

Supply, Installation and Commissioning of
4.5M C & Ext-C Band Rx Earth station

Request for Proposal (RFP)



**SPACE APPLICATIONS CENTRE
INDIAN SPACE RESEARCH ORGANIZATION
AHMEDABAD**

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Section-1: Introduction

1.1.Introduction

Space Application Centre, Bopal Technical campus, Ahmedabad, ISRO, is equipped for earth observation services receiving meteorological data from Indian satellite systems. There is an additional requirement of new 4.5M C & Ext. C-band antenna system to cater to the requirements of meteorological data reception from the current as well as future satellite systems-

This proposal is for the turn key solution required for receiving INSAT-3DS meteorological as well weather station data. The procurement of 4.5meter C & Ext. C-band receive only Earth Station mainly include “Supply, Installation, Commissioning, Acceptance and Maintenance.

1.2.Description of Earth Station

This proposal aims at establishing a 4.5 C & Ext. C band receive only earth station for the reception of meteorological data from INSAT-3DS satellite.

The proposed earth station system which consist of following sections.

- C & Ext. C- band Antenna System with dual linear polarization (outdoor unit)
- Antenna Tracking Systems (Indoor)
- RF Section up to IF signal distribution system. (Indoor)

The earth station will receive signal in C & Ext. C band data, consists of Antenna & Feed, tracking pedestal, & Mechanical systems.

The work includes, soil survey, civil works for antenna foundation, supply, installation, commissioning & final acceptance of the complete receive system up to C & Ext. C band down converter interface.

The System shall have the capability to track the GEO/GSO satellites, orbiting above earth equator in geostationary orbits having required inclination in step track, program track, and manual mode. The systems shall be installed and interfaced with the ground station RF systems up to the IF (70 MHz).

1.3. Earth Station Location

The proposed earth station is required to be established at SAC-Bopal campus, Ahmedabad. Table-1.1: Geo Location of the Site

Place	*Longitude (deg.)	*Latitude (deg)
SAC-Bopal, Ahmedabad	72.51	22.98

*Note:

The location details mentioned in the table is for reference only. However, the precise location information may be provided at the time of installation.

Section-2: RFP Guidelines

2.1 Scope of work

SAC intends to entrust the task of supply, installation, acceptance and maintenance of ‘C & Ext. C Band Receive only Earth station’ to a Vendor/ Bidder on turn-key basis.

1. The implementation of the project includes:

system engineering, preparation and submission of engineering schematic diagrams & drawings for antenna foundation design & installation including soil analysis & related civil works, RF interface link (including construction of cable duct) and overall system configuration as per RFP requirements, and supply, installation, integration, alignment (of antenna system), testing/characterization and commissioning of the complete earth station system as per RFP

specifications and requirements. Required system configuration, quality assurance related guidelines and other terms and conditions are described in this document.

2. The bidder shall explore and furnish all capabilities and resources to supply the required deliverable items and services in accordance with the delivery schedule and requirements mentioned in this RFP at appropriate places.
3. The bidder shall provide warranty for the complete system for three years and shall also quote for comprehensive annual maintenance contract (CAMC) for three years after the completion of warranty.
4. Supply of required interfacing cables of all types, patch panel, patch cords, RF, IF, coaxial connectors, transceivers, 5G IMT band reject filter (for pass band frequency from 3.71 to 4.8 GHZ) etc. and any other necessary accessories.
5. The project management team of SAC will periodically review the technical, commercial and managerial aspects of the activity. The typical reviews will be as under:
6. Design Review, with test plans and any other engineering reviews that seems necessary and essential.
7. Final On-site Acceptance Tests.

2.2 Responsibilities of Vendor

Following table defines vendor's responsibilities for entire turn-key work involving the establishment & commissioning of C & Ext. C band receive only system.

Table – 2.1: Responsibilities of Bidder

Sr. No	Bidders Responsibility	Compliance Yes/No	Remarks/ Justification
1.	To understand the requirements and scope of work completely and unambiguously as described in this RFP.		
2.	To Provide system engineering calculations along with the proposed hardware to meet the requirement, as projected in this RFP.		
3.	To provide requirement of space for electricity and equipment's		
4.	To submit a comprehensive list of deliverables covering all major/minor subsystems/components, cabling and interfaces along with the offer with price masked		
5.	To provide detailed cost break-up as part of the offer in the commercial bid		
6.	To comply and fulfil with the delivery schedule & engineering reviews as part of the offer		
7.	To prepare the Preliminary Design Review (PDR) and Detailed Design Review (DDR) documents and make presentation during engineering reviews before the committee appointed by SAC. It will be mandatory for the bidders to close all actions generated during these reviews and closure of these actions will be without impact on cost. .		

8.	To prepare, discuss and submit mutually agreed upon Acceptance Tests Plan (ATP) document to SAC incorporating all the changes suggested by SAC during the reviews		
9.	Vendor shall carry out detailed soil investigation, wind load, structural analysis before starting civil foundation work.		
10.	Vendor shall carry out site preparation and antenna pedestal and other construction work as per the soil investigation report.		
11.	To transport equipment to the site for installation and integration		
12.	Vendor shall provide the test reports for all sub-systems (eg. Antenna, LNA system, Downconverters, etc.) and get it approved by SAC.		
13.	Integration of the Hardware and Software of system.		
14.	To Install, commission and testing of the complete ground system as per the requirements given in this RFP		
15.	To perform acceptance tests as per approved ATP document		
16.	Supply of required interfacing cables of all types, patch panel, patch cords, power dividers, coaxial connectors, adaptors, power distribution boards etc falls under the scope of this RFP		
17.	To supply and install 5G IMT band reject filter		
18.	To Supply documentation, relevant OEM certificates, performance report of all subsystems and manuals in hard and soft copies.		
19.	To submit comprehensive maintenance plan for services during warranty period of 3 years.		
20.	The bidder shall provide list of critical spares, which the bidder shall maintain at the site for maintenance along with the offer.		
21.	The bidder shall Select the sub-systems in a manner which ensures the continuity of services for at least 10 years (preferably 15 years)		

2.3 General Guidelines and Other Conditions

1. Vendor shall comply all the specifications and requirements in RFP.
2. The bid submission must contain sufficient information and material to prove the bidder's interest and experience (minimum 5 years) in the field for similar type of work/solution. The bidder shall also submit the relevant documents indicating their previous experiences or list of similar type of work executed as turn-key solution. This is mandatory condition for the qualification of bid.
3. The bidder shall propose and quote for the most suited configuration and subsystems against the given set of overall specifications in this RFP and offer may include limited options with respect to subsystems. This should also clearly bring out merits and demerits
4. The overall system configuration and implementation plan should be clearly explained with the help of block schematic of the complete solution.
5. The bidder shall provide a Statement of Compliance (SoC), covering each specification of the system and subsystem involved in the complete earth station system as mentioned in the

respective system/subsystem details in this RFP. This SoC should be well supported by the documents consisting of data sheets, brochures, necessary calculations, etc. including make and model numbers, detailed specifications, block schematic, test data sheet if possible.

