

دولة الكويت

وزارة الإعلام

MINISTRY OF INFORMATION

Tender No:

ممارسة رقم:

توريد وتركيب وتشغيل وفحص وتسليم وضمان أطباق إرسال واستقبال ثابتة في مراقبة الإرسال الفضائي

Supply, install, Test, Commission, and Guarantee Fixed Transmission/Receiving Satellite Antenna Systems CHAPTER 1: SCOPE OF WORK

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CHAPTER 1 SCOPE OF WORK

1.1 Introduction

1.2 Objective

1.3 Time Scale

1.1 Introduction:

- 1.1.1. Ministry of Information (MOI) invites **SPCIALIZED** bidders **ONLY** to quote their best prices to supply, install, test, commission & Guarantee of **Four** standard Ku-Band Satellite Tx/Rx antenna systems including all their accessories (Dishes, Feed horns, LNBs, flexible waveguide cables, etc.) The project will be implemented at two different sites, two antennas at each site (MOI's Satellite Broadcasting Center and Al-Magwaa satellite Earth Station) according to the stipulated Tender Document (T.D.), ITU-R and all Arabsat and Eutelsat specifications and requirements. The required antenna system must be connected and compatible to the existing antenna system; the bidder is obligated to propose an optimum solution to connect the required antenna system as a backup in case of failure.
- 1.1.2. To be aware of the existing system in the site, the bidder may provide (On-site) visit before the designing phase to assure the compatibility of the system by its connections, distances, Power...etc.
- 1.1.3. The system shall meet all the General Conditions & Technical specifications that stated in this document, as this document is an essential part of the contract.
- 1.1.4. All offered equipment and required works shall be of the latest state-of-the-art technology. Due to importance of such critical on-air system, the participated bidder must have the required experience in satellite communications to execute the project in very high quality, broadcast standard and WELL-KNOWN manufacturers. The bidder should submit a list of their similar projects that have been done in **GCC** (if any). All offered equipment and works must be **in compliance** with the **following**:
 - a) This T.D., explicitly.
 - b) Arabsat specifications & requirements explicitly.
 - c) Eutelsat specifications & requirements explicitly.
 - d) CCIR ITU Recommendations & Reports.
 - e) Weather conditions in Sate of Kuwait according to MET: Metrological Department

1.2 Objective:

Execution of Supply, Installation, Testing, Commissioning, and Guarantee of **four** standard Ku-Band Satellite Tx/Rx Antenna systems as **following**:

- Installing **four** fixed antennas with diameter from range (2.4 3.8 m) at two different sites, two dish antennas at each site (MOI's Satellite Broadcasting Center and Al-Magwaa Earth Station) as described in chapter 3
- 2. Four Feed Horns
- 3. Professional PLL LNBs as described in chapter 3
- 4. Four completed flexible waveguide cables
- 5. All the necessary accessories for the antenna system

1.3 TIME SCALE:

The project must be completed and commissioned within **a month** of the date of signing the contract.

Following the successful commissioning, a one-week period shall be needed for testing the reliability of the whole system, before issuing the Final handing-over certificate (FHOC).

The guarantee period, twenty-four (24) months, shall start from the date of issuing the FHOC.

CHAPTER 2 GENERAL AND SPECIAL TECHNICAL CONDITIONS

- 2.1 System Engineering, Integration and Verification
- 2.2 Project Responsibility
- 2.3 Approval of Materials and System Drawings
- 2.4 Inspection, Testing, Commissioning and Design Review of equipment
- 2.5 Compliance & Offer Qualification
- 2.6 Guarantee
- 2.7 Selection, Rejection, Addition and/or Modification
- 2.8 Final Handing Over Certificate (FHOC)
- 2.9 Site Visits

CHAPTER 2: GENERAL AND SPECIAL TECHNICAL CONDITIONS

2.1 System Engineering, Integration and Verification:

- 2.1.1 All offered equipment must be of very high quality, broadcast standard.
- 2.1.2 Outdoor equipment shall be capable of withstanding the harsh conditions of temperature, humidity, wind & dust, which exist in THE STATE OF KUWAIT.
- 2.1.3 The bidder shall submit a compliance table indicating whether he is complying or not to each paragraph and sub-paragraph using the same numerical order. In case of not complying, the bidder shall give a detailed explanation.
- 2.1.4 Operation and maintenance manuals with detailed diagrams, circuit description (no black boxes shall be accepted), printed circuit layout & data sheets to be supplied with the equipment. All documentation shall be in English.
- 2.1.5 The contractor shall ensure for the state-of-the-art design and ensure that all the works including system integration, wiring, and installation.
- 2.1.6 Due to importance of such critical on-air system, the participated bidder shall have the required experience in satellite communications to execute the project. At least three references in executing similar projects must be submitted in the offer along with handover certificates from the end users.
- 2.1.7 The bidder shall give an Itemized price for each item of the offer along the brand and model of each item. The bidder shall give detailed prices of installation, commissioning & all the services in the BOQ as well.

