सत्यमेव जयते

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
उत्तर क्षेत्रीय विद्युत समिति
Northern Regional Power Committee

सं. उक्षेविस/ प्रचालन /108/04/2019/ 9691-9725 दिनांक: 03 सितम्बर, 2019
No. NRPC/ OPR/108/04/2019/ Dated : 03rd September, 2019

सेवा में / To,

Members of TeST Sub-Committee (As per List)
टेस्ट उप समिति के सभी सदस्य (संलग्न सूचीनुसार)

विषय: टेस्ट उप-समिति की 15 वीं बैठक का कार्यवृत्त ।
Subject: 15th meeting of TeST Sub-Committee – Minutes.

महोदय ,
Sir,

उत्तर क्षेत्रीय विद्युत समिति की टेस्ट उप-समिति की 15 वीं बैठक दिनांक 07 अगस्त, 2019 को उत्तर क्षेत्रीय विद्युत समिति, सम्मलेन कक्ष, कटवारिया सराय, नई दिल्ली में आयोजित की गई थी । इस बैठक के कार्यवृत की एक प्रति आपकी सूचना व आवश्यक कार्यवाही हेतु इस पत्र के साथ संलग्न है।

15th TeST Sub-Committee meeting of NRPC was held on 07th August, 2019 at NRPC, Conference Hall, Katwaria Sarai, New Delhi. A copy of the minutes of the meeting is enclosed herewith for favour of information and necessary action.

भवदीय
Yours faithfully,

(आर.पी. प्रधान)
(R.P. Pradhan)
अधीक्षण अभियंता
Superintending Engineer

List

1. Chief Engineer(SLDC), PTCUL, Dehradun-248001, (Fax-0135-2530336)
2. Dy Chief Engineer BBMB, Chandigarh-160019, (Fax-0172-2549548)
3. Chief Engineer (GM), CEA, R. K. Puram, New Delhi-110066, (Fax-011-26109750)
4. Chief Engineer, UT of Chandigarh, Chandigarh-160009, (Fax-0172-2740276)
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6. Chief Engineer ,HPGCL, Panchkula-134109, (Fax-0172-2560622 & 2565042)
7. Chief Engineer, HPPTC Ltd., Shimla-171004, (Fax-0177-2626284)
8. Chief Engineer, SLDC, HP Load Dispatch, Totu, Shimla, (Fax-0177-2837543)
9. Chief Engineer HPSEB Ltd, Shimla-171004, (Fax-0177-26163554)
10. Chief Engineer (SLDC) PSTCL, Patiala, (Fax-0175-2304017)
11. Chief Engineer (Distribution), PSPCL, The Mall, Patiala, (Fax- 0175-2212069)
12. SE(communication), RVPNL, Heerapura, Jaipur-302005, (Fax-0141-2250967)
13. Chief Engineer (TO), UPRVUNL, Lucknow-226001, (Fax-0522-2287861)
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17. Managing Director, UPCL, Dehradun-248006, (Fax-0135-2768867)
18. Chief Engineer (O&M), NHPC, Faridabad-121003, (Fax-0129-2255706)
19. General Manager (OS)(NCR), NCR-HQ, NTPC, Noida-201301, (Fax-0120-2410052)
20. General Manager(ULDC) & General Manager (LD&C) POWERGRID, New Delhi-110016, (Fax-011-26564849)
21. General Manager (C&SO), SJVNL, Sharma Niwas, Below BCS, New Shimla-171009 , (Fax-0177-2673283)
22. General Manager (Electrical Design),THDC, Rishikesh-249201, (Fax-0135-2438682)
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24. General Manager (Technical), IPGCL, New Delhi-110002, (Fax-011-23270590)
25. GM(O&M) DTL, New Delhi-110002, (Fax-011-23232721)
26. General Manager, NRLDC, New Delhi-110016, (Fax-011-26853082)
27. Chief Engineer (SO&C), SLDC, HVPNL, Sewah, Panipat , (Fax-0172-2560622)
28. Dy. General manager, Rosa PSCL , (Fax-05842-300003)
29. Chief Engineer(SLDC), UPPTCL, Lucknow.(Fax 0522-2287880)
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31. DGM, Electrical, Jhajjar Power Ltd., Haryana, (Fax-01251-270155
32. Director, Lanco Anpara Power Ltd., (Fax-124-2341627
33. GM (Comml.), Aravali Power Company Pvt. Ltd., NOIDA, (Fax-0120-2425944)
34. HOD power system control, TATA Power Delhi Distibution Limited, New Delhi, (Fax-011-66050601), CENNET building, Opp to PP Jewellers Netaji Subhsh Place,, New Delhi.
35. Sr. Vice President, JSW Energy Ltd., New Delhi-110066 (Fax: 46032343 / 26183546)

Minutes for 15th Meeting of
Telecommunication, SCADA & Telemetry (TeST) Sub-Committee

Date: 07.08.2019
Venue: Conference Hall, First Floor, NRPC, Katwaria Sarai, New Delhi

1. Confirmation of Minutes

1. Confirmation of Minutes:

Member Secretary, NRPC informed the subcommittee members that the minutes of 14th meeting of TeST sub-committee held on 17.12.2018, were issued vide letter no NRPC/OPR/108/04/2019/1406-40 dated 14.02.2019 and no comments were received. He requested members to confirm the same.

The subcommittee confirmed the minutes.

List of participants enclosed as **Annexure-1.1**.

1A. Follow -up

1A. Follow-up of Decisions taken in the last TeST meeting

POWERGRID informed that most works have been completed as discussed in 14th TeST meeting and some of the remaining issues, are included in agenda points of the 15th TeST meeting.

MS, NRPC requested subcommittee members to timely comply with the decisions taken in previous TeST meetings. He also informed that required action by the constituents along with timeline was mentioned in minutes of last (14th) TeST meeting.

2. Telecommunication Related Issues

2.1 Issues in OPGW laying (Agenda by POWERGRID)

2.1.1 HPSEBL:

POWERGRID informed that all the links as tabulated below are on rail pole structure. Vendor had tried for OPGW installation in Gumma-Kumarsain link. During execution, it had been observed that at most of the tower locations, either the condition of conductor/earthwire was very poor or earthwire was not present, due to which, the work had become almost impossible with possibility of tower collpase in these conditions. He further stated that a joint site inspection had been carried out with M/s HPSEB representative for further

possibilty of work in this link. The joint inspection came out with report (copy enclosed as **Annexure 2.1**) that in this condition it is not safe as well as feasible to carry out the work. Accordingly, work had been stopped in this link. Also, same was the condition of other 66KV links, having rail pole structure, which were more than 30 years old and it was not safe to carry out OPGW work in these links. He requested that the same may be deleted from scope of the scheme.

Representative of HPSEBL stated that other associated equipment are already installed at site but laying of OPGW was pending which resulted loss of connectivity in between. In regards to joint inspection report, he intimated that he would look into the report including the healthiness of the towers and revert by 31st August, 2019.

Member Secretary, NRPC requested POWERGRID to provide a copy of joint inspection report to HPSEBL. He further requested HPSEBL to facilitate.

S/No.	Link Name	Constituent	Length (Km)	Remarks
1	Naptha-Ghanvi 66KV	HPSEB	20	Rail pole structure
2	Ghanvi-Jeori 66KV	HPSEB	4	Rail pole structure
3	Jeori-Nagoli 66KV	HPSEB	25	Rail pole structure
4	Kumarsain-Nogoli 66KV	HPSEB	25	Rail pole structure
5	Guuma-Jutogh 66KV	HPSEB	15	Rail pole structure
6	Gumma-Kumarsain 66KV	HPSEB	42	Rail pole structure
7	Bhaba-Nathpa 66KV	HPSEB	2	Rail pole structure
8	Sainj-Hulli 66KV	HPSEB	21	Lattice Structure
	TOTAL		**133+21**	

Other 132 KV Links:

POWERGRID stated that most of the links were very old and the condition of earthwire is very poor. Further, sag in many sections of old links, is very uneven. While going for any preparation, any slight swing of rope etc. would cause tripping of 132KV Solan-Kunihar Line. He requested for shut down for getting the work done.

Member Secretary, NRPC requested HPSEBL to expedite the possibility of shut down to resolve the issue. HPSEBL needs to resolve the issue regarding strengthening of peak of the towers as per contract agreement.

Confirmation of Commissioning

POWERGRID stated that 11 nos OPGW links, have been installed and SAT had been done under Package-V but the confirmation of commissioning has been pending at the end of HPSEB since 07.06.2019. POWERGRID has been approaching HPSEB on regular basis. Confirmation of commissioning is required by NRLDC for issuance of DOCO certificates.

Representative of NRLDC stated that consent of the state is needed for issuance of DOCO certificate.

Representative of HPSEBL stated that if JMC has been completed, he would look into the matter and revert back by 15th August, 2019.

2.1.2 **BBMB:**

Name of line	Constituent	Length (KM)	Remarks
220 KV Bhakra- Jamalpur	BBMB	86	Lattice Structure

POWERGRID stated that in the above mentioned link, tower modification (raising of tower height as well as shifting of tower) has to be done by BBMB. Accordingly, details of towers (from T. NO. 55 to 270), where modifications are proposed, have been provided by BBMB, while no information has been provided for tower section 1 to 55. He further stated that in this condition, with proposed modification in line, it will not be feasible to carry out the installation and it will be better to carry out the work after completion of proposed modifications.

BBMB stated that initially LILO was proposed for this line but this proposal has been withdrawn. He requested POWERGRID to carry out the work on above link as it is required for redundancy.

POWERGRID stated that they would carry out the OPGW installation work for the above mentioned links as per the existing plan, submitted by BBMB and any modification in the link, after OPGW installation, would be carried out by BBMB on their own. BBMB, agreed for the same.

