GLOBAL TENDER ENQUIRY DOCUMENT FOR
SUPPLY, INSTALLATION, COMMISSIONING
OF THE RADAR FOR SPACE OBJECTS
OBSERVATION AND TRACKING –
(2500KmRange)
# TABLE OF CONTENT

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>INSTRUCTIONS TO BIDDERS</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>CONDITIONS OF CONTRACT</td>
<td>19</td>
</tr>
<tr>
<td>3.</td>
<td>SCHEDULE OF CONTRACT</td>
<td>21</td>
</tr>
<tr>
<td>4.</td>
<td>SPECIFICATIONS AND ALLIED TECHNICAL DETAILS</td>
<td>35</td>
</tr>
<tr>
<td>5.</td>
<td>DRAFT CONTRACT</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>FORM 1- TENDER FORM</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>FORM 2 - MANUFACTURER’S AUTHORISATION FORM</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>FORM 3- BANK GUARANTEE FORM FOR PERFORMANCE SECURITY AND WARRANTY PERFORMANCE</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>FORM 4 - MODEL CERTIFICATE OF INSTALLATION</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>FORM 5-MODEL CERTIFICATE OF RECEIPT OF RADAR FOR SPACE OBJECTS OBSERVATIONS AND TRACKING SYSTEM AT SITE OF INSTALLATION</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>FORM 6 - MODEL CERTIFICATE OF DELIVERY AND ACCEPTANCE</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>FORM 7 - CLAIM OF PAYMENT BY THE SUPPLIER</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>FORM 8 – DECLARATION</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>FORM 9 - INFORMATION IN RESPECT OF PREVIOUS SUPPLIES BY BIDDER</td>
<td>76</td>
</tr>
</tbody>
</table>
1. INSTRUCTIONS TO BIDDERS

1.1 Introduction

The ISRO Telemetry Tracking and Command Network (ISTRAC), the Purchaser, has issued this Tender Enquiry document for purchase of goods/stores/articles and related services as mentioned in "Request for Proposal (TENDER DOCUMENT)" which also indicates, inter alia, the required stores, delivery schedule, terms and conditions and place of delivery etc. This section ("Instructions to Bidders") provides the relevant information as well as instructions to assist the prospective bidders in preparation and submission of tenders. Bidders shall have to agree/accept all the terms and conditions of tender including payment terms etc. Acceptance shall be unconditional and bidders shall have no claim and right in future on their terms, if any. Last date of submission of the tender is 45 days from the date of advertisement of the tender.

Under the Network for space object Tracking and Analysis (NETRA) project of Indian Space Research Organization (ISRO), Radar for Space Objects Observation and Tracking is envisaged for space object observation in Low Earth Orbit (LEO). The requirement of this system is to detect, track and analysis of space objects in LEO orbit. The location of deployment of radar shall be at Shillong Meghalaya as decided by ISRO. With the principal objective of short-term realization and capacity building, ISRO is planning to identify potential industry/manufacturers capable of supply, installation and commissioning of space object tracking radar to meet all the requirements of ISRO within the specified time period.

The ISRO Telemetry Tracking and Command Network (ISTRAC) for and on behalf of the President of India invites tenders from eligible and qualified Tenderers to Supply, Installation and Commissioning of a state-of-the-art Radar for Space Objects observation and tracking for ISRO, on a turn-key basis and to provide related services, including site preparation works, as detailed in Section 3 “Schedule of Requirements” and which meets the “Specifications & Technical Details” as mentioned in Section 4 on “turn-key basis”. This Section gives instructions to tenderers regarding preparation and submission of tenders, the mode and procedure to be adopted for receipt and opening, scrutiny and evaluation of tenders and subsequent placement of contract. A contract will be signed with the successful bidder as per the Draft Contract (Section 6) which will be subject to the Conditions of Contract (Section 2).
1.1.1 Tender Document will be available on www.eprocure.isro.gov.in from 26 August 2020 to 12 October 2020.

1.1.2 Queries regarding tender document and site of installation should be uploaded latest by 16:00 hrs on 14 September 2020.

1.1.3 Pre-bid meeting queries shall be submitted in writing before 14 September 2020 at 16:00 hrs.

1.1.4 Tenders will be opened online from 20 October 2020, 17:00 hrs onwards.

1.1.5 Tenders should be valid for acceptance for at least 180 days after final bid submission date.

1.1.6 After 1.1.7 above, the technical bids will be evaluated by the 'Tender Evaluation Committee'.

1.1.7 Price bids of only those tenderers whose technical bids are found acceptable will be opened.

1.1.8 Price bids will be evaluated by the 'Tender Evaluation Committee' and successful bidder(s) determined.

1.1.9 Approval of the Competent Authority will be obtained and a Notification of Award of Contract will be issued.

1.1.10 Successful bidder shall submit a Performance Security within 21 days of the Notification of Award. (Form 4). [for Joint venture entity, also refer Form 2(A2)].

1.1.11 Successful bidder (Supplier) shall sign the contract within 21 days of Notification of Award.

1.1.12 Supplier shall submit a Time Schedule (Bar Chart) within 21 days of Notification of Award.

1.1.13 Supplier shall prepare for Preliminary Design Review (PDR) of Radar along with relevant information, before start of manufacture.

1.1.14 Supplier shall take timely steps to obtain export license(s) as may be required under the laws of 'Country of origin'.

1.1.15 Supplier shall submit Design Basis Report along with relevant Drawings to the Purchaser before commencement of site preparation works.

1.1.16 Supplier shall obtain requisite approvals/ clearances as required by statutory bodies (as applicable) as per their procedures.

1.1.17 Supplier shall submit to the Purchaser the Factory Acceptance Test (FAT) documents within eighteen months and Site Acceptance Test (SAT) documents within twenty four months of the Notification of Award.

1.1.18 FAT will be conducted on the dates to be intimated by the Supplier. The Supplier shall give prior intimation of at least two months to the Purchaser.

1.1.19 Only on completion of FAT, and after receipt of written communication from Purchaser, the Supplier shall dispatch, transport, install and commission the Radar as per the contract and intimate to the Purchaser the dates for SAT.

1.1.20 Supplier shall complete site preparation works and site activities prior to receipt of the Radar for installation.

1.1.21 SAT will be conducted and on its successful completion, the Certificate of Installation will be signed by the Supplier and the Purchaser together with expert which concludes the process of installation. (Form 6).
1.1.22 Supplier shall conduct comprehensive training of officers of ISRO in the operation of Total Radar System and Data Processing & analysis.

1.1.23 ISRO Engineers shall conduct tests and trials on the Radar System for 30 days after installation.

1.1.24 After successful completion of tests & trials and training, the Supplier shall deliver the Radar along with all other relevant materials including manuals, documents, etc. to the ISTRAC, ISRO.

1.1.25 Certificate of Delivery and Acceptance will be signed by the ISTRAC ISRO, which completes the Delivery. (Form 7)

1.1.26 Supplier shall maintain the Radar and associated systems for 1 years under warranty and submits Performance Bank Guarantee (Form 4) for the same.

1.1.27 Supplier shall submit Performance Bank Guarantee (Form 4) for Comprehensive Annual Maintenance Contract (CAMC) for ten years and shall sign CAMC contract separately [for Joint venture entity, also refer Form 2(A2)].

1.1.28 Performance Security will be converted to performance Bank guarantee after successful commissioning of the radar system and returned to the Supplier after completion of all obligations.

1.2 DEFINITIONS

1.2.1 “OEM” means Original Equipment Manufacturer

1.2.2 “Bidder” means tenderer who has participated and submitted the valid bid in this tender.

1.2.3 “Consignee” means the person to whom the goods should be delivered as per the contract; if the goods are required to be delivered to a person as an interim consignee for the purpose of dispatch to another person as provided in the Contract then that “another” person is the consignee, also known as ultimate consignee.

1.2.4 “Contract” means the written agreement entered into between the Purchaser and the Supplier together with all the documents mentioned therein and including all attachments, annexure etc. therein.

1.2.5 “Contract price” means price indicated in clause 1.19.3.1 through 1.19.3.4 of this tender document.

1.2.6 “Contractor’ means person/company/entity engaged by Supplier for carrying out its part work after approval of Purchaser.

1.2.7 “Day” means calendar day.

1.2.8 “Delivery” means supply of systems or stores in finished and completely ready for use condition. The delivery shall be deemed to take place on delivery of the systems or stores at the places of installation in accordance with the terms of the Contract after taking over the systems and issuance of delivery & acceptance certificate to the Supplier of the same at the sites.

1.2.9 “Radar System” the system completes with accessories, including all supports Facility, as per the specifications mentioned in the tender.

1.2.10 “E-tender” means tender floated and processed online.

1.2.11 “Goods” means the goods indicated in the Schedule of Requirements (Section 3).
1.2.12 “Inspection” means activities such as measuring, examining, testing, gauging one or more characteristics of the product or service and comparing the same with the specified requirement to determine conformity.

1.2.13 “L1” means the bidder whose tender is the lowest.

1.2.14 “Maintenance Contractor” means the contractor entrusted with the responsibility of maintaining the goods in warranty and post warranty period.

1.2.15 “Material” means anything used in the manufacture or fabrication or construction.

1.2.16 “Original Equipment Manufacturer” means the firm which designs, manufactures and delivers offered RADAR System.

1.2.17 “Performance Security” means monetary guarantee to be furnished by the successful tenderer for due performance of the terms of contract.

1.2.18 “Services” means services indicated in the Schedule of Requirements (Section -3)

1.2.19 “Specification” means the document / standard that prescribes the requirement with which the goods or service have to conform and include;
   a. Specifications / Requirements
   b. Drawings / Data and other relevant information for the turn key execution of contract
   c. Any other details governing the construction, manufacture or supply of goods as may be prescribed in the Contract.

1.2.20 “Supplier” means the bidder to whom a contract has been awarded for supplying goods and services as per this tender.

1.2.21 “Technical specification” includes Specifications, Drawings, Documents and certificates as referred in Section 4 and any other details governing the construction, manufacture or supply of stores as may be prescribed in the contract.

1.2.22 “Tender” means the bid received from a tenderer.

1.2.23 “Tenderer” means an entity participating in the bid.

1.2.24 “Tender Document” means the instant document.

1.2.25 "Test / Trial" means such tests as are prescribed in specifications to be made by the Purchaser or his nominee, after assembly ex-works before the equipment is installed by the tenderer as well as the tests to be performed before installation and commissioning.

1.2.26 “Turnkey basis” means the scheme of supply in which supplier shall be responsible for design, manufacture, supply, site preparation & services, installation and commissioning of equipment, tests and trials, training, maintenance and handing over to the Purchaser for operation.

1.3 WHO CAN BID?
   Only those who fulfill the following eligibility as well as the qualifications can submit tenders.

1.4 ELIGIBILITY
   To be eligible, the tenderer should have not been banned or suspended from Government transactions due to any reason including corrupt and fraudulent practices.
1.5 QUALIFICATIONS

1.5.1 Tenderer who have previous experience of manufacturing space objects/debris detection radar and its related software are only eligible for bidding. The Tenderer shall be a space objects/debris detection radar manufacturer and take complete responsibility of realizing the system as per ISRO specifications in hardware & software.

1.5.2 The Tenderer should have manufactured, installed and commissioned and operationalised at least one space object/debris detection radar either independently or jointly with full responsibility. Relevant documentary proof to be provided.

1.5.3 OEM is encouraged to engage with Indian Industries for the development of the subsystems of the radar. However, performance, reliability and meeting the specification is fully the responsibility of the OEM.

1.5.4 The tenderer should have manufactured & supplied and/or installed & commissioned similar space objects/debris detection Radar System, the tenderer shall submit documentary proof in this regard. The tenderer should also certify that he or his contractor has not been a defaulter in any previous tender or supply in any part of the world and has not been blacklisted in any country.

1.5.5 Only one bid can be submitted for the Radar manufactured by each OEM- either by the OEM himself or by his Indian subsidiary for each tender. However, OEM is fully responsible for the realization, commissioning and operationalization of the radar system meeting all technical specification. If more than one bid are received for the Radar manufactured by an OEM, the Purchaser may reject any or all such bids. If a Tenderer submits a bid on behalf of an OEM, the same Tenderer shall not submit a bid on behalf of another OEM. Offer containing multiple authorisations by OEM for the same scope of work to any entity(ies) shall be liable for rejection.

1.5.6 ISRO PREROGATIVE

1.5.6.1 Contract will be signed with successful bidder for the development of radar system as per the technical specifications provided by ISRO.

1.5.6.2 The ownership of complete radar system lies with ISRO and parties don’t have right to access the output data of radar system after installation without the prior permission/approval from ISRO.

1.6 HOW TO BID?

PRE-BID MEETING AND CLARIFICATIONS

1.6.1 A Pre-Bid meeting closure date and time is 14 September 2020 at 16:00 hrs. All queries and clarification required should reach to ISTRAC, Bangalore by email addressed to purchase@istrac.gov.in with a copy to anandanvk@istrac.gov.in.

1.6.2 Due to prevailing pandemic situation and international and national travel restriction, the parties are advised to send all queries in writing before the due date of pre-bid meeting-closure date.
1.6.3 Considering the prevailing situation due to COVID-19 pandemic across the world, if meeting is not possible in person, vendors are encouraged to send the clarification required in writing with in the stipulated time. ISTRAC/ISRO will give the consolidated reply within the framework of tender document.

1.6.4 Prospective tenderers should examine the tender document carefully and if they need any clarifications, they may submit them online on www.eprocure.isro.gov.in latest by 16:00 hrs. on 14 September 2020. No queries and requests for clarifications will be entertained after the Pre-Bid meeting closing date.

1.6.5 Tenderer may visit the sites of installation, at his own expenses, to have first-hand knowledge of the site & its surrounding and availability of resources for site preparation works, site services, installation and commissioning, etc. of Radar System.

1.6.6 All clarifications provided in connection with above shall be put on the website www.eprocure.gov.in.

1.6.7 The tenders shall be submitted on www.eprocure.gov.in in a two cover procedure. The first cover is a technical bid and the second cover will be the financial bid. If the tenderer is a company the tender should be signed by the person authorized by a resolution of the Board of Directors of the Company. A scanned copy of the relevant resolution should be attached with the technical bid.

1.7 PREPARATION AND SUBMISSION OF TENDERS

1.7.1 Tender documents may be downloaded from website: https://www.eprocure.gov.in

1.7.2 Tenders should be submitted online only at website: https://www.eprocure.gov.in/eprocure/app. Hard copies shall not be accepted at this stage.

1.7.3 Tenderers should follow the instructions provided in the Portal for procurement at https://www.eprocure.gov.in/eprocure/app.

1.7.4 The Technical Bid should be as per Tender Form (see Form 1) along with all relevant enclosures including the following:

1.7.4.1 Duly filled and signed Tender Form (Form -1).
1.7.4.2 Documentary evidence, establishing that the tenderer is eligible to submit the tender and, also, qualified to perform the contract if it’s tender is accepted. The documentary evidence needed to be submitted
1.7.4.3 Documents and relevant details to establish that the goods and the allied services offered conform to the requirement of the tender documents.
1.7.4.4 Tender document compliance and technical details for the proposed system.
1.7.4.5 Power of Attorney of firm / resolution of Board of Directors of company for person or persons authorized to sign the Tender;
1.7.4.6 Copies of documents defining constitution and legal status of the tenderer;
1.7.4.7 Documents indicating long term arrangements with the OEM (in the event of a collaborator bidding);
1.7.4.8 Documents indicating the arrangements in regard to maintenance during warranty and post warranty periods; including copies of documents of long-term agreement between the tenderer and the maintenance entity, if any;
1.7.4.9 An undertaking to the effect that the Price bid does not contain any conditions whatsoever;
1.7.4.10 Last three years certified published annual reports showing the turnover and financial results of the company;
1.7.4.11 Documents in respect of past supplies made by the tenderer/ OEM (Form 11);
1.7.4.12 Documents in respect of maintenance of Radar System;
1.7.4.13 Documents in respect of maintenance arrangement and technical support during warranty/ post-warranty periods, along with previous association with proposed agency.
1.7.4.14 An undertaking to the effect that OEM and Tenderer has not been a defaulter in any previous tender or supply in any part of the world and has not been blacklisted in any country.

1.7.5 The technical bid should not indicate the bid price directly or indirectly. If it is so indicated, the entire bid will be treated as invalid and shall be rejected.

1.8 PRICE BID (Price Schedule)

1.8.1 The financial bid should be prepared as per the Price Schedule given in Section 5 provided. It should have no inter-lineation, erasures or alterations and rates and amounts should be written in figures as well as in words, in such a way that interpolation is not possible. The total amount should be written both in figures and in words. Bid with options or conditions may be liable for rejection.

