भारत सरकार
अन्तरिक्ष विभाग
सतीश धवन अन्तरिक्ष केन्द्र
शार
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GOVERNMENT OF INDIA:: DEPARTMENT OF SPACE
SATISH DHAWAN SPACE CENTER SHAR:: SRIHARIKOTA – 524 124
SRI POTTI SREERAMULU.NELLORE DISTRICT (A.P)

TENDER NOTICE NO. SDSC SHAR/Sr.HPS/PT/RO/14/2020-2021

On behalf of President of India, Sr. Head Purchase and Stores, SDSC SHAR, SRIHARIKOTA invites on line quotations for the following.

Sl No	Ref. No.	Description	Qty.
01	**SHAR RO 2020 0 13625 E-Procurement [Two Part basis]**	**IT Infrastructure Management Services SCOF & MAFS/ RO SDSC-SHAR**	**1 Lot**
02	**SHAR RO 2020 0 13437 E-Procurement - Re-tender [Two Part basis]**	**Design, Fabrication, Integration, Testing, Supply and Commissioning of Vehicle Telecommand Systems**	**2 Nos**

Last Date for downloading of tender documents : 13.10.2020 at 16:00 hrs.
Due Date for submission of bids online : 13.10.2020 at 16:00 hrs.
Due Date for Bid Sealing on : 13.10.2020 at 16:01 hrs. to 13.10.2020 at 17.30 hrs.
Due Date for Open Authorization : 13.10.2020 at 17.31 hrs. to 15.10.2020 at 17:00 hrs.
Due Date for opening of tenders : 16.10.2020 at 14:30 hrs.

Instructions to Tenderers:

Bids shall be submitted on line through EGPS only and No tender fee shall be applicable.

01. For full details/scope of work and terms and conditions etc., please see the enclosed annexures.

02. Interested tenderers can download the e-tender from ISRO e-procurement website https://eprocure.isro.gov.in and submit the offer on line in the e-procurement portal. Offers sent physically by post/courier/in person will not be considered.

03. Tender documents are also available on ISRO website www.isro.gov.in ISRO e-procurement website https://eprocure.isro.gov.in and SDSC SHAR, Sriharikota website www.shar.gov.in. The same can be down loaded and offer submitted on line in the e-procurement portal only.

04. Quotations received after the due date/time will not be considered.

05. The tender documents are available for download upto 13.10.2020 at 1600 hrs. and last date for submission of tenders on line 13.10.2020 at 1600 hrs. and Tender Opening on 16.10.2020 at 14:30 hrs.

06. Interested vendors can attend the Bid opening sessions to know the details. Presence not mandatory to consider the quote for evaluation.

07. Sr. Head, Purchase and Stores, SDSC-SHAR, Sriharikota reserves the right to accept or reject any/or all the quotations.

DT: 16.09.2020

Sr. HEAD PURCHASE AND STORES

REQUEST FOR PROPOSAL

Design, Fabrication, Integration, Testing, Supply and Commissioning of Vehicle Telecommand Systems

Satish Dhawan Space Centre SHAR
Indian Space Research Organization
Sriharikota -524 124, INDIA

INTRODUCTION

Satish Dhawan Space Centre (SDSC) in Sriharikota range (SHAR) is the main launch centre of ISRO located in Nellore district of Andhra Pradesh which is 100km from both Chennai and Nellore. SHAR with two launch pads has the facility for processing solid propellants, static testing of solid motors, integration of launch vehicle, range and launch operation, contain mission control centre and telemetry, tracking and telecommand network. SHAR has three ground-based vehicle Telecommand systems. The application of ground based TeleCommand (TC) chains in SHAR is to continuously uplink the SAFE command in case of nominal flight path whereas destruct command sequence is to be uplinked towards the launch vehicle which is deviating from the safety zone. The proposed systems will be used as a part of new commanding requirement for Small Satellite Launch Vehicle (**S**SLV) **L**aunch **C**omplex (**SLC**) Site at Kulasekarapatnam, Tamilnadu. As per the range safety requirement, minimum three chains of TC are essential at launch base for continuous up-linking of RSO selected command towards the launch vehicle during real-time.

It is planned to realize three new TC chains with identical configuration to continuously command the vehicle under specified operating conditions. The three new TC chains are proposed to be designed and developed using state-of-the-art technology to achieve increased reliability, availability and maintainability. However, slab mode of indent generation is proposed for two chains as well as three chains of Telecommand such that vendor has to provide quotations separately for two chains and three chains. In case of two chain configuration is opted for realization by department initially, then all the interfaces should be made readily available for augmentation of third chain into configuration.

PROPOSAL DOCUMENT, CLARIFICATION AND ADDENDUM

Proposals are invited from the interested bidders for the enclosed scope of work in two-part bid, Part-1 with “Technical and unpriced part of the work” and Part-2 with “Priced commercial part”.

The RFP document is organized in three sections as follows.

SECTION–A General Terms and Conditions of the Contract

SECTION –B Technical Specifications & Scope of Work

SECTION –C Annexure

TITLE OF THE PROJECT: DEVELOPMENT OF VEHICLE TELECOMMAND FOR SLC

Title of the proposal: "Design, Fabrication, Integration, Testing, Supply and Commissioning of Vehicle Telecommand Systems"

DATE OF PUBLIC NOTIFICATION ISSUED:
Last Date of purchase / downloading tender Document:
Last date of submission of tender documents:
Place of submission of tender documents: SDSC SHAR, Sriharikota.

1. PROPOSAL DOCUMENT

1.1. One set of proposal document is issued. Bidder shall sign and stamp each page of proposal as token of his acceptance & submit along with his offer.

1.2. Transfer of Proposal document issued to one Bidder to another is not permissible.

1.3. Proposal documents shall remain the property of Department and if obtained by one intending Bidder shall not be utilizable by another without the consent of the Department.

1.4. The proposal shall be completely filled in all respects and shall be tendered together with requisite information and Annexure. Any offer incomplete in any particulars is liable to be rejected.

1.5. The Proposal shall be opened on the date and on the time specified in the Letter Inviting Bid or as soon thereafter as convenient. Proposal not received in time shall not be considered.

1.6. Bidders shall set their quotations in firm figures and without qualifications or variations or additions in the terms of the Proposal documents.

1.7. Proposal containing qualifying expressions such as "subject to minimum acceptance " or " subject to prior sale" or any other qualifying expressions or incorporating terms and conditions at variance with the terms and conditions incorporated in the Proposal documents are liable to be rejected.

1.8. ADDENDA /CORRIGENDA

Addenda/corrigenda to the tender document may be issued by SDSC SHAR prior to the date of opening of the tenders, to clarify or reflect modifications in the contract terms and conditions.

Such addendum/corrigenda will be distributed to each firm or person who had purchased the tender documents.

1.9. AMBIGUITY

Should there be any ambiguity or doubt as to the meaning of any of the tender clause/condition or if any further information is required, the matter shall be immediately brought to the notice of Head, Purchase & Stores and SDSC SHAR in writing.

2. PREPARATION OF BIDS

Validity of Offer

Bid shall remain valid for acceptance for a minimum period of 4 (four) months from the due date of submission of the Bid. The Bidder shall not be entitled during the said period to revoke or revise his Bid or to vary the Bid except and to the extent required by SDSC SHAR in writing. Bid shall be revalidated for extended period as required by SDSC SHAR in writing. In such cases, unless otherwise specified, it is understood that validity is sought and provided without varying either the quoted price or any other terms & conditions of Bid finalized till that time.

Cost of Bidding

All direct and indirect costs associated with the preparation and submission of Bid (including clarification meetings at SDSC SHAR, existing facility visit at SHAR), shall be to Bidder's account and the Department will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the Bid process.

Applicable Language

The Bid and all correspondence incidentals to and concerning the Bid shall be in the English Language. For supporting document and printing literature submitted in any other language, an accurate English Translation shall also be submitted. Responsibility for correctness in translation shall lie with the Bidder.

Arrangement of Bid

The Bid shall be neatly presented on white paper with consecutively numbered pages. It should not contain any terms and conditions which are not applicable to the Bid.

The Bid and all details submitted by the Bidder shall be signed and stamped on each page as token of acceptance by a person, legally authorised to enter into agreement on behalf of the Bidder. Corrections/ alteration, if any, shall also be

signed by the same person. Bidder shall submit Power of Attorney in favour of the person who signs the Bid and subsequent submissions on behalf of the Bidder.

Department will not be bound by any Power of Attorney granted by the Bidder or changes in the constitution of the firm made subsequent to submission of the Bid or after the award of the contract. He may, however, recognize such Power of Attorney and changes after obtaining proper legal advice, the cost of which will be borne by the Bidder.

The cancellation of any document such as Power of Attorney, partnership Deed etc should be communicated by the Bidder to the Department in writing well in time, failing which department shall have no responsibility or liability for any action taken by Vendor/supplier on the strength of the said documents.

Should the Bidder have a relative or relatives or in the case of firm or company one or more of its shareholders or a relative or relatives of the share holder (s) employed in a senior capacity in Department's organisation, the authority inviting Bids shall be informed of the fact at the time of submission of the Bid, failing which the Bid may be disqualified or, if such fact subsequently comes to light, Department reserves the right to take any other action as it deems fit in accordance with any applicable law, Rules, Regulations of the like in force for the time being.

Documents Comprising the Bid

Bids shall be arranged in the following order.

Part – I Technical and Unpriced Commercial Part

Technical and unpriced commercial part shall comprise the attachments, specifying attachment number arranged in the order as follows:

(a) Submission of bid letter along with one set of proposal document duly signed and stamped as token of acceptance

(b) Power of attorney in favour of authorised signatory of the bid / proposal documents.

(c) All the annexures enclosed in the proposal is to be duly filled, signed and sealed along with the bid.

(d) Unpriced copy of schedule of prices with all other commercial terms and conditions duly filled (Prices to be kept blank), signed and stamped

(e) Data sheets for all the HARWARE & checklists enclosed in proposal duly filled, signed, & stamped.

(f) Technical details, equipment general arrangement drawings with part list, catalogue, layout drawings, P & I diagram, catalogues etc. as applicable and any other drawing, document as mentioned in the proposal.

(g) Audited balance sheet including profit and loss account for last three financial years showing annual turn over

(h) Latest income tax clearance certificate.

(i) Latest solvency certificate from a scheduled bank.

(j) List of projects in hand & completed during last 5 financial year indicating the name of client, contract person, contract value, nature of work, work completed, work balance, name of Consultant, month & year of commencement & completion etc.

(k) Organisation chart for the proposed work with bio data of key personnel

(l) Bar chart.

(m) Execution Plan.

(n) Any other relevant document, bidder desires to submit.

Part – II Priced Commercial Bid

Priced commercial bid shall contain schedule of prices duly filled in, signed and stamped. No deviations, terms and conditions, assumptions, conditions, discounts etc. shall be stipulated in price bid. Department will not take cognizance of any such statement and may at their discretion reject such bids.

3. BID SUBMISSION

Bids duly filled in by the Bidder should invariably be submitted as stipulated in the Letter inviting bid.

Part – I Techno-Commercial Part of the Bid for the Work

Part – II Price Part of the Bid for the Work

a) Department may open Part – I of the bids on the due date of opening subject to meeting the minimum evaluation criteria. Price Bids (Part-II) of technically and commercially acceptable offers shall be opened at a later date.

b) Department reserves the right to reject any or all the Bids without assigning any reasons thereof.

4. DETERMINATION OF RESPONSIVENESS

The tender which does not satisfy the pre-qualification criteria as mentioned in above Section shall summarily be rejected and shall not be considered for further evaluation. SDSC SHAR will scrutinize tenders to determine whether the tender is substantially responsive to the requirements of the tender documents. For the purpose of this clause, a substantially responsive tender is one which inter-alia conforms to all the terms and conditions of the entire Tender document without any deviations and reservations. The decision of SDSC SHAR shall be final in this regard.

5. BID EVALUATION

5.1. During evaluation, Department may request Bidder for any clarification on the bid, additional documents.

5.2. Techno-commercial discussion shall be arranged with Bidder, if needed. Bidder shall depute his authorised representatives for attending discussions. The representatives attending the discussions shall produce authorization from his organisation to attend the discussion and sign minutes of meeting on behalf of his organisation if required. The authorised representative must be competent and empowered to settle/decide on all technical and commercial issues.

5.3. The complete scope of work is defined in the Proposal document. Only those Bidders who undertake total responsibility for the complete scope of work as defined in the Proposal document shall be considered.

5.4. In case Bid does not fully comply with the requirement of Proposal document and the bidder stipulates deviations to the clauses of the proposal in Schedule of deviations, which are unacceptable to the Department, the Bid will be rejected.

5.5. Performance of Bidder on similar nature of works executed/ under execution shall be taken into consideration before selecting the Bidder for opening his price bid.

5.6. The time schedule for completion is given in the Proposal document. Bidder is required to confirm the completion period unconditionally.

5.7. If necessary, to arrive at evaluated prices, wherever applicable, loading on total quoted prices shall be done as detailed in the proposal document or as considered suitable by Department if not detailed in the proposal.