2.1.3 **PSTCL:**

S/No.	Link Name	Constituent	Length	Remarks
1	220 KVJamsher-220KVJadla	PSTCL	67.33	OPGW laid 62.62 KM

POWERGRID stated that in the above link, balance 4.71 KM laying of OPGW was pending since more than 2 years due to severe ROW. He requested PSTCL to issue instructions to concern site officials to resolve the ROW problem, so that work could be completed and if required, help of District administration may also be taken up.

PSTCL submitted their reply vide email dated 06.08.2019 which is reproduced below:

"Matter has already been taken up with civil administration/SDM for resolving the said issue of 220kV Jamsher-*Jadla line & the same is likely to be redressed shortly."*

2.1.4 **Reliable Communication Scheme (Additional) under Central Sector for NR. (Agenda by POWERGRID)**

POWERGRID intimated that during 39th & 40th NRPC meetings, implementation of Reliable Communication Scheme envisaging installation of 5474 km of fibre optic line by POWERGRID, was approved to provide connectivity of substation of 132 kV and above under central sector.

POWERGRID stated that in order to provide reliability and redundancy (n-2 criterion) in ISTS communication system in line with draft MANUAL OF COMMUNICATION PLANNING IN POWER SYSTEM OPERATION, 2019 (CEA), and also Communication Regulation 2017, additional Central Sector fibre optic installation scheme, has been proposed as tabulated below:

S. No.	Name of Link	Route Length (km)	Purpose
1	400kV Panchkula-Patiala	65.494	Physical Path Redundancy & route diversity for Panchkula S/s
2	400kV Nalagarh-Patiala	93.78	Reliable ICCP link between HP, Punjab and NRLDC
3	400kV Jallandhar Moga	85.15	Physical Path Redundancy & route diversity for Jallandhar (PG) through Central Sector links.
4	400kV Parbati PS – Amritsar	250.53	Path Redundancy & route diversity of Parbati PS (Banala) & Hamirpur through Central sector network.
5	LILO of Parbati-Amritsar at Hamirpur	6.7	
6	400kV Kurukshetra-Malerkotla PG	180	Path Redundancy of Malerkotla (PG) through central sector network.
7	765kV Meerut - Moga	337.15	Route diversity of Moga S/S & creation of reliable ICCP link between Punjab, Rajasthan (through upcoming 765kV Bikaner Moga under GEC Part D & NRLDC.
8	400kV Bassi-Sikar	169.8	Redundancy of Sikar S/S
9	400kV Dehradun-Bagpat	165	Physical path Redundancy & for route diversity of Bagpat S/S
10	400kV RAPP B - Jaipur South with LILO at Kota	300	Redundancy of Kota & RAPP through Central Sector network
11	400kV Allahabad-Singrauli	200	Redundancy of Singrauli
12	400kV Allahabad-Fatehpur 765	130	Strengthening of Inter Regional Connectivity (WR-NR). (400kV Fatehpur –Mainpuri is under implementation under Reliable Communication scheme)
13	400kV Patna-Ballia	200	Strengthening of Inter Regional connectivity ER –NR.

S. No.	Name of Link	Route Length (km)	Purpose
14	400kV Kanpur-Ballabhgarh	260	Redundancy of old Agra-Kanpur link which has reached the end of its useful life of 15 years.
15	Chittorgarh 400kv RVPN to Chittorgarh 220 RVPN	52	Redundancy of Chittorgarh 220/132 through Central Sector network
16	400kV Lucknow – Kanpur	156	Redundancy of Network and avoiding multiple sub-stations
	TOTAL	**2651.604**	

He further added that the estimated cost for above proposal is approx. Rs 88.32 Cr for implementation on cost plus basis. This figure has been arrived on pro-rata basis of initial scheme. However, the actual quantity/cost shall be discovered only after implementation. The Tariff for the investment made, is to be shared by all constituents as per CERC notification. The scheme shall become part of existing Commercial Agreement signed for ULDC Project.

Member Secretary, NRPC sought the opinion of state utilities and invited suggestion/comments if, any by email for further deliberation in the TCC/NRPC meetings.

Sub-Committee granted in-principle technical approval to the above scheme and recommended for further deliberations in the next TCC/NRPC meetings.

2.1.5 Status of NHPC stations (Agenda by NHPC)

Parbati-III: NHPC intimated that out of 6.5 Kms, OPGW has been laid on 3 Kms patch only. Some additional commercial issues have arisen on the part of PKTCL due to which the work has been pending and the same shall be completed after resolution of the issues.

SE(C), NRPC informed that the issue was resolved in a separate meeting held on 05.03.2019 at NRPC Sectt. Minutes of the meeting is enclosed as **Annexure 2.1.5**. Representative of POWERGRID added that the work was further delayed due to some issues related to handing over the dismantled earth wire to PKTCL. The issue was bilaterally resolved and the work would be carried out by POWERGRID during the proposed shutdown between 19th and 31st September, 2019.

Sewa-II: NHPC briefed that during 42nd TCC and 45th NRPC meeting held on 07.06.2019 and 08.06.2019, POWERGRID informed that Connectivity is a part of Gladni-Hiranagar line of J&K which is being executed by PGCIL as a consultancy project. Since Aug'16, the payment amounting to Rs 30-35 Cr is

stuck at the end of J&K and PGCIL can't proceed further due to lack of fund being made available by J&K.

Representative of POWERGRID intimated that the Sewa-II connectivity was established through the alternate path.

Member secretary, NRPC informed that a DO letter addressed to Principal Secretary, PDD J&K, has been sent seeking favourable resolution of subject matter.

2.1.6 VSAT Connectivity at URI-II Power Station (Agenda by NHPC)

NHPC stated that during 42nd TCC and 45th NRPC meeting held on 07.06.2019 and 08.06.2019, POWERGRID informed that VSAT at URI-II PS will be installed within 03 months (Award by July 19 and installation by August 19).

POWERGRID stated that the contract would be awarded by 15th August, 2019 and is likely to be completed within 3 months subject to law and order situation in the J&K.

2.2 Replacement of S900 RTUs (Agenda by DTL)

AMC of S900 RTU:

DTL stated that existing AMC of S900 RTUs is expiring on 31.01.2020 and new RTUs are still awaited. He requested POWERGRID to consider for renewal of AMC or fresh award of AMC of old S900 RTUs till the work of replacement is not completed.

POWERGRID stated that matter would be discussed during the next TeST Sub-committee meeting and would be finalised before the expiry of the existing contract.

AMC of BTPS RTU:

DTL stated that after closure of BTPS Generating Plant, 200KV yard of BTPS station was taken over by DTL and BTPS RTU (Husky – OEM is M/s Synergy) was also maintained by DTL. He requested POWERGRID to consider for including the BTPS RTU in scope of AMC of S900 RTU.

POWERGRID agreed for the same.

Replacement of S-900 RTUs:

DTL requested POWERGRID to expedite the work in time bound manner for replacement and also the project schedule and targeted completion period may be apprised.

POWERGRID agreed for the same.

2.3 Arrangement of FRTU for monitoring of real time status of UPS and DG Set (Agenda by UPSLDC)

2.3.1 UPSLDC stated that this issue has been raised in several TeST meeting as well as in SCADA AMC meeting held recently on 17-05-19 wherein POWERGRID confirmed that same would be supplied under RTU replacement package.

POWERGRID stated that in the second lot, FRTUs would be supplied and it would take another 6 months.

He further added that for UPS, a separate system screen was also provided along with SCADA system and the same could be utilised for monitoring purposes.

2.4 RTU RELATED ISSUES (Agenda by HPSEBL)

HPSEBL stated that RTU (Siemens make) at 220 kV Baddi sub-station was not working properly as it had been observed that RTU leaves the data for some time, ask for restarting and sometimes it restarts itself. The matter stands informed to M/s SIEMENS'S site Engineer. M/s SIEMENS was requested to take necessary action in this regard.

Siemens stated that issue has been resolved. He further stated that this problem arises due to interfacing issue between ABB and Siemens. He suggested that if in future such problem occurs, a joint visit comprising representatives of Siemens and ABB, would be called to resolve the issue.

2.5 HPSEB Communication Related Issues: (Agenda by HPSEB)

2.5.1 <u>Implementation of OPGW under Package-I (a)</u>

HPSEBL stated that as per notification of award Ref. No. CC-CS/439-NR1/OFOC-3038/3/G5/R/NOA-I/5537 dated 30.09.2015, the project was supposed to be completed within 18 months from the date of notification of award i.e. by March, 2017 as such project completion is delayed by more than two years. Further, it is intimated that OPGW stringing work on HPSEBL transmission network under Package I(a) was commenced w.e.f. 09.02.2017 but as on date, about 200 Km OPGW has been laid by the firm i.e. M/s Ten Dot Cable Pvt. Ltd. out of 543 Km which shows that prevailing pace of laying of OPGW is very slow. Therefore, it was requested to POWERGRID that concerned vendor may be directed to deploy more gangs, so as to complete the OPGW laying work as soon as possible and also, SAT activity may be carried out on the links wherein OPGW stringing work has been completed so that real time data reporting could be shifted simultaneously to fibre.

Representative of POWERGRID stated that out of 543 Km, 133+21Km is covered in agenda no. 2.1 of this meeting. He further stated that OPGW

installation in 132 kV Bhaba-Kasang Line could not be completed due to aviation globule balls including the difficult hilly terrain to dismantle aviation balls and laying of OPGW without shut down. He requested HPSEBL to facilitate shut down for OPGW laying on continuous basis.

HPSEBL representative agreed to facilitate the shutdown wherever it is required.

HPSEBL stated that Optic fibre communication link between 132 kV Giri - Solan line installed under Package 1(a) is interrupted w.e.f 08.04.2019 and same was informed to PGCIL but the issue is not resolved till date. Due to non-availability of real time data in respect of 220KV Giri station & being interstate drawl point, it is becoming difficult for power regulation in real time, moreover, it has been pointed out in the 161st OCC meeting that there is drastic difference between SEM & SCADA value in respect of HP, therefore, POWERGRID is requested to kindly direct the concerned vendor to take immediate action for rectification of fault on said OPGW link.

