

प्रसार भारती/Prasar Bharati
(भारत का लोक सेवा प्रसारक)
(India's Public Service Broadcaster)
आकाशवाणी महानिदेशालय /Directorate General: All India Radio
योजना एवं विकास एकक, आकाशवाणी भवन, संसद मार्ग, नई दिल्ली-110001
P & D Unit, Akashvani Bhawan, Sansad Marg, New Delhi-110001
[एफ. एम. डिजाईन अनुभाग /FM Design Section]

No: SPECS-NMS FOR 100W FMTX.-9/4/2019-D (TD/FM)

Dated 28.05.2020

Subject: Specification for Design, Supply, Installation, Testing & Commissioning (DSITC) of Remote Monitoring, Operation & Control System to facilitate unmanned operation of 100 W (1+1) VHF FM Transmitters and associated equipments/items (100 sites) -**regarding getting Industry feedback & Budgetary quote**

DG: AIR is planning to procure Remote Monitoring, Operation & Control System to facilitate unmanned operation of 100 W (1+1) VHF FM Transmitters and associated equipments/items (100 sites) on DSITC basis. To get an estimated cost, the short listed bidders are requested to give their budgetary quote along with feedback for Design, Supply, Installation, Testing & Commissioning (DSITC) of Remote Monitoring, Operation & Control System to facilitate unmanned operation of 100 W (1+1) VHF FM Transmitters and associated equipments/items (100 sites). AIR draft technical specification is enclosed for reference.

On the basis of RFI offer & demonstration, the following four bidders are short-listed:

1. M/s Cineom Broadcast India Ltd.
2. M/s Infinium (India) Limited,
3. M/s Falcon Technologies Pvt. Limited &
4. M/s Arraycom (India) Limited

The short-listed bidders are requested to send the industry feedback & budgetary quote as above to reach this Directorate on or before 12.06.2020 & 18.06.2020 by 1700 Hrs. respectively at the following e-mail addresses.

rnahar@prasarbharati.gov.in
manzoor@prasarbharati.gov.in

Encl: As above.

Sd/-
(Manzoor Ali)
Assistant Director (Engg.)
for Director General

PRASAR BHARATI
(India's Public Service Broadcaster)
DIRECTORATE GENERAL: ALL INDIA RADIO
(PLANNING & DEVELOPMENT UNIT)

INTRODUCTION: This specification is for Design, Supply, Installation, Testing & Commissioning (DSITC) of Remote Monitoring, Operation & Control System to facilitate unmanned operation of 100 W (1+1) VHF FM Transmitters and associated equipments/items

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A. ESSENTIAL REQUIREMENTS FOR TENDER:

1. (i) The tenderer should submit Schedule of Requirements/Materials of DSITC **without price in the same format as given in Section-III (A & B)** of AIR Specifications in the technical bid, failing which the tender shall be considered incomplete and is liable to be rejected.

(ii) It is also mandatory to mention ***Make & Model of the offered equipment/system*** in the Schedule of Requirements/Materials of DSITC, failing which the tender shall be considered incomplete and is liable to be rejected.
2. Each statement of this specifications has to be complied with & supported by printed technical literature, technical data sheets, schematic drawings and technical manuals from the manufacturer of the equipment/system by the tenderer, to assess the full merit of the offer without which tender will be considered incomplete and is liable to be rejected.
3. The tenderer should submit the tender offer to AIR in the format given below, section wise & clause wise, in respect of all the sections of technical specifications. The OEM/tenderer must provide the page number reference, in column (4) of the table given below, of the technical bid clearly indicating the volume number also, if any, for each supporting document to verify the parametric values shown in the compliance statement, to assess the full merit of the offer, failing which the tender shall be considered incomplete and is liable to be rejected.

S. No. of AIR Specifications (Section wise & Clause wise) (1)	Details of AIR Specifications (Part/ Section wise & Clause wise) (2)	Compliance (Yes/No) (3)	The page no. of the tender offer, where the information/ supporting document is available. (4)	Remarks (5)
A. Essential requirements for tender				
B. Essential eligibility criteria for tenderer				
Section-I Clause wise				
Section-II Clause wise				

4. The tenderer should quote the rate/cost of individual items in the tender offer while submitting the offer for spares (**OPTIONAL**) in commercial bid.
5. The complete technical specifications (Section wise & Clause wise) compliance statement along with Schedule of Requirements/Materials (un-priced) must be signed & stamped by the respective Original Equipment Manufacturer (OEM) in the tender document including the clarifications, if any, asked by AIR, failing which the tender shall be considered incomplete and is liable to be rejected.
In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also sign & stamp on Technical specifications compliance statement (Section wise & Clause wise) including the clarifications, if any, asked by AIR, failing which the tender shall be considered incomplete and is liable to be rejected. The OEM & tenderer should mention their name in CAPITAL LETTERS & designation of the signatories, full address with pin code, phone number, fax number, e-mail addresses etc.
6. All the volumes of the entire technical bid must be page numbered.
7. The authorization and guarantee must be given by respective Original Equipment Manufacturer (OEM) on their letter head pad duly signed & stamped. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also give guarantee on their letter head pad duly signed & stamped, failing which the tender shall be considered incomplete and is liable to be rejected without any notice/back reference. Guarantee shall be as per the format given in clause 1.8 of Section-I. Guarantee for the commercially available off-the-shelf (**COTS**) products shall also be given by tenderer/OEM of the system.
8. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer should also furnish a certificate from the OEM that the tenderer can quote items of the OEM directly, failing which the tender shall be considered incomplete and is liable to be rejected without any notice/back reference.
9. Public Procurement (Preference to Make in India) Order No. P-45021/2/2017-B.E-II dated 15.06.2017 of Government of India, Ministry of Commerce and Industry, Department of Industrial Policy and Promotion shall be applicable.
10. Any change in the AIR technical specifications format or language or in parameters or of any other nature including the deletion of technical specifications clause, words, lines in the technical specifications compliance statement by the OEM/ tenderer will not be acceptable to AIR and the tender is liable to be rejected.
11. ***Optional items will not be considered for ranking purpose.***