1.8.2 For evaluation purpose the offer documents will be treated as authentic and final. The price bid submitted will be taken up for the purpose for evaluation. Please refer Appendix -I for further details.

1.8.3 Upon the successful and timely submission of bids, any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for the tender or the relevant contact person indicated in the tender.

1.9 INDIAN AGENT
If a foreign tenderer has engaged an Indian agent in connection with its tender, the foreign tenderer, in addition to indicating in the price schedule the commission payable by him to the agent if any, should also furnish the following information:

1.19.1 The complete name and address of the Indian Agent and its permanent income tax account number as allotted by the Indian Income Tax authority.
1.19.2 The details of the services to be rendered by the agent for the subject requirement.

1.19.3 It is encouraged that foreign tenderer may execute larger part of the development and execution of the job with Indian industry meeting all tender technical qualification criteria. The possible part of the contract that can be executed Indian counterpart may be mentioned in the tender and approximate percentage of the contract amount also may be indicated.

1.10 LANGUAGE OF TENDER
The tender and all subsequent correspondence shall be in English. If any literature submitted by the tenderer is any other language, an English translation thereof should also be submitted and the English translation shall prevail for interpretation of the tender.

1.11 TENDERING EXPENSES
The tenderer shall bear all expenses incurred in or in relation to preparation, mailing and submission of its tender and its subsequent processing regardless of the conduct or outcome of the tendering process. All expenses for visits to sites by the tenderer and their representatives shall also be borne by them only.

1.12 AMENDMENTS TO THE TENDER DOCUMENT
The Purchaser may, at any time prior to the deadline for submission of tenders, for any reason, whether at his own initiative or in response to a clarification sought by prospective tenderer, issue addenda or corrigenda modifying this Tender Document. Such addenda or corrigenda shall be uploaded on www.eprocure.gov.in and the tenderer should check for addenda and corrigenda before submitting his tender. Any other communication issued to the tenderers shall not be construed to amend the Tender Documents. In order to give the prospective tenderers reasonable time to prepare their tenders as per the amendment, the Purchaser may, at its discretion extend the deadline for the submission of tenders and other allied time frames, which are linked with that deadline.

1.14 TENDER VALIDITY
1.15.1 The tenders should remain valid for acceptance for a period of 180 days (one hundred Eighty days) after the date of tender opening indicated in the tender document. If the day up to which the tenders are valid falls on/ is subsequently declared a holiday or closed day for the Purchaser, the tender validity shall be automatically extended up to the next working day.

1.15.2 Under certain circumstances, the Purchaser may request the tenderer to extend the validity of their tenders upto a specified period. The tenderers, who agree to extend the tender validity, should do so without any change or modification of their original tender.
1.15 HOW WILL THE TENDERS BE EVALUATED?

1.15.1 OPENING OF E-TENDERS

1.15.1.1 The Purchaser will open the Technical bids at 1600 hrs on 17 August-2020. If this date falls on/ is subsequently declared a holiday or closed day for the Purchaser, the tenders will be opened at the appointed time and place on the next working day.

1.15.1.2 The first cover, i.e. technical bids will be opened first. These bids will be scrutinized and evaluated with reference to parameters prescribed in the tender document. If the details/data given in the technical bids are found in conformity with the technical specifications prescribed in Tender Document, testing of the models offered by the Tenderers may be carried out to ascertain the actual performance of the systems and seek technical presentation by the Tenderer, at the discretion of the Tender Evaluation Committee.

1.15.1.3 The second cover, i.e. price bids of only technically acceptable offers shall be opened and evaluated. All Tenderers whose technical proposals have been found acceptable will be informed about the time and date of opening of the Price Bids.

1.15.2 BASIC PRINCIPLE

1.15.2.1 Tenders will be evaluated on the basis of the terms & conditions already incorporated in the tender enquiry document, and amendments, if any, based on which tenders have been received and the terms, conditions etc. mentioned by the tenderers in their tenders. No new conditions will be brought in while scrutinizing and evaluating the tenders.

1.15.2.2 The Purchaser reserves the right to have the financial and other data / credentials claimed by the tenderer verified independently, if necessary by a third party. If the data/ credentials furnished are found to be incorrect, the Purchaser will reject the particular Tender summarily. The Purchaser also reserves the right to reject any Tender submitted by a tenderer if it comes to know suo-motu of any adverse reports on the financial condition, technical competence and other matters of the tenderer.

1.15.3 PRELIMINARY SCRUTINY OF TENDERS

The tenders will first be scrutinized to determine whether they are complete and meet the essential and important requirements, conditions, etc. as prescribed in the tender enquiry document. The tenders, which do not meet the basic requirements, are liable to be treated as unresponsive and ignored.
1.15.4 MINOR INFIRMITY / IRREGULARITY / NON-CONFORMITY

If during the preliminary examination, the Purchaser finds any minor infirmity and/or irregularity and/or non-conformity in a tender, the Purchaser may waive the same provided it does not constitute any material deviation and has no financial impact and, also, does not prejudice or affect the ranking order of the tenderers. Wherever necessary, the Purchaser will convey its observation on such ‘minor’ issues to the tenderer either online or by registered/speed post, etc. asking the tenderer to respond by a specified date. If the tenderer does not reply by the specified date or gives evasive reply without clarifying the point at issue in clear terms, that tender will be liable to be ignored.

1.15.5 SCRUTINY AND EVALUATION OF TENDERS TECHNICAL BIDS

1.15.5.1 The technical bids will be evaluated by the Tender Evaluation Committee (TEC) to assess the following:

1.15.5.2 Is the bidder eligible and qualified to submit the tenders?
1.15.5.3 Does the tender conform to all the Instructions to Tenderers?
1.15.5.4 Are the goods and services offered as per the Schedule of Requirements and Technical Specifications?
1.15.5.5 Is the proposed set-up for warranty and post-warranty maintenance satisfactory?
1.15.5.6 Is the bidder capable of providing the goods and services?
1.15.5.7 To assist examination, evaluation and comparison of the bids, the Purchaser may at its discretion, request any Tenderer for a clarification/ additional information on its bid. Any clarification/ additional information submitted by a Tenderer in respect to its bid that is not in response to a specific request by the Purchaser shall not be considered for purpose of evaluation. The Purchaser’s request for clarification and the response shall be in writing. No change in the price and substance of the bid shall be sought or offered or permitted.

1.15.6 PRICE BIDS

In the second stage, Price bids of bidders whose technical proposals are acceptable will be opened, scrutinised and evaluated. Price bids which are not as per the Price Schedule in the Tender Document will be ignored. Other price bids will be evaluated as follows:

1.15.6.1 Bids of all tenderers will be converted into Indian Rupees for comparison. Any part of the bid not in Indian Rupees will be converted at the exchange rates established by the State Bank of India (BC selling Rate) for similar transactions, as on the date of opening of the Technical Bid. If on this date, due to any reasons such exchange rates are not available (FOREX market being closed), the latest available rates prior to the date of opening shall be considered.
1.15.6.2 The lowest tenderer (L1) shall be determined on the cost of Radar System and all accessories required for running the radar supplied by the tenderer, including site preparation, facility & services.

1.15.6.3 Tenderer must consider all technical specification in terms of hardware, software, computing resources and accessories deliverables while quoting the price bid.

1.15.6.4 Supply of material from Indian companies and work carried out in India will be paid in Indian currency as per the billing details and balance amount will be paid in foreign currency in the contract price. Tentative part of foreign and Indian currency may be indicated in the price bid.

1.15.6.5 Tenderer must quote CAMC charge for the radar system (Hardware and software supplied by the tenderer and active part of the operational radar system) for 10 years. The price bid received without CAMC charges will be summarily rejected.

1.15.6.6 The CAMC charge shall not be more than 8% (eight percent) of the radar system.

1.15.7 SELECTION OF SUCCESSFUL BIDDER

Subject to clause 1.16 below, the lowest evaluated responsive tenderer will be the successful bidder and he will be awarded the contract.

1.16 PURCHASER’S RIGHT TO ACCEPT ANY TENDER AND TO REJECT ANY OR ALL TENDERS

1.16.1 The Purchaser reserves the right:

1.16.1.1 To disqualify one or more tenderers on grounds of national security and public interest;

1.16.1.2 To accept in part or in full any tender or reject any tender without assigning any reason;

1.16.1.3 To cancel the tendering process and reject all tenders at any time prior to award of contract.

1.16.2 The Purchaser shall not be liable to any affected tenderer or tenderers due to above decisions.

1.17 CONTRACT FOR GOODS AND SERVICES

1.17.1 NOTIFICATION OF AWARD

Before expiry of the tender validity period, the Purchaser will notify the successful tenderer in writing, by registered / speed post or by fax (to be confirmed by registered / speed post) that its tender for goods & services, has been accepted.

1.17.2 SIGNING OF CONTRACT

Immediately after notification of award, the Purchaser will mail the draft contract form, to the successful tenderer by registered / speed post and e-mail, which the successful tenderer should sign with Purchaser within 21 days from the notification of award as per mutually
agreed date. Until the contract is signed, the notification of award shall constitute the conclusion of the contract. The manufacturer/ supplier/ tenderer shall notify the Government of India for any material change in the status, in particular, where such change would impact on performance of the obligations under the contract.

1.17.3 PERFORMANCE SECURITY

The successful tenderer must submit performance security of 5% of the contract value within thirty days from the date of notification of award. Performance Security will be converted to performance Bank guarantee after successful commissioning of the radar system and returned to the Supplier after completion of all obligations.

1.17.4 CONTRACT FOR CAMC

A separate Comprehensive Annual Maintenance Contract of the system shall be signed for post warranty period. Entering in to CAMC is the sole discretion of the purchaser after the warranty period.

1.18 MISCELLANEOUS

1.18.1 CONTACTING THE PURCHASER

Information relating to the examination, verification, evaluation and comparison of tenders and recommendations concerning the award of contract shall not be disclosed to bidders or other persons. The tenderer shall not canvass in connection with tenders or attempt to influence the scrutiny, comparison and evaluation of tenders.

1.18.2 NON-RECEIPT OF PERFORMANCE SECURITY AND CONTRACT BY THE PURCHASER

1.18.3 CONTRACT PRICE

1.18.3.1 The Contract Price of the Radar facility shall be the price for delivery at the place of installation, Installation & Commissioning, Transportation & Insurance, Inspection & Survey charges, Test and Trials, Services of manufacturer’s for one years warranty period, Customs Duty and GST if & as leviable and all other taxes and duties as applicable. Contract Price shall be firm and fixed price subject to variation in Indian duties and taxes but not subject to any escalation whatsoever.

1.18.3.2 The Contract Price shall not be subjected to any adjustment in respect of rise or fall in the cost of labour, materials, currency rate variation, devaluation or any other matter having implication on the cost of the execution of the Contract and adjustments for subsequent legislation, statute, ordinance, decree, law, regulation that may occur in the country in which the Radar is being manufactured.

1.18.3.3 The contract price is irrevocable and not subject to any change whatsoever, even due to increase in cost of raw material components and fluctuation in the foreign exchange rates for the design parameters specified in the contract. However, since this involves design and development of new technology, if a need arises to modify the
design to meet the specification, developer/manufacturer/contractor shall support the design requirement and modify and deliver the subsystem to the acceptance of the project. The cost incurred for such development may be informed in advance to the purchaser and obtain concurrence. The cost implication, if any, will be discussed and arrive mutually acceptable terms and amendment shall be obtained in purchase order before carrying out the work.

1.18.3.4 Further, during the period of delivery systems, in case the supplier delivers the system of identical specification at less price to any other party (price being the sole consideration in the supply), the contract price will be deemed to have been reduced by the difference between the price offered to the Purchaser and the other party. Any difference in the terms of supply shall be duly accounted in the process.

1.18.3.5 Annual Maintenance charges for post warranty maintenance shall include the cost of spare parts that will be required to be replaced & consumables, inclusive of taxes and duties. GST on the contract charges shall be mentioned separately, which will be reimbursed as per actual.

1.18.3.6 Comprehensive Annual Maintenance Contract (CAMC) shall be only for the maintenance of stores (all equipment and software supplied by Contractor only) therefore prospective bidders are advised to quote CAMC charges accordingly and specifically for Ten years after the expiry of one years of warranty period. The charges are to be quoted for each year, on annual basis. The CAMC charge shall not be more than 8% (eight percent) of the radar system.

1.18.3.7 The reasonability of cost including the CAMC charges shall be a criterion in short listing the Bidders. Justification of CAMC charges with breakup need to be submitted along with the sealed price bid.

1.18.3.8 In case any charges not mentioned in the price bid, it will be treated as all the charges are inclusive for that item.

1.18.4 DUTIES AND TAXES

1.18.4.1 The tenderer shall pay all non-Indian taxes, duties, and levies, lawfully assessed against the Purchaser or the tenderer in pursuance of the contract.

1.18.4.2 All the duties and **taxes paid by the Supplier in India will be reimbursed as per actual**. No claim, on account of increase in cost of the raw materials due to increase of taxes or duties, will be entertained.

1.18.4.3 The tenderer should indicate tentative duties and taxes in the proforma as applicable on the date of opening of technical bids. However, payment of duties and taxes shall be made as per actual and the statutory variations in taxes and duties shall be allowed during the delivery period as agreed in terms of the Contract. The Purchaser shall get the benefit if duties and taxes get reduced and pay extra to the supplier if the same increase. However, any new taxes and duties imposed by the Government of India will be on the purchaser’s account. Likewise, any increase/decrease in net input tax credit on account of imposition of new taxes and duties imposed by the Government of India will be on the Purchaser’s account.
1.18.4.4 The Purchaser is not liable to any claim on account of fresh imposition and/or increase of statutory duties or taxes on the raw materials and/or components used directly in the manufacture of the contracted stores taking place during the pendency of the contract.

1.18.4.5 If Purchaser is required by Indian Law to deduct or withhold any other taxes or other amounts, the gross amount payable by Purchaser shall be paid after making such deductions or other withholdings. Necessary certificate for the deductions so made will be issued by the Purchaser.

1.18.4.6 The Supplier shall intimate to the Purchaser the anticipated delivery date of the Systems at least 30 (Thirty) days in advance.
1.18.5 STAGES AND METHOD OF PAYMENT
The Purchaser will pay the Supplier the following amounts, if the Supplier completes the work at each stage and produces billing documents.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Stage</th>
<th>Payment</th>
<th>Billing documents which the Supplier has to submit</th>
</tr>
</thead>
</table>
| 1.      | Upon satisfactory completion of Factory Acceptance Tests & receipt of Radar System at the site of installation | *60% of the ex-duty/tax cost                | 1. Claim as per Form 8.  
2. Supplier’s commercial invoice in quadruplicate.  
3. Receipt at Site Certificate issued by the user Commissionerate in Form 6 |
| 2.      | Upon completion of installation & commissioning of Radar System       | *20% of the ex-duty/tax cost                | 1. Claim as per Form 8.  
2. Supplier’s commercial invoice in quadruplicate.  
3. Submission of installation & commissioning Certificate issued by the Purchaser in Form 6 |
| 3.      | Upon completion of site trials and handing over of Radar System      | *20% of the ex-duty/tax cost                | 1. Claim as per Form 8.  
2. Supplier’s commercial invoice in quadruplicate.  
3. Certificate of delivery and acceptance of Radar System issued by the Purchaser in Form 7.  
4. Bank Guarantee for warranty performance as per Clause 2.9, Section 2.  
4. Bank Guarantee for warranty performance as per Clause 2.9, Section 2.  
|
| 4.      | Duties, taxes and levies, as applicable                              | 100% on payment, as and when made           | 1. Claim as per Form 8.  
2. Supplier’s commercial invoice in quadruplicate.  
3. Documents showing evidence of payment of duty/taxes |

*: Part of contract price not in INR will be converted at the exchange rates established by State Bank of India for similar transactions, as on the date of release of payment.
SECTION 2

2. CONDITIONS OF CONTRACT
The contract signed with the Supplier will be subject to the following conditions.

2.1 USE OF CONTRACT DOCUMENTS AND INFORMATION

2.1.1 The Supplier shall not, without the Purchaser’s prior written consent, disclose the contract or any provision thereof including any specification, drawing, sample or any information furnished by or on behalf of the Purchaser in connection therewith, to any person other than the person(s) employed by the Supplier in the performance of the contract emanating from this tender enquiry document. Further, any such disclosure to any such employed person shall be made in confidence and only so far as necessary for the purposes of such performance for this contract.

2.1.2 The Supplier shall not, without the Purchaser’s prior written consent, make use of any document or information mentioned in para 2.2 except for the sole purpose of performing this contract.

