

**Technical Committee Feasibility Report For
Establishment of State-of-the-Art Unified Centralized Network
Management System U-NMS for ISTS and State Utility
Communication Network in Eastern Region
Meeting held on 24th Oct' 2019 at ERLDC Conference Hall, Kolkata**

In 24th SCADA O&M Meeting held at ERLDC on 14th August 2019, it was informed that CERC notified Communication Regulation which envisages Centralized Supervision System for ISTS Communication.

As per the regulation clause no 7.2 (vii):

“CTU shall be the Nodal Agency for supervision of communication system in respect of inter-State communication system and will implement centralized supervision for quick fault detection and restoration.”

In the meeting, Member Secretary, ERPC informed that a Committee with members from ERLDC, ERPC, all the states and Powergrid is required to be formed for the assessment of technical requirements to facilitate monitoring of ISTS communication network in line with CERC regulation.

Accordingly, a Committee was constituted (list of members is enclosed at **Annexure-I**). The Committee met on 24th October, 2019 at ERLDC, wherein Powergrid made a detailed presentation on Unified Network Management System (U-NMS) Project to be implemented for managing Project for ISTS & State utilities communication network at State, Regional & National level. Presentation is enclosed at **Annexure-II**).

List of participants in the Committee meeting is enclosed at **Annexure-III**.

Deliberations in the Committee meeting:

1. Powergrid made a detailed presentation on Unified Network Management System (U-NMS) Project to be implemented for managing Project for ISTS & State utilities communication network at State, Regional & National level. Presentation covered various technical aspects of U-NMS, integration of existing NMSs and Network Elements not having visibility in NMSs etc.

Powergrid mentioned that the UNMS system will have tools which shall provide graphical representation of Communication network with topology of nodes and links, Inventory Management (SDH/PDH/Card level/ etc), auto discovery and rediscovery of Network Elements and sub-systems, Facility of configuration, end to end provisioning of bandwidth centrally, Faster fault resolution and reduced restoration times, Proactive maintenance and Customer support and working out channel availability, apart from analytics for predictive maintenance, etc. for communication network of State/ Regional/ National level.

In the proposed U-NMS Regions & States, each will have control for managing & operating their respective network, with desired report making features for channel availability report etc.

2. States opined that U-NMS is necessary because different make of communication systems (NMSs & SDHs/ PDHs primarily) are to be integrated at a common platform. Powergrid stated that in line with CERC's regulations mentioning communication system availability, the proposed U-NMS is also capable to calculate the availability of the communication system besides

providing holistic view of network for the remotely accessible communication network elements.

3. Powergrid informed that in line with regulation, provisions of Centralized NMS and Centralized Monitoring by integrating its NMS with other users NMS, has been kept in the documents of Technical standard & Manual of Communication Planning Criteria being finalized by CEA. In addition to this, guideline on availability of Communication system for ISTS has been submitted to CERC by CEA for which centralized NMS/OSS is considered essential.
4. Powergrid informed that U-NMS Project is conceived to facilitate Centralized Supervision for ISTS Communication in compliance to CERC Regulation for Communication System notified in May'17 as present NMSs do not have visibility of entire network and are not capable to support the requirements envisaged for ISTS Communication in CERC Regulation. Proposed U-NMS configuration at regional level shall also consider integration of NMSs of State Communication Network to facilitate STUs to monitor and maintain their network with the help of Work Station provided at their location having direct access of Regional Server.
5. Powergrid informed that the estimated cost for Eastern Region ISTS and state network U-NMS is Rs. 99.93 Crs. excluding AMC cost which is estimated as Rs. 2.6 Crs. for 6 years after Warrantee period. U-NMS Project implementation Schedule is considered as 24 months. Investment made by Powergrid is proposed to be recovered through tariff as notified by CERC. Also it has been deliberated and agreed upon that AMC for U-NMS shall be carried out by Powergrid itself for Central as well as State sector.
6. Powergrid informed that a format for requirement of details of NE and EMS/NMS shall be submitted by all constituents as per Annexure-IV attached.
7. All the Constituent members have given their consent for implementation of U-NMS Project for Central Sector as well as for the State Sector/Constituents. All constituents also requested Powergrid to implement the entire project for the Central Sector and State Sector Constituents including AMC.

Committee agreed with the proposal and referred to TeST Meeting and Commercial Committee Meeting.