POWERGRID stated that SAT for these links, has been completed during February, 2019 and issue arose due to diversion of transmission line along with OPGW by third party. On request of HPSEBL, POWERGRID agreed to rectify the link on chargeable basis. HPSEBL agreed for the same.

2.5.2 Partial reporting of real time data at backup SLDC, HVPNL, Panipat

In this context, it is intimated that presently, 39 Nos. RTUs have been configured in SCADA system at SLDC Control Centre, Shimla (26 Nos. are reporting on IEC101 and 13 Nos. are on IEC104). Further, it has come to the notice that all RTUs are not reporting at backup SLDC i.e. SLDC Panipat, Haryana and only a few RTUs of IEC101 are reporting at SLDC Panipat through multisite link. The matter was taken up with M/s. SIEMENS which has stated as under:

"We would like to inform you that HPSEBL recently migrated few RTUs from IEC101 to IEC104 for which configuration changes are to be carried out at backup control center end i.e. HVPNL. We request you to kindly inform to HVPNL to carry out these changes in IFS server and Siemens site engineer will support for the same".

In view of above, PGCIL was requested to configure a port in the Tejas SDH at SLDC, Shimla & SLDC Panipat and accordingly, it was confirmed by Sh. Nripesh, Tejas Networks Ltd., Gurgaon that one port has been configured for HPSEBL with port details – SLDC Jutogh- 1-7-2 and SLDC Panipat- 1-7-4. Simultaneously, it was requested to HVPNL to carry out the activity of synchronizing HPSEBL database, create channels in IFS Server and other updation/configuration if any, in the SCADA system and also, establish the connectivity between Tejas SDH to SCADA system at SLDC Panipat.

POWERGRID stated that communication port has been utilised by HVPNL on temporary basis only and same shall be available for multisite integration. HVPNL was requested to synchronise database at their control centre for HPSEBL RTUs.

Sub-committee advised HVPNL and HPSEBL to resolve the issue bilaterally and requested POWERGRID to co-ordinate the matter, if required.

2.6 DTL Communication issues (Agenda by DTL)

2.6.1 Replacement of diverted Communication Eqpts. /addl. BOQ.

DTL stated that a number of SDH/PDH communication equipment have been diverted/utilized by POWERGRID for project works, from earlier allocated DTL sites, such as 220KV Papanlkalan III/Preet Vihar etc. He sought for plan for replacement / installation at these sites alongwith the additional approved BOQ for other sites, by POWERGRID.

POWERGRID stated that they would consider the same under the ongoing reliable communication scheme with a completion target of six months by January, 2020.

DTL stated that new communication equipment (ECI make) which were supplied under ULDC Scheme, have been installed and the data has been shifted accordingly. He further added that in order to have reliable communication network, POWERGRID was requested to provide a plan for AMC/support i.e. start date of AMC and AMC period after guarantee period as per contract agreement for maintaining new communication equipment (ECI make) and also AMC/support for new laid OPGW (under ULDC phase-II)

POWERGRID informed that this Package covers the requirement of DTL, UPPTCL, HPSEBL, PSTCL and Central Sector. As of now, all equipment have been commissioned for constituents except few central sector links which would be commissioned by 30th August, 2019 and AMC for whole package, would commence thereafter.

DCPS and Auxiliary Power Supply:

DTL requested POWERGRID to appraise the action plan of renewal / fresh award of AMC of Auxiliary Power Supply installed at SLDC Delhi. Existing AMC was expiring in January 2020. Further the MoU (valid till June 2020) in this regard was also to be extended. He sought status from POWERGRID regarding AMC / Support of newly installed 10 nos. of 48V DCPS supplied under OPGW Project in DTL.

POWERGRID stated that AMC for existing DCPS will be extended. Further, some of the DCPS which were installed in ULDC Phase-I scheme are being replaced under Reliable communication scheme.

2.7 UPPTCL Communication issues (Agenda by UPPTCL)

UPPTCL stated that as discussed in 12th TeST Meeting, in replacement of NOKIA PDH, UPPTCL had requirement of new PDH at the following stations.

Sl.No.	Name of Stations	Requirement of V.28 cards
1.	220KV Muzaffarnagar	2
2.	220KV Modipuram Backup SLDC	17
3.	220KV Muradnagar	2
4.	220KV C.B ganj	2
5.	Harduaganj TPS	4
6.	220KV Etah	2
7.	220KV Mainpuri	2
8.	400 KV Sarojninagar	2
9.	400KV Unnao	2
10.	220KV Allahabad Rewa road	2
11.	Gomtinagar SLDC	17
12.	Obra(B)	2
13.	220KV Sahupuri	2
14.	400KV Sultanpur	3
15.	400KV Muradnagar	4
16.	Rihand Pipri(H)	2
17.	132KV Mirzapur	2
18.	220KV Khurja	2

He requested POWERGRID to discuss the Future/Phasing out of FIBRE home make SDH equipment.

POWERGRID stated that under reliable communication scheme in year 2018, PDH was removed from most of the locations citing upgradation of RTUs to 104 protocol & using of VOIP.

UPPTCL intimated the requirement of PDH at some locations and mentioned that RTUs at these locations would be replaced after 4-5 years and they needed PDH equipment for availability of data against replacement of Nokia equipment which was installed under ULDC Phase-I

POWERGRID agreed for the same and confirmed that the above additional requirement of PDH would be considered under the ongoing reliable communication scheme.

2.8 Fibre cut between Kishenpur-New Wanpoh (Agenda by NRLDC)

NRLDC stated that there was a fibre cut between Kishnepur-Wanpoh since January 2019 due to which PMU data from Wagoora, Wanpoh and Uri was not available at NRLDC. He added that data from these stations is critical for monitoring of Kashmir Valley.

POWERGRID stated that unprecedented ice deposition on OPGW in Kashmir valley has led to the breakage of the same. He further added that data from

alternate route has been restored. POWERGRID also stated that they have planned to replace heavy duty OPGW for approx. 30 km stretch in this area.

2.9 OPGW Connectivity at Bhadla Pooling Stations (Additional Agenda by NRLDC)

NRLDC stated that Bhadla Pooling Station was first time charged in the month of March 2019. The SCADA data of Bhadla was to be integrated on OPGW through 765 KV Bhadla-Bikaner Line but due to non-commissioning of the 765kV Bhadla-Bikaner line, data was transferred to NRLDC over GPRS which is highly intermittent. He further, informed that many Solar Power Plants are getting connected at Bhadla PG. As per Connectivity agreement data of these solar plants has to be integrated with OPGW at Bhadla PG. Due to unavailability of OPGW at Bhadla PG data transmission from these sub-stations is also getting affected as they are also integrating through GPRS Network.

At Present approximately 700 MW {Adani Power (250MW), Saurya Urja (200MW), and Mahoba Solar (250MW)} has already been integrated in the grid and non-availability of data from these sub-stations is causing constraint in smooth grid operation. Further, 580 MW {Azure (130 MW), Tata Power (150 MW) & Clean Solar (300 MW)} is likely to be connected in near future. There was evacuation constraint at Bhadla Pooling Station and proper visualization of data from these Solar Power Parks, was very essential for smooth monitoring and reliable grid operation.

Due to non-availability of OPGW at Bhadla PG, NRLDC was facing following issues:

a) High intermittency of RTU data from Bhadla (85%), Adani Power (94%) and Saurya Urja (79%).

b) Non availability of PMU data from these sub-stations

c) Non availability of dedicated Voice communication with Solar Power Parks.

NRLDC intimated that it was learnt that alternate arrangement of fiber connectivity to Bhadla PG has been done by POWERGRID. POWERGRID was requested to confirm the same and arrangements may be made for shifting of data at the earliest.

NRLDC requested POWERGRID to make fibre arrangement to Bhadla for resolution of telemetry issues from Bhadla PG and other Solar Park Developers.

POWERGRID informed that data would be shifted to Fibre, once 765 KV Bhadla-Bikaner line gets commissioned. Further he assured that line is expected to be completed by August 2019 or latest by 15th September and data

would be shifted to fibre within a month. He further added that existing link has been established through RRVPNL network (LILO of Bikaner-Bhadla RVPNL) which is reportedly not covered in any AMC. In case of fibre outage, data connectivity may be lost for longer periods.

2.10 Signing of side letters of MoU for AMC (Additional Agenda by POWERGRID)

Side letter of MoU for maintenance of RTUs, OPGW, Wideband was sent to respective constituents long back. However, side letters for MoUs are yet to be signed by following Constituents and payment has been stuck up

a) PTCUL – RTU (Long pending)

b) J&K PDD – OPGW and Wideband

c) UPPTCL – all (OPGW, wideband, APS, etc.)

POWERGRID again requested to expedite the signing of side letter to MoUs immediately otherwise it would be difficult to carry out the AMC works without MOU in place.

Since representatives of PTCUL & PDD J&K were not present during the meeting, status regarding the same could not be ascertained. Representative of UPPTCL confirmed that they would finalize the MOU within 2 weeks and subsequently, pending payments shall be released to POWERGRID.

2.11 Non-issuance of PTW (Additional Agenda by POWERGRID)

POWERGRID intimated that due to non-issuance of PTW / auto relay setting code for OPGW works in 400kV Dadri-Maharanibagh and Dadri-Mandola under Reliable communication package, permission for change in relay setting from auto to non-auto mode got repetitively (since April'2019) cancelled and thus, work would be delayed.

Sub-committee requested to expedite for approval of the same in the next OCC meeting.

