



भारत सरकार
अंतरिक्ष विभाग
इसरो नोदन कॉम्प्लेक्स
महद्रागिरि पी ओ
तिरुनेलवेली जिला
तमिलनाडु
क्रय व भंडार प्रभाग

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE
ISRO PROPULSION COMPLEX
MAHENDRAGIRI PO
TIRUNELVELI DISTRICT- 627 133
TAMILNADU
PURCHASE & STORES DIVISION

अभिरुचि का अभिव्यक्ति सं. आईपीआरसी/क्रय/प्र.क्र. . / - 1 /19
Expression of Interest No.: IPRC/PUR/HPS/EOI-TLHP/19

क्र. प्र.क्र. . / - 1 /19
Ref. IPRC/PUR/HPS/EOI- TLHP/19

01.08.2019

भारत के राष्ट्रपति के लिए और उनको ओर से प्रधान, क्रय व भंडार, इसरो नोदन कॉम्प्लेक्स (आईपीआरसी), महद्रागिरि, इसरो के निम्नतापीय कार्यक्रम (LH2) के लिए निमलकरण प्रणाली (LHPS) को विकसित करने के लिए अभिरुचि पत्र के () में

For and on behalf of the President of India, Head, Purchase & Stores, ISRO Propulsion Complex (IPRC), Mahendragiri invites Expression of Interest (EOI) from capable vendors to execute the project on Turnkey basis including Design, Procurement, Fabrication, Erection, Installation, Commissioning and Operation & Maintenance of Liquid Hydrogen Production plant and Liquid Hydrogen Purification System (LHPS) to supply Liquid Hydrogen (LH2) and Ultra High Pure Liquid Hydrogen as and when required for ISRO's Cryogenic Programmes.

संक्षिप्त विवरण के लिए - प्रत प्रत्र www.isro.gov.in/tenders - प्र
30.09.2019 ()

11:00) अधोहस्ताक्षरों के साथ, कृपया विवरण के साथ () में
A brief scope of the Project along with EOI – Response Form is available in ISRO website www.isro.gov.in/tenders and ISRO's e-procurement portal and the same can be downloaded from the website. Kindly submit detailed response to the undersigned on or before due date and time i.e., 30.09.2019 (11:00 Hrs. IST) in a sealed cover. While submitting your EOI, super-scribe the above mentioned Reference number and due date on the envelope.

प्र , क्र / Head, Purchase & Stores
महद्रागिरि/IPRC, Mahendragiri
/ Phone No.: 04637-281599/281550/1553

Expression of Interest No.: IPRC/EOI/TLHP-01/2019-20

For and on behalf of the President of India, Head, Purchase & Stores of ISRO Propulsion Complex (IPRC), Mahendragiri invites Expression of Interest (EOI) for establishment of a Liquid Hydrogen Production plant with a production capacity of 1.5 MTPD and Liquid Hydrogen Purification System (LHPS) of 1.5 MTPD at the party's premises. Party should have minimum 3 years experience in the Production and supply of Hydrogen gas / Liquid Hydrogen. The party shall establish the Liquid Hydrogen Production Plant along with LHPS with their own funding and shall execute on Turnkey basis including Design, Procurement, Fabrication, Erection, Installation, Commissioning and Operation & Maintenance of the Liquid Hydrogen Production Plant to supply Liquid Hydrogen (LH₂) and Ultra High Pure Liquid Hydrogen (UHP LH₂) as and when required for ISRO's Cryogenic Programmes.

Indian space Program envisages production & commercialization of Satellite Launch Vehicles. ISRO Propulsion Complex (IPRC) of ISRO has undertaken the ground testing, assembly and integration of Cryogenic Engines and Stages of ISRO's Geosynchronous Satellite Launch Vehicles (GSLVs). Liquid Hydrogen (LH₂) or Hydrogen Refrigerated Liquid is the fuel for Cryogenic Engine. To meet the requirement of testing cryogenic engines & stages for GSLV programmes, it is required to establish a Liquid Hydrogen Production plant with a capacity of 1.5 MTPD. The plant shall be established at the party's premises. For producing LH₂, Party shall meet all the requirements like Raw materials and other Utilities such as, Liquid Nitrogen, Power, Water, etc., including Land and Buildings. In addition to above, a Liquid Hydrogen Purification System shall also be established to produce Ultra high pure liquid Hydrogen and analytical laboratory for analysis of intermediate stream & products.

The process of Liquid Hydrogen production includes compressing the Hydrogen gas in the Non-lubricated Hydrogen gas compressors, compressing the Helium gas or the refrigerant gas in the compressors (based on the selected H₂ liquefaction cycle), pre-cooling using Liquid Nitrogen, expansion using Turbo-expanders or expansion valves and heat exchangers for producing Liquid Hydrogen.

LHPS shall be established and co-located with the Liquid Hydrogen Production Plant to produce ultra high pure liquid Hydrogen by reducing Oxygen and Nitrogen impurities of LH₂ down to Parts Per Billion (PPBV) level. LHPS mainly consists of major equipments like Sub-cooler, Vacuum pumps, evaporator and Adsorber.