6. The bidder may be invited for technical discussion and presentation on the offer to an evaluation committee at SAC for clarification on any type of technical issues if any.
7. The implementation plan or delivery schedule as proposed by the bidder shall not exceed more than ten months from the date of placement of the purchase order.
8. SAC reserves the rights to reject the offer, if there are any deviations in the commercial and/or general terms and conditions offered against the RFP requirements even though the offer is technically suitable.
9. SAC (Purchaser) will assign responsibility of turn-key execution on single bidder (prime vendor) for the entire work. Any dependency on any sub-vendors, if any, shall be managed by the prime vendor and shall not have any bearing whatsoever on SAC (Purchaser) and the performance of the final contract. The prime vendor for this work shall also ensure that the sub-vendors also abide the terms and conditions of this turn-key work including the requirements in CAMC.
10. The responsibility of safe transportation and delivery of the total system to the site rests on the vendor which includes:
 - a) Transportation from factory to the site
 - b) Loading/unloading wherever applicable during transportation
 - c) Transit insurance

All expenditures for above activities shall be borne by the vendor of the turn-key work. SAC will provide Custom Duty Exemption Certificate wherever applicable and requested. This requirement shall also be projected in the bidding.

11. The overall configuration and implementation plan should be clearly explained with the help of block schematic of the complete system; also include the technical justification of choosing each sub-system with respect to the goal of meeting overall system specifications requirements.
12. The vendor must provide a Statement of Compliance (SoC), covering each point of system and sub-system specifications of complete earth station system as mentioned in respective sub-system details. SoC by the OEMs and not supported by vendor is not acceptable. In case of any discrepancy between OEM datasheet and compliance statement, OEM datasheet will be considered final and binding. This SoC should be well supported by documentation consisting of data sheets, brochure, calculations, literature etc. All relevant details of each subsystem like make & model number, detailed specifications, block schematic, if possible test data sheet etc. should also be provided.
13. After receiving the offers, Vendors will be invited if found necessary to make technical presentation on their offer to an evaluation committee at SAC. Vendors will be required to provide clarification, if called for, by the evaluation committee, on any matter related to offer.
14. Vendors may further note that SAC also reserves the right to reject an offer, if there are any deviations in the commercial and/or general terms and conditions offered against the requirements as per this RFP, even if the offer is technically suitable.
15. Delivery schedule : The total delivery schedule should include PDR & DDR, Site readiness, installation commissioning and acceptance testing (ATP) shall not exceed 10 months ARO

2.4 Bidding model

Bids shall be submitted in two parts sealed envelopes:

Part-1: Technical Bid

This part should contain complete technical proposal without cost indications. The technical bid should bring out complete clarity on the total contract work in terms of conceptualization, implementation, and performance. This bid should include following but not limited to:

1. Heritage of providing similar solution - products and services
2. Technical compliance statement - point by point compliance
3. Each subsystem detail with complete specifications
4. Implementation details with block schematics with interface, signal flow diagram, level diagram etc.
5. Complete mechanical and structural details for antenna assembly, support structure, racks, etc
6. Complete civil work requirements (Antenna pedestal design, RF interface link, area needed for indoor system, air-conditioning, electricity etc.)
7. Earth Station commissioning, characterization and Acceptance Test Plan (ATP)
8. Time schedule with reference to major milestones
9. Comprehensive On-site warranty for three years
10. Comprehensive Annual Maintenance Plan after completing three years of warranty
11. All papers, documentation of part-2 (financial bid) without price (price masked)

Part-2: Commercial or Financial Bid

This part should be the same as the technical bid but with price. It should include complete cost of the solution with element wise break up as per format given in the section 4.8.

2.5 Delivery and Schedule

The bidders shall clearly define delivery schedule for the proposed turn-key work in their offer and should address following major milestones:

Total period of delivery for the complete earth station system including installation, commissioning and testing shall be of **Ten months**.

Table – 2.2: Milestone Delivery and Schedule

Sr. No	Major Milestone	Time Schedule		
1	Preliminary Design Review			
2	Detailed Design review and final ATP documentation			
3	Close out of all action generated from previous reviews			
4	Site Preparation			
5	Antenna and RF System integration & installation			
6	System Characterization			
7	Earth Station System Acceptance			
8	Commencement of Operations			

The responsibility of safe transportation / delivery of total system to the site rests with the Vendor. This includes:

- a) Transportation from factory to the site
- b) Loading / unloading where applicable during transportation.

- c) Transit insurance
- d) All expenditures for above activities shall be borne by the Vendor.

2.6 Warranty and Maintenance

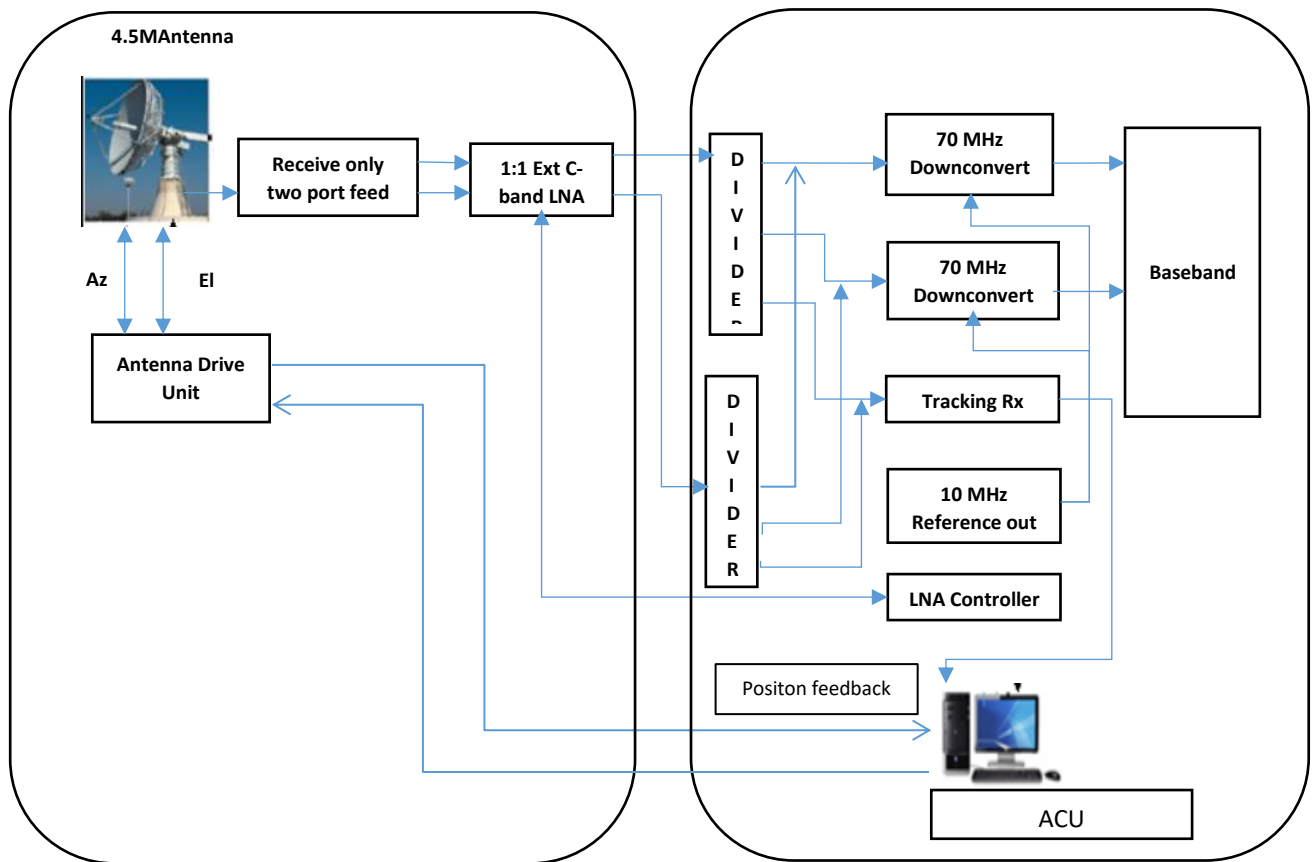
1. The bidder shall provide comprehensive on-site warranty for three years for the complete earth station system from the date of acceptance
2. The terms and conditions for repairs/services during the warranty period shall be clearly indicated and explained by the bidder while submitting the offer
3. The bidder shall commit for comprehensive annual maintenance contract (CAMC) after the completion of three years of warranty. The details of CAMC are given in Annexure-1. However, SAC may or may not opt for CAMC.

