

उत्तर क्षेत्रीय विद्युत बोर्ड
18-ए,शहीद जीत सिंह मार्ग,
कटवारिया सराय, आई दिल्ली-110016.
Northern Regional Electricity Board
18-A, Shaheed Jeet Singh Marg,
Katwaria Sarai, New Delhi-110016.

No. NREB/SE(O)/USMG/18//2006

Dated 20.07.06

Subject: 18th Meeting of ULDC Scheme Monitoring Group (USMG).

The Agenda for the 18th meeting of USMG has been e-mailed. The Agenda is also available on NREB's Website at <http://nreb.nic.in>. The meeting shall be held at **11:00 hrs on 27.07.06 at Casurina Hall, India Habitat Centre, Lodhi Road, New Delhi**

Kindly make it convenient to attend the meeting.

Sd-

(R P Aggrawal)

S.E. (Operations) & Member Convener USMG

All members of USMG

Sr. No.	Organization	Names of Officers & Designation S/Shri
1.	BBMB	Niraj Gulati, Director (PR)
2.	DTL	A K Kaul GM (SLDC); N.R. Dinkar DGM;
3.	HVPNL	SE/PPM, HPGCL, Panchkula, Arun Kumar, SE (SLDC) Panipat; R.K.Kaushik,AEE, Panipat
4.	HPSEB	Suneel Grover, Sr. EE
5.	J&K	G.M. Wadoo, CE (C&S), Jammu; Rohit, SLDC, Jammu
6.	PSEB	S.K. Paul, Dy CE (SLDC); R.K Gupta, DD (SLDC)
7.	RVPN	S.C. Datta, CE (C&LD); P.C. Trivedi, EE (SLDC)
8.	UPPCL	Raghav Shankar,GM(US);M.C. Pandey, DGM Fax:0522-2287880 , CBS Rathore, DGM, 220kV Agra, Fax 0562 2605465
9.	PTCUL	DGM (LD), A.K. Aggarwal, EE (T&C), Roorkee-Fax No. 01332- 265767
10.	UJVNL	K C Jain, General Manager-GV
11.	PowerGrid, NR-I	Ramesh Bahri, GM (O&M); Dr. L. Hari, DGM (ULDC)
12.	THDC	P K Srivastava, AGM, (Electrical design), Pragatipuram, Rishikesh.
13.	PowerGrid, NR-II	Jagmohan Sharma, DGM
14.	CEA	D.K. Jain, Dir (LD&T); D.K. Malik DD
15.	NRLDC	Devender Kumar, CM (CS); S.R. Narasimhan, CM (TS)
16.	NRPC	R P Aggarwal, SE (Operations); A K Singh, Sr Mgr, Vikram Singh, AEE

NORTHERN REGIONAL POWER COMMITTEE

Agenda for 18th Meeting of
ULDC Scheme Monitoring Group (USMG) of Northern Region

Date: July 27, 2006

Time: 11:00 Hrs

Venue: Casurina Hall, India Habitat Centre, Lodhi Road, New Delhi

0.0 WELCOME

1.0 CONFIRMATION

Summary Record of the 17th meeting of the USMG held on 10.02.2006 was circulated vide NREB/SE (O)/USMG/17/2005 Dated 25 .05.2006. (USMG Agenda and minutes are now also available on NRPC website at <http://nreb.nic.in>). As no written comments have been received so far, the minutes may be confirmed.

2.0 AMC of SCADA / EMS System.

POWERGRID has informed that the present AMC arrangement is with M/s Areva and is upto 28th Feb. 2007. Taking into account the process time, action needs to be initiated to have a new AMC in place well in advance of this date.

Constituents may discuss regarding centralized AMC and decide.

Rajasthan has stated that with the extension of maintenance period of AMC from 1.3.06 to 28.2.07 M/s Areva is providing only service of rectification of faults of the system and necessary hardware of the system are arranged by the respective constituents. M/s Areva is not taking responsibility for repairing the faulty hardware and it had become difficult for the constituents to replenish their stock of hardware on their own, since these are not easily available locally.

M/s Areva is unable to repair these hardware because the terms and condition of extended contract have not yet been finalized therefore, these terms and conditions of the extended maintenance period might be put up before the USMG for discuss and finalization.

3.0 System Security against virus threats.

The threats of viruses is on the increase globally. Several instances of attack of virus name blackmal has in reported in the ULDC system. This virus gets activated on 3rd of every month and possess great hazard for the data in the window NT machine in the ULDC system and therefore, requires immediate measure by all constituents.