2.1.3 Except the contract issued to the Supplier, each and every other document mentioned in para 2.2, shall remain the property of the Purchaser and, when advised by the Purchaser, all copies of all such documents shall be returned to the Purchaser on completion of the Supplier’s performance and obligations under this contract.

2.2 PATENT RIGHTS
The Supplier shall, at all times, indemnify the Purchaser, free of cost, against all claims which may arise in respect of goods & services to be provided by the Supplier under the contract for infringement of any right protected by patent, registration of designs or trademarks. If any claim of alleged breach of patent registered designs, trademarks, etc., is made against the Purchaser, he shall notify the Supplier about it and the Supplier shall, at his own expenses take care of its settlement without any liability to the Purchaser.

2.3 PERFORMANCE SECURITY

2.3.1 Within twenty-one days of the issue of notification of award by the Purchaser, the Supplier shall furnish performance security to the Purchaser for an amount equal to ten per cent of the Contract Price, valid up to sixty (60) days after the date of completion of all contractual obligations by the Supplier.

2.3.2 If the contract is amended, the Supplier shall, within fifteen days of issue of the amendment, furnish the corresponding amendment to the Performance Security (as necessary), valid in all respects in terms of the contract, as amended.

2.3.3 Faithful execution of the contract.

2.3.4 The successful and satisfactory supply of the complete radar system and its parts covered under this contract (including all the hardware, software, documents) under the condition and for the services specified.
2.3.5 Warranties against any and all defects in materials/components/sub-systems and workmanship during the operation of the system at specified site. Upon notice from ISTRAC, the Party has to replace the defective supply of system at no extra cost.

2.3.6 In case of emergency/system failure, it should be attended to within 3 days at developer/manufacturer/contractor’s cost. Minimum shutdown period of the system should not exceed 15 days continuously and in a year should not cross 30 days.

2.3.7 The Performance security or its amendments shall be denominated in Indian Rupees or in the currency of the contract and shall be in the form of a Bank Guarantee issued by a commercial bank in India, as per Form 4. A Bank Guarantee equal to 5% of the Contract Price shall be furnished, as per Form 4; after commissioning and before release of the final stage payment. This

2.3.8 Performance-cum-warranty shall remain valid for a period of 1 years from the date of completion and acceptance of work.

2.3.9 If the Supplier fails to fulfill its obligations in terms of the contract, the Purchaser shall appropriate the performance securities. Otherwise, the Purchaser will release the performance securities without any interest to the Supplier on completion of the Supplier’s all contractual obligations including the warranty obligations.
SECTION 3

3. SCHEDULE OF CONTRACT

3.1 SCOPE OF WORK
The Supplier shall supply the following goods and services. The cost of all of the following, except CAMC, is deemed to have included in the cost of the Radar System:

3.1.1 Supply, deliver, install and commission Radar and associated systems/equipment- list;
3.1.2 Carrying out site preparation works and providing site related services including civil works for radar;
3.1.3 Training of staff of user in the operation Radar and in comprehensive Data analysis during warranty and post-warranty period;
3.1.4 Maintenance of the Radar for one year under warranty including supply of spare parts and consumables;
3.1.5 Comprehensive Annual Maintenance under a contract (hereinafter referred to as CAMC) including supply of spare parts and consumables for a period of ten years after completion of warranty period of one years;
3.1.6 Product Support for life time of the radar (minimum 10 years) after one year’s warranty period;
3.1.7 Provide upgrades from time to time.

3.2 SUPPLY, INSTALLATION AND COMMISSIONING
The Radar shall be supplied, installed and commissioned at Shillong, Meghalaya or ISRO specified place. Radar should meet the specifications and technical details indicated in Section 4.

3.2.1 The supply, installation and commissioning are deemed to be completed once the Certificate of Delivery & Acceptance is signed by the Supplier and the Purchaser at the site of Installation.

3.3 REGULATORY & OTHER REQUIREMENTS
3.3.1 Supplier, after award of contract, will need to submit Design Basis Report, Design Calculations, Design drawings, QAP, etc. to the Purchaser and other agencies, as required, before commencement of works for review/approvals, as necessary.
3.3.2 The Bidder, in his own interest and own expenses, may visit the sites of installation to get first-hand assessment of the site, its surrounding and availability of resources. Prospective bidders may contact ISRO during the site visit for obtaining relevant information relating to site and other associated activities required for installation and commissioning of system.
3.3.3 It is advised that prospective bidders inform the Purchaser of their intention of visiting the sites, so that a common date can be fixed and representative(s)/experts of the Purchaser can be present to provide necessary information.
3.4 SITE WORKS & SERVICES

3.4.1 All site construction works and installation activities undertaken by the Supplier will be supervised by representatives of Purchaser as and when required.

3.4.2 Site works involve construction of building with reference to building Radar system and it accessories like DG, UPS, cooling system etc. All the construction material used shall be industry standards. The Supplier shall also carry out modifications (as directed by the Purchaser).

3.4.3 In general, site work will also include providing/ establishing electrical sub-station, electrical trenches, electricity distribution, communication, networking, firefighting equipment’s, earthing, lightning protection, water distribution, security & surveillance equipment around radar installation, diesel storage, water storage (underground & overhead) & distribution, if required, cooling system etc., as required for the radar system. Civil & structural construction works if required should meet the following requirements:

3.4.4.1 Foundation of the structures/ buildings should be decided based on the geotechnical survey to be carried out by the contractor for the sites concerned. Design of the foundation shall be carried out as per respective BIS codes & standards. Sub-grade soil should be treated suitably to increase the bearing capacity. Expansive soil at top level should be removed up to minimum 300 mm depth. It should be backfilled with compacted murrum before soling. Consolidation of soil may also be required in certain cases.

3.4.4.2 Structures/ buildings should be designed for site specific strata (obtained through geo-technical investigations) and should meet the requirements of seismic design criteria as per the seismic zone in which the site falls and as per the provisions of IS 456-2000 with due to consideration to environmental exposure condition. Structures/ buildings should undergo both static & dynamic design analysis.

3.4.4.3 Minimum M30 grade concrete shall be used in RCC construction along with suitable reinforcement, which should be provided in accordance with IS 13920-1993. Piles for foundation, when found necessary upon geotechnical studies, shall be designed as per the provisions of ARE 2911. Non-destructive testing of cast plies shall also be carried out as per the provisions of IS 14893-2001.

3.4.4.4 Radar Facility should be located above the highest flood level noted for the site. In any case, it shall not be located lower than 450 mm from the adjacent road level.

3.4.4.5 Radar Facility might have to be constructed in the proximity of the existing installations. Hence, the tenderer must consider, while making the bid, the care and caution to be taken and necessary provisions to be made such that no damage (underground/ over ground) occurs to the existing structures/ installations and services there. These installations shall continue to function normally during the construction of the Radar Facility. Boundary wall, fencing, gates, etc. will be in consonance to the existing design in the respective Ports.

3.4.4 Electrical & communication works will cover, but not limited to, supply, installation, testing and commissioning of:

3.4.4.1 230 V, 3 phase, 4 wire Power Control Centre(s). ISRO will provide the 3 phase (400 V) power supply.
3.4.4.2 Local Push Button Stations as needed for facility operation and its associated systems such as weigh-bridge, boom- barriers, motorised shutters/gates, air-conditioning units, pumps, ventilation dampers, etc wherever required.
3.4.4.3 Supply of cables & trays, cabling and terminations at various electrical panels/equipment of the Facility for power supply distribution.
3.4.4.4 Communication equipment for the remote operation of the radar with all security protection (hardware and software firewalls) and its connectivity to the communication line provided by the purchaser.
3.4.4.5 Supply & installation of high static electricity & lightning protection systems.
3.4.4.6 Concealed lighting distribution boards (LDB), lighting panels.switch boards/sockets, power receptacles, lighting fixtures and accessories within the Facility plot.
3.4.4.7 Supply and installation of AVR with suitable capacity after the main power supply to avoid any fluctuation in the input power supply reaching to the main radar system.
3.4.4.8 Supply & installation of DG set of suitable rating for the operation of the radar system and associated units as a whole.
3.4.4.9 Integration of DG power with commercial power supply with auto switch-over.
3.4.4.10 Supply & installation of day oil tank & oil storage tank (to meet three days’ requirement) and oil transfer arrangement for DG set.
3.4.4.11 Supply & installation UPS (along with necessary battery banks) of suitable rating to sustain the scanning operation for 30 minutes and its integration to commercial/emergency power supply.
3.4.4.12 Supply & installation of separate grounding arrangement for electrical and electronic systems insulated from each other.
3.4.4.13 Indication/alarm in the operation station, with associated hardware and cabling, of important parameters of the support/auxiliary systems.
3.4.4.14 Any modifications necessitated during design & detailing of the Facility to meet functional & operational requirements or due to constructional & site requirements, shall be carried out by the Supplier at no extra cost to the Purchaser.
3.4.4.15 Supplier shall give detailed engineering drawing of the electrical, civil and other related activity carried out at site for the installation of radar.
3.4.4.16 Supplier shall give in detail drawings of the land requirement and its leveling, power supply etc to the purchaser during the PDR time. The sketch of the radar system occupying in the land shall be provided in advance along with technical bid. The land is limited to 150m x 150m with a reserved land of 50mx50m for establishing auxiliary units by the purchaser for other purposes.
3.4.4.17 Sufficient spares of various subsystems and accessories also shall be supplied as per the requirement to run the system minimum uptime of 95% as per the requirement. The list shall be given along with technical bid.
3.4.4.18 Sufficient number of test instruments also shall be supplied along with the system to troubleshoot and diagnose, calibrate the system. The list shall be given along with technical bid.
3.4.4.19 Details of calibration procedures and setup shall be provided along with the system.

3.5 FORCE MAJEURE:

3.5.1 Force Majeure means an event beyond the control of the Contractor and not involving the Contractor's fault or negligence and which is not foreseeable. Such events may include, but are not restricted to, acts of the purchaser either in its sovereign or contractual capacity, wars or revolutions, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes, lockouts, and freight embargoes.

3.5.2 If there is delay in performance or other failures by the Contractor to perform its obligation under its contract due to event of a Force Majeure, the Contractor shall not be held responsible for such delays/failures.

3.5.3 If a Force Majeure situation arises, the Contractor shall promptly notify the purchaser in writing of such conditions and the cause thereof within twenty one days of occurrence of such event.

3.5.4 Unless otherwise directed by the purchaser in writing, the Contractor shall continue to perform its obligations under the contract as far as reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

3.5.5 If the performance in whole or in part or any obligation under this contract is prevented or delayed by any reason of Force Majeure for a period exceeding sixty days, either party may at its option terminate the contract without any financial repercussion on either side.

3.5.6 There may be a Force Majeure situation affecting the purchase organization only. In such a situation the purchase organization shall take up with the Contractor on similar lines as above for further necessary action.

3.6 WARRANTY

3.6.1 The warranty shall be on-site warranty for 01 (one) years from the date of commissioning and acceptance of the system.

3.6.2 All items supplied to stores should be free from all defects and faults in material workmanship and manufacture.

3.6.3 Goods should be of the highest grade and consistent with the established and generally accepted standards for material of the type used and in full conformity with the specifications, drawings, or samples and shall, if operable, operate properly.

3.6.4 The Contractor shall be bound to furnish a clear written warranty.
3.6.5 The Contractor will be required to replace defective goods, free of cost inclusive of all freight and handling charges.

3.6.6 The Contractor shall take over the replaced parts/goods after providing their replacements and no claim, whatsoever shall lie on the purchaser for such replaced parts/goods thereafter.

3.6.7 Custom duty charges, if any, for re-export/re-import of defective parts/repaired parts or replaced parts to the foreign supplier country for repairs etc shall be borne by Contractor only.

3.6.8 Transportation cost for sending defective parts for repairs and sending back repaired or replaced one to ISTRAC site, shall be borne by Contractor itself till CAMC.

3.6.9 Warranty shall be quoted as per ISTRAC requirements i.e. one years after commissioning of the Radar, otherwise the Bid shall be considered as unresponsive.

3.6.10 Other condition, if any, under warranty clause of “Technical specifications – Section-4, shall also be applicable.
3.7 COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT (CAMC) FOR EQUIPMENT AND SOFTWARE

3.7.1 The Purchaser/Consignee reserves the rights to enter into Comprehensive Annual Maintenance contract between Consignee and the Contractor after the completion of warranty period.

3.7.1 CAMC shall be for the maintenance of stores (all equipment and software supplied by the Contractor only). Prospective bidders are advised to quote accordingly and specifically.

3.7.1 Payment for maintenance contract is made on quarterly basis unless it is specified otherwise in the technical section.

3.7.1 The indenter has the discretion to award CAMC or not.

3.7.1 As per ISTRAC requirements, year wise CAMC shall be quoted for 10 years after completion of 01 years warranty period, otherwise the Bid shall be considered as unresponsive.

3.8 PENALTY CLAUSE/LIQUIDATED DAMAGES CLAUSE (LD) FOR DELAYED DELIVERY OF STORES & SERVICES

3.8.1 Penalty/Liquidated damages shall be calculated on the total purchase/contract price.

3.8.1 The Contractor shall deliver the goods and perform the services (delivery, installation, acceptance and commissioning) under the contract within the time schedule specified by the purchaser in the “Technical specifications – Chapter-3” section and as incorporated in the Purchase order. The delivery date shall considered as the date on which all the items/stores/materials/services etc., have been delivered as per Purchase order. Any delay shall be taken into account for penalty/LD purpose as per term/conditions of the contract.

3.8.1 The purchaser shall, without prejudice to other rights and remedies available to the purchaser under the contract, deduct as penalty/liquidate damage from the contract price, a sum equivalent to 0.5% per week of delay or part thereof on delayed supply of goods and/or delayed services in deviation to the milestone in Delivery Schedule, mentioned elsewhere in the document, subject to a maximum of 10% of the total contract value.

3.8.1 Once the maximum is reached purchaser may also consider following:
   i. Forfeiture of the security deposit.
   ii. Termination of the contract for default.

3.8.1 The Contractor shall not be held responsible for delay in delivery of stores and their installation under the follows reasons:
i. **Delay in providing Entry permits/Road Permits (if required) to the Contractor by the consignee.**

ii. **Delay in providing proper site(s) by the consignee to the Contractor, for installation of stores.**

iii. **Delay in providing No Objection Certificate (NOC), required from any other government agency/agencies.**

iv. **Delay in Communication facility required for project to be provided to the Contractor by the consignee, if it is not the responsibility of Contractor.**

v. **Due to delay in any or all of the above conditions the prescribed date of delivery may be extended by mutual consent.**

3.8.1 The Contractor shall not dispatch the goods after expiry of the delivery period. The Contractor is required to apply to the purchaser for extension of delivery period and obtain the same before dispatch. In case the Contractor dispatches the goods without obtaining an extension, it would be doing so at its own risk and no claim for payment for such supply and / or any other expense related to such supply shall be against the purchaser.

3.8.1 The Contractor shall inform to the purchaser directly in writing about any delays on part of ISTRAC.

### 3.9 AWARD CRITERIA AND TOLERANCE CLAUSE

3.9.1 The purchase order shall be awarded to the eligible responsive BIDDER tender, evaluated as L1, technically qualified and suitable to the requirements.

3.9.2 Based on the purchaser’s requirement, order for enhancement of number of radars may also be placed within 24 months of issue of purchase order, at the same price and with the same terms & conditions. The installation site may be anywhere in India.

### 3.10 MODIFICATION OF CONTRACT

a) If necessary, during the period of the contract, the purchaser may amend the contract, by making alterations and modifications within the general scope of contract and issue a written order in this regard to the Contractor at any time by mutual consent.

### 3.11 TAXES AND DUTIES IN INDIA:

#### 3.11.1 Duties and Local Taxes

3.11.1.1 Contractor shall pay Work Contract Taxes (WCT), GST/IGST/SGST/ Service Tax and other taxes where applicable as per existing rules at that time.

3.11.1.2 Normally materials to be supplied to Govt. Department against Govt. contracts are exempted from levy of town duty, Octroi duty, terminal tax and other levies of local bodies. The local Town/Municipal Body regulations at times, however, provide
for such exemption only on production of such exemption certificate from any authorized officer.

3.11.1.3 Contractors should ensure that stores ordered against contracts placed by this office are exempted from levy of town duty/Octroi duty, Terminal tax or other local taxes and duties.

3.11.1.4 Exemption certificates will be issued by the department to avoid payment of such local taxes or duties, however if not accepted by any agency the payment will be reimbursed on production of original receipts.

3.11.1.5 The Contractor shall pay the Octroi, entry tax etc. if exemption certificate not agreed by local authorities and same may be got reimbursed from purchaser on proof of payments to avoid delay in the supply of stores.