2.2 Project Responsibility:

- 2.2.1 The project shall be executed and handed-over to MOI under the full responsibility of the Contractor.
- 2.2.2 Installation and testing equipment are the responsibility of the contractor. MOI will not be responsible for any installation and testing.
- 2.2.3 MOI shall have the right to request replacement of items that are not compatible with existing system, considered suitable and/or compliant with all current laws and regulations.
- 2.2.4 The given BOQ is for illustration only. It is the responsibility of the bidder to provide a solution as per specifications. Therefore, any item not mentioned here but necessary to make a flawless system shall be added and priced.

2.3. Approval of Materials and System Drawings:

The materials and system drawings must be submitted to the MOI at least **two** working days before executing any job on site. To ensure Accessibility of components/units on site to perform maintenance, the field must be reachable without any obstacles, taken into consideration in the layout of different equipment/units.

2.4. Inspection, Testing, Commissioning and Design Review of Equipment:

2.4.1 Inspection, testing and Commissioning of Equipment:

Up-link and down-link power budget calculations showing overall system performance according to the offered equipment parameters MUST be submitted with the offer. The **following parameters** shall be EXPLICITLY submitted for review and approved in accordance with Arabsat and Eutelsat organization regulations:

- **1.** Maximum **EIRP** per carrier.
- **2.** Modulation Method.
- **3. G/T** taking into consideration other atmospheric losses, and all equipment losses (waveguides, transfer switches, etc.).
- 4. Transmit Gain.
- 5. Transmission Quality.

2.5 <u>Compliance & Offer Qualification:</u>

- 2.5.1 The bidder shall be considered in full agreement with the contents of this Tender Document Technical, Arabic documents, All Chapters, Annexes and respond to all and each point and sub point of the specifications. In case the Bidder has any reservation, disagreement or deviation from this tender document, they should clearly indicate it by filling separate tables (Non-Compliance Schedules) originated and divided into columns for: Chapter No., Page No., Item No. and Reasons of Non-Compliance.
- **2.5.2** The bidder must provide complete detailed data sheets for all equipment proposed which must include all relevant technical information. The bidder's offer must also include system description and system block diagram in order to explain the offered solution. The MOI will **reject** any offer that is not compliant to these requirements.
- **2.5.3** The bidder's proposal **must** include the price list for each item, and total price for the requirements as per bill of quantity. The detailed list must include the unit's brand, model and description of all features and licenses included in each unit.

2.6 Guarantee:

The Contractor shall guarantee all system/sub-systems of the project for a period of **<u>24 months</u>** from the date of the Final Handing Over Certificate (FHOC) All defective units, devices or components during this period shall be replaced by the Contractor, at no extra cost or time added to the contract value and duration. During the guarantee period if any repetitive or epidemic faults take place in such a way that affects the performance, reliability, or availability of any of the project sub-systems, the Contractor must bear full responsibility to correct and amend these problems in a good engineering practice at no extra cost to MOI.

The Contractor's Warranty commitment should include the following services:

The warranty shall include the free replacement and/or repair of the defective component parts of the system that has demonstrated defects in materials and/or manufacturing and/or design, including the dispatch of a local technician within **48** hours of notification off failure.

- **2.6.1** The replacement and/or repair of defective components shall be made in not later than **four** weeks.
- **2.6.2** Transport costs relating to the shipment of any repair parts shall be included in the warranty.
- 2.6.3 The Contractor, without charge and cost for the entire duration of the warranty, must provide all the necessary updates to ensure the proper functioning and operation of equipment placed in service.

2.7 <u>Selection, Rejection, Addition and/or Modification:</u>

- All Bidders shall submit their proposal with a softcopy on compact discs, compliance sheets must be submitted in Microsoft Excel and pdf formats.
- Ministry of Information has the right to disqualify (exclude) any proposal that it does not contain the softcopy (CD) of the tender documents including technical and commercial offer.

The MOI reserves the right to:

- **2.7.1** Select the most preferred Manufacturer to MOI in case the Bidder offers more than one manufacturer for the same type of product for any item, which must be in conformity with the Tender Document's specifications and requirements.
- **2.7.2** Reject/cancel any auxiliary items (or quantities) in the offer within 15% max., of the total value of the offered price of the project. Deductions for these items shall be accomplished according to the contract rates. It is confirmed that cancelled items if any shall not affect the overall performance of this turn-key system.

2.7.3 Add any auxiliary item/s (or quantities) similar to those in the offer within 15% maximum of the total value of the offered price for the project. Payments for these items shall be accomplished according to the contractual rates.