DTL has informed that recently, a virus named “backdoor first” has attacked their Windows NT based machines. In order to safeguard the SCADA system from such virus threats, provision of antivirus packages for Windows NT machines, installed under ULDC scheme are to be explored.

Constituents may like to discuss.

4.0 Updating of displays.

NRLDC has stated that old network model is one of the main reasons of difference in real time value as well as state estimate values. The net work model

is common for the entire region and each constituent state / RLDC is responsible for updating the data base and displays of respective SLDC / RLDC.

Northern Region is going to be synchronized with the central region shortly through Tala Transmission Network. In Northern Region the Tala transmission passes through UP and will have significant impact on UP transmission system, that needs to be monitored closely for tackling any eventuality. All constituent particularly UP should immediately update their network model, single line diagram, network diagram. Till temporary problems of CMRs / CT- PT transducers for analogue measurement is set right, digital status may be updated manually.

This would ensure correct network status availability to operators at RLDC / SLDC and state estimate output can be used more efficiently.

5.0 Integration of future RTUs.

Rajasthan has stated that in the last USMG meeting members opined that the next three years of requirement of RTUs might be assessed by individual constituents for centralized procurement by the PowerGrid. This issues may be further discussed and besides new RTUs list of adequate inventory of control room hardware / RTUs hardware (being proprietary item of M/s Areva) may also be finalised for smooth operation of SCADA system.

6.0 Non reporting of RTUs

NRLDC in the 4th OCC meeting had informed that Sub-LDC at Modipuram has been commissioned with 17 RTUs . Five RTUs namely Mohannagar ghaziabad, Noida, Khara, Merrut Partapur and Ghaziabad Bulandsahar have been integrated but they are not reporting due to communication problem. UPPCL was requested to look into the matter.

PowerGrid/ Constituents may submit details of RTUs non reporting.

7.0 Individual Constituents' problems

7.1 Problem of UP System are enclosed at Annexure -I.

7.2 DTL's Points are enclosed at Annexure -II.

7.3 BBMB' points are enclosed at Annexure -III.

7.4 PSEB's points are enclosed at Annexure -IV.

8.0 Expansion of Northern Region Unified Load Despatch and Communication (ULDC-NR) Scheme

The OCC in its 4th meeting proposed to form a group in view of development in the power sector of northern region after implementation of ULDC scheme. The group will overview the proper integration of all power elements with existing ULDC scheme. The group shall identify all deficiencies in the existing scheme, consolidate the requirements of all constituents and prepare a preliminary report for approval of NRPC. BBMB has prepared a draft paper / road map on the above proposal as directed by OCC (enclosed at **Annexure –V**).

Constitutes may like to discuss.

9.0 Functioning of EMS Packages

In the 15th USMG Meeting held on 28.10.2005, it was decided on the advise of Member Secretary, NREB, *‘that a team from NRLDC shall visit BBMB Chandigarh, resolve the problems in RTNET and run the package. State estimator package would be attempted to be functional for BBMB system, in the first instance and if necessary, the data of other utilities shall be suitably lumped up except that of BBMB’*.

The process is yet to be started Powergrid is requested to intimate the suitable dates in this regard.

10.0 ANY ADDITIONAL AGENDA POINT

11.0 DATE, TIME AND PLACE OF NEXT MEETING

The Group may decide date and venue of next meeting.

Problem of UP System.

UP had stated that the following matters are pending for a long time inspite of repeated requests.

- a) The mosaic board display panel at SLDC Lucknow does have lot of discrepancies as per one line data. The matter was discussed on 2nd June at RLDC where representative from M/s Areva was also present. It was agreed that they would depute their engineer to explain the updating of MB Server. This has not happen so far.
- b) The HIM server is not functioning properly since 20th June 06. There are two observations regarding HIM :
 - i) The stand by server did not take over and
 - ii) After retrieval it was found that no data of the period 22.00 hrs on 20th June 06 to 06.00 hrs next morning was available in the SCADA data server. This problem had occurred earlier also and M/s Areva has not replied for its cause.
- C) Complete data of Badaun Sub-Stations. RTU has not been integrated.
- D) Some connection of Allahabad RTU are yet to be made.
- E) Complete work of data integration of Gorakhpur 400kV RTU is yet to be done.
- F) The status of corrective measure required to be taken for setting right weather station at 400kV Lucknow and Moradabad Sub-SLDC are yet to be taken.
- G) Some of the equipment which had become defective after 28.2.06 are not been taken by M/s Areva for repairs. Policy decisions in this regard is to be taken at the earliest.

