



भारत सरकार / Government of India
अंतरिक्ष विभाग / Department of Space
द्रव नोदन प्रणाली केंद्र
LIQUID PROPULSION SYSTEMS CENTRE
एच ए एल II स्टेज, 80 फीट रोड
HAL II STAGE, 80 FEET ROAD,
बेंगलूरु / BANGALORE-560 008.
फोन सं. / Phone No.080 25037171
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विज्ञापन संदर्भ सं./Advt. Ref. No.: द्र.नो.प्र.के.बे/ LPSCB/ ईओआई/EOI/02-24 तिथि/Date: 08.04.2024

प्रस्ताव/रुचि की अभिव्यक्ति के लिए अनुरोध
REQUEST FOR PROPOSAL/EXPRESSION OF INTEREST

दाब ट्रांसड्यूसरों के संविरचन, समुच्चयन, अंशांकन, परीक्षण एवं इनकी सुपुर्दगी के लिए रुचि की अभिव्यक्ति।

EXPRESSION OF INTEREST FOR FABRICATION, ASSEMBLY, CALIBRATION, TESTING AND DELIVERY OF PRESSURE TRANSDUCERS

निर्धारित तिथियाँ / SCHEDULE

ई ओ आई की तिथि / EoI Date

: 08.04.2024

नियत तिथि/ Due Date

: 07.05.2024

सभी प्रस्ताव मोहरबंद वलफाफे में "क्रय व भंडार अधिकारी प्रशासन बिल्डिंग, द्रव नोदन प्रणाली केंद्र, बेंगलूरु - 560008" को पंजीकृत डाक / कूरियर / सीधी सुपुर्दगी के माध्यम से बोली प्रस्तुतीकरण की नियत तिथि या उससे पहले प्रस्तुत किए जाएँ।

All Proposals in sealed cover should be sent to "Purchase and Stores Officer, Administration Building, Liquid Propulsion Systems Centre, Bengaluru – 560008" through registered post / courier / direct delivery on or before bid submission due date.

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE
LIQUID PROPULSION SYSTEMS CENTRE
INDIAN SPACE RESEARCH ORGANISATION
BENGALURU – 560008, KARNATAKA STATE

No. LPSCB/EOI/02-24

Date: 08.04.2024

INVITATION FOR EXPRESSION-OF-INTEREST

Liquid Propulsion Systems Centre (LPSC), invites **Expression-of-interest (EOI)** for Fabrication, Assembly, Calibration, Testing and Delivery of pressure transducers to LPSC for use in various ISRO programs.

LPSC proposes to establish industry partners for fabrication, assembly, calibration, testing and delivery of pressure transducers. The required raw materials, consumables & standard parts shall be procured by the industry as per specification supplied by LPSC. It is proposed to utilize the expertise, experience and dedicated facilities of Indian industries who are in the field of aerospace manufacturing. Prior experience in production of aerospace sensors is preferred. The realization of pressure transducers requires various manufacturing facilities (at party's works) for high precision machining, Surface treatment, form & dimensional inspection, gold plating, electron beam welding, vacuum brazing, glass-to-metal sealing, space qualified precision soldering, pressure transducer assembly, test & evaluation (T&E), Tests including calibration, thermal testing, vibration testing and repeat of calibration after each milestone test. It is estimated that about 20 technical personnel comprising Graduate engineers, Diploma engineers & Technicians along with the above facilities are essential to achieve the targeted throughput. Since it is a very critical activity, all the works shall be carried out at industry and sub-contracting is not allowed.

The pressure transducers include high-precision and high-reliability elements like strain gauges, electrical connectors & glass to metal seals, which are to function in the harsh environment of space. The fabrication, assembly, calibration, testing of these pressure transducers requires experience in precision electrical assembly practices, skill & knowledge for operating sophisticated equipments, exceptional skill-sets of the technicians and ability of the QC personnel to evaluate/assess performance parameters and comply with stringent quality stipulations. Also, it is essential to adhere to stipulated delivery schedules.

Interested companies/Industries having adequate know-how, qualified & skilled technical personnel, expertise, experience, AS9100C or equivalent accreditation, sound financial background, commitment and desirous of long-term partnership with ISRO, are invited to participate in the Expression-of-interest. On response to the EOI, LPSC shall evaluate and assess suitability prior to empanelment. This assessment may include capability evaluation of the company/Industry by LPSC experts. This call for EOI does not carry with it, any guarantee for allotment of work.

Brief description and scope of work is available in the EOI document.