Annexure-I

Nomination of committee members for Establishment of State of the Art Unified Centralized Network Management System U-NMS for ISTS and State Utility Communication Network

S. No	Name of the constituents	Committee Member	Contact Address	Contact Detail
1	ERPC	Sri J. Ganesha Rao, Executive Engineer (Protection & Operation)	ERPC, 14, Golf Club Road, Tollygunge, Kolkata - 700 033	95478 91353 erpcprotection@gmail.com
2	ERLDC, POSOCO	Shri S. P Barnwal, General Manager (SCADA)	ERLDC, POSOCO, 14, Golf Club Road, Tollygunge, Kolkata - 700 033	94330 41812 spbarnwal@posoco.in
3	POWERGRID, ERTS-2, ULDC	Shri Kshitish K Prusti, General Manager (ULDC)	POWERGRID, ERTS-2, CF-17, Action Area-1C, New Town, Kolkata - 700 156	83938 83717 uldc2@powergrid.co.in, kkp@powergridindia.com
4	POWERGRID, ERTS-1, ULDC	Shri Mithun Choudhury, Manager (ULDC)	POWERGRID, ERTS-1, Near Transformer Repair Works, Board Colony, Shastri Nagar, Patna - 800 023	94318 15651 uldc1@powergrid.co.in, mithun@powergridindia.com
5	POWERGRID, Odisha project, ULDC	Shri S. K. Sahu, DGM(ULDC)	POWERGRID, Odisha Projects, Sahid Nagar, Bhubaneswar - 751 007	94330 41822 sksahu@powergridindia.com
6	POWERGRID, LD&C	Smt. Nutan Mishra, General Manager (LD&C)	POWERGRID, Tower No - I, 5th Floor, Engineers India Limited, R&D Complex, Sector-16, Gurugram - 122 001 (Haryana)	9873918449 nutan@powergridindia.com
7	WBSETCL	Shri Biswajit Madhu, Superintend Engineer (Communication)	WBSETCL, Abhikshan Bhawan, Salt Lake Sector-V, Kolkata-700 091	94349 10193 cmnabhikshan@rediffmail.com
8	DVC	Shri Chandan, SE (Communication)	DVC, Maithon	99311 18212 chandan@dvc.gov.in
9	OPTCL	Sri P.K Nayak, DGM(Telecom)	Technical Wing, OPTCL Head Quarters, Janapath, Bhubaneswar – 751 022	94389 07502 pranab94@gmail.com
10	BSPTCL	Sri Vivek Nandan, Electrical Executive Engineer (ULDC)	BSPTCL, 4th Floor, Vidyut Bhawan, Bailey Road, Patna - 800 001	9262594686 uldc.bsptcl@gmail.com
11	JUSNL	Sri Rimil Topno, Electrical Executive Engineer (ULDC),	Jharkhand Urja Sancharan Nigam Limited, JUSNL Building, Kusai Colony, Doranda, Ranchi - 834002	98357 15518 rimiltopno@gmail.com uldc.jusnl@gmail.com

**Presentation on
U-NMS
for
ISTS & State Utility Communication Network
In
U-NMS Technical Committee Meeting at
ERPC Kolkata on 24Th Oct'19**

Background

CERC notified Communication Regulation in May'17 which envisaged Centralized Supervision System for ISTS Communication.

As per CERC notification- CTU shall be the Nodal Agency for implementation of system for centralized supervision for quick fault detection and restoration of ISTS Communication.

Technical standard & Manual of Communication Planning Criteria being finalized by CEA envisage requirement of System for centralized supervision for ISTS Communication.

Guidelines framed by NPC for Availability Calculation of Communication envisage System for centralized supervision for ISTS Communication

Accordingly, POWERGRID has worked out Scheme for implementation of U-NMS System for centralised supervision of Communication network for Eastern Region including ISTS & State Utilities. The agenda was discussed in SCADA O&M meeting on 14th Aug'19 at ERLDC Kolkata and it was decided to deliberate on technical aspects of the project by a technical committee.