DTL's Points

1) AMC of Weather Station:

Annual contract for maintenance of weather station was awarded to M/s weather Technologies of India Pvt. Ltd. in the month of March, 2006 by Power Grid. The representative of M/s Weather Technologies of India Pvt. Ltd. visited the site on 17.5.006 and taken over the faulty items for its repair. Since then matter is being pursued with M/s Weather Technologies India Pvt. Ltd for early rectification of the weather station but their response is still awaited. DTL' Weather station is affected and not working for the last one year. Power Grid may decide the issue.

2) AMC OF SCADA/EMS SYSTEM

The details of Terms and Conditions of AMC of respective system like RTU, CFE, Data server and other auxiliary equipments associated with operation and integration of field datas at different ALDC's and SLDC can be taken for maintenance by M/s.AREVA T & D System India Limited. The responsibility of the vendors/constituents needs to be circulated.The guidelines & earlier terms and conditions for attending ALSTOM make equipments are required to be circulated.

a) *Frequent failure of hardware equipment at ALDC Ghazipur:*

CFE2 at ALDC Ghazipur is lying faulty for the last six months but no action has been taken by M/s.Areva. Further number of cards lying faulty which were handed over to M/s.Areva since long back for its rectification, has not been set right.

b) *Failure of hardware equipment at SLDC Minto Road:*

NBO LA-1 laser printer installed at SLDC, Minto Road is lying faulty for the last 6 months and needs to be set right.

c) **Repair of Faulty Data Servers & ICCP server lying faulty with DTL.**

1 No. ICCP server & 3 Nos. Data servers are lying faulty with DTL, which must be repaired to have sufficient backup in case of failure of presently working servers. M/s Areva has been requested for its repairs but they have shown their inability in absence of any decision from Powergrid. Powergrid may decide the issue as DTL has no healthy spare Servers available.

3) Configuration of different alarms at different works stations of SLDC and ALDCs.

Alarms of different operating console are not working at SLDC and ALDCs (except NB00C2) as these are not configured. Back up of NBOOC3 has already been handed over to M/s. Areva, but till date no action has been taken.

4) Provision of Antivirus Package:

Recently, a virus named “backdoor first” has attacked our Windows NT based machines. In order to safeguard the SCADA system from such virus threats, provision of antivirus packages for Windows NT machines, installed under ULDC scheme are to be explored. Power Grid may decide the issue.

5) AMC of VPS system installed at SLDC Minto road.

M/s. Barco Electronics has attended the VPS at SLDC in the month of Feb.2006.It should be maintained in similar way in future also. In this connection provision of AMC may be discussed and decided in details.

6) Frequent failure of communication cards at Ghazipur, Sarita Vihar and Okhla.

The communication cards are failing frequently at the above S/Stns but no proper diagnosis has been made by the vender in spite of repeated discussions and requests in the MRM meetings. Our Nokia make spare cards have been exhausted but it has not been set right by the vender in spite of repeated requests. Due to non-availability of these cards our channels are being affected at South of Wazirabad, Okhla, Narela and Ghazipur.

The PGCIL has taken up the matter with M/s SAMEER for exploring the possibilities for the adequate protection who have surveyed the sites and submitted the remedial measures for implementation of the protection scheme at Ghazipur but their action is still awaited.

PowerGrid for follow up. PowerGrid/ DTL may update the status.

BBMB's points

1 : Cyber Security of ULDC Scheme

The cyber security of ULDC Scheme was discussed in the 14th USMG meeting held on 26.7.2005 where possible threats to the SCADA systems were discussed. It was then informed by the PowerGrid that the '*LD & C Group is working in this direction and they shall submit a complete report to the Group in this regard*'.

In the first week of July, there was a virus attack on Windows NT machines at NRLDC. It seems that the spread of the virus could be contained but the damage done by the same is not known. It is, therefore, requested that:

- i) NRLDC may apprise the constituents about the details of the virus attack and also remedial action taken in this regard so that such like incidents do not recur in future.
- ii) PowerGrid may apprise the progress made with regard to solution being worked by LD&C Group as stated in the 14th USMG meeting.
- iii) In future, all '*incidents*' shall be reported to USMG for discussions..
- iv) Possibility of engaging a consultant for carrying out the security audit of the ULDC Scheme.

2 : Monthly Review Meetings for monitoring the performance of Annual Maintenance Contract.