Section - 3: Specifications and Requirements

3.1 Brief System Configuration of the Proposed Earth Station

This section provides details of mandatory features of the earth station. The baseline system configuration of the proposed earth station is outlined in the Figure-1

Baseline Earth Station Configuration



The proposed earth station has one 4.5M antenna with RF system. The antenna has two port linear receive only feed with associated tracking system for axes movement (Azimuth, Elevation & Polarization). The tracking system contains beacon tracking receiver, axes drive motors, angle encoders, and antenna control unit (ACU) for local/remote position control. The RF system for met data reception consists of Low Noise Amplifier (LNA), Down Converters providing IF-band of 70 MHz interface to the baseband systems (Data acquisition and processing systems). All RF systems especially down converters should have provision to connect to the external reference signal from standard GPS source or highly stable reference frequency source through the distribution system.

The C & Ext. C-band signal from the output of LNA is to be extended through the low loss RF cable connectivity. The expected length of this interface cable will be less than 250 meter from the antenna site.

All the RF equipment should have monitoring and control (M&C) facility for remote control operation through computer. LNA system with M&C is also preferable.

The LNA system in the outdoor unit should also have provision to connect 5G IMT reject Filter at the input.

The bidder is free to propose different type of implementation or configuration for the RF system (other than what is mentioned in the baseline configuration) but should meet all the functional and performance requirements specified in this document.

3.1.1 Technical Features

The earth station and RF system is proposed to have following features:

Table – 3.1: Mandatory Features of Proposed Earth Station

Sr.No.	Features	Compliance	Remarks/Justification
1	Steerable dual reflector antenna system with main reflector diameter of 4.5M (typical) or similar size and other associated subsystems such as 2-port linearly polarized feed with associated electronics, base structure, lightening arrestor, earthing etc.		
2	Antenna foundation, Elevation (EL) & Azimuth (AZ) pedestal in EL over AZ configuration		
2	Antenna drives (motorized axes) to have capability to point to all satellites in the Geo-stationary arc of 50 to 180 Deg. East Longitude visible to India		
3	Antenna position control system with drive electronics including beacon tracking, receiver and antenna control unit for remote operation supporting tracking functionalities such as slew, step track and program modes, manual mode.		
4	RF Electronics (LNA, Down Converters & associated RF/microwave accessories etc.)		
5	Reference Signal distribution system to provide 10MHz external reference to all RF systems		
6	Interface through low loss RF cable with indoor RF systems		

7	Complete Receive Chain up to the 70 MHz IF-band		
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3.2 Technical Specifications

The major specifications of the proposed earth station to be complied by the bidder are given in the following tables.

3.2.1 Earth Station System Specifications

The required antenna system may employ either Cassegrain or Gregorian Feed structure with all three axes rotations such as Azimuth, Elevation and Polarization. The antenna system should be motorized with physical limits for all the axes and equipped with tracking system, limit switches and angle sensors etc. The tracking system for the antenna should have drive system (Antenna Drive Unit) with local as well as remote operation with ACU (Antenna Control Unit). The tracking system should support and have functional modes such as manual mode, standby, slew mode, step track (a closed loop tracking system employing satellite beacon receiver) and program track mode. The tracking system should also interpret and display critical alarms and have provision for “emergency stop” and soft limits in addition to the physical limits on the axes rotations.

The output of the C & Ext. C-band (3.71 GHz to 4.8GHz frequency) Low Noise Amplifier (LNA) is required to be extended through the low loss RF cable laid in the cable duct to the receive system located in the control room (Indoor System).

The Down Converters (C & Ext. C-band) are required to provide 70 MHz IF-band output interface for the step track mode and baseband systems for meteorological data reception respectively.

The 10MHz reference frequency required for each RF system should be made available from a single source through the distribution system. The overall system should achieve the required performance as specified in this RFP.

Table – 3.2: Proposed Earth Station System Specifications

Sr. No	PARAMETERS	SPECIFICATIONS	Compliance Yes/No	Remarks
Antenna Mechanical System:				
1.	Frequency of operation	3.71 to 4.8 GHz		
2.	Antenna Reflector & Diameter	Dual Reflector with 4.5 meter (typical) parabolic solid dish as main reflector		
3.	Surface Accuracy	1.0 mm (rms) typical or better for normal wind conditions		
4.	Antenna Mount	Elevation over Azimuth		
5.	Receive System	Linear		
6.	Feed Configuration	C & Ext. C band Receive only OMT feed in Cassegrain or Gregorian configuration, Two port with inject coupler for test and measurement.		

