NOTE: Document Amendment No 1 dtd 03.08.15 to ANNEXURE-IA shall supersede the previous document ANNEXURE-IA. Bidders are requested to quote as per document Amendment No 1 dtd 03.08.15 to ANNEXURE-IA.

TECHNICAL SPECIFICATIONS WITH QUANTITY

Tender No & Date: SDI7175P16 Dated 15.05.15

New Radio Network for OIL:

Oil India Limited (OIL) is a premier Indian National oil company under the administrative control of Ministry of Petroleum and Natural Gas, Govt. of India. OIL is engaged in the business of Exploration, Development and Production of Crude Oil, Natural Gas and LPG and transportation of Crude Oil.

Existing Setup:

Oil India Limited has an existing 2.4 GHz ISM Band Ethernet Bridge Radio Network connecting OIL's field installations like OCS, GCS, Drilling Locations, Seismic camps, etc., located within a radius of 80 km from OIL's Field Headquarters, Duliajan, to OIL's campus computer network. The network is based on E-ION VIP 110-24 Ethernet Bridge Radios and was installed and commissioned in the year 2005. This network is used for both Voice and Data traffic. Oil India Limited is currently implementing a SCADA system for 81 (eighty one) production installations (Oil and Gas) in Duliajan, Digboi, Moran and Kumchai areas. The existing Radio Network is currently being utilized for transmitting SCADA data from field installations to the MCS.

In addition to the permanent installations connected by the above-mentioned Radio Network, there are installations which demand temporary network connectivity for a period of 3-4 months. In such cases, radio towers are erected and Radio, Antenna and Networking devices are installed on a temporary basis and the same are dismantled once the connectivity requirement for the site ceases.

Proposal:

OIL now plans to replace the existing IT radio network with new equipment, keeping the base infrastructure (mainly towers) intact. The detailed description of the project follows below.

Technical Specification	
Item No 1. RADIO NETWORK High Capacity AP. Qty = 56 Nos High Capacity (100 Mbps) Access Point, Make/Model: Vendor must Specify ~~1. System must operate in unlicensed band frequency spectrum of ISM-III Unlicensed band. Operating frequency range: 2.4 Ghz band.~~ 1. System must operate in unlicensed band frequency spectrum 2.4Ghz band as per India WPC. (Amendment)	

2. The system proposed may use active RF antenna to cover a distance of 15 km LOS condition.
3. The useable throughput shall be minimum 100 Mbps over 20 MHz Channel. Minimum Base Trans-receiver Station capacity should be 300 Mbps for 360 degree coverge

~~4. System should support a Channel Width of 5/10/20 MHz with 2.5 MHz channel spacing.~~
4. System should support a Channel Width of 5/10/20 MHz with 2.5/5 MHz channel spacing. (Amendment)

5. System should use an Access Method of TDD/TDMA
6. Modulation Type should be OFDM-MIMO based QPSK , 16 QAM , 64 QAM,256QAM
7. RF Power output upto 22 dBm
8. One way latency should not be more than 8 ms with data

~~9. IPV4, IPV6, UDP, TCP, ICMP, Telnet, SNMP, FTP Should be manageable from NMS.~~
9. Should be manageable from NMS. (Amendment)

10. Link Monitoring: Menu driven options for RF link monitoring with parameters like RSSI, Signal level and Uplink/Downlink efficiencies from both Central Point and Remote Point for checking the quality of RF link and for alignment of antenna / radio.

~~11. The system should be able to support at least 100 remote locations (CPEs) per sector.~~
11. The system should be able to support at least 80 remote locations (CPEs) per sector (Amendment).

12. The system should support remote maintenance of radio units & shall have the capabilities of upgrading the Software over the air from the central location
13. The system shall allow enabling prioritization of VOIP and Video over data traffic.

~~14. The system should support operating temperature from -35 deg Celsius to +55 deg Celsius.~~
14. The system should support operating temperature from -25 deg Celsius to +55 deg Celsius (Amendment).

~~15. The system should support Web user-interface, CLI (Telnet), SSH, HTTP, SNMP~~
15. The system should support Web user-interface, CLI over SSH, HTTPS, SNMP (Amendment).

16. The system should WEEE/RoHS compliance
17. The radio should be IP66/IP67 certified for outdoor deployment.
18. The complete system should support high level of security mechanisms such as DES/AES for end-to-end connectivity to prevent any breaches due to interference or hacking.
19. The complete system should be type approved by WPC & operate accordingly.

~~20. The system should have the capability to counter mutual interference in intra-~~

~~site & inter-site environment using GPS sync for TDD Synchronization.~~
20. The system should have the capability to counter mutual interference in intrasite & inter-site environment using GPS sync for TDD Synchronization or equivalent technology (Amendment).

~~21. The system should have the capability to reuse the frequency channel in co-located scenarios to increase the spectral efficiency in unlicensed frequency band - may be by using GPS sync.~~
21. The system should have the capability to reuse the frequency channel in co-located scenarios to increase the spectral efficiency in unlicensed frequency band - may be by using GPS sync or equivalent technology. (Amendment).

22. The system should have support for AAA authentication for better security and protection from intrusion.

~~23. The system should have an inbuilt surge protection mechanism up to 1 Joule.~~
23. The system should have a surge protection mechanism up to 1 Joule. (Amendment).

24. The system should be able to configure symmetric & asymmetric bandwidth. Upload and download percentage should be user configrable in steps of 1%.

~~25. The system should support VLAN 802.1ad (DVLAN Q-in-Q), 802.1Q with 802.1p priority, dynamic port VID.~~
25. The system should support 802.1Q with 802.1p priority. (Amendment).

26. The system should support minimum 512 subcarriers to support superior performance in NLOS condition
27. The system must support Automatic Transmit Power Control (ATPC) to limit the CPE power when not required.
28. Specification Certification
RSS Gen and RSS 210
FCC Part 15 Class B

Notes:
1. The equipment shall be used for outdoor purposes and shall be weather proofed to withstand local conditions such as exposure to rain, thunder & lightning and continuous sunlight.
2. The equipment should be able work in LOS and near Line of Sight conditions.
3. The system at Base Stations should have coverage of 360 degrees so that communication link can easily be set up between Base station equipment and CPE installed within an aerial distance of 15 Kms (LOS) from nearest Base station (BTS).

~~**Item No 2. BASE STATION SWITCH with GPS UNIT. Qty = 12 Nos**~~

Item No 2. BASE STATION SWITCH with GPS UNIT (If required). Qty = 12 Nos (Amendment).