3.12 SUPPLY OF ROAD PERMITS BY THE INDENTER /CONSIGNEE

In all such cases where the requirement of Road Permit for entry of goods into a particular State is mandatory, the following provisions shall be strictly followed:

3.12.1. The Contractor shall request the indenter /consignee for providing Road permit.

3.12.2. The Contractor shall furnish all the necessary information and documents in this regard to consignee.

3.12.3. On receipt of the above request from the Contractor, the consignee concerned shall arrange to provide the Road permit/Way Bill in the prescribed form to the Contractor within a maximum period of two weeks so that the same reaches the Contractor before the dispatch of the stores,

3.12.4. The Contractor shall not be held responsible for any delay in supply due to non-supply/delayed supply of Road permit.

3.13 TERMINATION OF TENDER BY THE PURCHASER

3.13.1 From the time of submission of tender to the time of awarding the contract, if a bidder needs to contact the purchaser for any reason relating to this tender enquiry and/ or its tender, it should do so only in writing, only to Purchase, ISTRAC.

3.13.2 In case a bidder attempts to influence the purchaser in the purchaser's decision on scrutiny, comparison & evaluation of tenders and awarding the contract, the tender shall be liable for rejection in addition to appropriate administrative actions being taken against that bidder, as deemed fit by the purchaser.

3.13.3 The purchaser, without prejudice to any other contractual rights and remedies available to it (the purchaser), may, by written notice of default sent to the Contractor, terminate the contract in whole or in part, if the Contractor fails to deliver any or all of the goods or fails to perform any other contractual obligation(s) within the time period specified in the contract, or within any extension thereof granted by the purchaser.
3.13.4 In the event of the purchaser terminates the contract in whole or in part, the purchaser may procure goods and/or services similar to those cancelled, with such terms and conditions and in such manner as it deems fit and the Contractor shall be liable to the purchaser for the extra expenditure, if any, incurred by the purchaser for arranging such procurement.

3.13.5 If the Contractor becomes bankrupt or otherwise insolvent, the purchaser reserves the right to terminate the contract at any time, by serving written notice to the Contractor without any compensation, whatsoever, to the Contractor, subject to further condition that such termination will not prejudice or affect the rights and remedies which have accrued and/or will accrue thereafter to the purchaser.

3.14 ARBITRATION CLAUSE

3.14.1 If dispute or difference of any kind shall arise between the purchaser and the Contractor in connection with or relating to the extension of contract, the parties shall make every effort to resolve the same amicably by mutual consultations.

3.14.2 If the parties fail to resolve their dispute or difference by such mutual consultation, then, unless otherwise provided in the “Technical specifications – Chapter-3” section, either the purchaser or the Contractor may give notice to the other party of its intention to commence arbitration, as herein after provided the applicable arbitration procedure will be as per Indian Arbitration and Conciliation Act, 1996.

3.14.3 In the case of a dispute or difference arising between the Purchaser/Consignee and all Contractors relating to any matter arising out of or connected with the contract, such dispute or difference shall be referred to the sole arbitration of an officer, appointed by ISTRAC.

3.14.4 The award of the arbitrator shall be final and binding on the parties to the contract.

3.14.5 Each party shall bear its own cost.

3.15 VENUE OF ARBITRATION

a) The venue of arbitration shall be the place from where the contract has been issued, i.e., Bangalore, India.

b) The contract shall be interpreted in accordance with the laws of India.

3.16 LIST OF DELIVERABLES

3.16.1 The bidder shall submit the final list of Deliverables as given at Section-5 for all the stores, Hardware, Software items, subunits etc and all other services which bidder is going to offer in their technical proposal to meet the requirements under “Technical specifications- Section-4”, of this tender document.

3.16.2 The list of deliverable shall be identical to that submitted in the price bid.
The price bid shall not be considered if it is not matching with the list of deliverable submitted with technical bids

**Note:** It is mandatory to mention the details of offered Stores Items.

### 3.17 TRAINING

After installation and commissioning of the radar, the Supplier shall initially train at site, ten ISRO officers (to be nominated by the user) in the operation of the Radar operation and Data analysis. The Supplier shall specify the course content and aids with the consent of ISRO. The training should take place in an environment where each participant has access to a workstation of his/her own. The training programme (class room, on-screen simulation and hands-on) shall cover all aspects of operation, image interpretation, administrator, etc. In addition, training should also be imparted on radiation safety, mechanical/electrical safety and first level trouble shooting. Operator feedback mechanism on the system performance should exist, which will assist in addressing the concerns, if any, of the users and also to upgrade the software as necessary. No additional cost will be paid in regard to the above.

### 3.18 TESTS AND TRIALS

After installation and commissioning, the Supplier and the user will conduct tests and trials for 30 days. If the delivered system works in accordance with the agreed specifications and without faults or malfunction during this trial period of one month, the equipment will be deemed to have been commissioned. If not, the faults and malfunctions are to be rectified and a further trial period of one month shall be added to permit an additional attempt to meet contract specification. For this extension of one month, the warranty period would be extended by two months. Only one extension of one month shall be granted. If the functioning of the system is not faultless in this extended period, no further extension shall be granted and the contacts shall be liable for cancellation. During the trial period, the ownership of the equipment shall continue to be with the Supplier.

### 3.19 DELIVERY

After successful completion of tests and trials, the Supplier shall deliver Radar and all related equipment, operation manuals, construction drawings, quality assurance reports, reference documents, etc. The delivery will be completed when the Supplier and the user ISRO sign the Certificate of Delivery and Acceptance as provided in Form 7. Decisions of the Purchaser as to compliance or non-compliance with the requirements shall be final and binding upon both parties hereto.

### 3.20 DELIVERY SCHEDULE

The Supplier shall deliver the Radar System along with Site preparation works within 30 (Thirty) months from the date of notification of award.

### 3.21 TERMS OF DELIVERY

3.21.1 Until the delivery is completed, the Radar system and all its associated systems & equipment are the responsibility of the Supplier. Accordingly, its packing,
transport, insurance, clearance through Customs, handling, maintenance and upkeep until the delivery shall be to the responsibility of the Supplier and to his account.

3.21.2 Any loss or damage to the Radar system & associated equipment during handling, transportation, etc. until completion of delivery shall be to Supplier’s account. The Supplier shall be responsible for preferring of all claims and make good for the damage of loss by way of repairs and/or replacement of the portion of equipment damaged or lost.

3.22 PROGRESS AND MONITORING
Within 21 days of the notification of award of contract, the Supplier should submit a detailed Time Bar Chart/PERT chart covering key phases of design, manufacture, inspection & testing, site works, supply, installation and commissioning of the Radar and its associated systems & equipment. If the Purchaser so requires, the Supplier shall discuss the Time Bar/PERT Chart with the Purchaser and revise it. Time Bar Chart/PERT Chart will be used to periodically review the progress of the project. The Purchaser through its representatives may convene periodic monitoring meetings with the supplier/sub-contractors and other stakeholders, from time to time, to ensure that the civil and other activities are being carried out as per the specifications given in the contract. All key plans, detailed drawings, materials stipulated in requirements and workmanship entering into the making of the Systems may at all times be subject to inspection and tests by the Purchaser or his representative. The facilities, labour and materials necessary for the safe and convenient conduct of such inspection shall be furnished by the Supplier without extra charge.

3.23 GENERAL MAINTENANCE REQUIREMENTS
Terms & Conditions of Comprehensive Annual Maintenance Contract (CAMC)

3.23.1 The CAMC includes all equipment installed at site, inclusive of all computers & workstations, peripherals, printers, Radar and equipment spares, components, cables, connectors etc. and Radar related materials.

3.23.2 The removed/replaced defective material becomes the property of "The Contractor".

3.23.3 The CAMC will commence immediately after the expiry of the warranty period.

3.23.4 The comprehensive maintenance contract includes preventive and corrective maintenance and free replacement of all types of the defective parts/devices.

3.23.5 The contractor should submit a detailed CAMC plan including preventive maintenance schedule.

3.23.6 The Contractor shall supply the details of its Compliant Centre meant for booking the complaints along with the contact numbers like mobile nos., phone nos., mail address and names etc. of its service engineers.

3.23.7 The Contractor shall carry out System Calibration Quarterly and produce the Test Report.
3.23.8 The Radar shall be under annual preventive maintenance for a period of two weeks.

3.23.9 The Contractor's engineers attending to the system are required to make all entries of their work done and corrective measures taken by them with their signatures in the log book kept with the Radar station.

3.23.10 Overall uptime of the system shall be at least 95%.

3.23.11 If there is a failure of the system for more than the criteria stipulated then as penalty, the CAMC amount of 0.5% per day (calculated for CAMC value of that station) for days it is down will be deducted, subjective to an upper ceiling of 10% of CAMC charges for that quarter.

3.23.12 If the failure duration (CONTINUOUS OR INTERMITTENT) extends beyond one month then the contract may be terminated on the discretion of competent authority of ISTRAC and cost of its repair from alternate source will be recovered from the Contractor and performance security may be forfeited.

3.23.13 Maximum two weeks shutdown for annual maintenance shall not come under the clause.

3.23.14 Radar down time due to external factors and force majeure shall exempt the penalty criteria.

3.23.15 Contractor shall ensure 95% uptime by supportive manpower if found necessary.

3.23.16 Date of commencement of preventive maintenance period of Radar shall be fixed by mutual consultation with ISTRAC.

3.23.17 The mode of payment will be quarterly and will be made after end of each quarter on the basis of satisfactory performance certificate from ISTRAC.

3.23.18 The Contractor will assist ISTRAC for regular backups of all the software.

3.23.19 The Contractor is also required to restore the existing Software from the Backups whenever required.

3.23.20 The Contractor will also be responsible for configuring the networking components.

3.23.21 CAMC contract will be signed for Ten years. If required, contract may be extended by ISTRAC. However, ISTRAC reserves the right to terminate the contract at any time by giving three months’ notice, if the performance of the system or the services rendered by the Contractor is not found satisfactory.

3.23.22 The Contractor has to submit an undertaking that it will not use ISTRAC data for any commercial purpose.

3.23.23 Data of Radar will not be copied or transmitted without permission from ISTRAC.

3.23.24 This contract shall be governed in all respects by Indian Laws.
3.24 WARRANTY MAINTENANCE
During warranty period, the Supplier or, as the case may be, the Maintenance contractor shall set right the Radar immediately on receipt of a complaint but in no case later than 24 hours. Preventive Maintenance shall be carried out once in 6 months i.e. 2 times during the warranty period of one year. The Supplier must deploy only qualified and experienced staff in maintenance activities. The spare parts whatever required shall be provided by the supplier free of cost.

3.25 PERFORMANCE SECURITY
At the time of signing the CAMC, the Supplier shall submit Performance security equivalent to 5% of the value of the contract in the form of Bank Guarantee from any Scheduled Commercial Bank as per Form 4. The Guarantee will remain valid during the currency of the contract.

3.26 SPARES AND TOOLS
The Supplier shall indicate the list of Tools, Toolkits or loose components that are to be given as part of supply and form accessories for servicing purposes. The spares and additional tools recommended by the manufacturer/contractor for all machinery equipment for smooth running of the Radar system for a period of 10 years excluding warranty period should be listed. The spare parts shall be based on his previous experience and failures encountered in earlier Installations.

3.27 PURCHASER ’S RIGHT TO TERMINATE THE MAINTENANCE CONTRACT
Purchaser reserves its right to terminate the maintenance contract at any time without assigning any reason. The Supplier will not be entitled to claim any compensation against such termination. However, while terminating the contract, if any payment is due to the Supplier for maintenance services already performed in terms of the contract, the same shall be paid to him as per the contract terms.

3.28 SOFTWARE & SOFTWARE UPGRADES
3.28.1 The Supplier shall agree to provide copies of as-built software in executable code that are installed in the system at all levels. It shall also state the Hardware that needs to be in place for implementation ensuring that the system un-availability is minimal. The Supplier shall also comply and guarantee software upgrades for the service life of the Radar System. Commercial processing software, if used, should be provided by work station.

3.28.2 Taking into account the operational requirements of the Purchaser, there may be a need to customize some portion of the software. Supplier should agree for such customization, which is expected to be limited, at no extra cost.
3.28.3 Any software upgrades developed by the Supplier during the warranty and the post warranty period should be made available to the Purchaser at no extra cost and should be delivered and installed in a prompt and efficient manner. The Supplier should install and train the operator with software upgrades.
3.29 DISASTER MANAGEMENT
The supplier has to provide detailed disaster management plan to meet any eventuality, which may arise during the operation of RADAR SYSTEM. The disaster management plan should be elaborate, detailing the actions to be undertaken in the case of any emergency and/or disaster and defining the role of every authority and person during such a situation.

3.30 DOCUMENTATION
3.30.1 The Supplier shall document design, manufacture, inspection, testing, site works & services, installation, commissioning, test & trials, operation & maintenance, quality assurance and delivery of RADAR SYSTEM and its associated systems & equipment. The complete documentation work shall be in English.
### SECTION 4

#### 4. SPECIFICATIONS AND ALLIED TECHNICAL DETAILS

##### 4.1 SPECIFICATIONS

The Radar for Space Objects/debris Observation and Tracking System shall meet the following technical specifications. The specifications, as given, are not exhaustive and any omission in the specifications shall not relieve the Supplier of its obligation to deliver a complete and fully operational Radar for Space Objects/debris Observation and Tracking System compliant with international regulations and with the technical specifications provided herein.

(Note: The Vendor to submit point-wise response to the system requirements and provide necessary information in his bid).