5.8. Department reserves the right to accept a bid other than a lowest and to accept or reject any bid in full or part without assigning any reasons. Such decisions by the Department shall bear no liability whatsoever consequent upon such decision.

5.9. Department reserves the right to split the order or alter the quantities specified based on prices quoted for part work or unit rate quoted by BIDDER.

5.10. The Bidder, whose bid is accepted by the Department, shall be issued a Letter of Intent (LOI) to proceed with the work. Bidder shall confirm acceptance by returning a signed copy of the LOI. Thereafter Department may issue purchase order or Department will sign the Contract with successful Bidder

5.11. Department shall not be obliged to furnish any information / clarification to unsuccessful bidder as regard non acceptance of their Bids.

6.0 MINIMUM CRITERIA FOR BIDDER QUALIFICATION:

Sl. No	Minimum Qualification Criteria	Fulfilled the specified criteria YES /NO
1.	The firm should be registered with Registrar of companies and Sales/Trade tax/Service Tax department. Copies of PAN Number/TAN number/Sales Tax number along with registration certificate /service tax number along with registration certificate and Income-tax clearance certificate/Returns for last 05 years must be attached. **Firm should provide the following details to confirm the above criteria:** **a) Provide PAN Number / TAN Number / Sales Tax Number.** **b) Provide Registration Certificate as proof of registration with Registrar of Companies.** **c) Provide Income tax return for last 5 Financial years / Income tax clearance certificate.**	
2.	Establishment of the firm must be more than **5 years** in similar field of Radars Tracking / Telecommand systems as on 01-01-2020 and the company average **annual** turnover should be more than **5.70 crores for the last 5 Financial years**. **Firm should provide the following details to confirm the above criteria:** **a) Provide proof to confirm that the firm is 5 years old in similar field.** **b) Provide proof to show that company average annual turnover is about 5.70 crore for the last 5 Financial years.**	
3.	The Firm must provide customer satisfaction letter from at least two customers preferably from a State/Central Govt. /Quasi Govt./PSU while submitting the technical bids. **Firm should provide the following details to confirm the above criteria:** **a) Two Customer satisfaction letter preferably from State/Central Govt. / Quasi Govt./ PSU.**	

4.	The Firm should provide two purchase orders, where they supplied the similar System and carried out service, installation and configuration in the last 5 years. The details of the above order should include client name, Quantity of supply, contract value and email address of contract manager should be provided. The copy of the purchase order should be attached. **Firm should provide the following details along with documents to confirm the above criteria:** **a) Single Purchase Order of similar Items supplied within last 5 years for a value of atleast 360 lakhs. (or)** **b) Two Purchase Orders of similar Items supplied within last 5 years for a value of atleast 270 lakhs each. (or)** **c) Three Purchase Orders of similar Items supplied within last 5 years for a value of atleast 180 lakhs each.** **Note:** *The details should include the following client address, description of work, value of work, time to be completed as per work, actual time of completion and reasons for delay. All the relevant Purchase Order copies to be provided.*	
5.	Attach Authorized Letter from all the OEM's, authorizing the supplier to quote. **Firm should provide the following details to confirm the above criteria:** **a) Authorization letters from all OEM's/ Authorizing the supplier to quote.**	
6.	The firm must provide a self-declaration that there is no complaint/vigilance inquiry against them in any Govt./Department /PSU and they have not been black listed by any Govt. Department/PSU.	
7.	Provide current financial year solvency certificate worth of 180 lakhs (Document to be attached).	
8.	Agreeing to all Terms and Conditions mentioned in General Terms & Conditions of the contract as below.	

6.1 Supplier Evaluation Format

SDSC SHAR seeks response to the following questionnaire for assimilating data which would be used for evaluating the capability of the supplier for executing the referred work. Hence, the supplier is requested to provide only genuine data and any discrepancy found at a later point of time may result in rejection of the supplier from purchase process. Furnishing of data cannot be construed as automatic qualification for participation in the tender. Questionnaire should be signed by a responsible and authorized person of the Company / Agency.

S. No	Description	Vendor Response
1	Name of the company :	
2	Type of the Company (Proprietary/Pvt. Ltd/Public Ltd/ Joint Venture) provide Registration code :	
3	Registered address :	

S. No	Description	Vendor Response
4	Name & Address of the Office of the Chief Executive of the Company :	
5	Contact person for this tender with name & address and contact number :	
6	Locations of the Branches of Company (if any) :	
7	From which year the Company is in operation :	
8	The Profit & Loss Account details for the last 3 years which is duly audited and Submitted as part of the Annual Report. :	

in Lakhs only	2017-18	2018-19	2019-20
Total assets (i) :			
Current assets (ii) :			
Total liabilities (iii) :			
Current liabilities (iv) :			
Net Worth (i-iii) :			
Working capital (ii-iv) :			
Turnover in lakhs :			
Profit/Loss in lakhs :			

9.	The major lines of business: :	
10.	Details of availability of design and analysis software :	**Software** / **No. of licenses** / **Skilled persons on software**
11.	Manpower details :	**Description** / **Qty** / **Remarks**: Admin&Acct; Design & Analysis; Workmen (floor); Supervisor
12.	The major customers for whom high power Antenna and associated systems are provided (Enclose copies of the Purchase Orders) :	
13.	Details of procuring & development of process flow for the fabrication of Antenna and associated systems	
14.	Availability of Specialized software tools/ equipments for the above process. Provide the technical details and calibration certificates	
15.	Turnaround time for the commissioning of Antenna and associated systems as per the specifications given in RFP.	
16.	Infrastructure and experience for customized antenna control system development	
17.	Whether all the processes for development and testing of Antenna and associated systems is in-house or outsourced. Details of outsourcing if any. Their names, address, type of job being out sourced, your quality check on it along with the MoU with the party	
18.	Standards and codes followed for the	

S. No	Description	Vendor Response
	fabrication and software development process if applicable	
19.	Test equipment and facilities available at your works to carry out the qualification tests of Antenna and associated systems as per RFP. Please provide the details along with photographs	
20.	Testing facilities, if any availed from outside agencies	
21.	Name & address of outside agencies from which testing facilities are availed.	
22.	Codes & standards followed for testing	
23.	Whether independent Q.C and Inspection Section is established?	
24.	Inspection & Quality Control and record procedure for: (i) Raw Materials, (ii) Antenna and associated systems, (iii) Final Integrated System	
25.	Any customers feedback on the services which is in writing (Pl. enclose copies) :	
	a. Vendor to fill in correct information as asked. Providing any false information, shall be liable to reject the parties	
	b. Vendor is requested to furnish all the asked information as applicable. As each & every information carries certain weightage during evaluation of offers. In absence of any information, it may ultimately will reflect in overall assessment of the offer	
	c. Vendor to attach separate sheet as Annexure where ever required to furnish the required information. Please attach your product catalogues/ leaflets and relevant technical information in support.	

26. Details of present works being executed by the vendor/supplier

S. No	Full postal address of the client with Contact Person	Description of the work	Value of the work (Rs. in Lakhs)

Note: copy of purchase orders may be enclosed.

Signature of Authorised Person with Seal

SECTION -A

GENERAL TERMS AND CONDITIONS OF CONTRACT

1.1. INTRODUCTION

SDSC SHAR invites tenders from reputed firms with proven ability to “Design, Fabrication, Integration, Testing, Supply and Commissioning of Vehicle Telecommand Systems” as per the specifications.

1.2. SCOPE OF WORK AND TECHNICAL SPECIFICATIONS

The detailed scopes of work and technical specifications are given in Section-B of this document. The general terms and conditions are given below.

2. SUPPLIER'S OBLIGATIONS & FUNCTIONS

2.1 SPECIFICATIONS AND DRAWINGS

The Supplier shall execute the detailed engineering and development works in compliance with the provisions of CONTRACT, good engineering practices and software coding requirements.

2.2 APPROVAL OF TECHNICAL DOCUMENTS / DRAWINGS

Supplier shall prepare and submit to Department for approval following documents and drawings:

(a) Technical literatures, data sheets, designs, drawings of subsystems and components

(b) Quality assurance plan.

(c) Layout drawings of all hardware.

(d) Installation & commissioning Sequence Schedule.

No activity shall be executed unless Department’s approval is obtained. The above documents / drawings shall be submitted in a format approved by Department. Quality Assurance Plan shall be strictly in accordance with Quality Control Manual and Formats to be provided after the award of CONTRACT.

2.3 DESIGN & SUPPLY OF EQUIPMENT

Supplier shall have detailed engineering, procure and supply the equipment in accordance with the scope, technical specifications and terms & conditions of contract.

All these goods or material shall be supplied or used to be new and of first quality. Where imported or partly imported goods or material are offered or intended to be used, the fact must be specifically stated and brought to the notice of Department.

2.4 INSPECTION AND TESTING

Department reserves the right to inspect all phases of vendors operations through its representatives and/or third-party inspection agency identified by the department. Therefore, it is the responsibility of the vendor/supplier to provide the necessary support for the inspection agency and get the works inspected at all stages of work as identified in quality assurance plan. The cost towards engaging third party inspection agency shall be borne by the Vendor/supplier. The presence or absence of a Department's representative does not relieve the Vendor/supplier of the responsibility for quality control in all phases of the work. In the event that any of the work being done by the Vendor/supplier or any Sub-Vendor/supplier is found by Department's representatives to be unsatisfactory or not in accordance with the procedures, specifications, and standards the Vendor/supplier shall, upon verbal notice of such discrepancy or deficiency, take immediate steps to revise the work in a manner to conform to the relevant procedures and specifications. The Vendor/supplier shall carry out required supervision and inspection as per Quality Assurance Plan and furnish all assistance required by the Department in carrying out inspection work during this phase.

2.5 DELIVERY AND STORAGE

Dispatch Instructions given in the Contract shall be strictly followed. Failure to comply with instructions of the contract may result in delay in payment of Invoice

The Supplier shall be responsible for transporting all the equipment to site, unloading and storage. No equipment shall be delivered without obtaining dispatch clearance from Department. All the equipment shall be properly packed to avoid any damage during transportation / handling / storage. The equipment received at site shall be stored at a place assigned for this purpose. Supplier shall take proper care while storing the equipment and shall provide watch and ward at his own cost.

3 SCHEDULE OF PRICE

3.1 CONTRACT price shall include all costs for complete execution of the CONTRACT.

3.2 CONTRACT prices shall also include all traveling expenses, living expenses, salaries, overtime, benefit and any other compensation for engineers, supervisors, skilled, semiskilled workmen, watch and ward staff, labours and other staff employed by the Supplier and other consumable material required, and all taxes, duties, and levies as applicable on the date of submission of bid.

3.3 Price shall be firm & fixed.

3.4 The rate quoted shall be on FOR SLC Site, Kulasekarapatnam, Tamilnadu basis.

3.5 The taxes applicable shall be ***indicated separately in terms of percentage*** in the price bid. If the offers submitted by the vendor/suppliers are silent on taxes, it will be presumed that quoted rates are inclusive of taxes & duties and no claim in this regard will be entertained later.

3.6 The supplier has to fill the Annexure-I checklist along with the price bid format.

3.7 If any exceptions or deviations to any of the requirements, then it has to be clearly brought out in the format attached in Annexure-II.

3.8 The schedule of prices shall be read in conjunction with all the sections of proposal document. The payment schedule shall be the basis of releasing milestone payments on pro-rata basis as applicable. The vendor has to provide price details as mentioned in the below Price bid form.

3.9 All communication and evaluation will be with SDSC SHAR and delivery, installation, commissioning and testing will be at SLC site at Kulasekarapatnam, Tamilnadu

Note:

- Slab mode of indent generation is proposed. Supplier has to quote for two chains and three chains of Telecommand. Department reserves the right to order part quantity.
- SDSC SHAR will decide two chains or three chains of Telecommand station during technical bid recommendation.
- L1 party will be decided based on two chains of Telecommand station configuration with 7 years post Comprehensive Maintenance quote for the same configuration. A separate purchase order will be released towards the same.

