



भारत सरकार अंतरिक्ष विभाग
Government of India Department of Space
यू.आर. राव उपग्रह केन्द्र (यू.आर.एस.सी.)
U R Rao Satellite Centre (URSC)
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भारत India



URSC/Eoi/B/01/2026-27

13-07-2026

भारत के राष्ट्रपति की ओर से व. प्रधान, क्रय एवं भंडार, यू.आर. राव उपग्रह केन्द्र (यू.आर.एस.सी.) निम्नलिखित के लिए ईओआई आमंत्रित करते हैं। On behalf of the President of India, Sr. Head, Purchase & Stores, U R Rao Satellite Centre [URSC] invites EOI for the following.

**“अंतरिक्ष AIT क्रियाकलापों के क्रियान्वयन”
“Execution of spacecraft AIT activities”**

ई ओ आई का मूल्यांकन बोलीकर्ताओं के अनुभव, कार्यक्षेत्र की जानकारी, सुविधा अवसंरचना, प्रस्तावित कार्यप्रणाली और कार्य योजना, कुशल जनशक्ति और उद्योग की वित्तीय ताकत 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.

यूआरएससी आवश्यकता पड़ने पर ईओआई की प्रक्रिया को रद्द करने/पुनः जारी करने या और जानकारी/विवरण मांगने का अधिकार सुरक्षित रखता 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 कोई कंपनी/फर्म किसी भ्रष्ट या धोखाधड़ीपूर्ण व्यवहार में लिप्त पाई जाती है, तो उसे निविदा प्रक्रिया में भाग लेने से रोक दिया जाएगा और 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.

ईओआई प्रतिक्रिया को पूरा करना/Completion of the EOI Response:

- कंपनी/फर्म को ईओआई दस्तावेजों के सभी अनुदेशों, निबंधन और शर्तों, प्रपत्रों, आवश्यकताओं और अन्य सूचनाओं का सावधानीपूर्वक अध्ययन करने की सलाह दी जाती है। ईओआई प्रस्तुत करना ईओआई दस्तावेजों के सावधानीपूर्वक अध्ययन और जांच के बाद किया गया माना जाएगा, जिसमें इसके निहितार्थों की पूरी समझ हो।

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 ई ओ आई का जवाब सभी मामलों में पूर्ण और संपूर्ण होना चाहिए। ई ओ आई दस्तावेज द्वारा आवश्यक सभी जानकारी प्रस्तुत करने में विफलता या ईओआई दस्तावेजों के हर पहलू के प्रति पर्याप्त रूप से उत्तरदायी न होने वाला प्रस्ताव प्रस्तुत करना कंपनी/फर्म के जोखिम पर होगा और इसके परिणामस्वरूप दस्तावेज 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. प्रस्तुत किए गए ईओआई के सभी पृष्ठों पर क्रमांक होना चाहिए और अधिकृत हस्ताक्षरकर्ता द्वारा हस्ताक्षरित होना चाहिए।

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

- d. ई ओ आई के संबंध में प्रचार करना सख्त वर्जित है और एजेंसी द्वारा प्रस्तुत किए गए ऐसे प्रचार किए गए ईओआई को 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.

क्रियाकलापों को अच्छी तरह समझने और यदि कोई संदेह हो तो उसका निवारण करने हेतु यू आर राव उपग्रह केन्द्र द्वारा एक **पूर्व ई ओ आई बैठक** का आयोजन किया जाएगा। तदुपरांत, आर एफ पी में मांगे गए विवरण के साथ विक्रेताओं को इच्छा की अभिव्यक्ति की प्रतिक्रिया प्रस्तुत करना होगा।

A **Pre-Eoi meeting** will be arranged by U.R. Rao Satellite Centre, Bengaluru in order to have a better understanding of the activities involved, clarify doubts, if any. Subsequently, the vendor(s) shall submit the response to Expression of Interest along with the details sought in RFP

सुरक्षा अनुमति की व्यवस्था करने हेतु इच्छुक विक्रेताओं को निर्दिष्ट प्राधिकार को सारणी -1 में विनिर्दिष्टानुसार नियत दिनांक से पहले पूर्व ई ओ आई प्रतिनिधियों का विवरण प्रदान करना है। विक्रेता के प्रतिनिधि, को पूर्व ई ओ आई बैठक में उपस्थित होने हेतु एक "प्राधिकार पत्र" लाना होगा। सदस्य प्रतिनिधियों की संख्या एक बोली कर्ता/कंपनी/संगठन से अधिकतम दो (2) 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

विक्रेता द्वारा पूर्व- ई ओ आई पूछताछ पूर्व ई ओ आई बैठक के दिनांक से 05 दिन पहले यू आर एस सी ई मेल आई डी psob@urssc.gov.in पर प्राप्त होना होगा। किसी भी परिस्थिति में ई ओ आई बैठक के दिनांक को पूर्वित करने/स्थगित करने के अनुरोध पर विचार नहीं किया जाएगा।

Pre-EOI Queries from vendor [s] shall reach URSC 5 days prior to date of Pre-EOI meeting to Mail ID: psob@urssc.gov.in. Please note that request for "Pre-ponement/postponement of Pre-Eoi meeting" will not be entertained under any circumstances.

उपरोक्त सभी जानकारी के साथ इच्छा की अभिव्यक्ति नीचे दिए गए पते पर, उपरोक्त संदर्भ संख्या का उल्लेख करते हुए, नियत तिथि और समय तक पहुंच 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.