7.	Feed Polarization	Linear, Simultaneous Vertical and Horizontal, orientable		
8.	Feed VSWR	1.3:1 OR better		
9.	Feed insertion loss	Break up to be provided by the bidder		
10.	Port to Port Isolation	30 dB or Better		
11.	Feed Interface	Waveguide WR 229G (compatible to C & Ext. C band LNA input), Flange CPR 229G		
12.	Protection	Against the environment condition stated in RFP		
13.	The bidder shall submit block diagram and details of feed system.			
14.	G/T @ 20 deg. Elevation	22.32 dB/K minimum with installed feed & LNA at 4.5 GHz (Vendor to provide break up in the calculation)		
15.	Antenna Gain	44 dBi minimum @ 4.5 GHz		
16.	Elevation Travel range	0 to 90 Deg. continuous		
17.	Azimuth travel range	0-120 Deg. Continuous and expandable up to 180 Deg.		
18.	Polarization Travel	± 90 Deg. CW and CCW motorized Remote & Manual Control		
19.	Radiation patterns & side lobe level	As per ITU-R Rec.580-5 or latest		
20.	Operating Temperature Range	0 deg. to 50 deg. C		
21.	Humidity	95% RH @ 40 deg. C		
22.	Rain	80 mm/hr without any degradation in the performance		
23.	Corrosion	Anti-corrosive and protective coating applied to all parts exposed to the stated environment condition		
Tracking Specifications:				
24.	Antenna Drive System	Motorized with independent variable speed control for AZ and EL axes with CW, CCW and UP/DOWN control respectively (with a provision for manual movement in case of failure of electrical supply)		

25.	Signal for step tracking mode	Satellite TT&C (Beacon) signal received through Satellite Beacon Receiver		
26.	Velocity (AZ and EL axis)	0.05-0.20 Deg. /sec or better in both axis , simultaneous movement should be possible for both axis		
27.	Angle display Resolution	0.001 deg. in AZ and EL		
28.	Pointing accuracy (RSS Peak)	Max. 1/5th of 3 dB beam width at operational wind velocity (Vendor to provide break up at the time of bidding)		
29.	Tracking accuracy (RSS Peak)	Max. 1/10th of 3 dB beam width at operational wind velocity (Vendor to provide break up at the time of bidding)		
30.	Travel Limits	Hardware and Software Limits for 1. Azimuth CW, CCW 2. Elevation UP, DOWN		
31.	User Operation modes	Standby, Manual, Designate, Slew, Step Track, Program Track		
32.	Monitoring Display	Status for Azimuth, Elevation, Polarization, Speed in Slew mode with critical alarms/warning, signal level, operating modes etc.		
33.	Operator Console (ACU)	IPC based with user friendly GUI console for operator interface		
34.	Angle Generation for Program Tracking mode	Through user friendly (GUI) software with sufficient timing resolution to meet tracking accuracy and Also the software should be capable of reading time tagged angles (AZ-EL) for tracking using file format in Text and/or MS-Excel. (Preferable: with a provision to utilize satellite Ephemeris or Two Line Element format)		
35.	Data Logging	Time tagged data logging for parameters such as AZ, EL, Tracking, Rx level etc. with a provision for variable timing interval settable by the		
36.	Password Protection for ACU access	Separate user and admin password		
37.	Communication protocol for the Control of Antenna Drive	TCP/IP on Ethernet interface (RJ-45)		

38.	Antenna Motor Input Power	415 V AC \pm 10%, 3 Phase supply		
39.	The bidder shall provide all interface details of ACU and associated tracking equipment like beacon receiver and drive electronics			
40.	All controls and status monitoring functions are to be made available at operator's PC based console			
Indoor Unit Environmental Specifications				
Parameter		value		
40	Operating Temperature	0 to 45 Deg. C		
41	Storage Temperature	0 to 65 Deg.C		
42	Humidity	80% RH non-condensing		
Outdoor Unit Environmental Specifications				
43	Operating Temperature	0 to 50 Deg. C		
44	Storage Temperature	0 to 65 Deg.C		
45	Humidity	100% RH non-condensing		
46	Rain	\geq 100 mm/Hr		
47	Wind Speed	Operational=70 Kmph gusting to 100 Kmph, Survival= 200 Kmph		
	EMI/EMC compliance	As per IEC, class A equipment		
<p>*Note: - The bidder shall provide detailed breakup for G/T, pointing error and tracking error. Against the baseline system configuration, the bidder must provide detailed block schematic of the proposed earth station in the technical proposal. The technical proposal should also explicitly include detailed configuration and parameters of the subsystems, losses, power consumption etc.</p>				

3.2.2 Specifications & Requirements for Antenna System Foundation

The bidder also has to comply with the requirements of outdoor systems (Antenna and associated tracking system, RF system & RF interface link requirements) as mentioned in the following tables.

Table – 3.3: Specifications & Requirements for foundation

Sr. No.	Specifications/Scope of Work	Compliance	Remarks/Justification

1	<p>Antenna subsystems should include but not limited to the following components/items:</p> <ul style="list-style-type: none"> • 4.5M diameter C & Ext. C-band antenna with motorized drives, 2-port receive (with inject coupler for test and measurement) linearly polarized feed and associated tracking system • Antenna mount structure with work platform • Lightening protection system and earthing • Angle Sensors and Limit switches • Other accessories required for antenna system foundation 		
2	<p>Bidder shall submit details of antenna mount structure considering the site and site specific requirements/structure analysis:</p> <ul style="list-style-type: none"> • Safe bearing capacity in case of foundation on land (necessary soil tests to be done by the bidder & analysis report to be submitted to SAC) 		
3	<p>The bidder shall provide necessary ground clearance required for antenna system</p>		
4	<p>The bidder shall provide following details to be reviewed and approved by SAC:</p>		
5	<ul style="list-style-type: none"> • Wind load data • Complete mechanical analysis for antenna assembly and support structure • Reflector panels and back up structure • Sub reflector fixture and supporting spars • Antenna pedestal, AZ/EL mechanical coupling, screws • Antenna Assembly drawings, interface drawings, 3D solid models • Documents containing all important results/analysis like maximum stresses in critical members, maximum deflections and complete simulation or test results for the antenna system RF performance 		
Antenna Alignment Requirements			
	<p>The bidder shall submit a detailed alignment plan with all relevant details</p>		
6	<p>The bidder shall carry out alignments of following components of antenna system:</p> <ul style="list-style-type: none"> • Azimuth and elevation axes • Reflector panels forming reflector surface • Feed and sub-reflector with main reflector • Marking of true north and alignment of angle encoders Reflector axis, feed axis, sub-reflector axis etc 		

7	The bidder shall estimate RMS surface accuracy and submit the details		
8	Overall tracking and pointing error should also include foundation contribution		
9	In case of height increase, the foundation should include RCC/steel pedestal		
10	The structural analysis should be comprehensive with various load cases for wind at various look angles of antenna including foundation		
Installation and Commissioning			
11	The bidder shall arrange necessary equipment, tools and material handling equipment required for assembly and installation		
12	The bidder shall carry out necessary civil work for antenna foundation		
13	The bidder shall provide details on protection of all exposed components/parts of antenna system from environment		
14	The bidder shall preferably use commercially available drive electronics and share the information with SAC on the types of drives used and their specifications/configuration etc.		
15	The bidder shall make provision for safe locking of axes movement by providing necessary limit or locking mechanism		
17	The bidder shall provide lightening arrestor on the reflector for protection against lightening under all pointing conditions and provide necessary grounding with earth pit as per prevailing standards		
18	The bidder shall make provision for necessary cable wrap arrangement to avoid cable twist in case of antenna rotation		
19	The bidder shall provide sufficient space below the reflector panels to accommodate feed assembly and for mounting LNA on Receive port.		
20	The bidder shall carry out necessary digging work for constructing cable duct for the RF interface between outdoor and indoor and lay the cable		

