

## **Expression of Interest (Eoi)**

### **INVITATION FOR EXPRESSION OF INTEREST (Eoi) FOR INDIGENISATION OF TEMPERATURE SENSOR FOR SU-30MKI AIRCRAFT**

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#### **1. Introduction :**

- 1.1. Avionics division, Korwa, Hindustan Aeronautics Limited, a navratna DPSU is involved in Production, Overhaul, Repair and Design & development of Avionics system for various aircrafts for military application.
- 1.2. The Temperature Sensor is a SRU of Air Intake Valve system of SU-30 MKI aircraft. The Indigenisation of Temperature Sensor is required for technology up gradation & to obviate obsolescence. The Indigenization will ensure better maintainability in addition to self reliance and Import substitution.

#### **2. Objective :**

- 2.1 The objective of this Expression of Interest (Eoi) is to seek responses from eligible Indian industries and to shortlist potential industry partners to participate in Indigenisation and Manufacture of latest technology Temperature Sensor for Su-30MKI aircraft.

#### **3. Scope of Work :**

- 3.1. Project entails indigenous design, development and manufacture of SRU Temperature Sensor for Su-30MKI aircraft.
- 3.2. Basic technical requirements of the system is detailed in Annexure – A.
- 3.3. The Initial estimated volume of the Temperature Sensor is around 30 nos. However the SRU may be required for entire fleet of SU-30MKI subjected to the customer order. The fleet size is 272 and quantity of SRU per aircraft is One (01).
- 3.4. Once the product is successfully developed and production clearance / type approval is received from CEMILAC, the system will be procured on proprietary basis. It is to be noted that development should be on No Cost basis.
- 3.5. Time line for design, development and certification of the system should not

be more than 12 months.

- 3.6. The unit must match in form, fit and function with dimensions and weight not exceeding that of existing unit.
- 3.7. However, form & fit requirement may be waived, if new technology or alternate design is offered by vendor which can result in low cost, low weight, low power requirement, smaller size & high reliability as compared to the existing unit/system. In this case the installation with parent system is to be ensured.
- 3.8. The vendor shall develop all necessary design documents required for airworthiness certification including BoM, MDI and shall get approved by airworthiness agency as applicable.
- 3.9. The vendor shall do necessary procurement along with CoC traceable to OEM as per approved document.
- 3.10. The development procedure and Airworthiness Certification (Type Approval / Production Clearance) of the Temperature Sensor shall be as per DDPMAS – 2002.
- 3.11. All development activities shall be done by vendor in co-ordination with RCMA, ORDAQA and HAL Indigenization / QC as defined in the DDPMAS-2002 & AFQMS.

#### **4. Vendor Evaluation Criteria :**

- 4.1. Original Equipment Manufacturer (OEM) / Vendor, with proven expertise in design, development & manufacture of similar system of aircraft are requested to participate in the Eol.
- 4.2. The vendor should be with full knowledge in the field of design, development and supply of similar system. Vendor should have developed/supplied in last 5 years same/similar/advanced specification type items.
- 4.3. The vendor may respond individually or in partnership as per their area of expertise. In case vendor wants to participate in collaboration with foreign vendor, it shall be able to demonstrate its technical expertise in design & development of similar systems. In addition, the manufacturing unit shall be located in India.
- 4.4. Vendor should design and develop unit/ system based on Technical Specifications provided by HAL, Avionics Division-Korwa. All tests as detailed in Technical specification of the unit / system shall be carried out by vendor.
- 4.5. Vendor should commit for trouble free and obsolescence free maintenance as well as supply of spare for next 20 years.

- 4.6. Details of similar projects (if any) completed by vendor including contact addresses of the existing customers should be provided (necessary documentary proof shall be provided).
- 4.7. Vendor should define quantitatively amount of import and indigenous content for each unit/ system. Indigenous content should not be less than 40% by value.
- 4.8. The prospective vendor should provide details of manufacturing facilities, details of current capabilities (technical expertise) related to design, manufacture, certification, maintenance and supply of the proposed system.
- 4.9. The prospective vendor should have AS9100 rev D accreditation.
- 4.10. Warranty of at least two years is required for the proposed system.
- 4.11. The vendor shall also be audited as per AFQMS guidelines and first off article will be subjected to first article inspection as per AFQMS guidelines.