वरिष्ठ प्रधान, क्रय एवं भंडार/Sr. Head, Purchase & Stores
यू आर राव उपग्रह केंद्र/U R Rao Satellite Centre,
एचएएल एयर पोर्ट रोड/HAL Airport Road,
विमानपुरा पोस्ट, बेंगलूरु/ Vimanapura Post, Bengaluru 560 017,
कर्नाटक, भारत/Karnataka, India

कृपया ई ओ आई बैठक संख्या का उल्लेख करते हुए अपने स्पष्टीकरण ई-मेल पर भेजें: psb@urssc.gov.in पूर्व ई ओ आई बैठक में भाग लेने के लिए अनुरोध **17.07.2026 @16:00 Hrs IST** या उससे पहले यहाँ उल्लिखित ई-मेल पर पहुँच जाना चाहिए। तथापि ई ओ आई का जवाब (हार्डकॉपी) केवल ऊपर उल्लिखित डाक पते पर भेजा जाएगा। ईमेल और फैक्स कोटेशन स्वीकार्य नहीं हैं। नियत तिथि और समय के बाद प्राप्त कोटेशन स्वीकार्य नहीं हैं।

Please address your clarifications quoting the EOI number to E-mail: psb@urssc.gov.in. Request for participation in Pre-EOI meeting shall reach on or before **17.07.2026 @16:00 Hrs IST** 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.

तालिका 1 Table 1:

ई ओ आई विवरण की प्रस्तुति Submission of EOI Details	
स्पष्टीकरण प्रस्तुत करने की अंतिम तिथि Last date of submission of clarification	23.07.2026 @16:00 Hrs IST
पूर्व-ईओआई बैठक (सम्मेलन कक्ष, यू आर एस सी में): Pre-EOI meeting (at Conference Hall, URSC)	20.07.2026 @14:00 Hrs IST
ईओआई प्रस्तुत करने की अंतिम तिथि Last date for submission of EOI	05.08.2026 @17:00 Hrs IST
ई ओ आई की खोलने की तिथि Opening date of EOI	06.08.2026 @10:00 Hrs IST

उपरोक्त सभी जानकारी के साथ इच्छा की अभिव्यक्ति **05.08.2026 @17:00 Hrs IST** बजे तक या उससे पहले उपरोक्त संदर्भ संख्या का उल्लेख करते हुए, नीचे अधोहस्ताक्षरी को पहुँच जानी चाहिए। यह प्रस्ताव पूर्व-ईओआई अर्हता के रूप में आरंभ किया गया है। यूआरएससी बिना कोई कारण बताए सभी या किसी भी इच्छा की अभिव्यक्ति को स्वीकार या अस्वीकार करने का अधिकार सुरक्षित रखता है।

"Expression of Interest" with all the above information shall reach the undersigned, Quoting above Reference Number on or before **05.08.2026 @17:00 Hrs IST**. 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.

हस्ता/sd-
वरिष्ठ प्रधान, क्रय एवं भंडार
Sr. Head, Purchase & Stores

**Expression of Interest (Eol)
for Execution of Spacecraft Integration
Activities**



**June 2026
Systems Integration Group
U.R. RAO SATELLITE CENTRE
VIMANAPURA POST BANGALORE – 560017**

STATEMENT OF WORK FOR EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

1	Introduction.....	8
2	Objective.....	8
3	Procedure for finalizing Contract:	9
4	Statement of Work	10
4.1	Management Structure	10
4.2	Milestone based activities:.....	11
4.3	Details of activities to be carried out in this contract:	13
4.4	Classification of Spacecraft Category:	19
4.5	Payment Methodology:.....	22
5	Tenure of the Contract	22
6	TECHNICAL Skill set requirements.....	22
7	General Conduct & Safety Precautions	24
8	Secrecy and Security.....	24
9	Eligibility and Evaluation criteria	25
10	TECHNICAL Evaluation Process:.....	26
11	Annexure - I	28
12	Technical Evaluation Matrix	29
13	Response Forms	34
Table 1: Milestone UNITS & Duration.....		20
Table 2: Payment Methodology (Typical/Tentative)		22
Table 3: Technical Skill Set Requirement		23

STATEMENT OF WORK FOR EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

Acronyms

SIG	-	Systems Integration Group
EID	-	Electrical Integration Division
MID	-	Mechanical Integration Division
OLM	-	Online Monitor

SPACECRAFT-Spacecraft

IST	-	Integrated Spacecraft Testing
TVAC	-	Thermo-vaccum
CATF	-	Compact Antenna Test Facility
EMI/EMC	-	Electro-Magnetic-Interference/Electro-Magnetic Compatibility
ESD	-	Electrostatic Discharge
EED	-	Electro Explosive Device
URSC	-	UR Rao Satellite Centre
EOI	-	Expression of Interest

1 INTRODUCTION

U R Rao Satellite Centre (URSC) at Bengaluru is responsible for building satellite systems for scientific, technological and other specific missions for national importance.

Systems Integration Group (SIG) has the major responsibility of executing the Spacecraft Integration Activities, performing the functional and interface test, supporting IST and environmental tests, shipment to launch base, planning & implementation of pre-launch operations. These activities for a spacecraft are spread throughout the development and realization phase of the spacecraft.

Increased Spacecraft integration demand is planned to be achieved with the support from technically competitive industry with proven expertise and skill sets in Spacecraft Integration and Testing.