3.2.3 Specifications of 1:1 Low Noise Amplifier (LNA)

Table – 3.5: Specifications for LNA

Sr. No.	Functional Features & Technical Specifications	Detailed description & Specifications	Compliance Yes/No	Remarks
1.	C-band Frequency Range	3.4 - 4.8 GHz		
2.	Noise Temperature	45 K OR better		
3.	Waveguide input	CPR229		

4.	Fully weatherproof	Suitable IP standards for outdoor installation		
5.	Usages	Outdoor application		
6.	Gain	60 ± 2 dB minimum or better		
7.	Gain Flatness	1 dB P-P full band and 0.5 dB P-P over 40 MHz		
8.	Output power at 1-dB compression	+10 dBm standard		
9.	Maximum input without damage	+10 dBm CW		
10.	Input VSWR	1.25:1 max or better		
11.	Output VSWR	1.5:1 max or better		
12.	Operating Temperature	0 deg. C (min.) to +50 deg. C (max.)		
13.	Input Power	230 VAC ± 10%, single phase, 50 Hz		
14.	RF Output connector	N-type Female.		
Note:- The specifications mentioned are of standard OEM product however it is the bidder's responsibility to integrate to achieve final system performance using any other suitable distribution system required for this turn-key solution				

3.2.4 Specifications of LNA Controller

Table – 3.6: Specifications for LNA controller

Sr. No.	Functional Features & Technical Specifications	Detailed description & Specifications	Compliance Yes/No	Remarks
1.	Unit Status	Controller monitors unit bias current; alarm is generated if current goes outside of allowed tolerance window (LNA systems). Controller also monitors external alarm inputs or combinations of both internal unit current and external alarm inputs		
2.	Switchover Time	100 ms or better		
3.	Power Supply	Dual Redundant		
4.	User Operation	Automatic Or Manual		
5.	Interface	RS 232/RS-422/RS-485		
6.	Ac Input	230 V ; Dual AC inputs		
7.	Operating Temperature	0 deg. To 50 Deg.C		
8.	Cable length to plate Assembly	250 meter		
9.	Input Power	230 VAC ± 10%, single phase, 50 Hz		

Note:- The specifications mentioned are of standard OEM product however it is the bidder's responsibility to integrate to achieve final system performance using any other suitable distribution system required for this turn-key solution		
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3.2.5 Down converter Specifications

Table – 3.7: Specifications for down converter

Sr. No.	Functional Features & Technical Specifications	Detailed description & Specifications	Compliance Yes/No	Remarks
	Down Converter Frequency range	3.4 to 4.8 GHz		
	IF output frequency	70 MHz ± 20 MHz		
	Gain	40 dB or better in steps for adjusting 0.1 dB		
	Attenuation Adjust	0 to 30 dB.		
	Input Impedance	50 Ω		
	Input Return Loss	≥18 dB		
	Output Return Loss	≥15 dB		
	RF output	+10 dBm at 1 dB compression		
	Spurious	-60 dBc (carrier related) -80 dBc (Non carrier related)		
	Spectrum Inversion	None		
	Phase Noise	As per IESS 308/309		
	External Frequency Reference Input	10 MHz		
	External Frequency Reference output	10 MHz		
	Operating Temperature	0 to 50 deg.		
	Power Supply	230 VAC ± 10%, single phase, 50 Hz		
	Input connector	N Type		
	Output connector	BNC		
	Monitor & Control (M &C) Interface	RS-485, RS232, RJ-45 for Ethernet		
	Control & Indications on front Panel	For Signal Lock, Gain, Local/Remote, Alarms etc.		
Note:- The specifications mentioned are of standard OEM product however it is the bidder's responsibility to integrate and achieve final system performance				

3.2.6 Tracking Receiver

Table – 3.7: Specifications for Tracking Receiver

Sr. No.	Functional Features & Technical Specifications	Detailed description & Specifications	Compliance Yes/No	Remarks
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1.	IF Input frequency range	3.4 to 4.2 GHz (Internal Block Converter)		
2.	Input Level (Dynamic range)	-90 dBm Minimum, -30 dBm Maximum		
3.	Input Impedance	50 Ω		
4.	Output Impedance	100 Ω		
5.	Tracking Gradient	0.5 V/ dB		
6.	Tracking Response	0 to +10 VDC		
7.	AFC (Auto frequency control)	\pm 30 kHz		
8.	Frequency Reference	10 MHz internal		
9.	Phase Noise	>75 dB-Hz, 1 kHz from Carrier		
10.	Primary Power	230 VAC \pm 10%, single phase, 50 Hz		
11.	Operating Temperature	0 to 50 deg.		
12.	Input Connector	Type-N,		
13.	Output Connector	BNC		
14.	Frequency Adjust	Front Panel OR Remotely		
15.	M & C Interface	RS-232 or RS-422/485		
16.	M & C connector	DB-9, Female		
Note:- The specifications mentioned are of standard OEM product however it is the bidder's responsibility to integrate to achieve final system performance				

3.2.7 Specification for 10 MHz Reference System

Table – 3.8: Specifications for 10 MHz system

Sr. No.	Functional Features	Specification	Compliance Yes/No	Remarks
1.	Frequency output GPS/GNSS based (with GPS/GNSS receiver)	10 MHz		
2.	Harmonics	< - 40 dBc		
3.	10MHz Sine wave Input			
4.	10MHz Sine wave outputs	4 or more		
5.	19" Rack mountable			
6.	Input Frequency	10 MHz Sine wave		
7.	Spurious	< - 90 dBc (100 kHz BW)		
8.	Output Return loss	> 20 dB		
9.	Output impedance	50 Ω		
10.	Output level	+7 dBm or Better		
11.	Phase Noise	As per IESS 308/309 standard		
12.	Connector	BNC female		
13.	Input Power	230 \pm 10%, VAC, 50-63 Hz		
14.	Operating Temperature	0 to 50 Deg. C		
15.	Input Impedance	50 ohms at 0 dBm		
16.	Input Level	0 dBm to +7 dBm		

17.	Output Waveform	Sine wave		
18.	Output Impedance	50 Ohms		
19.	Output Level	0 dBm to +13 dBm		
20.	Bandwidth (-3 dB)	±200KHz or better		
21.	Spurious	Better than -120 dBc within 100 KHz		
22.	Output Connector	BNC receptacle		
23.	Third Harmonic Distortion(THD)	Better than 1%		
24.	Operating Temperature	0 to 50 deg. C		
25.	Power Supply	230 VAC ±10%, Single Phase, 50 Hz		
	Note :- The specification mentioned are of standard OEM product however bidder may specify any other suitable distribution system required for this turn-key solution. Note :- The specification mentioned are of standard OEM product however bidder may specify any other suitable distribution system required for this turn-key solution.			