B. ESSENTIAL ELIGIBILITY CRITERIA FOR TENDERER:

- (a) The tenderer should either be the OEM of Remote Monitoring, Operation & Control System or their authorized representative/dealer.
- (b) The OEM of the Remote Monitoring, Operation & Control System must have carried out at least three similar or larger deployments for TV or Radio Networks. Documentary evidence to support this must be provided.
- (c) In case tenderer is the authorized representative/dealer i.e. other than OEM, the tenderer must be an authorized representative/dealer of any OEM of Remote Monitoring, Operation & Control System OR must be in the business of sales and supply of such similar works. Documentary evidence to support this must be provided.
- (d) The OEM of the offered Remote Monitoring, Operation & Control System must have his local office/authorized representative/dealer in India for after sales support. A certificate as per Annexure-III duly signed by the OEM as well as local office/authorized representative/dealer must be submitted with the offer. Copy of Agreement/MoU executed between OEMs and their authorized representative/dealer duly signed by both must also be submitted with the offer.
- (e) As per Request for Information (RFI) issued by this Directorate, Vendors shortlisted through RFI will only be allowed to participate in this tender.

**SECTION-I
GENERAL**

1.1 BRIEF DESCRIPTION:

All India Radio is planning to implement automation (Unmanned operation) of 100 W (1+1) VHF FM Transmitters and associated equipments/items, likely to be installed at 100 locations across the country.

The offered solution shall be field proven for satisfactory operation.

1.2 INSTRUCTIONS TO BIDDERS:

Tender documents shall be referred for general terms and conditions of contract for supply including all the commercial aspects like Packing and Packing List, Insurance and Marine Risk etc., Payment terms, Penalty/Compensation for Delay, Damages and Liabilities, Time Period and Extension for Delay, Foreclosure of Contract due to Abandonment or Reduction in Scope of Supply, Cancellation of Contract in Full or Part, Recovery of Security Deposit, Performance Guarantee, Unsatisfactory Workmanship, Damages Incurred During Transit, Tenderer Liable for Damages, Defects, Recovery of Compensation, Ensuring Payment and Amenities, Tenderer to Indemnify Government against Patent Rights, Release of Security Deposit, Safety Code, insurance from manufacturer's works/factory to respective site etc **i.e. in totality.**

1.3 LANGUAGE/ UNITS:

All information supplied by the tenderer and all markings, notes, designation on the drawings and associated write-ups including Instruction Manuals shall be in **"English language" only**. All dimensions and units on drawings and all references to weights, measures and quantities shall be in **SI units**.

1.4 DOCUMENTS TO BE SUPPLIED WITH THE TENDER:

- a. The complete technical specifications (Section wise & Clause wise) compliance statement alongwith Schedule of Requirements/Materials (un-priced) duly signed & stamped by the respective Original Equipment Manufacturer (OEM) and countersigned by the tenderer as per the format given above in clause A (3), to assess the full merit of the offer, without which the tender offer will be considered incomplete and is liable for rejection.
- b. Complete printed technical literature/technical data sheet/schematic drawings/detailed information including Technical Manual (for Installation, Testing, Commissioning, Operation, Maintenance & Servicing, including theory of operation and fault diagnosis) of Remote Monitoring, Operation & Control System in support of compliance statement should be furnished, to assess the full merit of the offer, without which the tender offer will be considered incomplete and is liable for rejection.
- c. Detailed Schedule of Requirements/Materials (un-priced) for DSITC of Remote Monitoring, Operation & Control System for each site should be in conformity with Section-III(A&B) without any change in the format, failing which the tender will be considered incomplete and is liable for rejection. The tenderer must quote all items.
- d. Descriptive information and complete details of each equipment offered shall be given by the tenderer.
- e. Country of Origin, Make, Type & Model of all the offered items should be mentioned including the name & address of their vendors.
- f. The performance parameters of the offered equipment/system/items must be given by the tenderer, to assess the merit of the offer, without which the tender will be considered incomplete and is liable to be rejected.
- g. A copy of Technical Manuals (for Installation, Testing, Commissioning, Operation, Maintenance &

Servicing, including theory of operation and fault diagnosis), must be enclosed with technical bid for assessing the system.

In addition to above, the tenderer is also required to submit the document (s)/information as asked elsewhere in the technical specifications.