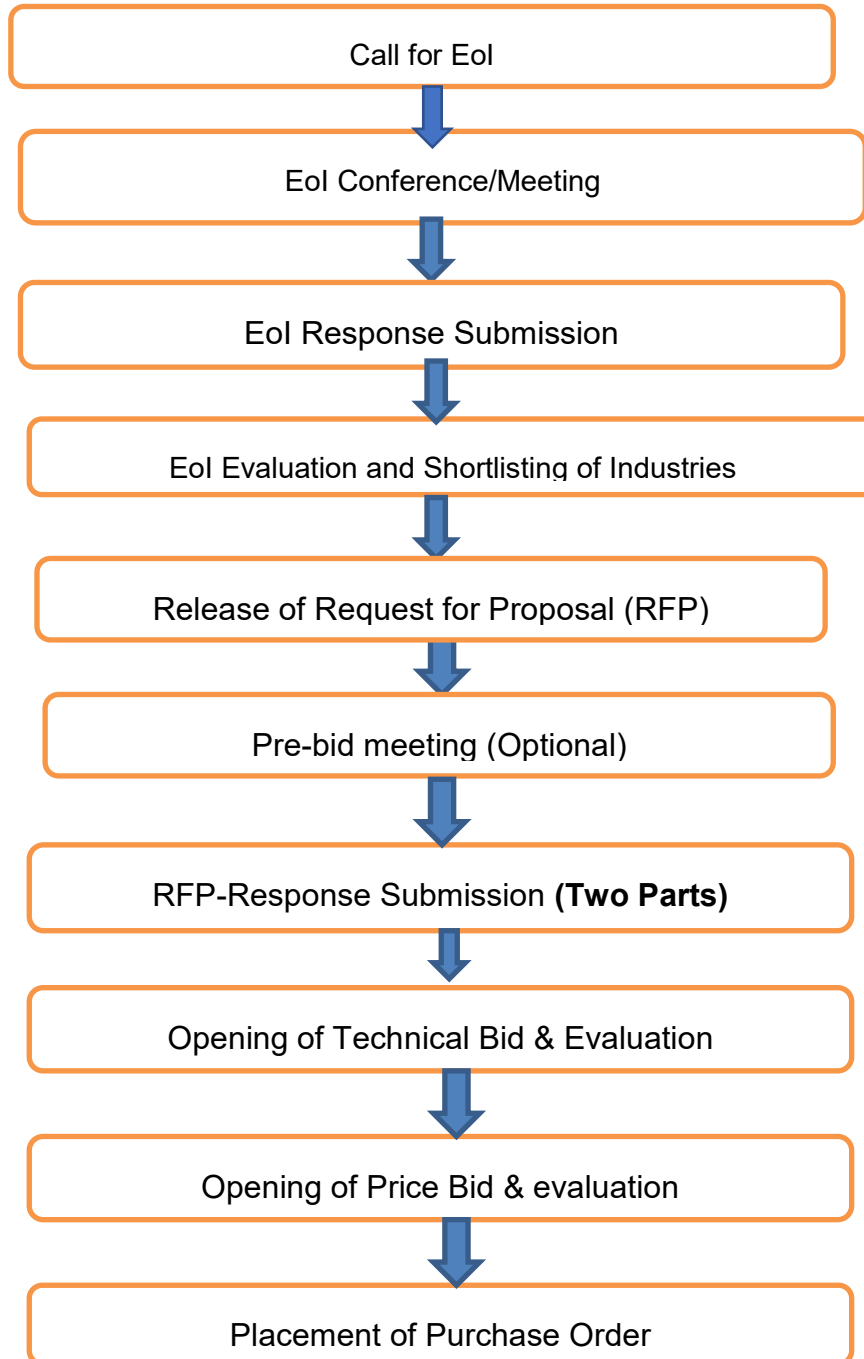
This EOI (Expression of Interest) document describes the Scope of work with brief descriptions and quantum of Electrical and Mechanical Integration and testing activities, skill sets requirement, general precautions / work instructions for reference to the technically competitive industries.

The Technical proposal for this EOI will be evaluated on the basis of bidder's expertise, its understanding of scope of services, proposed methodology and work plan, skilled workforce.

2 OBJECTIVE

The main objective of this Eoi is to invite industry partners to carry out the execution of spacecraft integration activities of different classes of spacecraft at URSC/ISITE premises.

