

Volume-III
Technical specification

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SECTION- 1

INTRODUCTION & GENERAL INFORMATION

1.0 Introduction

Ministry of Power, Govt. of India, has launched the Restructured Accelerated Power Development and Reforms Programme (R-APDRP) in the XI Five year Plan. Power Finance Corporation Limited (PFCL) has been designated by Gol as the Nodal Agency for the programme. The programme spans from data acquisition at distribution level till monitoring of results of steps taken to provide an IT backbone and strengthening of the Electricity Distribution system across the Country under the programme. The objective of the programme is reduction of AT&C losses to 15% in project areas. The program is divided into two (2) parts Part-A and Part-B. Part-A will include projects for establishment of baseline data and IT applications like Meter Data Acquisition, Meter Reading, Billing, Collections, GIS, MIS, Energy Audit, New Connection, Disconnection, Customer Care Services, Web self service, etc. to get verified baseline AT&C losses as well as SCADA/DMS Implementation. Part-B will include distribution strengthening projects.

The objective of reducing Aggregate Technical and Commercial (AT&C) losses in the project area can be achieved by plugging pilferage points, supply of quality power, faster identification of faults & early restoration of power, proper metering, strategic placement of capacitor banks & switches, proper planning and design of distribution network. The real time monitoring & control of the distribution system through state-of-the art SCADA/DMS system encompassing all distribution Sub-stations & 11 KV network would help in achieving this objective of R-APDRP. For deriving maximum benefits it is essential that necessary up-gradation of distribution S/S & 11KV network shall be carried out to meet the SCADA/DMS requirements. The augmentation /up-gradation of the distribution network for real time supervision & control mainly requires suitable compatibility of circuit breaker & switches, placement of RMUs and FPIs etc for effective monitoring & control. This augmentation /upgradation shall be considered under Part B of R-APDRP scheme. However, considering the growth & related network up-gradation, the full fledged SCADA/DMS shall be capable to meet the present as well as future requirements of the eligible towns for SCADA/DMS system under Part A of R-APDRP. The SCADA/DMS System will provide Real time monitoring & control, loss minimization/load balancing and considerable improvement in voltage/VAR profiles. It would also facilitate proper handling of loads while load shedding & restoration, efficient planning of network for future growth by using proven power system planning tools. All software applications & RTUs/FRTUs including system sizing requirements for the same shall be considered in the SCADA/DMS system being procured under Part – A

of R-APDRP.

As per present R-APDRP guidelines, SCADA/DMS system will include urban areas – towns and cities with population of more than 4, 00,000 & 350MUs annual input energy or based on any other criteria as informed by Nodal Agency from time to time. The number of such potential towns is currently seventy (70) approximately.

In order to ensure quality in implementation process, SCADA/DMS Implementation Agencies (SIA) & SCADA/DMS Consultants (SDC) have been empanelled by PFC/MOP. PFCL have prepared a model Request For Proposal (RFP) including this volume containing model technical specification (MTS) for SCADA/DMS system. Additional technical specifications required by Utility are provided in the **Appendix-A** of this volume.

The size of the programme is to the tune of Rs. 500 billion. The programme consists of Part-A (to the tune of around Rs. 10,000 crore) covering Information Technology application as well as SCADA/DMS Implementation, in the electricity distribution system and Part B (to the tune of around Rs. 40,000 crore) covering the System strengthening, Improvement and augmentation of distribution system capacity. Both parts entail planning of measures to be taken under the programme, implementation of such measures to be taken and monitoring/evaluation of results/impact of the programme as a whole and of its various components across the Country. The focus of the programme shall be on actual, demonstrable performance in terms of loss reduction. Establishment of reliable and automated systems for real time monitoring & control of urban power distribution network entailing 66kV/33 kV to 11kV network.

Under R-APDRP program, SCADA/DMS system will cover urban areas – towns and cities with population of more than 4, 00,000 & 350MUs annual input energy as per the present R-APDRP Guidelines of Gol.