“Expression of Interest” with all the essential information shall reach Purchase & Stores Officer, LPSC, HAL II Stage, Bengaluru – 560008, Karnataka, on or before 1400 hours on 07-May, 2024. This EOI is issued as a “Pre-Bid Qualification”. Inadequate, incorrect or incomplete information will attract summary rejection. LPSC reserves the right to accept or reject all or any EOI. Mere compliance to the EOI terms does not guarantee further consideration for qualification.

Head, Purchase & Stores
For & on behalf of the President of India
(The Purchaser)
Phone # 080-25037140/170/171
Fax # 080-25037139
/ email: purchase@lpscb.gov.in

ANNEXURE TO EXPRESSION OF INTEREST (EOI)

**LIQUID PROPULSION SYSTEMS CENTRE
Indian Space Research Organisation
Bengaluru - 560008, Karnataka**

Advt. Ref. No: द्र.नो.प्र.के.बें/LPSCB/ईओआई/EOI/02-24 तिथि/Date: 08.04.2024

Invitation for “Expression of Interest”

“Expression- of- interest for fabrication, assembly, calibration, testing and delivery of pressure transducers”

1. Preamble:

LPSC, Bangalore is engaged in the development, realisation and delivery of pressure transducers for various space programmes of ISRO. These transducers incorporate high-precision and high-reliability elements like strain gauges, electrical connectors & glass to metal sealing etc.

In order to build additional capacity to meet increased programmes of ISRO, LPSC is in the process of establishment of industry partner for fabrication, assembly, calibration, testing and delivery of pressure transducers.

LPSC proposes to effectively utilize the expertise, experience and capabilities of Indian industries who are in the field of aerospace manufacturing and who possess prior experience in production of similar aerospace components. Accordingly, it is proposed to invite Expression-of-Interest (EOI) for fabrication, assembly, calibration, testing and delivery of pressure transducers.

2. Scope of work:

The scope of work includes realisation of pressure transducers using various manufacturing facilities (at party's works) like high-precision machine tools, surface treatment facilities, metrology, gold plating, electron beam welding, vacuum brazing, glass-to-metal sealing, space qualified precision soldering, transducer calibration, vibration etc. The required raw materials, consumables & standard parts shall be procured by the industry as per specification supplied by LPSC. The operating personnel shall be conversant with handling high precision equipment, special tools & space qualified soldering techniques. Exceptional skill-sets and temperament is essential for technicians engaged in assembly operations. Additionally, several tests, like leak testing, pressure cycling, calibration, electrical testing and environmental testing like thermal soak and vibration are to be carried out under single roof as part of the production process. It is also essential to perform inspection using high-end metrology equipment. Knowledge and ability is essential on the part of competent Quality Control (QC) personnel to assess/evaluate performance parameters and adhere to stringent quality stipulations. The final product shall be delivered within the stipulated schedules with full complement of test and evaluation documents and stipulated delivery

documentation. The company/ industry should be conversant with safety practices and shall ensure compliance to safety regulations.

Essentially, the scope-of-work encompasses production and delivery of pressure transducers 1800 Nos. per annum (approximately), utilizing the raw materials, consumables & standard parts which are procured by industry.

It is envisaged that the production contract will be operated for an initial tenure of 5 years.

3. List of assembly & test equipment/facilities required.

The dedicated assembly & test facility shall be available at industry which should include full complement of manufacturing, assembly, testing and evaluation equipment/ machinery at the manufacturing site. The facility should also include captive power supply and utilities of gas bank, pneumatic supply, LN2 supply, UPS backup etc.

Essentially, following are the equipment/ facilities:

1. Bonded store
2. High precision tool room with high precision lathes, milling/ drilling machine, surface grinding machine, wire EDM, precision de-burring equipment and tools.
3. High-end metrology inspection laboratory including form-talysurf, roundness tester, CMM, profile projector, endoscope, video measuring system etc., for dimensional, geometrical and visual inspection.
4. Electron Beam Welding m/c (1 cu feet), Vacuum Brazing (0.3 cu meter), Vacuum Heat Treatment (0.3 cu meter) and Glass-to-metal sealing facilities.
5. Surface treatment facility for chemical cleaning, gold plating, copper plating and etching. (**Note:** Clearance from Pollution Control Board is necessary to carry out gold plating using potassium cyanide)
6. Pre-assembly facility for de-burring, visual examination, polishing, ultrasonic cleaning and space qualified precision soldering.
7. 100 class laminar flow tables, primary & secondary standard pressure calibrators, microscope, power supply, leak test facility and measuring instruments like DMM, Megohm meter, break down insulation tester etc.
8. Test facilities for carrying out environmental testing viz., thermal soak and vibration test, etc.