1. In the 6th USMG meeting held on 6.5.2004, it was decided that representatives of the constituents may also attend the Monthly Review Meeting (MRM) between PowerGrid and Annual Maintenance Contract Vendor to discuss various issues in respect of maintenance of Wide Band Equipment. The meeting is being held on 18th of every month at NMS Room of NRLDC Building, New Delhi. Further, the MoU for AMC of Wide Band Communication Network signed between PowerGrid and constituents provides as under:

'7.2 Monthly Reports of maintenance and testing carried out by contractor shall be circulated to respective constituents after MRM. Constituents may depute their representatives in the MRM. Observations during site visit and observation at MMS will be highlighted in the report for contractor/constituents to take further necessary action if required.

Later on, the outstanding issues with regard to hardware, software and auxiliary power supply equipment were also taken up for discussion in the MRM.'

2. From the above, it is clear that the monthly review meeting were held only to discuss outstanding issues relating to maintenance of ULDC scheme. Of Late, it has been observed that policy matters such as provisioning of additional communication

channels are being decided in the MRM. The provisioning of additional channels and such like matters fall under the category of network planning and clearly do not fall in the scope of MRM.

3. It is, therefore, requested that:
- i) No policy matter shall be discussed in the MRM.
 - ii) The provisioning of additional resources required for the ULDC scheme shall be planned by PowerGrid and discussed in the USMG meetings.
 - iii) PowerGrid may be asked to give details of all the resources allocated to various constituents after the commissioning of the ULDC scheme or decided during the MRMs etc.
 - iv) The plan for utilization of the spare capacities available may be framed and discussed in the USMG meeting.

3 : **Issues Pending for More than One Year**

The response of vendor for maintenance support is not very good and problems remain unresolved for very long time. For Example, a line matrix printer at SLDC Chandigarh became defective on 08.11.2005 which was repaired on 20/22.06.2006. Incidentally, the 2nd printer at SLDC Chandigarh also became defective on 15.05.2006 and was repaired on 20/22.06.2006. Thus, there was no line matrix printer available at the control centre and great difficulty was felt in getting print out of logs and reports.

Though there is a long list of pending maintenance problems, the following is a list of problems which have remained unresolved for more than one year:

Sr. No	Description	Pending since	Status
1.	Whenever any HUB is switched off at SLDC Chandigarh, the data of Sub-LDCs become suspect for some time.	20.10.04	M/s Areva have reconfigured the Hubs at Jamalpur on 09.03.2006 and Ganguwal on 10.03.2006. However, even after that, when Hub-1 was switched off, the data at SLDC Chandigarh remained suspect for 10 minutes. Thus, there is no improvement & problem remained un-resolved.
2.	One Laptop (Sr. No. 00002 012 515 812)	27.07.04	The keyboard of this laptop was defective and the laptop was taken by M/s Areva for

	00003 913 515 842)		and the laptop was taken by M/s Areva for repairs. They delivered it back after repairs on 06.08.04, 14.02.05, 22.09.05 and 08.03.06. However, the same problem persisted & the laptop was again handed over to the firm on 30.11.04, 01.04.05, 21.01.06 and 08.03.06.
3.	LED indication- 3 (for RSCC port) on Router NJ0RT1 is not glowing.	22.03.05 23.05.05	After protracted correspondence on the issue the health of communication channel was got checked from M/s COMMTEL on 03.02.06 & 09.02.06 and was found OK. Even after replacement of Router NJ0RT1 on 01.05.06, the problem persists.
4.	Color printer (HP 2500CM) at SLDC Chandigarh	23.08.05	The printer was not working & 'prnt_hd not aligned' message appeared on its facia. The defective printer (without color ink cartridges) was handed over to M/S Areva's engineer on 08.03.06 for repair.
5.	Testing/Calibration of transducers for UPS	Before 30.06.05	Testing/calibration for digital signals appearing in SCADA of both the UPSs at all the sites is still pending
6.	Software issues		All the pending old software issues are being taken up separately & are not included here.

It is requested that the AMC vendor may be asked to improve his service and there shall be a provision for penalty if the service standard is found to be less than the agreed standards.

4: Disposal of defective battery cells beyond warranty period

While there is a provision for replacement of defective cells with new cells at the cost of constituents, there is no provision for disposal of defective cells. Generally, defective cells are taken back by the supplier by adjusting their scrap value against the cost of new cells. It is requested that similar provision may also be made in the AMC contract for the maintenance of Auxiliary Power Supplies (UPS and DC Supply System) as under.