2.12 Implementation of Multisite Configuration between BBMB SLDC Chandigarh and SLDC Patiala. (Additional Agenda by BBMB)

BBMB stated that the following Multisite Configurations are yet to be implemented by M/s SIEMENS:

a) Scheduling and UI rate calculations to be implemented between Backup Control Centre and NRLDC.
b) Flow of BBMB ICCP data between Backup Control Centre and NRLDC.

Siemens stated that implementation of above was not feasible.

NRLDC stated that Schedule, Actual and Frequency Rate data is already available at the SCADA screen. Siemens just need to do some mathematical operations to show the blockwise deviation amount.

Siemens stated that they would discuss the feasibility with NRLDC and explore to implement the same.

Further, the following SIEMENS make RTUs are yet to be configured for multisite due to non-availability/provision of communication links between RTU and PSTCL Patiala.

- Bhakra Left
- Bhakra Right
- Pong
- Dehar
- Bhiwani
- Chandigarh

POWERGRID needs to provide communication links for multisite configuration of the left out RTUs.

POWERGRD informed that new equipment at Bhakhra left, Pong and Dehar has been installed and the same shall be commissioned within one month. Further for Bhiwani, new Equipment has been considered under Reliable communication scheme and the same shall be provided within 6 months.

2.13 Loss of Critical Interstate Drawl Data of Punjab leading to SEM/SCADA mismatch (Table Agenda by Punjab-SLDC)

Punjab-SLDC stated that problem regarding Loss of Critical data has been observed various times in the past and discussed in various TeST meetings as well. Recently also, Interstate Telemetry drawl data of Punjab got suspected at odd hours even when communication links were healthy. This issue is of very serious nature as it leads to mismatch of SEM SCADA data, which in turn leads to monetary loss for PSPCL/PSTCL.

Recently the Interstate data of Punjab got suspected on various dates i.e. 9th July, 2019; 18th July, 2019; 19th July 2019; 20th July 2019 and remained suspected/disturbed for around 7-8 hours respectively. Matter was taken up with M/s Siemens and they stated that the problem occurred due to network issues, hence matter was taken up with POWERGRID as well, for which they instructed Commtel Engineer to reconfigure the network.

It was requested that POWERGRID may please provide detailed investigation report of the above referred issue, so that in future these kind of problems could be avoided.

POWERGRID stated that most of the time, data availability was disturbed due to power supply failure. He further added that the issue was reported by PSTCL

on 18th, 19th and 20th July 2019. Data was restored after reset of terminal servers at Patiala SLDC and system has been working fine thereafter.

3. Issues in Unified Load Dispatch & Communication scheme of NR (Phase-II):

3.1 SCADA issues of UPSLDC (Agenda by UPSLDC)

UPSLDC intimated the following issues:

3.1.1 **Web Server Issues**

- Non Working of Web Server-2
- Frequent stoppage/interruption of data viewing on COL consoles through web server-1.
- Non-inclusion of new updates in COL data viewing. It needs to be done manually

Siemens stated that they deputed their engineer on 9th July, 2019 but issue remained unresolved because, it was a new and typical issue. He assured to get it resolved by the end of August, 2019.

3.1.2 OTS issues:

Non utilization of OTS applications due to data sync. problem of OTS. In SCADA AMC Meeting held on 17th May'19 at PGCIL New Delhi, Siemens agreed to send EMS Engineer in 1st Week of June'19 for resolving the issues. Siemens EMS Engineer reached SLDC on17-06-19 and remained up to 22-06-19 but issue could not be resolved. Further action from Siemens is still pending.

3.1.3 **EMS Issues:**

Non-running of voltage scheduler, Security dispatch and optimal Power flow Applications. This issues has also been raised continuously in various TeST as well as in MRM also and during previous SCADA AMC Meeting Held on 17th May'19 at PGCIL, New Delhi, Siemens agreed to send EMS Engineer during 1st week of June'19 for resolving the issues. Siemens EMS Engineer reach SLDC on 17.06.19 and remained at SLDC but these issues are still unresolved. No further action has been taken by Siemens for resolving these issues.

NRLDC stated that for such issues Siemens should have provided contact person details as asked for in previous meetings too.

Member Secretary, NRPC stated that Siemens should provide contact number of nodal person for rectification of such issues to NRPC and Siemens may connect through video conferencing facility at WRLDC whenever required.

3.1.4 **SCADA AMC Meeting date 17-05-19 pending issues :-**

- POWERGRID requested Siemens to submit the names of reserve engineers within one month but the same has not yet been intimated by Siemens.
- Siemens was requested to streamline complaint portal and M/S Siemens agreed to resolve all issues in complaint portal within 15 days but the issues are still pending even after lapse of more than two months.
- Siemens informed that there is change in hierarchy and POWERGRID asked Siemens to inform new escalation matrix to SLDCs, NRLDC and POWERGRID by 23rd May 2019 but the same has not yet been informed even after lapse of three months.
- It was agreed by Siemens that it would impart training to resident engineers through VC for knowledge sharing and other purposes. Such sessions will be held on fortnightly basis and first meeting shall be held on first week of June'19 but the same have not yet been started by Siemens. Siemens representative agreed to look into this.

3.1.5 **Networking Issues:-**

UPSLDC stated that in the meeting related to SCADA AMC on 17-05-2019 Siemens agreed that for IP conflicts issues an Engineer of Siemens shall visit at SLDC. Siemens Engineer reached SLDC on 11-06-19 afternoon and remained up to 12-06-19 forenoon, but issue could not be resolved.

Representative of Siemens stated that after IEC104 this problem was reported in other regions also, whenever there was IP conflict data becomes suspected.

UPSLDC stated that when they connect both Modipuram and Lucknow, SCADA data becomes suspected within one/two hours which results operation from only one location and provision of redundancy vanishes out.

Representative of NRLDC stated that NRLDC has also been facing similar IP conflict issue. Siemens needs to resolve the issue at NRLDC and then for NR utilities.

Representative of Siemens stated that they will send manpower to NRLDC by the end of August, 2019.

3.1.6 **IMM Issues:-**

- Issues of frequent shut down of IMM workstation has been reported to Siemens through site engineer and complaint portal several times but problem is still unresolved even after lapse of 4-5 months.
- Issues of slow down and database sizing have been occurring repeatedly but no permanent solution has been offered by Siemens so far.

Siemens will provide contact details of nodal person for such problems.

3.1.7 **PDS issues**

It is basically a Relational database problem. Data is not in sync with master database**.** Siemens will provide contact details of nodal person for addressing such problems.

3.2 DTL SCADA issues (Agenda by DTL)

Representative of DTL intimated the following issues:

3.2.1 **Short Term Load Forecasting:**

a) Features for manual execution and correction is not activated in STLF.
b) All forecast type (Similar day etc.) feature in STLF is not working properly.
c) Technical support regarding STLF is not available from M/S Siemens.
d) In load error analysis page the current forecast value does not match with any of the forecasted values.

3.2.2 **EMS TUNING.**

a) Problems regarding EMS tuning and convergence have not been resolved even with the help/support from M/s Siemens.
b) Unable to retrieve correct estimated value even after proper database synchronization resulting in failure of OTS (Operator Training Simulator).

3.2.3 **Problem regarding ICCP integration of MES:-**

ICCP configuration for MES has not been done properly resulting into Data transfer failure since May.
Remote end support from Siemens is very poor. Issues of emergency nature are not resolved in time bond nature.

Representative of Siemens stated that DTL may register their complaint for issues described at 3.2.1, 3.2.2 & 3.2.3 and generate ticket or they may directly send mail to them.

3.2.4 **Charges for bay extension in Siemens RTU's**

DTL stated that as requested in previous TeST meetings, Unit charges for extension of 220 / 66 / 33 KV bays in RTU's installed by M/s Siemens under ULDC Phase 2 needs to be provided to the constituents to enable the new bay extension work at various sites. Same has still not been provided by M/s POWERGRID. Accordingly, POWERGRID is requested to finalize the rates of bay extension work with M/s Siemens and provide the same to constituents.

POWERGRID stated that this issue was already discussed in previous TeST sub-committee meetings. He requested the constituents to place order for additional bay integration at their own.

3.3 Mapping of UFR, df/dt relay details in SCADA (Agenda by NRLDC)

NRLDC stated that as per CERC regulation, UFR and df/dt mapping is mandatory. In 136th OCC meeting held on16.06.2017, it was decided that in addition to the SCADA mapping, states should provide the following information regarding the UFR, df/dt relays installed at their respective substations:

- Source of frequency measurement for UFR, df/dt relay viz. positive sequence, phase-to-neutral, phase-to-phase
- Computational time for measurement of frequency, rate of change of frequency in UFR, df/dt relays respectively.

In the 137th OCC meeting dt. 18.07.2017, NRPC reiterated that mapping of UFR has to be done in the SCADA of SLDC & NRLDC for better visibility of relay status and feeder load relief. In the subsequent OCC meetings, all state utilities were requested to correct the SCADA UFR, df/dt displays as per the comments.

NRLDC representative in the 160th OCC meeting, sensitized the house about requirement of mapping of UFR and df/dt and how it is helpful during crisis / grid disturbance condition.

NRLDC representative further presented the current status of mapping of UFR and df/dt in SCADA.

% SCADA data visibility

State Name	UFR (Main)	UFR (Alternate)	df/dt (Main)	df/dt (Alternate)
Punjab	67	13	77	12
Haryana	91	0	0	0
Rajasthan	29	75	100	100
Delhi	100	100	100	100
Uttar Pradesh	2	0	48	0
HP	88	79	73	0
Uttarakhand	0	0	0	0
J&K	0	0	0	0

Following action points were decided in the 160th OCC meeting:

- All the feeders coming under UFR and df/dt scheme shall be mapped in the display despite of data availability, RTU availability. In case data is not available, alternate feeder details to be mapped. All the details (main feeder details and alternate feeder details) to be mapped before 30th June 2019. (Action by: All the state utilities of NR)
- All the state utilities shall check and monitor the UFR, df/dt display on monthly basis and submit the monthly progress report to NRPC / NRLDC. (Action by: All the state utilities of NR)
- All the suspected data in the mapping shall be monitored on daily basis and accordingly remedial measures shall be taken. (Action by: All the state utilities of NR)

Representative from NRLDC requested all constituents to comply to the action points as decided above and provide the updated SCADA UFR, df/dt display status.