Specification:

Make/Model: Vendor Must Specify

1. DATA INTERFACE: (minimum)

8 Powered input ports (from radios) 8 Data output ports (to switch) ~~1 GPS timing port (RJ-25)~~ 1 GPS timing port (RJ-25) (If required) (Amendment). 1 Controller (administration) port ~~1 N-Type GPS antenna port.~~ 1 N-Type GPS antenna port. (If required) (Amendment). 2. SURGE SUPPRESSION : Included for all radio ports ~~Included GPS lightning suppression~~ Included GPS lightning suppression. (If required) (Amendment). 3. SWITCH FEATURES: (minimum) USER INTERFACE: 14 10/100BaseT ports, 2 1000BaseT ports ETHERNET INTERFACE: 10/100BaseT, half/full duplex, rate auto negotiated (802.3 compliant) PROTOCOLS USED: IPv4,IPv6, UDP, TCP, IP, ICMP, Telnet, SNMP, HTTP, FTP NETWORK MANAGEMENT: HTTP, Telnet, FTP, SNMP v2c VLAN : 802.1ad (DVLAN Q-in-Q), 802.1Q with 802.1p priority, dynamic port VID 4. Physical: MAX DISTANCE FROM MANAGED RADIOS: 328 cable feet (100m) ~~MAX DISTANCE TO GPS ANTENNA: 100 cable feet (30.5m)~~ MAX DISTANCE TO GPS ANTENNA: 100 cable feet (30.5m) (If required) (Amendment). CABINET TEMPERATURE : -40° C to +55°C (-40° F to +131° F), 100% humidity, condensing 5. Power Supply: POWER CONSUMPTION 5W plus 0.5W per radio attached, Plus 12W for PoE switch POWER INTERFACE TERMINALS Two 30V, Two 56V, One Ground	
Item No 3. Ethernet Line Surge Protector. Qty = 190 Nos. Specification: Make/Model: Vendor must Specify CONNECTORS RJ45 CAPACITY 1500J peak energy dissipation with 10/10000 micro sec waveform GROUND LOOP ELIMINATION Digital Noise Isolation	
Item No 4. 7000M Outdoor Cat 6 STP Cable. Qty = 1 No.	

Technical Specification for Outdoor Cat6 STP Cable: Make/Model: Vendor Must Specify Type Cat6 U/UTP 4 pair Outdoor Cable, solid bare copper with cross filler pair separator Application Outdoor usage suitable in an IP65 environment Jacketing Double jacketed. Inner Jacket - Polyethylene Outer jacket - LSZH Max pull force: 80 N Frequency: Tested upto 250 MHz Outer Diameter: 7.2 mm Packaging: 500m reel Fire Rating: Shall meet IEC 60754-1 for Toxicity Shall meet IEC 60754-2 for Acid Gas Outer jacket color: Preferably Black Compliance ROHS/ELV compliant	
Item No 5. Chemical Earth Pit. Qty = 118 Nos. Chemical earth Pit: Parameters Features Type of Earthing Chemical, as per above mentioned Drawing Length of the Electrode 3000 mm Outer Pipe Diameter 62 mm Inner Pipe Diameter 32 mm Hygroscopic Material GRIP (Ground Resistance Improvement Powder) Desired Earth resistance < 0.5 Ohms Earthing Strip 25 X 3 mm thick Grounding Wire Pure Copper, AWG 10 or 6mm2 No. of Earthing pits per site 2 Earth Distribution From Earth pit to equipment rack bus bar by 16 sq.mm green insulated multistrand single core copper cable Connecting lugs: 16 sq. mm Copper lugs Type of fastners: SS Nuts, bolts and washers for fitting of copper plate with copper strip, for interconnection of pits by copper lugs etc. Warranty The Chemical Earthings shall be warranted for TEN(10) years.	
Item No 6. 9 U RACK. Qty = 9 Nos 9U Rack Specification: Racks manufactured out of steel sheet punched, formed, welded and Powder coated Rack should be from ISO 9001:2008 Certified Company & UL Listed Standard for Racks configuration will be welded frame and vented top cover Rack should have Front Toughened Glass Door with lock & Key and Back Cover Rack should be 9U(1U=44.45 mm) in Height, 550MM Width, 500MM Depth. Rack should Conforms to DIN 41494 or Equivalent EIA /ISO / EN/CEA Standard Rack should have Adjustable mounting depth, Rack 4 No Adjustable, 19" verticals with Punched 10mm Square Hole and Universal 12.7mm-15.875mm-15.875mm alternating hole pattern offers greater mounting flexibility, maximizes usable mounting space. Rack should have Numbered U positions,	

Rack should have 100% assured compatibility with all equipments conforming to DIN 41494 (General industrial standard for equipments) Powder coated finish with seven Tank pretreatment process meeting IS Rack should have Proper Grounding & Bonding Rack should have Fan module Mount Provision on top Cover 1Ph, 230V, 8A, 2U standard rack mount power distribution unit with 6 X Indian Round Pin 5A, Inlet Plug type 6A Indian Round Pin, 8A Fuse - PDU Rating 1.8KVA Rack should have 1 No Cantiliver shelf. Rack should have minimum 2 Nos of FAN. Rack should have 1 No Horizontal Cable Organizer with Plastic Loops. Rack should have provision for cable entry Exit from Both top & Bottom. Rack should have 1 Packet of Mounting hardware, Pack of 20	
Item No 7. 6 U RACK. Qty = 80 Nos 6U Rack Specification Racks manufactured out of steel sheet punched, formed, welded and Powder coated Rack should be from ISO 9001:2008 Certified Company & UL Listed Standard for Racks configuration will be welded frame and vented top cover Rack should have Front Toughened Glass Door with lock & Key and Back Cover Rack should be 6U(1U=44.45 mm) in Height, 550MM Width, 500MM Depth . Rack should Conforms to DIN 41494 or Equivalent EIA /ISO / EN/CEA Standard Rack should have Adjustable mounting depth, Rack 4 No Adjustable, 19" verticals with Punched 10mm Square Hole and Universal 12.7mm-15.875mm-15.875mm alternating hole pattern offers greater mounting flexibility, maximizes usable mounting space. Rack should have Numbered U positions, Rack should have 100% assured compatibility with all equipments conforming to DIN 41494 (General industrial standard for equipments) Powder coated finish with seven Tank pretreatment process meeting IS Rack should have Proper Grounding & Bonding Rack should have Fan module Mount Provision on top Cover 1Ph, 230V, 8A, 2U standard rack mount power distribution unit with 6 X Indian Round Pin 5A, Inlet Plug type 6A Indian Round Pin, 8A Fuse - PDU Rating 1.8KVA Rack should have 1 No Cantiliver shelf. Rack should have minimum 2 Nos of FAN. Rack should have 1 No Horizontal Cable Organizer with Plastic Loops. Rack should have provision for cable entry Exit from Both top & Bottom. Rack should have 1 Packet of Mounting hardware, Pack of 20	
Item No 8. High Capacity CPE. Qty = 27 Nos. Technical Specification for High Capacity (55Mbps) Customer Premises Equipment(CPE): Make/Model: Vendor must Specify ~~1 System must operate in unlicensed band frequency spectrum of ISM-III Unlicensed band. Operating frequency range: 2.4 Ghz Band~~ 1 System must operate in unlicensed band frequency spectrum 2.4Ghz band as per India WPC (Amendment)	