PRICE BID FORMAT

Two chains of Telecommand

Sub-system/ Parameter	Chain-1	Chain-2	Common for all three chains	Total Quantity (For Two chains config)	Unit Price	Total Price
Design, Engineering, Fabrication, Integration and Testing of the following Systems						
a. Industrial grade Data Processing System with all accessories and drivers	1unit	1unit		2units		
b. Servo Control System (drive, motor, panel, interfaces with cables)	1unit	1unit		2units		
c. Antenna Mount system with encoders, gears, enclosures, routing guide)	1unit	1unit		2units		
d. Solid State Power Amplifier system	1unit	1unit		2units		
e. RF Signal generator	1unit	1unit	1unit	3units		
f. High gain and wide beam RF antenna and very low loss feeder	1unit	1unit		2units		

cable from PA (min 100m)						
Common Items to all the three chains						
g. Bias and status Control unit			1unit	1unit		
h. Data loggers with all accessories			3Nos	3Nos		
i. Spectrum Analysers (Preferably atleast one model Handheld)			3Nos	3Nos		
j. Network Analysers			1No	1No		
k. Digital Storage Oscilloscope			2Nos	2Nos		
l. Digital Multimeter			2nos	2nos		
m. RF Power Meter			1Nos	1Nos		
n. Attenuator Load (2KW, 30dB)			3Nos	3Nos		
o. Power Supplies (TDK-Lambda, model- Zup36-6)			8Nos	8Nos		
p. Variable Regulated Power supplies (0 to 32V DC)			3Nos	3Nos		
q. Pick up antennae			2Nos	2Nos		
r. Standard known gain antenna linear (420MHz to 450MHz): one linear and other circular polarisation			2Nos	2Nos		
s. Low loss RF cable for pick up antenna to console room with connecterisation (2runs, each run length will be intimated later: a total of 300meters)			300meters	300meters		
t. 4-way RF Power dividers (420MHz to 450MHz) with N-F connectors			2nos	2nos		
u. Standard 19" racks with accessories			2Nos	2Nos		
v. General purpose 3 core electrical cable			200meters	200meters		
w. General purpose BNC cable			100meters	100meters		
x. General purpose BNC connectors			50nos	50nos		
y. N type terminations 50Ω (Male and Female)			20nos	20nos		
z. Power extension boards (5A/15A) with 5sockets			5nos	5nos		
aa. Tool Kit (taparia make: All in one)			2sets	2sets		
bb. 2M cable assemblies with N type Male connectors (2KW, CW power, low loss, 420MHz to 450MHz)			10nos	10nos		
cc. Operator control console and racks along with chairs (4nos), lab bench				1 unit		
dd. Data cables (18pair)				4Km		
Supply, Erection and Commissioning of Telecommand chains						
Packaging & Handling charges & Others if any						
Telecommand Control Software Development Charges						
Comprehensive AMC support for 7 years after completion of first three years of standard warranty.						
a. GST Breakup for all the items						
Total Cost						

Three chains of Telecommand

Sub-system/ Parameter	Chain-1	Chain-2	Chain-3	Common for all three chains	Total Quantity (For Three chains config)	Unit Price	Total price
Design, Engineering, Fabrication, Integration and Testing of the following Systems							
a. Industrial grade Data Processing System with all accessories and drivers	1unit	1unit	1unit		3unit		
b. Servo Control System (drive, motor, panel, interfaces with cables)	1unit	1unit	1unit		3unit		
c. Antenna Mount system with encoders, gears, enclosures, routing guide)	1unit	1unit	1unit		3unit		
d. Solid State Power Amplifier system	1unit	1unit	1unit		3units		
e. RF Signal generator	1unit	1unit	1unit	1unit	4units		
f. High gain and wide beam RF antenna and very low loss feeder cable from PA (min 100m)	1unit	1unit	1unit		3unit		
Common Items to all the three chains							
g. Bias and status Control unit				1unit	1unit		
h. Data loggers with all accessories				3Nos	3Nos		
i. Spectrum Analysers (Preferably atleast one model Handheld)				3Nos	3Nos		
j. Network Analysers				1No	1No		
k. Digital Storage Oscilloscope				2Nos	2Nos		
l. Digital Multimeter				2nos	2nos		
m. RF Power Meter				1Nos	1Nos		
n. Attenuator Load (2KW, 30dB)				3Nos	3Nos		
o. Power Supplies (TDK-Lambda, model- Zup36-6)				8Nos	8Nos		
p. Variable Regulated Power supplies (0 to 32V DC)				3Nos	3Nos		
q. Pick up antennae				2Nos	2Nos		
r. Standard known gain antenna linear , circular (420MHz to 450MHz): one linear and other circular polarisation				2Nos	2Nos		
s. Low loss RF cable for pick up antenna to console room with connecterisation (2runs, each run length will be intimated later: a total of 300meters)				300meters	300meters		
t. 4-way RF Power dividers (420MHz to 450MHz) with N-F connectors				2nos	2nos		
u. Standard 19” racks with accessories				3Nos	3Nos		
v. General purpose 3 core electrical cable				200meters	200meters		
w. General purpose BNC cable				100meters	100meters and 50nos		
x. General purpose BNC connectors				50nos	50nos		
y. N type terminations 50Ω (Male and Female)				20nos	20nos		
z. Power extension boards (5A/15A) with 5sockets				5nos	5nos		

aa. Tool Kit (taparia make: All in one)				2sets	2sets		
bb. 2M cable assemblies with N type Male connectors (2KW, CW power, low loss, 420MHz to 450MHz)				10nos	10nos		
cc. Operator control console and racks with chairs (4nos), lab bench					1unit		
dd. Data cables (18pair)					4Km		
Supply, Erection and Commissioning of Telecommand chains							
Packaging & Handling charges & Others if any							
Telecommand Control Software Development Charges							
Comprehensive AMC support for 7 years after completion of first three years of standard warranty.							
a. GST Breakup for all the items							
Total Cost							

4 DISCOUNTS

Bidders shall not indicate any discount separately and quoted price should be after deducing the discount.

5 MODE OF PAYMENT

All the payments due to the Supplier shall be paid in Indian currency through RTGS/NEFT. The contractor has to show the bank details in their invoice.

6 TAXES AND DUTIES

IGST

For Inter State: As per the Notification No.47/2017-Integrated Tax (Rate) Dt: 14.11.2017 issued by Ministry of Finance (Dept. of Revenue), SDSC SHAR is eligible to avail reduced rate of IGST @5% for the procurements made by the Dept. of Space (DOS) being a public Funded Research Institution. We will provide IGST exemption certificate.

For Intra State: As per Notification No.45/2017- Central Tax (Rate) dated 14.11.2017 and Government of Andhra Pradesh Goods and Service Tax Act, 2017 (Act No.16 of 2017), G.O.MS.No.599, Dated: 12.12.2017 issued by Ministry of Finance (Dept. of Revenue), SDSC SHAR is eligible to avail a reduced rate of CGST/SGST @ 5% for the procurements made by the Dept. of Space (DOS) being a public funded research Institution. We will provide IGST exemption certificate.

INCOME TAX

Income tax at the prevailing rate as applicable and if applicable from time to time shall be deducted from the supplier's bills as per Income Tax Act and a certificate issued (TDS Certificate).

7 **Customs Duty –** As per notification No.05/2018 Customs dated 25th January, 2018, ISRO is eligible only for partial exemption of Customs Duty. The reduced rate of CD is 10.775% (CD@5%+Surcharge@10%+IGST@5%). Suppliers are requested to submit their bid by loading these elements wherever, it is applicable. In case of an order, we will issue CD exemption certificate to avail the exemption. The actual amount will be reimbursed against submission of documentary evidence.

In case tenderers offering items considering customs duty exemption, they should also indicate the bill of materials and price, separately, with Customs Duty component and terms and conditions thereto.

8 TERMS OF PAYMENTS

In general, our payment terms will be 100% within 30 days after commissioning. However, if Vendors/Suppliers are requesting for payment after delivery of items, department may consider as given below,

After receipt and acceptance of items at SLC Site:

80% supply value of Payment for the cost of the Purchase order against receipt of materials at Purchasers / Department site along with GST.

After commissioning at SLC site:

20% of supply value cost of basic cost and 100% of cost of commissioning charges after acceptance by Department against submission of Performance bank guarantee of equal amount valid till warranty period plus 3 months.

9 DELIVERY SCHEDULE

The realization of **Telecommand chains and associated systems** is very critical for realization of Vehicle Telecommand PROJECT at SLC. Vendor/suppliers are requested strictly adhere to the schedules provided by the Department

- Placement of PO : T0
- PDR Review and clearance : T0+ 1months
- FAT : T0+ 8months
- Integration at site : T0+ 9months
- SAT : T0+ 10months

9.1 The Supplier shall inform the Department within 30 days of any occurrence that is likely to cause delay in delivery. The Department shall determine, in the light of

circumstances reported, whether or not any respite or modification of the delivery requirements of the contract can be permitted on this account.

9.2 An extension of the time limit for execution or postponement of delivery shall be granted only in the respect of delay, which is not attributable to the fault or the negligence of the Supplier. An extension of the time limit for execution shall be granted to the supplier to the extent that he establishes force majeure events or that any action or inaction on the part of the Department makes the execution of the Contract impossible within the limit specified thereon. In other case and with due regard to the justification provided, the Department may grant respites.

9.3 In the event that the contract includes possible cost/price-revision(s) the new time-limit shall be taken into consideration in the determination of final payments to be made to the Supplier, basing this revision upon, and only on the rules/conditions of cost/price revision stipulated in the contract.

10 LIQUIDATED DAMAGES

In the event of the Supplier failing to complete the work within the delivery period specified in the contract agreement or in extension agreed thereto, the Department shall reserve the right to recover from the Supplier as liquidated damages, a sum of **0.5** percentage per week or part thereof of the undelivered portion of the total contract price of equipment or work. The Total liquidated damages shall not exceed the **10.0** percentage of the total Contract price.

11 EXTENSION OF TIME

If the completion of deliveries of equipment, work is delayed due to reason of Force Majeure the Supplier shall without delay give notice to the Department in writing of his claim for an extension of time. The Department on receipt of such notice may agree to extend the Contract period or delivery date as may be reasonable but without prejudice to other terms and conditions of the Contract.

Both parties shall keep a record of the circumstances referred to above which are responsible for causing delays in the execution of the services and shall give notice to the other party of any such cause as soon as it occurs. An event of Force Majeure, where so ever it occurs, provided it affects either party in fulfilling its obligations under this contract, shall justify the affected party's claim of Force Majeure. Should one or both the parties be prevented from fulfilling their contractual obligations by a state of Force Majeure lasting continuously for more than a month, the parties shall consult with each other regarding the future execution of the contract.

12 RISK COVERAGE

The Supplier shall arrange comprehensive risk coverage at his own cost covering the value of equipment including transportation to the site from manufacturer's work spot, storage at site, testing and commissioning at site. The period of such coverage shall be up to contractual completion period or any extension granted by Department thereof.

13 SECURITY DEPOSIT

13.1 The supplier whose tender is accepted will be required to furnish by way of Security Deposit for the due fulfillment of the contract such a sum as amount to 10 % of the contract price of the work awarded.

13.2 The security deposit (bearing no interest) shall be held by the Department as security till satisfactory competition, testing and handing over of all the system and for the due performance of all suppliers' obligations under the contract as per delivery period or extension granted thereof by the Department.

13.3 The supplier within 10 days of Purchase Order or signing of Contract, deposit with the Accounts officer, Satish Dhawan Space Centre SHAR, Sriharikota as detailed above by any one or more of the following modes namely

(a) By a crossed demand draft in favour of Accounts officer, Satish Dhawan Space Centre SHAR drawn on SBI and payable at Sriharikota.

(b) By an acceptance bank guarantee. The bank guarantee shall be from a nationalized bank for & shall be valid for 60 days beyond completion period.

13.4 In case of breach of contract, the Security deposit shall stand forfeited in addition to other relief available to the Department under this contract.

14 PACKING AND FORWARDING

14.1 The Supplier shall arrange to have all the material suitably packed as per the standards & statutes and as specified in the contract. Unless otherwise provided for in the contract, all containers (including packing cases, boxes, tins, drums, and wrappings) used by the Supplier shall be non-returnable.

14.2 All packing and transport charges, transit handling costs, transit risk coverage and transport fees of agents employed at the place of delivery or elsewhere, shall be deemed included in the price to be paid to the Supplier.

15 WARRANTY

The bidder shall provide 36 months warranty for the entire system for a defect liability, after final official handing over at his cost. During this period supplier has to provide and adhere to the following:

15.1 This period shall include maintenance; replacement of defective/failed parts at free of cost.

15.2 Supplier has to attend four periodic maintenances and unlimited breakdown calls.

15.3 Break down maintenance should be responded within 48 Hours time and shall be completed within 48 Hours after response.

15.4 Department will not provide any transport/accommodation for this purpose.

15.5 Upon oral or written notification of defects in or malfunctioning of the goods during the warranty period which require corrective action, Supplier shall send the necessary personnel to job site to supervise and assume responsibility for repairs and/or replacement, if necessary, of the software modifications at his own cost. If Supplier does not, within seven (7) days after receipt of notification, take steps to correct the breach, Department may do so at the cost and expense of Supplier. Supplier shall reimburse Department all expenses incurred by Department to repair or replace malfunctioning or non-conforming goods.

15.6 Department has no obligation to discover defects, patent or otherwise, and this shall be sole responsibility of Supplier. Inspection and clearance for shipment by Department's inspectors or Inspection agency appointed by Department shall not relieve Supplier of any of his obligation and duties under the terms and conditions herein.

15.7 Where defects in items are remedied under warranty, the period for which the warranty operates shall be extended by such period, as the items were not available to the Department. Where defects items are replaced by new ones, the full warranty period stipulated in the contract shall apply to such replacement items as from the date of their delivery.

15.8 Supplier shall obtain similar warranty from each of his OEM. However, the overall responsibility shall lie within the Supplier.

15.9 Post warranty Comprehensive AMC support for a period of 7 years is required from the date of completion of warranty period of three years. A separate PO will be released on the post warranty CAMC support as per departmental terms and conditions.