Towns/areas for which projects have been sanctioned in X Plan APDRP shall be considered for the XI Plan only after either completion or short closure of the earlier sanctioned projects. Projects under the scheme shall be taken up in Two Parts. Part-A shall include the projects for establishment of baseline data and IT applications for energy accounting/auditing & IT based consumer service centers and SCADA /DMS Implementation. Part-B shall include regular distribution strengthening projects. The activities to be covered under each part are as follows:

Part – A: Preparation of Base-line Data System for the project area covering Consumer Indexing, GIS Mapping, Automatic Metering (AMR) on Distribution Transformers and Feeders, and Automatic Data Logging for all Distribution Transformers & Feeders and SCADA / DMS system for big cities only. It would include Asset Mapping of the entire distribution network at and below the 11kV transformers and include the Distribution Transformers and Feeders, Low

Tension lines, poles and other distribution network equipment. It will also include adoption of IT applications for meter reading, billing & collection; energy accounting & auditing; MIS; redressal of consumer grievances and establishment of IT enabled consumer service centres etc.

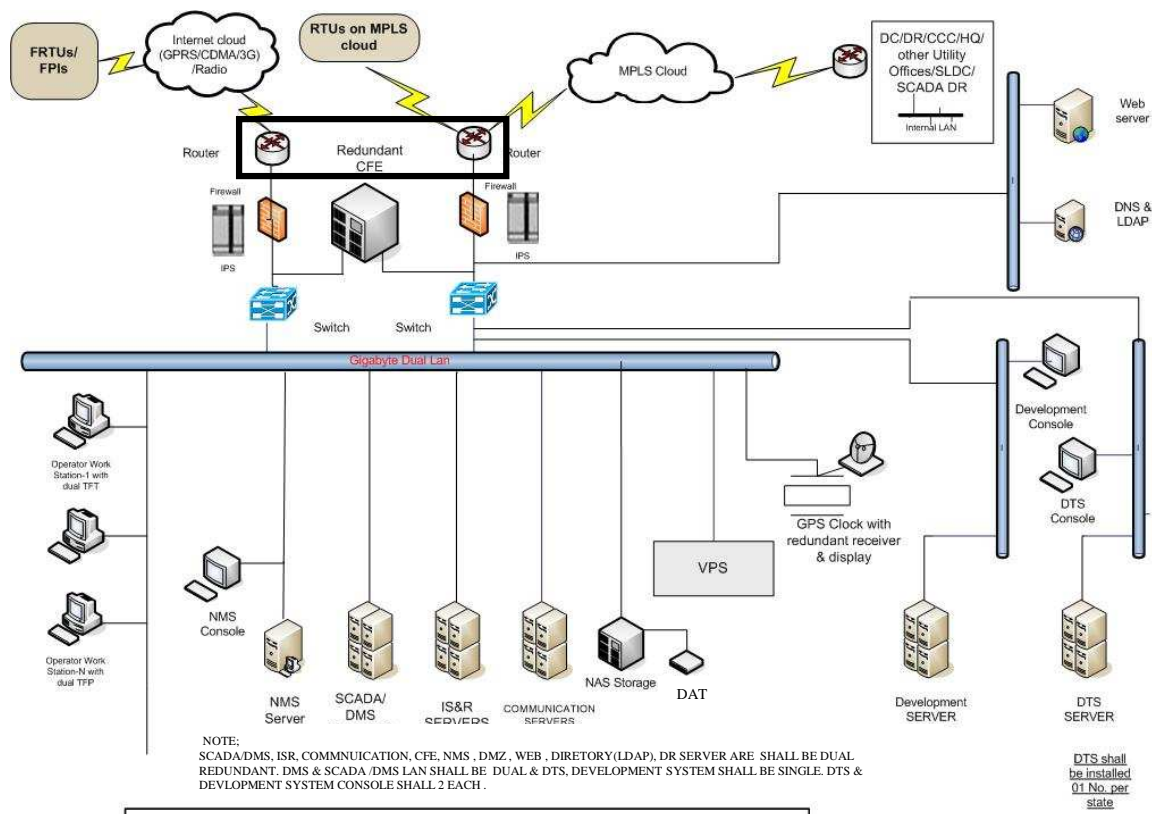
Part – B: Renovation, modernization and strengthening of 11 kV level Substations, Transformers/Transformer Centres, Re-conductoring of lines at 11kV level and below, Load Bifurcation, Feeder segregation, Load Balancing, Aerial Bunched Conductoring in thickly populated areas, HVDS, installation of capacitor banks and mobile service centres etc. In exceptional cases, where sub-transmission system is weak, strengthening at 33 kV or 66 kV levels may also be considered.