Representative of UP stated that mapping of UFR and df/dt alternate path would be completed by 15th August, 2019 and regarding main path they would discuss with NRLDC bilaterally and would accordingly plan.

PSTCL submitted their reply vide email dated 06.08.2019 which is reproduced as below:

"Feeders coming under UFR and df/dt scheme, whose telemetry is available, have been mapped in the display including digital data and data of alternate feeder mapped wherever RTU installed but real-time data not available through UFR & df/dt bays.

Monthly progress report in respect of Telemetry Status(Containing Availability %age of each RTU /SAS of Punjab) is being shared on monthly basis with NRLDC.

All the suspected data in the mapping is being monitored on daily basis and accordingly remedial measures are also being taken."

3.4 Cyber Security of SCADA/EMS System (Additional Agenda by BBMB)

As per Govt. of India, Ministry of Power Office Memorandum dated 2nd August 2017 (Annexure-3.4 of Agenda) regarding steps to be taken to prevent cyber incidents due to malware, under the heading "Important and immediate steps need to be taken by the Power Sector Companies" (point (iv)), it has been mentioned that:

"No use of Word processing software Power Point, Excel sheets on ICT systems deployed *in the operational network".*

In this regard, preparation of Control Room Reports and extraction of history data from SCADA/EMS System installed under ULDC Phase-2 is being done by using MS Excel.

Sub-committee suggested BBMB to carry out works in compliance to OM issued by MoP and other relevant guidelines issued by Ministry regarding the same**.**

3.5 Updation of SCADA data in Web Server (Table Agenda by Punjab-SLDC)

Punjab-SLDC stated that as already pointed out in the past TeST meetings, it was again reiterated that problem related to data updation in Web Server was not being resolved completely. Recently, New Data of Transformers MVA, was added in SCADA, which did not get updated in Web Server even after span of

20 hours, for which the matter was taken with M/s Siemens and a ticket (On Siemens Complaint Portal) was generated on 18th July,19. PGCIL/ M/s Siemens is requested to permanently resolve this issue.

4. Telemetry Related Issues

4.1 Non-Availability / Reliability of Telemetry (Agenda by NRLDC)

NRLDC informed that telemetry from the above stations was intermittent during the month of June 2019. He informed that uninterrupted availability of telemetry is essential for smooth operation of grid. It is essential to ensure 100% of availability of the data. He further requested all constituents, POWERGRID, NTPC, NHPC etc. to regularly monitor the reliability of data and ensure that data from all the stations is available at NRLDC / respective control centres.

All members agreed for the same.

The non-availability of various 400 kV / 765 kV stations was calculated for the month of June 2019. The list of stations where data availability is less than 80% is given below.

Out of 198 number of 400 kV/765 kV sub-stations, data of nearly 29 (14.6%) stations are highly intermittent.

PGCIL			
Malana	Bhadla (PG)	RAPP-D	Kanpur 400
Parbati-2	Uri-2	Parbati-III	Budhil
Chamera-3	Koteshwar Pooling	Chamera-I	Sewa-2
PTCUL			
Srinagar(UK)	Kashipur		
DTL			
Harsh Vihar			
RRVPNL			
Barmer	Hindaun	Kawai	
UPPTCL			
Aligarh (UP)	Vishnu Prayag	Agra South	Rosa
HPPTCL			
Sainj			
PSTCL			
Nakodar	Dhuri	Nhuyawali	Makhu

4.2 Telemetry of digital status (Agenda by NRLDC)

NRLDC informed that telemetry of digital status is very poor from Constituents. He further informed that availability of correct telemetry is very essential of grid monitoring. Also correct digital telemetry is essential for functioning of State Estimator and other EMS applications. He requested all to take necessary action for improvement of telemetry of digital points.

Member Secretary, NRPC showed concerned about non-availability of digital status and requested all to take necessary action on priority basis and requested all to submit the availability report of digital points to NRLDC/NRPC on quarterly basis.

4.3 Unreliable Telemetry from States/Utilities (Agenda by NRLDC)

NRLDC informed that there is negligible improvement in availability of telemetry from last one year. Month wise non-availability report is given below:

Monthly Data Non-availability	
Jun-18	26%
Jul-18	24%
Aug-18	24%
Sep-18	22%
Oct-18	25%
Nov-18	24%
Dec-18	22%
Jan-19	22%
Feb-19	28%
Mar-19	25%
Apr-19	26%
May-19	23%
Jun-19	25%

He further requested all constituents to take necessary action with regards to improvement of telemetry.

It was also informed that there is no improvement in telemetry from PTCUL and J&K. Since both were not present in the meeting it was decided that NRPC shall write a letter to J&K and PTCUL showing concern about non availability of telemetry and requesting them to arrange telemetry to NRLDC/SLDCs at the earliest.

Members agreed to take necessary action with regards to improvement of telemetry.

4.4 Communication plan for channel redundancy and to back-up NRLDC (Agenda by NRLDC)

NRLDC informed that redundant channel configuration is essential for reliable availability of telemetry to NRLDC. He further informed that 19 out of 128 RTUs is coming on single channel and requested concerned to arrange redundant port/channel to NRLDC. List of stations along with comments for resolution is given below:

S.NO.	Name of RTU	Comments	Updated Status
1	BHADLA (PG)	Will be arranged along with Fibre connectivity of 765 KV Bhadla-Bikaner	September 2019
2	KISHANGANGA	NHPC	NHPC to revert
3	KURUKSHETRA NEW	Available	Rectified on 06th Aug 2019
4	PARBATI-2	NHPC	NHPC to revert
5	SALAL	NHPC	NHPC to revert
6	SEWA-2	NHPC	NHPC to revert
7	RIHAND-3	NTPC	NTPC to revert
8	SINGRAULI HYDRO	NTPC	NTPC to revert
9	BHADLA (ADANI)	Will be arranged along with Fibre connectivity of 765 KV Bhadla-Bikaner	September 2019
10	BHADLA (SAURYA URJA)	Will be arranged along with Fibre connectivity of 765 KV Bhadla-Bikaner	September 2019
11	BUDHIL	IPP	
12	KARCHAM WANGTOO	IPP	
13	MALANA	IPP	
14	SHREE CEMENT	IPP	
15	CHEMERA-3*	NHPC	NHPC to revert
16	KOLDAM*	NTPC	December 2019
17	NATHPA JHAKRI*	RTU to be replaced	October 2019
18	URI-2*	NHPC	NHPC to revert
19	JHAJJAR*	Second channel arrangement in process	31 August 2019

Since many IPPs were not available in the meeting, Member Secretary, NRPC informed that a special meeting may be called with IPPs within one month for arrangement of telemetry through redundant channel.

4.5 Frequent Interruption of data from NR-II stations (Agenda by NRLDC)

NRLDC informed that they have faced data outage in recent times due to failure of DC power supply at many PSTCL locations. NRLDC informed that after the Grid Disturbance in 2010, the importance of DCPS supply was highlighted and

it was advised to ensure healthiness of DCPS supply all the time. Further, as per the draft "Manual of Communication Planning in Power System Operation" by CEA which is under draft stage also mandates that there should be redundancy in DCPS supply as well as battery bank.

Member Secretary, NRPC expressed serious concern regarding failure of power supply and requested POWERGRID/PSTCL to submit the status of DCPS healthiness/Battery backup of all the locations of NR-II to NRPC/NRLDC within a period of one month.

Further it was requested that PSTCL may initiate action for replacement of battery bank where sufficient backup is not available and status of the same to be updated to NRPC/NRLDC.

5. Unified Real Time Dynamic State Measurement (URTDSM) Scheme

5.1 Maintenance of PMUs installed under URTDSM (Agenda by NRLDC)

NRLDC informed that PMU maintenance is not being carried out due to which small issue in PMU is taking long time for restoration of data.

POWERGRID informed that the procedure for maintenance is in approval stage and once approved maintenance activities would start.

NRLDC further requested to impart training to Sub-station personnel regarding PMU maintenance etc.

POWERGRID agreed for the same and confirmed to share names of nodal officers from each sub-station for PMU maintenance.

Further, NRLDC requested POWERGRID to circulate a "Check List" to other constituents also (where PMU has been installed), so that early restoration of PMU data can be ensured.

5.2 PMUs installed under URTDSM Scheme at 400 kV Substations / Power Houses of BBMB. (Additional Agenda by BBMB)

BBMB stated that due to phase mismatch of 400 kV viz-a-viz 220 kV system at 400 kV Substations / Power Houses of BBMB, phasor mismatch is being observed in the PMUs installed under URTDSM Scheme. POWERGRID is requested to impart necessary instructions to M/s GE to alter the phase sequence wiring in PMUs installed at Dehar Power House, Bhiwani & Panipat

substations of BBMB, so as to rectify the discrepancy in the phasor mismatch being observed in the PMUs installed under URTDSM Scheme.

POWERGRID agreed that they would take up the matter.

6. OTHER AGENDA

6.1 Establishment of State-of-the-Art Unified Centralized Network Management System U-NMS for ISTS and State Utility Communication Network. (Agenda by POWERGRID)

POWERGRID briefed the committee about the 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."*

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.

POWERGRID made a detailed presentation (a copy of the same attached at **Annexure-6.1**) on Unified Network Management System (U-NMS) Project to be implemented for managing ISTS Communication System at Regional and National level. Presentation covered various technical aspects of U-NMS, configuration at Regional and National level, integration of existing NMSs and Network Elements not having visibility in NMSs etc.