16 PERFORMANCE BANK GUARANTEE

The supplier shall guarantee for the performance of the contract by providing bank guarantee in favor of the Department for an amount equivalent to 20 % (twenty percent) of the total value of this contract valid till the warranty period plus three months of the contract. The performance bank guarantee shall be submitted by the supplier with in fifteen days from the date of accepting the equipment as per the CONTRACT. The format for the performance bank guarantee shall be obtained from Department.

17 DISCLOSURE AND USE OF INFORMATION BY THE SUPPLIER

- If the documents supplied by the Department are marked 'restricted use' the Supplier shall take all necessary steps to ensure that the requirements of the contract or any specification, plan, drawing, pattern, sample or information supplied by, or on behalf of, the Department in connection therewith shall not be disclosed to any person other than a person employed or engaged by the Supplier, whether under sub-contract or otherwise, for the performance of the contract.
- Supplier shall guarantee that all information and data received during execution of Contract from Department shall be classified as confidential within the meaning of the Official Secrets Act and will not be divulged to any third party without prior written permission of Department. All drawings & documents shall be returned after execution of work.

18 ARBITRATION

In the event of any dispute or difference arising under these terms & conditions or any condition contained in the Purchase Order or in connection with this Contract. (except as to any matter the decision of which is specially provided for by these conditions), the same shall be referred to the sole arbitration of the Head of the Purchase Office or of some other person appointed by him, and the dispute further processed in terms of the Arbitration & Conciliation Act, 1996. There will be no objection that the arbitrator is a Government Servant that he had to deal with matter which the Contract relates to or that in the course of his duties as Government Servant has expressed views on all or any of the matters in dispute or difference. The award of the arbitrator shall be final and binding on the parties of this Contract.

19 APPLICABLE LAW AND JURISDICTION

The laws of India shall govern this contract for the time being in force. The Courts of Andhra Pradesh only shall have jurisdiction to be with and decide any legal matters or disputes what so ever arising out of the contract.

20 FORCE MAJEURE:

Should a part or whole work covered under this agreement be delayed due to reasons of Force Majeure which shall include legal lockouts, strikes, riots, civil commotion, fire accident, quarantines, epidemic, acts of God and Government, fright embargoes, the completion period for work, equipment referred to in this agreement be extended by a period not in excess of the duration of such Force Majeure. The occurrence shall be notified by either party with in reasonable time.

21 GENERAL

21.1 SAFETY

Supplier shall follow the safety regulations / codes or safety instructions issued by DEPARTMENT and shall take necessary measures at his own cost.

21.2 CHANGES AND MODIFICATION TO SPECIFICATIONS, DESIGNS AND QUALITATIVE / QUANTITATIVE REQUIREMENTS.

21.2.1 Supplier shall obtain approval for the designs from the Department before initiating the action for procurement from OEM.

21.2.2 Department is free to modify the designs during design review. Party has to carry out one-time modifications at each stage without any extra cost and obtains the approval from Department. Two levels of design reviews are contemplated viz. preliminary design review and detailed design.

21.2.3 The Department reserves the right at any time to modify the Quantitative Requirement, Specifications, patterns or SOFTWARE requirements relating to the work covered by the contract. The Supplier shall inform the Department, within 15 days, of any objection he has to the modifications required.

21.2.4 The Department may also accept modifications proposed by the Supplier on his own initiative or behalf of sub-suppliers.

21.2.5 Unless the Department directs otherwise, the Supplier shall in either case, submit within a reasonable time limit to be specified by the Department, an estimate of the effect of any such modification in the cost of performance of the contract and/ or on the delivery schedule.

21.2.6 Any amendment to the contract, which may be necessary in this respect, will be established within a reasonable time in the form of an Amendment to Contract to be signed by both parties. If the parties do not agree on the amendment to the contract, in particular regarding costs/prices, responsibility, delivery schedule, etc. the dispute shall be submitted to Arbitration.

21.3 ACCEPTANCE AND REJECTION:

ACCEPTANCE AND REJECTION:

On completion of the work or part of the work as specified in the contract, the representative of the Department referred to, shall check as soon as possible, but in any event within the month of notification of readiness for acceptance, which the work performed complies with the contract requirements as regards quantity and quality.

In the event of rejection of any of the articles, whereby the Supplier feels himself aggrieved, he may within eight days of the receipt of notification of rejection and before such articles have been removed from the place of inspection, give the Department notice of objection. Such objection shall be considered by a Board of Appeals of the Department. The Department shall, without prejudice to the arbitration clause in the contract, take a decision upon presentation of the Board's findings.

On completion of tests, the members of the Inspection Organisation of the Department or Inspection agency appointed by Department shall prepare a report, which must be countersigned by the Supplier.

21.4 SUSPENSION:

21.4.1 Department may notify the Supplier to suspend performance of any or all of his obligations under the Contract. Such notice will specify the reasons for suspension and the effective date of suspension. Supplier there upon shall suspend the performance of such obligations until ordered in writing to resume performance of Contract by Department.

21.5 CANCELLATION

GENERAL RULE:

The Department shall have the right at any time to cancel a contract either wholly or in part by giving written notice by registered mail. From the time of receipt of the written notice the Supplier shall undertake to observe the instructions of the Department as to the winding up of the contract both on his own part and on the part of his sub-suppliers.

SECTION -B

TECHNICAL SPECIFICATIONS & SCOPE OF WORK

1. OVERVIEW

Three chains of TeleCommand are being realized at SLC with turnkey realisation by making using of Indian industry participation to meet range safety requirement during the launch phase. Slab mode of indent generation is proposed such that vendor/supplier has to provide offer for two chains as well as three chains of Telecommand. In case of realisation of two chains of Telecommand then all the interfaces like bias control panel and Remote console should be designed for three chains of Telecommand such that in future third chain will be kept into configuration. RF antenna, high power amplifier, antenna mount with servo control system having maintenance free gear boxes, limit switches, absolute encoders aligned to the axis of gear and industrial grade data processing system are planned to be realized with the participation of Indian industry. This RFP covers the technical specifications and other conditions for Design, Fabrication, Integration, Testing, Supply and Commissioning of Vehicle Telecommand systems for SSLV project at SLC, Kulasekaraptnam, Tamilnadu.

2. SCOPE OF THE WORK

The Scope of the work includes

A) Mount and drive control system

- Design, Fabrication, Integration, Testing, Supply and Commissioning of Antenna mount with limit switches, maintenance free gearboxes, encoders in both Azimuth and Elevation channels, RF antenna element(s) to meet the requirements.
- Selection of Motor, drive amplifier and gear box system which are meeting the requirements of design with suitable interlocks
- Selection of high-resolution absolute encoders as per design requirements
- Design of digital servo system for steering the antenna based on mode of operation of antenna.
- Defining all hardware interfaces among systems, selection of cables with suitable lengths, making of connectors preferably MS crimping type, providing accessing and monitoring points where ever possible for the entire system,
- Demonstration of the performance of the integrated system as per the specifications.

B) RF Antenna and High-power Solid State Power Amplifier (SSPA)

- Design, Fabrication, Integration, Testing, Supply and Commissioning of high gain and wide band RF antenna in UHF range as per design requirements
- Design of SSPA in UHF band with allowable gain flatness across the band with CW mode of operations and other interfaces as per design requirements
- Defining, arriving and realisation of different interlocks to safe guard the system
- Defining all hardware interfaces among systems, selection of high-power low loss cables with suitable lengths, making of connectors preferably MS standard N-type, providing accessing and monitoring points where ever possible for the entire system
- Demonstration of the performance of the integrated system as per the specifications.

C) Data acquisition and processing system / Data System:

- PC should be of industrial grade meeting the specifications as mentioned
- Defining and Selection of Hardware suitable for the requirements as per details mentioned along with firmware and drivers.
- Defining, configuring of the application software and type of OS compatibility with all the hardware employed.
- Demonstration of the performance of the integrated system as per the specifications.

D) Ergonomic operator console with chairs along with joysticks for antenna movement i.e., Azimuth and Elevation, accommodating data processing system and monitors.

E) Integration, Installation, Testing and commissioning of total system

- All the sub-systems interfaces, routing & labelling, integration to be defined clearly
- Health and status monitoring parameters at different sub-systems to be defined clearly
- All systems to be integrated after independent testing and clearances with defined interfaces

- Commissioning of integrated system to be done such that the total system meets the required specifications.
- Interlocks among sub-systems and among three independent chains should be incorporated and tested.
- Redundancy at power supply level and encoders levels to be provided as per requirements with in sub-systems of each chain.

F) Remote console panel realisation along with data cables laying and connectrisation

- Remote panel (4U/3U size) fabrication, preparation is in the scope of vendor. All the interface formats and other details will be provided by department during reviews/design phases. Clearances to be obtained from SDSC SHAR for final panel layout and labelling.
- Four runs of 20 pair data cables to be layed between TC console room to RSO room each with a length of 500m to 800m. Cable preparation and connecterisation to be done as per the details provided by SDSC SHAR team.
- This panel should be capable to support four chains (whether two chains or three chains configuration, others act as spare)

G) Documentation

- Documentation of the following: design criteria, different interfaces, hardware employed, softwares developed for implementation, different formats employed, signal flow descriptions, test and evaluation, FAT reports, user input formats, make of the hardware and supplier details, etc. to be provided in two sets both in hard copy and soft copy at different phases of towards commissioning works
- Data sheets of different add on interfaces, requirements and design documents related to softwares also to be provided.

3. REQUIREMENTS & SPECIFICATIONS:

General: The design considerations should include the following:

- The TeleCommand shall be highly reliable (refer design objectives in the same section)
- The Antenna structure should meet the operating as well as survival load conditions
- Maintenance free gear box to be chosen, coupling with selected motors and drive amplifiers to be ensured.
- Absolute encoder alignment with mount gears
- Structure should have adequate rigidity to meet
    - System pointing accuracy requirements under varying conditions of wind, gravity and acceleration loads
    - The natural frequency and locked rotor frequency (LRF) requirements defined by the dynamic simulation of the tracking servo system.
    - various load conditions while maintaining system accuracy
- The entire installation and commissioning are in the scope of vendor.

Each subsystem while being as compact and as light as possible should comply with the strength, rigidity and accuracy criteria, assigned space & weight constraints and configuration requirements. The gear boxes employed should be of maintenance free type.

Design Objectives

- An EIRP of min 79 dBm should be realized with Antenna and RF systems with Mechanical beam steering in both channels (Az & El) with a beam width of min 19º ± 0.5º. CW radiated power is to be considered for achieving the EIRP. The beam width and EIRP mentioned are the minimum requirements. The kind of polarisation is RCP. A gain flatness of ±0.5 dB across the band of 420MHz to 450MHz. A maximum of 100m RF cable length between power amplifier and antenna can be taken into consideration for achieving EIRP of 79dBm.

- Main reflector size should not be more then 2m x 2m. Main reflector is the one which accommodates the RF antenna.
- If more number of RF elements are employed in 2m x 2m, then all should be phase matched. The phase matching in RF elements should be confirmed by the vendor during technical bid.
- In case of employing divider/combiner circuitry, protection should be provided from environment and RF interference with suitable enclosures and should be accessible for maintenance.
- Total weight of the antenna mount (Az & El channels with gear boxes, limit switches, encoder alignments, RF elements) should not be more than 2500Kg.
- Provision for cable guiding and/or routing to be provided for both Az and El channels
  - RF power cable from amplifier to RF feeder element(s) located on the top of El
  - Limits & Pre-limits status cables from Az and El
  - Az and El encoder information
  - Az and El motor power and feedback cables
  - Two number of pickup antenna cable from antenna to console room
  - One number of standard gain antenna in the band 420MHz to 450MHz
- There should be provision to assemble and disassemble all the antenna structure, elements and mount.
- Proper operating platform for operation, testing & maintenance of each sub-system should be provided.
- Maintenance free gear box system of adequate capacity from reputed standard manufacturers are to be selected to meet velocity and acceleration rates specified along with degree of rotation with respect to motors and associated drive system. Details of selection criteria of motor drive system and encoders employed for servo control system should be discussed with

SDSC SHAR. Minimum driving capability of the drive amplifier to motor should never be less than 100m

- All components should be of industrial grade
- Evolve the simplest design that meets the performance, safety and reliability, while conforming to operational parameters.
- Incorporate ease of manufacture, assembly & installation and maintenance features through modular design
- Mean Time to Repair (MTTR) of the system should be 1hour
- Build in ergonomic features to minimize operator fatigue and increase safety
- Meet the specified environmental conditions during system operation
- Cables and connectors are to be chosen such that they can with stand minimum double the required power/voltage with minimum losses.
- Proper shielding for all the cables to be provided to avoid interference effects.