1.1 Existing System

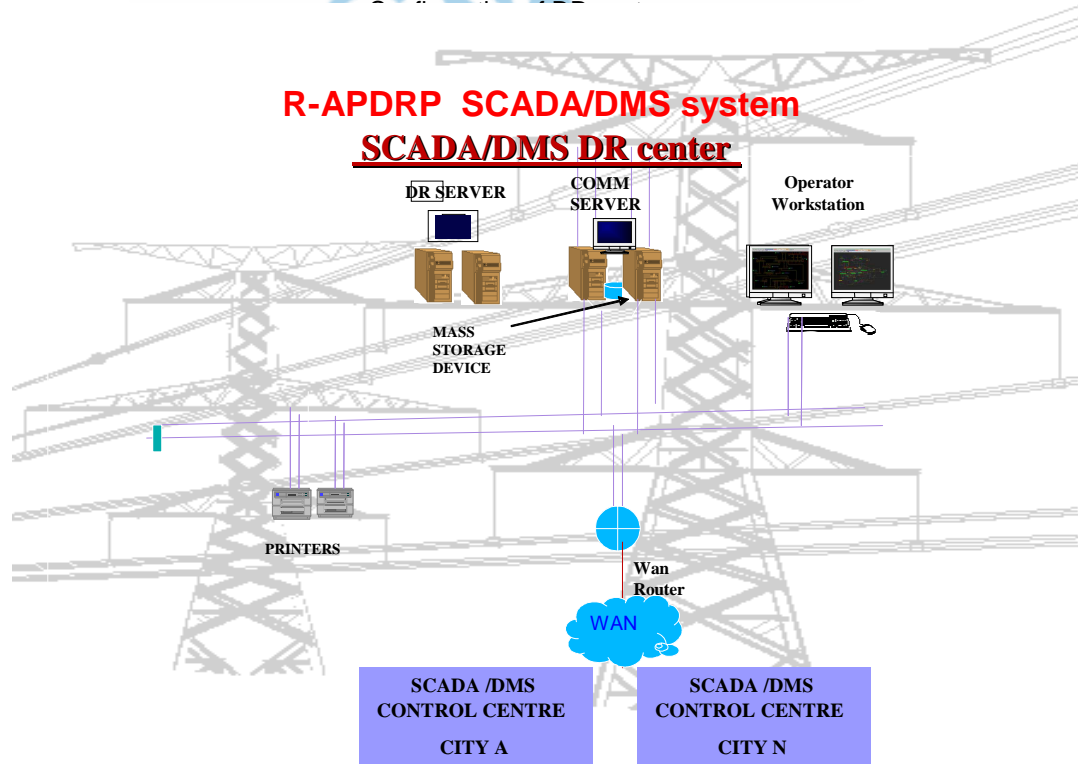
Refer Volume V- Utility Information for details on existing system

1.2 Generic system architecture

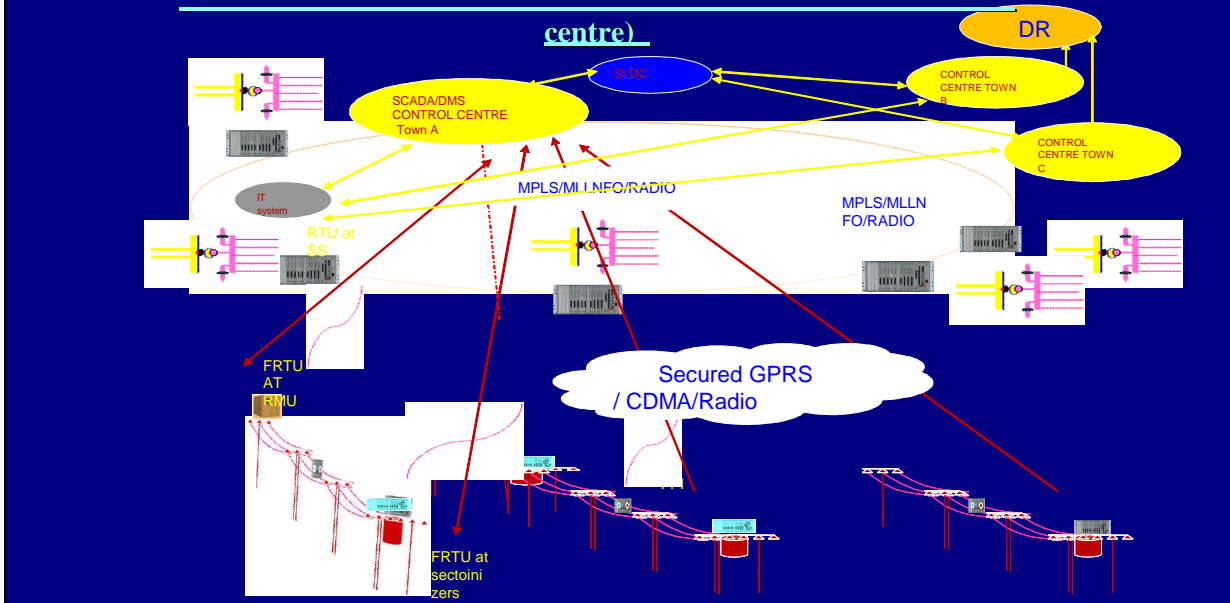
The intent of this specification is to establish (i) SCADA/DMS System along with RTUs/FRTUs (ii) Associated Auxiliary Power Supply System (iii) Communication System (iv) integration with IT system under R-APDRP or any legacy system. The functional details are given in respective chapters of the specification. Configuration of Data centre (Schematic configuration diagram)



