भारत सरकार / GOVERNMENT OF INDIA
अंतरिक्ष विभाग / DEPARTMENT OF SPACE
मानव अंतरिक्ष उड़ान केंद्र (एचएसएफसी) / HUMAN SPACE FLIGHT CENTRE (HSFC)
बेंगलूरु / BENGALURU

Ref No.: HSFC/EoI/02/2026-27 26.11.2026

विषय: मिशन अंतरिक्ष के संपूर्ण कार्यान्वयन हेतु इच्छा की अभिव्यक्ति (ईओआई) का आमंत्रण

Invitation for Expression of Interest [EoI] for End-to End Realization of Mission ANTARIKSH – reg.

समानव अंतरिक्ष उड़ान केंद्र [एचएसएफसी], अंतरिक्ष विभाग, भारत सरकार के अंतर्गत भारतीय अंतरिक्ष अनुसंधान संगठन [इसरो] का एक केंद्र है, जो मिशन नियोजन, मानव अंतरिक्ष उड़ान अभियांत्रिकी प्रणालियों के विकास तथा अंतरिक्ष यात्रियों के प्रशिक्षण के लिए उत्तरदायी है। एचएसएफसी द्वारा कर्मीदल के प्रशिक्षण, मिशन पूर्वाभ्यास, प्रणालियों के मान्यकरण तथा कर्मीदल एवं प्रणालियों के बीच पारस्परिक क्रियाओं के मूल्यांकन हेतु पृथ्वी-आधारित मानव अंतरिक्ष उड़ान अभियांत्रिकी अनुकरण सुविधा के रूप में मिशन अंतरिक्ष [ANTARIKSH] स्थापित करने का प्रस्ताव है। इस संबंध में, एचएसएफसी इस सुविधा के संपूर्ण कार्यान्वयन तथा तत्पश्चात दो (02) वर्षों की अवधि के लिए मिशन प्रचालन हेतु भारतीय उद्योगों/विक्रेताओं से, स्वतंत्र रूप से अथवा संघ के रूप में, इच्छा की अभिव्यक्ति आमंत्रित करता है। मिशन अंतरिक्ष में अंतरिक्ष यान एवं अंतरिक्ष स्टेशन के प्रतिरूप अनुकरण मॉड्यूल, मिशन नियंत्रण केंद्र तथा संबंधित सहायक अवसंरचना शामिल होंगे, जिनके माध्यम से नियंत्रित पृथ्वी-आधारित परिस्थितियों में चयनित मानव अंतरिक्ष उड़ान गतिविधियों का अनुकरण किया जाएगा।

Human Space Flight Centre [HSFC], a centre of Indian Space Research Organisation [ISRO] under Department of Space, Government of India, is responsible for mission planning, development of human spaceflight engineering systems and astronaut training. HSFC proposes to establish Mission ANTARIKSH, an Earth-based Human Spaceflight Engineering Simulation Facility for crew training, mission rehearsal, systems validation and evaluation of crew–system interactions. In this regard, HSFC invites Expression of Interest from Indian Industries/Vendors, individually or in consortium, to undertake the End-to-End Realization of the facility, followed by mission operations over a period of two (02) years. Mission ANTARIKSH shall comprise representative spacecraft and space station simulator modules, a Mission Control Centre and associated support infrastructure to simulate selected human spaceflight activities under controlled terrestrial conditions.

ईओआई दस्तावेज़ हमारी वेबसाइट www.isro.gov.in से डाउनलोड किए जा सकते हैं।
EoI Documents can be downloaded from our website **www.isro.gov.in**

एचएसएफसी मिशन अंतरिक्ष [ANTARIKSH] के संपूर्ण कार्यान्वयन हेतु भारतीय विक्रेताओं/उद्योगों के संघ से इच्छा की अभिव्यक्ति [ईओआई] आमंत्रित करता है। मिशन अंतरिक्ष एक पृथ्वी-आधारित मानव अंतरिक्ष उड़ान अनुकरण

सुविधा है, जिसका उद्देश्य कर्मीदल का प्रशिक्षण, मिशन पूर्वाभ्यास, प्रणालियों का मूल्यांकन तथा प्रचालन प्रक्रियाओं का मान्यकरण करना है। इस सुविधा में मानव अंतरिक्ष उड़ान अनुकरण मिशनों के संचालन हेतु अंतरिक्ष यान एवं अंतरिक्ष स्टेशन के प्रतिरूप मॉड्यूल, मिशन नियंत्रण केंद्र, अनुकरण हार्डवेयर एवं सॉफ्टवेयर तथा संबंधित सहायक अवसंरचना शामिल होंगे।

कार्य के दायरे में सुविधा एवं उसकी प्रणालियों का डिजाइन, विकास, खरीद, निर्माण, संयोजन, स्थापना, एकीकरण, परीक्षण एवं कमीशनिंग तथा तत्पश्चात निर्धारित मिशन अभियानों का प्रचालन, अनुरक्षण एवं प्रबंधन शामिल है। उपरोक्त कार्यों को निष्पादित करने हेतु आवश्यक तकनीकी अवसंरचना, अभियांत्रिकी क्षमता, कुशल जनशक्ति एवं अनुभव रखने वाले विक्रेता/उद्योगों के संघ इस ईओआई के प्रत्युत्तर में अपना प्रस्ताव प्रस्तुत कर सकते हैं। मिशन अंतरिक्ष से संबंधित विस्तृत कार्यक्षेत्र एवं आवश्यकताओं का विवरण इस ईओआई दस्तावेज़ तथा इसके परिशिष्टों में दिया गया है।

HSFC invites Expression of Interest [EoI] from Indian Vendors/Consortium of Industries for the End-to-End Realization of Mission ANTARIKSH. Mission ANTARIKSH is an Earth-based Human Spaceflight Analog Simulation Facility intended for crew training, mission rehearsal, evaluation of systems and validation of operational procedures. The facility shall comprise representative spacecraft and space station modules, Mission Control Centre, simulation hardware and software, and associated support infrastructure for the conduct of human spaceflight analog missions.

The scope of work includes design, development, procurement, fabrication, assembly, deployment, integration, testing and commissioning of the facility and its systems, followed by operation, maintenance and management of the specified mission campaigns. Vendors/Consortium of Industries having the requisite technical infrastructure, engineering capability, skilled manpower and experience to undertake the above activities may respond to this enquiry. The detailed scope of work and requirements of Mission ANTARIKSH are provided in this EoI document and its Annexures.

ईओआई का मूल्यांकन बोलीदाता के अनुभव, कार्यक्षेत्र की समझ, सुविधाओं एवं अवसंरचना, प्रस्तावित कार्यपद्धति एवं कार्ययोजना, कुशल जनशक्ति तथा उद्योग की वित्तीय सुदृढ़ता के आधार पर किया जाएगा।

The EOI will be evaluated on the basis of bidder's experience, understanding of scope of work, facility infrastructure, proposed methodology and work plan, skilled manpower and the financial strength of the industry.

एचएसएफसी आवश्यकता पड़ने पर ईओआई प्रक्रिया को रद्द करने/पुनः जारी करने अथवा अतिरिक्त जानकारी/विवरण मांगने का अधिकार सुरक्षित रखता है।

HSFC reserves the right to cancel/re-issue the process of EOI if the necessity so arises or to seek further information/details.

यदि कोई कंपनी/फर्म भ्रष्ट अथवा कपटपूर्ण गतिविधियों में संलिप्त पाई जाती है, तो उसे निविदा प्रक्रिया में भाग लेने से प्रतिबंधित कर दिया जाएगा तथा उसके ईओआई दस्तावेज़ पर विचार नहीं किया जाएगा।

Companies/Firms, if found to have indulged in any corrupt or fraudulent practices, will be debarred taking part in the Tendering process and their EOI Document will not be taken up for consideration.

"इच्छा की अभिव्यक्ति" के साथ आपूर्तिकर्ताओं/फर्मों को निम्नलिखित जानकारी भी विस्तार से प्रस्तुत करनी चाहिए:

Along with "Expression of Interest" Suppliers/ Firm[s] should furnish the following information also in detail:

1. कंपनियों का पंजीकृत पता, फोन नंबर, फैक्स, ईमेल, वेबसाइट आदि।
   Registered address of the Companies with Phone, Fax, Email, Web etc.

2. कंपनी/संगठन की स्थिति (एकल स्वामित्व/साझेदारी/निजी/सार्वजनिक लिमिटेड आदि) तथा स्वामी, साझेदारों, निदेशक मंडल आदि के नाम एवं पते।
   Company/Organization Status (Proprietary/Partnership/Private/Public Ltd. etc.) with Name and Address of Proprietor, Partners, Board of Directors, etc.

3. सहयोगी: (क) भारतीय (ख) विदेशी।
   Associates: (a) Indian (b) Foreign.

4. पिछले दो वर्षों के प्रमुख ग्राहकों की सूची, उनके पूर्ण पते तथा संपर्क व्यक्तियों के विवरण सहित।
   List of Major Customers during the last 2 Years with full address and their Contact Persons.

5. स्वामित्व में उपलब्ध/उपयोग हेतु उपलब्ध/निर्माणाधीन अनुकरण अवसंरचना एवं सुविधाओं का विवरण।
   Details of Analog Infrastructure/Facilities owned/available/under construction.

6. कंपनी के प्रमुख शेयरधारकों के नाम एवं पते तथा शेयर पूंजी में उनकी हिस्सेदारी का प्रतिशत।
   Names and addresses of the major Shareholders of the Company and the percentage of their share capital.

7. पिछले दो वित्तीय वर्षों की पूंजी एवं कारोबार का विवरण, नवीनतम वार्षिक रिपोर्ट की प्रति सहित।
   Capital and Turnover for the preceding 2 Financial Years with copy of latest Annual Report.

8. वित्तीय क्षमता/उपलब्ध ऋण सुविधाएं।
   Financial Capacity/Credit facilities available.

9. बैंकरों के नाम एवं पते।
   Name and Address of Bankers.

10. उस व्यापारिक संघ का विवरण, जिससे उद्योग संबद्ध है।
    Trade Association to which Industry/ies belong to.

11. प्रतिष्ठान/बिक्री कर/सेवा कर पंजीकरण संख्या।
    Establishment/Sales/Service Tax Registration Number.

12. व्यवसाय की प्रकृति।
    Nature of Business.

13. बैंकरों द्वारा जारी फर्म की शोधनक्षमता/वित्तीय क्षमता का प्रमाणपत्र।
    Solvency/Financial capacity of the Firm issued by their Bankers.

14. अन्य कोई जानकारी, जिसे उद्योग प्रासंगिक समझता हो।
    Any other information the Industry/ies consider relevant.

15. कंपनी का परिचय, जिसमें उसकी सुदृढ़ताओं एवं कमजोरियों का स्पष्ट उल्लेख हो।
    The Profile of the Company/ies clearly bringing out the areas of Strength and Weaknesses.

16. ईओआई में भाग लेने हेतु तकनीकी एवं संगठनात्मक दक्षता का स्व-मूल्यांकन।
Self-Assessment Technical and Organizational Competence to take part in the EOI.

17. ईओआई में उल्लिखित प्रत्युत्तर प्रपत्र।
Response forms as mentioned in the EoI

ईओआई प्रत्युत्तर की पूर्णता / Completion of EoI Response

a. कंपनियों/फर्मों को सलाह दी जाती है कि वे ईओआई दस्तावेज़ों में दिए गए सभी निर्देशों, निबंधनों एवं शर्तों, प्रपत्रों, आवश्यकताओं तथा अन्य जानकारी का ध्यानपूर्वक अध्ययन करें। ईओआई प्रस्तुत किए जाने पर यह माना जाएगा कि संबंधित कंपनी/फर्म ने ईओआई दस्तावेज़ों का सावधानीपूर्वक अध्ययन एवं परीक्षण किया है तथा उनके निहितार्थों को पूरी तरह समझ लिया है।

The Company/Firms are advised to study all the instructions; Terms and Conditions; Forms; Requirements and other information in the EOI documents carefully. The submission of EOI shall be deemed to have been done after a careful study and examination of the EOI documents with full understanding of its implications.

b. इस ईओआई का प्रत्युत्तर सभी दृष्टियों से पूर्ण होना चाहिए। ईओआई दस्तावेज़ में अपेक्षित समस्त जानकारी प्रस्तुत न करना अथवा उसकी आवश्यकताओं के पर्याप्त रूप से अनुरूप न होने वाला प्रस्ताव प्रस्तुत करना संबंधित कंपनी/फर्म के जोखिम पर होगा तथा इसके परिणामस्वरूप दस्तावेज़ अस्वीकार किया जा सकता है।

The response to this EOI should be full and complete in all respect. Failure to furnish all the information required by the EOI document or submission of proposal not substantially responsive to the EOI documents to every aspect will be at the risk of the Company/Firms and may result in rejection of the document.

c. प्रस्तुत ईओआई के सभी पृष्ठ क्रमांकित होने चाहिए तथा उन पर अधिकृत हस्ताक्षरकर्ता के हस्ताक्षर होने चाहिए।

All the pages of the EOI submitted must be numbered and signed by the authorized signatory.

d. ईओआई के संबंध में किसी भी प्रकार की सिफारिश करवाना सख्त वर्जित है। ऐसा करने वाली एजेंसी द्वारा प्रस्तुत ईओआई अस्वीकार की जा सकती है।

Canvassing in connection with the EOI be strictly prohibited and such canvassed EOI submitted by the Agency are liable to be rejected.

e. कार्य के दायरे को स्पष्ट करने तथा प्रश्नों का समाधान करने हेतु समानव अंतरिक्ष उड़ान केंद्र, बेंगलूरु द्वारा पूर्व-ईओआई बैठक आयोजित की जाएगी। इच्छुक विक्रेताओं को इस ईओआई दस्तावेज़ में निर्दिष्ट जानकारी एवं सहायक दस्तावेज़ों सहित अपना प्रत्युत्तर प्रस्तुत करना होगा।

A Pre-EoI meeting will be arranged by Human Space Flight Centre, Bengaluru to explain the scope of work and clarify queries, if any. Interested vendors shall submit their responses along with the information and supporting documents specified in this EoI document.

f. इच्छुक विक्रेताओं से अनुरोध है कि वे पूर्व-ईओआई बैठक में भाग लेने वाले अपने प्रतिनिधियों का विवरण सुरक्षा अनुमति की व्यवस्था हेतु तालिका 1 में निर्दिष्ट तिथियों से पर्याप्त समय पूर्व नामित संपर्क अधिकारी को उपलब्ध कराएं। बैठक में भाग लेने वाले प्रतिनिधि अपने साथ "प्राधिकार पत्र" लाएं। प्रत्येक बोलीदाता/कंपनी/संगठन से अधिकतम दो (2) प्रतिनिधियों को भाग लेने की अनुमति होगी।

Interested Vendor[s] may please provide the details of the representative[s] taking part in the Pre-EoI meeting well in advance prior to dates specified in Table-1 to the Focal Point in order to arrange for Security clearance. Vendor[s] representative shall carry an "Authorization Letter" for attending the Pre-EoI meeting. Member Representative shall be limited to maximum of two (2) per bidder/company/organisation.

g. विक्रेताओं के पूर्व-ईओआई प्रश्न, पूर्व-ईओआई बैठक की तिथि से कम से कम पांच (5) दिन पहले **sharmask-hsfc@isro.gov.in** पर एचएसएफसी को प्राप्त हो जाने चाहिए। पूर्व-ईओआई बैठक की तिथि आगे बढ़ाने अथवा स्थगित करने के अनुरोधों पर विचार नहीं किया जाएगा।

Pre-EoI queries from vendors shall reach HSFC at **sharmask-hsfc@isro.gov.in** at least five (5) days before the date of the Pre-EoI meeting. Requests for advancement or postponement of the Pre-EoI meeting will not be entertained.

h. उपरोक्त सभी जानकारी सहित "इच्छा की अभिव्यक्ति", ऊपर दी गई संदर्भ संख्या का उल्लेख करते हुए, निर्धारित अंतिम तिथि एवं समय तक नीचे दिए गए पते पर प्राप्त हो जानी चाहिए।

"Expression of Interest" with all the above information shall reach the address given below, quoting the above Reference Number on or before the due date & time."

i. स्पष्टीकरण तथा पूर्व-ईओआई बैठक में भाग लेने के अनुरोध, ईओआई संदर्भ संख्या का उल्लेख करते हुए, तालिका 1 में निर्दिष्ट संबंधित तिथियों एवं समय-सीमाओं के भीतर **sharmask-hsfc@isro.gov.in** पर भेजे जाने चाहिए। ईओआई प्रत्युत्तर, अपेक्षित सहायक दस्तावेज़ों सहित, नीचे दिए गए डाक पते पर मुद्रित प्रति के रूप में प्रस्तुत किया जाना चाहिए। यदि ईओआई दस्तावेज भारी है और निविदा बॉक्स में नहीं डाल सकता है, तो निविदाकर्ता को सलाह दी जाती है कि वह केवल एच. एस. एफ. सी. के अधिकृत प्रतिनिधि को व्यक्तिगत रूप से अपनी ईओआई जमा करें । ईओआई संख्या और निविदा की नियत तिथि का उल्लेख कवर के शीर्ष पर किया जाएगा । यदि ईओआई दस्तावेज एच. एस. एफ. सी. निविदा बॉक्स के अलावा अन्य निविदा बॉक्स में गिराया जाता है तो इसे अस्वीकार किया जा सकता है । पोस्ट / कुरियर के माध्यम से प्राप्त ईओआई के लिए स्वीकृति प्रदान नहीं की जाएगी । निविदा कर्ता से अनुरोध है कि वह आपकी संबंधित एजेंसियों को उपयुक्त सलाह दे । ईमेल अथवा फैक्स द्वारा प्रस्तुत ईओआई प्रत्युत्तर स्वीकार नहीं किए जाएंगे। निर्धारित अंतिम तिथि एवं समय के बाद प्राप्त प्रत्युत्तरों पर विचार नहीं किया जाएगा।

Requests for clarification and participation in the Pre-EoI meeting shall be sent **sharmask-hsfc@isro.gov.in** quoting the EoI Reference Number, within the respective dates and times specified in **Table 1**. The EoI response, together with the required supporting documents, shall be submitted in hard copy to the postal address given below. If the EoI document is bulky and cannot drop in tender box, tenderer is advised to submit your EoI in person to the authorised representative of HSFC only. EoI number and due date of the EoI shall be mentioned on the top of the cover. If the tender document is dropped in other tender box than HSFC tender box, it is liable to be rejected. Acknowledgement will not be provided for EoIs received through post/courier. Tenderer is requested to suitably advise your respective agencies. Submission of EoI responses by email or fax will not be accepted. Responses received after the due date and time will not be considered.

तालिका 1 / Table 1:

ईओआई प्रस्तुत करने संबंधी विवरण **Submission of EoI details**	
पूर्व-ईओआई बैठक (प्रत्यक्ष एवं ऑनलाइन माध्यम से) Pre-EoI meeting (Hybrid meeting)	11th December, 2026
स्पष्टीकरण हेतु प्रश्न प्रस्तुत करने की अंतिम तिथि Last date of submission for clarification	15th December, 2026
विक्रेता द्वारा पूर्व-ईओआई प्रस्तुतीकरण Pre-EoI Presentation by vendor	18th December, 2026
ईओआई प्रस्तुत करने की अंतिम तिथि Last date for submission of EoI	30th December, 2026
ईओआई खोलने की तिथि Opening date of EoI	30th December, 2026

समस्त अपेक्षित जानकारी एवं सहायक दस्तावेज़ों सहित पूर्ण "इच्छा की अभिव्यक्ति", ऊपर दी गई संदर्भ संख्या का उल्लेख करते हुए, तालिका 1 में निर्दिष्ट अंतिम तिथि एवं समय तक अधोहस्ताक्षरी को प्राप्त हो जानी चाहिए। यह ईओआई मिशन अंतरिक्ष [ANTARIKSH] के संपूर्ण कार्यान्वयन हेतु इच्छुक विक्रेताओं/उद्योगों के संघों की तकनीकी एवं संगठनात्मक क्षमताओं के आकलन के लिए जारी की गई है। एचएसएफसी बिना कोई कारण बताए किसी भी अथवा सभी ईओआई प्रत्युत्तरों को स्वीकार या अस्वीकार करने का अधिकार सुरक्षित रखता है।

The "Expression of Interest", complete with all required information and supporting documents, shall reach the undersigned on or before the due date and time specified in Table 1, quoting the above Reference Number. This EoI is issued for assessment of the technical and organisational capabilities of interested vendors/Consortium for the End-to-End Realization of Mission ANTARIKSH. HSFC reserves the right to accept or reject any or all EoI responses without assigning any reasons whatsoever.

Please send your EOI to the following address:
Purchase and Stores Officer, Human Space Flight Centre, ATF Building, Doddenakundi (URSC Sports Complex), Near Doddenakundi Post Office, Karthik Nagar, Bengaluru – 560037

SD/-
वरिष्ठ प्रधान, क्रय एवं भंडार
समानव अंतरिक्ष उड़ान केंद्र
बेंगलूरु
कर्नाटक, भारत

SD/-
Sr. Head, Purchase & Stores
Human Space Flight Centre
Bengaluru
Karnataka, India

EXPRESSION OF INTEREST (EoI) FOR END-TO-END REALIZATION OF MISSION ANTARIKSH

(Advanced Native Testbed for Analog Research in Indian Kinetography & Station Hardware)

HUMAN SPACE FLIGHT CENTRE

INDIAN SPACE RESEARCH ORGANISATION

BENGALURU

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1. INTRODUCTION

1.1 Human Space Flight Centre (HSFC), a centre of Indian Space Research Organisation (ISRO) under Department of Space, Government of India, is responsible for mission planning, development of human spaceflight engineering systems and astronaut training. HSFC proposes to increase industry participation in the establishment of ground-based facilities for human spaceflight engineering, crew training and mission simulation through the End-to-End Realization of Mission ANTARIKSH.

1.2 The proposed End-to-End Realization of Mission ANTARIKSH includes design, development, procurement, fabrication, assembly, installation, integration, testing and commissioning of the simulation facility, analog modules, associated hardware and software, and support infrastructure. The scope also includes conduct of the specified mission campaigns, operation and maintenance, inter-mission servicing and modifications, and handover of the identified systems to HSFC. The facility and its systems shall meet the technical, functional, operational and safety requirements specified by HSFC.

1.3 The technical proposals submitted against this EoI will be evaluated on the basis of the vendor's experience, understanding of the scope of work, proposed methodology and work plan, available facilities and infrastructure, skilled human resources, and financial strength.

1.4 HSFC is seeking Indian vendors/Consortium of industries capable of undertaking the complete scope of Mission ANTARIKSH. Interested vendors/Consortium shall furnish details of their capabilities and relevant experience in design, development, fabrication, system integration, testing and operation of simulation facilities or comparable engineering projects, together with details of the facilities and resources proposed for execution of the work.

1.5 The EoI proposals received from vendors/Consortium of industries will be evaluated against the eligibility criteria, technical requirements and compliance matrix specified in this document. Respondents shall furnish the prescribed response forms and supporting documents to establish their capability to undertake the proposed work.

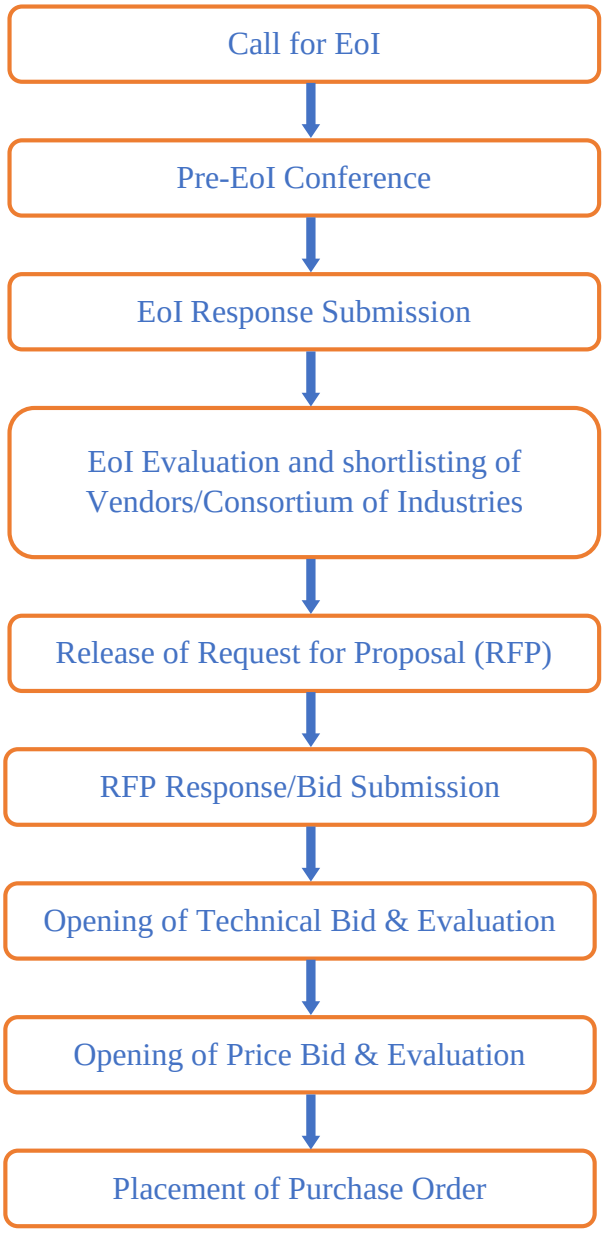
1.6 Mission ANTARIKSH is an Earth-based Human Spaceflight Engineering Simulation Facility intended to support crew training, mission rehearsal, systems evaluation, validation of operational procedures and assessment of crew–system interactions. The facility shall comprise representative Gaganyaan and Bharatiya Antariksh Station simulator modules, a Mission Control Centre, a Neutral Buoyancy Simulator, specialised Space Specific Engineering Task (SsET) systems, and associated crew, medical, ground support and utility infrastructure. These facilities shall support simulation of selected human spaceflight activities, including operations within the modules, extravehicular activities, docking, robotic operations, crew coordination and contingency response. The hardware and software shall be integrated to support Human-in-the-Loop (HITL) and Hardware-in-the-Loop (HIL) simulations under controlled terrestrial conditions. The facility shall provide for repeated mission campaigns, maintenance, reconfiguration and incorporation of modifications specified by HSFC.

2. OBJECTIVE

The main objective of this EoI is to identify Indian vendors/Consortium of industries having the requisite technical capability, experience, infrastructure, skilled manpower and financial capacity to

undertake the End-to-End Realization of Mission ANTARIKSH, an Earth-based Human Spaceflight Engineering Simulation Facility. The proposed activities will broadly cover design, development, fabrication, assembly, integration, testing, commissioning, operation and maintenance of the simulation facility and its associated systems, including support for the conduct of analog mission campaigns. Responses received against this EoI will be assessed to identify suitable vendors/Consortium for participation in the subsequent procurement process. The detailed scope of work, technical requirements and contractual terms shall be specified in the Request for Proposal (RFP) to be issued subsequently. The total contract period shall be three (03) years, comprising one (01) year for facility realization and commissioning followed by two (02) years of mission operations and inter-mission maintenance. The operational period may be extended by up to three (03) additional years, if required by HSFC.

3. PROCEDURE FOR FINALIZING CONTRACT



Note:

1. Consortium shall be headed by single agency who will be focal point to HSFC.

2. Authorized team members from HSFC will visit vendor's facilities to ascertain the availability of infrastructure/facilities.

4. SCOPE OF WORK

The vendor is responsible for the End-to-End Realization of Mission ANTARIKSH, which involves design, development, procurement, fabrication, assembly, integration, testing and commissioning of the analog simulation facility, its modules, associated hardware and software, and support infrastructure. The scope also includes operation and maintenance, technical support for mission campaigns, and preparation of associated documentation and reports.

HSFC is responsible for defining the mission objectives, functional and operational requirements, and providing the agreed reference configurations, interface information and mission procedures. HSFC will review the designs, monitor progress, review test results and carry out acceptance of the identified deliverables. The suggestive division of scope is given below. Detailed requirements and contractual responsibilities will be specified in the subsequent RFP.

HSFC SCOPE	VENDOR SCOPE
1. Supply of mission requirements and functional and operational specifications. 2. Supply of agreed reference drawings, interface data and mission procedures. 3. Review and approval of designs, drawings and integration plans. 4. Definition of mission profiles, campaign schedules and simulation scenarios. 5. Review of testing procedures, test results and acceptance (FAT's & SAT's). 6. Technical direction and coordination of HSFC mission activities. 7. Approval of modifications and acceptance of identified deliverables.	1. Design and development of the simulation facility and associated systems. 2. Procurement, receipt inspection and inventory control of equipment, materials and consumables. 3. Fabrication, assembly and integration of simulator modules, hardware and software. 4. Installation of facility systems, mission control equipment and supporting services. 5. Subsystem testing, integrated testing, commissioning and submission of test reports. 6. Deployment of technical manpower and execution of mission operations support. 7. Operation, maintenance, approved modifications, documentation and handover of identified mission ANTARIKSH systems. 8. Storage, packaging, & delivery of identified Systems, Sub-systems,

	Hardware and Software after completion of the full contract period to HSFC

5. TRANSFER OF TECHNOLOGY

Realization of Mission ANTARIKSH involves development and integration of ground-based simulator modules, mission control systems and associated engineering hardware and software. HSFC may, where required, extend technical support and make available identified technical know-how, reference configurations, interface information, simulation logic and operational procedures to facilitate realization of the facility by the selected vendor/consortium.

Any Transfer of Technology required for the above activities shall be limited to the systems or processes identified by HSFC and undertaken in accordance with applicable ISRO procedures. The scope of such transfer, including technical documentation and training support, if any, will be specified in the subsequent RFP and the applicable agreements.

6. QUANTUM OF WORK

The vendor shall establish one (01) integrated Mission ANTARIKSH simulation facility and support the conduct of six (06) analog mission campaigns in two (02) operational phases, with three (03) campaigns per phase, preceded by a preparatory dry rehearsal.

The total contract period is three (03) years: one (01) year for facility realization and commissioning, followed by two (02) years for mission operations and inter-mission maintenance. The operational period may be extended by up to three (03) additional years, if required by HSFC. Handover of identified systems forms part of contract completion.

7. RESOURCES

To execute Mission ANTARIKSH, the vendor shall deploy qualified, experienced and trained engineering, supervisory, technical and operational personnel for the design, development, construction, fabrication, assembly, integration, testing and commissioning of the analog modules, Space Specific Engineering Task (SsET) systems and supporting facilities. The vendor shall also provide personnel for mission control, crew and ground support, mission operations, safety, maintenance and documentation, commensurate with the scope and schedule approved by HSFC.

8. RESPONSIBILITY

The responsibilities of vendor and HSFC are listed in following subsections:

8a. Responsibility of vendor:

a. Establish the Mission ANTARIKSH facility at the site identified/approved by HSFC. This includes the simulator modules, the Mission Control Centre and the associated support infrastructure for Human-in-the-Loop (HITL) and Hardware-in-the-Loop (HIL) analog simulations.

b. Carry out the design, development, construction, procurement, fabrication, assembly, installation, integration, testing and commissioning of the facility and its systems in accordance with the requirements and specifications provided by HSFC. The vendor may engage sub-contractors to support execution of these activities; however, the vendor shall retain full responsibility for the design, construction, quality, integration and timely completion of all work, including work performed by sub-contractors.

c. Make the necessary arrangements for the civil, electrical, HVAC, plumbing, fire safety (as per Indian Norms) and other utility infrastructure required.

d. Procure the capital equipment/minor equipment, tools, jigs and fixtures needed for realization, testing and operation of the facility.

e. Develop, integrate and maintain the in-house critical subsystems, including IoT frameworks, sensor arrays, telemetry modules and mission control software, required for the conduct of analog missions.

f. Calibration and maintenance/servicing of the capital equipment, sensors and instrumentation.

g. Carry out subsystem testing, integrated testing, Factory Acceptance Tests (FAT) and Site Acceptance Tests (SAT) as per the test procedures approved by HSFC, while following all Quality Assurance (QA) guidelines.

h. Support the conduct of the specified analog mission campaigns. This includes deployment of technical and ground crew manpower, mission control operations, crew support, data recording and post-mission reporting.

i. Carry out inter-mission maintenance, servicing, reconfiguration and incorporation of modifications approved by HSFC.

j. Prepare, maintain and supply necessary documentation of all activities meeting quality standards, including design documents, test reports, mission logs and operation and maintenance manuals.

k. Establish a quality management system limited to the facility build-up, covering design, development, construction, fabrication, assembly, integration, testing and commissioning. The system shall include online quality control and monitoring, including online assessment during the realisation period, and non-conformance (NC) reporting and management.

l. Employ sufficient skilled manpower. Any replacement of trained personnel needs to be trained by the vendor, and the vendor shall ensure relevant certification by HSFC, if needed.

m. Establish suitable safety practices for crew/personnel safety, facility safety and hardware safety, including emergency egress and medical contingency support, throughout the design, development, deployment and conduct phases of the Mission.

n. Maintain an asset register for all the equipment procured by the vendor, as specified by HSFC.

o. Maintain a register with calibration details for all equipment.

p. Carry out quality control (QC) audits of all design deliverables and associated documentation to verify their completeness, accuracy and compliance with the requirements and specifications approved by HSFC. Maintain records of audit findings and the closure of corrective actions.

q. Ensure confidentiality and controlled handling of all mission data, telemetry, crew data and documents provided by or generated for HSFC.

r. Handle, pack, transport and deliver the identified deliverables, and hand over the identified Mission ANTARIKSH systems at contract completion.

s. Complete each work order for the specified scope within the indicated timeframe.

t. Perform all work strictly in accordance with the acceptance specifications of HSFC.

8b. Responsibilities of HSFC/ISRO:

a. HSFC will have a steering and monitoring committee to monitor the progress of the facility build-up and the subsequent conduct of mission campaigns.

b. Provide mission objectives, functional and operational requirements, reference configurations, interface data and mission procedures.

c. Review and approve designs, drawings, integration plans and test procedures.

d. Define mission profiles, campaign schedules, crew requirements and simulation scenarios.

e. Inspect and certify the facility established by the vendor, and witness and accept the FAT/SAT.

f. Provide technical direction and coordination of HSFC mission activities.

g. Review mission data, test results and reports submitted by the vendor.

h. Liaise with the vendor throughout the contract period.

i. Approve modifications and accept the identified deliverables.

j. In the event of any major change involving additions to or deletions from the agreed configuration prior to contract, HSFC and the vendor shall review the resulting financial implications and mutually agree on the appropriate course of action.

k. Any additional financial requirements arising **during execution** shall be evaluated and decided upon by the HSFC committee. Any resulting financial commitment shall be subject to mutual agreement between HSFC and the vendor.

9. TECHNICAL EVALUATION MATRIX

The technical evaluation matrix is prepared considering the expertise available with respect to conduct of analog missions in diverse terrains, availability of validated analog habitat infrastructure, access to fabrication facilities and in-house subsystem development capability, and financial soundness of the bidding entity. As per the scope of the EoI, vendor / consortium of industries (Form K) are expected to carry out End-to-End Realization of Mission ANTARIKSH.

S. No.	Criteria	Marks	Response form vendor
1.	**Operational Track Record & Field Experience in Analog Missions**	**50**	**Form A, B, C** • Proof of conduct of analog missions (photographs, mission reports, log sheets, crew rosters). • Work order / MoU / certificate from client or collaborating agency for successful completion of the mission.
	a) Demonstration of design and fabrication capabilities, expertise for conduct of analog operations - Specialization in design of crew modules, orbital habitats and extra-terrestrial living environments and their deployment, In-situ Resource Utilization (ISRU) for sustainable resource management, deployment capability for versatile pods, capable of integrating habitat and plant production systems. **(15 marks Max)** Documented missions or high-fidelity simulations related to aerospace, space analog or extreme environment operations. Criteria: More than 08 missions (15 marks)		

	06 to 08 missions (12 marks) 05 missions (9 marks) Less than 05 missions (6 marks)		
	b) Geographic and terrain versatility (10 marks Max) Proven field deployment experience in any one or both of: Extreme Low-temperature cold desert terrain (5 marks) Hyper-arid, high-saline desert terrain (5 marks)		
	c) International exposure (10 marks) Verified track record of missions on an international scale within the last one (01) year prior to the date of issue of this EoI. This includes collaborative ground crew operations, data-sharing or joint exercises for Analog Astronauts with recognized international analog facilities or global space research entities within India.		
	d) Cumulative simulation experience (15 marks Max) Active, documented analog mission simulation operations (crew changeover allowable). Criteria: More than 60 days (15 marks) 46 to 60 days (12 marks) 30 to 45 days (9 marks) Less than 30 days (6 marks)		

	Remarks: Minimum qualifying marks: 25 out of 50. Minimum five (05) missions, deployment atleast in one of the terrains and 30+ days of cumulative simulation are mandatory.		
2.	**Infrastructure Capabilities**	**40**	**Form D** Photographic evidence to be provided as part of bid submission. The evidence provided as part of the bid will be verified at the vendor premises, if required.
	a) Validated infrastructure (20 marks) Deployed/Completed construction, fully operational and independently validated/certified Space/Analog Habitat facility with Human-in-the-Loop, under the IGSA (International Guidelines for Space Analogs) standard Adherence Matrix.		Validation /certification report and IGSA Adherence Matrix.
	b) Integrated fabrication facility (5 marks) The vendor shall have a fabrication and manufacturing facility, either owned or accessible through a documented partnership, lease, available-to-use arrangement or collaboration. The arrangement shall provide access to the machinery, equipment, personnel and capacity required for Mission ANTARIKSH throughout the relevant execution period.		List of machinery/equipment with photographs, together with proof of ownership or the applicable partnership, lease, access or collaboration agreement. The proposed facility shall be available for HSFC verification.

	c) Self-reliance (10 marks Max) Proprietary, in-house development capability for critical subsystems: IoT frameworks (2.5 marks) Specialized sensor arrays (2.5 marks) Telemetry modules (2.5 marks) Mission control software (2.5 marks)		Documentary proof of in-house development / IP ownership and deployment in missions.
	d) Documented analog capability (5 marks) Three (03) different analog infrastructures*, out of which: Two (02) should have already been completed and deployed with human subjects (04 marks) One (01) can be under development. (01 mark) ***Analog Infrastructure:** A Facility/Setup Being Capable of simulating Human in the Loop and Hardware in the Loop simulations as a part of human spaceflight mission simulation phases from launch to splash down or any one particular phase of Human Spaceflight mission especially orbital phase.		Documentary proof including sizes, location, development status and supporting photographic evidence.
	Remarks: Minimum qualifying marks: 20 out of 40. Criterion 2(a) is mandatory.		

3.	**Financial Soundness & Leadership Credibility:** Considering the financial magnitude of Mission ANTARIKSH, and to guarantee long-term financial viability, capitalization capability and risk mitigation for high-gestation space projects, at least one (01) Promoter / Founding Board Member of the bidding entity shall possess a verifiable turnover of ₹50 Crores or more from other business(es). **Remarks:** It is mandatory and qualifying marks - 10.	**10**	**Form H, I and J** • CA certificate of turnover of other business for FY 2024-25. • Proof of role/position of the Promoter as Director of the bidding entity. • Proof of Promoter role in the other business entity.
	TOTAL MARKS	**100**	
	Minimum marks to pass/qualify: 50 marks		

NOTE:

1. The EoI proposals from vendor / consortium of industries will be evaluated based on the compliance matrix (Form L) as given in this document.
2. Vendor should provide complete details and compliance to the technical specifications and requirements as per the EoI. Mere 'YES' as compliance is not acceptable for technical specifications. Incomplete details shall be considered as non-compliance and are liable for rejection.

10. ELIGIBILITY AND EVALUATION CRITERIA

A detailed list of the vendor qualification criteria is provided in the technical evaluation matrix. The interested vendor/consortium of industries shall produce necessary documentary evidence at the time of EoI submission to prove their capability to execute Mission ANTARIKSH. These responses will be evaluated and eligible vendors will be selected by HSFC based on the details provided.

- It is to be noted that only EoI responded vendors/consortium of industries are eligible to participate in the RFP.
- Vendor shall submit the compliance matrix with supporting documentary evidence as asked, without fail.
- In case of EoI with consortium, it shall clearly identify the lead of the consortium. Further correspondence will be entertained only with the lead vendor.

Eligibility Criteria:

a) The vendor responding to this EoI, or the lead vendor in the case of a consortium, shall be a Private Limited Company incorporated in India under the Companies Act, 1956 or the Companies Act, 2013, as applicable. A copy of the Certificate of Incorporation shall be submitted as documentary evidence.

b) The EoI responded vendor/consortium of industries should not have been blacklisted by any Central/State Government institution. A self-attested declaration to this effect must be submitted along with the Expression of Interest.

c) The EoI responded vendor/lead of consortium shall possess a pre-built, fully operational and independently validated/certified Space/Analog Habitat facility with Human-in-the-Loop under the IGSA standard Adherence Matrix.

d) The EoI responded vendor/consortium of industries shall have executed a minimum of five (05) documented analog missions or Analog simulations. These shall total a minimum of thirty (30) days of active simulation operations, with field deployments.

e) At least one (01) Promoter / Founding Board Member of the bidding entity shall possess a verifiable turnover of ₹50 Crores or more from other business(es), supported by a CA certificate for FY 2024-25.

Evaluation Process:

a) HSFC will have a technical evaluation committee (referred to as the Committee hereafter) to evaluate the responses received against the EoI.

b) The Committee shall also evaluate all supporting documents and documentary evidence. If the EoI responded vendor/consortium of industries does not submit the requisite supporting documents or documentary evidence, it may lead to rejection of the EoI proposal.

c) Each of the responses shall be evaluated to validate compliance according to the eligibility criteria, technical evaluation forms and the supporting documents specified in this document.

d) The decision of the Committee in the evaluation shall be FINAL. NO correspondence will be entertained outside the evaluation process of the Committee.

e) As part of evaluation of EoI proposals, an authorized team from HSFC will visit the vendor facilities with a prior notice to confirm the availability of facilities/infrastructure. The evaluation of vendors will be based on the response forms and verification of the same during the industry visit.

f) The Technical Evaluation Committee reserves the right to reject any or all proposals.

g) The technical proposal will be evaluated on the basis of the vendor's experience, its understanding of the scope of services, facility infrastructure, proposed methodology and work plan, and the financial strength of the industry. EoI responded that vendor / consortium of industries require a minimum technical score of 50 out of 100 as per the technical evaluation matrix, along with fulfilment of all mandatory criteria. Only those responses are declared as qualified for further evaluation. Responses securing less than 50 marks shall be rejected.

A Request for Proposal (RFP) will be issued to the short-listed (i.e. qualified) EoI responded vendors/consortium of industries from this EoI. They will be asked to submit their detailed technical proposal and price (Two-part bid).

11. RESPONSE FORMS

Form – A: General details of the industry

S. No.	Component	Details
1	Name of the Industry	
2	Year of Establishment	
3	Core capabilities of the industry	Type brief profile of the industry, not more than 2 pages (any other report/s can be provided as Annexure)
4	Head office location and address with contact number & email id	
5	Local address in Bangalore, if any, with contact number & email id	
6	Addresses of analog habitat facility, fabrication facility and/or operational setup in India (highlight the address where HSFC representative will visit for audit)	1. 2. 3.
7	Corporate website URL	

Form – B: Experience in Space Analog / Aerospace / Extreme Environment Missions

Provide the details of each analog mission / high-fidelity simulation executed in the specified format below (one table per mission).

Name of the Mission / Simulation	
Client / Collaborating Agency (with address)	
Type of Mission*	
Mission Location & Terrain Type**	
Mission Dates (From – To) & Duration (in days)	
Crew Size & Crew Changeover (if any)	
Human-in-the-Loop (Yes/No)	
Scope of Work / Role of the Bidder	
Work Order / MoU Details	
Present Status of the Mission	
Any part of the above work subcontracted to other industries? If yes, provide the details	
Name of the sub-contractors	Description of activity outsourced to sub-contractors

*Indicate whether it is a space analog / aerospace / extreme environment / high-fidelity simulation mission.
**Mention whether the terrain is low-temperature cold desert, hyper-arid high-saline desert, or any other terrain.

Use above table format for each mission listed for the EoI

Summary of Missions:

S. No.	Name of Mission	Terrain Type	Duration (days)	National / International
1				
2				
3				
4				
5				
	Cumulative Simulation Days			

Note: Mission reports, log sheets, photographs and copies of work orders/MoUs are to be enclosed as annexure.

Form – C: International Exposure

Have you conducted missions on an international scale within the last one (01) year prior to the date of issue of this EoI, in collaboration with recognized international analog facilities or global space research entities? If yes, provide the details in the given format.

S. No.	Name of the International Facility / Entity with Address	Country	Name of the Mission / Exercise and Dates	Nature of Collaboration*	Responsibility of the Bidder

*Indicate whether collaborative ground crew operations, data-sharing, or joint exercise for Analog Astronauts.

Note: Copies of MoU/collaboration agreements, joint mission reports or letters from the international partner are to be enclosed as annexure.

Form - D: Infrastructure Capabilities

Part 1: List of major infrastructure presently available to carry out Mission ANTARIKSH activities

S. No.	Name of Infrastructure / Facility	Year of Commissioning	Brief Specifications (including size & location)	Validation / Certification Details	Utilization Status (Operational Status)
1	Validated Space/Analog Habitat facility with Human-in-the-Loop (IGSA standard Adherence Matrix)				
2	Fabrication and manufacturing facility (owned, partnered, leased, available to use or accessed through collaboration) (Co-Owned / Collaborated / Partnered)				
3	Analog Infrastructure – 1				
4	Analog Infrastructure – 2				
5	Analog Infrastructure – 3				Under Development

Part 2: In-house development capability for critical subsystems

S. No.	Subsystem	Developed In-house (Yes/No)	Brief Description	IP / Ownership Proof	Missions in which Deployed
1	IoT frameworks				
2	Specialized sensor arrays				

3	Telemetry modules				
4	Mission control software				

Note: The IGSA Adherence Matrix, validation/certification report and photographic evidence are to be enclosed as annexure.

Form – H: Financial Details

Part 1: Financial information of Industry / Lead Industry in case of consortium

Heads	FY 2024-25	FY 2025-26
Revenue from operations (in INR Crores)		
EBTD (Earnings Before Tax and Depreciation)		
% of Revenue from Aerospace / Space Analog Segment		
Net Worth		
Share Capital		
% of shareholding by Indian Investor		
% of shareholding by Foreign Investor		

Part 2: Promoter Capitalization & Credibility

S. No.	Particulars	Details
1	Name of the Promoter / Founding Board Member	
2	Designation / Role in the bidding entity	
3	DIN (Director Identification Number)	
4	Name and address of the other business entity	
5	CIN / Registration Number of the other business entity	
6	Role of the Promoter in the other business entity	
7	Turnover of the other business entity for FY 2024-25 (in INR Crores)	
8	CA Certificate Reference No. & Date	

Form – I: Provide the shareholding pattern of the industry in the given format

S. No.	Category of Shareholder	No. of Shareholders	% of Shareholding
	Total		**100%**

Form – J: Mandatory supporting documents

I. Auditor certified statements for the last two years, FY 2024-25 and FY 2025-26, as Annexure (please provide the profit and loss statement and balance sheet).

II. Unaudited statements certified by the company auditors for the latest year 2025-26 (in case the auditor certified statement for 2025-26 is not available).

III. Certification by the company auditors supporting the revenue break-up.

IV. Certificate from Chartered Accountant (CA) for FY 2024-25 certifying a turnover of ₹50 Crores or more of the other business entity of the Promoter / Founding Board Member.

V. Proof of role/position of the Promoter as Director of the bidding entity (MCA records / Board resolution).

VI. Proof of the Promoter role in the other business entity.

VII. Validation/certification report of the Space/Analog Habitat facility along with the IGSA standard Adherence Matrix.

Form – K: Consortium

In order to meet the scope of this contract, has the industry formed a consortium or equivalent association with any other Indian agency? Yes/No

If yes, provide the following details of the consortium partners. The agreement copy is to be provided.

Parameter	**Industry 1**	**Industry 2**	**Industry 3**	**Industry 4**
Name & address				
Brief description of major work executed for ISRO Centres or any other space industry (mention any one)				
Date of Consortium Agreement				
Technology association of partner				
Infrastructure association of partner				
Manpower / Workforce support of partner				
Financial support of partner				

Form - L: Acceptance of Compliance Matrix - to be filled by industry

Section	Description	Compliance (Yes/No)	Remarks
1	Acceptance of Introduction		
2	Acceptance to EoI Objectives		
3	Acceptance to Procedure for Finalizing Contract		
4	Acceptance of Scope of Work		
5	Acceptance of Transfer of Technology		
6	Acceptance of Quantum of Work		
7	Acceptance to Resources		
8	Acceptance to Responsibility		
9	Acceptance to Technical Evaluation Matrix		
10	Acceptance to Eligibility and Evaluation Criteria		
11	EoI Response Forms duly filled		

Organisation shall sign a Non-Disclosure Agreement (NDA) with HSFC before the Pre-EoI meeting and if the purchase order is awarded.

Appendix

The vendor shall design, develop, construct, procure, install, integrate, test and commission the following terrestrial simulation facilities and systems, and provide the operation, maintenance and technical support required for the specified mission campaigns. Detailed configurations, quantities, performance criteria and acceptance requirements shall be defined by HSFC in the RFP and approved design documents.

Closed Roof Facility (CRF):

A. External Structure

The Closed Roof Facility shall accommodate all analog infrastructure modules, supporting infrastructure and associated engineering systems within a common integrated facility.

ID	Requirement	Minimum Specification
CRF - 01	Facility Type	Rectangular shaped existing/leased/rented/owned industrial warehouse or hangar structure with heavy duty concrete floor
CRF - 02	Built-Up Area	Minimum 3,600 m² internal clear all four sides area.
CRF - 03	Clear Height	Minimum 15 m from finished floor to underside of ventilation systems such as fans/exhaust fans placed beneath the primary structural trusses.
CRF - 04	Analog Infrastructure clearance area inside of CRF facility	Minimum 850 m² (refer the drawing for layout)
CRF - 05	Doors Entry/Exit (to be discussed)	A total of: 1. 03 Main Heavy Vehicle entry/exits and 2. main exits with motorized rolling shutter, minimum 6 m × 6 m.
CRF - 06	Windows	Glass windows if present within the facility, should be covered entirely as complete blackout conditions are required for the conduct of mission simulations
CRF - 07	Internal Logistics	Minimum 4 m clear peripheral heavy-vehicle and maintenance corridor.
CRF - 08	Parking	Parking for 10 cars and 20 two-wheelers, within site or 200 m walking distance.