1.5 DOCUMENTS TO BE SUPPLIED BY THE TENDERER WITHIN ONE MONTH AFTER ISSUE OF ACCEPTANCE OF TENDER:

One set of **Technical Manuals** (for Installation, Testing, Commissioning, Operation, Maintenance & Servicing, including theory of operation and fault diagnosis), **COLOUR** printed and duly bound, for Remote Monitoring, Operation & Control System along with one soft copy on Pen drive must be supplied to “The DDG (E-FM), P & D Unit, DG: AIR, New Delhi-110001”.

1.6 INFORMATION TO PRECEDE DESPATCH OF EQUIPMENT:

Following information should be supplied to The DDG (E-FM), P & D Unit, DG: AIR and each of the consignees prior to dispatch of equipment:

- a) Detailed list of equipments under dispatch.
- b) Photograph showing location of various units/subunits with item numbers marked thereon.

1.7 DOCUMENTS TO BE SUPPLIED ALONG WITH EQUIPMENT:

Technical Manuals (for Installation, Testing, Commissioning, Operation, Maintenance & Servicing, including theory of operation and fault diagnosis), for Remote Monitoring, Operation & Control System and inspection report shall be supplied as per the details given below: -

- (i) For Consignee- 1 Set each comprising of one hard copy **COLOUR** printed and duly bound alongwith one soft copy on pen drive.
- (ii) For the following Offices/Officers-One soft copy on pen drive for each offices/officers DDG(E-FM), DDG(E-TM), Zonal Offices (Maintenance Wing of all five zones), Zonal Offices(Project Wing of all five zones), Technical Library(P&D Unit), R&D & NABM (T)

1.8 DELIVERY PERIOD/COMPLETION OF DSITC:

For Indian Bidders:

DSITC will have to be completed within Six (6) months from the date of Acceptance of Tender or Five (5) months from the date of the Decision Letter from WPC(whenever is required) in respect of RF equipment, provided by AIR, whichever is later.

For Foreign Bidders:

DSITC will have to be completed within Five (5) months from the date of Opening of Letter of Credit (LC).

However, the Payment for the tender shall be linked to various milestones of DSITC work as detailed below:

S. No.	Milestone	Payment
1	On receipt of Complete Equipment as per Schedule of Requirements/Materials for DSITC in good condition at all sites and completion of DSITC at 10 sites including completion of DSITC at central site	40% of supplied Equipment (Hardware & Software) & Cost for all sites.
2	After successful completion of Installation, Testing & Commissioning at respective sites	50% of supplied Equipment (Hardware & Software) cost for commissioned sites + 90% of DITC Cost of commissioned sites {maximum in three bills}
3	On completion of one year after successful completion of Installation, Testing & Commissioning at respective sites	Balance 10% of supplied Equipment (Hardware & Software) cost for commissioned sites + balance 10% of DITC Cost of commissioned sites.

1.9 GUARANTEE:

The tenderer shall submit with his offer an undertaking to accept the following guarantees:
{This Guarantee clause is applicable to all the equipments/items mentioned in Schedule of Requirements/Materials (un-priced)}.

- a. A guarantee that the equipment supplied will be in accordance with these specifications, varied only to the extent stated in his tender and agreed to in the contract.
- b. A guarantee to make good within 15 days (from the date of first intimation to OEM/tenderer) at tenderer's expense any component/software which becomes defective/malfunctioning for **30 MONTHS** from the date of Commissioning. If the tenderer failed to rectify the fault within the stipulated period of 15 days, the guarantee period of the system for that particular site would be extended corresponding to the outage period.
- c. A guarantee to supply all components/software for a period of ten years from the date of Commissioning, at rates at which these are being supplied by the firm to other customers and also should match prices of original manufactures of these components/software prevailing at that time.
- d. If at any stage during next 10 years, the manufacturer stops production of the offered system, the firm shall intimate All India Radio in advance to enable the latter to stock the critical items.

1.10 PRE-DISPATCH INSPECTION:

- a. Remote Monitoring, Operation & Control System will be accepted on the basis of OEM's test certificates (as per AIR specifications) duly stamped and signed by respective OEM on their letterhead, failing which test certificates will be considered incomplete and equipment offered by the firm is liable to be rejected.
- b. The complete Acceptance Test Procedure/Protocol (ATP) will be prepared by the OEM of the Remote Monitoring, Operation & Control System and submitted to DDG (E-FM), P&D Unit, DG: AIR for approval within **15 days** of issue of Acceptance of Tender. The **approved ATP** shall form the basis for OEM test certificate of actual performance measurements to be carried out by OEM. AIR has the right to include other technical parameters in ATP submitted by OEM within the ambit of specification of the system offered.

1.11 TESTING & COMMISSIONING:

- a) After installation at each site, complete System including Remote Monitoring, Operation & Control would be tested by representatives of AIR for smooth functioning.
- b) All passwords, operational keys & drivers for software & hardware shall be handed over to concerned authorities of AIR.
- c) Test report should be submitted for complete system installed at each site, duly signed by the AIR authorized representative.
- d) The system shall be tested by AIR authorized representative for trouble free operations for at least two days. The system shall be considered as commissioned only after this test run.