2.8 Final Handing Over Certificate (FHOC):

This FHOC shall be issued by the Assistant under Secretary of Engineering Affairs, <u>24</u> <u>months</u> from the date of the FHOC. FHOC issuance may be delayed for the period in which system failures occurred until the restoration of acceptable performance of the system to the normal acceptable state.

2.9 Site Visits:

For proper & realistic quotation of the offers, all Bidders may visit the site (MOI satellite broadcast Center and Al Magwaa Satellite Earth Station). These visits can be arranged upon request.

CHAPTER 3: TECHNICAL SPECIFICATIONS

- **3.1** General Requirements and system description
- 3.2 Equipment Specification
- 3.3 Other Works

3.1 General Requirements and system description

This project is to supply, install, test, commission & Guarantee of **Four** standard Ku-Band Satellite Tx/Rx antenna systems at two different sites, antenna systems at each site (MOI's Broadcasting satellite center and Al Magwaa Earth station) as a backup for the existing antennas and to be supplied from the existing HPAs.

3.2 Equipment Specification

Fixed Antenna System Specifications'.

The bidder can gather all needed information on the installation location for the required antennas system in both sites (MOI Satellite Broadcasting Center and Magwaa satellite earth Station).

3.2.1 Fixed Antennas

3.2.1.1 Supply, Installation, Testing, Commissioning, and Guarantee of **four** (2.4 - 3.8 m) Ku-Band Satellite Tx/Rx fixed antenna systems from a well-known brand with their proper base and all their accessories (Dishes, Feed horns, LNBs, flexible waveguide cables, etc.). Two antennas shall be installed in the MOI Satellite broadcasting center and the other two antennas in Al-Magwaa Earth Station (One for Arabsat and the second for Eutelsat) at each site.

3.2.1.2 The required antenna systems are intended to be used as a back-up for the existing motorized antennas in case of emergency. Waveguide shall be installed to route the RF output from the existing HPAs to the required fixed antenna systems.

3.2.1.3 Antennas specification:

- Reflector: Aluminum painted with highly diffusive white paint.
- Ground Mount: Hot-dipped galvanized steel.
- Hardware: stainless steel
- Antenna optics: Front feed Focus recommended: Gregorian
- Reflector Material: Glass Fiber Reinforced Polyester
- Mount Type: El over Az, Tubular Mount
- Operational Winds: min. 45 mph (72 km/h) min. Gusts to 65 mph (105 km/h)
- Temperature: -40°C to 60°C
- Frequency: Rx:10.70 12.75 GHz , Tx: 13.75 14.5 GHz.
- Port-to-Port Isolation: Rx 30 dB Min, Tx 35 dB Min. @ 13.75 14.0 GHz , 75 dB Min. @ 14.0 - 14.5 GHz.

- VSWR: Tx: 1.3:1, Rx:1.5:1
- Gain: Tx: 48 dBi, Rx: 47 dBi

3.2.1.4 Frequency range must cover the same range as the existing Antenna/HPAs. The waveguide MUST be capable of handling full HPA power transmitted to the antenna.

3.2.1.5 RF Cables (Rj11 Coaxial Cable) recommended model: Belden

- 2 Reels: 100 meters
- Impedance (Ohm):75
- Inductance (µH/m): 0.35 or better.
- Capacitance (pF/m): 53.48
- Velocity of Propagation: 83% or better
- Delay: 3.971 or less.
- Conductor DC Resistance @ 20°C: 36.1 (Ohm/km) or less.
- Outer Shield DC Resistance @ 20°C (Ohm/km): 9.85 or less.
- Conductor Material: Bare Copper Covered Steel.
- Insulation Material: Foam Polyethylene.
- Outer Shield Material: Bonded Aluminum Foil-Polyester Tape-Aluminum Foil.

High Band 11.70 - 12.75 GHz

1100 - 2150 MHz

10.60 GHz

- Outer Jacket Material: PVC Polyvinyl Chloride
- Operating Temperature Range: -20°C to +80°C

3.2.2. Dual output PLL LNB type E:

3.2.2.1. Frequency Band:	Low Band
3.2.2.2. Input Frequency:	10.70 - 11.70 GHz

- **3.2.2.3.** LO Frequency: 9.75 GHz
- **3.2.2.4.** Output Frequency: 950 1950 MHz
- **3.2.2.5.** Spuriouses: -60 dBm @ 1700 MHz typ.
- **3.2.2.6.** Gain: 60dB typ.

3.2.2.7. Flatness: ±0.25 dB max. within 30 MHz ±2 dB max. each band

3.2.2.8. Noise Figure / Noise Temperature: 0.8 dB / 59 K typ.

3.2.2.9. Phase Noise (Std): -35 dBc @ 10 Hz -62 dBc @ 100 Hz -75 dBc @ 1 kHz -80 dBc @10 kHz -90 dBc @ 100 kHz -120 dBc @ >1MHz, typ

3.2.2.10. Phase Noise (Option ULP): 35 dBc @ 10 Hz -65 dBc @ 100 Hz -82 dBc @ 1 kHz -94 dBc @ 10 kHz -98 dBc @ 100 kHz -120 dBc @ >1MHz, typ.