Section - 4: System Installation, Integration & Commissioning

4.1 General guidelines for System Installation and Integration

The bidder shall adhere to the following general guidelines while planning the installation and integration of the system:

1. Detailed layout of the indoor and outdoor systems with drawings will have to be finalized in consultation with the purchaser (SAC) subsequent to the design review of the system and after the placement of the order. Prior to this, the bidder may submit tentative layout plan and drawings to SAC for consideration and review.
2. There should be separate grounding for all RF electronics and it should be separate from AC Supply ground.
3. The LNA output from the antenna system will be interfaced with Down Converters through necessary low loss RF cable. The maximum distance between the outdoor and indoor system for consideration is 250 meter. The bidder also has to keep redundancy of the interface link in either case.
4. The bidder has to construct necessary cable duct for laying RF cable running from the outdoor (antenna) system to the indoor system.
5. The antenna control unit (ACU) will preferably be part of indoor system whereas its drive system will be part of outdoor system.
6. All subsystems of the indoor system will be of standard 19" rack mountable. It will have signal and electrical interfaces on the rear side and monitoring & controlling (operator activities) on the front side.
7. The bidder shall supply suitable 19" rack(s) required for housing all subsystems of the indoor system.
8. The supplied rack for indoor system should have copper earthing/grounding strip for connecting chassis ground, which in turn will be connected to the RF signal ground.
9. The rack should have vertical mounting tray for fixing harnesses.
10. Two AC distribution boards are required to be fitted at the rear side mainly for distribution of AC power for each subsystem and one AC distribution board is required to be fitted at the front side of the rack for supplying AC mains for test equipment

11. The rack should have one sliding drawer at the bottom for keeping accessories/tools etc
12. AC supply connection for the rack will be from the bottom side through the shielded cable connected to the distribution boards.
13. The bidder shall make provision for “maintenance platform” for easy access to each of the component of antenna system such as motors, drive electronics, LNA and feed assembly etc
14. Digging and constructing necessary cable duct running between the outdoor and indoor systems will be the responsibility of the bidder

4.2 Project Reviews

The turn-key solution involving system configuration design, antenna system, control & drive system and all RF subsystems catering to the requirements of purchaser (SAC) will be reviewed at SAC.

Following design reviews will be conducted:

1. Preliminary Design Review (PDR) - To review the system design and to define turn-key execution plan and schedule. The PDR will address at least the following topics with support of submitted information and drawings:
 - Overall system configuration and layout
 - Review on detailed information for mechanical and structural analysis of all the antenna system components and foundation including wind load calculations
 - Pointing and tracking error budget with analysis
 - Antenna optics
 - Details of safety aspects such as lightening arrestor, earthing etc
 - Break up of G/T, Antenna gain & Beamwidth, System noise temperature, interface cable loss etc.
 - Antenna radiation patterns
 - Reliability and Quality assurance
 - Test methods and procedure
 - Important milestones in project execution and schedule
2. Detailed Design Review (DDR) - To critically review, evaluate and finalize design & system configuration including antenna control system, equipment to be supplied and feed design result with respect to the specifications. The DDR will be arranged within one month of PDR.
3. Any other engineering review that become necessary and essential.

4.3 Reliability and Quality Assurance Requirements

1. The operational life of the complete earth station system (including antenna system drive and other moving parts of the antenna and control system) is expected to be at least 10 years (preferably 15 years). Bidder should therefore ensure and convince this aspect in the proposal to the purchaser and this should be evident by the details submitted in the proposal. The technical proposal should have a separate heading covering this aspect.
2. The bidder shall be responsible for the characterization of the commissioned earth station and important parameter like G/T at different frequencies in the band will be characterized using applicable methods. Characterization of other systems shall also be done.

4.4 Acceptance Tests Plan (ATP)

1. The test plan shall contain all essential tests suggested as minimum requirement. However, the ATP may also include additional tests as recommended and mutually agreed upon during PDR/DDR or any other engineering reviews.
2. Bidder shall provide brief description of the test procedures along with block schematic of test configuration/setup. The test procedures shall also include list of test equipment.

3. All tests shall be documented in the form of test data sheets which should also include equipment being tested & associated test equipment along with the date and signatures of bidder's test engineer and engineer from purchaser side.
4. All tests & test procedures shall be approved by the purchaser and site ATP will begin only with approved test procedures and written authorization from purchaser.
5. Acceptance tests will be done as follows:
 - Subsystem level tests at site
 - Testing of antenna, position control and tracking systems
 - Testing of integrated receive chain (Estimation of G/T using applicable method)
 - Final acceptance test of the earth station with spacecraft (The acceptance test plan should also contain contingency test plan in case the spacecraft is not available)

4.4.1 Subsystem level tests

1. Subsystem level tests include visual inspection and all types of electrical testing.
2. The bidder shall list the parameters to be tested for each subsystem and shall also provide detailed test & measurement procedure in the proposal.

4.4.2 Testing of Antenna, Position Control and Tracking system

Acceptance Tests	
1	The bidder shall conduct factory and site acceptance tests in accordance with requirements mentioned in the approved test procedures. The results of factory and site acceptance tests shall be recorded including functional tests, material inspection etc.
2	The bidder shall provide following documents as part of acceptance tests: <ul style="list-style-type: none"> • Antenna assembly, interface drawings etc. • Antenna optics • Details of lightening arrestor, earthlings etc. • Radiation patterns of feed and antenna • Measured data like insertion loss, return loss of feed assembly, port to port isolation etc. • Wind load calculations, antenna structure and mechanical analysis report • Pointing and tracking error analysis • True north marking • Break up of G/T, Gain, System noise temperature etc
Onsite inspection	
3	Alignment of main reflector, sub-reflector and feed
4	Alignment of Azimuth and Elevation axes
5	Angle calibration and axes rotation
6	Antenna steerability and coverage with respect to the true north marking
On site tests	
7	The bidder shall include following tests as minimum requirement in addition to those mutually agreed upon: <ul style="list-style-type: none"> • Antenna coverage • Antenna tracking speed & performance of step track mode in closed loop • Polarization movement • Antenna gain • Port to port feed isolation • Satellite tracking in all modes (especially slew, step track and program track)

4.4.3 Testing of Integrated Receive Chain

The overall performance of the integrated receive chain will be characterized which also include testing of various system level parameters but not limited to the following:

Test Parameter	Remarks
Frequency response & stability	<ul style="list-style-type: none"> Frequency stability will be tested at several frequencies in the receive band over 24 hours Frequency response over the full band will be obtained
Line loss or Rx path attenuation measurements	<ul style="list-style-type: none"> Path loss of receive chain including the interface link
Noise Floor and Spurious Measurements	
System Noise Temperature	

4.4.4 Final characterization & Acceptance of the Earth Station with spacecraft

The performance of the earth station shall be evaluated through the spacecraft including tracking system using available satellite system in orbit. All functional modes of the tracking system such as slew, step track and program track will be checked and tested. The G/T of the station shall also be ascertained using applicable method. Other integrated tests include radiation pattern measurements, gain, noise floor, spurious measurements, power level measurements etc.