MAIN SCHEMATIC AND ARCHITECTURE OF SCADA CONTROL CENTER



R-APDRP SCADA/DMS system DATA FLOW - A



1.3 Proposed SCADA/DMS system

The proposed SCADA/DMS system shall be designed to operate & monitor distribution substations and the network from a designated centralized location of each project area/town. The communication backbone for the envisaged SCADA/DMS system consists MPLS-VPN/MLLN and 3G/CDMA/GPRS across the project area. Divisional offices, Circle office are identified as the functional area of DISCOMs for SCADA/DMS implementation, the monitoring should be possible from the proposed system for any remote VDU locations. SIA has to do site study of the project area and define the interface requirements for SCADA/DMS system and for necessary connections with switchgears including protection relays/controlling equipments (mechanical/numerical/microprocessor). The site study team shall include all necessary experts to understand and identify the above requirements. Proposed system envisages the following key functions at minimum and SIA has to strictly comply with all international and national standards and codes while implementing. DMS functions at control centre should enable automatic and manual operations of the network devices and monitor all the power meters of interest. All the data pertaining to substation shall be collected by RTU and the same shall be send to control centre via MPLS-VPN network. If MPLS-VPN is not feasible

at a specific location alternate options like leased line, broad band shall be considered by the SIA.

1.4 Scope of Work

1.4.1 Broad Role Definition for SIA

The SIA in coordination with utility (as per the requirement to be given in the detailed RFP) shall carry out field survey, design ,engineering, supply, installation, testing & commissioning of SCADA/DMS software applications, Dispatcher Training Simulator (DTS) , hardware (including PCs, Servers, Routers, Switches, VPS, RTU, FRTUs, Multi function Transducers (MFTs), Communication equipment , Auxiliary power supply etc), software (including operating system, databases, network management system etc.), network (LAN, WAN), etc.

Integration with existing /under implementation IT system under R-APDRP & any other relevant SCADA/ DMS legacy system in the identified project areas of the utility

Integration with State Load Dispatch centre (SLDC) for the state for exchanging relevant real time data & scheduling data over ICCP is to be opted by utility. In case utility includes data exchange facility with SLDC , then it is their responsibility to do necessary bilateral agreement for data exchange with TRANSCO or owner of SLDC. & facilitate necessary help to SIA

Facilities management services for maintaining infrastructure, post successful completion of acceptance tests for a period of five years from the date of completion of acceptance test.

Major components that a SCADA /DMS implementation would include are given as under. However, the final scope of work will be finalized by the utilities as per their requirements in the relevant RFP document.

- SCADA/DMS Control Centre for SCADA/DMS per town eligible for SCADA
- DR Centre for SCADA/DMS common for whole state
- SCADA/Information Storage & Retrieval (ISR) Functions
- DMS Functions
 - o Network Connectivity Analysis (NCA)

- o State Estimator (SE)

- o Load Flow (LF)

- o Voltage VAR Control (VVC)

- o Load Shed application (LSA)

Restoration Fault Management and System Restoration (FMSR)

- o Feeder Reconfiguration, Loss Minimisation, Load Balancing, etc (LMFR,LBFR)

- o Operation Monitor (OM)

- o Distribution Load Forecasting(DLF)

- SCADA/DMS/ Dispatcher training simulator (DTS)

- SCADA/DMS system to supervise primary S/S & HV Distribution network

- RTUs at all primary S/S & FRTUs at RMUs, /Auto Reclosures/Sectionalizers on HV Distribution network etc.