<table>
<thead>
<tr>
<th>S.No</th>
<th>Parameter</th>
<th>Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>System Capability</td>
<td>To detect &amp; track at least single 10cm object at 2500 km range for a minimum duration of 2 minutes and to independently catalog it with specified orbit estimation &amp; reconstruction accuracy. System should be capable of detecting the target for less duration also with reduced accuracy mentioned in Sr.No.6,7,8,9,11,12</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Radar Operating Freq.</td>
<td>UHF or higher</td>
<td>Selection of frequency and its justification for space object detection of various shapes and sizes to be given. Total maximum area available for the realization of radar is around 150mx150m.</td>
</tr>
<tr>
<td>3.</td>
<td>Type of Radar</td>
<td>Solid-State Power Amplifier (SSPA) based Bistatic/monostatic / quasi-monostatic phased array configuration with element or group level Digital beam forming feature.</td>
<td>The contractor has to clearly specify the way of achieving the sensitivity &amp; detection capability (with ref. to OVERALL SYSTEM REQUIREMENTS) with supportive documents of claim and appropriate calculations for SSPA based transmitter with link budget considering all attenuation at operational frequency (atmosphere, cloud, precipitation and</td>
</tr>
</tbody>
</table>
The calculations for achieving the required operational characteristics such as scanning capabilities, maximum range, maximum velocity, sensitivity, signal interference and clutter suppression have to be provided. Confirmation with supporting images, test printouts etc., are to be provided.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Minimum Detectable Object Size</td>
<td>10 cm Diameter or better</td>
</tr>
<tr>
<td>5.</td>
<td>Slant Range Coverage</td>
<td>2500 km or better</td>
</tr>
<tr>
<td></td>
<td>For complete Field-of-View</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Slant Range Configurable -</td>
<td>Up to 4000Km</td>
</tr>
<tr>
<td></td>
<td>Aiming to detect bigger target in higher orbits</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Minimum Slant Range Coverage</td>
<td>2 km or better</td>
</tr>
<tr>
<td></td>
<td>For calibration &amp; low range modes</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Range Resolution</td>
<td>100 m or better</td>
</tr>
<tr>
<td>9.</td>
<td>Angular Resolution (AZ &amp; EL)</td>
<td>1 deg rms or better</td>
</tr>
<tr>
<td>10.</td>
<td>Range Accuracy</td>
<td>30 m rms or better</td>
</tr>
<tr>
<td>11.</td>
<td>Angle Accuracy (AZ &amp; EL)</td>
<td>0.1 deg rms or better</td>
</tr>
<tr>
<td>12.</td>
<td>Range rate accuracy</td>
<td>2 m/s rms or better</td>
</tr>
<tr>
<td>13.</td>
<td>Orbit Estimation Error (object-centered radial/along-track/out-of-plane frame-UVW coordinates) Radial Error (U); Along track error (V); Cross Track Error (W)</td>
<td>( \sigma_U \leq 15m ); ( \sigma_V \leq 100m ); ( \sigma_W \leq 70m ); ( \sigma_U \leq 0.5m/s ); ( \sigma_V \leq 0.5m/s ); ( \sigma_W \leq 0.5m/s );</td>
</tr>
<tr>
<td></td>
<td>Minimum requirement is specified, better specification on this parameter should be attempted. If any deviation is essential for parameters specified together may be stated and reason may be explained.</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Field-of-regard</td>
<td>( \pm 60 ) deg or better, (in both azimuth &amp; elevation)</td>
</tr>
<tr>
<td></td>
<td>For an object revisit time of 48 Hours minimum and coverage of minimum 90% of existing NORAD space objects.</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Radar FoV orientation</td>
<td>Looking towards zenith Horizontal antenna placement</td>
</tr>
<tr>
<td></td>
<td>As per the radar location maximum number of object tracking is aimed accordingly array will be tilted. Decision will be taken during design review time.</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Radar Min Elevation</td>
<td>20 deg</td>
</tr>
<tr>
<td></td>
<td>Orientation of antenna</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>17.</td>
<td>Object Revisit time</td>
<td>within 48 hour or better</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Independent cataloging after acquisition through Un-cued or Cued</td>
</tr>
<tr>
<td>18.</td>
<td>Orbit reconstruction accuracy</td>
<td>Objects should be detected within 24 hrs with mode of operation for cataloging</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The values shall be specified in the technical document</td>
</tr>
<tr>
<td>19.</td>
<td>Nominal Tracklet Duration</td>
<td>2 minutes or better</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To get precise orbit estimation and reconstruction within the respective accuracy limits. System shall be capable of detecting and tracking the target with in 10 sec also</td>
</tr>
<tr>
<td>20.</td>
<td>No of objects for simultaneous tracking</td>
<td>20 or more</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Depending on the radar resources and object position in FoV. Details of multi object tracking strategy shall be submitted along with tender document</td>
</tr>
<tr>
<td>21.</td>
<td>Probability of false alarm</td>
<td>$10^{-6}$ or better</td>
</tr>
<tr>
<td>22.</td>
<td>Probability of detection</td>
<td>90% or better</td>
</tr>
<tr>
<td>23.</td>
<td>Operating Pulse width</td>
<td>Programmable Long and short Pulse</td>
</tr>
<tr>
<td>24.</td>
<td>Pulse Repetition Freq.</td>
<td>Programmable</td>
</tr>
<tr>
<td>25.</td>
<td>Digitization Feature</td>
<td>Element-level digitization with adaptive DBF</td>
</tr>
<tr>
<td>26.</td>
<td>Signal processing Features</td>
<td>a) All latest signal processing techniques should be used in detecting and tracking of space objects. Details shall be submitted along with technical document</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>
| 27. | Modes of operation | a) Cued search with prior knowledge  
 b) Surveillance in specified sectors  
 c) Cued Search & track  
 d) Un-cued search and track  
 e) Independent tracking after acquisition through Un-cued or Cued  
 f) Beam-park Mode  
 g) Search & Track (SAT)  
 h) Track while scan (TWS)  
 i) TwS mode interleaved with tracking tasks  
 Autonomous object detection, tracking & cataloging  
 Provision shall be given to select either one of the mode or multiple modes depending on scheduler. |
| 28. | Additional estimation software | a) Orbit Determination  
 b) Orbit Propagation  
 c) Orbit Update & Reconstruction  
 d) Object TLE Generation  
 Parties can list out additional system dependent, vendor specific software products available also |
| 29. | Final Data Output | Radar data in CCSDS format with option for TLE |
| 30. | Calibration Provision | Automated system calibration & simulation |
| 31. | System Operation | 24/7 operation with 90% overall system reliability |
| 32. | Min 90% of the NORAD cataloged objects need to be observed every day with the orbit estimation accuracies to meet object re-identification in 24Hrs |
| 33. | The catalogue correlation procedure either recognizes that the object is already catalogued and updates its orbital parameters, or adds new objects (resulting from launches or explosions), or deletes objects (resulting from re-entry or original exploding object) |
| 34. | Design and installation of auxiliary subsystems Like module- cooling system, mechanical structure, Radom, Civil Structure, UPS(with required power backup), DG, AC etc., as. required for the radar system is in the scope of supply of the radar manufacturer. Housing for these systems are in the scope of the radar manufacturer. The land area required and architectural drawing also shall be given along with technical document. |
| 35. | Radar control room will be made by the ISTRAC/ISRO. Vendor shall give requirement and detailed architectural and civil drawings along with readiness time to establish the radar system on scheduled time. |
| 36. | Radar Controller | a) Workstation-based radar controller with user friendly GUI. Radar operation parameters (including selection of Wave form parameters, |
| 39. | Display, Archival, Product Generation and Peripherals | a) Workstations with latest hardware configuration and licensed operating system to be supplied along with the system for processing, storing etc. (Computing and storage infrastructures for radar data processing to till end product)  
   b) NTP Server for Network Time Synchronisation: Symmetricom Sync Server S600 or better.  
   c) NAS storage with RAID MirrorDual parity or equivalent disk protection configuration, Dual Controller, Total cache 48GB, 4 x 10GbE Ethernet Ports, support NFS v3, CIFS or higher, with usable capacity 20TB (NL SAS/SATA) minimum  
   d) Provision for web based remote Radar control, monitoring and operations.  
   e) Archived data in binary to be specified with header information.  
   f) All software license shall be multiuser and open, without any restriction/hardware lock / soft-lock. | 37. | 38. | Computer for the post analysis and research to be supplied and installed at user defined place | Minimum configuration: High Performance Computing Cluster with Compute node 10 Nos. with all Accessories like Master Node, Cluster Management Software, Infiband Switch and Storage. Each Node should have scan parameters, Signal Processing parameters, Operation modes selection, Scan strategy selections, etc.) should be selectable through the workstation-based Radar Controller software. Scheduler for long time observation also to be provided.  
   b) Radar controller shall display system Health Check parameters including status, interlocks & important analog parameters of all the subsystems.  
   c) Radar controller shall have provision to record and replay the data for all above mentioned status, interlocks and analog parameters.  
   d) Provision for web based remote Radar control, monitoring and operations. (One set of workstation computers deployed for radar system shall be provided at Remote monitoring station located at ISTRAC, Bangalore)  
   e) Super user and user level configurations shall be provided for Radar Controller and the details will be given during implementation stage. |
at-least following specifications  2 x Intel Xeon-Gold 6142 (2.6GHz/16-core) Processor, 192GB Memory, 4TB SAS HDD, 2port 1G Adapter, 1port InfiniBand EDR 100Gb Adapter. This is in addition to Radar signal processing computers.

1. System should be designed for continuous operation on a 24 x 7 basis with standard preventive maintenance schedules.

2. Mounting structure of the radar should take care all environmental requirement and hazardous weather protection.

3. Suitable base foundation and concrete structure for antenna and related mechanical structure is in scope of the supplier, Foundation template and anchor bolts etc., if required are part of the supply.

4. Lightning protection is to be in place ensuring safety of the system and mounted elements by the way of grounding cable through ground bar or other suitable mechanism.

5. The required number of electrical earthing lines for various peripherals inclusive of Radar, has to be indicated by the Contractor. Suitable earthing line for radar and peripherals shall be build by the supplier in ISRO specified site.

6. The antenna mount should be equipped with suitable leveling system to ensure horizontal alignment of azimuth and elevation axis. Suitable readers shall be included with an accuracy of 0.2 degree or better, if required.

7. All fasteners should be of Stainless Steel.

8. RF performance of the antenna should be tested at Test Range and results to be provided.

9. Suitable air conditioning system also shall be provided as and where required to operate all subsystems as per the specification.

10. EMI/EMC aspects must be followed in the design.

11. Proper shielding of the cables, intra rack and
inter rack, should be followed to avoid interference and spurious pickups.

12. All the components used shall be of industrial grade.

13. Entire Radar system to be configured for operation in different modes through a Radar Controller with provision for Remote operation, Data archiving and data transmission through standard communication interfaces.

14. The Radar system should be having required menu driven software with GUI controls for:
   a) Operating the Radar.
   b) Setup of operational parameters.
   c) Configuration of modes.
   d) The process of setup of various operational parameters should be easily accessible to operators using GUI.
   e) Generation of alerts and warning.
   f) Setup of communication channels.
   g) Automatic calibration for antenna parameters, dynamic range, etc.
   h) Provision to incorporate the Bias Values for correction.
   i) Monitoring the health of the Radar using BITE as well as logging of subsystem level information at fixed intervals while Radar in operation.
   j) Interlock, status and analog parameters from sub systems shall be available in Radar controller GUI display for monitoring and should be included in the Radar operation for the system and subsystem safety.
   k) The system should be capable of detecting failures of subsystems and should provide indication locally and remotely.

15. Real Time display of base products for the selected scan.

16. Simultaneous display of data having more than one parameter

17. Requisite software protection for denying
unauthorized access to be provided.
18. System should be operated remote monitoring and control including equipment power supply.
19. The base data (output of Radar processor) shall be stored automatically on hard disk and NAS in compressed form. At least three month past data shall be available on the local computer disk at a time.
20. Base product generation in Near Real time as per configuration.
21. Contractor shall provide Communication hardware for data transfer to central location.
22. The network link between the systems will be provided by ISTRAC; Contractor shall suggest suitable bandwidth for real time system control and monitoring;
23. Detailed thermal analysis to be carried out for all subsystems and all subsystems should be designed with efficient thermal management like proper conductive plates & heat sink etc.,
24. The contractor shall do necessary modifications in the design based on PDR committee suggestions & recommendations, if any, without extra cost.
25. The project is to be executed on a turnkey basis and all items shall be supplied and complete the installation and commissioning within the stipulated time as mentioned in the document.
26. Transportation from the factory to the site will be the responsibility of the developer/manufacturer.
27. The entire site preparedness and custom tuning/positioning is to be fully borne by the developer/manufacturer and the work is to be undertaken by the developer/manufacturer in the presence of ISTRAC engineers.
28. The entire work of installation and commissioning of the Radar has to be carried out by the developer/manufacturer,
though ISTRAC may station few of its officials at the site for guidance.

29. ISTRAC will take possession of the Radar after commissioning. Cost involved of the system (Radar, inclusive of all the deliverables as per this document) and operator till then shall be borne by the Contractor.

30. Endurance test of complete integrated system for 30 days, with full load.

31. Operation, Reference, maintenance and troubleshooting manuals for both hardware (Transmitter, Receiver, Control and Data Acquisition Systems etc.) and software and all peripherals should be made available.

32. Adequate test points should be provided in the system for the health monitoring and speedy trouble shooting. These aspects should be explicitly stated in the maintenance/trouble shooting manual.

33. The required number of electrical earthing lines for various peripherals inclusive of Radar, has to be indicated by the Contractor and implemented at the installation site.

34. Total power requirement to run the radar shall be provided in the technical document.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>40.</strong></td>
<td><strong>Power</strong></td>
</tr>
<tr>
<td></td>
<td>Capable of operating, 230V ±10% V, 50 ±5% Hz in Single phase. 415V ±10% V, 50 ±2% Hz in Three phase.</td>
</tr>
</tbody>
</table>

| **41.** | **Environmental condition** |
|   | The system shall be capable of operation in a tropical environment under conditions specified below: |
|   | **Outdoor unit** |
|   | a. Ambient Temperature: 2 deg to 55º c |
|   | b. Ambient Relative Humidity: up to 95%, non-condensing |
|   | **Indoor unit** |
|   | a. Temperature: 23º C ± 2º C |
|   | b. Relative Humidity: up to 55%, non-condensing |
|   | Or the specification to meet the design and operation of the radar system. The cooling system shall be provided as per the requirement. |

| **42.** | **Spares, Consumables &Tools** |
| a) Vendor should maintain sufficient spares and cables, in stock as required to keep |
the system up and operational for 95% of the time as explained in the document.
b) Vendor shall explain his strategy for all the single point failures in the system, for 95% system availability.
c) Consumables required for one year after commissioning shall be supplied with the system. The list of items supplied as part of the spares shall be given along with technical bid.
d) A test of test instruments essential for the testing of the system shall be supplied along with the system as part of deliverables. The details shall be given in the technical bid.
e) The contractor shall give an assurance for continued supply of critical spares and consumables for a minimum period of 11 years or life time of the radar from the date of commissioning of the system.
f) All spares and consumables required during installation and acceptance tests prior to commissioning shall be provided by the contractor at his own cost. All spares used during the warranty maintenance period will be replaced by the contractor at his own cost before the end of the warranty period.
g) A set of standard and specialized tools required for repair, disassembly and assembly of the system shall be supplied with the system.

4.2 INSTALLATION:
4.2.1 Pre-Installation Information Package
Three bound copies of the pre-installation information document shall be provided. The package shall include, but not be restricted, to the following:
4.2.1.1 A general description of the system operation and a list of its most significant characteristics.
4.2.1.2 Detailed instructions for the installation of major assemblies and other portion of the system.
4.2.1.3 Power requirements (including consumption), location of power inputs to the equipment, and heat gain caused by each enclosure.
4.2.1.4 Outline drawings for all items requiring installation, including clearance required for operational and maintenance access.
4.2.1.5 Outline drawings showing antenna assembly mounted in Radome, if required.
4.2.1.6 Drawings showing details of grouting of pedestal, Radome, and other units requiring grouting to floor. The details of type of bolts, size, depth of grouting and other load details shall be provided.
4.2.1.7 Complete installation cabling lists and diagrams presenting cable runs etc.
4.2.1.8 Outline drawings of all typical wave guide and wave guide flanges or RF cables to be used to interconnect the transmitter/receiver and antenna assemblies.

4.2.2 Installation Material
All materials like wave guides/RF Cables, templates for pedestal and Radome, interconnecting cables, grouting bolts etc. required for the installation of the system shall be supplied along with the equipment.

4.2.3 Installation
4.2.3.1 Three bound copies of detailed system installation instruction shall be supplied. These instructions shall include all information (in step by step form) required to install the system. The written instructions shall be supported by pictures and drawings and shall include instruction for all work to be performed including the assembly connectors.
4.2.3.2 The Contractor shall carry out the installation. Required material handling equipment for installing Radome, Antenna and other heavy equipment shall be arranged by the contractor at their cost. However, ISRO personnel shall be actively associated with the installation process.

4.3 ACCEPTANCE TESTING
4.3.1 The system will be accepted only after obtaining successful base data products that meet all the scientific and technical requirements stated in Technical Specification chapter. The Derived data products will be validated with the available dataset (time of the day). The system should be operated continuously for 24/7 period without any performance degradation for 30 days. Any interruption during the test run will offset the required period to the full period stated above.
4.3.2 The contractor shall submit detailed test plans for Factory Acceptance Testing (FAT) prior to shipment and after installation at site. The test plan shall require approval by the ISTRAC/ISRO.
4.3.3 The object of the Factory Acceptance Tests shall be the verifications of performance of the system as per the specifications and functional requirements.
4.3.4 As per the mutually agreed test procedures, FAT shall be carried out at the contractor’s premises prior to shipment. The contractor shall arrange for necessary test equipment. The equipment shall be shipped only after satisfactory conclusion of the pre-shipment acceptance testing.
4.3.5 As per the mutually agreed test procedures, Site acceptance tests should be carried out at site after installation. The contractor shall arrange for necessary test equipment.

4.3.6 Any defects / deviations noticed during the site acceptance tests shall be rectified within a maximum period of one month from the completion of the tests. After such rectification, the tests shall be repeated to verify the rectification. System will be subjected to the endurance test for commissioning only after the satisfactory test results.

4.4 SYSTEM COMMISSIONING

After the satisfactory completion of the site acceptance tests, the Contractor shall demonstrate the reliabilities and capability of the system to be operated continuously and satisfactorily for a period of 30 days endurance test of the complete Radar system, after which it will be said to be “Commissioned”.

4.5 WARRANTY/GUARANTEE

The following warranty will form part of the contract placed on successful bidder:

4.5.1 The developer/manufacturer/contractor warrants that the goods supplied under the contract conform to technical specifications prescribed and shall perform according to the said technical specifications.

4.5.2 The contractor warrants for a period of 1 years from the date of commissioning and acceptance. The warranty shall also include all third party bought out items / subsystems.

4.5.3 If within the period of warranty, the goods are reported by the buyer to have failed to perform as per the specifications, the developer/manufacturer/contractor shall either replace or rectify the same free of charge, within a maximum period of 15 days of notification of such defect received by the contractor, provided that the goods are used and maintained by the buyer as per instructions contained in the operating manual. Warranty of the equipment would be extended by such duration of downtime. Record of the down time would be maintained by the user in the logbook. Spares required for warranty repairs shall be provided free of cost by the contractor. The contractor also undertakes to diagnose, test, adjust, calibrate and repair/replace the goods/equipment arising due to accidents, by neglect or misuse by the operator or damage due to transportation of the goods during the warranty period, at the cost mutually agreed to between the buyer and the contractor.