~~2 The Wireless system shall be for outdoor type supported with integrated antenna.~~
2 The Wireless system shall be for outdoor type supported with integrated/external antenna (Amendment).

3 The system proposed shall not use active RF antenna and cables to avoid failures due to moisture/rain etc.
4 System should support a Channel Width 5/10/20 MHz
5 System should use an Access Method of TDD/TDMA
6 Modulation Type should be OFDM based QPSK, 16 QAM , 64 QAM , 256 QAM
7 RF Power output shall be less than 22 dBm.

~~8 Should have provision to increase the gain of integrated antenna up to 19 dBI for 2.4 GHz band by adding passive antenna without cables to support for longer range.~~
8. Should have provision to increase the gain of integrated/external antenna up to 19 dBI for 2.4 GHz band by adding passive antenna to support for longer range (Amendment).

9 One way latency should not be more than 7 ms.

~~10 Protocols: IPV4,IPV6,UDP, TCP, ICMP, Telnet, SNMP, FTP Should be manageable from NMS.~~
10 Should be manageable from NMS (Amendment).

11 Inbuilt spectrum analyser for selecting appropriate sub Channels
12 Link Monitoring: Menu driven options for RF link monitoring with parameters like RSSI, Signal level and Uplink/Downlink efficiencies from both Central Point and Remote Point for checking the quality of RF link and for alignment of antenna / radio.
13 Power Consumption of the radio should be less than 10 W.
14 The system support remote maintenance of radio units & shall have the capabilities of upgrading the Software over the air from central location
15 The system shall allow enabling prioritization of VOIP and Video over data traffic.
16 The system shall be capable of applying different qualities like offering different services types, latency, jitter and bandwidth control for each direction (uplink and downlink) independently
17 The system shall pass through bridging mode SLA per CPE(CIR/MIR).
18 The system shall be equipped with surge suppressors to protect it from unavoidable lightning conditions.
19 The complete system should support high level of security mechanisms such as AES for end-to-end connectivity to avoid any breaches due to Interference or hacking, FIPS-197
20 The system should be type approved by WPC & operate accordingly
21 System should support operating temprature from -20 deg Celsius to +55 deg Celsius.

~~22 Web user interface, CLI (Telnet), SSH HTTP, SNMP.~~
22 Web user interface, CLI over SSH, HTTPS, SNMP (Amendment).

23 System should WEEE/RoHS compliance
24 Radio Shoud be IP55/IP66/IP67 certified for outdoor deployment.
25 System should be able to serve as DHCP Server and DHCP client
26 System should have inbuilt surge protection mechanism up to 1 Joule

27 System should support features like NAT and L2TP, DHCP option 82 to enhance security and prevent broadcast. ~~28 System should have the support of VLAN 802.1ad (DVLAN Q-in-Q), 802.1Q with 802.1p priority, dynamic port VID~~ 28 System should have the support of VLAN 802.1Q and 802.1p priority (Amendment). 29 System should support minimum 512 subcarrier to support superior performance in NLOS condition Notes: Capacity 55 Mbps 1. These equipment are intended for use at repeater locations situated within minimum aerial distance of 15 Kms (LOS) from any of the nearest Base station and should be able to give minimum throughput of 30 Mbps at 10 db fade margin. 2. The equipment shall be used for outdoor purposes and shall be weather proof to withstand local conditions such as exposure to rain, thunder & lightning and continuous sunlight. 3. The equipment shall be lightweight for rapid deployment and easy to set-up.	
Item No 9. 10 MB CPE. Qty = 105 Nos. TECHNICAL SPECIFICATIONS & FEATURES OF SUBSCRIBER RADIO EQUIPMENT (CPE) for Remote Sites Notes: Capacity 10 MB 1. These devices are intended for use at remote locations situated within maximum aerial distance of 15 Kms (LOS) from any of the nearest Base stations and should be able to give a minimum throughput of 6 Mbps at 10 db fade margin. Some of the remote installations will be fixed and some will be Semi - fixed type. The details are mentioned in the file Sitedetails. 2. The equipment shall be used for outdoor purposes and shall be weather proof to withstand local conditions such as exposure to rain, thunder & lightning and continuous sunlight. 3. The equipment shall be lightweight for rapid deployment and easy to set-up. Specifications: Make/Model: Vendor must Specify ~~1 System must operate in unlicensed band frequency spectrum of ISM-III Unlicensed band. Operating frequency range: 2.4 Ghz Band.~~ 1. System must operate in unlicensed band frequency spectrum 2.4Ghz band as per India WPC (Amendment). ~~2 The Wireless system shall be for outdoor type supported with integrated antenna.~~ 2 The Wireless system shall be for outdoor type supported with integrated/external antenna (Amendment). 3 The system proposed shall not use active RF antenna and cables to avoid failures due to moisture/rain etc. 4 System should support a Channel Width 5/10/20 MHz 5 System should use an Access Method of TDD/TDMA 6 Modulation Type should be OFDM based QPSK, 16 QAM , 64 QAM , 256 QAM	

7 RF Power output shall be less than 22 dBm.
8 Should have provision to increase the gain of integrated antenna up to 19 dBI for 2.4 GHz band by adding passive antenna without cables to support for longer range
9 One way latency should not be more than 7 ms.

~~10 Protocols: IPV4,IPV6, UDP, TCP, ICMP, Telnet, SNMP, FTP Should be manageable from NMS.~~
10 Should be manageable from NMS (Amendment).