3.2.2.11. Image Rejection: 40 dB min.

3.2.2.12. Output P1dB: +15 dBm typ

3.2.2.13. Output IP3: +25 dBm typ.

3.2.2.14. Output VSWR: 1.7:1 typ.

3.2.2.15. Output Connectors: 2 pcs F-type 75Ω / N-type 50Ω Option SMA-type 50Ω

- 3.2.2.16. Input Waveguide: WR 75 / R 120. Flange PBR 120
- 3.2.2.17. Input VSWR: 2.3:1 max., 1.3:1 with isolator max. (option)
- 3.2.2.18. LO Leakage: -60 dBm @ waveguide input
- **3.2.2.19**. Internal Ref. Stability: ±5 kHz -20 to +70°C (±10 kHz -40 to +80°C) ±10 kHz -20 to +70°C (±15 kHz -40 to +80°C)
- **3.2.2.20**. External 10MHz Ref.: Level: -15 to +5 dBm. Supplied through the High band output connector (with no ext. 10 MHz ref. present LO shifts -20 ppm)

3.2.2.21. DC Input: +12 to +26 V. supplied through any or both output connectors (Ext. 10 MHz ref. model: High band output connector)

- **3.2.2.22.** Power consumption: 5 W typ.
- **3.2.2.23.** Temperature Range: -40 to +80°C

3.3 Other Works:

To supply, install, integrate, test, commission, and guarantee **one** new Multiviewer. The required Multiviewer shall be installed and connected to the existing transmission system at MOI satellite broadcasting Center in the subdivision News Exchange Section.

3.3.1 Multiviewer specifications:

3.3.1.1 Connections:

- Video Inputs:
 16 x 10-bit SD-SDI, HD-SDI and 6G-SDI
- SDI Video Outputs: 16 x 10-bit SD-SDI, HD-SDI and 6G-SDI
- SDI Rates: 270Mb, 1.5G, 3G, 6G
- SDI Video Multiviewer Outputs: 2x 10-bit HD-SDI, 2 x 10 bit 6G-SDI
- HDMI Video Multiviewer Outputs:
 1 x HDMI type A connector Output supports EDID of the monitor
- Reference Input: Black Burst and Tri-Sync for SD, HD and 4K.
- Multi Rate Support Auto detection of SD, HD, or 6G-SDI Simultaneous viewing of 4K, HD and SD video.

3.3.1.2 Standards

- SD Video Standards NTSC, PAL

3.2.1.3 Support the following standards:

- HD Video Standards
 2K Video Standards
 Ultra HD Video Standards
 4K Video Standards
- 3.2.1.4 SDI Compliance
- 3.2.1.5 Audio Meters
- 3.2.1.6 Source Routing
- 3.2.1.7 SDI Video Sampling
- 3.2.1.8 SDI Audio Sampling
- 3.2.1.9 SDI Auto Switching

<u>CHAPTER 4:</u> Bill Of Quantity

4.1 B.O.Q 4.2 Important Notes

CHAPTER 4: BILL OF QUANTITIES

4.1. <u>B.O.Q.:</u>

No.	Description	Qty.	Unit Price		Total Price	
			K.D.	Fils	K.D.	Fils
1.	System Engineering & Design Review	L.S.				
2.	Fixed Transmission/Reception	4				
	Antenna system					
3.	PLL LNB	4				
4.	Rj coaxial cable reel 100 meter	2				
5.	Waveguide cables	4				
6.	Feedhorns and Accessories	L.S.				
7.	Additional Equipment or works that	L.S.				
	are required to complete the system					
	but not mentioned in the above					
	specifications and any extra					
	cost/materials not clearly mentioned					
	above.					
8.	Other Works	L.S.				
GRA	GRAND TOTAL: (K.D.)					

4.2. Important Notes:

- **4.2.1.** Any items/works not mentioned in the previous pages and/or the attached BOQ but indispensable for proper installations / implementations / performance of the different sub-systems of this project MUST be inserted, described, and priced in the relevant schedule/s. Otherwise, these items/works shall be provided/done free of any charge to MOI, before PHO.
- **4.2.2.** The contractor MUST include in their Detailed BOQ all the Items/works <u>either</u> <u>mentioned/required in all previous pages or in the BOQ</u>.
- **4.2.3.** Detailed breakdown lists of all offered items/works MUST be submitted in the requested BOQ including manufacturer name and product's part number. The technical evaluation will be performed based only on the part numbers/models that mentioned in the detailed BOQ.
- **4.2.4.** All items must be priced. No option items will be accepted in the BOQ.