3 PROCEDURE FOR FINALIZING CONTRACT:

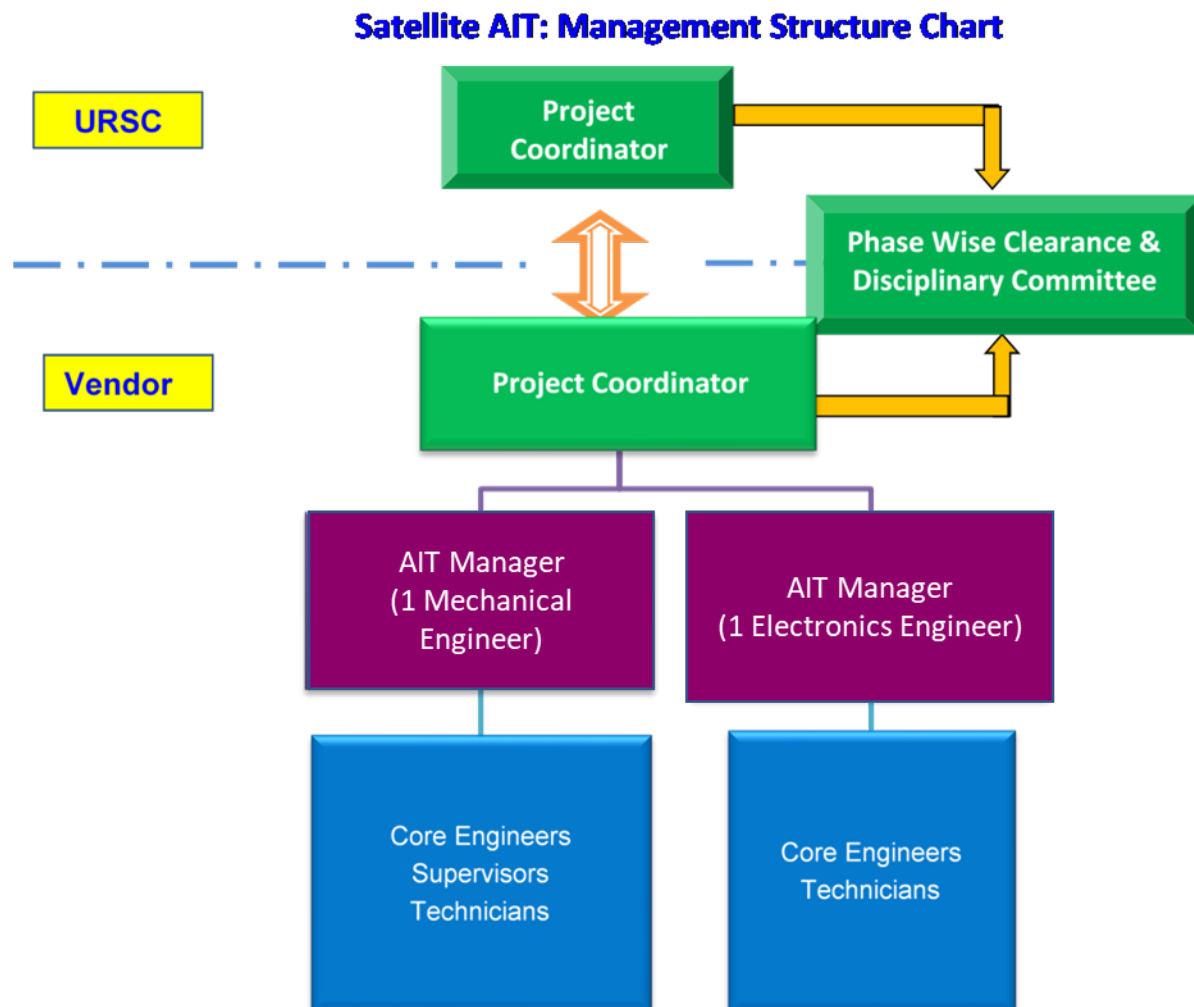


4 STATEMENT OF WORK

The statement of work comprises of nature of work and the responsibilities of the industry in connection with integration and testing related activities at URSC/ISITE, Bangalore.

4.1 Management Structure

Project Executives DPD, PM, Project Engineers, Technicians from URSC team shall guide the industry's team for the project activities whenever required. However, actual AIT execution shall be carried out by the industry's team under the supervision from URSC team.



STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

4.2 Milestone based activities:

The spacecraft AIT activities are sequential in nature. Depending upon the requirement, these operations shall be carried out round the clock basis. The SPACECRAFT Integration activities are apportioned into five (5) milestones as indicated below in a brief manner (Not exhaustive list).

Work orders shall be released to each milestone separately as and when planned by URSC committee.

Sequence of Spacecraft AIT Activities & Milestones

Milestones	Brief list of activities
Milestone-1	▪ Matching of EIDs and generation of data pack ▪ Readiness of MGSE, EGSE and associated checklists ▪ Incoming Inspection and Clearance of Structure ▪ Positioning of structure on fixture ▪ Propulsion System Integration-Part-1 ▪ Related Thermal Implementation Completion of Milestone 1
Milestone-2	▪ Incoming Inspection of Equipment panel, Subsystem ▪ Electrical Mainframe System Integration & testing ▪ Incoming Inspection of Payload Deck/Panel ▪ Payload Integration & testing ▪ Dis-Assembled Mode IST Completion of Milestone 2
Milestone-3	▪ Preparation for Panel Closure ▪ Panel Closure ▪ Assembled Mode IST ▪ Preparation for Spacecraft Thermovac Test ▪ Spacecraft Thermovac Test Completion of Milestone 3

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

Sequence of Spacecraft AIT Activities & Milestones	
Milestone-4	▪ Propulsion System Integration-Part-2 ▪ Appendages Integration & testing ▪ Alignment test ▪ End-to end polarity test ▪ Physical Parameter Measurement ▪ LAM deck assembly &testing ▪ Satellite fit check with Launch Vehicle adaptor ▪ Preparation for Satellite Dynamic Test ▪ EMI/EMC test/Vibration test/Acoustic Test Completion of Milestone 4
Milestone-5	▪ Post dynamic activities ▪ CATF Test ▪ Support for SP-1 IST ▪ Preparations for Shipment ▪ Packing of materials and allied equipment to launch base ▪ Pre-Launch Phase activities at launch base ▪ Post-launch packing & transportation of spacecraft container & allied equipment to URSC Completion of Milestone 5

4.3 Details of activities to be carried out in this contract:

Detailed AIT activities are mentioned below:

- Generation of database: The electrical interface definitions (EIDs) received from all the subsystems of the spacecraft are to be matched and a database of EIDs will be generated. The EID shall indicate the exact details of each interface such as type of wire, type of signal, signal amplitude, gauge of wire, source and destinations, inter panel patch details etc.,
- Data-pack readiness which involves generation of Worksheets and labels based on the EID database, FIM estimation and jig preparation.
- Development of special harness such as MIL-STD-1553B, LVDS etc.,
- Supporting industries for harness fabrication activities at URSC/ISITE.
- Preparation of fabrication sheet for thermal elements and propulsion elements which includes implementation drawings and connector formation details.
- Grouping of heaters as per the drawings, wire addition, labelling and routing.
- Wire addition, labelling and routing of Temperature sensors, PRTs, FTS etc.,
- Testing of wired thermal elements.
- Grouping, labelling, connector formation and testing for propulsion elements.
- Support for the Receive Inspection of subsystem electronics flight package (package quantity approx 100 to 200) needs to be received and inspected.
- Support for the Receive Inspection of flight panels, structure and brackets. Verification of the inserts/ counter bore holes and measurement of mass.
- Support for the Placement on the respective flight panels/structure on the identified frame/fixture.
- Preparation for flight hardware assembly, up keep of tools & equipment.
- Support during movement & transportation SPACECRAFT & flight hardware.
- Work platform regular maintenance etc& readiness use.
- Support & help for the thermal implementation activities.
- Support& help for propulsion integration activities, viz ware platform readiness help in setting up and movement of equipment etc.

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

- Harness installation on the panels, anchoring and proper shaping.
- EMI/EMC/ESD mitigation implementation at spacecraft level.
- Planning, Implementation and validation of harness reworks as per sub-system requirements.
- SADA-Yoke connector formation, contact resistance measurement, wet-probe testing, implementation of ESD mitigation
- Connector formation of RCS-Pyro, EED interface, and thermocouple interfaces.
- Validation and labelling of Online Monitors, harness buffers and installing at the appropriate places
- Establishment of Electrical Ground Support Equipment and carrying out Testing and Evaluation for the same
 - Power Supply
 - Tele command Encoder
 - Telemetry Data Acquisition and Page display system
 - Thruster Load simulator
 - Battery cell Simulator
 - EED loads and any other special loads
- Preparation of subsystem test procedures: The functional and integration test (FIT) procedures will be made for each subsystem. Typically, 30 numbers of sub-systems are expected in a spacecraft.
- Compilation of test results after completion of corresponding sub-system integration tests.
- Preparation of checklists
- Preparation of rework notes as per sub-system requirements
- Preparation and compilation of results in Ground Checkout Test & Evaluation document
- Generation of TM-TC database for carrying out integration activities
- Performing EID verification with sub-system & QA teams
- Carrying out receive inspection procedure including isolation checks

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

- SGRP verification post package mounting on the panels
- Connector mating with Online monitors (wherever required)
- Carrying out the signal measurements viz. open ended & loaded checks and simulation of various signals as per the sub-system test procedures
- Issuing of Telecommands and monitoring of corresponding telemetry channels as per the sub-system test procedures
- Performing limited functional and interface tests (FIT) on each subsystem
- Carrying out test and evaluation of Ground Checkout equipments at every phase of spacecraft testing.
- Carrying out the measurement on any RF connectors and any other special connectors like MIL-STD-1553 connector viz. Trompeter (Measurements with spectrum analyzer, Digital Storage Oscilloscope, 1553 signal checks)
- Connectors involved for integration activities can be of Micro-D, DSUB, HD DSUB, DBAS circular, SMA, Trompeter, Nicomatic connectors.
- Interface verification on inter-panel breaks (Patch connector interface)
- Establishing test set up for special tests on integrated spacecraft such as AOCE polarity tests, thruster flow checks, fault current tests, deployment tests, solar panel illumination tests etc.,
- Carrying out sub-system level EMI/EMC testing/CATF testing
- Preparation of satellite for dis-assembled IST: The team has a major role during these tests and some important activities are mentioned below.
 - Establishing proper GC interfaces and verification of the same.
 - Interconnecting the panels/decks using harness buffers and establishing OLMs as per requirements.
 - Installation of thruster load simulator, EED/PYRO loads, RCS-EED loads, battery cell simulator, installing SADA bypass harness, installation of stimuli and associated cables, installation of RF cables for Checkout interface.
 - Verification of interfaces for the elements present outside the cuboid by simulation/TC verification/Voltage measurements.

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

- Supporting dis-assembled IST activities along with checkout.
- Package mounting along with connector torquing activities.
- Patch bracket mounting on the spacecraft.
- Fabrication of interface plates based on the requirements for dis-assembled mode IST.
- Support in carrying out special tests like wheel polarity test etc.
- Thermal implementation on packages.
- Maintenance of mass table, DOR, SSIP documents.
- Preparation of satellite for panel closure activities as mentioned below:
 - Connector mating, torqueing, ecco-bonding
 - Final Harness shaping, anchoring, simulation with cutouts
 - Providing support for X-ray of all RF connectors
 - Implementing all EMC/ESD control measures and inspection of the same
 - Grounding and bonding measurements and recording the entries in panel closure checklist
 - Panel closure committee inspection and implementation of the corrections as per committee's recommendation
 - Panel closure activities and patch connectors mating
 - Supporting payload mounting activities and connector mating, torqueing, ecco-bonding of payload connectors.
 - This phase requires 3 shifts (round the clock).
- Preparation of satellite for assembled IST activities as mentioned below:
 - Establishing proper GC interfaces and verification of the same.
 - Supporting assembled IST activities along with checkout.
 - This phase requires 3 shifts (round the clock).
 - Conducting special tests on integrated spacecraft such as AOCE polarity tests, thruster flow checks, fault current tests etc.
- Preparation of satellite for Thermovac activities as mentioned below:

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

- Continuity, cross-continuity checks of conversion cables and harness buffers and baking of the same
- Simulation of non-available thermal elements like thermistors, PRT, FTS
- Wiring of live SQUIBs as per the thermovac configuration
- Continuity, cross-continuity checks of thermovac flange along with QA, checkout teams
- Establishing proper GC interfaces and verification of the same at TVAC area.
- Providing support for simulation activities like feeding voltages for Voc/Isc interfaces, verification of pre-amplifier output voltages of earth sensor etc. during TVAC testing.
- Providing support for loading/unloading of Spacecraft into thermo-vacuum chamber.
- Disconnecting harness buffers, conversion cables at TVAC chamber area post TVAC testing
- Shifting of the SPACECRAFT to cleanroom
- ESD implementation (Aluminized Kapton tape wrapping & grounding) on solar panel harness
- Thermal wiring on reflectors & verification of the same
- Establishing and verification of EGSEs required for EMI/EMC/CATF tests
- ESD implementation (Kapton & Copper tape wrapping & grounding) on harness present outside cuboid
- Preparation of satellite for solar panel deployment, illumination activities
- Preparation of satellite for reflector deployment activities
- Preparation of SPACECRAFT for dynamic & acoustic tests
- Establishing & verification of Checkout interfaces
- Establishing and verification of propulsion console interfaces
- Post TVAC test, final torquing of equipment panels/decks
- Mounting of appendages, external elements

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

- Mounting of MRCs, pre-dynamic alignment activities
- Mass properties measurements
- Preparation of satellite for Post-dynamic solar panel deployment, illumination activities
- Preparation of satellite for Post-dynamic reflector deployment activities
- Post-dynamic alignment activities
- Establishing and verification of EGSEs required for CATF tests
- Preparation of satellite for CATF testing activities
- Preparation of documents for GAT audit
- Providing support for Pre-shipment IST activities along with checkout
- Conducting special tests on integrated spacecraft such as AOCE polarity tests, thruster flow checks etc.,
- Support for SPACECRAFT containerization activities to launch-pad
- Packing of allied equipments, documents for launch base activities
- Transportation systems Test, validation of heavy MGSEs, CATF Zero G test set-up
- Transportation systems: To assist our senior engineer for re-configuring container based on the procedures and check list ISO Format. Preparation of schematic layout drawings of operations sequences.
- SPACECRAFT Container Environmental Control and Monitoring System: Readiness (including trails) of the system, Testing, Maintenance, integration to container & ON road control of environmental parameters (Temp and RH) & Validation Report generation & Presentation preparation.
- SPACECRAFT Transit Vibration data acquisition system: Readiness, Calibration, Accelerometer layout study, Accelerometer Mounting on SPACECRAFT, Wiring & IR Programming, Accelerometer Removing from SPACECRAFT, Processing the vibration data, Report generation & Presentation preparation.

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

- Dynamic Balancing: Readiness, Envelope study, Calibration, Measurement and report generation.
- SPACECRAFT CATF RF Testing: Configuration and assembly of zero 'g' backup structure, mounting for multiple reflector positioning and removal from DUT.
- Calibration of the mass properties machines
- Participation of during Mass properties Measurement Viz., readiness of the machine, logging of data during measurement etc.
- Preparations for Shipment, packing of materials and allied equipment to launch base
- Pre-Launch Phase activities at launch base
- Post-launch packing & transportation of spacecraft container & allied equipment to URSC

4.4 Classification of Spacecraft Category:

Definition of UNITS: - AIT activities for each spacecraft are classified into 5 milestones. Depending upon the maturity of concerned SPACECRAFT for AIT activities, work order shall be issued for each milestone. At the time of release of work order, time duration for completion shall be specified. LD Clause is applicable only for the released work order. **Work order shall be released for milestones in terms of UNITS.**

One UNIT (1U) is defined as the cost of Execution of Class-I spacecraft AIT activities identified through this EOI / RFP.

For Class-II spacecraft, cost of execution is 1.25 UNITS (1.25U).

For Class-III spacecraft, cost of execution is 1.5 UNITS (1.5U).

The RFP shall indicate the procurement of total number of UNIT (U).

It may be noted that if more than 1 spacecraft are available for AIT operations, multiple work orders shall be awarded to individual industries, having similar time frames and separate teams and resources shall be planned by the industry. The allocation of the concerned work order to individual industry will be finalized by URSC committee.

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

Spacecrafts are classified depending on mass and proportionate spacecraft integration activities into different classes as follows.

Class of Spacecraft	Typical mass of Spacecraft (in kg)	UNIT (U)	*Typical Duration in working days(Months)
Class – I	400-1000	1 U	208(~8)
Class – II	1001-2500	1.25 U	260(~10)
Class – III	2501-4000	1.5U	312(~12)

*Cumulative duration of all five milestone activities

- Typically, 10-15U is planned in this contract subject to URSC planning.
- The concerned spacecraft classification in terms of Class - I / II / III shall be as per the recommendations of URSC committee.