POWERGRID further added that that U-NMS configuration proposed at Regional and National levels shall provide graphical representation of topology of nodes and links, auto discovery and rediscovery of Network Elements and sub-systems, Facility of end to end provisioning of bandwidth centrally, Fast fault resolution and reduced restoration times, Proactive maintenance and Customer support and working out channel availability etc. apart from analytics for predictive maintenance etc.

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.

POWERGRID further stated that U-NMS Project implementation Schedule is considered as 24 months and estimated cost for National and Regional U-NMS is Rs. 120 Cr (Rs. 99.93 Cr for each Regional and Rs. 20Crs for National U-NMS, considering 100Crs for National level covering all 5 Regions i.e. NR, ER, NER, WR and SR) excluding AMC cost which is estimated as Rs. 2.6 Cr for 6 years after Warrantee period. However, the actual cost shall be discovered only after implementation. The Tariff for the investment made is to be shared by all constituents as per CERC notification. The scheme shall become part of existing Commercial Agreement signed for ULDC Project.

Members deliberated on U-NMS proposal. The need of implementation of U-NMS at Regional and National level was agreed by all members considering provisions of Communication Regulation.

Member Secretary, NRPC requested utilities for their technical comments. He further stated that utilities can also send their comments, if any, via email at sec-nrpc@nic.in by 31st August, 2019.

NRLDC enquired regarding the space availability for U-NMS installation.

POWERGRID stated that they would install U-NMS in their premises and informed that CTU shall manage the system after installation.

Sub-Committee agreed for in-principal technical approval of the scheme and recommended for further deliberations in the next TCC/NRPC meetings.

6.2 Mapping of analogue data and digital status of SPS operation related information in SCADA (Agenda by NRLDC)

NRLDC requested all concerned to integrate SPS signals in RTU so that same can be visualized in SCADA. Further it was SPS signals originating from DTPC to various sub-stations shall be integrated by POWERGRID. Further signals shall also be wired and integrated at receiving end by respective utility.

NRLDC informed that as per the decision taken in various meeting, all mapping of SPS signal for new SPS should be done by the agency who is responsible for SPS installation.

Further NRLDC requested all concerned utilities to integrate SPS signals on priority basis.

All utilities informed that integration work is in process and will be integrated at the earliest.

6.3 Installation of Terminal Server (Agenda by NRLDC)

NRLDC informed that the matter from shifting of terminal servers to remote locations was also discussed in 42nd TCC and 45th NRPC Meeting where POWERGRID confirmed to share the locations of shifting of terminal servers. NRLDC informed that POWERGRID is yet to share the locations.

NRLDC requested POWERGRID to suggest 2-3 locations, where the communication equipment's and communication channel are available for shifting of terminal server. After sharing of the proposed locations, a joint visit of POWERGRID and NRLDC representatives, if required can be carried out for finalization of the location.

POWERGRID confirmed that they will share the details of locations to NRLDC within a week' time.

6.4 Disposal of old and obsolete SCADA equipment of ULDC-I scheme: (Agenda by DTL)

DTL stated that the recovery charges against the ULDC-I Scheme has been completed during July'2017 but the communication regarding the disposal of old & obsolete equipment's under said scheme was still awaited from POWERGRID. He requested POWERGRID to send letter indicating confirmation of completion of useful life of the equipment and its salvage value (if any) so as to be disposed off the same.

Himachal Pradesh stated that for calculating the salvage value of IT equipment, the relevant Regulations of CERC may be referred. He further added that SCADA equipment may also be considered under IT equipment of DTL sought for salvage value from POWERGRID.

POWERGRID stated that it was difficult to calculate the salvage value. However, POWERGRID may intimate the LoA price to DTL.

6.5 Dismantling of Microwave Tower at NRLDC (Agenda by NRLDC):

NRLDC stated that as per discussion in 31st NRPC and 28th meeting of TCC held on 23rd and 24th July'2014 at New Delhi, Microwave tower shall be dismantled by respective constituents. He mentioned that one microwave tower is installed at NRLDC and the same needs to be dismantled. As per statutory aviation norms, continuous maintenance of 48 V DC and aviation lights is required till the time of tower dismantling. NRLDC had also requested for dismantling of Tower at their premises via letter dated 04th May 2017. (Details given in Annexure-6.5 of agenda). NRLDC requested NRPC to grant permission for dismantling of tower and further requested POWERGRID for dismantling of Microwave Tower.

Member Secretary, NRPC stated that the matter would be taken up with CEA and accordingly resolved.

6.6 Action on CERT-in advisory C/AD-2019-0012 regard end of life for windows 7 (Agenda by UPSLDC)

UPSLDC informed that in SCADA AMC Meeting dated 17-05-19, Siemens agreed to submit detailed action plan by 31st July'2019.

6.7 Issue of stoppage of ICCP data from WUPPTCL (Agenda by UPSLDC):

UPSLDC informed that the issue was persisting even though less frequently manual ON/OFF of admin state through ICCP summary display is still required.

6.8 Delay in Payment (Additional Agenda by POWERGRID)

POWERGRID stated that they were providing consultancy services on RTU/APS/Wideband/OPGW maintenance to constituents on overhead charges basis as per MOU signed with respective Constituents. Constituents were paying on quarterly or yearly basis with advance payment, however even advance payments were being released on delay of 5-6 months and in some cases the delay was of up to one and more years which was not acceptable and POWERGRID have no other option to deduct the overhead charges from advance 1% deposited with us and cancellation of AMC with immediate effects.

He further stated Outstanding payment as below:

DTL – approx. Rs. 5 Lacs (RTU)

J&K PDD – Approx. Rs 13 Lac (APS, OPGW, RTU, wideband & Insurance)

PTCUL – approx. Rs 5 Lac (RTU, APS, OPGW & short payments)

UPPTCL – approx. Rs 50 Lac (APS, RTU, OPGW, wideband)

HPSEBL- approx. Rs 5 Lac (RTU, OPGW, wideband & APS)

He further added that above outstanding amounts were pending since long and POWERGRID was regularly pursuing the case with respective Constituents however settlement of payment issue was not closed till date even repeated reminders. POWERGRID was going to stop AMC works for UPPTCL, PTCUL and J&K PDD where payment had not been released since long and total outstanding is also very huge.

DTL stated that they would take up the matter with their finance.

UP stated that the payment is under process.

HP asked POWERGRID to provide details of outstanding dues.

6.9 Pending TDS (Additional Agenda by POWERGRID)

All Constituents are requested to submit Quarterly TDS certificate in time against payment made to POWERGRID for Consultancy / AMC services which is required to match the books of Accounts.

In view of non-payment of insurance charges, all constituents are requested to do their insurance at their own. POWERGRID is not taking any overhead charges; audit has also objected several times for this type of works without any overhead charges and delay in payment.

Meeting ended with vote of thanks to the chair.

Annexure-1.1

List of Participants of 15th TeST Sub-Committee Meeting

S. No.	Name	Designation	Organisation	E-mail
1	Sh. Naresh Bhandari	Member Secretary	NRPC	ms-nrpc@nic.in
2	Sh. R.P. Pradhan	S.E.(C)	NRPC	sec-nrpc@nic.in
3	Sh. Ratnesh Kumar	E.E.(C)	NRPC	
4	Sh. Manish Maurya	A.E.E.(C)	NRPC	
5	Sh. Vikrant Singh Dhillon	A.E.E.(C)	NRPC	
6	Sh. B Chandrasekhar	A.E.(O)	NRPC	
7	Sh. Y.K.DIXIT	CGM	POWERGRID	ykdixit@powergridindia.com
8	Sh. Narendra Kumar Meena	Manager	POWERGRID	nkmeena@powergridindia.com
9	Sh. H.H SHARAN	Sr.GM	POWERGRID	sharan@powergridindia.com
10	Sh. N.Mishra	G.M	POWERGRID	nutan@powergridindia.com
11	Sh. Furkan A. Siddique	Chief Manager	POWERGRID	fa.siddiqui@powergridindia.com
12	Sh. Rajeev Mohan	SE	UPSLDC	-
13	Sh. Amit Narain	EE	UPSLDC	sescadait@upsldc.org
14	Sh. A.K Verma	AE	UPSLDC	akverma.kl@gmail.com
15	Sh. Sahil Panthri	AM(T)	DTL	sahil.panthri@gmail.com
16	Sh. Pavez Khan	Manager(T)	DTL	parvez.khan@dtl.gov.in
17	Sh. S.Sutradhan	DGM(T)	DTL	shyamalsutradhan.dtl@gmail.com
18	Sh. Mukesh Kumar	Manager(T)	DTL	mukeshdtlhw@gmail.com
19	Sh. Vinod Kumar	JE(E)	DTL	sameermourya21@gmail.com
20	Sh. S.K Shrivastara	AM(T)	DTL	shrivastara.dtl@gmail.com
21	Sh. Sanjeet Kumar Singh	Deputy Manager	POWERGRID	sanjeetsingh@powergridindia.com
22	Sh. V.Prasanth	EMS Engineer	SIEMENS	prashh25@gmail.com
23	Sh. M.Shazad Alam Khan	SE	UPPTCL	emtc2lko@upptcl.org
24	Sh. M.N Shukla	EE	UPPTCL	ceee@upptcl.org
25	Sh. M.Srikanth Reddy	Dy.Director	PCD,CEA	srikanthreddy@nic.in
26	Sh. G.Rama Krishna Reddy	Project Manager	SIEMENS	g.reddy@siemens.com
27	Sh. Ketan Panwar	ET(EMD)	THDCIL	ketan.panwar@gmail.com
28	Sh. Bhagat Singh	Sr.Manager(E&C)	THDCIL	bsnapalchyal@gmail.com
29	Sh. Rahul Ranjan	Sr.Manager(E&C)	NHPC	nhpcgmcnew@gmail.com
30	Sh. B.L.Yadav	AGM	NTPC	blyadav@nhpc.co.in
31	Sh. S.K.Sharma	Sr.Xen	HPSEBL	srxen.scada@gmail.com
32	Sh. S.Silbagi	Dy.Director	BBMB	sdilbagi@gmail.com
33	Sh. Rahul Sharma	Dy.Director	BBMB	rahulshhh@yahoo.com
34	Sh. Ankur Gulati	Chief Manager	NRLDC	ankurgulati@posoco.in