- MFTs at Feeder, RMUs

- Secured Communication using VPN/SSL

- o MPLS VPN for connecting all S/S RTUs to Main Control center and & DR centre

- o Secured 3G/CDMA based communication, etc. for communicating with control centres for FRTU.

- o The 3G modem shall support Tri-band UMTS/HSxPA 850/1900/2100MHz or EVDO.

Protocols for communication

- o IEC 60870-5-104 –RTU, IEC 60870-5-104 for FRTUs, FPI to control centres.

- o MODBUS for MFTs to RTUs/FRTUs.

- o ICCP (TASE.2) between SCADA/DMS Control centre /DR centre & state load dispatch centre
- o Support /compliance to IEC61850 ,IEC60870-5 suite for RTU/CC
- Conducting Factory Acceptance Test (FAT), Site Acceptance Test (SAT), Type test (as required), etc. successfully, Go live, operational acceptance & handing over to customer.

The key components of the model RFP includes & not limited to following:

1) **Hardware:** site survey, planning, assembly/ manufacturing, design & Engineering, Supply, loading, transportation, unloading, insurance, delivery at site, handling, storage, installation, testing, commissioning and documentation of all necessary hardware and networking equipments and its connectivity, as specified in the detailed specifications. The SIA shall take the responsibility to install the servers, RTU/FRTU, MFTs, Video Projection System (VPS) switches, routers, backup and tape devices, Workstation PCs, Aux Power supply, communication equipment etc and other necessary hardware/software at the sites. The SIA shall provide the time frame for procuring and delivering all the necessary hardware. Though the scope covers establishment of a SCADA/DMS control centre along with associated hardware and software, the SIA shall design and provide the Software & hardware at SCADA/DMS control centre including RTU/FRTU locations with 100% expandability for future growth in electrical distribution network of the city. The delivered hardware (Processor ,HDD, RAM &software) for servers, PCs ,RTU, FRTU etc shall be sized for ultimate system sizing while maintaining the performance, availability & functions as per specification. . However, other items such as I/O modules, additional workstation can be added as per the growth in the network The SIA shall provide the necessary design & engineering documents, drawings and plan, sizing, cabling and connectivity and the bill of material, etc. & obtain approval from utility

2) **Software:** Site survey, planning, assembly/ manufacturing, design & Engineering, Supply, loading, transportation, unloading, insurance, delivery at site, handling, storage, installation, testing, commissioning and documentation of operating systems at servers/desktops, database and SCADA/DMS application software, etc.

3) **Facilities management services (FMS)** for maintaining infrastructure, post successful completion of acceptance tests for a period of five years from the date of completion of operational acceptance of the SCADA/DMS System. However, under R-APDRP scheme, utilities will be funded for FMS for one year only but bids will be evaluated considering five years of FMS

The Contractor shall be required to provide the services under FMS so as to manage SCADA / DMS system including all equipments, installations including hardware,

software & networks installed & commissioned by Contractor for the utility in order that they meet the availability requirement as specified in the document.

The System Management Services shall be provided by FMS Contractor in order that maximum uptime & performance levels of SCADA/DMS systems installed are ensured. As such, FMS Contractor is expected to provide services as per ITIL (IT Infrastructure Library) standards with performance levels meeting or exceeding those mentioned in Service Level Agreement (SLA) agreed between utility & Contractor.

To achieve the desired Service Levels, the Contractor may need to interact, coordinate and collaborate with the other Service Providers as required. The Contractor will act as the Single Point of Contact for all issues relating to the Service Levels. The Contractor will have the responsibility to deal with the other vendors (during warranty period) /other vendors as selected by utility (after warranty period) as the case maybe, to provide the services at agreed service levels. However, the prime responsibility of providing desired services shall be that of lead Contractor during warranty period. The role of FMS Contractor shall start immediately after systems are installed, commissioned and handed over to the owner after Operational acceptance of the SCADA/DMS System.