## **5. Instruction for Potential vendors**

- 5.1. The Scope of Work for design & development Temperature Sensor as per para 3 is only tentative in nature and are subject to change. This may be considered only as advance information for market exploration.
- 5.2. HAL will freeze the technical scope based on response to this Eol and as deemed necessary at the time of issuing RFP (Request for Proposal) at HAL's discretion.
- 5.3. Compliance against each requirement of para 3 of this document (Scope of Work) and para 4 of this document (Vendor Evaluation Criteria) should be provided in a matrix form by the vendor in the technical offer.
- 5.4. The potential vendor can propose suitable and proven solution to meet HAL's Eol requirements.
- 5.5. This document is not intended to form the basis of any decision to purchase / finalize contract and it does not constitute an offer or invitation or solicitation of an offer to purchase.
- 5.6. Future Process: Based on the evaluation of Eol proposals received, HAL will finalize Technical Specification of the system / LRU and float Request for Proposal (RFP) at HAL's discretion.
- 5.7. Following documents are required to be submitted by respondents
  - a) Technical Offer
  - b) Budgetary proposal – RoM (Rough order of Magnitude) Cost of Design & Development and Production Unit separately
  - c) Documents in proof of evaluation criteria

- 5.8. Guidelines for submitting responses**
- a) The responses should be submitted strictly in hard copy.
  - b) All response should be submitted in a single file / folder. Supporting documents / additional reference should be submitted in a separate folder with proper reference mentioned against each parameter / sub parameter in respective appendices.
- 5.9.** Any supporting document/ evidence without any reference to specific parameter of criteria will not form part of the assessment.
- 5.10.** HAL may visit the vendor's place for audit purpose during vendor evaluation based on the Eol responses.
- 5.11.** Selected Vendor has to get registered at HAL Korwa before the placement of any order and will have to provide all the necessary documents as required. If vendor is already registered in any other division of HAL for similar activity, Vendor registration letter issued by the division will be required for registration at HAL Korwa.
- 5.12.** The information provided by HAL Korwa is the proprietary information & is to be kept strictly confidential and should not be shared to other agencies, vendors and outside world without written permission from competent authority of HAL Korwa.
- 5.13.** A company can submit only one response.
- 5.14.** HAL at its discretion can extend this deadline for the submission of responses to Eol and the same shall be notified in writing.
- 5.15.** HAL is not responsible for delays / problems faced if any while submitting EOI response.
- 5.16.** HAL reserves rights to reject any or all the bids received from vendor (s) without assigning any reason what so ever.
- 5.17.** The EOI project proposal (Technical & Budgetary price proposal) document duly completed and signed should be sent to:

Chief Manager (Indigenization)  
Avionics Division-Korwa  
Hindustan Aeronautics Limited  
Amethi (U.P) - 227412, INDIA  
Mobile: 9415877515  
Fax: +91-5368-256142/148  
email: [neeraj@hal-india.co.in](mailto:neeraj@hal-india.co.in)

- a) As an advance copy email may be sent to above email Ids, however Hard copy of Eol response is to be sent to above address with mention of Eol reference on envelope on or before due date.

b) The due date for submission of EoI proposal is 31 Aug 2020 @ 17:00 Hrs IST.

Thanking you.

Yours faithfully,  
For Hindustan Aeronautics Limited,

**(Neeraj Saxena)**  
**Chief Manager (Indigenization)**

## **Basic Technical details of Temperature Sensor for SU-30MKI aircraft**

### **1. System Description**

Temperature sensor (figure.1) is meant for feeding the electrical signals, proportional to the temperature of air stream on the object.

The external electrical connection of the sensor is made with the help of connectors.

The temperature sensor consists of two sensitive elements, placed in the frame. Each sensitive element is manufactured from platinum wire (in the form of spiral), which, during the change of ambient temperature, changes the electrical resistances as per the specified law.

### **2. Functional Requirements**

Resistance of sensitive elements of sensor at 0<sup>0</sup>C should be  $46 \pm 0.1 \text{ Ohm}$

The relation of resistance of sensitive element of sensor at 100<sup>0</sup>C for the resistance at 0<sup>0</sup>C should be  $\frac{+0.0015}{1.3910 - 0.0010}$

Permissible working current through the sensitive element of sensor should not exceed 35 mA, during this the temperature of overheating of sensitive element from the maximum working current, passing simultaneously on two sensitive elements, should not exceed 5<sup>0</sup>C (without blowing of air).