4.5 Documentation and certifications

The bidder shall supply following set of documents/material certificates:

1. Preliminary Design Review (PDR) Document
2. Detailed Design Review (DDR) Document
3. Compliance certificates
4. Test records of all parameters performed
5. Acceptance Test Reports
6. Acceptance Test Certificates
7. Three copies of operational manuals for all the subsystems and integrated system
8. Final set of drawings/documents such as assembly drawings for antenna, interface drawings, drawings for indoor system layouts etc. including soft copy.

4.6 Delivery Schedule

Delivery schedule for the complete earth station system including installation and commissioning shall be **Ten months** from the placement of the order.

4.7 List of Deliverables/Price Bid format

The bidder shall provide the list of deliverables as per bid model (Technical & Financial).

Sr. No.	Item descriptions	Qty	Price/unit	Tax	Total price
1.	Down converter 1:1	01set			
2.	Tracking Receiver (Beacon receiver)	01			
3.	Low Noise Amplifier (LNA) 1:1	01 set			
4.	10 MHz reference and distribution system	01			

5.	Antenna with Feed	01 set			
6	Antenna Control unit, Drive and Control, tracking system components & other associated components	01 set			
7	Site preparation and Antenna Foundation	01set			
8	RF Interface link (Low loss RF cable, & equipment etc.) with redundancy	01 set			
9	Indoor system accessories (racks, power dividers, interface cables, adaptors, power distribution boards, patch panels & other accessories required for harnessing)	1 set			
10	Cable duct for RF interface between outdoor and indoor equipment's.	01set			
11	Necessary lighting and grounding work etc.	01set			
12	AMC for 3 years post 3 years warranty	01set			
13	Installation, integration and testing	01 set			
	Total (for L1 consideration)				
Note:- The bidder shall arrange necessary equipment, tools and material handling equipment required for assembly and installation					

4.8 Format for Quotation

The bidder shall provide detailed breakup of the total cost estimates in the quote on following lines:

1. Cost of each individual RF/IF subsystem such as
 - Down Converters (C & Ext. C-band)
 - Beacon Receiver (C & Ext. C-band)
 - Low Noise Amplifier (LNA)
 - 10 MHz Reference & Signal Distribution System
 - RF Interface link (Low loss RF cable, & equipment etc.) with redundancy
 - Indoor system accessories (racks, power dividers, interface cables, adaptors, power distribution boards, patch panels & other accessories required for harnessing)
2. Cost of antenna, Drive and Control, tracking system components & other associated components
3. Cost of site preparation and civil work for antenna system foundation (with option if any).
4. Cost of RF interface cable duct between indoor & outdoor systems - digging & construction
5. Cost of receive chain (with option if any)
6. Any other cost on account of integration, fabrication, testing etc. which are not reflected above towards the realization of receive system under the scope of this RFP.
7. Cost of Comprehensive Annual Maintenance Contract (CAMC) for three years after warranty and subsequent up to four years in slabs of one year. However SAC reserves the right to fully or partly reject the offer

4.9 Terms and Conditions

1. The bidder can propose a different type of implementation or configuration for proposed earth station (other than mentioned in this RFP) but should meet all the functional & performance requirements specified in this RFP. However, the purchaser shall have rights to modify bidder's configuration/implementation if found unsuitable to the requirements or not providing the operational convenience

2. The bidder shall propose and quote one and only one option and multiple options proposed by the bidder for any subsystem will not be accepted and evaluated by the purchaser.
3. In any case, the bidder shall provide explicit block schematic of the complete earth station system including whatever modifications in the system configuration suggested by the bidder in the proposal.
4. The bidder's proposal should compulsorily include statement of compliance against each section and sub paragraph of the RFP, covering all the specifications and requirements for the complete earth station system. The proposal without explicit compliance will not be evaluated and will be rejected without any further communications with bidder. Complying with the requirements in totality without affecting the performance requirements will be the deciding factor for considering the bidder's proposal.
5. Deviations in the bidder's specifications if any, should justify and establish that those deviations would not affect the overall performance requirements of the proposed earth station system. All deviations from the specifications should be clearly stated in the compliance statement. The purchaser however, reserves rights to waive some deviations based on the technical assessment and may accept or reject thereof either in full or in part.
6. The bidders shall submit all the relevant details of each subsystem (such as make & model no, block schematic, data sheet, test results etc) along with the compliance statement to also work out genuine interest in the turn-key solution. Without such supporting documents and technical details would not qualify for consideration.
7. The bidders shall also submit relevant documents stating their experience in providing similar turn-key solution. Copies of relevant purchase orders executed for similar work should be submitted along with the proposal.
8. Subcontract made with any other supplier by the bidder pertaining to this proposal should be clearly mentioned in the bidder's proposal by submitting profile and experience details. Proposals without this will not be evaluated and rejected thereof without any notice.
9. The bidders shall submit their proposal in two parts viz Technical bid and financial bid.

Section - 5: Site Preparation/Civil Works for Establishment of Earth Station

5.1 Site Readiness

The bidder shall carry out major site activities as per the following procedures:

Table – 5.1: Antenna Site Readiness

Stage	Site Activity	Compliance	Remarks/Justification
PLANNING	1. Bidder to obtain site related information from SAC 2. Ensure necessary permits are available 3. Bidder may visit site and conduct detailed site investigation including land survey for antenna system foundation 4. Review, verify and evaluate site condition from bidder's perspective 5. Determine site related works required		

DESIGN	6. Prepare site readiness requirements and installation plan 7. Present detailed site installation drawings, specifications along with installation schedule to SAC (Purchaser) 8. Provide site readiness information to proceed with installation after all relevant materials are received at site with necessary permits		
INSTALLATION & COMMISSIONING	9. Bidder to receive notice from Purchaser (SAC) to proceed with site installation 10. Bidder to deploy necessary materials required for installation along with manpower to the site 11. Marking of antenna center point and true north referencing 12. Installation of antenna system foundation 13. Installation of grounding (earth pit) and lightning protection system 14. Installation of antenna related cabling for interfaces with indoor system 15. Installation of cable duct between outdoor and indoor systems for RF interface link 16. Installation & Commissioning of indoor systems 17. Bidder to prepare and perform acceptance tests for the commissioning of earth station systems 18. Bidder to prepare & provide O & M manuals for the earth station operator 19. Bidder to conduct final site acceptance for sign-off 20. Warranty support implementation as per RFP		

Annexure - 1: Comprehensive Annual Maintenance Contract

Introduction

SAC/ISRO is establishing 4.5M C/Ext. C-band Receive Only Earth Station at SAC-Bopal, Ahmedabad for the reception of Meteorological data from Indian satellite systems.