1.12 ESSENTIAL REQUIREMENT FOR LOCAL OFFICE/AUTHORIZED REPRESENTATIVE/ DEALER:

- (a) The OEM should have complete setup for maintenance/repair of the Remote Monitoring, Operation & Control System in India, either of its own or through local office/authorized representative/dealer.
- (b) The local office/authorized representative/dealer will be the nodal point for resolving issues related to after sales support. It is the responsibility of local office/authorized representative/dealer to arrange the repair/replacement of faulty items. Any module of Remote Monitoring, Operation & Control System or other equipment requiring repairs will be repaired at site. If it is not feasible to repair the module at site, the same will be collected from the site by local office/authorized representative/dealer that will arrange repairs locally. The cost of transportation, repairs etc. shall be borne by the tenderer during the guarantee period.

- (c) After sales support for the repairs/maintenance of system after the completion of guarantee period, shall also be provided by the respective OEM of Remote Monitoring, Operation & Control System and other associated equipments through their local offices/authorized representatives/dealers in India.
- (d) The details of technical facilities available with local office/authorized representative/dealer for after sales support must be provided in the technical bid.

1.13 TRAINING:

- a. OEM's Engineer(s) shall train total 30 (Thirty) AIR Engineers for 3 working days at one AIR site / Delhi to enable them to become acquainted with all particulars as well as installation, operation, maintenance, trouble shooting of the system and associated equipments at no cost to AIR. However, AIR shall bear all touring expenses of AIR Engineers deputed for training and the same is not to be included by the tenderer in their offer.
- b. The training shall cover theoretical concepts, demonstration of salient features, configuration, operational, maintenance & servicing, fault finding, trouble shooting, preventive maintenance and other relevant topics etc. related to the system.
- c. Training material in hard and soft copies are to be provided by the OEM to each AIR engineer undergoing the above training.
- d. **Colour printed & duly bound** two sets of training lecturer notes, schematic drawings, hand books etc. shall be supplied to DDG (E-FM), P&D Unit, DG: AIR within One Month of placement of AT.

1.14 PACKING AND PACKING LISTS

All the equipment should be securely and properly packed to withstand transit hazards. Equipment packing shall be fit for sea freight and incorporate adequate protection against ingress of moisture. Packing slips giving details of the items contained in each package shall be placed inside the package in a water proof envelop to enable easy identification and should contain cross references to item/part numbers of installation drawings/components lists. Copies of packing slips and other details should be sent separately to respective consignee and also to The DDG (E-FM), P & D Unit, DG: AIR, New Delhi.

1.15 ENVIRONMENTAL CONDITIONS FOR SYSTEM AND ALL ASSOCIATED EQUIPMENT:

Ambient temperature range for operation : 0° C to + 45° C
Relative humidity : 95 percent, non-condensing
Working altitude : Up to 3000 meters AMSL

1.16 POWER SUPPLY FOR SINGLE PHASE EQUIPMENTS:

Operating Line Voltage : AC Single phase, 230V ± 10 %,
Frequency : 50Hz ± 4 %
Power Factor : Better than 0.9

SECTION-II

TECHNICAL DESCRIPTION OF REMOTE MONITORING, OPERATION & CONTROL SYSTEM:

A. BRIEF DISCRIPTION:

1. All India Radio is planning to implement automation (Unmanned operation) of 100 W (1+1) VHF FM Transmitters and associated equipments/items, installed at 100 locations across the country.
2. This specification aims at design, supply, installation, testing and commissioning (DSITC) of Remote Monitoring, Operation & Control System to facilitate unmanned operation of 100 W (1+1) VHF FM Transmitters and associated equipments/items installed at the station, on turnkey basis.
3. The Remote Monitoring, Operation & Control System should be capable for operation, control and monitoring various parameters of FM transmitters and associated equipments/items from a distant location.
4. The System shall be controllable from distant location with web browser-based GUI and SNMP over TCP/IP via a telecom or network connection as well as locally with password protection and shall works with any PC/laptop or smart phone.
5. The web browser-based/SNMP complied devices which need to be controlled/monitored remotely includes FM transmitters, Automatic change over unit, Automatic audio changeover switch, Air-conditioners, UPS, Inverter, Fire & Smoke detector, CCTV surveillance system, Temperature sensor, Humidity sensor and other associated equipments/items, installed at the station.
6. A brief details of Remote Monitoring, Operation & Control System is given in Annexure-II. Any other parameters/settings which the tenderer considers essential for proper control /functioning of the system shall also be given by the tenderer to access the full merit of the offer.
7. Software and allied equipments/devices required for remote control, operation and monitoring shall be part of this DSITC. The devices which need to be controlled/monitored remotely includes FM transmitters, Automatic change over unit, Automatic audio changeover switch, Air-conditioners, UPS, Inverter, Fire & Smoke detector, CCTV surveillance system, Temperature sensor, Humidity sensor are not the part of this DSITC. The broadband connection shall also be provided by AIR.
8. The system shall have provision for integrations of SNMP compliant devices & non-SNMP compliant devices.
9. The bidder shall provide the widely recognized system in order to achieve National Level, Regional Level and Site Level management.
10. The system shall support important functions (but not limited to) Monitor, Control, Reporting, Dashboards, Mobile Access, Email/SMS Management, Scheduling, Correlation etc.
11. 10 to 12 devices per site are required to be controlled, operated & monitored.
12. The interface drivers must be of open format (like XML/JSON), so that anybody can create new drivers.
13. The offered system shall allow operators to design dashboard that consolidate all essential information and key Performance Parameters from the devices.
14. The offered system shall allow creating all user accounts (with username & password) from scratch, and also to create groups and assign individual users to one or more groups so that different levels of administration, operation etc. can be assigned.
15. The system shall support automatic transfer of data to Excel etc.
16. The system shall offer trending, where high volumes of data related to some Key Performance Parameters are collected in the database in order to present to the operator the evolutions of the last week, last month and last year.
17. The system shall support Performance Monitoring, which is the capability to analyze performance data such as creating statistics or zooming in order to get more details. Also the capability to export the trend data to spreadsheet applications to compare two or more trending parameters for analysis.
18. The system shall offer reporting, providing statistical analysis information, including but not limited to: top-5 (or user defined number) of devices that generated most of the alarm (number of alarms), top-5 (or user defined number) of devices that were the longest time in alarm (duration of alarms), status reports with a complete overview of all settings of a device, trend reports etc.