Present Scenario

- POWERGRID took up implementation of ISTS Communication as part of Schemes i.e. ULDC, Microwave Replacement, ER FO Expansion, ER FO Expansion (Addl) and ER Reliable in Eastern Region.
- Network Management Systems(NMS) for SDH & PDH for maintenance of Communication System came up as part of the project.
- Supplied NMSs are proprietary in nature managing the ISTS communication of implemented nodes.
- There are multiple NMSs for SDH & PDH are available in Eastern Region working in isolation.
- Majority of ISTS Communication nodes implemented by other utilities are not integrated with existing NMSs as they were implemented in different projects.
- Present NMSs were considered with requirement mainly for monitoring and maintenance of implemented Communication Nodes.
- In light of Communication Regulation 2017 certain provisions are envisaged for ISTS Communication for which existing NMSs are not capable.
- Centralized Management of ISTS Communication in the present scenario needs State of the Art NMS for Centralized Management of ISTS Communication.
- To meet these objectives, Unified Network Management System (U-NMS) at National and Regional level are conceived for managing Communication System.

Proposed U-NMS Scheme

Centralised Management of ISTS Communication System at Regional and National levels by integrating existing NMSs and Network Elements (which are remotely accessible or having standard & open APIs). The U-NMS Scheme shall consist of Centralised Application Server acquiring data of Communication nodes from multiple NMSs in the region as well as from NEs.

The proposed U-NMS shall acquire data directly from existing NMSs of ISTS and State Utility and also from nodes not integrated with existing NMS for all ISTS and all other Utility communication links. The system shall be designed for managing Intra State, ISTS, Inter-Regional Communication Systems for State, Regional and National level respectively.

U-NMS Configuration for National & Regional shall consist of Servers, Storage Devices, VPS, Switches, Routers, Firewall, Remote workstations, Printer, Furniture etc. in dual LAN in Main (High Availability-HA) and Backup configuration to manage ISTS regional, inter-regional and Cross Border communication links.

U-NMS Configuration for managing Intra State Communication for SLDCs shall also be considered by providing Remote workstations, Furniture etc. with rights to access servers of respective RLDCs to manage their respective Communication Network.

Benefits of Scheme

- Availability of Communication System through Centralized U-NMS system for entire ISTS & State Communication in a region for efficient management
- Visibility of all ISTS & State Utility Communication Nodes in single NMS.
- State of the Art UNMS with advance features such as availability calculations, fault report generation for inter-patched network, centralised configuration, Provisioning, Quick Fault detection Restoration, Analytics, data retention for two calendar years plus the current year for all interfaces in the network etc., to meet challenges post Communication Regulations scenario.

U-NMS Project Proposal

- Centralised Network Management System for National, Regional and State Level Communication Networks to be taken up in unified manner for effective management of Communication System.
- Configuration consisting Application Servers, Work Stations, VPS, Web Server, Fire Wall and required Peripherals for Regional and National (and EMS/ NMS Server as required)
- Workstation based Control Centre at State level with VPS/ Tv Screen and peripherals
- Estimated cost- Rs. 100 Crs. for ER and Rs 600 Crs for all regions including National (excluding AMC cost and Civil Works)
- Implementation Schedule: 24 Months from date of Investment Approval

The scheme shall be implemented by POWERGRID on tariff route basis and investment to be recovered as per CERC notification.

Members may deliberate the scheme for consideration of approval.

Centralised Supervision for Communication System

Abstract of Cost Estimate of U-NMS

Abstract cost estimate for U-NMS for ISTS Communication System (L1 Bidder from Telecom Operational Support System (OSS) for Transmission & IP/MPLS Network Package-O Tender)

S. No.	Description	L1 price Amount (In Cr.)
A	Plant and Equipment (including Mandatory Spares Parts) to be supplied, including Type Test Charges for Tests to be conducted	
A.1	Hardware	47.25
A.2	Software	17.40
B	Local Transportation, In transit Insurance, Loading & unloading	0.00
C	Installation	
C.1	Hardware	3.74
C.2	Software	0.21
D	Training	1.32
E	GST (Supply)	11.61
F	GST (Service)	3.56
	Total (A to F)	85.10
G	Incidental Expenditure during Construction(@ 10.75%)	9.15
H	Contingency (@ 3%)	2.55
	Total (A to)	96.80
J	Interst During Construction (IDC)	5.57
	Grand Total	102.37
Total Cost for Control Centre at NLDC/RLDCs/SLDCs (5 Regional, 1 National) Systems		614.23
K	Maintenance charges for 1 year during warranty period and 6 years after warranty period*	2.61
Total AMC Cost for Control Centre at NLDC/RLDCs/SLDCs (5 Regional, 1 National) Systems		15.66

Communication Regulation 2017.....

