	1	11	6
Total	**37**	**37**	**47**	**40**	**109**	**45**	**20**	**9**	**58**	**50**






UFR MONITORING DISPLAY_OPTCL
UFR_BIHAR
UFR_JH
FREQ 49.94
UFR_DVC
UFR_WB
STAGE-1
U/F RELAY SETTING :49.2HZ
STAGE-2
U/F RELAY SETTING :49.0HZ
STAGE-3
U/F RELAY SETTING :48.8HZ
STAGE-4
U/F RELAY SETTING :48.6HZ
FEEDER'S NAME
MW
STATUS
KESINGA - 33KV NARIA
JUNAGARH - 33KV CHATRAHAL
BHANJANAGAR - 33 KV KBPUR
ASKA - 33KV BUGUDA
BERHAMPUR - 33KV CHILITI
BALUGAON - 33KV TANGI
KHURDA - 33KV BANKI
NAYAGARH - 33KV KHENDAPADA
BOINDA- 33KV JHARPADA
BHADRAK - 33KV DHAMNAGAR
BALASORE - 33KV SRIJANG
BOLANGIR - 33KV DUMERBAHAL
BARAGARH - 33KV DUNGURI
ROURKELA - 33KV LATHIKATA
KHARIAR - 33KV KHARIAR RE
JAGATSINGHPUR - 33KV BALIKUNDA
JAYANAGAR - 33KV BORIGUMA
SUNABEDA - 33KV LAXMIPUR(NANDPUR)
THERUBALI _33KV BISAM KATAK
PHULBANI - 33KV KALINGA
KENDRAPARA -33KV LUNA
PATTAMUNDAI - 33KV RAJNAGAR
CHATRAPUR - 33KV TARATARINI(RANIBHA)
CHANDIKHOLE - 33KV KABALABANDHA
NIMAPARA -33KV KAKATPUR
KHURDA -33KV DELANGA
DHENKANAL -33KV HINDOL RD
CHAINPAL - 33KV BANARPAL
JAIPUR ROAD -33KV PANNIKOLI
BHANJANAGAR -33KV BELAGUNTH
SUNDERGARH -33KV BARGOAN
ASKA - 33KV BUDAMBA
BHADRAK - 33KV CHANDBALI
DHENKANAL -33KV GONDA
SAMBALPUR - 33KV RENGALI
BARAGARH - 33KV TUKUNG
NAYAGARH -33KV BINDEPARA
BRAJRAJNAGAR - 33KV SARGIPALLI
PATNAGARH - 33KV KHAPRAKHOL
PALASPONGA -33KV REMULI
BOINDA - 33KV ATHMALIK
CHAINPAL -33KV PALGANJ
KALARANGI -33KV GODA
KESINGA -33KV TITLAGARH
NIMAPARA -33KV KONERK
ASKA -33KV NUAGAON
JAIPUR ROAD -33KV KUAKHIA
KHARIAR -33KV KHARIAR FEEDER-2
SUNABEDA -33KV NANDAKUMAR FEEDER
BARKOTE - 33KV MAHULDIHA
POLAPONJA - 33KV KEONJHAR
ASKA -33KV KABISURYANAGAR
SUNDERGARH -33KV SARDEGA
BHANJANAGAR - 33KV PHULBANI
KENDRAPARA -33KV PATAMUND
JAIPUR ROAD -33KV ANANDAPUR
BOLANGIR NEW -33KV PATNAGARH
JAYANAGAR -33KV TENTULIKHU