19. The GUI display screens should be clear and intuitive to the operator. The display screen layout should contain mimic diagram. Preferably, each unit may have its own display screen in a block diagram style for quick location of faults. UI shall be such that it can be customized at later stage as per AIR requirements.
20. The system shall support sending e-mail and SMS-notifications to authorized user and should be fully user definable. Details shall be provided by AIR at the time of commissioning.
21. The offered system shall be capable of scalable for new added Transmitters in future in AIR setup.
22. There shall also be provision for creating Equipment wise History sheet of faults.
23. The offered system shall offer a comprehensive fault management experience, including visual alarm, threshold editing in order to reduce the time to resolve issues by providing a visual historical context to alarms.
24. The system shall provide an unconditional and guaranteed interface with any SNMP or non-SNMP devices from any manufacturer.
25. It shall support at least 500 simultaneous client accesses from any location through web.
26. The system shall run on industry standard hardware/software that is readily available from different vendors.
27. MIB file will be provided by vendor.
28. All the necessary software required for satisfactory working of the system and the required licenses are to be supplied in the name of All India Radio on perpetual basis.
29. It shall have Centralized/Regional Access of all Site Level including the underlying elements.
30. Customized reporting shall be needed or shall schedule to achieve automated reports of any possible parameter, site etc.
31. It shall support Mobile Web Access, offering a lightweight web interface for mobile devices such as smart phones. The graphical user interface shall be secured by the standard user account and shall enable the operator to access and control any of the data available in the solution platform for devices and services.
32. Shall support static map integration with Drill down architecture.
33. The solution shall be capable to support the ticketing management and shall be upgradable by adding the additional modules as and when required.
34. The offered platform shall have the interactive UIs for Mobile devices to offer simplified entry point to all key data across all managed operational systems, which shall be running on any mobile tablet or phone platform.
35. Hardware Server in (1+1) hot redundant mode of suitable capacity as per Annexure-I (A) for National Centre shall be provided at New Delhi for Remote control, operation and monitoring system.
36. The solution must be able to monitor, operate & control multiple equipments from multiple vendors.
37. The solution must come with pre-built drivers for integrating and communicating with the remote devices and equipment.
38. The solution must support the monitoring, operating & Controlling of equipments across multiple sites and/or locations.
39. The polling frequency must be adjustable for each device and/or site.
40. The solution must display the equipment in a hierarchical list based on their location/sites.
41. The solution must come with a map-based display to visualize the sites/locations.
 - a. The map display must support multiple layers to enable the focus/zoom-in onto a specific site or location.
 - b. The map display must support the import of custom background images (diagrams, pictures, etc.).
 - c. Diagrams must be customizable and dynamic so they can be colored based on the status of each equipment

B. ALARMS & NOTIFICATIONS:

1. The solution must support the management of equipment-specific alarms.
 - a. The alarms must be customizable in a graphical user interface.
 - b. In addition to the alarms already available on the unit or its driver, new alarms should be creatable for each equipment directly into the solution graphical interface.

2. The alarms must be categorized based on their severity (critical, major & minor).
3. The solution must allow the Administrator to configure audio alarms, which can play different sounds based on their severity.
 - a. The user must have the ability to filter each view/module based on one or multiple severities.
4. The solution must enable the user notification in case of an issue.
 - a. The solution must support email notifications.
 - b. The solution must support SMS notifications.
 - c. The solution must support in-application notifications (e.g. visual indicators, pop-ups, etc.).
 - d. The solution must require user acknowledgment for a notification and keep track of the acknowledgement.

C. INCIDENT MANAGEMENT & ASSIGNMENTS:

1. The solution must offer an incident management capability.
2. Tickets shall be creatable from events and alarms and assigned to specific users or user groups.
3. Ticket priority must be definable to allow an efficient management of operational priorities. The priority of each ticket must be displayed in each ticketing panel.
4. Tickets and user assignments must be managed through a graphical user interface.
5. The end-user must receive a notification upon the assignment of a ticket.
6. Users must be notified if the following actions are taken on a ticket: add of a new user, and when a ticket is closed. All the users assigned to one ticket must be automatically notified by email and/or SMS.
7. The ticket management tool must allow the aggregation of user comments and operational guidelines for the resolution of incidents.
8. The Incident Management module must allow the tracking and visualization of all steps taken operationally to resolve incidents and issues.
9. The system shall be able to automatically suggest and link together similar incidents or tickets (open or closed) to help with the resolution and information sharing.
10. Closed tickets and past events can be reviewed and linked to ongoing incident for documentation purposes.