11 Inbuilt spectrum analyser for selecting appropriate sub Channels
12 Link Monitoring: Menu driven options for RF link monitoring with parameters like RSSI, Signal level and Uplink/Downlink efficiencies from both Central Point and Remote Point for checking the quality of RF link and for alignment of antenna / radio.
13 Power Consumption of the radio should be less than 10 W.
14 The system support remote maintenance of radio units & shall have the capabilities of upgrading the Software over the air from central location
15 The system shall allow enabling prioritization of VOIP and Video over data traffic.
16 The system shall be capable of applying different qualities like offering different services types, latency, jitter and bandwidth control for each direction (uplink and downlink) independently
17 The system shall pass through bridging mode SLA per CPE(CIR/MIR).
18 The system should support VLAN 802.1Q feature.
19 The system shall be equipped with surge suppressors to protect it from unavoidable lightning conditions.
20 The complete system should support high level of security mechanisms such as AES for end-to-end connectivity to avoid any breaches due to Interference or hacking, FIPS-197
21 The system should be type approved by WPC
22 System should support operating tempratures from -20 deg Celsius to +55 deg Celsius.

~~23 Web user-interface, CLI (Telnet), SSH HTTP, SNMP.~~
23 Web user-interface, CLI over SSH, HTTPS, SNMP (Amendment).

24 System should WEEE/RoHS compliant
25 Radio should be IP55/IP66/IP67 certified for outdoor deployment.
26 System should be able to serve as DHCP Server and DHCP client
27 System should have inbuilt surge protection mechanism up to 1 Joule
28 System should support features like NAT and L2TP, DHCP option 82 to enhance security and prevent broadcast
29 System should be upgradable with software license keys without changing the Hardware

~~30 System should have the support of VLAN 802.1ad (DVLAN Q-in-Q), 802.1Q with 802.1p priority, dynamic port VID~~
30 System should have the support of VLAN 802.1Q with 802.1p priority (Amendment).

31 System should support minimum 512 subcarriers to give superior performance in NLOS condition

Item No 10. Antenna for AP Base. Qty = 60 Nos. ACCESS POINT ANTENNA/ Base Station Antenna: Specification: Make/Model: Vendor Must Specify 1.FREQUENCY RANGE 2.4 – 2.48 GHz 2.ANTENNA TYPE Access Point Sector 3.GAIN 18dBi +1dBi /-1dBi 4.VSWR 1.5:1 max 5.PORT TO PORT ISOLATION 28 dB min 6.6dB BEAMWIDTH-AZIMUTH 65° 7.3dB BEAMWIDTH-AZIMUTH 52° 8.3dB BEAMWIDTH-ELEVATION 6° 9.ELEVATION NULL FILL Down to -18° 10.POLARIZATION Dual Slant, +/- 45° 11.MAXIMUM INPUT POWER 20 W per channel 12.INPUT IMPEDANCE 50 Ohms 13.FRONT-TO-BACK RATIO > 33 dB, 180 ± 30° 14.CROSS POLARIZATION > 20 dB, 0 ± 30° 15.MOUNTED ANT WEIGHT (w/ AP) Should not exceed 15 kg (33 lb) 16.ANTENNA CONNECTOR 2 X N-Type Female, Straight 17.WIND SURVIVAL 206 km/h 18.WIND LOADING (@216 km/h) Front: 1202 N (273 lbf) 19.Side: 461 N (105 lbf)" 20.POLE MOUNTING HARDWARE Quick Release, 1.5” TO 4.5” Dia. Pole to be supplied 21.MECHANICAL DOWNTILT 0° TO 5°	
Item No 11. PoE. Qty = 135 Nos. Specification: Make/Model: Vendor must specify Input Voltage: AC 100-240 VAC Output Voltage: + 29.5 VDC Minimum Peak load current 0.6 A Environment Operating Temperature : -40 C to +60C Operating Relative Humidity : -5% to 90%, Non- Condensing EMI: FCC Class B EN55022 Class B Power On Indicator: Green LED	
Item No 12. 2 KVA UPS SNMP based. Qty = 12 Nos. 2KVA UPS Specification Make/Model: Vendor must specify Rating 2 KVA / 1600 Watts Input AC Parameters	

Input Voltage 160 - 300V Frequency 50 Hz; Tolerance (45-55) Hz Input power factor > 0.98 Output AC Parameters Rated apparent/active power 1000VA / 800W Output Voltage 220/230 V AC Frequency 50 +/- 0.5 Hz Waveform True Sine Wave Over load 110% for 30 seconds, 125% for 1 second Output Power Factor 0.8 Indication & Controls LED Indication/ Display Level Indications LED mimic diagram + LCD Display with measurements (Input / Output / Bypass V & Hz, Battery V & capacity level indicator, Load % & level Indicator) Audio Alarm operation Suitable Alarms for Battery Operation / Overload Communication Ports 1 x Intelligent-Slot (SNMP), 1 x RS232 Serial Port. UPS Remote Management & Administration UPS should have a SNMP Manager for remote administration and monitoring of UPS Parameters. Detailed specifications are enumerated below Back-up Time & Battery Bank Details (VAH Rating) 12V, VRLA Sealed lead-acid Maintenance Free batteries for providing necessary back-up of 12 hours @450W load (7200 VAH) Isolation Transformer UPS output shall be fully isolated by dedicated isolation transformer at the Input of the UPS Environmental Operating Temperature: 0 Degree C to 40 Degree C Relative humidity 0% to 95%, non-condensing Audible Noise <50 dB Certification Quality System ISO 9001, ISO14001, OHSAS 18001 Markings CE Safety IEC 62040-1 EMC IEC 62040-2 Environmental RoHS Rack: Necessary Rack for UPS and Batteries must be supplied	
<u>Item No 13. TVSS 25 KA. Qty = 12 Nos</u> TECHNICAL SPECIFICATIONS OF TRANSIENT VOLTAGE SURGE SUPPRESSOR (TVSS) Make/Model: Vendor Must Specify Transient Voltage Surge Suppressor (TVSS) shall be connected to AC input line. Surge Current Capacity : 25 KA Connection Type : 1 Phase Parallel Operating Voltage Range : 15% Fault Current Rating(AIC): 14 KAIC Operating Frequency Range: 47 to 63 KHz	

