REQUEST FOR PROPOSAL

OF

Ka BAND WR51 WAVEGUIDE HIGH POWER LOAD

FREQ. : 17.7 GHz TO 21.2 GHz

(SAC/AUG/2016/02)

(AUGUST 2016)

GOVERNMENT OF INDIA

SPACE APPLICATIONS CENTRE

INDIAN SPACE RESEARCH ORGANISATION

AHMEDABAD – 380 015, INDIA
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INTRODUCTION

The Indian Space Research Organization (ISRO) requests your company to submit quotation for space qualified Ka BAND WAVEGUIDE HIGH POWER LOAD as detailed in this document. These will be used in the Flight Models of the Communication /Broadcast Satellite Service Payloads of INSAT & GSAT series Operational Space crafts. This document consists of five sections:

ANNEXURE–I A: Gives the general background of the Project for which the units are required.

ANNEXURE–I B: Gives the details which vendor shall follow for preparing the response against this RFP.

ANNEXURE–I C: Gives the Electrical Specifications and conceptual drawing.

ANNEXURE–I D: Gives the details on quantity, delivery schedules and warranty.

ANNEXURE–II: Gives the Reliability & Quality Assurance requirements.
ANNEXURE – I A

BACKGROUND

1.0 The Geostationary Satellite System (GSAT) is a domestic multipurpose system, using satellites in geo-stationary orbit, for long distance telecommunications, Radio and TV program distribution, meteorological earth-observation, data relay, search and rescue. The Department of Space of the Government of India, which has the responsibility for establishing and maintaining the GSAT space segment, has embarked on development and fabrication of GSAT series Space crafts.

2.0 The GSAT satellite series is designed to be compatible with most of the commercially available launchers and also the Indian Geosynchronous Launch Vehicle (GSLV). The items under procurement are to be used for the development/fabrication of GSAT satellites.

3.0 For fabrication of these GSAT Space crafts, the Department of Space of the Government of India, through its Indian Space Research Organization (ISRO), is planning to purchase certain spacecraft components and related services. Since your company is a supplier of components for our/other satellite projects, we are requesting, proposals from you for similar products and services for the GSAT project.

4.0 It is very important for our evaluation of offer that your proposal also includes sufficient technical data on form, fit and function. If this technical data is not in public domain, we request that you apply in advance to your Department of State for a license to export this technical data in your proposals.
GUIDELINES TO VENDORS

1.0 GUIDELINES FOR PREPARING TECHNICAL DETAILS

1.1 These are very special hardware and ONLY THOSE VENDORS who have adequate experience in

a) Design, development and fabrication of Hi-Rel systems

b) Qualification of such hardware for onboard communication, satellites should respond and quote against this RFP.

1.2 The vendor is requested to examine the RFP thoroughly and offer compliance/non-compliance point by point. In case of non-compliance, the deviation from the specified parameter shall be furnished and for complied parameters the vendor specification (better or same) shall be provided.

1.3 The vendor should also submit compliance statement consisting of compliance / noncompliance with test philosophy, test plans and other requirements as detailed in Annexure –II under "Reliability &Quality Assurance Requirements". The vendor may submit the Screening /Lot Acceptance testing program which might have been used for supplying similar hardware for other space missions. If compliance statement is not supplied along with the relevant documents, the offer will not be considered.

1.4 It is necessary for the vendor to furnish complete information as required in various annexure (I A to I D & II) of this RFP for proper evaluation and assessment of his proposal.

1.5 The vendor can attach additional information, if any, which may provide more information on these products.

1.6 The vendor may seek clarifications, if any, in advance before submitting the quotations. However, any clarification thus sent to the vendor will also be sent to all other vendors.
1.7 The vendor shall give complete qualification status, flight history, space program details and failure data etc. along with the response.

2.0 GUIDELINES FOR PREPARING QUOTATIONS
2.1 The quotation shall include, in addition to unit cost, all the prices towards screening, and lot-acceptance testing etc. The cost break up should include charges for each test to enable SAC in deciding to include/exclude any test depending on the cost and schedule constraints. The break-up of overall cost in terms of Phase-1 and 2 (as defined in para 1.0) also needs to be indicated.

2.2 The vendor is requested to acknowledge the receipt of this RFP and his willingness/inability to respond and quote against this RFP.

2.3 The vendor must ensure that his quotation along with all the details reaches SAC/ISRO before the due date.

2.4 The quotation shall consist of two parts:

a) PART-1: `Detailed Technical Proposal'
   Giving all details as required in Annexure –I C & II.

b) PART-2: `Cost & Management Proposal'
   Giving cost, payment terms and other financial details.