35	Sh. Neeraj Kumar	DGM	NRLDC	neeraj.kumar@posoco.in
36	Sh. M.K Agarwal	GM(MD&SE-II)	NRLDC	mkagarwal@posoco.in
37	Sh. Ankit Bedi	AEE/PSTCL	SLPC PSTCL	srxen.sldc@pstcl.org
38	Sh. Abid Jan Khan	Assistant Manager	POWERGRID	abid@powergridindia.com

Annexure-2.1

Date: 26.06.2019

Inspection report regarding Installation of OPGW on 66KV HPSEB Transmission lines having Rail Pole structure

During inspection of 66KV HPSEB transmission lines under jurisdiuction of ES Division, Kotla (Jeori) having rail pole structure following observation has been found:-

1. 66KV lines having rail pole structure are more than 30 years old.
2. Rail pole structures are old. Due to aging rusting are found approx. on all rail pole structure which weaken the pole strength.
3. In many spans earth wire condition is not healthy & even earth wire are missing in few spans.
4. Due to aging structure foundations & support stays are not in healthy condition. Also at many locations rail poles are found slightly tilt.
5. These 66KV HPSEB feeders are important links to sub-distribution system & any damage to these links may result in electricity blackout of connected area & inconvenience to public.
6. In this condition it is not safe to continue OPGW installation work & safety inspection of rail pole structures are required before laying of OPGW on such old structures.
7. Also executing agency M/s Tendot has earlier started OPGW work on 66KV S/C Gumma-Kumarsain but abandoned the work within 02 days due to unhealthy condition of rail pole structures.

For HPSEB
Es. B.D. Bhardwaj
Sr. Executive Engineer
HPSEBL, KOTLA (JEORI)

For POWERGRID
Es VIJAY KUMAR
(E.No. 500166675)

TENDOT NET CABLE PVT. LTD.
27/6/19.

Praveen Kumar
Chief Manager TL Nalagarh

Date : 27.06.2019

Inspection Report regarding Installation of OPGW on 66KV HPSEB Transmission lines having rail pole structure

During inspection of 66KV HPSEB transmission lines under jurisdiction of ES Division, Jutog (Shimla) having rail pole structure following observation has been found:-

1. 66KV lines having rail pole structure are more than 30 years old.
2. Rail pole structures are old. Due to aging rusting are found approx. on all rail pole structure which weaken the pole strength. Un-Healthy
3. In many span earth wire condition is healthy & even earth wire are missing in few spans.
4. Due to aging structure foundation & support stays are not in healthy condition. Also at many location rail poles are found slightly tilt.
5. These 66KV HPSEB feeders are important links to sub-distribution system & any damage to these links may result in electricity blackout of connected area & inconvenience to public.
6. In this condition it is not safe to continue OPGW installation work & safety inspection of rail pole structure is required before laying of OPGW on such old structures.
7. Also executing agency M/s Tendot has earlier started OPGW work on 66KV S/C Gumma-Kumarsain but abandoned the work within 02 days due to poor condition of rail pole structure.

Er Shalok Singh
For HPSEB

Er Malook Singh
J.E. (E)
132KV S/STN Sub
HPSEB Ltd Tehsil Sulah.
(H.P.)

27/06/19
For POWERGRID
SANDEEP KUMAR
Junior Engineer
Emp. No. 60016816
Power Grid, Solan (H.P.)

Sr. Executive Engineer
Electrical System Division
HPSEB Ltd. Tehsil Sub-11

27/6/19.

Praveen Kumar
Chief Manager TL Nalagarh

Annexure 2.1.5

Minutes of meeting held on 05.03.2019 at NRPC regarding laying of OPGW on PKTCL lines under Reliable Communication for Central Sector in Northern Region

List of participants:

NRPC:

1. Sh. M.A.K.P. Singh, Member Secretary, NRPC
2. Sh R. P. Pradhan, S.E.(Commercial)
3. Sh. R.K. Pandey, Sr. DGM

NRLDC

1. Sh Neeraj Kumar-DG
2. Sh Kamaldeep - manager
3. Sh Ankur Gulati - manager

PKTCL

1. Sh. Lokendra Singh Ranawat, DGM
2. Sh. Anirban Mazumder, Sr. Manager
3. Sh. Prateek Mohan Rai, Manager

NHPC

1. Rahul Ranjan, Sr. Manager, NHPC

POWERGRID

1. Sh H. H. Sharan, Sr. GM
2. Sh Narendra Kumar Meena, Manager
3. Sh. Sundeep Gupta, Dy. Manager
4. Sh Abid Khan, Asst. Manager

The issue of installation of OPGW on PKTCL lines (1. 400kV line from LILO point of Parbati Pooling station – LILO point of Parbati-III, 2. 400kV Parbati – III (from LILO point) – Parbati – II (T/L Part), 3. 400kV from LILO point of Parbati Pooling Station to Koldam), had been discussed during 40th TCC/43rd NRPC meetings and subsequently, in the 14th TeST sub-committee meeting too. As PKTCL was not part of the above meetings, it was decided to address the issue by conducting a separate meeting.

In view of above, a meeting was held on 05.03.2019 in NRPC under Chairmanship of M.S, NRPC and following were arrived:

1. Regarding indemnification issue raised by PKTCL, M.S. NRPC suggested that any outage occurring due to OPGW installation work and tripping after installation shall be reviewed and considered on case to case basis. It was also clarified in the meeting that after OPGW installation, O&M of the same shall be done by POWERGRID.

2. PKTCL asked POWERGRID to deal with any type of RoW related to OPGW installation issue on their own during OPGW installation on lines. POWERGRID affirmed that they shall tackle any type of RoW arising due to OPGW installation but requested PKTCL to assist for any major/specific RoW issue. Further, POWERGRID shall not be responsible for any previous RoW/compensation issues associated with transmission line.

Minutes of meeting held on 05.03.2019 at NRPC regarding laying of OPGW on PKTCL lines under Reliable Communication for Central Sector in Northern Region

3. PKTCL requested to consider all three points agreed in 28th WRPC in view of similar case in respect of Reliance lines. The deliberation of 28th WRPC for same are as below:

"

a. Any damage to asset of RETL during installation of OPGW by PGCIL, shall be rectified by PGCIL.
b. PGCIL shall bear the expenses and are responsible for re-rolling of dismantled earth wire and securely storing the same at any of PGCIL Sholapur, Parli, Pune and Shikrapur s/s till RETL/WRTMPL arranges its disposal.
c. The OPGW being installed by PGCIL is only for usage for ULDC project purpose and prior approval from WRPC has to be obtained for any commercial use of the same by PGCIL.

"

POWERGRID agreed for all the above points for PKTCL except point (b), regarding dismantled Earthwire. POWERGRID informed that the cost of OPGW is discounted considering taking back of Earthwire by installing agency, hence benefit on account of dismantled earthwire is already considered shared amongst beneficiaries, which is in line with the spirit of CERC Sharing Regulation. Hence, no earthwire shall be returned to PKTCL.

Annexure-6.1

Presentation on U-NMS

Presentation
on
U-NMS for ISTS Communication in NR (TeST)

07.08.19 at NRPC, Delhi

Background

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

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 UNMS System for Western Region.

Present Scenario

- POWERGRID took up implementation of ISTS Communication as part of Schemes i.e. ULDC, Master Communication Plan and Master Communication Plan(Addl.) in Western Region.
- Network Management Systems(NMS) 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 available in Northern 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 not connected to any NMS.

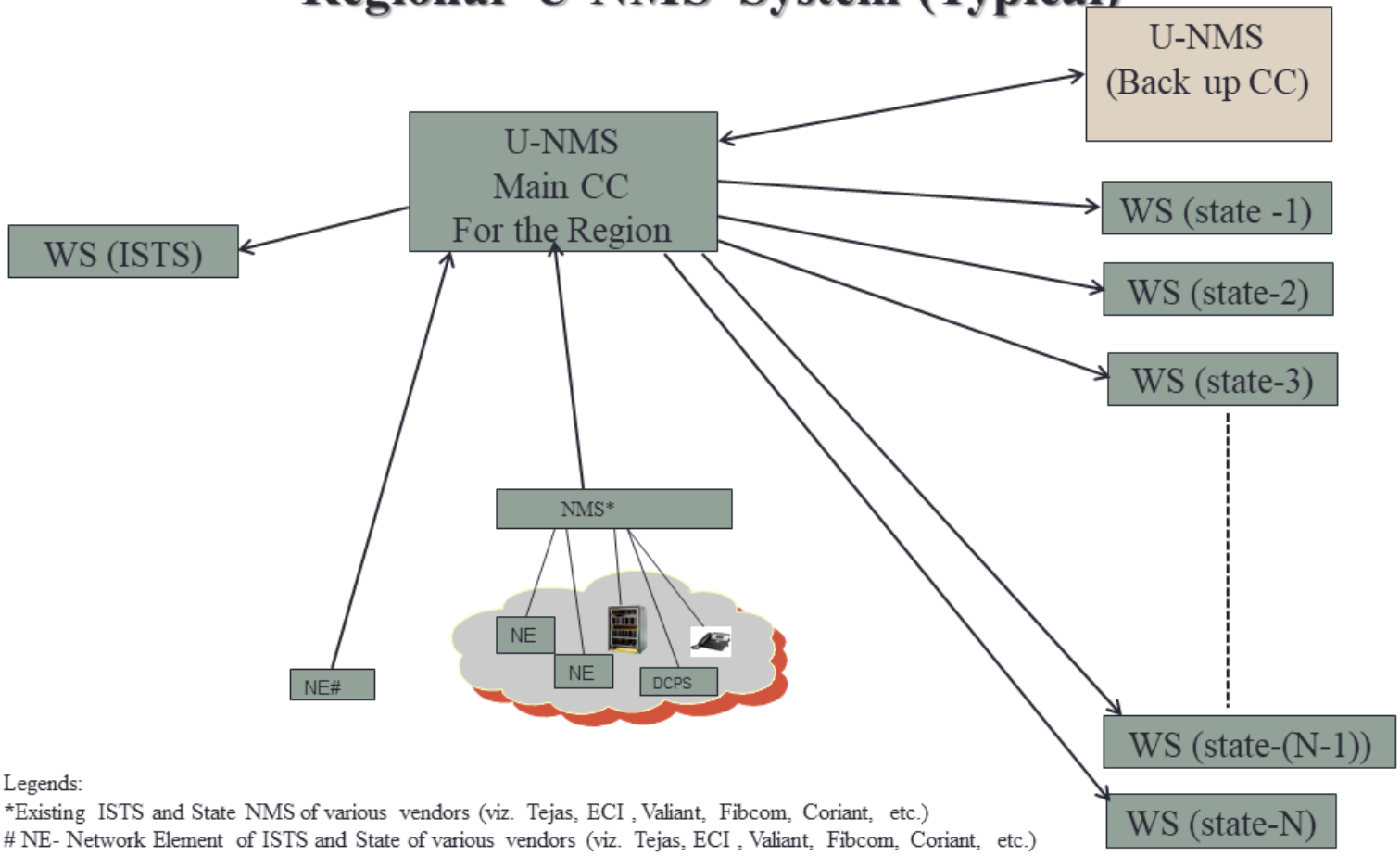
The UNMS Scheme shall consist of Centralised Application Server acquiring data of Communication nodes from multiple NMSs in the region as well as from NEs.