EMI/RFI Attenuation : 40 dB typical Response Time : <0.5 nanosecond	
Item No 14. Spike board with surge suppressor. Qty = 120 Nos. **Make/Model: Vendor Must Specify** **"Features a 2,444 Joule energy rating"** Maximum Spike Current: 86,000 Amps 1,500 Watts of Continuous Power Cable management Delivers power through a 3-metre, heavy duty cable Safety Shutters help to protect from dust and debris from unused sockets Allow room for large AC adapter blocks	
Item No 15. EMS S/w for Wireless devices. Qty = 1 No. NMS specification & requirement: Make/Model: Vendor must Specify 1.The proposed solution shall have network management system at Sector Headquarter (Network Operator Control) to manage & configure Base Station Unit & Remote Station Unit with the following features & functionality: a)Automatic & Manual device discovery of all network elements such as Base Station, Remote stations etc. System shall keep details of all the network elements. b)A real time physical network map containing all the different network element with drill down to individual card level view which are being managed shall be provided. c)It shall provide intuitive web interface and a comprehensive, context sensitive user guide/ help system d)Shall be possible to use pre-defined custom filters for searching entities such as alarms, Base Stations, Remote stations etc through NMS e)Support for both user based and rol based authorization to limit and control access to NMS f)Automatic & Manual device discovery of all network elements such as Base Station, Remote station etc. System shall keep details of all the network elements. Displays of connected network devices from the NMS Hardware, giving a complete view of the network without physically checking each device at remote sites. g)Alarms to be collected from the entire network and stored within the database and displayed using filters in the alarm custom view. h)Performance management of network elements i)NMS should be able to generate performance report for each RF parameter for more than six months j)Should be able to support atleast 10000 nodes. Should support high availability feature k)NMS should be able to configure Radio without login to radio.NMS should support the configuration of multiple device at the same time.NMS Should be able to take backup and restore configuration of single and multiple simultaneously. l)System should be able to generate historical and current graph of statistic for all RF parameter and ethernet Parameter. m)System should be able to store all the report for minimum 6 months. System should have the report for all inventory device System must support graphical report of RF and Ethernet statistic. System should be	

able to generate the report for Device configuration. System should be able to generate the report for all radio system health. n) It is mandatory for NMS to Support High Availability feature for redundancy of NMS.	
Item No 16. NMS S/w for UPS. Qty = 1 Nos. UPS Management Software (2 KVA UPS): The UPS management software should monitor and manage from one to multiple UPSs in a networked environment including LAN, INTERNET and Modbus networks. It should not only prevent data loss from power outage and safely shutdown systems, but also store programming data and scheduled shut down of UPS Systems. The SNMP manager through the SNMP card should allow remote monitoring and management of multiple UPSs from anywhere with internet access. The Power Management Software should leverage internet capability of SNMP manager to remotely program or shut down UPS's. Network Support RJ45 10/100BaseT Supported MIB RFC1213, RFC1628, oem MIB Supported Software oem Supported OS Windows family, Linux, MAC, and Solaris Supported Extension Devices Optional environmental monitoring detector Power Input 12V Power Consumption 2 watt (max.) Operating Temperature 0 - 40°C Operating Humidity 0%-95% Technical Features of SNMP Card " Allow control and monitoring of multiple UPSs through RJ-45 Network connection " Real-time dynamic graphs of UPS data (voltage, frequency, load level, battery level) " Warning notifications via audible alarm, broadcast, mobile messenger, e-mail and SNMP traps " Historic data log should be stored in centralized PC database " Simple firmware upgrade with one click " Password security protection and remote access management " Support optional environmental monitoring detector for temperature, humidity and smoke	
Item No 17. SERVER Grade PC with OS. Qty = 2 Nos. Server Grade PC Specification: Specification for Workstation 1. Make & Model: Vendor should mention the make and model 2. Processor : Intel® Xeon® E5-1620 3.60 GHz, 10MB cache, 4 Core or higher 4. RAM : Minimum 16 GB(4X4GB) DDR3 1333 MHz ECC expandable upto 64 GB with atleast 8 DIMM Slots 5. HDD : Minimum 2 X 500 GB(7200RPM) SATA Drive, RAID 0 Configuration. 6. Network : Integrated 10/100/1000 Mbps Ethernet Controller and IPV6	

compliant. 7. Optical : Minimum 16X DVD + /-RW with Dual Layer Drive Write Capabilities (Preferably same make & colour as CPU box) Complete with driver software on CD/DVD media, standard accessories and cables. 8. Slots : Min 3 nos of PCI series slots 9. Graphics : 2GB nVIDIA Quadro graphics card to be fitted in the motherboard. 10. Standard : USB 2.0 (minimum two on front panel, minimum 4 on I/O back panel) 11. Monitor : OEM Monitor 23 inches(Minimum) diagonal Flat Panel LCD/LED Monitor with standard accessories and cables (Preferably same make & color as CPU box) 12. Keyboard : USB 104 Key Standard Keyboard (Preferably same make & colour as CPU box) 13. Mouse : USB Optical Scroll Mouse (Preferably same make & colour as CPU box) 14. Operating System: Windows 8.1 Pro 64 downgrade to Windows 7 Professional 64-bit OS DVD + Driver DVD 15. Chassis : Vertical Tower 16. Other : a) Power Cables c) Power Extension spike guard with 4nos. of 5 Amps output d) Patch cord - Min. 3m length with Branded Factory made e) All drivers on CD/DVD media f) Energy Star 5.0 certified	
Item No 18. 42 inch LED Display. Qty = 2 Nos. LED Display Specification: Display Type LED LED Screen Size 40-42" Max. Resolution 1,920 x 1,080 Brightness 500cd/m2 Contrast Ratio 5,000 : 1 Aspect Ratio 16:09 Viewing Angle (H/V) 178° / 178° Display Color 16.7million Response Time 8ms (G to G) Video System NTSC / PAL Panel Life 50,000hours Filter Type 3D combfilter Interface Video Connector CVBS, HDMI x 2, Component (D-sub 15pin) RGB / DVI Connector Analogue D-sub, DVI-D, Display port Input Signal 0.7Vp-p ±5% HDMI Connector HDMI 1, HDMI 2 Audio Connector RCA (L/R), Stereo mini jack Output Signal Loop-through line level (PC only), Speakers 2 x 5W On Screen Display Language English General Electrical Input Voltage 100 ~ 240V AC (50/60Hz) Power Consumption Type 108W Type 85W Environmental Operating Temperature 0 ~ +40°C (+32°F ~ +104°F)	