Maximum working voltage of power supply of the sensitive element of the sensor at permissible working current of 35 mA:

At -60 <sup>0</sup> C	1.3 V
At +300 <sup>0</sup> C	3.5 V

### **2. Weight of the system**

**520 gm (max.)**

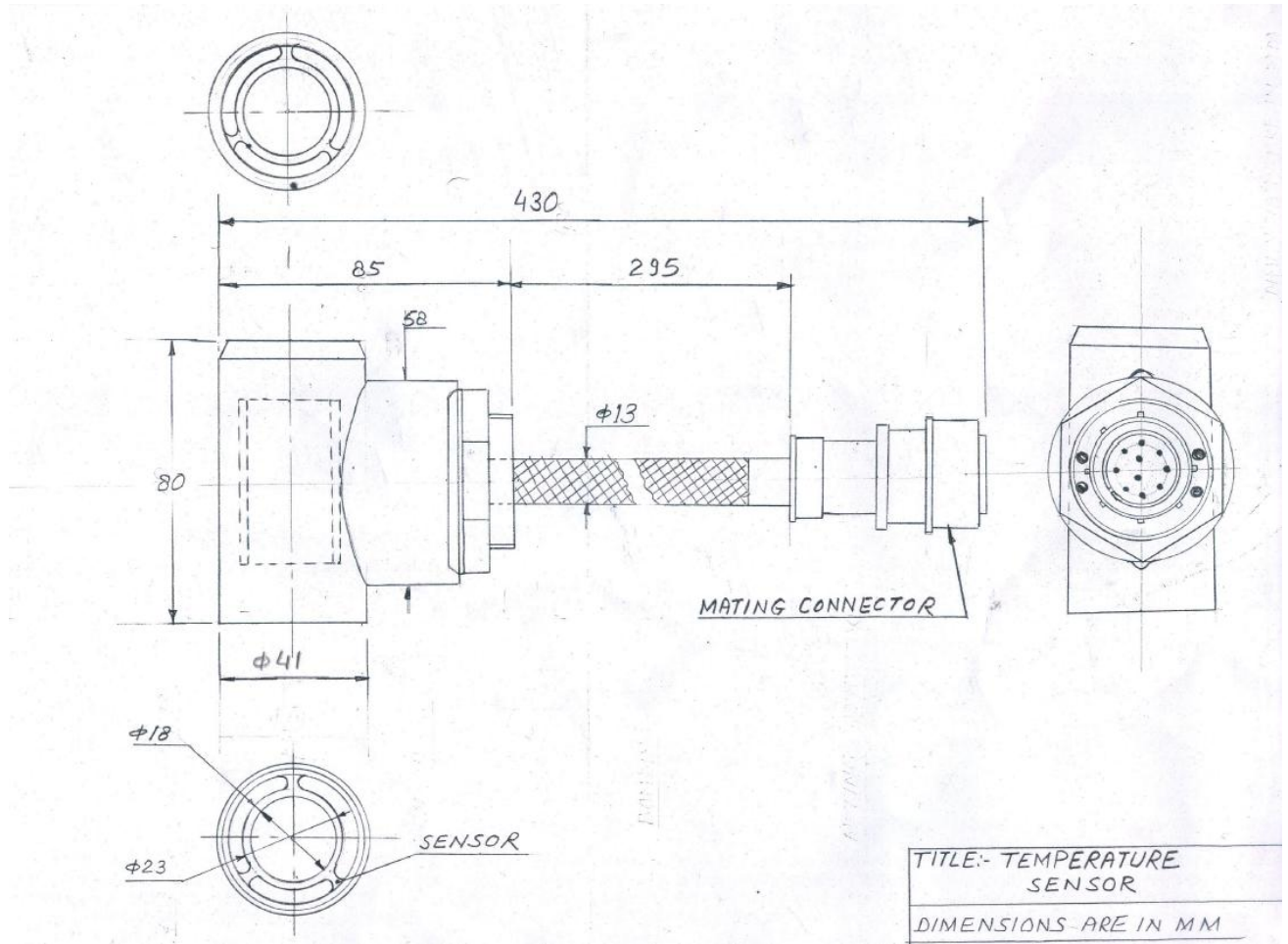


Fig. 1

### 3. Environmental Requirement for Temperature Sensor:

The developed system need to be undergo following test as per the profile applicable for Su-30MKI aircraft.

SI No.	Test Parameter
1.	Stability to the effect of sinusoidal vibration
2.	Stability to the effect of mechanical impact of multiple action
3.	Testing for the strength of joint during the effect of mechanical impact of single action.
4.	Testing for the effect of linear acceleration
5.	Testing for the effect of decreased atmospheric pressure
6.	Stability to the cyclic change of surrounding temperature
7.	Testing for the effect of increased humidity
8.	Testing for the stability to the effect of atmospheric condensed precipitation (dew and internal icing)

The tests mentioned above are as per existing system. The test requirement may change and final qualification test requirement shall be evaluated during development process.