Table 1: Milestone UNITs & Duration

Class – I		
Milestones	UNIT (U)	Duration in working Days
Milestone-1	0.2U	42
Milestone-2	0.3U	63
Milestone-3	0.2U	42
Milestone-4	0.2U	42
Milestone-5	0.1U	19
Total	1U	208

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

Class – II		
Milestones	UNIT (U)	Duration in Working Days
Milestone-1	0.25U	52
Milestone-2	0.375U	78
Milestone-3	0.25U	52
Milestone-4	0.25U	52
Milestone-5	0.125U	26
Total	1.25U	260

Class – III		
Milestones	UNIT (U)	Duration in Working Days
Milestone-1	0.3U	64
Milestone-2	0.45U	90
Milestone-3	0.3U	64
Milestone-4	0.3U	64
Milestone-5	0.15U	30
Total	1.5U	312

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

4.5 Payment Methodology:

Payment will be based on the pro-rata basis, workorder completion of assigned milestone activities for applicable class of spacecraft. URSC committee shall clear the payments based on milestone completion. This payment methodology is applicable for spacecraft belonging to different classes. Milestones are indicative and during the release of work order, milestone details shall be finalized. Details are as shown below.

Table 2: Payment Methodology (Typical/Tentative)

S. No	Milestone / Work Order	Payment
1.	Work Order 1	20%
2.	Work Order 2	30%
3.	Work Order 3	20%
4.	Work Order 4	20%
5.	Work Order 5	10%

For each class of SPACECRAFT, 5 work orders shall be issued in the above mentioned % of the total Pay value for the applicable class of SPACECRAFT.

5 TENURE OF THE CONTRACT

Tenure of the Contract is planned for a period of three years.

6 TECHNICAL SKILL SET REQUIREMENTS

Execution of spacecraft integration activities require highly skilled, highly efficient continuous workforce over the tenure of contract. Suitably qualified personnel shall be deployed by the industry for executing the job detailed in the Section 4.

The Technical Personnel will be directly involved in handling the spacecraft sub-systems. It is a highly skilled & competent activity involving the safety & protection of the spacecraft. It is hence mandatory to have minimum 1-year know-how in Aerospace / Space industry in the domain of electronics system realization & testing activities, mechanical system design and realization activities.

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

Table 3: Technical Skill Set Requirement

Technical Skill Set requirement for Electronics		
S. No	Skill Set	Qualification
1	Engineers	B.E/B.Tech./Equivalent first class in the relevant engineering discipline (Electronics) with min. of 65% of marks or equivalent CGPA Grade
2	Technicians	ITI in the relevant trade (Electronics) with min. of 60% marks or equivalent CGPA Grade.
Technical Skill Set requirement for Mechanical		
S. No	Skill Set	Qualification
1	Engineers	B.E/B.Tech./Equivalent first class in the relevant engineering discipline (Mechanical) with min. of 65% of marks or equivalent CGPA Grade
2	Diploma Holders	Diploma/Equivalent first class in the relevant engineering discipline (Mechanical) with min. of 60% of marks or equivalent CGPA Grade
3	Technicians	ITI in the relevant trade (Mechanical) with min. of 60% marks of marks or equivalent CGPA Grade.

Technical Skill Set Requirement for each class of Spacecraft (Typical)

Class	Engineers = 6		Diploma = 2		ITI (Technicians) = 12	
	Electrical	Mechanical	Electrical	Mechanical	Electrical	Mechanical
Class-I	4	2	-	2	6	6
Class-II	4	2	-	2	6	6
Class-III	4	2	-	2	6	6

Note: All the above details are Indicative only. However, during peak project activities, additional skillset shall be planned

7 GENERAL CONDUCT & SAFETY PRECAUTIONS

- The industry personnel should adhere to the general work rules, procedures and office timings followed at URSC/ISITE and keep maintain harmonious relations with URSC/ISITE staff during their visit to URSC/ISITE
- The personnel of industry must adhere to all the safety guidelines while handling flight packages while testing and transporting, particularly the ESD protection measures such as wearing ESD overcoats, shoes / chapels, wrist bands, grounding and other measures as per ESD protection guide line document.
- It is imperative that the industries personnel do not touch any card, component, package without ESD protection.
- Industry personnel are strongly encouraged to duly report discrepancies / accidents / procedural violations occurring during course of tests as these transparencies improve the overall reliability of the product being tested.

8 SECRECY AND SECURITY

- All documents prepared for test procedures, log books, drawings, schematics and any other communications, codes revealed during the process of testing will be exclusive property of URSC and industry shall have no right what so ever on them.
- These documents are to be strictly confidential and should not be reproduced, copied / transmitted to any media
- Further, the industry must not quote any of these works in any publications or to any of their customers without explicit permission from URSC and adhere to strict confidentiality.

9 ELIGIBILITY AND EVALUATION CRITERIA

Eligibility Criteria:

9.1 The Bidder should be a company registered under Indian Companies Act 1956 or a firm registered under Limited Liability Partnership (registered under LLP Act, 2008). The industry should have been in existence for a minimum of Five (5) years in India.

9.2 Industry shall mandatorily submit ISO 9001: 2015 / aerospace AS9100D certification.

9.3 Successful bidder should have a working office located in Bangalore as the contract is to carryout day to day activities at URSC/ISITE campus Bangalore in coordination with URSC focal point/manager and to meet any exigency. Also, industry should not change his office location outside Bangalore during the tenure of contract. Documentary proof in this regard shall be provided. Any deviation of this clause is a punishable offence.