UFR MONITORING DISPLAY_DVC
FREQ → 50.03
STAGE-1
U/F RELAY SETTING :49.2HZ
STAGE-2
U/F RELAY SETTING :49.0HZ
STAGE-3
U/F RELAY SETTING :48.8HZ
STAGE-4
U/F RELAY SETTING :48.6HZ
FEEDER'S NAME
MW
STATUS
GIRIDIH SUB STATION - JSEB LINE 1
GIRIDIH SUB STATION - JSEB LINE 2
KODERMA SUB STATION - JSEB LINE 1
KODERMA SUB STATION - JSEB LINE 2
BURDWAN- WBSEB LINE 3
BURDWAN- WBSEB LINE 4
HAZARIBAGH- JSEB LINE 1
HAZARIBAGH- JSEB LINE 2
HAZARIBAGH- JSEB LINE 3
RAMGARH- JSEB LINE 1
RAMGARH- JSEB LINE 2
PUTKI SUB STATION- JSEB GODHOR F#1
PUTKI SUB STATION- BHULI F#2(GODHOR F#2)
PUTKI SUB STATION- JSEB GANESHPUR F#1
PUTKI SUB STATION- JSEB GANESHPUR F#2
PUTKI SUB STATION- BCCL BHALGORA LINE1
PUTKI SUB STATION- BCCL BHALGORA LINE2
PUTKI SUB STATION-KATRAS LINE 1 (KATRAS SIUIA)
PUTKI SUB STATION-KATRAS LINE 2
PUTKI SUB STATION-KATRAS LINE BCCL
PATHERDIH SUB STATION - GOVINDAPUR_1
PATHERDIH SUB STATION - GOVINDAPUR_2
PATHERDIH SUB STATION - GOVINDAPUR_3
PATHERDIH SUB STATION - GOVINDAPUR_4
PATHERDIH SUB STATION - MUKUNDA
PATHERDIH SUB STATION - DIGWADI_1
PATHERDIH SUB STATION - DIGWADI_2
KALAYNESWARI SUB STATION- RMA STEEL
KALAYNESWARI SUB STATION- IMPEX STEEL
KALAYNESWARI SUB STATION- HIRA CONCAST
KALAYNESWARI SUB STATION- MPL
KUMARDHUBI SUB STATION - MUGMA_1
KUMARDHUBI SUB STATION - MUGMA_2
KUMARDHUBI SUB STATION - KUMARDHUBI_1
KUMARDHUBI SUB STATION - KUMARDHUBI_2
KUMARDHUBI SUB STATION - SANJOY CHOWK(MUGMA 3 & 2)
DURGAPUR SUB STATION- GRAPHITE INDIA_1
DURGAPUR SUB STATION- GRAPHITE INDIA_2
DURGAPUR SUB STATION- JAI_BALAJI INDUS_1
DURGAPUR SUB STATION- JAI_BALAJI INDUS_2
DURGAPUR SUB STATION- LAI_BALAJI SPONJ
DURGAPUR SUB STATION- RR_BALAJI INDUS_1
DURGAPUR SUB STATION- RR_BALAJI INDUS_2
DURGAPUR SUB STATION - BRAHMA ALLOY
DURGAPUR SUB STATION- VENKY STEEL
DURGAPUR SUB STATION- VSP UDYOG
DURGAPUR SUB STATION - SHREE GOPAL HITE
UFR MONITORING DISPLAY_WEST BENGAL
UFR_BIHAR
UFR_JH
FREQ 49.96
UFR_DVC
UFR_OPTCL
STAGE-1
U/F RELAY SETTING :49.2HZ
STAGE-2
U/F RELAY SETTING :49.0HZ
STAGE-3
U/F RELAY SETTING :48.8HZ
STAGE-4
U/F RELAY SETTING :48.6HZ
FEEDER'S NAME
MW
STATUS
NBU - 33KV TCF
NBU - 33KV KHANBARI
NBU - 33KV UJANU
NBU - 11KV TEESTA
NBU - 11KV BAGDOGRA
NBU - 11KV PHANSIDEWA
ULBERIA - UHBC 1
ULBERIA - BANITABLA
ULBERIA - FOODPARK
ULBERIA - AMTA
ULBERIA - UHBC 2
KALYANI - 33KV WBIDC_1
KALYANI - 33KV WBIDC_2
KALYANI - 33KV UNIVERSITY_1
KALYANI - 33KV UNIVERSITY_2
KALYANI - 33KV 16.3 MVAR & 1 * 5 MVAR 33/11 KV TR 1,2,3
DHARNAPUR - 33KV PANPUR
DHARNAPUR - 33KV KACHARAPARA
DHARNAPUR - 33KV GAURIPUR