Operating Humidity 10% ~ 80% (Non-condensing) Rack Mounts	
Item No 19. CPE Antenna. Qty = 130 Nos CPE ANTENNA SPECIFICATION Make/Model: Vendor Must Specify 1. ANTENNA TYPE: PROPOSED ANTENNA SHOULD BE CAPABLE OF AVOIDING RF CABLE LOSS, EFFECT OF MOISTURE, ETC. 2. GAIN: 15dB	
Item No 20. Any Other Item Required to Complete the Project. Qty = 1 AU Any other item which may be required for successful completion of the project to be quoted by the bidder.	
Item No 21. Installation & Commissioning. Qty = 1 AU Delivery, Installation, Testing, Commissioning & System Integration: Delivery: 1. The successful bidder has to deliver the material to Head Materials Oil India Limited Duliajan, Dist. Dibrugarh Assam - 786602 Within 90 days from the date of issue of Purchase Order by OIL. Installation and Commissioning: The installation and Commissioning must be completed within 120 days from the date of delivery of materials. 1. The scope of installation, commissioning & system integration shall mean to install, configure and integrate the following (but not limited to), adhering to essential security and safety measures. a) Carry out installation of active components, passive components and accessories supplied as per standards for successful integration and implementation of the systems at all sites. b) Configuring and fine-tuning of subsystems to achieve overall optimal network performance and highest security. 2. The components to be installed and configured shall include but not be limited to: i) Wireless equipment/network units ii) Network Management System. iii) All patches and updates to be provided by the successful bidder during the currency of the contract. iv) Carrying out all general tests such as Power on test on delivery, pre-installation checks to ensure correct connections, completeness of system documentation, etc. v) The successful bidder shall not cause any damage to buildings/other	

premises/property; if any damage occurs, the successful bidder will perform restoration. Trenches, path/road cutting, etc. will be back-filled and restored to the original condition immediately after laying of the conduit/cable/erection of mast etc. The successful bidder, if required, shall also plug conduits and entrance holes with suitable sealing material, where the cable has been laid. vi) The system shall be subjected to inspection at various stages. The successful bidder shall follow all Safety Regulations and practices. vii) Bidders shall spell out various tests that are being proposed to be carried out for demonstrating the functionality of the solution. viii) The Successful Bidder shall provide warranty for all the components including hardware, software, etc. as per Tender for a period of one year from the date of the issuance of Final Acceptance Certificate. Any delay for acceptance caused by the successful bidder will result in automatic extension of the total warranty period by the same duration. x) The successful bidder shall be responsible for the commissioning and maintenance of the entire system. xi) The Successful bidder has to make his own arrangements for transportation and accommodation of the Installation Engineers at Duliajan.	
Item No 22. Warranty for One Year. Qty = 1 AU Warranty Terms: 1.Minimum 1(one) year onsite warranty against each item after successful commissioning. 2. Warranty has to cover all equipment, including power devices and batteries, workmanship of any equipment-fixing work carried out by successful bidder. 3. During the warranty period, any defective device shall have to be replaced with a new one within 48 hours of reporting the failure. Necessary configuration of the replacement device for proper operation of the device in the said Radio Network is the responsibility of the successful bidder. 4. Cost of all visits (including transport to and from Duliajan and accommodation at Duliajan) by bidder's personnel for warranty-related work shall have to be borne by the successful bidder. 7. Absence of the Service engineer / rigger-men during the warranty period will attract penalties as per the Penalty Clause of this document. 8. Delay in replacement of defective items will attract penalties as per the Penalty Clause of this document. 9. The successful bidder has to maintain the stock of spare items at IT Department, Duliajan during Warranty and AMS period as per list given below. Any spare item consumed must be replaced by the bidder within 15 days of consumption. In case of non-replacement of spares within stipulated 15 days period, OIL reserves the right to procure the same at its own cost and deduct the same from the amount due to the bidder. Spare items will become property of OIL after the completion of AMS period. Spare Items: 1.High Capacity AP: 2 Nos 2.High Capacity CPE: 2 Nos 3.10 MB CPE: 2 Nos	
Item No 23. Annual Maintenance Service for 4 years. Qty = 1 AU.	

1. The Annual Maintenance Contract shall start after successful completion of warranty period, as certified by OIL. 2. For any reason, if the warranty period is extended, AMS shall start after completion of the extended warranty period. 3. The AMS shall be for a period of four (4) years. 4. During the AMS period, any failed device shall have to be repaired/ replaced with a new/ standby one within 48 hrs. of reporting the failure. Necessary configuration of the replacement device for proper operation of the device will be the responsibility of the successful bidder. 5. In case of failure on the part of the successful bidder to rectify a reported problem within 48 hrs of reporting the problem, the tenure of the AMS will be extended on a pro-rata basis till rectification of fault, at no extra cost to OIL. This will apply to those failures which affect a) a backhaul link, which results in disconnection of all the nodes serviced by that backhaul b) the base station equipment, which disrupts the entire network. 6. Transport arrangements for the successful bidder's personnel for AMS-related work shall have to be made by the successful bidder. 7. AMS charges will be paid quarterly after completion of the quarter. The successful bidder must submit appropriate invoices to Head-IT, IT Department, Oil India Limited, Duliajan, Assam - 786602, on a quarterly basis, clearly mentioning the OIL Purchase Order no. and period of billing. 8. Non-OEM bidders must have a service agreement with the OEM for providing maintenance support for the solution. The bidder must submit a copy of the service agreement to OIL immediately after the placement of Purchase Order and before commencing installation and commissioning. 9. Absence of service team members/ delay in replacement of defective items will attract penalties as per as per the Penalty Clause in this document. 10.The successful bidder has to maintain the stock of spare items at IT Department, Duliajan during Warranty and AMS period as per list given below. Any spare item consumed must be replaced by the bidder within 15 days of consumption. In case of non-replacement of spares within stipulated 15 days period, OIL reserves the right to procure the same at its own cost and deduct the same from the amount due to the bidder. Spare items will become property of OIL after the completion of AMS period. Spare Items: 1.High Capacity AP: 2 Nos 2.High Capacity CPE: 2 Nos 3.10 MB CPE: 2 Nos	
Item No 24. Installation of Temporary Sites. Qty = 25 Nos. 1. The successful bidder has to establish connectivity to temporary installations from a nearby Base Station as per OIL's requirement. The job must be completed within 5 days of issue of work order by OIL. 2. Towers required for such temporary installations shall be provided by OIL. 3. The Successful bidder must submit separate invoices for such installations to Head-IT on a quarterly schedule. 4. Delay attributable to the bidder will attract penalties as per the Penalty Clause in this document.	
Item No 25. De-Installation of Temporary sites. Qty = 25 Nos.	