D. EVENTS, READINGS, DATA CAPTURE & REMOTE CONTROL:

1. The solution shall display basic information about any of the equipment monitored/controlled including the following:
 - a. Device Name
 - b. Device type
 - c. Device Version / Serial Number
 - d. Device IP address / host name
 - e. Device uptime
2. The solution must display real-time data (technical readings) about the equipment.
3. The solution must capture readings of each monitored equipment.
 - a. These readings must be specific to each equipment.
4. The solution must preserve historical readings.
 - a. The readings must be presented in graphs.
 - b. The user shall be able to define the time-scale of the graphs (e.g. last week, last month, etc.).

E. REPORTING & ANALYTICS:

1. The solution must come with a built-in reporting and analytics module.
2. This module must enable the filtering of the data presented based on:
 - a. Sites/Location
 - b. Type of equipment
 - c. Alarm/Event severity
3. This module must allow the dynamic browsing of events and /or issues.
4. Reporting templates shall be configurable, saveable and retrievable later.
5. The reporting module must be able to output a PDF-based report showing the Availability rate and/or

Quality of service (QoS) information for each site individually as well as for the entire ecosystem as a whole.

6. Report templates can be built, saved and shared for future or collaborative use.
7. Report templates can be automatically emailed to a diffusion list at a definable frequency.

F. USER MANAGEMENT:

1. The solution must support multiple user accounts.
2. User accounts shall be creatable and manageable within the solution.
3. User accounts shall be importable from an Active Directory.
4. User groups should be created and managed within the solution.
5. User groups shall be assignable to site groups to allow the interaction with units and sites within these site groups.
6. Specific user rights can be assigned to users and/or user groups.
 - a. A group membership must determine the access to the various modules.
 - b. A group membership must determine the access to the various sites and equipments.
7. Notifications can be customized for each user or user group.
8. The system must come with a GUI for user & group administration.
9. The solution must come with an Audit Trail functionality to log all user activity within the system.
10. The administrator can monitor in real-time the user connection status.

G. DRIVERS & ADMINISTRATION:

1. The solution must come with a complete driver library.
 - a. The library must contain all available drivers to date at no extra cost.
 - b. The solution must support the management of multiple driver versions for each product or product version.
2. Drivers shall be importable and exportable.
3. The solution must come with a web-based Graphical User Interface for its administration.
4. The configuration settings must be only accessible to administrator users.
5. The solution must provide database back-up & restore functionalities.
 - a. Safety backups shall be automated at a given frequency.
 - b. The backups must contain both the solution settings and the equipment data.
 - c. The backups must be self-contained files.
 - d. The backups must be transferable from one system instance to another one (e.g. secondary backup system).

H. ARCHITECTURE:

1. The proposed solution must be built on a client-server architecture.
2. The solution must use an open-source database technology such as MySQL, PostgreSQL or equivalent
3. The client must be fully web-based and compatible with HTML5 and HTTPS.
 - a. It must not require any application to be installed on the user workstation.
4. The client must be compatible with mobile devices (Android, Apple, etc.) regardless of their OS version.
5. The solution communication layer must be based on the TCP/IP protocol.
6. The solution must support industry-standard protocols for communication.
7. The solution must ensure no data is lost or compromised when switching to a secondary or backup node/instance.
8. The solution must be deployable in a decentralized architecture to prevent data loss in case of network disconnection or interruptions.

I. SECURITY:

1. The solution must be HTTPS compliant.
2. The solution must be HTML5 compliant.
3. The solution must not use libraries or environments that present security threats (e.g. Java, etc.).
4. The solution must be compatible with the usage of a Firewall & Antivirus.

- 5 Network ports used by the solution shall be customizable.
- 6 The user passwords must be encrypted or hashed in the database.

J. LICENSING & DEPLOYMENT:

- 1 The licensing model of the solution shall be only based on the number of equipments monitored/controlled.
- 2 The licensing shall not be linked to the number of end-users, nor number of sites nor the nature of equipment monitored/controlled.
- 3 The solution shall be easy to install and configure and shall not require extensive professional services or internal resources to do so.