4.5.4 The equipment should be guaranteed for trouble free performance during warranty period after installation. Contractor shall finally warrant that all the stores, equipment and components supplied under the ORDER shall be new and of the first quality according to the specifications and shall be free from the defects (even concealed fault, deficiency in the design material and workmanship). The defects, if any, during the guarantee period are to be rectified free of charge by arranging free replacement wherever necessary. Further, the technical specifications and requirements may also be verified.
4.5.5 Warranty period will automatically stand extended for a period of total downtime of the equipment.

4.5.6 The warranty shall also be included for third party bought out items / subsystems. The Contractor shall supply the software updates, if any, during the warranty and CAMC period free of cost.

4.5.7 Upon receipt of notice about faults, the contractor shall repair or replace the defective goods or parts thereof, free of cost, at the site.

4.5.8 The Contractor shall take over the replaced parts/ goods after providing their replacements and no claim, whatsoever shall lie on the purchaser for such replaced parts/ goods thereafter.

4.5.9 The firm shall supply the software updates, if any, during the warranty and CAMC period, free of cost.

4.5.10 Contractor shall ensure 95% of 365 days annual-uptime. The contractor shall give a detailed plan including spare list for achieving the targeted operation during Warranty & CAMC.

4.5.11 If the Contractor, could not meet the 95% annual-uptime (calculated Quarterly at the time of payments) and there is a failure of the system for more than the criteria stipulated then a penalty amount of 0.05% of the total cost per day, for days it is down, will be deducted from the performance guarantee amount, subject to an upper ceiling of 10% of the total equipment cost. Furthermore the purchaser may proceed to take such remedial action(s) as deemed fit by the purchaser, at the risk and expense of the Contractor and without prejudice to other contractual rights and remedies, which the purchaser may have against the Contractor.

4.5.12 Maximum two weeks shutdown for Annual maintenance shall not come under the clause. Delay due to force majeure/external factors and natural calamity beyond human control will be exempted.

4.5.13 During warranty period, the Contractor is required to visit consignee's site at least once in three months commencing from the date of acceptance at site for preventive maintenance, calibration and various types of checks of the goods/ equipment and a detailed report consisting of all test procedure values etc. must be submitted to ISTRAC/ISRO.

4.6 SYSTEM LIFE & RELIABILITY

The useful life of the system shall be 20 years after acceptance at site. The system shall be capable of round-the-clock continuous operation during its useful life. State of the art technology shall be incorporated in the design and development of the system.

4.6.1 All components of the system shall be of industry standard or better.

4.6.2 The system shall be designed on a modular concept. When a fault has been located in a module, its replacement shall be possible without realignment and adjustment of the system.

4.6.3 The contractor shall submit an analysis of all single point failures which the system may prone to and also submit a detailed failure mode/ contingency operation plan.
4.6.4 The contractor is required to submit a complete analysis of MTBF (Mean Time Between Failures) and MTTR (Mean Time To Repair) of the system.

4.7 TRAINING

4.7.1 The Contractor shall provide factory training in operation, maintenance, calibration and fault identification of the Radar system along with modification & up-gradation in application software to 10 persons from ISTRAC/ISRO at ISTRAC specified premises for a period of 3 weeks.

4.7.2 The training shall also include lectures on the system design, computer hardware/software, operation and such other aspects which are considered essential for optimum utilization of the Radar system.

4.7.3 Onsite training in operations and first level fault identification to be provided for a period of five working days.

4.8 DOCUMENTATION

The Contractor shall furnish three copies of the following documentation in well-bound sets/volumes of good print quality. Soft copy of all the manuals should also be provided along with hard copy.

4.8.1 The manuals shall, relate and describe in detail the System's mechanical, electrical, structural, operational and maintenance features and functions and their theoretical analysis from the most basic to the total system level.

4.8.2 All standard manuals, technical data sheets and other pertinent information of functional, electrical and mechanical modules used in the System shall be included in the manuals.

4.8.3 Interface connectivity document has to be provided for hardware as well as software interfaces.

4.8.4 Detailed documentation of all the proprietary data formats, bit-by-bit information on the header and data patterns should be provided.

4.8.5 Free updates made to firmware, processing software and clarifications should also be supplied with relevant documentation during the period of warranty and CAMC thereof.

4.8.6 The system functional block diagram shall be laid out so that a user can readily understand and identify the major functions of the system.

4.8.7 The operating instructions shall include routine procedures, safety and emergency procedures as applicable. These instructions shall include switch-on, standby, normal operating procedures and switch off procedures. The sequence of turn-on procedures shall be optimized and shall account for controls at different physical locations. The instructions shall provide assistance to an operator to use the System for optimum performance.
4.8.8 Sufficient illustrations shall be included to identify and locate all operating controls and indicating devices.

4.8.9 Maintenance instructions shall include fault isolations to the function entity. The isolation technique shall isolate first test function, then to an equipment, assembly, circuit or part. This shall be accomplished by a minimum of three levels of circuit schematics and/or block diagrams.

- System level to identify functions.
- Intermediate level to identify assemblies related to and performing functions.
- Detailed assembly level to identify the functional circuits of the individual assemblies.

Each level of schematic or block diagram shall be supported with individual dependency charts designed to provide fault isolation to the degree established by its related diagram. Block diagrams and schematics shall be supported with text on the same or facing page. Text shall be in a blocked columnar format and keyed to the relevant circuit, blocks etc. by an encircled key number. The schematic diagrams shall also include the same number encircled. Text shall explain how, when, why each keyed item accomplishes its function and its purpose to the functional portion of the system to which it is relevant.

4.8.10 Parts List: Detailed parts list with part numbers shall be provided.

4.8.11 Algorithm of Products: The algorithms used in product generation shall be supplied.

4.8.12 It shall be the responsibility of the Contractor to provide detailed parts list of modules sourced. List of items imported and incorporated in the system should also be provided separately. Only such items may be used in the system whose technical details are made available by the manufacturer.

4.9 DELIVERY SCHEDULE

4.9.1 Radar to be installed, accepted and commissioned within 24 months from the date of issue of Purchase order. In this regard the contractor will submit the actual schedule along with time line for execution of installation and commissioning work for Radar.

4.9.1.1 Supply of all deliverables at site within a period of 20 months from issue of purchase order.

4.9.1.2 Installation of all equipment to test the Radar within two month from the date of receipt of intimation from ISTRAC.

4.9.1.3 Acceptance and commission of Radar within two month after installation.

4.9.2 Preliminary Design Review (PDR): PDR will be held within 6 weeks from the date of issue of purchase order where in the design of hardware & software to be delivered as part of the system will be discussed at the office of ISTRAC/ISRO, Bangalore.

4.9.3 Subsystem Readiness Tests: This will be conducted where in the design along with performance parameters of the sub units will be discussed in details to ensure that the
system achieves the performance parameters to be delivered as per TENDER DOCUMENT.

4.9.4 The Supplier shall provide within six months of the notification of award, a FAT document detailing the manner in which the FAT will be conducted and how each of the parameters will be checked. The Supplier shall provide the equipment, instruments, test jigs, etc., and make all necessary arrangements for conducting the FAT at his own cost. Supplier or its subcontractor(s) shall provide all reasonable facilities and assistance, including access to relevant drawings, design details and production data, to the Purchaser’s inspectors at no charge to the Purchaser. The cost of travel, board and lodge for Purchaser’s representatives shall be borne by the Purchaser. The following steps will be followed in conducting the FAT.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Requirement</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Submission of FAT document</td>
<td>Shall be made available to the Purchaser for review within six Months of the notification of award.</td>
</tr>
<tr>
<td>2.</td>
<td>Contents of FAT document</td>
<td>Details the inspection and tests to be conducted, including the procedures for conducting the same, and where these will be conducted. It should describe how each parameter of the Radar will be checked.</td>
</tr>
<tr>
<td>3.</td>
<td>Intimation for FAT</td>
<td>Supplier shall intimate to the Purchaser at least two months in advance of the dates set for conducting FAT.</td>
</tr>
<tr>
<td>4.</td>
<td>Equipment &amp; jigs for FAT</td>
<td>Supplier shall provide all duly calibrated equipment, instruments &amp; jigs, software &amp; hardware modules, etc. and make all necessary arrangements for conducting the FAT. It is the responsibility of the Supplier to organize the FAT.</td>
</tr>
<tr>
<td>5.</td>
<td>Access during FAT</td>
<td>Supplier or its subcontractor(s) shall provide all reasonable facilities and assistance, including access to relevant drawings, design details and production data.</td>
</tr>
<tr>
<td>6.</td>
<td>Documents during FAT</td>
<td>Documents in respect of all QA and QC, inspection reports of assemblies, sub-assemblies, components, type/routine tests, etc. carried out during/after manufacture shall be made available to the Purchaser’s representatives to ensure that the system meets the Purchaser’s requirements / complies with industrial standards for the System. All materials supplied or used in the manufacturing shall be accompanied by valid and approved materials certificates and tests and inspection report.</td>
</tr>
</tbody>
</table>
## Conducting FAT

FAT shall be conducted as per the agreed FAT document. As it may not be feasible to conduct FAT of Radar system as a whole, the Supplier may undertake major sub-systems for FAT, in such a way that it is possible to control the system in total. (Vendor may elaborate in his Bid the scheme for conducting FAT).

## Re-inspection/re-test

If during FAT, the Radar system or its sub-systems fail to conform to the required specifications and standards, the Purchaser’s inspector may reject them and the Supplier shall either replace the rejected goods or make alterations necessary to meet the specifications and standards, as required, free of cost to the Purchaser. The Supplier shall resubmit such goods to the Purchaser’s inspector for conducting the inspections and tests again.

## Supplier’s responsibility

Purchasers’ contractual right to inspect, test and, if necessary, reject the goods after the goods’ arrival at the final destination shall have no bearing of the fact that the goods have previously been inspected and cleared by Purchaser’s inspector during pre-dispatch inspection i.e. FAT mentioned above.

## Dispatch of Radar System

Supplier shall dispatch the Radar System or its sub-system (in case partial FAT has been agreed upon) only after obtaining the specific advice of the Purchaser in writing once FAT has been carried out and goods have been accepted by the Purchaser, in writing, after resolving the deficiencies communicated if any.

(Note: The Vendor to submit point-wise confirmation/response to FAT requirements in his bid).

### 4.9.5 Site Acceptance Test (SAT):

The Supplier shall submit within eighteen months of the notification of award, SAT document detailing the manner in which the SAT will be conducted and how each of the parameters will be checked. After installing and commissioning the Radar for Space Objects Observation and Tracking System, the Supplier shall intimate to the Purchaser the dates for SAT at least two month in advance. The Supplier shall provide the equipment, instruments, test jigs, etc., and make all necessary arrangements for conducting the SAT at his own cost. The Supplier, in co-ordination with ISRO, shall carry out SAT to verify that the equipment fulfills the specifications according to the Contract Document and the Tender Specifications.
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Requirement</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Submission of SAT document</strong></td>
<td>Shall be made available to the Purchaser for review within eighteen months of the notification of award.</td>
</tr>
<tr>
<td>2.</td>
<td><strong>Contents of SAT document</strong></td>
<td>Plan for installation, inspection and tests to be carried out, including the procedures for conducting the same. It should describe how each parameter will be checked for conformity with the specified requirements</td>
</tr>
<tr>
<td>3.</td>
<td><strong>Pre-requisite for SAT</strong></td>
<td>All sites works and services should have been completed as per the requirements of specifications &amp; standards and should have been inspected and accepted for installation of the Radar for Space Objects Observation and Tracking System.</td>
</tr>
<tr>
<td>4.</td>
<td><strong>Intimation for SAT</strong></td>
<td>Supplier shall intimate to the Purchaser at least two month in advance of the dates set for conducting SAT. The purchaser shall intimate the concerned ISRO regarding the proposed SAT.</td>
</tr>
<tr>
<td>5.</td>
<td><strong>Equipment &amp; jigs for SAT</strong></td>
<td>Supplier shall provide all duly calibrated equipment, instruments &amp; jigs, software &amp; hardware modules, etc. and make all necessary arrangements for conducting the SAT.</td>
</tr>
<tr>
<td>6.</td>
<td><strong>Installation test</strong></td>
<td>It shall secure that the installation has been properly and as per agreed plan. It shall also ensure availability of software, hardware and other modules. All shortfalls in the installation should be fixed before conducting the functionality test. Purchaser will have right to demand a new Installation test, if found unsatisfactory. The result of this test should be documented.</td>
</tr>
<tr>
<td>7.</td>
<td><strong>Functionality test</strong></td>
<td>It shall be an integrated test to confirm that the system is working properly and according to specification after delivery and installation the site. Functionality test may, if desired by the Purchaser, include the same elements as in FAT, or other elements mutually agreed upon. If the test is set aside, the Supplier will be permitted to repeat the test after modifications.</td>
</tr>
</tbody>
</table>
8. **Documentation check test**  
Supplier will be responsible for planning and working out the test. The documentation check test should include test plans and test cases for the system documentation. This test shall confirm that the documentation contain information relevant for implementing the system. The result of this test should be documented.

---

| 9 | **Facility inspection & acceptance** | The Facility acceptance shall be carried out after successful completion of all tests in respect of Radar and will include, but not limited to:  
- Functioning of Radar  
- Physical inspection of the Facility for quality & completeness of all works.  
- Review of quality assurance & inspection reports during development and realization  
- Functioning of communication system, networking, etc.  
- Functioning of DG  
- Functioning of UPS  
- Functioning of Cooling System  
- Integration of DG & UPS operations, and its capabilities, etc.- |

| **Test & Trials** |
- After successful completion of all tests and inspections, Radar for Space Objects Observation and Tracking System shall be at the Purchaser’s disposal for a trial period of one month (30 days).
- During this period the Purchaser will operate the system. If the system works in accordance with the agreed specifications and without faults or malfunctions during this trial period of one month, it will be commissioned.
- If any fault or malfunctions are noted the same shall be rectified and a further trial period of one month (30 days) shall be added to permit an additional attempt to meet contract specifications.
- For this extension of one month, the warranty period would be extended accordingly. No further extension shall be granted and the contract shall be liable for cancellation. The decision of the Purchaser in this regard shall be final and binding on the Vendor.
- Purchaser shall in no case be responsible for any loss of damage that may occur to the rejected stores while these are in its premises.

(Note: The Vendor to submit point-wise confirmation/response to SAT and other inspection & test requirements in his bid).

4.10 PENALTY CLAUSE/LIQUIDATED DAMAGES CLAUSE (LD) FOR DELAYED STORES & SERVICES

The Contractor shall deliver the goods and perform the services (delivery, installation, acceptance and commissioning) under the contract within the time schedule specified by the purchaser in the “Technical specifications – Section-4” and as incorporated in the purchase order. The LD will be imposed if delivery schedule is not met as per Clause mentioned.

4.11 COMPLIANCE SATATEMENT

4.11.1 The Contractor shall submit detail para-wise compliance statement mentioning full details with reference Para, Clause and page no. Of the bid for each parameter along with reasons for compliance/ non-compliance, if any.

4.11.2 The Contractor shall also submit the details of references, reports etc. for each compliance giving name of technical manual, chapter number, page number and para and shall provide a copy of referred documents along with the technical bid.

4.11.3 Silence on any para or simply making a statement ‘complied’ without proper justification or reference will be considered as non-compliance.
4.11.4 All the claims with respect to any specification shall be supported by document along with bid document otherwise same may be treated as non-compliance.

4.11.5 Compliance matrix should be filled in at all points of TENDER DOCUMENT individually.

All pages should be signed.

COMPLIANCE TABLE (To be submitted along with the Tender Proposal)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description</th>
<th>Compliance</th>
<th>Supporting Documents attached?</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Compliance with necessary documentation to be provided for Section 1,2,3,4,5 for all the points</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>System design, simulations/analysis and subsystem specifications report to be provided to meet the technical specifications in Section 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>The design, development, installation, testing and commissioning of the system will be reviewed by an expert committee at all stages and any suggestion by the committee should be incorporated. Whether this condition acceptable to you?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Any deviation in the design, material, and configuration will be subjected to the review and approval of the ISTRAC expert committee. Whether this condition acceptable to you?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Technical documents of capital and minor equipments (in English) should be supplied by the Party to ISTRAC. These documents should be self-explanatory and should be prepared after discussions with ISTRAC. All supplied software should be such that ISTRAC users would be able to modify the source code if needed. Whether this condition acceptable to you?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>At any point of time, if ISTRAC requires the Party to do any additional work related to the project work beyond what is mentioned in the scope of work, the Party should undertake the work on existing terms and conditions and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>additional remuneration, as mutually agreed upon. Whether this condition is acceptable to you?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Design and development of the sub systems of the proposed radar System should meet all the scientific and operational requirements stated. Extensive simulations should be carried out before finalizing the detailed design. The results should be submitted to ISTRAC and presented before the ISTRAC review committee. Any modifications suggested by the ISTRAC expert committee should also be carried out and presented. Whether this condition is acceptable to you?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Parties submitting the Tender or those short listed may be called for a meeting at ISTRAC before opening commercial bid, if required.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>The Party should provide 1 (one) years of Warranty. This should include all defects in materials, equipments, components and workmanship after the commissioning and acceptance of the item as well as all defects observed during the operation of the system. Based on request by the ISTRAC, the Party will have to visit the site and replace the defective system at no extra cost. Is it acceptable?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Availability of all the components/subsystems should be ensured by the party for at least 10 years after the commissioning and acceptance by ISTRAC. Is this condition acceptable to you?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**4.12 BROAD TERMS AND CONDITIONS**

4.12.1 The design, development, installation, testing and commissioning of the system will be reviewed by an expert committee of ISRO at all stages and any suggestion by the committee shall be incorporated, otherwise reason shall be given.