1. The successful bidder has to dismantle communication equipment at temporary installations as per OIL's requirement. The job must be completed within 5 days of work order issued by OIL. 2. The successful bidder must submit separate invoices for such de-installation to Head-IT on a quarterly schedule. 3. Delay attributable to the bidder will attract penalties as per the Penalty Clause in this document.	
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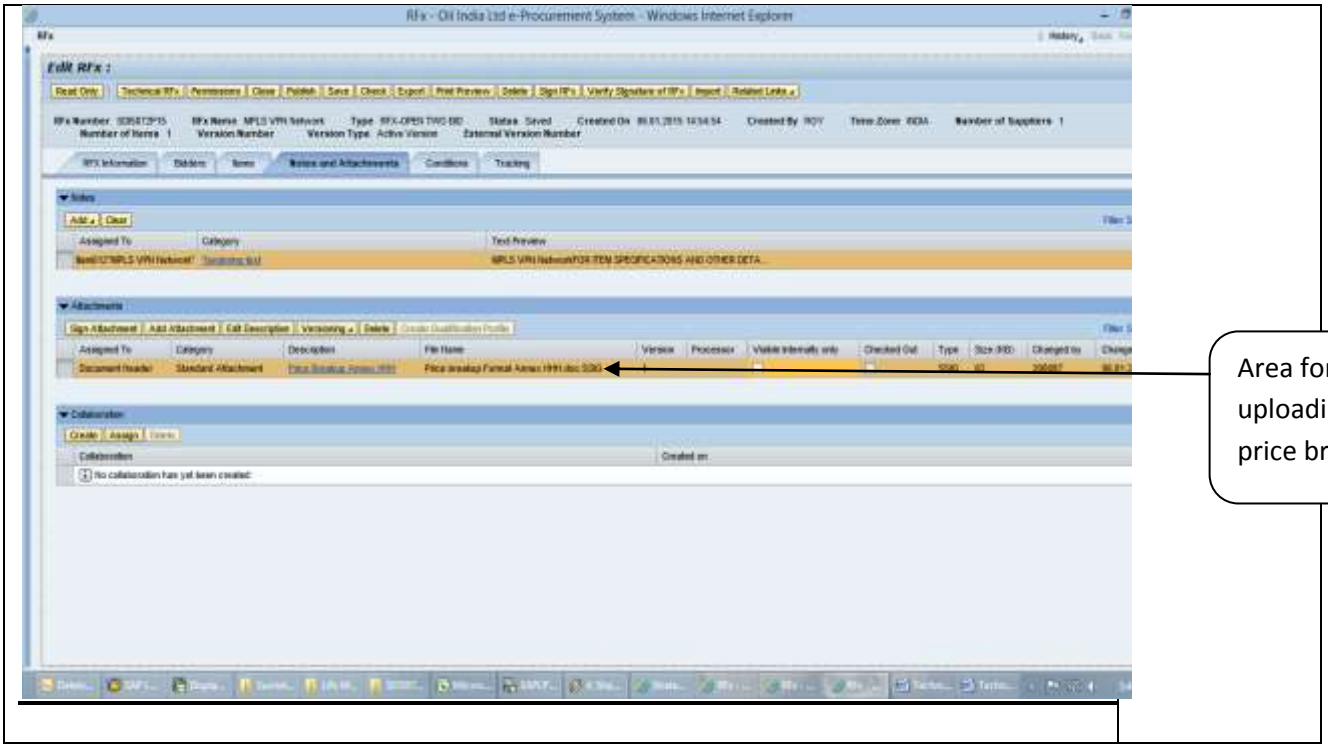
Scope of Work: 1. The successful bidder has to replace OIL's existing the radios with new radios in 81 (eighty one) remote sites. The successful bidder has to dismantle the exiting radios from tower and hand it over to IT Department, Oil India Limited. 2. The successful bidder has to design the network clearly specifying antenna and power requirement. **The sites details are given in this document.** 3. The successful bidder has to use OIL's existing infrastructure, i.e. towers, routers(CiscoWSC3560C12PC-S), switches(L2) while designing and implementing the new radio network. 4. OIL reserves the right to add new Radio Installations with similar radios and networking equipment. In case of such additions, OIL will inform the vendor in writing. Payment for such newly installed equipment will be made on a pro-rata basis from the date of informing the vendor. 5. For temporary installations, the towers will be provided by OIL; the radio equipment will have to be installed and de-installed as per OIL's requirement under this order. 6. The successful bidder has to place one (1) maintenance team at Duliajan,, consisting of atleast two service engineers (CCNA certified) and two rigger-men exclusively to provide maintenance support for entire period of Purchase Order(Warranty & AMS). The successful bidder has to arrange for Health Certificate and Work Accident Insurance for his personnel as per safety guidelines of Oil India Limited. 7. The successful bidder has to submit the bio-data of the service engineers/ rigger-men to OIL's IT Department within one month of placing purchase order. The bio data has to include full name of the person including any identification mark, his/her permanent address, present address amongst other details. The successful bidder has to ensure good health and physical fitness of the riggers. 8. In case of replacement personnel posted at Duliajan, OIL's IT Department has to be informed at least one month in advance. 9. Before discharging any personnel, the vendor has to ensure that all documents and material connected with OIL's Radio Network made available to the person are returned to OIL. In case of loss or misuse of any such material or document, the successful bidder will be liable for the same. 10. The successful bidder has to ensure that no document or information regarding OIL's installations/ radio network, made available to the vendor for carrying out this order, is misused for any un-lawful activity or activity detrimental to OIL's business interests. 11. Spare items must be stocked at IT Department, Duliajan during Warranty and AMS period. Any spare item consumed must be replaced by the bidder within 15 days of consumption. In case of non-replacement of spares within stipulated 15 days period, OIL reserves the right to procure the same at its own cost and deduct the same from the amount due to the bidder. Spare items will become property of OIL after the completion of AMS period. 12. The successful bidder has to arrange for transportation of his personnel and	