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ANNEXURE-I**Brief Technical specification for Server in (1+1) Mode at Central Site (New Delhi) (Minimum requirements):**

Items	Qty.	Description
Processor	1	Intel® Xeon® E3-1230 v6 3.5GHz with 4c/8T(72 W)
RAM	1	16 GB 2400MT/s DDR4 ECC UDIMM
Hard drive	4	1TB 7.2K RPM SATA 6Gbps 3.5in Hot-plug Hard Drive
RAID Controller	1	PERC H330 Integrated RAID-5 Controller for Hot Plug Chassis
Power Supply	1	Dual, Hot-plug, Redundant Power Supply, 350 W
Network	4	1 GB Ethernet Network Interface Card
Operating System	1	Ubuntu v14.04 (or above) Server LTS or Desktop LTS (including GUI)

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ANNEXURE-II**DETAILS OF REMOTE MONITORING, OPERATION & CONTROL SYSTEM:**

S. No.	Technical Parameters	Technical Specifications
1.	Remote Monitoring, Operation & Control System (Controllable Settings/Parameters)	<ol style="list-style-type: none"> 1. Transmitter: ON/OFF 2. Selection of Transmitter 1/Transmitter 2 through ACU 3. RF Output Power Level Control 4. Input Audio: Selection(1/2) & ON/OFF 5. Audio input level Control 6. UPS: Selection & ON/OFF 7. Inverter: ON/OFF 8. Air Conditioners: Selection & ON/OFF 9. Reset Button for transmitters 10. Any other parameters which the tenderer considers essential for proper control /functioning of the system
2.	Remote Monitoring, Operation & Control System (Monitorable Settings/Parameters) with alarm/SMS alerts/Email alerts wherever required	<ol style="list-style-type: none"> 1. RF forward and reflected power of each transmitter 2. Power supply status i.e. Voltages, Currents etc. 3. Alarm Indications: Temperature, VSWR, ON AIR, Audio etc. of transmitter (including but not limited to) 4. Demodulated Audio Streaming of transmitters 5. Fire and Smoke detector 6. CCTV surveillance 7. Ambient Temperature 8. Humidity 9. Any other parameters which the tenderer considers essential for proper control /functioning of the system
3.	Data Format	To be indicated by tenderer and compatible for above system.
4.	Data Rate and Bandwidth	To be indicated by tenderer and compatible for above data format.

SECTION-III (A)**A. SCHEDULE OF REQUIREMENTS/MATERIALS (UN-PRICED) FOR DSITC OF ONE SET OF REMOTE MONITORING, OPERATION & CONTROL SYSTEM: -****1. SUPPLY AT SITE:**

S. No.	Description	Make	Model	Unit	Qty
1.	Supply of Remote Monitoring, Operation & Control System as per AIR Specification with technical manual as per AIR Specification			Set Complete	1Set Complete
2.	Supply of Hardware/software system for converting non- SNMP/non-TCP/IP compliant device into SNMP/ TCP/IP compliant device (5 per each location)			Set Complete	1Set Complete
3.	Applicable license for the above system at remote site, if applicable			Lot	1 Lot
4.	Any other items/hardware materials etc. offered for the completeness of the above system. (Item wise details of the offered items/hardware materials etc. shall be given by the tenderer)			Lot	1 Lot

2. DESIGN, INSTALLATION, TESTING & COMMISSIONING AT SITE:

S. No.	Description	Make	Model	Unit	Qty
1.	Design, Installation, Testing, Commissioning of Remote Monitoring, Operation & Control System as per AIR Specification			Lot	1 Lot
2.	Installation, Testing, Commissioning of Hardware/software system for converting non-SNMP/non-TCP/IP compliant device into SNMP/ TCP/IP compliant device (5 per each location)			Lot	1 Lot
3.	Any other works etc. for the completeness of the above system. (Item wise details of the works etc. shall be given by the tenderer)			Lot	1 Lot

3. SUPPLY AT CENTRAL SITE:

S. No.	Description	Make	Model	Unit	Qty
1.	Supply of Server in (1+1) mode complete alongwith required software for Remote Monitoring, Operation & Control system as per AIR Specification with technical manual			Set Complete	1Set Complete
2.	Applicable license for the above system at central site			Lot	1 Lot
3.	Any other items/hardware materials etc. offered for the completeness of the above system. (Item wise details of the offered items/hardware materials etc. shall be given by the tenderer)			Lot	1 Lot

4. DESIGN, INSTALLATION, TESTING & COMMISSIONING AT CENTRAL SITE:

S. No.	Description	Make	Model	Unit	Qty
1.	Design, Installation, Testing, Commissioning of Server in (1+1) mode complete alongwith required software for Remote Monitoring, Operation & Control system as per AIR Specification			Lot	1 Lot
2.	Any other works etc. for the completeness of the above system. (Item wise details of the works etc. shall be given by the tenderer)			Lot	1 Lot

SECTION-III (B)**SCHEDULE OF REQUIREMENTS/MATERIALS (UN-PRICED) FOR DSITC OF ONE SET OF REMOTE MONITORING, OPERATION & CONTROL SYSTEM (SPARES) (OPTIONAL)**
(Not to be considered for ranking purpose) {The tenderer must quote all items}

S. No.	Description	Make	Model	Unit	Qty
1.	List of recommended spares and any other accessories. (Items wise details of offered material including part number are to be given by the tenderer)			Set Complete	1Set Complete

SECTION-III (C)**SCHEDULE OF REQUIREMENTS/MATERIALS (UN-PRICED) FOR AMC SUPPORT FOR REMOTE MONITORING, OPERATION & CONTROL SYSTEM (SPARES) (OPTIONAL)**
(Not to be considered for ranking purpose) {The tenderer must quote all items}

S. No.	Description	Make	Model	Unit	Qty
1.	On site AMC support for the entire Remote Monitoring, Operation & Control system at all remote sites and central site after completion of 30 Months of guarantee period:				
	(a) For One Year after completion of 30 Months of guarantee period			Lot	1 Lot
	(b) For two Years after completion of 30 Months of guarantee period			Lot	1 Lot
	(c) For three Years after completion of 30 Months of guarantee period			Lot	1 Lot