4.12.2 Any deviation in the design, material, configuration, component, etc. from the approved proposal/design will be subject to the approval of the ISRO expert committee.

4.12.3 Test results of the sub-systems to final stage should be recorded and provided to ISRO during the developmental phase. The material certificate should be provided.

4.12.4 ISRO reserves the right to witness the tests and review the progress of work at various milestones of the program at any point of time during the developmental phase.
4.12.5 Integration of system at site and the test results: The developed system should be integrated at Shillong Meghalaya or at ISRO specified place in India and test runs as per the Acceptance Test procedure (ATP) should be carried out at the site in the presence of experts and Scientists/Engineers appointed by ISRO. The system performance should meet all the technical requirements stated in Table 1.

4.13 INFORMATION TO BE PROVIDED BY BIDDER WITH TECHNO-COMMERCIAL BID

4.13.1 Technical information to be provided by the Supplier shall address requirements specified herein. The offer should be complete stating not only compliance of requirements but also the relevant technical description for each item. Non-compliance will be liable for rejection of the offer. Hence, the Supplier should provide all information, descriptions, design values, qualification information and standards of compliance, acceptance levels, schedules, manufacturing plans, etc. as required while submitting the offer.

4.13.2 Information requested here would be for Tender Evaluation purpose; will be treated confidential and used only for the purpose requested. The details sought herein may be given in the form of catalogues, diagrams, sketches, drawings, specifications, test results, copy of codes & standards, design notes/ description, etc.

4.14 REFERENCE DOCUMENTS

The Bidder shall indicate in his offer the codes & standards proposed to be followed for the materials and in the manufacture, inspection, testing, performance evaluation and installation of the Radar systems including associated systems.

4.15 ADDITIONAL REQUIREMENTS

The Radar for Space Objects Observation and Tracking System shall meet the following additional requirements. The specifications, as given, are not exhaustive and any omission in the specifications shall not relieve the Supplier of its obligation to deliver a complete and fully operational Radar for Space Objects Observation and Tracking System compliant with international regulations and with the technical specifications provided herein.

(Note: The Vendor to submit point-wise response to the system requirements and provide necessary information in his bid).

<table>
<thead>
<tr>
<th>(i)</th>
<th>System design, manufacturing &amp; servicing</th>
<th>a) The system/ sub-systems &amp; equipment used in the manufacture of Radar should be as per international standards.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ii)</td>
<td>Rated life</td>
<td>Radar &amp; its associated systems(UPS, AC, DG, Civil Structure for radar) should have a rated life of at least 10 years after expiry of warranty period.</td>
</tr>
<tr>
<td>(iii)</td>
<td>Environment</td>
<td>Operating temperature (0° to +50°C), humidity (0 to 100%); rain (50-100 mm per hour) with wind speed up to 150 kmph.</td>
</tr>
</tbody>
</table>
| (iv) Corrosion protection & tropicalisation | a) Radar system should be designed and manufactured to prevent corrosion by weather, airborne pollution, geographic operating environment, galvanic reaction.  
   b) Components of the system should be fully tropicalised and suitable for trouble free operation in the environment specified above. |
| (v) Electricals & communication | Electrical & communication provisions, required for the operation of the Radar & its sub-systems, will be established by the Vendor. |
| (vi) Power supply | a) Radar and its associated systems & equipment, should be able to operate from a power supply source at 230 volts, 3 phase, 50 Hz commercially available in India.  
   b) In case of requirement of a standby diesel generator, rating of the same should be specified in the Bid. |
| (vii) UPS | a) A true on-line, double-conversion UPS system of sufficient ratings complete with backup batteries to enable continuation of Radar operation.  
   b) Make & model along with the proposed rating, technical specifications and compliance to relevant BIS specification should be provided. |

4.16 FINAL ACCEPTANCE/ COMPLETION OF WORK

On satisfactory completion of trials Completion of Work shall be effected by the Purchaser as follows:

a) Radar for Space Objects Observation and Tracking System will be handed over to the Purchaser by the Supplier after commissioning with all the specified certificates, free of recommendations and remarks, at the location of installation.  
   b) The Purchaser will take delivery of the Radar System and sign the Delivery & Acceptance Certificate.  
   c) Acceptance of the System by the Purchaser shall be subject to receipt by the Purchaser of the following documents (soft & hard copies) and items from the Supplier:  
      i. Record of inspection, tests & trials including test reports review documents submitted/ accepted during FAT and SAT;  
      ii. Record of inventory of the equipment of the Radar system. This includes, besides the delivery of Radar system and its associated systems required for operation, all the accessories and tools, fixtures, test equipment, etc. required for maintenance or calibration purposes. The inventory shall also include all computer based systems such as servers, workstations, printers, terminals,
communication systems & components, operating and application software and other hardware & software mentioned in FAT and SAT;

iii. System manuals, operation & maintenance manuals and operating manuals for other equipment, drawings and plans pertaining to the Radar system as stipulated in the specifications;

iv. Declaration of Warranty of the Supplier that the Radar System & associated facilities is/ are delivered to the Purchaser free and clear of any liens, charges, claims, mortgages, or other encumbrances upon the Purchaser’s title thereto, and in particular, that the Systems is/ are absolutely free of all burdens in the nature of imposts, taxes or charges imposed by the prefecture or country of the port of delivery, as well as of all liabilities of the Supplier to its sub-contractor, employees and of all liabilities including those of third parties arising from the operation of Systems, in trials, or otherwise, prior to delivery. The Supplier further covenants to save the Purchaser harmless from any and all claims, suits, actions or other legal proceedings that might arise from any one or all of the aforementioned causes that might be brought against the Purchaser.

4.17 PERIODIC QUALITY ASSURANCE CHECKS/TESTS

4.17.1 Once the System is put under regular operation, it shall undergo periodic quality assurance checks/tests to ensure that the system/ sub-systems etc., are working as per the requisite specifications and design intent.

4.17.2 The periodicity of such checks/ tests/ surveillance will be decided based on the system/sub-system/ instrument involved.
SECTION 5

PRICE SCHEDULE

Important Notice:
The bidders should submit their financial bids in this format only. Price shall be mentioned in price bid template only. No price should be mentioned in the technical bid.

PART - I: PRICE SCHEDULE

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Detail of cost</th>
<th>Site of Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Cost of Radar System and all its accessories as listed in Section 4 (Civil Works necessary for radar, DG, UPS, AC ..etc) (including insurance and freight), convertible currency (indicate the currency) Warranty</td>
<td>Shillong</td>
</tr>
<tr>
<td>2.</td>
<td>Any other charges up to the stage of landing/delivery (to be specified), if any, (INR or any freely convertible currency) (indicate the currency)</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Total landed cost (INR or any freely convertible currency) (indicate the currency)</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Installation and Commissioning charges, if any, in INR</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Customs Duty in INR</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>GST, applicable if any, in INR</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>GST, if any, on installation and commissioning charges in INR</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Any other cost/charges (to be specified), if any, in INR</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Any other taxes, levies(to be specified), if any, in INR</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Commission to Agent, if any, in INR</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Total Cost of Radar for Space Objects Observation and tracking (INR or INR+ freely convertible currency)</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Cost of site preparation works &amp; site services for Space Objects Observation and tracking Radar, in INR</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>GRAND TOTAL (INR or INR + free convertible currency)</td>
<td></td>
</tr>
</tbody>
</table>

PART - II : CAMC

All amounts in INR

<table>
<thead>
<tr>
<th>Year of CAMC</th>
<th>Site of installation - Shillong</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cost of CAMC</td>
</tr>
<tr>
<td>1st after 1 years’ of Warranty</td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td></td>
</tr>
<tr>
<td>5th</td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td></td>
</tr>
<tr>
<td>7th</td>
<td></td>
</tr>
<tr>
<td>8th</td>
<td></td>
</tr>
<tr>
<td>9th</td>
<td></td>
</tr>
<tr>
<td>10th</td>
<td></td>
</tr>
<tr>
<td>Grand Total</td>
<td></td>
</tr>
</tbody>
</table>
5. DRAFT CONTRACT

Contract between President of India acting through Department of Space/ISRO and M/s…………………………………………for supply (including site preparation works & services), delivery, installation, commissioning, training, warranty & post-warranty maintenance of Radar for Space Objects Observation and Tracking System at Shillong, Meghalaya, India on “turnkey basis”.

Whereas the Department of Space/ISRO (hereinafter referred to as the Purchaser) has published, on behalf of the President of India, e-Tender No.: …………. inviting tenders for supplying (including site preparation works & services), installing, commissioning of Radar for Space Objects Observation and Tracking System on turnkey basis and, maintaining it during warranty period and maintaining it on Comprehensive Annual Maintenance Contract after the warranty period and providing comprehensive training and product support;

Whereas M/s…………………………………………………….. (Hereinafter referred to as the Supplier) had, in response, submitted his tender;

Whereas the Purchaser accepted the tender of the Supplier and issued him a notification of award vide _____ dated ____________;

Now, therefore, it is agreed as follows:
1. The Supplier will supply goods and services as per the tender.
2. This contract will be subject to the Conditions of Contract which are laid down in Section 2 of e-Tender ______ of the enclosed Tender Document.
3. The following documents will be read with and will be construed as part of this contract:
   i. Purchaser’s e-Tender No.: ……………………………. and the Tender Document
   ii. Purchaser’s pre-bid clarifications issued vide F.No…………………………………
   iii. Supplier’s tender submitted vide …………………………………
   iv. Clarifications furnished by Supplier………………
   v. ……………………………

Goods and Services to be supplied
4. The Supplier shall supply the following goods and services:
   (i) Supply, deliver, install and commission Radar for Space Objects Observation and Tracking System and associated systems/equipment;
   (ii) Carrying out site preparation works and providing site related services;
   (iv) Training of staff of ISRO in the operation of Radar for Space Objects Observation and Tracking System and associated systems/equipment and in comprehensive analysis during warranty and post-warranty period;
(v) Maintenance of the Radar for Space Objects Observation and Tracking System and associated systems/equipment for one year under warranty including supply of spare parts and consumables;
(vi) Comprehensive Annual Maintenance under a contract (hereinafter referred to as CAMC) including supply of spare parts and consumables for a period of ten years after completion of warranty period of one year; CAMC order will be placed after the successful completion of warranty period and it is under the discretion of ISTRAC.
(vii) Product Support for ten years after one year’s warranty period;
(viii) Provide upgrades from time to time.

6. Other clauses on quality assurance, inspection & tests, delivery, force majeure, liquidated damages, termination, arbitration, resolution of disputes, etc., as mentioned in tender documents, shall also be especially mentioned in the contract.

Signed on ………………….. day of ………… (month) Two thousand and …………… in Bangalore.

| (xxxxx) | (xxxxxxxxxx) |
|———|———|
| For Supplier | For Purchaser |
| | Director, ISTRAC |
| | For and on behalf of the President of India |

| (xxxxx) | (xxxxx) |
|———|———|
| Witness | Witness |

****
STANDARD FORMS

FORM 1- TENDER FORM

Please read the following INSTRUCTIONS carefully before filling up the form

1. Tenderer must obtain and/or download and carefully examine the above Notice Inviting Tender and the Tender document, including amendments, if any, and unconditionally agree to all the terms and conditions indicated in the tender enquiry documents and subsequent amendments. This tender form, duly filled and signed, must be submitted along with the Technical Bid.

2. The copy of the Tender Document and amendments retained in the records of the Purchaser shall be deemed authentic in case of any dispute at any stage.

3. The following tenders shall be ignored:
   a) Tenders submitted by those who do not meet the eligibility and qualification criteria;
   b) Tenders sent by fax/telex/cable/email/hand delivery;
   c) Tenders that do not meet the basic requirements;
   d) Tenders which have minor infirmities/irregularities and the tenderer does not respond to clarifications sought by the Purchaser within the time specified by him;
   e) Tenders where, in the opinion of the Purchaser, there is an arithmetical inaccuracy in the price bid and the tenderer does not agree with the Purchaser;
   f) Incomplete tenders and not accompanied by duly filled and signed Tender Form;

4. Any tender may be rejected, if:
   a) The bid price is directly or indirectly indicated in the technical bid;
   b) Tenderer fails to provide required information or provide incorrect information or gives evasive reply to the Purchaser’s queries or modify the tender or resile or fail to comply with the instructions in the Tender Document;
   c) The prices are not quoted in the manner indicated in the Tender Document;
   d) price bid does not include CAMC charges and that shall be less than 8% of the radar system cost.
   d) If serious unbalanced price bids are noted for different Port locations;
e) Tender validity is for less than 180 days from the date of opening of tenders as indicated in the Tender Document;

f) On verification, the data/credentials furnished by the tenderer are found to be incorrect or any adverse report on requisite financial condition has come to the knowledge of the Purchaser;

g) Tenderer attempts to influence the Purchaser’s decision during scrutiny, comparison and evaluation of tenders and award of contract;

h) Tenderer is disqualified on the grounds of national security or public interest.

5. Purchaser is not bound to accept the lowest or any tender that may be received against the above-referred tender enquiry.

6. Purchaser may accept any tender at any time before the date of expiry of its validity indicated in the tender form or any date up to which its validity is further extended by the tenderer.

7. Until a contract is signed, this tender form submitted by the tenderer read with its acceptance by the Purchaser constitutes a binding contract between them.

Having carefully gone through the above instructions, the Tender Notice and the Tender Document, we, M/s ____________, the Tenderer, agree to all the terms and conditions mentioned in therein and hereby, make the following offer to supply goods and perform services as per the listed requirements, delivery schedule and in conformity with all other conditions in the tender document and amendments thereto. We shall arrange for demonstration, as required, of Radar System and all its accessories at the place of its field installation as per the convenience of the Purchaser.

TENDERER

1. Name of the tenderer: ______________________________________________

2. Address: _________________________________________________________

3. E-mail: ___________________________________________________________

4. Phone: _______________ Fax: _______________ Mobile: _______________

5. Income Tax Permanent Account Number (PAN): _____________________

6. Name and designation of the person signing and submitting the bid on behalf of the tenderer __________________________________________________________________

7. Has the person at (6) above been authorised by a Resolution of the Board of Directors of the Tenderer Company to sign and submit this tender? (Yes/No)
8. Has a copy of the Resolution of the Board of Directors been enclosed? (Yes/No)

9. Name and complete address of the Tenderer’s bankers:
   a) 
   b) 

ELIGIBILITY AND QUALIFICATION

10. Do your Business dealings currently stand suspended/banned by any Ministry/Department of Govt. of India or any State Government? (Yes/No)

11. Are you applying as:
   a) Original equipment manufacturer (OEM) or its Indian subsidiary (duly incorporated in India as per Companies act) of OEM of the Radar Systems being offered; or

14. Turnover of the tenderer during the past three years (in Rs. Crores)

   2016-17 _________
   2017-18 _________
   2018-19 _________

(Please enclose certified audited published annual accounts and reports. If the accounts are maintained in some other currency, please give the figures in that currency as well as its conversion at the exchange rate on the date of filling up this form. If the accounts are managed calendar year wise, please provide figures for 2017, 2018 and 2019).

15. How many Space Objects Observation and Tracking Radar have been supplied and installed by the OEM during the past five years? (Please enclose purchaser order copies & other documentary proof).

16. How many Space Objects Observation and Tracking Radar have been installed the OEM which are under actual field operation during the past three years? (Please enclose purchase order copies & other documentary proof).