The following clauses should be incorporated in the AMC contract dated 13.07.2005 for the maintenance of Auxiliary Power Supplies after the first para of clause 4.16

- a. The defective battery cells (which become defective after warranty period is over) have also to be taken back by the firm at the time of replacement & the cost (scrap value) of such defective battery cells has to be adjusted in the bill raised by the firm.
- b. Provision for Battery Evaluation Testing through β -check method (a microprocessor-based system that discharges the cells-on line- for a limited period without disconnecting the battery bank from the charger or load

PSEB Points

1. Award of AMC for SCADA equipment installed under Unified Scheme.
2. Award of AMC for UPS Power Supply installed at SLDC/ALDC expired on 30th June, 2006.
3. Repair of the following equipment by M/s Areva lying at SLDC and reported after the 28th Feb. 2006.
 - a) GPS Block
 - b) Data Server (spare) NGODS2
 - c) 21” Colored monitor of OC2
 - d) Key Board NG00C3
 - e) Data server monitor 14” NGODS1
 - f) Data server monitor 14” NGODS2
4. Early return of equipment pending repair with M/s Areva under warranty prior to 28th Feb. 2006.
 - a) 21” coloured monitor of NGOPCS
5. Software problem:
 - a) General Application is not functioning properly on NGODS2.
 - b) Visit of EMS – Team pending to validate functioning of EMS application as already discussed during 15th USGMG meeting.

Expansion of Northern Region Unified Load Despatch and Communication (ULDC-NR) Scheme – Phase-II.

1. Background

1.1 The Memoranda of Understanding for execution of ULDC-NR Scheme was signed by the Northern Region Constituent with PowerGrid in Feb 1998. After passing through various phases of design and implementation, the scheme was commissioned on 01.082002.

1.2 The ambitious scheme of ULDC-NR was executed by the PowerGrid as a lead member and manager, as per the instructions of the Govt. of India, on behalf of all the constituents. The scheme comprised SCADA, EMS and Wide Band Communication. It covered augmentation of PLCC network in the States also. Though the scheme has been implemented as intended yet some of the benefits did not accrue due to various reasons. Further, the benefits are diminishing with the passage of time as briefly described below:

1.2.1 The power network is expanding without any integration of new facilities with the ULDC infrastructure and soon ULDC scheme will become ineffective.

1.2.2 Some of the equipment has already become obsolete and needs urgent replacement.

1.2.3 Certain important features could not be visualized at the time of formulation of ULDC Scheme which has resulted in some structural deficiencies.

1.2.4 Some of the older RTUs could not be integrated due to non-compatibility of communication protocols.

1.2.5 Some of the RTUs, though integrated, persistently remain out-of-service for long durations due to communication link failures.

2. Roadmap

2.1 When the ULDC-NR Scheme was undertaken for execution, it was first scheme of its kind in the country. The successful completion of the scheme & its subsequent operation speaks volumes about the meticulous planning and high-level co-ordination amongst the constituents and the PowerGrid. The scheme was conceived and implemented keeping in view the scarce resources and as per the knowledge available with the states & CPSUs including PowerGrid. In hindsight, it is seen that there is scope for improvement as there shall always be in future.

2.2 In the absence of any integrated scheme which takes care of the needs of the constituents due to expansions, obsolescence and needs arising out of re-structuring due unbundling etc., the constituents may embark upon such like schemes of their own, limited to their jurisdiction. Such a solution may turn out to be less cost effective, heterogeneous and difficult to operate & manage. Further, with such a sub-optimal solution, difficulties may arise with regard to exchange of data which is very crucial for integrated operation of northern region power system.

2.3 Keeping this in view and also expansion of the power system network, a roadmap is proposed as under:

2.3.1 The next phase shall cover the following improvements:

- a. All existing deficiencies shall be identified and addressed.
- b. The obsolete equipment/hardware/software shall be replaced.