DHARNAPUR - 33KV CHORD RD_1
DHARNAPUR - 33KV CHORD RD_2
DHARNAPUR - 33KV JEERAT
SANGRAMPUR - 33KV SUNIADPUR_1
SANGRAMPUR - 33KV SUNIADPUR_2
SANGRAMPUR - 33KV SALAP
SANGRAMPUR - 33KV RAMPUR
SANGRAMPUR - 2*6.3 MVA R (33/11) TR 1 AND 2
CHAKMIR 55MVA T1(CESC)
CHAKMIR 55 MVA T2(CESC)
NCSS KAMARHATI T1(CESC)
NCSS KUTIGHAT T3(CESC)
DOMJUR - 33KV JANGALPUR
DOMJUR - 33KV JALADHULAGURI_1
DOMJUR - 33KV MUNSHIRHAT
BAGNAN - 33KV BAGNAN_1
BAGNAN - 33KV BAGNAN_2
BAGNAN - 33KV AMTA
BAGNAN - MUNGKALYAN_1
BAGNAN - MUNGKALYAN_2
MALDA - 33KV NARAYANPUR
MALDA - HABIBPUR RABINDRA BHAWAN
MALDA - MANIKCHAK
MALDA - 33KV KPS
MALDA - 33KV KALIYACHAK
MALDA - GAZOLE
MALDA - 1*4.5 MVA 1*5 MVA (33KV/11) TR 1,2
NEW BISHNUPUR - 33KV SONAMUKHI
NEW BISHNUPUR - 33KV PATRASAYAR
BARJORA - 33KV BARJORA - 2
BARJORA - 2 * 6.3 MVA (33KV/11) TRF 1
BARJORA - 2 * 6.3 MVA (33KV/11) TRF 2
DUM DUM - NEW DUM DUM T1(CESC)
DUM DUM - NEW DUM DUM T2(CESC)
DUM DUM - SOUTH DUM DUM T1(CESC)
DUM DUM - DUM DUM T3(CESC)
BGSS - RAJIRA 1 & 1(CESC)
BGSS - FORE SHORE RD DIS(CESC)
BGSS - SHALIMAR RD DIS(CESC)
ULUBA - 33 KV KONA
ULUBA - 33KV NJP
ULUBA - 33KV KTT
ULUBA - 33KV MKD
ULUBA - 33KV BALTIKURI_1
ULUBA - 33KV BALTIKURI_2
NJP - 33KV RADHABARI
NJP - 33KV RANINAGAR
NJP - 33KV DEBOGRAM
NJP - 33/11 KV 6.3 MVA TRF 1 AT NJP
NJP - 33/11 KV 6.3 MVA TRF 2 AT NJP
SALTLAKE - 33/11 KV MSF 1 AT SALTLAKE
SALTLAKE - 33/11 KV MSF 2 AT SALTLAKE
OLD BISHNUPUR - 33KV KOTOLPUR
OLD BISHNUPUR - 33KV JAPUR
OLD BISHNUPUR - 33KV SIMLAPUR
OLD BISHNUPUR - ONDA
OLD BISHNUPUR - BANKADAHA
OLD BISHNUPUR - 2 * 5 MVA & 6.3 MVA (33/11) TR 1,2,3
MAJERHAT - DIAMOND CITY N(CESC)
MAJERHAT -THAKURPUKUR T1(CESC)
MAJERHAT -THAKURPUKUR T2(CESC)
JADAVPORE - SOUTH CITY T2(CESC)
JADAVPORE - TOLLYGUNGE(CESC)
KRS - BALLYGUNGE(CESC)
PRS - PRINCEP(CESC)
NCSS - KUTIGHAT T1(CESC)
NCSS - KUTIGHAT T2(CESC)
NCSS - KUTIGHAT T3(CESC)
SILIGURI - 33KV SILIGURI_1
SILIGURI - 33KV SILIGURI_2
SILIGURI - 33KV RABINDRANAGAR_1
SILIGURI - 33KV HOUSING BOARD
DARJELLING - 33KV LEBONG
DARJELLING - 33KV HAPPY VALLEY
JANGIPARA - 33KV JANGIPARA
JANGIPARA - 33KV SAIKHALA
JANGIPARA - 33KV SINGHATI
JANGIPARA - 6.3 MVA 33/11 KV TRF 1 AT JANGIPARA
JANGIPARA - 6.3 MVA 33/11 KV TRF 2 AT JANGIPARA
TAMLUK - BARBELA
TAMLUK - MOYNA
TAMLUK - GOPALPUR
TAMLUK - TAMLUK
TAMLUK - 6.3 MVA 33/11 KV TRF 1 &2 AT TAMLUK
RISHRA - 33KV RADHUNATHPUR
RISHRA - 33KV DANKUNI 1 &2
RISHRA - KAIKALA -2
RISHRA - 4 * 6.3 MVA (33/11 KV) TRF 1,2,3 &4
LILUAH - WBSETCL 1(CESC)
LILUAH - WBSETCL 2(CESC)
LILUAH - WBSETCL 3(CESC)