Overall System Specifications:

1. Frequency band : 420 to 450 MHz
2. Antenna Type : Suitable to meet the requirement
3. Gain variation : +/- 0.5 dB over the frequency band
4. Size : 2m x 2m (max)
5. 3dB Beam width : 19 ° +/- 0.5° (Az and El)
6. VSWR : 1.5 (max)
7. Side lobe (1st) : 10 dBc (minimum)
8. Polarization : Right Circular polarisation (RCP)
9. Power handling of the antenna : Min double the transmitted CW power
10. Phase match of all RF elements (if any) : ±3°
11. Gain match of all RF elements (if any) : ±0.5 dB
12. Operational wind speed : 60 Kmph min
13. Gusting wind speed : 80 Kmph min
14. Survival wind speed : 240 Kmph min
15. Rainfall in mm/hour : 100 mm
16. Operational temperature : 0 to 60 °C

17. Operational Humidity : Upto 95% RH
18. Azimuth coverage : 5º- 355º (Limits)
19. Elevation coverage : 2º to 178º (Limits)
20. Speed of rotation : 0.01 deg to 15 deg /sec (both in Az & El)
21. Acceleration of rotation : 15 deg /sec^2 (max both in Az & El)
22. Pointing accuracy : 0.1º or better
23. Constraint on weight : Max of 2500Kg including all the antenna elements
24. Safety measures : Stow lock, limit switches, lightening arrestor\
25. Rack structure material : Steel
26. MTTR : 1 Hour max. Except antenna
27. Continuous operating time: 8 Hours max.
28. Life time of system : 20 years min.

- The Antenna will be exposed to saline environment and hence the vendor has to choose appropriate materials and components.
- Absolute encoders should be from reputed brands Heiden & Hein or Hengstler

3.1 Specifications of Antenna Mount:

The basic drive configuration of the mount is elevation over azimuth. This mount is installed on a pedestal.

Mount Type	:	Elevation over Azimuth
Mount velocity for Azimuth & Elevation	:	0º to 15°/sec
Mount acceleration for Azimuth & Elevation	:	0º to 15°/sec^2
Pointing Accuracy	:	0.1º or better
Elevation Rotation	:	2º to 178º
Azimuth Rotation	:	5^0-355^0
Position sensors	:	13 bit (min) Absolute Optical encoders with SSI interface
Rate sensor	:	Resolver/Tacho
Payload weight	:	To be considered from the Antenna and feed design
Operating Temperature	:	0 to 60 ℃, 95% RH
Operational Wind Speed (Max.)	:	60 kmph
Survival Wind Speed	:	240 kmph
Gear system	:	To be designed based on the load such that it should be maintenance free type
Interlocks	:	1. Limits and pre-limits 2. Emergency stop 3. Sequential and failsafe Switching ON Methodology 4. Operating modes interlock 5. Power supply interlocks (if any)

Status monitoring	:	Various status should be sent to data acquisition system. Status includes position (encoder) information; mode of operation, limits, pre-limits, Emergency Stop status and power supply interlocks if any.

Bearings are to be procured from SKF / NTN / ROTH ERDE / FAG / MagTorque

Maintenance free Gear Boxes shall be from Standard suppliers like Shanthi / ABB / Elecon / Allroyd / MagTorque

3.2 Specifications of Antenna Control system (can be considered for mount type and gearbox selections):

Drive type	: Brushless DC/AC Motors and its compatible drive amplifier unit
Make	: Siemens/ Kollimorgen /IRT
Type of loops	: All loops should be digital (position, rate and current)
Capability of drive amplifier	: digital drive amplifier should be capable of driving the motor at a distance of 100m and if required a choke mechanism can be chosen for increasing the driving capability of the amplifier
Rate feedback	: resolver/Tacho
Pointing accuracy	: 0.1º or better
Locked Rotor Frequency (LRF)	: 10Hz
Azimuth coverage	: 5^o to 355^o
Elevation coverage	: 2^o to 178^o
Azimuth and Elevation rates	: 0º to 15°/sec
Azimuth and Elevation Acceleration	: 0º to 15°/ sec^2
Operational modes	: StdBy (no movement and ground extension), Slew (as per joystick deflection), CDM (Commanded angle is from network-based data), PROG (file-based data as commanded)

Controller	: Suitable controller to be used. Source code and tools for modification of the code are to be provided.
Environmental standard	: IP65 standard
Others	: Suitable firmware details along with drivers, loading and operational procedures to be provided
No of encoders in Azimuth	: 2nos
No of encoders in Elevation	: 2nos

3.3 Specifications of RF Antenna

- Frequency : 420MHz to 450MHz
- Gain flatness across the band : +/- 0.5 dB
- Beam width : 19 ° +/- 0.5° (Az and El)
- Polarisation : Right Circular Polarisation
- Main reflector size : 2m x 2m max
- EIRP from antenna : 79dBi min
- Type of antenna : Suitable type to meet the requirements
- VSWR : Max 1.5:1
- Physical properties : As compact as possible
- Environmental conditions : Should withstand the environmental conditions as mentioned above and capable of working in saline conditions

3.4 Specifications of RF Solid State Power amplifier

Parameter	**Required Specifications**
Frequency Range	420 MHz – 450 MHz
Power level selection at front end	From higher level in steps of 3dB to minimum possible level.
Modulation	Frequency Modulation (FM)
Maximum Deviation	250 KHz
Maximum distortion in the demodulated output	<5% even for a maximum deviation of 250KHz
Gain Flatness	+/- 0.5 dB Max. Across the band

Output Power Stability	+/- 0.5 dB Max. over a period of 8Hrs
Impedance	50 ohms
Input & Output VSWR	1.5:1 Max
Spurious Harmonics	-60dBc or better -50dBc or better
Remote Control	Radiation ON/OFF with an option of setting Power levels and monitoring status of parameters VSWR, HIGH TEMP, Over Drive, Power Down Mode through any standard communication interface.
Communication I/F and Remote Application software	LAN interface should be provided with a provision for the configuration of user required IP address. All the front panel operations have to be remotely accessible from general purpose PC using Remote Application software.
RF I/P & O/P Connectors	Standard N Socket at front panel
Front panel indicators	Standard interlocks and power indications to be provided at the front end. Digital indication with selectability for monitoring forward power in Watts and dBm, VSWR to be provided at the front panel.
Standard protections	Any load VSWR (including short and open circuit), excess Temperature +70 deg C, and input overdrive. Transmitter should with stand and should not give any shut down for a reverse power of 25% of the max incident power
Interface to Data processing system	Equivalent Vf and Vr corresponding to forward power and reverse power from the output of power amplifier
Modulator (It can be of standard available product or built in)	A modulator also to be included in power amplifier either external or internal to the unit such that ▪ An analog signal of max 5VP-P it should take ▪ Applies type of modulation as per selection (AM, FM, PM and any others if possible) ▪ Modulation parameters to be user selectable and configurable with modulation on/off option ▪ Modulator can be operable in the frequency band min to max of 2.5GHz with high stable oscillator ▪ Capable of generating output power in the range -110dBm to +20dBm ▪ The output of this modulator is taken as input for SSPA towards amplification

3.5 Specifications of Data processing systems/ Signal Processing System

Industrial grade PC with following hardware and supporting softwares

S. No	Item	Specification
1	Mother board	Server grade Xeon based mother board suitable or better one suitable for industrial applications
2	Chassis	19” rack mountable
3	Backplane	As per design requirements
4	Processor	Intel Xeon or latest industrial grade, 8 core or more or

		better version
5	Memory	32GB min, DDR4 SDRAM with ECC support
6	Drive Controller	SATA
7	Flash drive	SATA 128GB or more SSD Flash HDD
8	Hard Disk	1TB minimum capacity
9	Graphics Card	Integrated Intel HD graphics 2GB or More
10	Removable media	External USB interface, DVD RW
11	Network	4 x 100/1000Ethernet
12	I/O ports and Connectors	4USB or more, VGA/HD port, DVI port, 4 – RJ45 ports
13	Input device	Keyboard and mouse
14	Monitor	21" LED Monitor or better based on the console selection by the supplier
15	Power supply	SMPS-400Watts + 400 Watts Redundant SMPS - FSP
16	Power	230V @ 50Hz, Indian power cords to be supplied
17	Software	System management software, driver and utilities
18	Software tools	• Application development tool: Licensed Qt Creator 5.4+ or latest version or any other tool approved by SDSC SHAR during design reviews • DVD disc writing/burning tools • Office tools like word, Excel, ppt for data analysis. • All required packages for different tools employed to be provided
21	Operating System	Red Hat Linux Enterprise server 8.0 or latest OS with FTP feature
22	Add on cards	Standard add on cards should be chosen for interfacing all the sub-systems. Interfaces to be defined clearly. Hardware to be chosen such that 50% cushion in load to be only consumed (like DIO ports, serial ports, ADC, DAC, etc.)
23	Development of Application software	▪ Should acquire data from all the sub-systems using different interfaces ▪ Total processing cycle to be less than10ms ▪ Display pages: Parameters and plotting at different rates ▪ Logging: Parameters logging to hard disk for different files at different rates will be shared ▪ Transmission and reception of data using different interfaces and at different rates ▪ C++, Threads, parallelism, memory sharing, multi core utilization., etc. concepts can be used to arrive total cycle time for processing to less than 10ms ▪ Input configurable files to be provided to make use of additional ports/configuration of additional ports, IP assignments/ network configurations, serial ports and parallel ports, etc. ▪ Enable/disable buttons for page selections, data selections, plotting ▪ Continuously execute and should execute the project with all updating and plotting for a minimum of 72Hrs
24	Additional features	▪ Should be capable of peak logging and plotting of radiated RF power level from pickup antenna from

		terrace in the same system at selected rates ▪ OR Can be interfaced to Spectrum analyser and Should execute SCIPI commands to log the peak signal strength through MATLAB/SCILAB
25	Others	▪ The drivers for the different cards chosen should be compatible to the kernel version embedded in the Red Hat Linux Enterprise server. Else, the corresponding Kernel should be supplied and installed ▪ License CDs related to ssystem drivers, OS, application tool and any other tools employed in the PC should be supplied ▪ Any updations in kernels/BSP should be provided at least five years

3.6 Specifications of Spectrum Analysers

S. No.	Parameters	Required Specifications
1	Frequency Range	3 Hz to 3 GHz
2	Resolution	0.1 Hz
3	Internal Oscillator Stability	+/- 0.1ppm
4	RBW	1 Hz to 3 MHz (10% Steps)
5	Video Bandwidth	1 Hz to 3 MHz (10% Steps)
6	Safe input Level	Min to 30 dBm or more
7	Displayed Average Noise Level (pre amp off) 1.2 to 2.1 GHz 2.1 to 3.0 GHz 4.2 to 8.4 GHz	 –153 dBm or still less –152 dBm or still less –150 dBm or still less
8	Attenuation Range	0 to 94 dB in 2 dB steps (mechanical +electronic) Mechanical +70 dB Electronic attenuator range 24dB in 1 dB steps (3 Hz to 3.6 GHz)
9	Phase Noise, CF=1GHz, Offset frequency 100Hz	–100 dBc /Hz typical
10	Display Range	Log Scale:0.1 to 1 dB/division in 0.1 dB steps, 1 to 20 dB/division in 1 dB steps (10 display divisions) Linear Scale :10 divisions
11	Measurement uncertainty	0.3dB Max
12	Communication Interface	LAN, GPIB, USB2.0
13	Power requirement	230V AC,50Hz
14	Detector Functions	Max & Min peak search functions, Auto peak search functions
15	Other required features	• Instrument should be configurable to Windows PC through MATLAB or Linux PC using suitable software • Data logging • Remote desktop access • Frequency analysis
16	Instrument documentation	Two sets
17	Make	R&S or Keysight or Agilent or Anritsu

3.7 Specifications of Vector Network Analyser

S.No	Parameter	Specification
1.	Operating Frequency Range	10KHz to 3 GHz
2.	Frequency Resolution	1 mHz
3.	Stability	±7 ppm(@ 5°C to 40°C)
4.	No. of ports	2
5.	Dynamic Range	120 dB (-85dBm to 15dBm)
6.	Output Power	Up to 15 to 20 dBm and adjustable
7.	Maximum Input Level at Receiver Input	15 dBm
8.	Measurement Bandwidth	1Hz to 10 mHz
9.	Frequency Stability	± 1 ppm
10.	Harmonics	-25 dBc (2^{nd} or 3^{rd})
11.	Test port Input Attenuator	0 dB – 30 dB
12.	Required Options/Accessories	▪ Standard mechanical calibration kit, Type-N, 50 ohms ▪ Cable, Type-N(male) to Type-N(male), 50 ohm, 24 inches ▪ Cable, Type-N(male) to Type-N(female), 50 ohm, 24 inches ▪ Time domain Measurements ▪ Impedance measurement kit ▪ S-parameter kit ▪ Remote assistance application software
13.	Communication Interfaces	LAN, GPIB, USB2.0
14.	Power	230Vac, 50Hz
15.	Make	R&S or Keysight or Agilent or Anritsu

3.8 Specifications of Power supply unit

S. No	Parameter	Remarks/ Value
1	Input Voltage	230 V +- 10% AC, 50Hz +- 5% Nominal
2	Output voltages and currents	As per the maximum voltage and current requirements of all the configured modules with double current drive capability
3	Line regulation	0.05% for 10%-line change
4	Output ripple	< 200mv