- 2.3.2 The ULDC network shall be augmented/expanded to include all substations, which have come up during the intervening period.
- 2.3.3 Local consoles shall be provided with all existing/new RTUs commissioned under the ULDC Scheme.
- 2.3.4 Minimum standards for monitoring of analog/digital data and providing the communication facilities shall be evolved.
- 2.3.5 The additional requirements of the constituent states over and above these minimum standards, both for monitoring and communication shall be included at the cost of these states.
- 2.3.6 Future expansion for next 5 to 7 years shall be worked out and included in the contract to ensure simultaneous installation of SCADA equipment and integration of new facilities with ULDC Scheme as soon as possible.
- 2.3.7 The communication needs of the states for voice and data other than the ULDC scheme shall be fully met and enough scope for future needs shall be kept.
- 2.3.8 The vendor shall be responsible for executing the work on turn-key basis including all wiring etc. required at any station and shall be fully responsible for making the scheme functional. The payment shall be linked with completion of scheme.
- 2.3.9 The vendor shall be responsible for the comprehensive maintenance of the scheme during its life cycle (say 7 to 10 years).
- 2.3.10 The bids shall be evaluated including the recurring cost of maintenance during the AMC period.
- 2.3.11 The AMC shall including replacement of all unserviceable/obsolete hardware during the life-cycle of the scheme.
- 2.3.12 The terms and conditions for the AMC shall be included in the bid document and there shall be a penalty for not meeting the minimum standards of equipment availability.
- 2.3.13 All security features as per ISO 27001 standards shall be incorporated.

3. Proposal

- 3.1 In view of the above, it is proposed as under:
 - 3.1.1 Constitute a working group comprising
 - a. One representative from Powergrid.
 - b. One representative from NRPC.
 - c. Three representatives from states/other constituents.
 - 3.1.2 All constituents should send their assessed requirements to the working group in the fixed time frame.

3.1.3 The working group shall identify all deficiencies in the existing scheme, consolidate the requirements of all constituents and prepare a preliminary report.

3.1.4 Lead role shall be performed by PGCIL.

3.2 A resolution recommending start of phase – II of the ULDC Scheme and constitution of a working group for assessment of the requirements is placed at Annexure – 1. The members may discuss and pass the resolution with or without amendment(s) and forward to NRPC for further action in the matter.

RESOLUTION

1. The ULDC System Monitoring Group (USMG) of NRPC resolves that:
 - a) There is urgent need for taking up the Phase-II of ULDC-NR Scheme, both to address the structural deficiencies in ULDC scheme due to non-visualization of the same at the conceptualization stage as well as due to rapid expansion of power system network in the intervening period.
 - b) There shall be a ‘Working Group’ constituted by the NRPC for assessing the scope and requirements of the Phase-II of the scheme, identify the structural deficiencies in the original scheme based on the experience gained during its operation and prepare a blueprint for the Phase – II of the scheme.
 - c) The Working Group shall study all other similar schemes in the country and any other international information available and submit the pre-feasibility report within 3 months of its constitution giving broad scope of work and changes required from the previous scheme.
2. The USMG wishes to place on record deep appreciation for PowerGrid for successfully managing the affairs of ULDC-NR implementation and hopes that the same lead role will be played by PowerGrid for Phase-II also.
3. The broad scope for the Working Group is stated herewith.

Broad Scope of Work for ULDC – NR (Phase – II)

- 1 The next phase shall cover the following improvements:
 - a. All existing deficiencies shall be identified and addressed.
 - b. The obsolete equipment/hardware/software shall be replaced.
- 2 The ULDC network shall be augmented/expanded to include all substations, which have come up during the intervening period.
- 3 Local consoles shall be provided with all existing/new RTUs commissioned under the ULDC Scheme.
- 4 Minimum standards for monitoring of analog/digital data and providing the communication facilities shall be evolved.
- 5 The additional requirements of the constituent states over and above these minimum standards, both for monitoring and communication shall be included at the cost of these states.

- 6 Future expansion for next 5 to 7 years shall be worked out and included in the contract to ensure simultaneous installation of SCADA equipment and integration of new facilities with ULDC Scheme as soon as possible.
- 7 The communication needs of the states for voice and data other than the ULDC scheme shall be fully met and enough scope for future needs shall be kept.
- 8 The vendor shall be responsible for executing the work on turn-key basis including all wiring etc. required at any station and shall be fully responsible for making the scheme functional. The payment shall be linked with completion of scheme.
- 9 The vendor shall be responsible for the comprehensive maintenance of the scheme during its life cycle (say 7 to 10 years).
- 10 The bids shall be evaluated including the recurring cost of maintenance during the AMC period.
- 11 The AMC shall including replacement of all unserviceable/obsolete hardware during the life-cycle of the scheme.
- 12 The terms and conditions for the AMC shall be included in the bid document and there shall be a penalty for not meeting the minimum standards of equipment availability.
- 13 All security features as per ISO 27001 standards shall be incorporated.