Quote:

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4. OBJECTIVE:

These regulations provide for planning, implementation, operation and maintenance and up-gradation of reliable communication system for all communication requirements including exchange of data for integrated operation of National Grid.

5. SCOPE and APPLICABILITY:

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

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

6. NODAL AGENCY:

(i) The nodal agency for planning, and coordination for development of communication system for inter-State transmission system user shall be the **Central Transmission Utility.**

(ii) The nodal agency for planning, and coordination for development of communication system for intra - State transmission system user shall be the **State Transmission Utility.**

(vii) CTU shall be the Nodal Agency for supervision of communication system in respect of inter-State communication system and will implement centralized supervision for quick fault detection and restoration.

.....

Unquote

U-NMS for ISTS & State Utility Project Proposal- Status

NERPC:

Minutes of 20th TCC & 20th NERPC Meeting held on 12th September, 2019 at Guwahati

“After deliberation, TCC gave in-principle approval for the project and for the cost to be booked under POC mechanism.

TCC noted and recommended for approval of RPC.

Deliberation of the RPC

The RPC noted and approved the recommendation of TCC.

”

43rd TCC & 46thNRPC Meetings (23rd and 24th September, 2019) – Minutes

U-NMS for ISTS & State Utility Project Proposal- Status

NRPC:

43rd TCC & 46th NRPC Meetings (23rd and 24th September, 2019) – Minutes

..... “NRPC Deliberations

B.16.2 POWERGRID stated that scheme has been discussed at length in last meeting of TeST sub-committee wherein POWERGRID had made a detailed presentation before the members. The estimated cost of Rs 600 Cr is for all regions.

B.16.3 Haryana stated that U-NMS is a necessary system because different make of communication systems are to integrated at common platform. POWERGRID stated that in line with CERC's regulations mentioning communication system availability, the proposed U-NMS is also capable to calculate the availability of the communication system besides providing holistic view of network.”

B.16.4 The Committee after detailed deliberation, approved the scheme.

Minutes of 20th TCC & 20th NERPC Meeting held on 12th September, 2019 at Guwahati

Deliberation of the TCC

ED (LD&C and AM), POWERGRID alluded to CERC Communication Regulations. Already the matter of U-NMS project has been cleared by sub committees of other regions NR, WR and SR. The matter was discussed in 14th NETeST meeting of NERPC, however, no comments were received from any of the states in this regard. The infrastructure for the entire country is around 600Cr on PoC basis. In the proposed UNMS project the state network would also be integrated in the State NMS. Cost is proposed to be borne on POC basis. However, detail recovery process will be guided by CERC order during petition stage. Now in-principle approval of the forum may be given so that POWEGRID may go ahead.

After deliberation, TCC gave in-principle approval for the project and for the cost to be booked under POC mechanism.

TCC noted and recommended for approval of RPC.

Deliberation of the RPC

The RPC noted and approved the recommendation of TCC.

43rd TCC & 46thNRPC Meetings (23rd and 24th September, 2019) – Minutes

Establishment of State-of-the-Art Unified Centralized Network Management System U-NMS for ISTS and State Utility Communication Network

TCC Deliberations

B.16.1 POWERGRID informed that provisions of Centralized NMS and Centralized Monitoring by integrating its NMS with other users NMS has been kept in the draft Technical standard and Communication Planning Criteria Manual of CEA. In addition to this, guideline on availability of Communication system for ISTS has been submitted to CERC by CEA for which centralized NMS/OSS is considered essential. MS, NRPC stated that the scheme has been recommended by TeST sub-committee in its 15th meeting and same may deliberated in NRPC for approval.

NRPC Deliberations

B.16.2 POWERGRID stated that scheme has been discussed at length in last meeting of TeST sub-committee wherein POWERGRID had made a detailed presentation before the members. The estimated cost of Rs 600 Cr is for all regions.

B.16.3 Haryana stated that U-NMS is a necessary system because different make of communication systems are to integrated at common platform. POWERGRID stated that in line with CERC's regulations mentioning communication system availability, the proposed U-NMS is also capable to calculate the availability of the communication system besides providing holistic view of network.

B.16.4 The Committee after detailed deliberation, approved the scheme.