This proposal is made to award annual maintenance contract for the uninterrupted earth station operation and its maintenance/services.

Period of Contract

The vendor shall execute this contract for the period of three years after the three years of warranty.

Scope of Work

Techno-commercial proposal from vendor is invited for the on-site comprehensive annual maintenance contract for the maintenance & services of the established 4.5M C/Ext. C-band earth station at SAC-Bopal.

1. Comprehensive Annual Maintenance

The vendor shall carry out following maintenance activities:

- 1.1. The maintenance and services of complete earth station system is required on site

- 1.2. The details of equipment of the complete earth station is as per the supply contract of this RFP.
- 1.3. The vendor shall have representatives/offices located zone wise in India for easy interface and communications and should have phone/fax numbers to get immediate attention in the case of breakdown calls
- 1.4. Preventive maintenance (PM) shall be carried out every six months during the period of contract that will include general maintenance services, calibration/testing and thorough checking of all the subsystems, interfaces and complete receive system.
- 1.5. After every visit for maintenance, the service engineer of the contractor shall prepare detailed report on maintenance/service which will be duly signed by the contract manager from SAC for payment purpose. The format of the service report will be finalized in coordination with the contract manager.

2. Terms and Conditions

- 2.1. The vendor shall provide service related certificates of OEM for the equipment used in the earth station for smooth functioning of the contract. Offer without these certificates will be liable for cancellation.
- 2.2. The term “Comprehensive” means that the vendor shall diagnose and repair/replace the faulty component/system/peripherals/software installed using his own resources within the given time frame and make the system operational. All expenditures related to CAMC shall be borne by the vendor.
- 2.3. All logistics like arrangement of required transport of equipment and lodging/boarding for the maintenance persons will be the responsibility of the vendor.
- 2.4. In the event of any injury or loss of life to vendor’s employee (maintenance personnel working at user’s premises for contract work) due to the negligence, the responsibility solely rest with the vendor. Also SAC/ISRO shall not be responsible for the loss of life of employee of the vendor at the time of maintenance work at user’s premises due to natural calamities/accident/explosion etc., if any and the person(s) engaged by the vendor for carrying out maintenance work shall not have any right or claim for any kind of compensation including employment in any of the ISRO/DOS establishments.
- 2.5. For any problem/breakdown reported by the user, the same shall be attended within 48 hours. All replaced parts/equipment shall be of same type and capacity. In case of non-availability of identical replacement, the replaced part/equipment should be of similar or better specification duly approved by SAC
- 2.6. All types of replacement of defective/faulty parts/equipment shall be arranged by the vendor at no extra cost during CAMC. The replacement shall be new or equivalent functional unit. The faulty part may be taken by the vendor.
- 2.7. The vendor shall define proper call reporting formats and procedures
- 2.8. As the maintenance is comprehensive in nature, the vendor shall stock spares of essential as recommended by the OEM. The vendor shall also furnish details of stock of such critical spares.
- 2.9. The vendor shall bear all type of expenditures towards lodging, boarding, travel etc. for paying visits to the site

3. Contract Manager

SAC/ISRO will nominate one person as “Contract Manager” for this contract for the purpose of matters related to this CAMC. All correspondences shall be marked in the name of contract manager.

4. Payment Terms

4.1. Payment shall be made on quarterly basis at the end of each quarter after completion of satisfactory service (PM).

4.2. The bill duly signed by the contract manager shall be submitted to the Accounts Officer, SAC/ISRO, Ahmedabad, for payment.

5. Penalty clause

The down time should not be more than 48 working hours for the earth station. The faults reported from the user must be attended and repaired/replaced within 48 hours from the time of report of the complaint. For each subsequent hour of delay after 48 working hour from the time of reporting of the complaint, 0.5% of the annual value of CAMC with ceiling of 10% of total contract value will be recovered from the bill.

6. Arbitration

Dispute, if any shall be settled mutually, failing which it shall be referred to a one man arbitrator appointee by the Director, SAC Ahmedabad, in accordance with Arbitration Act 1996 whose decision shall be final and binding on both the parties.

7. Termination of Contract

ISRO reserves the right to terminate the contract if the performance of the Vendor is found to be unsatisfactory during the current period of the contract by giving one month’s notice in writing without any financial implications on either side.

8. Fall Clause

The charges for the above work shall in no event exceed the lowest charges at which you provide service to the other party for identical work description during the current period of the contract. If, at any time during the AMC period, you reduce the charges for similar work to any other customer, you shall forthwith notify the same to us (SAC/ISRO) and the charges payable under the contract for the service shall stand correspondingly reduced.

9. Force Majeure

Should a part of whole of the services covered in this contract be delayed due to reasons of force Majeure (for sites Identified by ISRO) which shall include Lock-outs, strikes, riots, civil commotion, fire accidents, acts of God and war, stoppage of deliveries by Government, refusal of or the training schedules referred in the respective order shall be extended by a period(s) not in excess of duration of such force Majeure, Each party undertakes to advice the other as soon as it becomes aware of the circumstances of such force Majeure. So that actions under the provisions of those orders can be mutually reviewed and agreed upon between Vender and ISRO if the force Majeure conditions extended over a period of six months both the parties of the order shall mutually discuss and arrive at an agreement for continuation or termination of the contract.

10. Price Bid Format

The vendor shall submit price bid for CAMC as per the following table:

Sr.No.	Description deliverable item	Quantity	Price in INR
1	On site Comprehensive Annual Maintenance Contract (CAMC) for the 4.5M C & Ext. C-band Receive only Earth Station System at SAC-Bopal Technical campus, Ahmedabad as per the RFP specifications for three years after warranty		
2	On site Comprehensive Annual Maintenance Contract (CAMC) for the 4.5M C & Ext. C-band Receive only Earth Station System at SAC-Bopal Technical campus, Ahmedabad as per the RFP specifications after three years of CAMC - on yearly basis for four years		

Annexure - 2: Representative Compliance Statement Format

The following table shows representative compliance statement format for bidder as a reference:

Sr.No.	Specification*	Complied (Yes/No)	Reference Page no.*	Specification in the proposal*	Justification*	Remarks if any
	[Note*: Section/subsection wherein the Specification/requirement is described is mentioned here. The bidder shall however type the individual specification of the respective section/subsection, in this compliance statement]		[Note*: If complied, then bidder shall provide the page no./nos. in his technical Proposal, on which the compliance to the specification /requirement is mentioned and supported. Bidder shall provide here the reference to the attached additional documents, manufacturer's catalogues for the specified model no., etc for supporting the compliance]	[Note*: If not complied, then the actual specification proposed]	[Note*: If not complied, the reason / justification that how the deviation from the specification would not affect the overall performance]	
2	Section-1: Introduction (Compliance to Sr. No. 1.1 to 1.3)					
3	Section-2: Scope of Work (Compliance to Sr. No. 1 to 4)					
4	Section-2: 2.2 to 2.6 (point by point compliance to all points)					
5	Point by point compliance to all the sections of RFP					