The Scope of Work shall include the software and hardware maintenance support to be provided by the Contractor in respect of the system supplied under this project during five year Facility Management Services(FMS) period alongwith Supervision & Operationalizing five year warranty of the SCADA/DMS System after the Operational Acceptance of the SCADA/DMS System. :

4) System Design and Engineering: The SIA shall be responsible for detailed design and engineering of overall system, sub-systems, elements, system facilities, equipments, services, including systems application software and hardware etc. It shall include proper definition and execution of all interfaces with systems, equipment, material and services of utility for proper and correct design, performance and operation of the project.

SIA shall provide complete engineering data, drawings, reports, manuals and services offered etc. i.e. complete set of documentation /drawings for Utilities review, approval and records

5) Supply of Equipment and Material: The SIA shall also be responsible for manufacture, inspection at manufacturer's works, supply, transportation, insurance, delivery at site, unloading, storage, complete supervision, installation and successful commissioning of all the equipment, systems and application software. The proposed deliverables should be state of the art in architecture and engineering practices. In case of third party products/software packages, SIA should furnish at least 5 years warranty along with supporting plan from respective OEMs

Any item though not specifically mentioned, but is required to complete the project works in all respects for its safe, reliable, efficient and trouble free operation & to meet performance ,availability & functional requirements as envisaged in the RFP shall

also be taken to be included, and the same shall be supplied and installed by the SIA without any extra cost

6) **Testing and Commissioning:** The SIA shall be responsible for the testing processes such as planning (includes preparing test plans and defining roles and their responsibilities), preparation (consists of preparing test specification, test environment and test data) for all tests viz. Type tests, FAT, SAT and successful commissioning

7) **Geographical Scope:** The Locations where the systems shall be implemented shall be detailed by the particular utility in the RFP

8) **Integration Scope:** SIA should ensure that legacy systems and the new solutions lined up by them are tightly integrated and do not remain stand-alone and shall perform on real time basis as envisaged in specifications. All required external systems shall be integrated using an integration middleware layer. The scope of integration of external systems includes, legacy SCADA/DMS system, RTU/FRTU, IT systems under R-APDRP including billing , customer care , GIS etc already existing and functional in the utility, but outside the present scope of work. The integration is expected to be Industry Standards Based on IEC 61968-1 Bus (SOA Enabled on enterprise Bus) using CIM/XML, OPC, ICCP etc., which is, on-line, real time or offline where appropriate and shall operate in an automated fashion without manual intervention, which is documented for future maintenance.

SIA shall make necessary provisions/software linkages in the proposed solution so that the IT system or any legacy SCADA/DMS system may be integrated seamlessly.

9) **Training for Employees:** The SIA shall organize training to the core Group of implementation team of the utility as well as end user training. Representatives from the successful bidder, Purchaser's implementation project and change management teams will be involved throughout in the development of training strategy, training material design and development, standards and training delivery to ensure that change management issues are incorporated, and that training strategies and materials are aligned to the requirements of the project and as business-specific as possible

10) **Assist Utility and SCADA/DMS Consultant for responding to queries to Nodal Agency:** SIA may be responsible for preparing responses to the queries raised by the Nodal Agency. Adequate support will be provided by the utilities to the SIA

11) **Progress Update:** The SIA may also provide periodic status update reports highlighting critical issues to the utility. Further, any information (progress report, etc.) as and when sought by the Nodal Agency/Ministry of Power shall be furnished by the SIA

12) In addition to the above, following works are also in the scope of the contractor:

- (a) Database and display development

- (b) Training
- (c) Obtaining the statutory clearances required, if any from Ministry of Communication/ Govt Authority . All the charges deposited to aforesaid authority for obtaining statutory clearance will be reimbursed by the owner. The owner will also provide the necessary support if required in getting the clearances

13) **Other Services and Items:** The scope also includes, but not limited to the following services/items described herein and elsewhere in specification:

a. Project Management and Site Supervision: The bidder shall be responsible for the overall management and supervision of works, including the implementation of risk management as well as change management initiatives. He shall provide experienced, skilled, knowledgeable and competent personnel for all phases of the project, so as to provide the utility with a high quality system

b. Interface Coordination: The bidder shall identify all interface issues with utility and other agencies if any, and inform utility which shall interface, coordinate and exchange of all necessary information among all concerned agencies.

c. Scope Change Management: Utility to finalize the scope change management procedure during development/Implementation stage