Analytical laboratory shall also be established to analyze products and intermediate streams. Analytical laboratory consists of analytical equipments like Gas Chromatographs, Moisture meter, Oxygen analyzer, Para Hydrogen analyzer and UV-Visible spectrophotometer. In addition to above, a suitable Gas Chromatograph is also required for analyzing PPBV level of impurities like Oxygen and Nitrogen in UHP LH₂.

ISRO will enter into a long term contract for a period of 20 years to procure liquid Hydrogen and Ultra high pure liquid Hydrogen on payment in the Metric Ton (MT) basis. The minimum guaranteed off-take quantity of liquid Hydrogen and Ultra high pure liquid Hydrogen is 100 MT per year.

The produced liquid Hydrogen and Ultra high pure liquid Hydrogen shall have the following specification:

Specification of Liquid Hydrogen:

Purity	: > 99.995 % by vol
Impurities:	
Nitrogen (N ₂) + Moisture + Volatile Hydrocarbon	: < 9.0 ppmv
Oxygen (O ₂) + Argon	: < 1.0 ppmv
Carbon-dioxide (CO ₂) + Carbon monoxide (CO)	: < 1.0 ppmv
Helium	: < 39.0 ppmv
Para-Hydrogen	: > 95.0 %

Specification of Ultra High Pure Liquid Hydrogen:

Purity	: > 99.995 % by vol.
Impurities:	
Oxygen (O ₂)	: < 1 ppbv
Nitrogen (N ₂)	: < 100 ppbv
Argon, CO, CO ₂ , Methane & Helium gases	: Not Traceable
Moisture	: < -90 deg. C
Para Hydrogen	: ≥ 98 %

Along with Expression of Interest, the following information shall also be furnished:

1. Company's Registered address with Phone, fax, e-mail etc. and year of establishment.
2. Focal Person of the Company.
3. Status (Proprietary/Partnership/Private Ltd. etc) with names and addresses of Proprietor, Partner, Board of Directors etc.
4. Address of Associates if any : (a) Indian (b) Foreign
5. List of contracts executed for the last five years with full address of customer including contact details. (A copy of Purchase Orders / Contracts).
6. Details of Existing Contracts.
7. Details of Infrastructure such as Production plants, R & D structure, Technical & Administrative manpower, buildings, utilities etc. (company's profile and organization chart shall be attached).
8. Financial Capacity / Credit facilities available with copy of balance sheet, profit & loss account and latest income tax returns.
9. Capital and turnover for last three years with copy of latest Annual report. Average Annual turnover during the last 3 years, ending 31st March of the previous financial year, should not be less than Rs. 27 crores.
10. Name and Address of Bankers.
11. A brief note on your plan for establishment of Liquid Hydrogen Production Plant, Liquid Hydrogen Purification System, Analytical Laboratory and Production & Supply to meet the requirements of ISRO.
12. Compliance of bidder for establishment of the plants within 24 months from the date of signing the contract.
13. Any other information you consider relevant.

Expression of Interest (EOI) with all the above information shall reach the undersigned quoting Ref. No. within 30 days from the date of publishing. IPRC reserves the right to accept or reject all or any such EOI without assigning any reasons what so ever.

Interested parties may download the below mentioned documents and submit detailed response in a sealed cover to the undersigned on or before due date and time i.e. 30.09.2019 (11.00 hrs. IST) in sealed cover. While submitting your EOI, super-scribe the above mentioned Reference No. and due date on the envelope.

In the event the due date indicated is declared as holiday, the next working day at IPRC shall be considered as the due date for receiving & opening of responses. Late/Delayed responses will not be accepted. No request for extension of due date shall be entertained. Queries, clarifications, if any, can be addressed in writing to Head, Purchase and Stores, ISRO Propulsion Complex (IPRC) Mahendragiri P.O., Tirunelveli Dist. – 627 133, Tamil Nadu, India (mail id: hps@iprc.gov.in).

Head, Purchase & Stores
IPRC, Mahendragiri

Expression of Interest – Response Form

1.	Company's Registered address with Phone, fax, e-mail etc., and year of establishment	
2.	Focal Person of the Company	
3.	Status (Proprietary / Partnership / Private Ltd. etc) with names and addresses of Proprietor, Partners, Board of Directors etc.	
4.	Address of Associates: (a) Indian (b) Foreign	
5.	List of contracts executed for the last five years with full address of customer and contact person (A copy of executed Purchase Orders / Contracts shall be enclosed)	
6.	Details of Existing Contracts	
7.	Details of infrastructure such as Production Plants, R&D structure, Technical & Administrative manpower, Buildings, utilities etc. (company's profile and organization chart shall be attached)	
8.	Financial Capacity / Credit facilities available with copy of balance sheet, profit & loss account and latest income tax returns.	
9.	Capital and turnover for last three years with copy of latest Annual report. Average Annual turnover during the last 3 years, ending 31 st March of the previous financial year, should not be less than Rs. 27 crores.	
10.	Name and address of Bankers.	
11.	A brief note on your plan for establishment of Liquid Hydrogen Production plant and Liquid Hydrogen Purification System to meet the requirements of ISRO.	
12.	Compliance of bidder for establishment of the plants within 24 months from the date of signing the contract.	
13.	Any other relevant information	

Signature of Competent authority