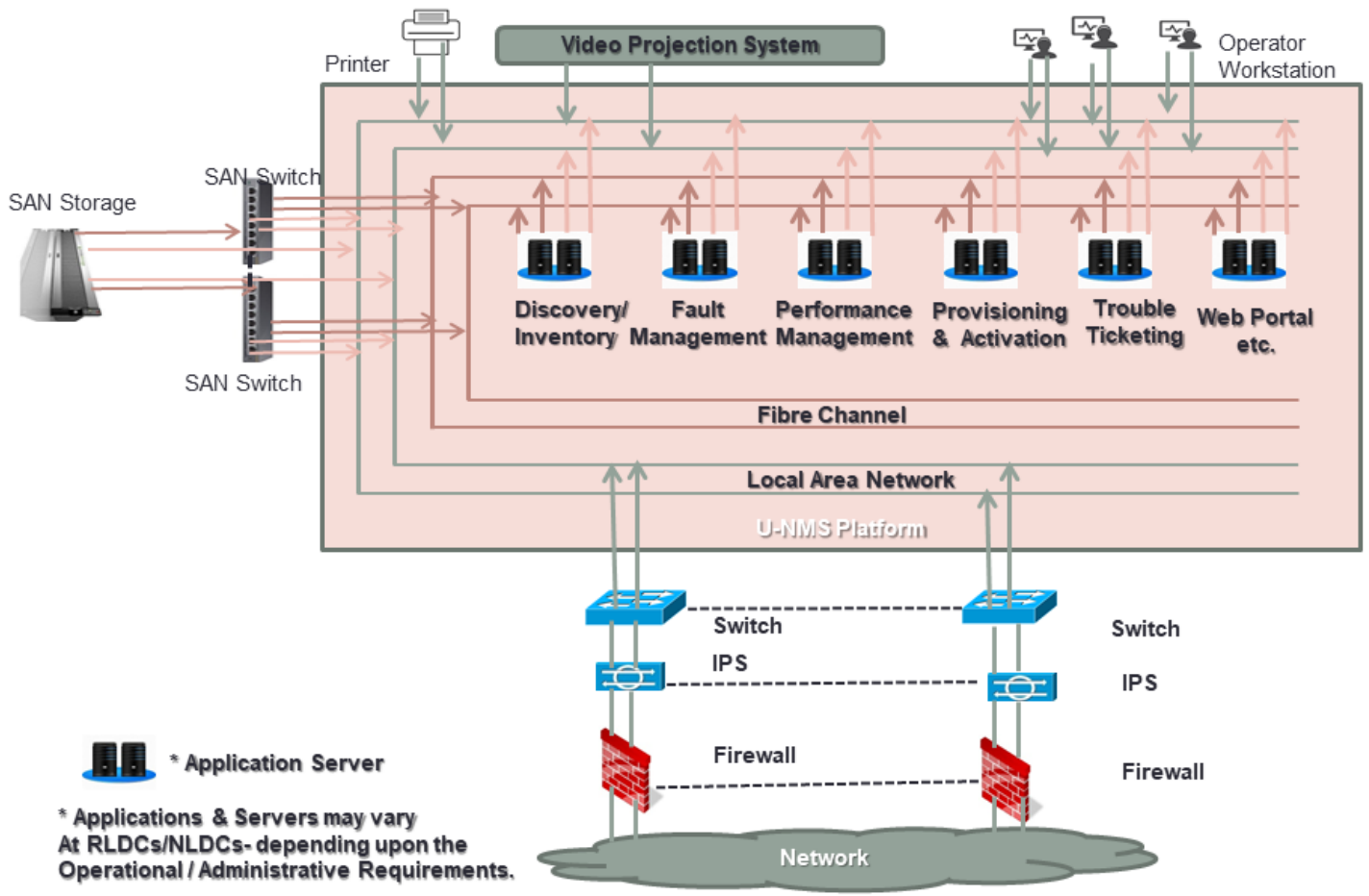
The proposed U-NMS shall acquire data directly from existing NMSs of ISTS and State Utility and also from nodes not integrated with existing NMS for all ISTS and all other Utility communication links.

The U-NMS Configuration to be implemented shall be designed for managing ISTS and Inter-Regional Communication Systems Regional and National level respectively.

U-NMS Configuration for National & Regional Communication system 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, VPS, Furniture etc. with rights to access servers of respective Regional U-NMS to manage their respective State owned Communication Network.


Regional U-NMS System (Typical)
U-NMS
(Back up CC)
U-NMS
Main CC
For the Region
WS (ISTS)
WS (state -1)
WS (state-2)
WS (state-3)
NMS*
NE
NE
DCPS
NE#
WS (state-(N-1))
WS (state-N)
Legends:
*Existing ISTS and State NMS of various vendors (viz. Tejas, ECI , Valiant, Fibcom, Coriant, etc.)
NE- Network Element of ISTS and State of various vendors (viz. Tejas, ECI , Valiant, Fibcom, Coriant, etc.) not on any NMS
WS – Work Station
N – Number of State Utility


Typical UNMS Configuration Typical for Regional and National
Printer
Video Projection System
Operator Workstation
SAN Storage
SAN Switch
SAN Switch
Discovery/ Inventory
Fault Management
Performance Management
Provisioning & Activation
Trouble Ticketing
Web Portal etc.
Fibre Channel
Local Area Network
U-NMS Platform
Switch
IPS
Firewall
Switch
IPS
Firewall
Network
* Application Server
* Applications & Servers may vary At RLDCs/NLDCs- depending upon the Operational / Administrative Requirements.

Salient Features of U-NMS

- **Geographically Network Visualisation facilitating monitoring**
- **Capability to interface with multiple make NMSs and Network Elements**
- **Configuration and Provisioning of bandwidth for various services**
- **Inventory Management**
- **Performance management**
- **Availability calculations for channels configured**
- **Report generation.**
- **Web Server for interface with Stake holders for fault reporting**
- **Analytics for predictive analysis and recommendations for efficient management**

Benefits of Scheme

- Availability of Centralized NMS for entire ISTS Communication in a region for efficient management
- Visibility of all ISTS Communication Nodes in single NMS.
- State of the Art UNMS with advance features such as availability calculations, fault report generation for inter-patched network, 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 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
- Workstation based Control Centre at SLDCs with VPS and peripherals
- Estimated cost- Rs. 100 Crs. for NR 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)		
		L1 price
S. No.	Description	Amount (Rs. in Cr.)
A	Supply	65.65
B	Installation and Services	3.95
C	Training	1.32
D	Inland Freight and Insurance (@4%)	2.63
E	Taxes and Duties	
F	Excise Duty (@12.5%)	8.21
G	CST(@2%)	1.31
	Total (A to G)	83.07
H	Incidental Expenditure during Construction(@ 10.75%)	8.93
I	Contingency (@ 3%)	2.49
	Total (A to I)	94.49
J	Interest During Construction (IDC)	5.44
	Total for Single Regional Control Centre	**99.93**
K	Maintenance charges for 1 year during warranty period and 6 years after warranty period	2.6
Total Cost for (Centralised at Regional Level) Control Centre U-NMS Systems including AMC of 6 years after warranty.		**102.5**

Communication Regulation 2017…..

Quote:

….

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

Proposed U-NMS Scheme

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 U-NMS will acquire information of communication network of ISTS, State Utility and cross Border communication system. The U-NMS application shall facilitate for controlling, managing, operation, fault detection and restoration and maintenance of ISTS and State communication System.

Centralised Database (Inventory) at Regional Level for Management of Individual Communication Network for ISTS & for Intra State Systems.

The proposed U-NMS to be deployed for NLDC, RLDC & SLDC to manage National, Regional and State level Communication System.

U-NMS Configuration considered for National & Regional communication set up 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.

(Typical CC Configuration enclosed**)**

U-NMS Configuration for states shall consist of Remote workstations, Furniture etc. are considered with rights to access servers of respective Regional level U-NMS to manage their respective Communication Network.