14) **Specific Exclusions**

a. All civil & architectural works, internal and external electrification, special electronic earthing for Server system, Air conditioning and ventilation, fire fighting system and Access control system required for SCADA/DMS system are outside the scope of the SIA, however contractor has to indicate the space requirement for SCADA/DMS control centre , DR centre, RTU / FRTU/Auxiliary power supply & communication equipment any other specific requirement, power supply requirement including standby supply requirement, so that the utility can provide the same as per bidder's requirement

b. Manpower required for managing SCADA/DMS system

c. The SIA is not expected to address the following:

d) A.C. input power supply

The detailed technical requirements including Bill of Quantity of the above components is described in subsequent sections of this volume.

The responsibility of the Contractor shall include supplying, laying and termination of

the cables, wherever required for:

- a) Acquiring analog data using MFT , transducer, sensor which shall be connected with the primary devices.
- b) Acquiring the digital data for status of field devices, relays in the control room.
- c) Extending control output to field devices through heavy duty relays
- d) Interconnection between Contact Multiplying Relays (CMRs) and RTUs/FRTUs & field devices (CMRs to be supplied by the contractor as per BOQ),
- e) Power and signal cabling between the supplied equipment & Owner's equipments.
- f) Any other cabling required for completion of the project.

15) Generic requirements:

The contractor shall undertake detailed site survey immediately after award of the contract of all the sites to access the various requirements such as space, identification of input terminals, and availability of air-conditioning, spare contacts etc for completion of engineering, site installation, testing and commissioning of the project. The type and number of hardware and software elements (Bill of Quantity) within the scope of the project to be supplied for the various sites are identified in the Appendices. The individual functions to be performed by the hardware and software and system sizing criteria are described in the relevant sections. The specification defines requirements on functional basis and does not intend to dictate a specific design. On the other hand certain minimum requirements must be met in accordance with the particular details provided elsewhere in the specification.

The items, which are not specifically identified but are required for completion of the project within the intent of the specification, shall also be supplied & installed without any additional cost implication to the employer/owner.

1.5 Facilities to be provided by Employer/Owner (Utility)

- (a) Arranging necessary shutdowns and work permits at various sites.
- (b) Providing all the necessary data regarding the Distribution system network.
- (c) Providing storage space at site free of cost wherever available. Special storage needs such as watch and ward services and air conditioning shall be provided by the contractor.
- (d) The existing earthing system at the substations may be utilised for earthing of the offered equipment. However, the contractor shall assess its suitability for the offered equipment . and carry out the modifications if required
- (e) Suitable space/Infrastructure for Control centre/DR, Substations for installation of control centre/ DR equipments, RTUs /FRTUs/APS etc in line with SCADA/DMS system implementation schedule.
- (f) Responsibility of contractor if communication network is to be created using FO & RADIO. However, in case of hired /leased communication network, utility shall be responsible for the same & arrange SLA with service provider. Once

SIA is appointed, a tripartite agreement among Utility, service provider & SIA shall be signed.

- (g) Providing details of Existing Legacy systems SCADA/DMS, RTU/FRTU, IT system under R-APDRP for integration.

1.6 General Requirements

The Bidder's proposal shall address all functional , availability and performance requirements within this specification and shall include sufficient information and supporting documentation in order to determine compliance with this specification without further necessity for enquiries

An analysis of the functional , availability and performance requirements of this specification and/or site surveys, design, and engineering may lead the Contractor to conclude that additional items and services are required that are not specifically mentioned in this specification. The Contractor shall be responsible for providing at no added cost to the employer all such additional items and services such that a viable and fully functional system is implemented that meets or exceeds the capacity, and performance requirements specified. Such materials and services shall be considered to be within the scope of the contract. To the extent possible, the Bidders shall identify and include all such additional items and services in their proposal.

All equipment provided shall be designed to interface with existing equipment and shall be capable of supporting all present requirements and spare capacity requirements identified in this specification.

The offered items shall be designed to operate in varying environments. Adequate measures shall be taken to provide protection against rodents, contaminants, pollutants, water & moisture, lightning & short circuit, vibration and electro-magnetic interference etc.

The Contractor shall demonstrate a specified level of performance of the offered items during well-structured factory and field tests. Further, since at the substations limited space is available the contractor shall make all the efforts to economise the space requirement.