ANNEXURE-III**PERFORMA FOR INFORMATION ABOUT LOCAL OFFICE /AUTHORIZED REPRESENTATIVE/ DEALER IN INDIA FOR AFTER SALES SUPPORT**

1.	Address of local office/authorized representative/dealer	
	Telephone (Landline) No.	
	Mobile No.	
	E-mail Address	
2.	Address for communication (if different)	
3.	Legal Status (local office/authorized representative/dealer)	
4.	Name, contact number (Mobile number) & e-mail address of official representative of the local office/authorized representative/dealer	
5.	Brief details of Technical facilities available for after sales support: The details of technical facilities available with local office/authorized representative/dealer for after sales support such as test bench, necessary test & measuring equipment and photographs thereof, must be provided in the technical bid.	
6.	Main line of business, specialization and number of years of operation	
7.	Total number of permanent technical employees including their designation and qualification	
8.	Details of Agreement/MoU for after sales support with OEM (Copy must be provided with the offer)	Date of Agreement: Executed at : Executed by :
(Authorized Signatory of local office/authorized representative/dealer)		(Authorized Signatory of Remote Monitoring, Operation & Control System OEM)
Name :		Name :
Signature :		Signature :
Place and Date:		Place and Date:

ANNEXURE-IV**List of places for DSITC of Remote Monitoring, Operation & Control System:**

S. No.	Name of Place	State	S. No.	Name of Place	State	S. No.	Name of Place	State
1	Alagadda	Andra Pradesh	35	Gangawati	Karnataka	69	Malkangiri	Odhisia
2	Rajahmundry	Andra Pradesh	36	Kolar	Karnataka	70	Nabarangpur	Odhisia
3	Madanapalle	Andra Pradesh	37	Renebenur	Karnataka	71	Phulbani	Odhisia
4	Banka	Bihar	38	Udupi	Karnataka	72	Balasore	Odhisia
5	Buxar	Bihar	39	Kayamkulam	Kerala	73	Abohar	Punjab
6	Gopalganj	Bihar	40	Pathanamthitta	Kerala	74	Baran	Rajasthan
7	Jamui	Bihar	41	Badwani	MP	75	Bhadre	Rajasthan
8	AIR Darbhanga	Bihar	42	Burhanapur	MP	76	Bhilwara	Rajasthan
9	Lakhisaria	Bihar	43	Khargone	MP	77	Bhinmal	Rajasthan
10	Sheikhpura	Bihar	44	Khurai	MP	78	Dungarpur	Rajasthan
11	Nawada	Bihar	45	Kukdeshwar	MP	79	Hanumangarh	Rajasthan
12	Siwan	Bihar	46	Murwara	MP	80	Jalore	Rajasthan
13	Narayanpur	Chhattisgarh	47	Narsinghpur	MP	81	Karanpur	Rajasthan
14	Amreli	Gujarat	48	Panna	MP	82	Khajuwala	Rajasthan
15	Botad	Gujarat	49	Piparia	MP	83	Pali	Rajasthan
16	Chhote Udaipur	Gujarat	50	Seoni	MP	84	Phalodi	Rajasthan
17	Dohad	Gujarat	51	Shajapur	MP	85	Sujangarh	Rajasthan
18	Modasa	Gujarat	52	Shyampur	MP	86	Pratapgarh	Rajasthan
19	Morvi	Gujarat	53	Nagda	MP	87	Kumbakonam	TN
20	Rapar	Gujarat	54	Achalpur	Maharashtra	88	Kachipuram	TN
21	Jamjodhpur	Gujarat	55	Barshi	Maharashtra	89	Davarkonda	Telangana
22	Tharad	Gujarat	56	Hingoli	Maharashtra	90	Nalgonda	Telangana
23	Valsad	Gujarat	57	Mahad	Maharashtra	91	Nirmal	Telangana
24	Veraval	Gujarat	58	Nandurbar	Maharashtra	92	Ramagundam	Telangana
25	Khambalia	Gujarat	59	Pandharpur	Maharashtra	93	Auraya	UP
26	Radhanpur	Gujarat	60	Rajapur/ Rajpur	Maharashtra	94	Deoria	UP
27	Narnaul	Haryana	61	Chiplun	Maharashtra	95	Fatehpur	UP
28	Jind	Haryana	62	Satana	Maharashtra	96	Lalitpur	UP
29	Bhiwani	Haryana	63	Shirdi	Maharashtra	97	Naugarh	UP
30	Godda	Jharkhand	64	Sironch	Maharashtra	98	Car Nicobar	Andman & Nicobar
31	Bagalkot	Karnataka	65	Umarkhed	Maharashtra	99	Mayabunder	Andman & Nicobar
32	Bidar	Karnataka	66	Washim	Maharashtra	100	Alipurduar	West Bengal
33	Belgavi	Karnataka	67	Bargarh	Odhisia			
34	Hosur	Karnataka	68	Kendrapara	Odhisia			

Note: The site locations mentioned above are tentative and the same may be changed later on by AIR Directorate.