17. To the best of your knowledge, has any other tender been submitted against this Radar for Space Objects Observation and Tracking from the same OEM? (Yes/No)
ORIGINAL EQUIPMENT MANUFACTURER (If you are yourself the OEM, please skip this section)

19. Name of the OEM ____________________________________________________

20. Address of the OEM ________________________________________________

21. Phone ____________________ : Mobile __________________

22. Fax _______________________

23. Email ________________________

WARRANTY AND POST WARRANTY MAINTENANCE

24. Do you have set up in India to provide the maintenance during warranty period and Post- warranty period under CAMC? (Yes/No)

25. If yes, please provide details (in 100 words) including experienced manpower & resources details and enclose relevant documents.

26. If answer to question at 24 above is no, do you have service level agreement with any other manufacturer or entity having previous experience in maintaining Radar systems, to act as Maintenance Contractor to provide maintenance services during warranty and post- warranty period? (Yes/No)

27. If yes, please provide details (in not less than 100 words) and enclose a copy of the agreement, including previous experience and manpower details of the manufacture/entity in maintenance of similar scanner systems/ electronic & imaging systems.

DOCUMENTS TO BE ENCLOSED

28. Have you enclosed the following documents? (Yes/No)

a) Documentary evidence to show your eligibility, qualification and capability to provide the goods and services required as per this Tender Document including the establishment to carry out site works & services, installation & commissioning, maintenance and product support; (Yes/No)

b) Documents and relevant details to establish that the goods and the allied services offered conform to the requirement of the tender documents ;(Yes/No)

c) Power of Attorney of firm / resolution of Board of Directors of company for person or persons authorized to sign the Tender;(Yes/No)
d) Power of Attorney/Authorization letter by the Manufacturer to Indian company/firm/ representative to represent the Manufacturer in India; (Yes/No)

e) Copies of documents defining constitution and legal status of the tenderer;(Yes/No)

f) Documents containing detailed of OEM, clearly bringing-out role, responsibilities & scope of work/services (in the event of a collaborator bidding or long-term agreement);(Yes/No)

g) Documents containing the arrangement between the tenderer and the Maintenance contractor, along with the details of previous association with OEM, experience & resource the Maintenance contractor possess; (Yes/No)

h) An undertaking to the effect that the Price bid does not contain any conditions whatsoever of the price demanded for sale; (Yes/No)

i) Documents indicating the past supplies of the proposed Radar system by you; (Yes/No)

j) Documents indicating maintenance of experience in the past; (Yes/No)

k) Any other documents/ technical literature that you consider necessary to strengthen your bid; (Yes/ No/ None required).

l) An undertaking to the effect that OEM and Tenderer has not been a defaulter in any previous tender or supply in any part of the world and has not been blacklisted in any country; (Yes/No).

Signature ___________

Company seal         (Name and Designation)
Dear Sir,

Ref: Your Tender No. ……………………., dated ………………….

We ………………………………., who are proven and reputed manufacturer of Radar for Space Objects Observation and Tracking System having our registered offices at ………………………………, hereby authorize M/S………………….. (name and address of the agent) to submit a tender, process the same further and enter into a contract with you against your requirement as contained in the above referred tender document for the Radar for Space Objects Observation and Tracking System manufactured or developed by us.

We further confirm that no Supplier or firm or individual other than M/S …………………………….. (name and address of the above agent) is authorised to submit a tender process the same further and enter into a contract with you against your requirement as contained in the above referred tender enquiry documents for the offered make & model of Radar for Space Objects Observation and Tracking System manufactured by us.

We also hereby extend our full warranty, as contained in the Tender Document, for the Space Objects Observation and Tracking Radar System & associated equipment/systems and Site Services offered for supply by the above firm against this tender.

Yours faithfully,

……………………………..

……………………………..

[Signature with date, name and designation]

Note: This letter of authorisation should be on the letter head of the manufacturing firm and should be signed by a person competent and having the power of attorney to legally bind the manufacturer.

*****
FORM 3- BANK GUARANTEE FORM FOR PERFORMANCE SECURITY
AND WARRANTY PERFORMANCE

Whereas ……………………………………………………………………………. (name and address of the Supplier) (herein after called “the Supplier”) has undertaken, in pursuance of contract no……………………………. dated …………. to supply (description of goods and services) (herein after called “the contract”).

And Whereas it has been stipulated by you in the said contract that the Supplier shall furnish you with a bank guarantee by a scheduled commercial bank recognised by you for the sum specified therein as security for compliance with its obligations in accordance with and due performance of the contract;

And Whereas we have agreed to give the Supplier such a bank guarantee;

Now therefore we hereby affirm that we are guarantors and responsible to you, on behalf of the Supplier, up to a total of ………………………………………………………. (amount of the guarantee in words and figures), and we hereby irrevocably and absolutely undertake to pay you immediately, upon your first written demand declaring the Supplier to be in default under the contract and without cavil or argument, any sum or sums within the limits of (amount of guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Supplier before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the contract to be performed there under or of any of the contract documents which may be made between you and the Supplier shall in any way release us from any liability under this guarantee and we hereby waive notice of any such change, addition or modification.

The Bank guarantee shall be interpreted in accordance with the laws of India.
The Guarantor Bank represents that this Bank Guarantee has been established in such form and with such content that is fully enforceable in accordance with its terms as against the Guarantor Bank in the manner provided herein.

The Bank Guarantee shall not be affected in any manner by reason of merger, amalgamation, restructuring or any other change in the constitution of the Guarantor Bank or the Supplier.

The Bank further undertakes not to revoke this Guarantee during its currency except with the previous express consent of the Purchaser in writing.

The Bank declares that it has power to issue this Guarantee and discharge the obligations contemplated herein, the undersigned is duly authorized and has full power to execute this Guarantee for an on behalf of the Bank.

This guarantee shall be valid upto and including the …….. day of ………, 20……

……………………………………
(Signature with date of the authorised officer of the Bank)

…………………………………………………………
Name and designation of the officer

…………………………………………………………
Seal, name & address of the Bank and address of the Branch

******
FORM 4 - MODEL CERTIFICATE OF INSTALLATION

F. No. _________________________________ Dated __________

1. Reference Contract No. __________________________ Dated _________________

2. It is certified that:
   a) M/s ______________________ have completed installation of Radar for Space Object
      observation and tracking system on ___________ [date(s)] and Site Acceptance Test
      (SAT) and other inspection & tests, as stipulated in the contract on___________
      [date(s)] to the satisfaction of the Purchaser and user Commissionerate at the Designated
      Site (Name of the Site).

   b) Records of SAT and other inspection & tests are annexed to this Certificate.

   c) Sample test jigs, Software in electronic media, Instruction Manual & Technical
      Manual, Soft & hard copies of Documentation, etc. have been taken over (all documents
      required to be delivered at the time of SAT) and the same are listed in the Annexure
      enclosed.

For Contractor         For Purchaser
Witness:          Witness:
Signature         Signature
Name:           Name:
Designation:          Designation:
Address:          Address:
Date:          Date:

*****
FORM 5-MODEL CERTIFICATE OF RECEIPT OF RADAR FOR SPACE OBJECTS OBSERVATIONS AND TRACKING SYSTEM AT SITE OF INSTALLATION

F.No. ___________________________     Dated _____________

1. Reference Contract No. date ____________

2. It is certified that:

   a) Radar for Space Objects Observation and Tracking System have been received in good condition at _______________________ on ____________, after satisfactory Factory Acceptance Test conducted at the works of M/s _______________________ (OEM) during ______________ and supplied by ___________________ to the satisfaction of the Purchaser.

   b) The consignment is accompanied by all Accessories, Instruction Manuals & Technical Manuals for satisfactory installation of the Space Objects Observations and Tracking System. The list of the same is annexed herewith.

For Contractor

Witness:       For Purchaser
Signature:    Witness:
Name:        Signature
Designation: Name:
Address:    Designation:
Date:        Date:

*****
FORM 6 - MODEL CERTIFICATE OF DELIVERY AND ACCEPTANCE

F.No. ___________________________   Dated ____________
1. Reference Contract No. date __________
2. It is certified that:
   a) M/s _____________________________ have completed the delivery of the Space Objects Observations and Tracking System (date) at designated site (name of the site).
   b) The process of handing / taking over of the aforesaid system, accessories and services specified in the Contract to the satisfaction of the Purchaser, has been completed on __________ (date).
   c) The aforementioned Radar for Space Objects Observation and Tracking worked satisfactorily during the trial period of 30 days starting w.e.f. __________ (date) to __________ (date)

For Contractor
Witness:
Signature
Name:
Designation:
Address:
Date:

For Purchaser
Witness:
Signature
Name:
Designation:
Address:
Date:

*****
FORM 7 - CLAIM OF PAYMENT BY THE SUPPLIER
(To be typed and printed on the Supplier’s official letterhead)

Date…………………
_________________
_________________
_________________
_________________

Sir/ Madam,
We claim the following amounts as per contract ……………… entered into pursuant to GNIT_______ and have enclosed necessary billing documents

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Stage</th>
<th>Amount and currency</th>
<th>Payment</th>
<th>Billing documents enclosed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. We certify that:

   a) the above payments are claimed strictly in terms of the contract and all our obligations under the contract for claiming them have been fulfilled;

   b) of such taxes and duties claimed, if we get any refund from the tax authorities we shall refund the same to you.

Yours sincerely,

(…………………………………..)

*****
FORM 8 – DECLARATION

(To be typed and printed on the Supplier’s official letterhead)

Date……………………

_________________
_________________
_________________
_________________

Sir/ Madam,

Ref.: Tender Enquiry Document No……….Dated……..

We …………………… hereby confirm and declare that we have not engaged and shall not engage any individual or firm, whether Indian or foreign whatsoever, to intercede, facilitate or in any way recommend to the Government of India or any of its functionaries, whether officially or unofficially for the award of contract to us, nor any amount has been paid, promised or intended to be paid to any such individual or firm in respect of any such intercession, facilitation or recommendation.

(Signature, name and address of the Supplier’s executive duly authorised to sign)

******
FORM 9 - INFORMATION IN RESPECT OF PREVIOUS SUPPLIES BY BIDDER

Part-I: Summary

<table>
<thead>
<tr>
<th>Year/Month</th>
<th>Nos. of Space Objects Observations and Tracking Radar System</th>
<th>Clients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part-II: Details of each Supply mentioned in Part-I

1.0 Brief specification of Radar for Space Objects Observations and Tracking System

2.0 Location where installation done
   a) Country (ies)
   b) Town(s)

3.0 Details of the Client(s)
   a) Physical Address
   b) Phone Nos.
   c) Fax No. & E-mail ID

4.0 Clients’ key contact person(s)
   a) Name(s)
   b) Designation
   c) Phone Nos. & E-mail ID

5.0 Project schedule
   a) Commencement date
   b) Completion date
   c) Reasons for delay, if any

6.0 Project cost

7.0 Nos. of technical staff deployed by firm for the supply

8.0 Third party firm(s) involved with project
   a) Name(s)
   b) Roles and responsibility of the firm
   c) Address, Phone Nos., Fax No. & E-mail ID

9.0 Scope of supply/service (equipment, building, maintenance- comprehensive or otherwise, software upgrades, long-term warranty, etc.)

10.0 Performance certificate from the agency whom the supply has been made
| 11.0 | State any challenges or problems experienced by yourselves during project implementation or do you have any suggestion to make |

*****
### APPENDICES-I PARAMETRIC TESTS & INSPECTIONS FOR ACCEPTANCE

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Requirements/Checks to be carried-out for compliance of Contract Tech. Specs.</th>
<th>Compliance / Acceptance Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td><strong>General Requirements</strong></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>System/sub-system &amp; equipment used in the manufacture of the Radar for Space Object Observations and Tracking System should be as per the international standards.</td>
<td>Documentation</td>
</tr>
<tr>
<td>1.2</td>
<td>System and subsystems reliability and burn-in tests reports shall be provided to meet the 24x7 continuous operation of the Radar system as specified.</td>
<td>Documentation</td>
</tr>
<tr>
<td>1.3</td>
<td>Minimum system uptime, MTBF and MTTR shall be complied as per Specifications.</td>
<td>Documentation</td>
</tr>
<tr>
<td>1.4</td>
<td>Compliance shall be provided for Radar &amp; its associated systems for the rated life as per the specifications.</td>
<td>Documentation</td>
</tr>
<tr>
<td>1.5</td>
<td>Radar System should be designed and manufactured to prevent corrosion by airborne pollution, flood, geographic operating environment, galvanic reaction.</td>
<td>Documentation + Process employed</td>
</tr>
<tr>
<td>1.6</td>
<td>Components of the system should be fully tropicalised and suitable for trouble free operation in the specified environment.</td>
<td>Documentation + Process employed</td>
</tr>
<tr>
<td>1.7</td>
<td>Quality assurance and control deployed at various stages in the manufacture, assembly and testing of scanner &amp; its associated systems.</td>
<td>Documentation</td>
</tr>
<tr>
<td><strong>2</strong></td>
<td><strong>Additional Conditions</strong></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Environmental Test Reports shall be complied and submitted as per the Specifications.</td>
<td>Documentation Documentation</td>
</tr>
<tr>
<td>2.2</td>
<td>Supply of one set of test rigs/jigs/devices for evaluating the performance of the Radar System &amp; its associated systems.</td>
<td>Verification+ Demonstration Verification+ Demonstration</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
<td>Verification</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td>--------------</td>
</tr>
<tr>
<td>2.3</td>
<td>Test rigs/jigs and instruments for evaluating the performance of the Radar &amp; its associated systems should conform to national/international standards.</td>
<td>Verification + Certification</td>
</tr>
<tr>
<td>3</td>
<td>Sensors &amp; Safety</td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Sensors to perform various safety functions as mentioned in ‘System requirements’.</td>
<td>Documentation+ Specifications+ Demonstration</td>
</tr>
<tr>
<td>3.2</td>
<td>Provision of safety interlocks as mentioned in ‘System requirements’ and functionality of the interlocks.</td>
<td>Documentation+ Demonstration</td>
</tr>
<tr>
<td>3.3</td>
<td>Redundancy features should be provided to minimise single point of failure in the system leading to non-availability of the Radar.</td>
<td>Documentation+ Demonstration</td>
</tr>
<tr>
<td>3.4</td>
<td>Radar and its associated systems should have built- in self-test and fault diagnostic capability/facility.</td>
<td>Specification+ Documentation + Demonstration</td>
</tr>
<tr>
<td>3.5</td>
<td>Radar and its associated systems should have trouble shooting and auto correction capability.</td>
<td>Documentation+ Demonstration</td>
</tr>
<tr>
<td>3.6</td>
<td>System should have automatic shutdown device to stop scanning operation in the case of emergency of any kind.</td>
<td>Specification+ Documentation + Demonstration</td>
</tr>
<tr>
<td>4</td>
<td>Civil, Electrical, UPS, DG, AC &amp; Communication Works</td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Review of layouts, specifications, documents, drawings, etc.</td>
<td>Submissions+ Documentation</td>
</tr>
<tr>
<td>4.2</td>
<td>Installation checks for all equipment, components, fittings &amp; fixtures, etc.</td>
<td>Verification+ Documentation</td>
</tr>
<tr>
<td>4.3</td>
<td>Review of documents on inspection, testing &amp; Commissioning of complete electrical &amp; communication system, as per specifications/ as- built drawings.</td>
<td>Submissions + Documentation</td>
</tr>
<tr>
<td>4.4</td>
<td>Supply, installation, testing &amp; commissioning of DG set &amp; its associated systems as per specification and its integrated operation with commercial power supply.</td>
<td>Design calculation+ Specifications+ Demonstration+ Documentation</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
<td>Design Calculation</td>
</tr>
<tr>
<td>---------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>4.5</td>
<td>Supply, installation, testing &amp; commissioning of UPS its associated system, including battery banks, as per specification.</td>
<td></td>
</tr>
<tr>
<td>4.6</td>
<td>Integrated operation of UPS with DG/ commercial power supply source. Integrated operation of UPS, AC, DG.</td>
<td></td>
</tr>
<tr>
<td>4.7</td>
<td>‘As-built’ drawings for complete installation work, compilation of testing &amp; commissioning reports, QA and acceptance documents.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td><strong>Regulatory Approvals &amp; other</strong></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td><strong>Software &amp; Software upgrades</strong></td>
<td></td>
</tr>
<tr>
<td>6.1</td>
<td>Fulfillment as per Contract Document</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td><strong>Training</strong></td>
<td></td>
</tr>
<tr>
<td>7.1</td>
<td>Fulfillment as per Contract Document</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td><strong>Warranty Maintenance</strong></td>
<td></td>
</tr>
<tr>
<td>8.1</td>
<td>Fulfillment as per Contract Document</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td><strong>Post-warranty Maintenance</strong></td>
<td></td>
</tr>
<tr>
<td>9.1</td>
<td>Fulfilment as per Contract Document</td>
<td></td>
</tr>
</tbody>
</table>

****