4. List of assembly & test operations:

- 4.1 **Procurement and storage** of raw materials, standard parts and consumables which are procured by them at bonded stores.
- 4.2 **Machining:** Precision turning, milling/drilling, surface grinding and polishing.
- 4.3 **Dimensional inspection** of machined parts.
- 4.4 **Surface treatment viz.,** chemical cleaning, gold plating, copper plating, etching etc.
- 4.5 **Pre-assembly operation:** Precision de-burring of machined parts & sub-assemblies under microscope, visual inspection of standard parts, strain gauge, bonding, crimping, matching, pre-calibration etc.
- 4.6 **Sub-assembly conversion:** Electron Beam (EB) welding, vacuum brazing, vacuum heat treatment, glass to metal sealing, coil winding and precision micro soldering.
- 4.7 **Dimensional inspection & NDI** of sub-assemblies.
- 4.8 **Sub-assembly level testing** viz. electrical checks, pre-calibration, proof pressure test, leak test, temperature cycling etc.
- 4.9 **Final assembly:** EB welding, functional testing viz: electrical check, pressure test, calibration etc.
- 4.10 **Environmental testing viz.,** vibration tests and thermal soak tests.
- 4.11 **Acceptance tests:** Electrical check and pressure calibration before and after environmental testing.
- 4.12 Verification of Interface Control Dimension (ICD)
- 4.13 On-line quality surveillance at all stages of assembly & testing operations.
- 4.14 Documentation, packing & delivery.

5. Delivery schedule:

The company/Industry shall assimilate pressure transducer technology within three months from the date of placement of contract and shall roll out the first batch of pressure transducers within six months after the technology assimilation.

6. Human resource and HR policy:

- 6.1 The company/industry shall have all the required workforce (Technical and skilled) for executing the production contract. LPSC shall train the proposed workforce and clear them for the technical suitability for the highly specialized jobs.
- 6.2 Company/ industry workforce should be qualified, experienced and possess requisite skill-sets for operation of the dedicated facilities and to perform production work as specified.
- 6.3 It is anticipated that a work force of about 20 personnel (comprising of Graduate Engineers, Diploma Engineers & Technicians/ may be required to be deployed by the company/industry for the production task.
- 6.4 The company/ industry shall have a HR policy of retaining LPSC trained workforce. This is very essential since attrition would lead to derailment of production activities, affect quality, result in inordinate delay in delivery schedule and lead to uncertainty in contract execution.

7. Training of company/ industry workforce:

LPSC shall impart essential training in the area of assembly and testing of pressure transducers and in order areas as necessary for assimilation pressure transducer technology.

8. Other requirements:

- **Safety:**
Company/ Industry workforce shall follow all safety stipulations.
- **Secrecy:**
The company/ industry and their entire workforce shall abide by **INDIAN OFFICIAL SECRET ACT** in vogue and shall provide information of awareness of the above in writing.

9. Following are the criteria for scrutiny of EOI proposals:

9.1 General:

The EOI shall contain complete information of the company/ Industry, human resource, infrastructure, assets, financial standing, line of business and credentials.

9.2 Essential criteria for evaluation of EOI:

- 9.2.1 The companies/ industries desirous of submitting EOI proposals shall mandatorily be accredited with AS9100C or equivalent standard for the last 3 years for the company's /industry's existing operations.
- 9.2.2 Prior experience of last 2 years is essential in working in manufacturing assembly, testing, evaluation and production of similar aerospace sensors to a tune of minimum Rs 2.00 Crores per annum.
- 9.2.3 The company/ industry shall possess human resource with adequate knowledge, skill and experience in the areas of manufacturing, metrology, assembly/ testing, non-destructive inspection and quality control.
- 9.2.4 The companies/ industries shall possess high precision machining, manufacturing, metrology/ NDI and assembly, calibration & test facilities suitable for production of similar aerospace sensors.
- 9.2.5 Average of any two years of annual turnover of the company/ industry for similar nature of work related to aerospace products should be Rs. 4.00 Crores or higher per annum during the last 5 financial years (FY: 2018-19, 2019-20, 2020-21, 2021-22 & 2022-23) ending 31st March of corresponding year.
- 9.2.6 The company/ Industry should not have incurred any loss in more than 2 years during the last 5 financial years (FY: 2018-19 to 2022-23) ending 31st March of corresponding year. Certified copies from Chartered Accountant for the annual financial turnover and balance sheet showing profit/ loss to be furnished.
- 9.2.7 In the event of response from companies/ Industries already executing ISRO contracts, past performance will be considered.

Note:

- 1. All information provided by the companies/ industries shall be backed by documentary evidences. Printed brochure of the company/ industry.
- 2. The final evaluation of the response will be based on inputs furnished against our criteria, assessment based on facility visit, if required; feedback from customers and overall assessment.