3.9. Specifications of Digital Storage Oscilloscope

S. No	Parameters	Required Specifications
1	No of input channels	2
2	Bandwidth	DC to 100MHz
3	Sampling rate	2 GSa/s
4	Memory depth	2Mpt
5	Integrated Digital Voltmeter	Functions- ACrms, DC Resolution- ACV/DCV:3digits
6	Trigger type	Edge, pulse width, pattern, external

7	Display characteristics	
	Display	7-inch, TFT LCD WVGA or better
	Modes	Normal, XY, Roll, Delayed
8	Mains Voltage	
	Level	230V ± 10%
	Frequency	50Hz ± 10%
9	Connectivity	USB 2.0 or latest, Ethernet
10	Features	Digital storage, Vertical and horizontal adjustment, scale variations
11	Manuals	All relevant servicing and operating manuals
12	Make	R&S or Agilent or Fluke or Keysight

3.10. Through line power meter

Sl no	Parameter	Specifications
1	Frequency	400MHz to 500MHz / 420MHz to 450MHz / 430MHz to 440MHz
2	Forward sensing power	2KW ± 0.5dB
3	Reverse sensing power	10W to 100W
4	Supply	Rechargeable type and input 230V± 10%
5	Connectors	Standard N-type Female connectors for the unit
6	Display	Digital display with options like forward power (W and dBm selectable), reverse power (W and dBm selectable), VSWR, Return loss
7	Manuals	All relevant servicing and operating manuals
8	Make	Bird Make: Model 4391A or equivalent

3.11. Attenuator

Sl no	Parameter	Specifications
1	Frequency	400MHz to 500MHz
2	Attenuator level	Min 30dB
3	Power Input	63dBm CW Max
4	Cooling	Oil cooling or fan cooling
5	Connectors	Standard N-type Female connectors
6	Impedance	50Ω
7	Manuals	All relevant servicing and operating manuals
8	Make	Bird Make: Model or equivalent

3.12. Data loggers

Intel i-7 seventh generation or latest processor-based personal computer. Model equivalent to better than 'HP Z240 Tower Workstation' with all accessories (Mouse, Keyboard, LED Monitor, cables and adaptors along with manuals) and OS (latest windows) and other driver CDs (MSOffice, Network) with license. These will be used for peak power radiated from Telecommand and decoded command word being uplinked from antenna.

3.13 General Power supplies (36V DC Power Supply)

Brand: TDK-Lambda, model- Zup36-6 or better model

Sl no	Parameter	Specifications
1	Input Voltage	230V AC
2	Frequency	50Hz
3	Output Voltage	0-37V DC
4	Output Current	0-6 Amps
5	Line Regulation	
	CV mode	0.005% +1mV
	CC Mode	0.01% +2mA
6	Load Regulation	
	CV mode	0.005% of rated output +2mV
	CC Mode	0.01% of rated output +5mA
7	Ripple (rms)	5mV rms 5Hz to 1MHz
8	Volt meter	3-digit Display, Accuracy: 0.2%+/-2digit
9	Ammeter	3-digit Display, Accuracy: 0.5%+/-3digit
10	Vout programming accuracy	0.02%+35mV
11	Iout programming accuracy	0.4% + 40mA
12	Vout programming Resolution	0.028% of Full scale
13	Iout programming Resolution	0.03% of Full scale
14	Programming Interface	RS 232 & RS 485 Interface
15	Front Panel Indication	Voltage, Current, Fold Back option, Alarm indication, CV/CC indication, Remote/Local sense indication, Output ON/OFF indication
16	Protection	Over voltage, Over current and over temperature protection
17	Fold back option	Fold back should shut down the power supply output if the load current exceeds the current limit set level
18	Last setting memory	Previous setting should be retained once AC input resume
19	Dimension	Less than 70mm(W) x 124mm(H) x 350mm(D)
20	Weight	Less than 3Kg
21	Operating Temperature	0deg C ~ 50deg C 100% load
22	Storage Temperature	-20deg C to 70deg C
23	Cooling	Fan cooled and the fan speed is controlled according to the load current
24	Operating humidity	30 to 90% RH (No Condensation)
25	Storage humidity	10 to 90% RH (No Condensation)
26	EMI Standards	Conducted – EN55022B, FCC-B, VCCI-B Radiated – EN55022A, FCC-A, VCCI-A
27	Approvals	UL & CE Approvals
28	Others	Necessary 19” rack accessories kit and AC power cords should be provided
29	Manuals	All operating and serving manuals to be provided

3.14 Bias Control Panel

- Should be capable of generating interlock among three chains of Telecommand such that at a time only one chain radiated through antenna irrespective of realisation of two chains or three chains configuration.

- Chain selection status to be made available for all the data processing systems and Remote panel through suitable interfaces.
- It should generate overall readiness status independently for each Data Processing system.
- Front end display to be provided for all selections and displays.
- If any power supply is employed, it should be redundant with respect to both A/C input and DC O/Ps
- Suitable monitoring points to be provided and ease of access to be maintained.
- Detailed circuit diagrams to be provided along with all relevant documents.
- Components if any should be industrial grade.

3.15 Operator Console and Racks, lab bench

- System to be as compact as possible and standard type which should be capable of accommodating three chains of Telecommand (in case of realisation of two chains configuration initially which will be decided during the process of offers reception and evaluation, the console should be capable of housing three chains)
- Independent operator console to be planned with Data Processing system display at front end
- Should be capable of positioning Intercom units, time code readers, spectrums, monitors.
- The design of console and racks for positioning of sub-systems to be discussed with SDSC SHAR team for final fabrication and fixing.
- Operator console chairs compatible with consoles to be provided.
- Should accommodate three industrial grade PCs
- Should accommodate RF Peak Monitoring system which contains two spectrum analyzers and a windows PC

3.16 Paired Data cables

Length of the cable	: 4000 meters
No. of pairs	: 18 min
Conductor	: 7/0.27 mm Dia ATC. The quality of copper shall conform to ICE 28
Core insulation	: By high quality medium density polyethylene

No. of nominal twists : Approximately 15 to 20 twists/meter length of the pair.

Marking/labelling : Length marking in units to be provided at regular intervals on the final outer sheath

Cable Formation:

- Two such cores are twisted to form a pair.
- 18 such pairs are suitably laid up so as to result in minimum cross talk and overall 100% shielded with Poly aluminum foil enclosing 10/0.254mm ATC drain wire inside making electrical contact with aluminum surface of the foil.
- The entire formation is over all sheathed with minimum 1mm thick PVC Grey. Each pair should be colour coded with standard colour coding scheme.
- Armoring: G.I. wire/strip, 4x0.8mm strip as per is: 1554/equivalent.
- Outersheeth: 1.24mm (min) thickness Black-color, PVC, ST-1
- Overall shield to be provided and no independent shield for each pair

Electrical Parameters:

1. Resistance / Km of the pair : Around 40 Ohms at 30 deg C.
2. Minimum insulation resistance : More than 5000 M Ohms/ 1KM at 500V and 35º C
3. High voltage test : The insulated conductor should be subjected to spark test at 3KV RMS AC during production.
4. The cable should with stand 700 V Rms supplied between any two conductors for a period of 2 minutes continuously.
5. Operating temperature : 0ºC to 60ºC

3.17 Integration, Connectors and Cables Assembly

- Integration of all modules inside consoles, racks, and chassis using suitable cable assemblies has to be done. Required signals to be terminated on to chassis/ console using suitable interface connectors and cable assemblies as mentioned.
- All necessary cable assemblies, connectors, and cable harness for testing to source by the vendor for all units.
- Internal cabling to be done using industrial grade cable. The internal wiring and routing have to carry out properly to ensure no loss of signal. Rugged LED is to

be used for displaying indications and toggle switch if any to be provided for ON/OFF

- Industrial grade Crimping connectors to be employed wherever required.

4. Hard ware Acceptance, qualification tests and delivery schedules:

- The vendor shall be required to supply all items as mentioned, demonstrate the working of hardware after integration in the industrial chassis/console enclosure and conduct Acceptance test.
- The final acceptance shall be subject to clearance of ATP and Completion of qualification tests.

4.1 Acceptance and Qualification tests/ Acceptance and test procedures (ATP)

- Acceptance and Qualification test procedures for all the sub systems and overall system to be listed and approval to be taken from SDSC SHAR
- Procedures and qualification tests at FAT and SAT to be separately listed.
- A technical committee of SDSCSHAR would then interpret the results of all the tests and if found correct will clear Systems.
- SDSC SHAR will not provide any software development environment or development tools to the vendor for developing application programs as specified in ATP. All development tools and environment for developing the application programs are to be sourced by the vendor.
- Hard copies of all Hardware manuals, software manuals, SRS & SDD documents and user manuals shall be provided at the time of acceptance tests.
- Non completion of the ATP and the qualification tests would lead to “complete rejection by SDSC SHAR stores”.
- The vendor shall provide **warranty of three years** from the date of acceptance of all the items including the spares. During warranty period, the vendor shall provide technical support for the hard ware as well as software.
- The warranty shall cover hard ware maintenance. The vendor has to repair/replace free of cost any faulty component/ module within the warranty period.
- Vendor shall provide a technical compliance table quantitatively for all the specifications of the deliverables
- All the above tests must be carried out at SLC site.
- Diagnosis and BITE results for each of the hardware modules are mandatory using GUI.

4.2 CRITICAL SPECIFICATIONS TO BE MET INVARIABLY

1. EIRP of each chain : 79 dBm (min)
2. Beam width of each chain : 19° +- 0.5deg
3. Polarisation of antenna : RCP
4. Size of antenna main reflector : 2mx2m (max)
5. Weight of the antenna mount : 2500Kg Max

5. SPECIFIC TASKS

5.1 PDR Document and Review

The vendor, after Successful bidding, shall carry out detailed design and analysis on all subsystems of the radar to meet all the specifications. **The vendor shall prepare a detailed design document covering the following aspects and submit the same for preliminary design review (PDR) at SDSC SHAR. All Recommendations regarding the system design aspects, made by the PDR review committee, shall be incorporated in the system design without any cost implication.**

a) Calculation of loads

All the static and dynamic loads applicable to the antenna and all associated components must be calculated.

a) Design of antenna structure

The antenna structure must be designed taking the Electromagnetic design, weight constraints and loads into account.

c) Motor Drive Details and interfaces

Motor and driver selection criteria to be documented and discussed in detail along with interfaces and type of gear box employed along with associated accessories and couplers.

b) Data Processing System and its hardware

c) Servo Control System

d) Control Console and interfaces

5.2 Guide lines for Integration and Acceptance

a) Integration of antenna

The antenna must be integrated with RF element(s), maintenance free gear boxes, limit switches, encoder and its junction boxes along with cable guiders.

a) Testing of antenna

Antenna mounts to be tested for no load and full load conditions using servo drive assembly.

The vendor as a part of FAT has to test the entire antenna with RF element(s) in a standard Antenna Test facility and the results will be reviewed and clearance will be given before installation.

b) General conditions for Mechanical System:

- Different configurations of Antenna Structure have to be worked out by the vendor along with the pros and cons of each configuration and the same should be submitted to SDSC SHAR for finalizing the configuration. The vendor should request for any details during arriving different configurations.
- Design Review, Analysis and detailed Engineering: After finalizing the configuration, the vendor has to carry out the detailed design & FE Analysis of each sub-system along with engineering drawings. The Design Report shall be submitted to PDR committee of SDSC SHAR.
- The vendor should mention the entire pre-installation requirement such as civil works, electrical and mechanical configuration, power requirements, antenna mounting assemblies, cable routing requirements, details of system assemblies etc.
- The vendor should provide Material test certificate for fabricated items, Calibration and warranty certificate for Instruments etc.
- After the PDR process and based on the suggestions given by the design review team, the vendor has to incorporate the suggestions and total fabrication drawings have to be developed and the same should be submitted to SDSC SHAR for final approval. Submission of Design Validation, fabrication

drawings, Quality Assurance Plan, Integration / Assembly Procedure and T&E procedure for review and clearance by Department.

- Fabrication: Procurement of Raw materials as per specifications in the approved drawings and fabrication shall be carried out as per the tolerances given in the approved drawings as well as suitable to the interfacing requirements of other sub-system.

c) Integration & Testing at Vendor work's place (FAT):

Integration of the fabricated mount with bought out sub-systems/components shall be carried on the shop floor, alignment of encoders, limit switches, motors, drive amplifier, antenna control panel & any other components and successfully demonstrate all the specifications and features along with functioning of the Antenna mount.

All necessary checks like Geometric Tolerances, tests like DP test / Ultrasonic Test / Radiography for welding and qualification tests like Full Load test are to be performed.