The Bidders are advised to visit sites (at their own expense), prior to the submission of the proposal, and make surveys and assessments as deemed necessary for proposal submission.

The successful bidder (Contractor) is required to visit all sites. The site visits after contract award shall include all necessary surveys to allow the contractor to perform the design and implementation functions.

After the site/route survey the Contractor shall submit a survey report for all the sites.

This report shall include at least the following items, however, the exact format of the report shall be finalized by the contractor with the approval of Employer.

- (a) Proposed layout of Equipment in the existing rooms and buildings.
- (b) Proposed routing of power, earthing, signal cables and patch cords etc.
- (c) Confirmation of adequacy of Space and AC Power supply requirements
- (d) Proposals for new rooms/buildings, if required
- (e) Identification of facility modifications, if required
- (f) Identify all additional items required for interconnection with the existing equipment.
- (g) Requirement of Modification to existing earthing arrangement, if any.

1.7 General Bidding Requirements

The offered equipment/system must be in successful operation for at least one year as on the date bid opening. However, the computer hardware shall be of current industry standard models as per section 2 hardware chapter. The Bidder shall be responsive to the technical requirements as set forth in this specification. To be considered responsive, the Bidder's proposal shall include the following:

- (1) A detailed project implementation plan and schedule that is consistent with the scope of the project. The plan shall include all the activities required, show all key milestones, and clearly identify the nature of all information and project support to be provided for completion of the project. Manpower resources, proposed to be deployed by the Contractor during the execution phase, shall be clearly indicated.
- (2) Documentary evidence in support of the qualifying requirements specified in the bidding document i.e. RFP shall be submitted along with the bid.
- (3) Performance certificate for the offered equipment/systems from the user's in line to the requirements mentioned in the bidding documents.
- (4) The type test certificates for the offered equipments. In case it is not type tested. The commitment for same to be conducted during implementation
- (5) Completed equipment Data Requirement sheets/Questionnaire
- (6) Technical details of the offered equipment/systems.
- (7) Complete line of action w.r.t requirements in Part B –RAPDRP
- (8) Description of existing IT system shall be included by utility

1.8 Items of Special Interest

To assist in understanding the overall requirements of the project, the following items of special interest are listed. The Bidder shall pay particular attention to these items in preparing the proposal.

- (a) The contractor shall be responsible for overall project management, system integration and testing to complete all the facilities under the project.

- (b) The project shall be implemented in the time schedule described in the section-8.
- (c) The database, displays and reports for SCADA/DMS system are to be developed by the contractor; however, the contractor shall associate the employer/owner's engineers also during the data base development. The required hardware & software for completion of this activity may be used out of the hardware & software to be supplied under this contract.
- (d) The APIs (Application Program Interfaces) specified/needed section 2 are to be supplied. However the supply of source code is not mandatory.
- (e) SCADA/DMS system, shall exchange data with IT system.

1.9 Site Conditions

The sites are located in the city of The minimum to maximum temperature & relative humidity generally falls between ... to ...°C. & to % respectively. The state is well connected with road, rail and air transport. However, the system/equipment shall be designed as per the environmental conditions mentioned in the relevant section of this specification.

1.10 Applicable Standards

The applicable standards are mentioned in the respective technical section. The offered equipment shall conform to the standards mentioned in the specification except to the extent modified by this specification. In case of any discrepancy between the description given in the specification and the standards the provisions of the technical specification shall be followed. The parameters not specifically mentioned in this specification shall conform to the standard mentioned in this specification.

Wherever, new standards and revisions are issued during the period of the contract, the Contractor shall attempt to comply with such standards, provided there is no additional financial implication to employer/owner.

In the event the Contractor offers to supply material and/or equipment in compliance to any standard other than those listed herein, the Contractor shall include with their proposal, full salient characteristics of the new standard for comparison.

1.11 Warranty

This would include five years warranty for the related hardware & software supplied under the SCADA/DMS project after the operational acceptance of the SCADA/DMS System. The five year warranty shall include comprehensive OEM on-site warranty for all components (H/W and Software including OS) supplied including reloading and reconfiguration of all Software and device drivers/patches etc. if required. For details refer section 6 chapter 2.

1.12 Terms for utility & SIA

The term contractor & bidder shall be referred as SCADA/DMS implementation agency (SIA) & owner ,employer shall be referred as utility where ever mentioned in the RFP /Model Technical specification(MTS).

End of Section-01