material to/ from remote sites for carrying out maintenance/ installation jobs. However, OIL will facilitate the arrangement of entry permits for personnel and vehicle . The successful bidder has to provide necessary details of their personnel and vehicles as required by OIL's security norms and shall also have to abide by OIL's security and safety rules to obtain the entry permits. 13. The successful bidder has to arrange for the accommodation of his personnel at Duliajan at his own cost. 14. The successful bidder has to provide cell phones to his service engineers to IT department. 15. The successful bidder has to provide all tools and equipment required for maintenance of the network, including Digital Multi-meter, Compass, GPS (Global Positioning System), etc. 16. Bidder's maintenance staff has to be available at OIL's IT department on all working days during OIL's working hours. However, on holidays and after office hours, they have to be available on call basis. 17. The successful bidder has to supply all materials required for Chemical Earthing at sites and construct the earth pit as per the specification mentioned in this tender document.	
Confidentiality Agreement: OIL Confidentiality and Non-Disclosure Agreement(NDA) will be applicable and bidder has to submit Non-Disclosure Agreement as per given format duly signed & Sealed by the authorized signatory of the bidder.	
Special Terms and Conditions: 1.The proposed solution of the bidder should be vetted by OEM of Radio equipment and the technical bid shall contain Point to Multipoint link engineering report on the basis of Base station coordinates. 2.Bidders must not propose solutions involving hardware products that have reached or are near end of life. The proposed solution must have minimum of 5 years of end of support/end of life from the date of bid closing. OEM certificate to this effect must be submitted along with the bid. 3. MAF must be submitted by the bidder for a) Radio Equipment - High Capacity AP,CPE,10 MB CPE, Antenna for AP & CPE. b) Base Station Switch 4. Bidder must submit un-priced bill of materials with Make/Model. (Inclusion). 5. System acceptance test to check performance, interference mitigation, spectrum reuse and link redundancy will be done after delivery of the materials at Duliajan for 20 sites to be decided by OIL. In case of failure of the system acceptance test, PO will be cancelled and OIL will not be liable for any payments. (Inclusion). 6. The system acceptance tests will have to be carried out at IT Data Centre, Duliajan in presence of IT Personnel and Service Engineers deputed by the vendor. (Inclusion). Following pre-requisites must be completed before conducting the acceptance tests: I. At least 20 remote sites in addition to all the 9 base stations shall be	

commissioned prior to the commencement of system acceptance test. The list of 20 remote sites to be commissioned will be prepared by OIL and provided to the vendor. II. The NMS/EMS system shall be commissioned and all the features as per NIT shall be demonstrated. The NMS/EMS system shall be used for verifying the system details of the installed radios. (Inclusion). 7. Following System Acceptance tests shall be performed after fulfilling pre-requisites: I. Power on Test: All the received equipment will be powered on and physical specifications of the hardware supplied will be checked against the NIT specifications. II. The following Radio parameters/features as per the NIT shall be demonstrated in live environment for each type of the Radio supplied: High Capacity AP, High capacity CPE and 10 MB CPE: a. Usable throughput b. Channel Width and Channel spacing c. Access Method d. Modulation Type e. RF Power output f. One way latency g. Link Monitoring functionality h. Remote Maintenance Support i. Prioritization of certain traffic j. Secure Web user interface, CLI over SSH k. End-to-end security mechanisms l. AAA authentication m. Symmetric & asymmetric bandwidth configuration n. VLAN support o. Subcarrier support p. Automatic Transmit Power Control III. The following Radio parameters/features as per the NIT shall be demonstrated in live environment for CPE radios (High capacity and 10 MB) in addition to the features in clause – 3 above: a. Inbuilt spectrum analyser for selecting appropriate sub Channels b. Power Consumption c. SLA per CPE(CIR/MIR) d. DHCP Server and DHCP client e. NAT IV. The system shall be tested to verify that interference mitigation has been done and all performance parameters as per NIT are being met for the solution. V. The system shall be tested to verify the capability to reuse frequency channel in collocated scenarios to increase the spectral efficiency. VI. The system shall be tested to verify the link redundancy of the repeater stations.	
Payment Terms: ~~1. 70% payment of the equipment cost will be paid against delivery of material. Balance 30% will be paid after commissioning of the entire network.~~ 1. 70% payment of the equipment cost will be paid against delivery of material and successful completion of System Acceptance test. Balance 30% will be paid after commissioning of the entire network. (Amendment)	

2. Warranty charges (if any) and AMS charges will be paid Quarterly after completion of the Quarter. The successful bidder must submit appropriate invoices to Head-IT, IT Department, Oil India Limited, Duliajan, Assam - 786602, on a quarterly basis, clearly mentioning the OIL Purchase Order No. and period of billing. The amount will be paid after deduction of penalty (if any) for this period of billing. 3. Charges for Installation & De installation of Temporary Sites shall be made on actual after completion of the job.	
Penalty Terms: 1. During the AMS/Warranty period, any failed device shall have to be repaired/ replaced with a new/ standby device within 48 hrs. of reporting the failure. Necessary configuration of the replacement device for proper operation of the device will be the responsibility of the successful bidder. In case of failure on the part of the bidder to rectify the problem within 48 hrs of reporting, a penalty of Rs 1000.00 per day per device will be levied and the tenure of the AMS/Warranty will be extended for the period on a pro-rata basis at no extra cost to OIL. However, maximum penalty will not exceed 15% of the total AMS charges for the period in question. 2. Non-availability of maintenance team personnel will be penalized as follows: a) Service Engineer (CCNA certified): Rs. 1000 per day per person. b) Rigger-man: Rs. 500 per day per person. 3. Delay in installation/ de-installation of temporary sites will be penalised at Rs 3000 per day.	
Price Breakup: Bidders should submit the price breakup of all the items as per "Annexure HHH" which has been uploaded under "Notes & Attachments" > "Attachments" as shown below. The price breakup "Annexure HHH" should be filled up, signed and uploaded under "Notes & Attachments" > "Attachments" only. **The filled up price breakup of all the items should not be uploaded in Technical RFx Response folder as it shall lead to rejection of the offer as per Bid Rejection Criteria.**	



NOTE:

Bidders should submit their bids (preferably in tabular form) explicitly mentioning compliance / non compliance to all the NIT terms and conditions of NIT.

Annexure-I

Sample Format of authorization letter from OEM
(To be typed on the letterhead of the OEM)

Ref. No_____ Date _____

Head (Materials)
Oil India Limited,
Duliajan-786 602

Sub: Authorization Certificate

Ref: Your tender enquiry No._____ Dated _____.

Sir,

We hereby authorize M/s_____ to quote for supply of equipment , provision of onsite warranty and Annual Maintenance support, including replacement of spares, for the above tender, on our behalf.

Yours faithfully,

For ……..…(Type Name & Affix Seal of the firm)

……..
(Signature of Authorized Signatory)

Name:
Designation:
Place: Email:
Phone No.: