भारत सरकार / Government of India
अंतरिक्ष विभाग / Department of Space
यू.आर. राव उपग्रह केंद्र / U.R.RAO SATELLITE CENTRE
एच.ए.एल. एयरपोर्ट रोड, विमानापुरा डाक / HAL Airport Road, Vimanapura Post,
बेंगलूरु/ BENGALURU – 560 017

Ref No.: **URSC/PUR/ISIP 2026069540/EoI/2026-27** **11.11.2026**

एक्स-रे शील्डिंग सिस्टम के विकास के लिए इच्छा की अभिव्यक्ति (ईओआई) के लिए निमंत्रण
Invitation for Expression of Interest [EOI] for Realisation of X Ray Shielding System

भारतीय अंतरिक्ष अनुसंधान संगठन [इसरो] के अंतर्गत, अंतरिक्ष विभाग, भारत सरकार की 'यू.आर. राव उपग्रह केंद्र [यूआरएससी] (जिसे पहले इसरो उपग्रह केंद्र के नाम से जाना जाता था), सभी भारतीय निर्मित उपग्रहों के डिजाइन, विकास, निर्माण और परीक्षण के लिए जिम्मेदार है। यूआरएससी वर्तमान में उन औद्योगिक भागीदारों को आमंत्रित कर रहा है जो एक्स-रे शील्डिंग सिस्टम के निर्माण में सहयोग कर सकें

U.R. Rao Satellite Centre [URSC] (Formerly known as ISRO Satellite Centre), of Indian Space Research Organization [ISRO] under Department of Space, Government of India is responsible for Design, Development, Fabrication and Testing of all Indian made Satellites. URSC is currently inviting Industry Partners to carry out the **realisation of an X Ray Shielding System.**

यू. आर. राव उपग्रह केंद्र (यूआरएससी), बेंगलूरु, एक मौजूदा स्वच्छ कक्ष सुविधा के भीतर, एक विशेष एक्स-रे रेडियोग्राफी कक्ष स्थापित करने का इरादा रखता है। इसका उद्देश्य पोर्टेबल एक्स-रे मशीन का उपयोग करके अंतरिक्ष यान के प्लंब लाइन वेल्ड और विद्युत कनेक्टर्स का रेडियोग्राफिक निरीक्षण करना है। प्रस्तावित कक्ष को एक मौजूदा उपग्रह एकीकरण स्वच्छ कक्ष के अंदर स्थापित करने की योजना है, जिससे चल रहे स्वच्छ कक्ष के संचालन और स्वच्छता आवश्यकताओं पर कोई प्रभाव न पड़े। सुरक्षात्मक डिज़ाइन इस प्रकार होना चाहिए कि यह लागू विकिरण सुरक्षा आवश्यकताओं का अनुपालन सुनिश्चित करे, साथ ही लैमिनार वायु प्रवाह की स्थितियों को भी बनाए रखे, जो संवेदनशील अंतरिक्ष यान हार्डवेयर के प्रसंस्करण और भंडारण के लिए आवश्यक हैं।

U R Rao Satellite Centre (URSC), Bengaluru intends to establish a dedicated X-Ray radiography enclosure within an existing clean room facility for carrying out radiographic inspection of spacecraft plumb line welds and electrical connectors using a portable X Ray machine. The proposed enclosure is planned to be installed inside an existing satellite integration clean room without affecting ongoing clean room operation and cleanliness requirements. The shielding design has to be carried out to ensure compliance with applicable radiation safety requirements while maintaining the laminar airflow conditions essential for processing and storage of sensitive spacecraft hardware.

यह प्रस्ताव भारतीय उद्योगों से केवल उन प्रस्तावों को आमंत्रित करने के लिए है जिनके पास एक्स-रे शील्डिंग सिस्टम के डिजाइन, विकास और कार्यान्वयन के लिए आवश्यक तकनीकी बुनियादी ढांचा और क्षमता है।
This proposal is to invite Expression of Interest exclusively from Indian industries having technical infrastructure and capability to execute the **design, development and realisation of the X Ray Shielding System.**

ईओआई (EOI) के दस्तावेज़ हमारे वेबसाइट www.isro.gov.in से डाउनलोड किए जा सकते हैं।
EOI documents can be downloaded from our website www.isro.gov.in

ईओआई (इच्छा की अभिव्यक्ति) का मूल्यांकन बोली लगाने वाले की अनुभव, सेवाओं के दायरे की उसकी समझ, अवसंरचना, प्रस्तावित पद्धति और कार्य योजना, कुशल कार्यबल और उद्योग की वित्तीय स्थिति के आधार पर किया जाएगा।
The EOI will be evaluated on the basis of bidder's experience, its understanding of scope of services, facility infrastructure, proposed methodology and work plan, skilled manpower and the financial strength of the industry.

यदि आवश्यकता हो तो यू आर एस सी (URSC) के पास ईओआई (EOI) की प्रक्रिया को रद्द करने या फिर से शुरू करने का, या अतिरिक्त जानकारी/विवरण प्राप्त करने का अधिकार है।
URSC reserves the right to cancel/re-issue the process of EOI if the necessity so arises or to seek further information/details.

यदि किसी कंपनी/फर्म में भ्रष्टाचार या धोखाधड़ी की कोई गतिविधि पाई जाती है, तो उसे निविदा प्रक्रिया में भाग लेने से रोका जाएगा और उसकी इच्छा की अभिव्यक्ति (ईओआई) दस्तावेज 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.

इसके साथ ही, "इच्छा की अभिव्यक्ति" (एक्सप्रेशन ऑफ इंटरेस्ट) जमा करने वाले आपूर्तिकर्ताओं/फर्मों को निम्नलिखित जानकारी भी विस्तृत रूप से प्रदान करनी चाहिए:
Along with "Expression of Interest" Suppliers/ Firm[s]should furnish the following information also in detail:

1. कंपनियों के पंजीकृत पते, साथ ही फोन, फैक्स, ईमेल, वेबसाइट आदि की जानकारी।
   Registered address of the Companies with Phone, Fax, Email, Web etc.

2. कंपनी/संगठन की स्थिति (निजी स्वामित्व/साझेदारी/निजी लिमिटेड/सार्वजनिक लिमिटेड, आदि) के साथ-साथ मालिक, भागीदारों, निदेशक मंडल के सदस्यों, आदि के नाम और पते।
   Company/Organization Status (Proprietary/Partnership/Private/Public Ltd. etc.) with Name and Address of Proprietor, Partners, Board of Directors, etc.

3. सहयोगी: (अ) भारतीय, (ब) विदेशी।
   Associates: (a) Indian (b) Foreign.

4. पिछले 3 वर्षों के दौरान प्रमुख ग्राहकों की सूची, जिसमें उनका पूरा पता और संपर्क व्यक्ति का विवरण शामिल हो।
   List of Major Customers during the last 3 Years with full address and their Contact Persons.

5. बुनियादी सुविधाओं (जैसे कि भवन, उपकरण, आदि) की जानकारी जो उपलब्ध हैं या जिनका स्वामित्व है।
   Details of Infrastructure Facilities owned / available.

6. कंपनी के प्रमुख शेयरधारकों के नाम और पते, साथ ही उनके स्वामित्व वाले शेयर पूंजी का प्रतिशत।
   Names and addresses of the major Shareholders of the Company and the percentage of their share capital.

7. पिछले तीन वित्तीय वर्षों के लिए पूंजी और कारोबार की जानकारी, साथ ही नवीनतम वार्षिक रिपोर्ट की प्रतिलिपि संलग्न करें।
   Capital and Turnover for the preceding 3 Financial Years with copy of latest Annual Report.

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

9. बैंकों के नाम और पते।
   Name and Address of Bankers.

10. वह व्यापार संघ जिससे उद्योग/उद्योगों का संबंध है।
    Trade Association to which Industry/ies belong to.

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

12. व्यवसाय का स्वरूप।
    Nature of Business

13. फर्म की बैंकों द्वारा जारी की गई वित्तीय क्षमता/दिवालियापन की स्थिति का प्रमाण पत्र।
    Solvency/Financial capacity of the Firm issued by their Bankers.

14. कोई अन्य जानकारी जो उद्योग/उद्योगों को प्रासंगिक लगती है।
    Any other information the Industry/ies consider relevant.

15. कंपनी/कंपनियों का विवरण, उनकी ताकत और कमजोरियों के क्षेत्रों को स्पष्ट रूप से दर्शाता है।
    The Profile of the Company/ies clearly bringing out the areas of Strength and Weaknesses.

16. ईओआई (EOI) में भाग लेने के लिए आवश्यक तकनीकी और संगठनात्मक क्षमता का स्वयं मूल्यांकन।
    Self-Assessment Technical and Organizational Competence to take part in the EOI.

17. इच्छा की अभिव्यक्ति में यथा उल्लिखित प्रतिक्रिया प्रपत्र।
    Response forms as mentioned in the EoI

ईओआई (इच्छा की अभिव्यक्ति) प्रतिक्रिया का समापन:
Completion of the EOI Response:

a. कंपनियों/फर्मों को सलाह दी जाती है कि वे ईओआई (EOI) दस्तावेजों में दिए गए सभी निर्देशों, नियमों और शर्तों, प्रपत्रों, आवश्यकताओं और अन्य जानकारी को ध्यानपूर्वक पढ़ें। ईओआई का जमा करना तभी मान्य माना जाएगा जब ईओआई दस्तावेजों का सावधानीपूर्वक अध्ययन और जांच की जाएगी, और इसके निहितार्थों को पूरी तरह से समझा जाएगा।
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 अभिव्यक्ति (ईओआई) का उत्तर सभी मामलों में पूर्ण और विस्तृत होना चाहिए। यदि ईओआई दस्तावेज़ में मांगी गई सभी जानकारी प्रदान नहीं की जाती है, या यदि प्रस्ताव ईओआई दस्तावेजों के सभी पहलुओं के अनुरूप नहीं है, तो यह कंपनी/फर्मों के जोखिम पर होगा और इसके परिणामस्वरूप दस्तावेज़ को 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. इच्छा की अभिव्यक्ति (ईओआई) के सभी पृष्ठों पर क्रमांक अंकित होना चाहिए और उन्हें अधिकृत हस्ताक्षरकर्ता द्वारा हस्ताक्षरित किया जाना चाहिए।
All the pages of the EOI submitted must be numbered and signed by the authorized signatory.

d. इच्छा की अभिव्यक्ति (ईओआई) से संबंधित किसी भी प्रकार की प्रचार गतिविधि सख्त रूप से प्रतिबंधित है, और यदि किसी एजेंसी द्वारा प्रचार के माध्यम से प्राप्त ईओआई जमा किया जाता है, तो उसे अस्वीकार किया जा सकता है।
Canvassing in connection with the EOI be strictly prohibited and such canvassed EOI submitted by the Agency are liable to be rejected.

"सभी उपरोक्त जानकारी के साथ "इच्छा की अभिव्यक्ति" निम्नलिखित पते पर भेजा जाना चाहिए, जिसमें उपरोक्त संदर्भ संख्या का उल्लेख किया गया हो, और यह नियत तिथि और समय तक प्राप्त होना 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.

वरिष्ठ प्रधान, क्रय तथ भंडार/Sr. Head, Purchase & Stores
यू. आर. राव उपग्रह केंद्र /U R Rao Satellite Centre,
एच.ए.एल. एयरपोर्ट मार्ग/HAL Airport Road,
विमानपुरा डाकघर, बेंगलूरु – 560 017/Vimanapura Post, Bengaluru – 560 017,
कर्नाटक, भारत/Karnataka, India

कृपया अपने प्रश्नों और स्पष्टीकरणों को "ईओआई"संख्या का उल्लेख करते हुए **pso_e@ursc.gov.in** ईमेल पते पर भेजें। "ईओआई" से संबंधित सभी प्रश्नों का उत्तर "प्री-ईओआई" बैठक में दिया जाएगा। "प्री-ईओआई" बैठक में भाग लेने के लिए अनुरोध **23** नवंबर**, 2026** को शाम **4:00** बजे (भारतीय मानक समय) तक ऊपर बताए गए ईमेल पते पर भेजे जाने चाहिए। हालांकि**, "**ईओआई" के लिए प्रतिक्रिया (हार्ड कॉपी) केवल ऊपर बताए गए डाक पते पर ही भेजी जानी चाहिए। ईमेल और फैक्स के माध्यम से भेजे गए कोटेशन स्वीकार नहीं किए जाएंगे। नियत तिथि और समय के बाद प्राप्त कोटेशन स्वीकार नहीं किए जाएंगे।

Please address your clarifications quoting the EOI number to E-mail: pso_e@ursc.gov.in. All queries related to EOI will be addressed in the Pre-EOI meeting. Request for participation in Pre-EoI meeting shall reach on or before 23-11-2026 16:00IST to the Email mentioned herein. However, response to EOI (hardcopy) shall be sent to above mentioned postal address only. **E-mail & Fax quotations are not acceptable. Quotation received after due date & time are not acceptable.**

ईओआई (EOI) का प्रकाशन/Publishing of EOI	:	13-11-2026	16:00HRS
स्पष्टीकरण जमा करने की अंतिम तिथि/ Last date of submission of clarification	:	23-11-2026	16:00HRS
ईओआई (इच्छा की अभिव्यक्ति) प्रक्रिया से पहले, संबंधित सुविधाओं का दौरा/ Visit to facilities as part of pre-EOI Meeting	:	30-11-2026	10:00HRS
ईओआई (इच्छा की अभिव्यक्ति) से पहले की बैठक (दूसरा तल, सम्मेलन कक्ष, एआईटी-1 भवन,आईसाईट)/ Pre-EOI meeting (at 2nd Floor Conference Hall, AIT-1 Building, ISITE)	:	01-12-2026	10:00HRS
ईओआई जमा करने की अंतिम तिथि/ Last date for submission of EOI	:	17-12-2026	13:00HRS
ईओआई (EOI) की शुरुआत की तारीख/ Opening date of EOI	:	18-12-2026	10:00HRS

नोट/Note:

1) ईओआई (EOI) से पहले की बैठक एआईटी-1 भवन के दूसरे तल पर स्थित सम्मेलन हॉल में आयोजित की जाएगी, जो आईएसआईटीई परिसर, यू.आर. राव उपग्रह केंद्र, बाहरी रिंग रोड, कार्तिक नगर बस स्टॉप, दोड्डनेक्कुंदी मैन रोड, मारतहल्ली, बेंगलुरु-560037 में स्थित है। Pre-EOI meeting Shall be conducted at 2nd Floor Conference, Hall, AIT-1 Building, ISITE, Campus, U.R. Rao Satellite Centre, Outer Ring Road, Kartik Nagar Bus Stop, Doddanekundi Main Road, Marathahalli, Bengaluru-560037.

2) "इच्छा की अभिव्यक्ति" (एक्सप्रेशन ऑफ इंटरेस्ट), जिसमें उपरोक्त सभी जानकारी शामिल हो, **17 दिसंबर, 2026 को दोपहर 13:00 बजे** (भारतीय मानक समय) तक, निम्नलिखित संदर्भ संख्या का उल्लेख करते हुए, अधोहस्ताक्षरो को पहुंचना चाहिए। यह प्रस्ताव प्रारंभिक "इच्छा की अभिव्यक्ति" योग्यता प्रक्रिया के रूप में शुरू किया गया है। यूआरएससी (URSC) के पास किसी भी "इच्छा की अभिव्यक्ति" को स्वीकार या अस्वीकार करने का अधिकार है, और इसके लिए किसी भी प्रकार का कारण देने की आवश्यकता नहीं होगी।
"Expression of Interest" with all the above information shall reach the undersigned, Quoting above Reference Number on or before **17-12-2026 13:00IST**. This proposal is initiated as a Pre-EOI Qualification. URSC reserves the right to accept or reject all or any such "Expression of Interest" without assigning any reasons what so ever.

[Sd]
वरिष्ठ प्रधान, क्रय व भंडार /Sr. Head, Purchase & Stores

Expression of Interest for realization of X-Ray Shielding System

1 Introduction

U R Rao Satellite Centre (URSC), Bengaluru proposes to establish a dedicated X-Ray radiography enclosure within an existing clean room facility for carrying out radiographic inspection of spacecraft plumb line welds and electrical connectors using a portable X Ray machine. The proposed enclosure is planned to be installed inside the existing satellite integration clean room without affecting ongoing clean room operation and cleanliness requirements. The shielding design has to be carried out to ensure compliance with applicable radiation safety requirements while maintaining the laminar airflow conditions essential for processing and storage of sensitive spacecraft hardware.

This document outlines the EOI methodology to shortlist interested vendors based on their technical proposal to meet the requirements for the X-Ray shielding system for final procurement.

2 Objective

The main objective of this EOI is to invite industry partners to propose a turnkey solution including design, material supply, fabrication, installation, testing, and final certification support, fully integrating with the existing structure and cleanroom environment at AIT-1 Extension, ISITE, URSC, Bangalore.

3 Procedure for Finalizing Contract



4 Radiation Shielding System Requirements

The vendor shall provide a solution for the following requirements. The solution shall include a preliminary design and installation plan and all necessary details to demonstrate that their proposals meets the requirements detailed below.

4.1 X-Ray Equipment

The system will be used with the following X-ray machines:

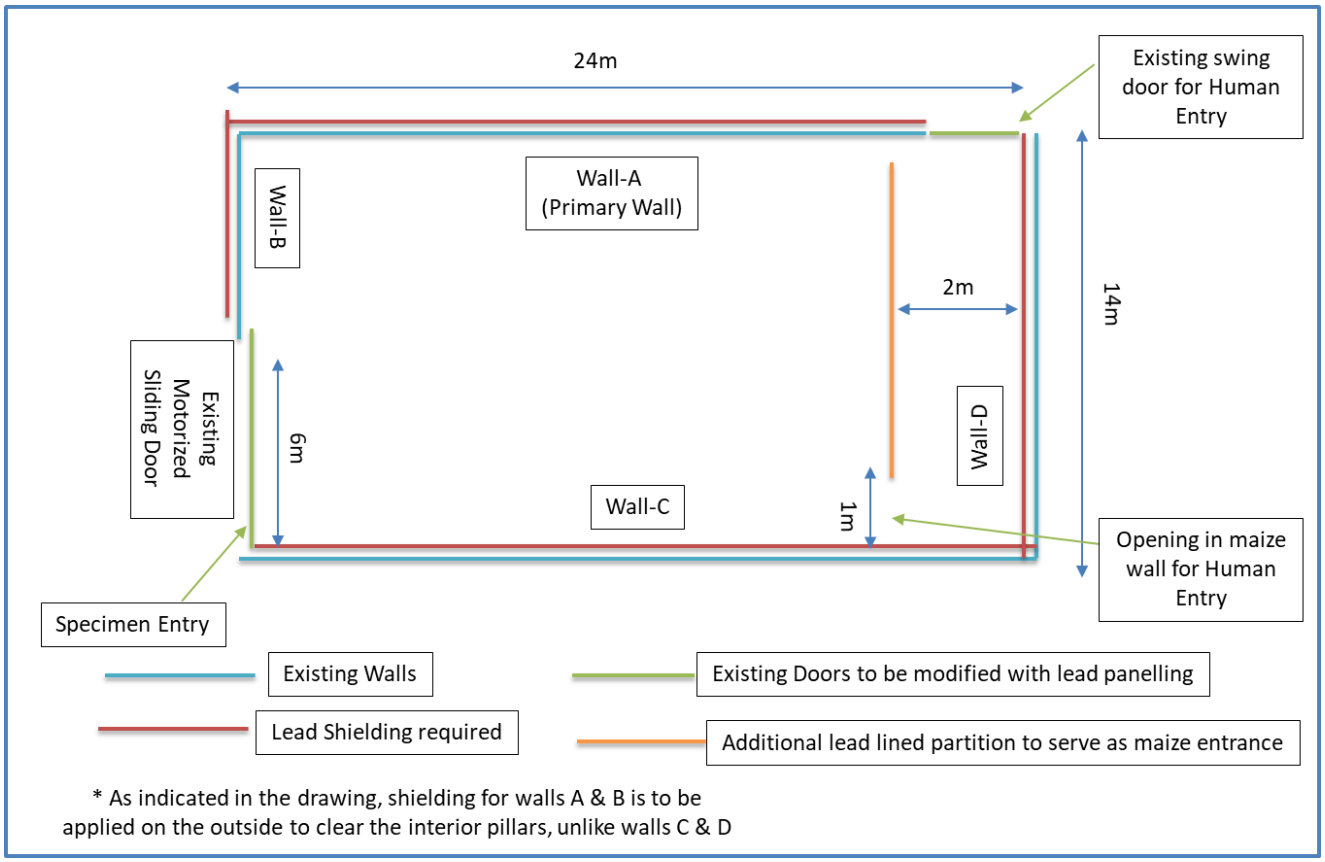
- Machine 1: Teledyne ICM 160, 160 KeV, 0.5 mA
- Machine 2: PEXRAY PXR 160, 160 keV, 1 mA

4.2 Proposed Shielding Arrangement

The shielding system is to be planned for an existing facility with the following details:

- Existing Room Size: 14 meters × 24 meters x 15 meters
- Shielding requirement: 14 meters × 24 meters, up to a height of 6 meters on all sides
- Open-top configuration (no roof) to preserve cleanroom laminar airflow. The area directly above is an unoccupied double height space containing only HVAC ductwork.
- Primary Wall (A): 12 mm lead thickness
- Secondary Walls (B, C, D, Maze Wall and Doors): 6 mm lead thickness
- The existing swing doors to be replaced with 6 mm thick lead lined swing doors
- The existing motorized sliding door to also be modified with 6 mm thick lead panelling

The shielding arrangement is proposed to be as per the image below. This schematic and wall thickness has also been approved by AERB.



4.3 Shielding System Construction

- **Structure**: A self-supporting metal structure must be installed on the floor, fixed close to the existing cleanroom wall, upon which shielding panels will be mounted.

- **Modularity**: The shielding system shall be modular, with all cutting, welding, and fabrication completed off-site.
- **On-Site Work**: Only mechanical assembly is permitted on-site (no welding/cutting).
- **Floor Loading:** The ISITE cleanroom floor is provided with 125 mm thick M25 grade RCC flooring and the vendors may design the system loading accordingly.
- **Gaps and Joints**: Shielding panels must have no visible gaps and must incorporate additional lead overlapping strips over the panel joints. The overlap width should be sufficient to eliminate all radiation leakage risks.
- **Integrity:** The system requires rigid structural integrity to prevent sagging or deformation over time. The supporting metal structure must be designed to withstand 1.5x the static load of the lead shielding to ensure zero creep.
- **Encapsulation:** The shielding panels must be fully encased and covered by protective panels such that the shielding material is neither visible nor in direct contact with the cleanroom environment or personnel.

4.4 Access Points and Vents

- **Motorized Sliding Door**: The existing sliding door should be modified to accommodate 6mm lead panels up to the height of 6 metre. The door should also be fitted with a safety interlock system (refer section 3.3).
- **Swing Doors**: Existing swing doors and frames must be replaced with lead-lined swing doors and frames.
- **Maze**: The design shall incorporate a restricted human access passageway (the maze) leading to the room in order to reduce the radiation dose near the entrance.
- **Vents and Panels**: Shielding around air vents and electrical panels must allow for ventilation/access while preventing radiation escape (15 No. of air vents, dimensions 1 m x 0.8 m). For all the air vents and electrical panels, the shielding shall be designed to ensure no direct line-of-sight for radiation.
- **Fastener Shielding:** Any mechanical fasteners (Bolts/Screws) used to fix the panels should be covered by appropriate lead overlap strips or discs of equivalent thickness.
- **Dust Management**: Suitable provision should be included to allow for accessing the area between the wall and the lead sheet to clear accumulated dust, or the system must be designed to not allow any accumulation of dust.

4.5 Safety and Monitoring

- **Warning Sign:** An illuminated warning sign is to be displayed at the entrance to the maze and inside the X-ray hall to indicate that X-Ray activity is being undertaken.
- **Safety Interlock:** The system shall include a fail-safe safety interlocking mechanism featuring a dedicated power socket for the X-ray machine. This socket must be electrically interlocked to the motorized sliding door, ensuring power is only supplied to the machine when the main sliding door is in the fully closed position. The power socket assembly shall incorporate a manual switch that simultaneously energizes the X-ray machine and activates the 'Radiation On' warning lights. The machine must remain de-energized if the warning lights are switched off or if the door is opened.
- **Radiation Zone Monitors:** Radiation zone monitors (4 nos) of reputed make (as per specifications given in Annexure) with warning alarms shall be positioned in safe areas on each wall outside the room so that any leakage radiation can be identified.

- **Radiation Survey meters:** 2 nos. of Handheld radiation survey meters of reputed make (as per specifications given in Annexure) are to be provided.

4.6 Cleanroom Requirements:

- **Prohibited Material:** Use of wood is strictly prohibited in shielding panels or structures due to cleanroom compliance.
- **Materials:** All materials must be corrosion-resistant and suitable for cleanroom environments.
- **Environment:** The environmental conditions within the X-Ray room (Temperature, Humidity, Particle Count) should not be affected by the shielding system. The roofless layout is considered to meet this requirement.
- **ESD flooring Protection:** The vendor's operations should not damage any ESD flooring in our facilities (Airlock, Hazard room etc.). If any damage occurs, the vendor has to bear the cost of repair.
- **Hermetic Encapsulation:** Lead panels must be fully encapsulated so that lead is not in direct contact with environment.
- **Sealants:** All joints and interfaces must use Low-VOC, non-outgassing, silicone-free cleanroom-grade sealants (if needed).
- **Surface Finish:** All surfaces must be spray painted and the final surface must be IPA-compatible (Isopropyl Alcohol). The finishing must be smooth and match the aesthetics of the facility.

4.7 Material & Quality Compliance:

- **Material Grade:** All lead used shall be ASTM B29 Refined Pure Lead with a minimum purity of 99.9%. The lead must be free of laminations, scale, and inclusions.
- **Density Requirement:** The lead must have a minimum density of 11.34 g/cm^3.
- **Zero-Negative Tolerance**: The specified thicknesses (12 mm for Wall A, 6 mm for others) are absolute minimums. A Zero-Negative Tolerance and a positive tolerance of up to +10 % is acceptable.

5 Design and Inspection Protocol

After release of the PO, the vendor is required to provide a detailed design report as per the following details:

5.1 Design Submission and Approval

- **Design Report**: The vendor shall to provide a detailed design report, which shall include:
  - Design philosophy
  - Detailed implementation and fabrication drawings
  - Demonstration of sag resistance (through simulation or empirical data)
  - Demonstrate that requirements of section 4 are met satisfactorily
  - Detailed on-site installation sequence
  - Detailed cleanroom safety precautions that will be followed
  - A complete, itemized requirement from customer at installation site (civil work/electrical/crane requirement). The fulfilment of this requirement is at

URSC's discretion and availability. Vendor to make necessary arrangements if URSC is not able to fulfil requirement.

- Detailed timeline for design, approvals, procurement, fabrication, installation and commissioning of the system.

- **Design Approval:** The design report will be evaluated by URSC committee. Any requested minor modifications by URSC committee are to be incorporated by the vendor.
- **Material Initiation:** After clearance by URSC committee, URSC engineer will provide written clearance for Material procurement.

5.2 Inspection Protocols and Acceptance Criteria: A number of mandatory stage-wise inspections will be carried out by URSC engineers before and during the fabrication, assembly and installation stages. Further clearance to proceed with the next stage of execution is contingent upon satisfactory written compliance.

- **Stage I: Raw Material Verification (Prior to Fabrication)**
  - **Inspection Requirement:** To verify the chemical purity and physical density of the lead material before it is processed or encased.
  - **Method of Inspection:** Review of NABL-certified Material Test Certificates (MTC) for chemical composition and batch-specific density test reports.
  - **Acceptance Criteria:** Lead purity must meet ASTM B29 standards (≥ 99.9%) and measured density must be ≥11.34 g/cm^3.
  - **Clearance:** Clearance for fabrication will be issued only after these documents are verified and approved by URSC engineer.
- **Stage II: Fabrication and Sub-Assembly Inspection (In-Process)**
  - **Inspection Requirement:** To verify the actual thickness of the lead sheets and ensure no internal defects exist before they are hermetically sealed supporting panel material.
  - **Method of Inspection:** Thickness measurement will be performed at five distinct points per panel (centre and four corners). Additionally, a visual audit of the internal "Weight Log" shall be conducted, where the mass of each raw lead sheet is recorded and compared against the theoretical weight required for the specified thickness.
  - **Acceptance Criteria:** The thickness must be a minimum of 12 mm for Wall A and 6 mm for Walls B, C, and D at every measured point. Any detection of internal voids, porosity, or thinning will result in immediate rejection of the panel.
  - **Clearance:** Written fabrication inspection clearance by URSC engineer.
- **Stage III: Dimensional Audit**
  - **Inspection Requirement:** To ensure the modular components are fabricated according to the approved engineering drawings and that the overall dimensions match the intended site layout.
  - **Method of Inspection:** Physical measurement of panel heights, widths, and structural frame alignments. Verification of the matching of modular interfaces (male/female joints) as per the assembly drawing.
  - **Acceptance Criteria**: All dimensions must be within the specified tolerances of the approved design drawings.
  - **Clearance:** Written assembly inspection clearance by URSC engineer.
- **Stage IV: Pre-Shipment Inspection (PSI) at Vendor's site**

- **Inspection Requirement**: To verify the shielding integrity and modular continuity of all fabricated shields, including wall surfaces and modular interfaces, prior to dispatch.
- **Method of Inspection: Comprehensive Leakage Test**: The vendor shall perform a trial assembly of critical modular interfaces and shielding sections using temporary factory supports. Verification shall be conducted via a surface scan of the panels and shielding interfaces using light-leak tests or low-energy radiation-source tests. This scan must confirm the continuity of the lead overlaps and the absence of any shielding voids or "thin spots" on the panel surfaces.
- **Acceptance Criteria:** Verification of modular integrity and zero radiation leakage paths across both the shielding surfaces and all modular interfaces. Successful audit of the physical assembly against approved design drawings.
- **Clearance:** Dispatch clearance is strictly contingent upon the successful completion of this modular and surface-level audit. Clearance will be provided by URSC's RSO.

- **Stage V: Final Acceptance Test (FAT) / Radiation Survey (On-Site)**
  - **Inspection Requirement:** Final verification of total shielding effectiveness and integrated safety functionality within the ISITE cleanroom environment.
  - **Method of Inspection:**
    1. Radiation Survey: A 100% continuous surface scan of all walls, joints, door seals, and ventilation baffles using a calibrated handheld survey meter. The X-ray source (Teledyne ICM CP160B) shall be operated at its maximum service parameters of 160 keV and 0.5 mA.
    2. Safety Interlock Test: Functional verification of the electrical safety interlock and 'Radiation On' switch once the motorized door is installed.
  - **Acceptance Criteria:** The maximum radiation leakage must not exceed 1 µSv/hr at any point on the wall surface. The X-ray power socket must remain de-energized if the door is open or if the warning lights are inactive. Final handover and certification support are dependent on meeting these criteria.
  - **Clearance:** Clearance shall be provided by URSC's RSO and engineer.

6 Technical Proposal Requirements

Parties are requested to include the following mandatory documentation in detail with their technical proposal for EOI submission:

- **System Concept:** Vendors shall provide conceptual/schematic layouts, standard modular structural concepts and material specifications demonstrating feasibility against all section 4 requirements. (Note: Detailed structural calculations and fabrication drawings are not needed at this stage. They will be required post release of PO).
- **Method Statement:** A method statement describing
  - The on-site installation sequence.
  - Tentative timeline for design, procurement, fabrication, installation and commissioning of the system.
- **Additional Documentation:**
  - Documentation related to previous implementation of industrial X-ray shielding for systems with 160keV and above. Additionally, a leakage test report

performed by an AERB approved third party for any of the above systems may be provided.

- Declaration of relevant ISO certifications.
- Registration with Defence PSU/Department of Space (if applicable).
- Details of manufacturing facilities and after-sales service support available in India.
- Filled table of Compliance and any other necessary evidence/documents in support of it.

7 Technical Proposal Evaluation:

- The vendors are asked to fill the Table of Compliance below and provide all possible evidence as requested. **Failure to provide the filled Table of Compliance will lead to rejection of the bid.**
- The compliance table's response and all the documents/evidence submitted by the vendor will be evaluated by the URSC committee.
- The committee will score the vendor's proposal against each criteria and a final score of a minimum of 131 points out of 200 are required for a vendor to be considered as qualified in the EOI.

Sl. No.	Description	Criteria/Compliance	Check for compliance (Yes/No)	Document/Evidence (separate sheet can be used for details)	Score
1.	Shielding Arrangement Requirements (Section 4.2)	The shielding system can be assembled as per the arrangement provided with the required lead thickness		Schematic concept for shielding layout to be submitted as evidence	**20**
2.	Shielding System Construction (Section 4.3)	The shielding system design meets the modularity and construction requirements		Schematic concept for system construction to be submitted as evidence	**20**
3.	Access point & Vent Requirements (Section 4.4)	All requirements can be incorporated in the shielding system design			**10**
4.	Safety and Monitoring Requirements (Section 4.5)	All requirements can be met in the shielding system			**10**
		Required specifications of Handheld radiation survey meters and Radiation zone monitors can be met		Provide brochure meeting specifications and OEM or Authorized supplier certificates for the products	**10**

5.	Cleanroom Requirements (Section 4.6)	All requirements will be met			**10**
6.	Material and Quality Requirements (Section 4.7)	All requirements will be met		Provide sample material test certificates for purity of lead	**10**
7.	Additional Documents	Previous implementation of industrial X-ray shielding for systems with 160keV and above		Provide evidence for execution of work	**50**
		Approval for safe handling and discharge of lead products		Provide suitable approval certificate from competent authority	**20**
		ISO9001 or AS9100D certifications		Provide certifications for lead chamber manufacturing	**10**
		Availability of a minimum of 10,000 sq. ft. floor space for machining, fabrication and testing of lead shield		Provide details of manufacturing facility for the fabrication of the system	**30**

8 Additional Notes:

- **Vendor Clarifications:** The vendor may visit our premises to understand the requirements further.
- **Vendor Facility Visit:** URSC reserves the right to visit the vendor's premises/facilities to ascertain the vendor's facilities and ability to execute the scope of work.
- **Commissioning Deadline:** The entire system design, fabrication, installation, and full commissioning must be completed in a maximum of 24 months from the date of Purchase Order (PO) release. Commissioning is accepted subject to written clearance of the FAT.
- **Standard Warranty:** The vendor shall provide a comprehensive standard warranty for a period of 12 months from the date of final acceptance with The X Ray Shielding system.
- **After-Sales Service:** The vendor must have an after-sales service support and a manufacturing facility in India. In case of a problem, the vendor must physically attend to the breakdown call and visit the site within a "committed period" (to be specified in the quotation).
- **Payment Terms:** The Vendor shall be paid 70% of the PO value upon the supply of all material required for the shielding system, with the remaining balance to be paid following the commissioning of the system. Additionally, an advance payment of 30% of

the PO value may be provided upon the vendor's request, subject to the submission of a Bank Guarantee.

- Items should be delivered to ISITE, Marathahalli, Bangalore.

Annexure

1. Specifications for Handheld radiation survey meters

Sl. No.	Specification	Description
1	Measurement range	0 µSv/Hr -1 Sv/Hr. Accuracy: ±15%.
2	Calibration certificate	Supplier shall furnish the calibration certificate and warranty certificate for survey meter
3	Carrying case	Party shall supply carrying case for Radiation Survey Meter.

2. Specifications for radiation zone monitors

Sl. No.	Specification	Description
1	Measurement range	0.1 µSv/Hr -1 Sv/Hr
2	Radiation monitoring	Continuous monitoring of X-Ray radiation level
3	Calibration certificate	Supplier shall furnish the calibration certificate and warranty certificate for zone monitor
4	Warning light	Built-in red blinking light with audible siren

END OF RFP