List of Participants

Annexure-III


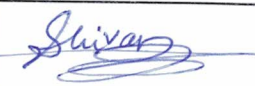
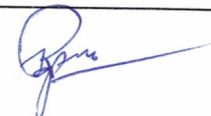




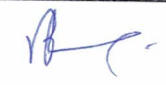


1st U-NMS Technical Committee Meeting held on 24th October 2019 at ERLDC, Kolkata

Sl. No	Name	Organisation/Region	Designation	Contact Details (E-mail & Mobile No.)	Signature
1	J BANDYOPADHYAY	ERPC	MS		
2	D K JAIN	ERLDC	ED		
3	S. P. Barnwal	"	GM	spbarnwal@posoco.in 9433041812	Spbarnwal 24/10/19.
4	B. Mondal	Dy ERLDC	Dy Manager	BISWAJIT. MONDAL@posoco.in 990332927	B Mondal
5	K. K. Prusti	POWERGRID	GM	KKP@powergrid.co.in 8393882712	K K Prusti
6	MITHUN CHOWDHURY	POWERGRID ERLDC	Manager	MITHUN@POWERGRIDINDIA.com	Mithun
7	CHANDAN	DVC	S.E	Chandan@dvc.gov.in	Chandan
8	A.K. Tiwary	DVC	CE(Comm.)	ashok.tiwary@dvc.gov.in	A Tiwary
9	K.T.R. Achary	OPTCL	So-GM (Telecom)	ktarachary@optcl.co.in	K T R Achary
10	P. K. Nayan	OPTCL	DGM (Telecom)	pranab94@gmail.com	P K Nayan

List of Participants

Annexure-1



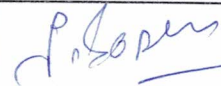

1st U-NMS Technical Committee Meeting held on 24th October 2019 at ERLDC, Kolkata

Sl. No	Name	Organisation/Region	Designation	Contact Details (E-mail & Mobile No.)	Signature
11	Santanu Rudrapal	Powergrid	Manager	Santanu.rudrapal@powergridindia.com	
12	Shivam Asati	ERPC	AD-11	Shivamasati786@gmail.com	
13	Rimil Topno	JUSNL	Sr. Manager	rimiltopno@gmail.com	
14	Rakesh Kumar	BSPTCL	EEE/ULDC	uldc.bsptcl@gmail.com	
15	BISWAJIT MADHU	WBS ETL	SE(E)	biswajit_madhu@ydc.co.in	
16	Nutan Mishra	Powergrid	GM, LD & C	ms.nutan@powergridindia.com	
17	J. G. Rao	ERPC	EE	ganesh.jada@gov.in	
18	Bibek Agrawal	ERLDC	JE	bibek@fosco.in	
19	RASHAN JAISWAL	ERLDC	JE	Rashan.jaiswal@fosco.in 9007184589	
20	Sunil Kumar Meena	ERLDC	ET	Sunil.meena@fosco.in	

List of Participants

Annexure-1

1st U-NMS Technical Committee Meeting held on 24th October 2019 at ERLDC, Kolkata

Sl. No	Name	Organisation/Region	Designation	Contact Details (E-mail & Mobile No.)	Signature
21	M. Viswanadh	ERLDC	DGM	mviswanada@posoc.in 9433041821	
22	S.K. SAHU	PGCIL / Odisha Project	DGM (AM/IT)	SKSahu@powergridindia.com	
23	Prachin Soren	DVC, Howrah SLDC	SE (Comm)	prachin.soren@dvc.gov.in	
24	Shambhu Das.	SLDC DVC Howrah	BB (Comm)	shambhu.das@dvc.gov.in	
25					
26					
27					
28					
29					
30					

Details of Node Elements and EMS/NMS of States/ISTS(ULDC)

S.No	EMS/NMS Type	Make of EMS/NMS	Year of Commissioning of EMS/NMS	Qty of EMS/NMS to be integrated	Number of NEs being monitored EMS/NMS	Does EMS/NMS support NBI (Northbound interface)? (Yes/No)	Make of NEs to be integrated (not being monitored on any EMS/NMS)	Number of NEs to be integrated (not being monitored on any EMS/NMS)
1	SDH	1					1	
		2					2	
		3					3	
		4					4	
		5					5	
		6					6	
2	PDH	1					1	
		2					2	
		3					3	
		4					4	
		5					5	
3	Other Technologies	1					1	
		2					2	
		3					3	
		4					4	
		5					5	
	Total							