The Vendor has to carry out all the functional checks, Servo response and tests given in FAT. This testing is to be offered to the Department for Pre-delivery inspection / dispatch clearance.

d) Supply:

The Antenna Mount is to be painted with one coat of epoxy primer and 2 coats of white Polyurethane paint for corrosion resistance. The fully integrated Antenna mount with all deliverables shall be properly packed against damage during en-route and dispatch to SSLV project site i.e., SLC at Kulashekarapatanam, Tamilnadu.

e) Testing & Commissioning at SSLV Launch Complex (SLC) site (SAT):

After installation of the Antenna mount at SLC site in Kulasekarapatnam, Tamilnadu, the mount is to be tested manually and through Servo drive motors and antenna control panels. Total drive system will be integrated with data processing system and other sub systems of Telecommand. Then, T&E has to be carried out for the system in total Telecommand configuration to ensure that it is meeting all the intended requirements as per the specifications. Acceptance testing and performance demonstration at site as per SAT.

f) Documentation:

Detailed subsystems design configuration document is to be submitted by the vendor

- Manufacturer Test Certificates of Raw materials, bought out components, Inspection Reports in original and 3 copies (Dimensional report before and after welding / machining, LPT, PWHT, Integration of sub-systems and its components, trial run of system & Load test at shop floor, Painting reports are to be submitted.
- Three sets of hard copies and soft copies (DVD) of all "As-built" fabrication drawings of the mount shall be submitted.

5.3 Guide lines for Periodical Review

- The vendor shall attend the progress review meetings at regular intervals not exceeding four weeks at the premises of the SDSC SHAR. The vendor shall present the status of activities and the milestones during the meetings.
- The scope of the work is not limited to the above, vendor has to ensure all the requirements for the fully functional of Telecommand to meet all the requirements regardless of whether they are explicitly mentioned or not.

6. DELIVERABLES

The following physical deliverables are required.

a. **Design report on the Design of the RF antenna system, Mount and drive control system along with antenna control panel**. This report must document the mechanical design of the antenna system, RF antenna system, servo motor and drive control system along with accessories and couplers. At least the following elements need to be addressed:
   - Load levels.
   - Stiffness.
   - Deformation.
   - Temperature sensitivity.
   - Dimensional tolerances achieved as a function of temperature and loading.

- Details of maintenance free gears to be used
- Details of motor drive system, feedback, compensations to be used
- Details of limit switches, encoder junction boxes and their alignments with respect to gear.
- Details of viscous coupling
- RF antenna design along with pattern, gain, beam width, side lobe levels, null levels
- Antenna control panel details and interfaces to servo drive system and data processing system

b. Data pack on the manufactured items: Full information in the form of a data-pack on the manufactured system. For all items manufactured on a design of the bidder, this will include copies of the drawings used for manufacture that will include all materials used, lay-up used and any special manufacturing techniques used. For items bought: the item number, manufacturer and copies of applicable documents such as brochures and user manuals must be supplied.

c. Simulations studies and Design Calculations required:

The following are required during technical bid

i) Beam synthesis design configuration
ii) Gain and beam width along with antenna pattern
iii) Link margin calculations
iv) Calculations of Power dissipation
v) Simulated Antenna Pattern (RCP) for both Az and El channels
vi) System Engineering Aspects and design
vii) Servo load calculations, arriving configurations of motor and drive control system

The following details shall be presented during Preliminary Design Review (PDR) meeting.

1) Phase matching among all the RF elements (in case of multiple elements are used)
2) If multiple RF elements are employed then failure mode cases of simulated antenna radiation pattern (a) when few elements operated in HP while the others VP; (b) when few elements are at different frequencies; (c) when few elements are in different phase than others; (d) effect of failure of one of the elements on the total pattern from antenna (gain, beam width, sidelobes, polarisation) and the failure mode cases can be considered at the ends and also at the centre of the array.
3) The simulations related to Antenna parameters like Gain, frequency band, Cross-pol, polarisation, Side lobe level, null depth, VSWR., should be provided.
4) All the design calculations and simulations of the control loops (position, velocity, current) along with bandwidth, error constants measurements should be provided.
5) Mount Design and interface details
6) FEA based static and dynamic structural analysis
7) Control system and mechanical system design
8) Life cycle calculations
9) Error budgeting and accuracy calculations
10) Weight and CG calculations
11) Natural frequency calculations
12) Design details of all sub systems

d. Antenna: A complete antenna according to the design. An initial list of included components is:

i) Antenna single element or Array antenna with the given specifications
ii) In case of more RF elements, then elements as per specifications with 10% spares
iii) Backup structure
iv) Any divider/combiner circuitry, if so 10% spares to be provided

v) Antenna mounting structure and interface
vi) Drive system and its attachment interface
vii) Static and dynamic balancing system.
viii) Maintenance free Gearbox casing
ix) Maintenance free Gearbox internal components.
x) Two Drive motors without counter torque mechanism and gearbox shafts.
xi) Interface between gearbox and motor shafts
xii) Encoders and gearbox interfaces
xiii) 2 Nos of Encoders mounted to the Antenna in Azimuth and 2 Nos of Encoders mounted to the Antenna in Elevation such redundant information of antenna position in azimuth and elevation is made available to servo control system for error correction and pointing towards the target as per specifications
xiv) Suitable change over criteria for selection of encoders in either of the channels like azimuth and elevation to be arrived and discussed.
xv) Suitable controller along with control software and interface computer for standalone operation for moving the antenna in various modes and control and monitoring of antenna element(s)
xvi) Dual Redundant PS if any employed to be with 30% margin over calculated full load (redundancy such that failure of one of the single phase AC inputs and/or failure of one of the power supplies should output required rated output)
xvii) Any components (software or hardware) required for meeting the requirements of the integrated antenna and its control system

e. Antenna Test report: A test report outlining the test procedures as well as the completed test results on the integrated antenna will be compiled and delivered. The results shall include at least:

i) Deviation of Antenna structure when anticipated loads are applied to the antenna.
ii) Stability testing of the drive train and control over the complete spectrum of rotational speeds.

f. Integrated Antenna

After integration of the Antenna mount and RF element(s) network, as well as all associated support structure and drive train and performing mechanical qualification tests, the integrated antenna will be delivered to SLC Project site.

g. Data Processing system: Installation and procedure documents of OS, drivers for add on cards to be provided; Test procedures along with T&E results of independent card level along with integrated system to be provided as per the specifications; Separate software & Hardware requirement documents and design documents to be provided for Data Processing Systems which will be reviewed and cleared separately

h. Power amplifier: Design document to be provided which describes all the specification along with design criteria, failure mode conditions, interlocks, fail safe conditions. Test procedures along with T&E document to be provided especially module level wherever it is possible. Proper cooling to be incorporated for taking care of heat dissipation by means of thermal design.

i. Servo System: Design document to be provided which describes all the specification along with design criteria, failure mode conditions, interlocks, fail safe conditions. Test procedures along with T&E document to be provided especially module level wherever it is possible.

j. Integrated system: Total system integration to be carried out to the maximum possible extent at factory site and FAT as per procedures to be carried with due participation of SDSC SHAR officials. Detailed test cases at sub-system level and integrated system level to be brought out by discussing with SHAR team. Detailed report to be provided right from component level, sub-system level and integrated system level with all interfaces, signal flows, levels of voltages/currents, type of signals with formats by employing low loss cables, redundancy at power supply levels.

k. Documents and reports: Three sets of documents both in hard copy and soft copy to be provided. These include the following

(i) Preliminary design report (PDR)

(ii) Systems Requirement Documents (SyRs)

(iii) Software Requirement Documents (SRS)

(iv) Test cases and procedures sub-system wise, integrated system wise for FAT and SAT

(v) Test report: Nominal as well as off nominal

(vi) Design report: This includes the following like description of requirement, sub-system wise details, interfaces and connectivity, circuits, components, cables, connectors, calculations, reports, references, integrated systems, troubleshooting techniques/methods with probable cause and effects, etc.

(vii) Reviews document: Minutes of meetings; Action item statuses; Problems encountered during design and their solutions; any design changes proposed, approved and statuses; etc.

(viii) Details and specification of Hardware employed for arriving the configuration.

l. **List of deliverables:** Quantity required chain wise and in total

Two chains of Telecommand

Sub-system/ Parameter	Chain-1	Chain-2	Common for all three chains	Total Quantity (For Two chains config)
1. Design, Engineering, Fabrication, Integration and Testing of the following Systems				
a. Industrial grade Data Processing System with all accessories and drivers	1unit	1unit		2units
b. Servo Control System (drive, motor, panel, interfaces with cables)	1unit	1unit		2units
c. Antenna Mount system with encoders, gears, enclosures, routing guide)	1unit	1unit		2units
d. Solid State Power Amplifier system (Power amplifier + Modulator/ Signal Generator)	1unit	1unit		2units
e. Signal Generator	1unit	1unit	1unit	3units
f. High gain and wide beam RF antenna and very low loss feeder cable from PA (min 100m)	1unit	1unit		2units
g. Operator console along with chairs (4nos), lab bench	1unit	1unit		2units
tems to all the three chains				
h. Bias and status Control unit			1unit	1unit
i. Data loggers with all accessories			3Nos	3Nos
j. Spectrum Analysers (Preferably atleast one model Handheld)			3Nos	3Nos
k. Network Analysers			1No	1No

l. Digital Storage Oscilloscope			2Nos	2Nos
m. Digital Multimeter			2nos	2nos
n. RF Power Meter			1Nos	1Nos
o. Attenuator Load (2KW, 30dB)			3Nos	3Nos
p. Power Supplies (TDK-Lambda, model- Zup36-6)			8Nos	8Nos
q. Variable Regulated Power supplies (0 to 32V DC)			3Nos	3Nos
r. Pick up antennae			2Nos	2Nos
s. Standard known gain antenna linear (420MHz to 450MHz): one with linear and other with circular polarisation			2Nos	2Nos
t. Low loss RF cable for pick up antenna to console room with connecterisation (2runsm, each run length will be intimated during discussions, Maximum total length will be 300meters)			300meters	300meters
u. 4-way RF Power dividers (420MHz to 450MHz) with N-F connectors			2nos	2nos
v. Standard 19" racks with accessories			2Nos	2Nos
w. General purpose 3 core electrical cable			200meters	200meters
x. General purpose BNC cable			100meters	100meters
y. General purpose BNC connectors			50nos	50nos
z. N type terminations 50Ω (Male and Female)			20nos	20nos
aa. Power extension boards (5A/15A) with 5sockets			5nos	5nos
bb. Tool Kit (taparia make: All in one)			2sets	2sets
cc. 2M cable assemblies with N type Male connectors (2KW, CW power, low loss, 420MHz to 450MHz)			10nos	10nos
b. Operator control console and racks with chairs (4nos), lab bench			1unit	1unit
c. Data cables (18pair)			4Km	4Km

Three chains of Telecommand

Sub-system/ Parameter	Chain-1	Chain-2	Chain-3	Common for all three chains	Total Quantity (For Three chains config)
1. Design, Engineering, Fabrication, Integration and Testing of the following Systems					
a. Industrial grade Data Processing System with all accessories and drivers	1unit	1unit	1unit		3unit
b. Servo Control System (drive, motor, panel, interfaces with cables)	1unit	1unit	1unit		3unit
b. Antenna Mount system with encoders, gears, enclosures, routing guide)	1unit	1unit	1unit		3unit
c. Solid State Power Amplifier system	1unit	1unit			3units
d. Signal Generator	1unit	1unit	1unit	1unit	4units
e. High gain and wide beam RF antenna and very low loss feeder cable from PA (min 100m)	1unit	1unit	1unit		3unit
f. Operator console along with chairs (4nos), lab bench	1unit	1unit	1unit		3unit

Common Items to all the three chains					
g. Bias and status Control unit				1unit	1unit
h. Data loggers with all accessories				3Nos	3Nos
i. Spectrum Analysers (Preferably atleast one model Handheld)				3Nos	3Nos
j. Network Analysers				1No	1No
k. Digital Storage Oscilloscope				2Nos	2Nos
l. Digital Multimeter				2nos	2nos
m. RF Power Meter				1Nos	1Nos
n. Attenuator Load (2KW, 30dB)				3Nos	3Nos
o. Power Supplies (TDK-Lambda, model- Zup36-6)				8Nos	8Nos
p. Variable Regulated Power supplies (0 to 32V DC)				3Nos	3Nos
q. Pick up antennae				2Nos	2Nos
r. Standard known gain antenna linear , circular (420MHz to 450MHz): one with linear and other with circular polarisation				2Nos	2Nos
s. Low loss RF cable for pick up antenna to console room with connecterisation(2runs, each run length will be provided during discussions, Maximum total length will be 300meters)				300meters	300meters
t. 4-way RF Power dividers (420MHz to 450MHz) with N-F connectors				2nos	2nos
u. Standard 19" racks with accessories				3Nos	3Nos
v. General purpose 3 core electrical cable				200m	200m
w. General purpose BNC cables				100meters	100meters
x. General purpose BNC connectors				50nos	50nos
y. N type terminations 50Ω (Male and Female)				20nos	20nos
z. Power extension boards (5A/15A) with 5sockets				5nos	5nos
aa. Tool Kit (taparia make: All in one)				2sets	2sets
bb. 2M cable assemblies with N type Male connectors (2KW, CW power, low loss, 420MHz to 450MHz)				10nos	10nos
d. Operator control console and racks with chairs (4nos), lab bench				1unit	1unit
e. Data cables (18pair)				4Km	4Km

8. UPS Load requirements: UPS budget requirements to be provided taking all three chains and general-purpose systems into account. UPS is in the scope of SDSC SHAR and it is must that the vendor has to project the requirements with respect to phase and load for each and every sub-system.