CRF - 09	Material Handling	Provision for forklift movement, heavy lifting, equipment staging and crane interfaces.
CRF - 10	Reconfiguration	Modular and reversible construction enabling future changes and relocation.

B. Internal Structure - Analog Infrastructure Modules

The Closed room facility shall accommodate the following analog infrastructure modules and associated structural support systems, including the internal scenarios comprising of the hardware elements and internal architecture of Gaganyaan and BAS

ID	Module	Basic Requirement
AIM - 01	Gaganyaan Crew Module (CM)	1:1-scale ground simulation module (3m Ø x 3m height) with compatible crew ingress ladder.
AIM - 02	Gaganyaan Service Module (SM)	Scaled-down, visually representative mock-up (2.75m Ø x 1.8m height) integrated with the CM simulation setup.
AIM - 03	BAS Airlock Module (BAM)	1:1-scale terrestrial simulation module (4m x 4m x 4m).
AIM - 04	BAS Lab Module (BLM)	1:1-scale laboratory module with adapter extension (4m Ø x 8.6m length).
AIM - 05	BAS Utility Module (BUM)	1:1-scale laboratory module with adapter extension (4m Ø x 8m length).
AIM - 06	BAS Crew Support Module (BCM)	Cuboidal crew module (12.2m x 2.45m x 2.9m) accommodating four Astronauts.
AIM - 07	BAS Node / Connector Module (BNM)	A node (2.5m Ø x 3.4m length) connecting BAS Lab Module, BAS Crew Support Module, BAS Utility Module
AIM - 08	Neutral Buoyancy Simulator (NBL/NBS)	A temporary/semi-permanent aquatic simulator (10m x 10m x 5m - depth) with submerged static BAS module mock-up. A dedicated water supply, filtration, circulation and drainage provisions to be made. (refer the diagram for more details & Infrastructure requirement section)

AIM - 09	BAS static module for NBL operations (BNM)	3:4 - scale static BAS module limited to only external structure.
AIM - 10	Supporting Structural Truss System (SSTS)	A MS supporting structural Frame to support the BAS modules.

C. Internal Structure - Supporting Infrastructure

The Closed Roof facility shall provide the following support facilities necessary for crew accommodation, mission operations, medical support and facility maintenance.

ID	Facility	Area	Requirement
SI - 01	Mission Control Centre (MCC)	45 m²	Mission monitoring, operator stations, communication and telemetry infrastructure (7m x 6.5m).
SI - 02	Astronaut Isolation / Crew Quarters	50 m²	Accommodation for 04 crew, (7m x 7.2m) with sleeping pods, toilets, showers, galley, lounge and tabletop trainer.
SI - 03	Ground Crew Accommodation	100 m²	Accommodation for 10 personnel (10m x 10m) with sleeping areas, lockers and segregated sanitation facilities
SI - 04	Medical Room	50 m²	Medical assessment, emergency stabilization and treatment facilities (7m x 7.2m).
SI - 05	Visitor & Media Area	As required	Controlled visitor reception and observation facilities
SI - 06	Mechanical / Machine Room	100 m²	Generator, mechanical services, maintenance and equipment storage (10m x 10m).
SI - 07	Pump Room	50 m²	General water supply, NBL water services and related pumping equipment (5m x 10m).

Space Specific Engineering Tasks (SsET):

Provide the following fifteen (15) principal SsET systems, with the mounting, power, controls, communications, safety provisions and facility/module interfaces required for integrated mission operations.

SsET 01 IVA and EVA Simulation Suits:
Provide simulation suits reproducing the selected fit, mobility, ergonomic and operational characteristics of intra-vehicular and extra-vehicular suits, with applicable cooling, communications, monitoring and suspension interfaces.

SsET 02 Upper Torso Compression System:
Provide controlled upper-torso compression hardware for representative launch, ascent, abort and re-entry loading cues, integrated with the crew seat and coordinated simulation controls

SsET 03 Vibro-Acoustic Simulation System:
Provide crew-seat motion/vibration and acoustic simulation hardware to reproduce controlled cues associated with launch, ascent, abort, re-entry, descent and splashdown, synchronised with the mission sequence.

SsET 04 Docking Simulation Kit:
Provide joysticks, crew-console interfaces and computing/control hardware for rendezvous, proximity operations, docking and berthing simulations, with real-time visual feedback and interfaces to the Mechanical Docking Platform

SsET 05 Docking Adaptors and Hatches:
Provide representative operable docking adaptors and hatch assemblies for crew transfer, opening/closing, latching/unlatching and simulated capture procedures at the designated module interfaces.

SsET 05.1 Mechanical Docking Platform:
Provide the associated controlled-motion platform and payload-module interface for physical approach, alignment, contact, capture and undocking simulation, integrated with SsET 04 and SsET 05.

SsET 06 Internal Gravity Offload System:
Provide body-weight offloading and movement-tracking hardware for simulated microgravity translation, equipment handling and hatch operations within the BAS habitation/laboratory module, with suitable harnesses and emergency recovery provisions.

SsET 07 Bharat Arm:
Provide manually controlled and automated robotic-arm configurations for payload positioning, alignment and representative berthing operations, with compatible end-effectors, operator controls and protective interlocks.

SsET 08 Non Precision Planar Air Bearing Floor and Miniature Robotic Arm:
Provide an air-bearing table and miniature robotic-arm system for low-friction planar movement of spacecraft/module models, supporting proximity, docking and berthing simulation and control-algorithm evaluation.

SsET 09 Space Motion Sickness Induction Chair:
Provide a controlled yaw-rotation chair for vestibular adaptation and sensorimotor studies, with occupant restraints, monitoring interfaces, operator supervision and emergency stop provisions.

SsET 10 Extra Vehicular Activity Mobility Simulation Systems:

Provide Skylift and suspended EVA configurations for maintenance familiarisation, external task positioning and gravity-offloaded translation, with compatible suit interfaces, restraints and recovery arrangements.

SsET 11 Deployable Solar Array:
Provide electromechanical deployment/stowage demonstrators for the Gaganyaan service module and representative static BAS solar-array assemblies for EVA familiarisation, inspection and maintenance rehearsal.

SsET 12 Camera System:
Provide fixed and portable camera systems for crew/activity observation, operations monitoring, inspection and mission recording, integrated with the designated module locations and Mission Control Centre.

SsET 13 Orbital Projection Screen:
Provide an integrated visual display system presenting synchronised orbital Earth views, space backgrounds and day/night transitions for module viewports and EVA simulation activities.

SsET 14 Health and Fitness System:
Provide the agreed exercise, physiological countermeasure and crew-monitoring hardware for analog human-performance studies. The final equipment selection, monitoring scope and operating protocols shall be confirmed by HSFC in the RFP.

SsET 15 Virtual Reality Systems: Provide virtual-reality equipment and associated simulation interfaces for the mission training scenarios specified by HSFC. The final scenarios, hardware configuration and integration scope shall be confirmed by HSFC in the RFP.

End of Document