2.5 The supplier shall give preliminary thermal design analysis along with the offer, particularly for the Ka BAND WR51 HIGH POWER LOAD. The detailed analysis may be provided later.

Note: Part-2 shall be submitted in a separate sealed envelope. This requirement shall be strictly adhered to. However, both parts shall be submitted together in a sealed envelope.
**ANNEXURE – I C**

**Ka BAND WR51 HIGH POWER LOAD**

<table>
<thead>
<tr>
<th>1.0</th>
<th>ELECTRICAL SPECIFICATIONS</th>
<th>COMPLIANCE/ NON-COMPLIANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Operating Frequency Band</td>
<td>17.7 GHz -21.2 GHz</td>
</tr>
<tr>
<td>1.2</td>
<td>Return loss</td>
<td>20 dB (min)</td>
</tr>
<tr>
<td>1.3</td>
<td>Average Power handling capacity</td>
<td>140 W (CW)</td>
</tr>
<tr>
<td>1.4</td>
<td>Multipaction Threshold (Peak Power)</td>
<td>560 W</td>
</tr>
<tr>
<td>1.5</td>
<td>Shielding Effectiveness</td>
<td>&lt; -75 dBi</td>
</tr>
<tr>
<td>1.6</td>
<td>Input port</td>
<td>WR-51 CMR Flange (Plain) with Taped holes (6 nos.) for M3 screw.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.0</th>
<th>TEMPERATURE RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Over which electrical Specifications to be met (base plate temp.)</td>
</tr>
<tr>
<td></td>
<td>-25°C to +75°C (Lot Acceptance)</td>
</tr>
<tr>
<td></td>
<td>-20°C to +70°C (Screening)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3.0</th>
<th>MECHANICAL SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Size &amp; Mountings</td>
</tr>
<tr>
<td>3.2</td>
<td>Overall Mass</td>
</tr>
<tr>
<td>3.3</td>
<td>Outside Finish</td>
</tr>
<tr>
<td>3.4</td>
<td>Venting Hole</td>
</tr>
</tbody>
</table>

**IMPORTANT NOTE:**

**PLEASE REFER CONCEPTUAL DRAWING FOR SAC REQUIREMENT WHICH MUST BE MET BY MANUFACTURER.**

**PARTS TO MEET ALL ELECTRICAL SPECIFICATIONS IN ALL ENVIRONMENT CONDITIONS SIMULTANEOLY.**
FIG. 3: Conceptual drawing of WR51 WAVEGUIDE HIGH POWER LOAD
QUANTITIES, SCHEDULE AND WARRANTIES

1.0 QUANTITIES

The vendor shall quote in step quantities for **WR51 WAVEGUIDE HIGH POWER LOAD**.

STEPS OF QUANTITIES

1.1 FLIGHT UNITS QUANTITY

Please quote in quantity **slabs** as given below:

- 10-19, 20-39, 40-59, 60-79, 80-100

1.2 LAT Units : 1 LOT (5% of the ordered Qty.)

PLEASE QUOTE IN FOLLOWING FORMAT ONLY

<table>
<thead>
<tr>
<th>SR NO</th>
<th>ITEM/ TEST CHARGES</th>
<th>QTY (SLABS)</th>
<th>EACH COST</th>
<th>TOTAL COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FM INCLUDING SCREENING (FROM TOTAL FM ORDERED, 5% WILL BE USED AS LAT units)</td>
<td>10-19, 20-39, 40-59, 60-79, 80-100</td>
<td>XXX XXXXX XXXXXXX</td>
<td>XXXXX XXXXXXX XXXXXXXXXX</td>
</tr>
<tr>
<td>2</td>
<td>LOT ACCEPTANCE TEST CHARGES ON 5% UNITS OF ORDERED FM QUANTITY</td>
<td>1 LOT</td>
<td>--------</td>
<td>XXXXXXX</td>
</tr>
<tr>
<td>3</td>
<td>OTHER CHARGES IF ANY WITH BREAKUP</td>
<td>XXXX</td>
<td>XXXXXXX</td>
<td></td>
</tr>
</tbody>
</table>

2.0 ORDERING

The order will be placed for total requirement including Lot Acceptance and Flight models.
3.0 DELIVERY SCHEDULES

Flight Model & LAT Units : WITHIN 10 Months ARO

4.0 WARRANTY

(a) The vendor shall provide warranty as given below:

“The units supplied here upon shall be free from any defects in material or workmanship and in accordance with the applicable specifications and drawings”.

(b) This warranty shall run for period of **One year** from the date of final acceptance by SAC/ISRO and shall be in addition to any other rights available to SAC/ISRO. This warranty shall continue to be valid for corrected or replaced units until four years after the date of final acceptance by SAC/ISRO of the corrected or replaced parts.