9. Air Conditioner Load requirements: Heat dissipation budget requirements for Air Conditioner to be provided by the supplier/vendor taking all the systems into account. Air conditioners for systems will be in the scope of SDSC SHAR.

10. TESTS TO BE CARRIED OUT UNDER FACTORY ACCEPTANCE TEST (FAT)

The detailed FAT document should be prepared by the vendor and submit to SHAR for review and approval which contains the tests covering the following major items

i. Testing of absolute encoders, motors, drive assembly and driving capability for 100m
ii. Antenna radiation pattern, gain and beam width along with power handling tests (and individual elements testing if any)
iii. Servo: Position loop, Rate loop and Current loop testing of antenna control system with all interlocks and status generations
iv. Data processing system: acquisitions, processing, display, plotting, logging and transmissions at different rates with different interfaces
v. Power amplifier: Stability, gain flatness, interlocks, power selections, calibrated voltages, harmonics and spurious signals
vi. Status from all systems to other systems as per interface requirements and signal flow levels across sub-systems
vii. Peak logging of radiated signal in data system w.r.to position and time
viii. Endurance for each sub-system for min of 8Hrs

Note: Final test procedures to be evolved by mutual discussions

11. TESTS TO BE CARRIED OUT UNDER SITE ACCEPTANCE TEST (SAT)

The detailed SAT document should be prepared by the vendor and submit to SHAR for review and approval which contains the tests covering the following major items

i. Radiation pattern, gain and beam width measurements of the antenna
ii. Antenna Step and rate response in different modes
iii. RF loss measurement from PA output to radiating element Input.
iv. Encoder data verification
v. Command modulations and verifications
vi. Status of all systems in data processing system, updations, logging, plotting, transmitting
vii. Endurance of the total integrated system for min of 8Hrs for all systems except for data system for which it should be 24Hrs min

12. WORKS UNDER DEPARTMENT'S SCOPE

a. Design Review and clearance: The design report will be subjected to the review by Department experts committee.

b. Stage inspections on intimation of progress in works by vendor

c. Pre-delivery / dispatch inspection up on intimation by vendor or as per mutual discussions as per requirements

d. Inspection report for all critical dimensions and parameters specified by ISRO has to be submitted.

e. Command encoder, time code readers, intercom units, UPS, A/C and network switches for external station requirements will be provided by department. The formats will be shared during design phases.

SECTION-C

ANNEXURE

CHECK LIST (Annexure – I)

S.No	Description	Response by Supplier
1.	The detailed scope of work and technical specifications are under stood and price was quoted accordingly	Yes / No
2.	All the general conditions of the contract as per the SECTION-A are acceptable.	Yes / No
3.	In case of some general conditions of the contract as per the SECTION-A are not acceptable, deviation statement is to be enclosed	Yes / No
4.	Compliance to the critical specifications mentioned in 3.6.	Yes / No
5.	The supplier evaluation format as enclosed along the proposal document is filled-in and necessary supporting documents are enclosed.	Yes / No
6.	Un-priced copy of schedule of prices, payment schedule is enclosed in the techno-commercial bid.	Yes / No
7.	Taxes are quoted in the price bid	Yes / No
8.	List of spares are mentioned in the priced bid with value	Yes / No
9.	Delivery schedule is acceptable. If not, the deviation is brought-out in the deviation statement	Yes / No
10.	Terms of payment are acceptable. If not, the deviation is brought-out in the deviation statement	Yes / No
11.	Liquidate damages clause is acceptable. If not, the deviation is brought-out in the deviation statement	Yes / No

Signature of Authorised Person with Seal

EXCEPTIONS AND DEVIATIONS (Annexure – II)

In line with Proposal Document, Bidder may stipulate Exceptions and deviations to the Proposal conditions if considered unavoidable.

SL. NO	Reference in Specification		Dept. Specification	Offered Specification	DEVIATION
	PAGE NO	CLAUSE NO			

NOTE :

Only deviations are to be written in this Annexure – II.

Any deviations taken by the Bidder to the stipulations of the Proposal document shall be brought out strictly as per this format and enclosed along with the bid.

Any deviations not brought out as per this Proforma (Annexure – II) and written elsewhere in the Proposal document shall not be recognized and the same is treated as null and void.

Any willful attempt by the Bidders to camouflage the deviations by giving them in the covering letter or in any other documents that are enclosed may render the Bid itself non-responsive.

(SIGNATURE OF BIDDER)

Satish Dhawan Space Center SHAR

Welcome, Materials Master (isro)

31 August 2017, 17:16:08 IST

MAIN VIEW HELP

Preview For STANDARD TERMS AND CONDITIONS

Page Destination: Tender Header **Format Type :** Normal

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

SATISH DHAWAN SPACE CENTRE

PURCHASE DIVISION

Tele No.08623-225023/225174/225127
Fax No.08623-225170/22-5028
e-Mail ID : hps@shar.gov.in, hasan@shar.gov.in, sselvan@shar.gov.in

STANDARD TERMS & CONDITIONS

1.OFFERS SHALL BE SENT ONLINE ONLY USING STANDARD DIGITAL SIGNATURE CERTIFICATE OF CLASS III WITH ENCRYPTION / DECRYPTION. THE TENDERS AUTHORISED ONLINE ON OR BEFORE THE OPEN AUTHORISATION DATE AND TIME ONLY WILL BE CONSIDERED AS VALID TENDERS EVEN THOUGH THE BIDS ARE SUBMITTED ONLINE.

2.THE TENDERER MUST AUTHORISE BID OPENING WITHIN THE TIME STIPULATED IN THE SCHEDULE BY SDSC SHAR. OTHERWISE THE ONLINE BID SUBMITTED WILL NOT BE CONSIDERED FOR EVALUATION. PHYSICAL COPY WILL NOT BE CONSIDERED EVEN THOUGH IT IS RECEIVED BEFORE THE BID SUBMISSION DATE.

In case of two-part tenders, parties shall submit their offers as follows:-

1) Part-I – Techno-commercial Bid

(No price details shall be mentioned in this bid and shall not upload the details of price along with the techno-commercial bid)

2) Part-II – Price Bid

In view of Two Part Tender, the Offers submitted contrary to above instructions will be summarily rejected.

3.In case, the tenderer is not interested to participate in the tender, the tenderer shall submit regret letter giving reasons, failing which future enquiries will not be sent.

4.**Offer Validity:** The validity of the offers / tenders should be 90 days (in case of single part tender) and 120 days (in case two part tender) from the date of opening of the tenders. Tenders with offer validity less than the period mentioned above, will not be considered for evaluation.

5.**GST** - GST and/or other duties/levies legally leviable and intended to be claimed should be distinctly shown separately in the tender. GST details are given below

GSTIN: 37AAAGS1366J1Z1

LEGAL NAME : SATISH DHAWAN SPACE CENTRE SHAR

VALIDITY FROM:29/08/2017

TYPE OF REGISTRATION:REGULAR

6.**Customs Duty** - SDSC-SHAR is eligible for 100% Customs Duty exemption as per Notification No. 050/2017 539 (b) Dt: 30.06.2017. This may be taken into account while quoting for import items, if any.

In case tenderers offering items considering customs duty exemption, they should also indicate the bill of materials and price, separately, with Customs Duty component and terms and conditions thereto.

8.**Advance Payment** - Wherever advance payment is requested, Bank Guarantee from any Nationalized Bank/Scheduled Bank should be furnished. In case of advance payments, if the party is not supplying the material within the delivery schedule, interest will be levied as per the Prime Lending Rate of RBI plus 2% penal interest.

Interest will be loaded for advance payments/stage payments as per the prime lending rate of RBI and will be added to the landed cost for comparison purpose. In case of different milestone payments submitted by the parties, a standard and transparent methodology like NPV will be adopted for evaluating the offers.

9.**Liquidated Damages** - In all cases, delivery schedule indicated in the Purchase Order/Contract is the essence of the contract and if the party fails to deliver the material within the delivery schedule, Liquidated Damages will be levied @ 0.5% per week or part thereof subject to a maximum of 10% of total order value.

10.**Performance Bank Guarantee** - Performance Bank Guarantee for 10% of the order value should be furnished in the form of Bank Guarantee from nationalized/scheduled bank or by Demand Draft valid till warranty period plus sixty days as claim period.

11.**Security Deposit** – Security Deposit for 10% of the order value is mandatory, if the ordered value is Rs.5.00 lakhs and above. Party shall furnish the Security Deposit in the form of Bank Guarantee from nationalized/scheduled bank or by Demand Draft valid till completion of the contract period plus sixty days towards claim period for faithful execution of the contract.

12.**BANK GUARANTEE FOR FIM:** Supplier has to submit Bank guarantee for equal value of Free Issue of Materials (FIM) issued by the Department from Nationalised / Scheduled Bank valid till receipt and acceptance of supply and satisfactory accounting of FIM plus sixty days as claim period.

13.The delivery period mentioned in the tender enquiry, IF ANY, is with the stipulation that no credit will be given for earlier deliveries and offers with delivery beyond the period will be treated as unresponsive.

14.The Department will have the option to consider more than one source of supply and final orders will be given accordingly.

15.The bidders should note that conditional discounts would not have edge in the evaluation process of tenders.

16.Non-acceptance of any conditions wherever called for related to Guarantee/ Warranty, Performance Bank Guarantee, Security Deposit, Liquidated damages are liable for disqualification.

17.Wherever installation/ commissioning involved, the guarantee/warrantee period shall reckon only from the date of installation and commissioning.

18.Purchase/Price Preference will be extended to the MSMEs under the Public Procurement Policy for MSMEs formulated under the Micro, Small and Medium Enterprises Development Act, 2006 and instructions issued by Government of India from time to time. Vendors who would like to avail the benefit of MSME should clearly mention the same and submit all the documentary evidences to substantiate their claim along with tender itself.

19.The drawings, specifications, end use etc., given by the Centre/Unit along with the tender enquiry are confidential and shall not be disclosed to any third party.

20.**SPECIAL CONDITIONS FOR SUBMITTING QUOTATIONS IN FOREIGN CURRENCY BY THE INDIAN AGENTS**

The Tenderer should submit the following documents/information while quoting:-

a)Foreign Principal's proforma invoice/quote indicating the commission payable to the Indian Agent and nature of after sales service to be rendered by the Indian Agent.

b)Copy of Agency agreement with the Foreign Principal and the Indian Agent, precise relationship between them and their mutual interest in the business.

c)Registration and item empanelment of the Indian Agent.

d)Agency Commission will be paid only Indian Currency.

e)Compliance of the tax laws by the Indian Agent.

21. **High Sea Sales**- Against High Sea Sale transactions:

a.Offers shall be on all inclusive basis including delivery upto Sriharikota at the risk and cost of the supplier. Customs Clearance is the responsibility of the supplier and at his cost and risk.

b.100% payment will be made within 30 days after receipt and acceptance of the items at our site.

c. GST as applicable

d.Customs Duty Exemption Certificate and other relevant documents required for Customs clearance will be provided.

e.High Sea Sales Agreement furnished by the supplier in accordance with the terms and conditions of our purchase order will be signed and issued by SDSC-SHAR.

22.The following information/ documents are to be submitted wherever applicable.

1.Product Literature

2.Core banking account number of SBI, RTGS Details

3.PAN No. in quotation and invoices

4.GST Registration details.

5.In case of MSME, registration details / documents from Competent Authority.

23.**EXCLUSION OF TENDERS**

The following tenders shall be summarily rejected from the procurement process

a.Tenders received from vendors who have not qualified in terms of their registration.

b.Tenders received against publishing of a limited tender in the CPP portal.

c.Tenders of vendors who have been removed from the vendor list or banned/debarred from having business dealings.

d.Unsolicited tenders from vendors.

e.The tenders which materially depart from the requirements specified in the tender document or which contain false information.

f.The tenders which are not accompanied by the prescribed Earnest Money Deposit.

g.The tenders of vendors who have not agreed to furnish Security Deposit, Performance Bank Guarantee and Liquidated Damages.

h.The validity of the tenders is shorter than the period specified in the tender enquiry.

i.The tenders received from vendors or their agents or anyone acting on their behalf, who have promised or given to any official of the Centre/Unit/Department, a gratification in any form, or anything of value, so as to unduly influence the procurement process.

j.The tenders received from vendors, who, in the opinion of the Centre/Unit, have a conflict of interest materially affecting fair competition.

k.The tenders received from Indian agents on behalf of their foreign Principals/OEMs (in cases where the Principals/OEMs also submit their tenders simultaneously for the same item/product in the same tender).

l.In case two or more tenders are received from an Indian agent on behalf of more than one foreign Principal/OEM, in the same tender for the same item/product.

m.If a firm quotes 'NIL' charges / consideration, the bid shall be treated as un-responsive and will not be considered.