DETAILS REQUIRED FOR PMU-1

Annexure-1

SIGNALS REQUIRED FOR CONFIGURATION OF PMU & SWITCH	DETAILS REQUIRED FOR PMU INTEGRATION WITH LDC	REMARK
SUBSTATION NAME		Name of substaion, example: for Kankroli it is KNKRL_PG, for Rihand it is RIHND_NT
REPORTING LDC		Name of control station where PMU data is require to report
NO OF PMU		No. of PMU as per architecture, considering 1 PMU can accommodate 2 no. of line data
VLAN ID		
PMU IP		This IP is to be provided by PGCIL considering no conflict from all other PMU's reporting to RLDC
SUBNET MASK		
SWITCH IP		Switch IP will be in same series as PMU IP, it is same for all PMU's
GATEWAY IP		Gateway IP will be in same series as PMU IP, it is same for all PMU's
PDC-1 IP		PDC at control center-1
PDC-2 IP		PDC at control center-2 if pmu reporting to 2 LDC's
VT-1 Ratio		VT/CT ratio of Bay-1 connected in PMU-1
CT-1 Ratio		
VT-2 Ratio		VT/CT ratio of Bay-2 connected in PMU-2
CT-2 Ratio		
STREAM 1 ID CODE		PMU id code
PMU 1 ID CODE		Virtual PMU-1 id code for bay -1
PMU 2 ID CODE		Virtual PMU-2 id code for bay-2
PORT DETAIL OF SDH PANEL		port available in SDH panel where PMU switch is required to connect for sending data to LDC
CHANNEL NAMING		
SUBSTATION NAME		CHANNEL NAMING OF ALL ANALOG SIGNALS OF BAY-1 IN PMU, ALL MUST BE OF 16 CHARACTER
V1A		
V1B		
V1C		
V1 POS		
I1A		
I1B		
I1C		
I1 POS		
WATT		
VAR		
DIGITAL 1		CHANNEL NAMING OF ALL DIGITAL SIGNALS OF BAY-1 & BAY-2 REQUIRED IN PMU-1, ALL MUST BE OF 16 CHARACTER
DIGITAL 2		
DIGITAL 3		
DIGITAL 4		
DIGITAL 5		
DIGITAL 6		
DIGITAL 7		
DIGITAL 8		
DIGITAL 9		
DIGITAL 10		
DIGITAL 11		
DIGITAL 12		
DIGITAL 13		
DIGITAL 14		
DIGITAL 15		
DIGITAL 16		
V2A		CHANNEL NAMING OF ALL ANALOG SIGNALS OF BAY-2 IN PMU, ALL MUST BE OF 16 CHARACTER
V2B		
V2C		
V2 POS		
I2A		
I2B		
I2C		
I2 POS		
WATT		
VAR		

DETAILS REQUIRED FOR PMU-2

SIGNALS REQUIRED FOR CONFIGURATION OF PMU & SWITCH	DETAILS REQUIRED FOR PMU INTEGRATION WITH LDC	REMARK
SUBSTATION NAME		Name of substaion, example: for Kankroli it is KNKRL_PG, for Rihand it is RIHND_NT
REPORTING LDC		Name of control station where PMU data is require to report
NO OF PMU		No. of PMU as per architecture, considering 1 PMU can accommodate 2 no. of line data
VLAN ID		
PMU IP		This IP is to be provided by PGCIL considering no conflict from all other PMU's reporting to RLDC
SUBNET MASK		
SWITCH IP		Switch IP will be in same series as PMU IP, it is same for all PMU's
GATEWAY IP		Gateway IP will be in same series as PMU IP, it is same for all PMU's
PDC-1 IP		PDC at control center-1
PDC-2 IP		PDC at control center-2 if pmu reporting to 2 LDC's
VT-1 Ratio		VT/CT ratio of Bay-1 connected in PMU-2
CT-1 Ratio		
VT-2 Ratio		VT/CT ratio of Bay-2 connected in PMU-2
CT-2 Ratio		
STREAM 1 ID CODE		PMU id code
PMU 1 ID CODE		Virtual PMU-1 id code for bay -1
PMU 2 ID CODE		Virtual PMU-2 id code for bay-2
PORT DETAIL OF SDH PANEL		port available in SDH panel where PMU switch is required to connect for sending data to LDC
CHANNEL NAMING		
SUBSTATION NAME		CHANNEL NAMING OF ALL ANALOG SIGNALS OF BAY-1 IN PMU, ALL MUST BE OF 16 CHARACTER
V1A		
V1B		
V1C		
V1 POS		
I1A		
I1B		
I1C		
I1 POS		
WATT		
VAR		
DIGITAL 1		CHANNEL NAMING OF ALL DIGITAL SIGNALS OF BAY-1 & BAY-2 REQUIRED IN PMU-1, ALL MUST BE OF 16 CHARACTER
DIGITAL 2		
DIGITAL 3		
DIGITAL 4		
DIGITAL 5		
DIGITAL 6		
DIGITAL 7		
DIGITAL 8		
DIGITAL 9		
DIGITAL 10		
DIGITAL 11		
DIGITAL 12		
DIGITAL 13		
DIGITAL 14		
DIGITAL 15		
DIGITAL 16		
V2A		CHANNEL NAMING OF ALL ANALOG SIGNALS OF BAY-2 IN PMU, ALL MUST BE OF 16 CHARACTER
V2B		
V2C		
V2 POS		
I2A		
I2B		
I2C		
I2 POS		
WATT		
VAR		