9.4 The spacecraft integration activity requires skilled & know-how as it is being interfaced and executed directly on the spacecraft. Industry shall have good understanding of the spacecraft systems and the ground support equipment. As the activity concerns safety, protection aspects & critical sequences related to space system, it is mandatory to provide/submit documents with aerospace/ space sector in the domain of electronic/mechanical system realization & testing or of similar nature as proof.

9.5 Industry shall have minimum infrastructure having electronic labs and test & measurement equipments for carrying out space system realization & testing. Submit proof of lab area and measurement equipments. URSC reserves the right to inspect the same, if required.

9.6 The bidder should not have been blacklisted by any Central/State Government institution. A signed declaration to this effect must be submitted along with the EOI response.

9.7 Industry who scores minimum of 65 marks out of 100 (Evaluation as mentioned in Section 12) shall be short listed for RFP.

9.8 A Request for Proposal (RFP) will be issued to the short-listed (technically qualified) agencies from this Eol and asked to submit their detailed proposal and price (Two-part bid).

Note: Startup and MSME companies/organizations shall also satisfy the above-mentioned eligibility and evaluation criteria.

10 TECHNICAL EVALUATION PROCESS:

- URSC Committee shall evaluate the Eol responses of the industry to shortlist the technically qualified industries for the further process.
- URSC committee shall evaluate the responses to the Eol based on the supporting documents & documentary evidence provided by industry/s. Inability to submit requisite supporting documents or documentary evidence, may lead to rejection of the Eol proposal.
- Industry need to fill the compliance matrix as well as technical evaluation forms (As mentioned in Annexure-A) and provide supporting documents as applicable. Each of the responses shall be evaluated to validate compliance of the industries according to the eligibility criteria.
- The decision of URSC committee in the evaluation of responses to the Eol shall be final. No correspondence will be entertained outside the evaluation process of the Committee.
- To evaluate the proposals, URSC reserves the right to visit the premises of industries participated in Eol, with a notice of 48 hours. The evaluation of industries will be based on response forms and verification of the same during the industry visit.
- The TEC may ask for presentation / meetings / clarifications with the industries to evaluate its EOI response.
- The TEC reserves the right to reject EOI responses.

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

- A Request for Proposal (RFP) shall be issued only to the short- listed (technically qualified) agencies from this EoI (as mentioned in S. No 10.1) and asked to submit their detailed techno-commercial bid in two parts.

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

11 ANNEXURE - I

Compliance Matrix

EOI evaluation matrix – to be filled by industry [Mandatory]

Sl.No	Description	Write' YES/NO' Submit proof wherever applicable.
1.	Compliance to carry out work at URSC & ISITE campus, Bengaluru	
2.	Submit Organisation Profile (Refer 9.1)	
3.	Submit ISO 9001: 2015 / aerospace AS9100D proof (Refer 9.2)	
4.	Submit proof for the presence of working office in Bangalore (Refer 9.3)	
5.	Submit a self-undertaking as a proof for compliance to point number 9.6	

Note: The compliance to the above-mentioned table is mandatory. In case vendor fail to submit, further EOI evaluation will not be carried out.

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

12 TECHNICAL EVALUATION MATRIX

Following table shows the weightage of marks across different criteria which may be suitable for the execution of spacecraft integration activities. Industry(s) shall be awarded the marks across these criteria based on the responses submitted via Response Forms A to H. Industry who scores minimum of 65 marks out of 100 shall be short listed for RFP (As mentioned in Section 9.7). The vendor shall ensure to fill all the forms for evaluation.

S. No	Criteria	Marks	Response form
A.	Skilled skill set involved in Spacecraft Integration and testing activities Spacecraft Assembly Integration & Testing Realisation Activities • AIT Realisation of Spacecraft (10 marks) • Realisation of Aerospace sub-systems like Power/Digital/RF sub-systems (15 marks) a. Power Systems (5 marks) b. Digital Systems (5 marks) c. RF Systems (5 marks) • Realisation of Mechanical Systems (20 marks) a. Propulsion Sub-Systems (5 marks) b. Mechanisms Sub-Systems (5 marks) c. Thermal Sub-Systems (5 marks) d. Structure Sub-Systems (5 marks)	45	Form A and B

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

S. No	Criteria	Marks	Response form
B.	Availability in handling Mechanical Integration MGSEs a. Fixtures (1 mark) b. Crane operation (1 mark) c. Man lift operations (1.5 mark) d. Package assembly (1.5 mark)	5	Form C
C.	Availability in operating machines • Bench drilling machine- (1 mark) • Milling machine- (1 mark) • Helicoil tool for reworks. - (1 mark) • Lathe machine – (1 mark)	4	Form C
D.	Availability in Electronics fabrication activities • Soldering Station- (1 mark) • Wire Strippers- (1 mark) • Crimping Tools- (1 mark) • Hot tweezers – (1 mark)	4	Form C
E.	Availability in Usage of EGSEs • Data Acquisition Systems - min 16kbps – (1 mark) • DC Power supplies - Transformer isolated power supply with 5V, $\pm 15V$, 2A – (2 mark) • Digital Storage Oscilloscopes – minimum 100MHz – (2 mark)	10	Form C

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

S. No	Criteria	Marks	Response form
	- Voltage Calibrators $\pm 5V$, resolution 1mV. – (1 mark) - Breakout boxes - 50 pin with online monitoring points. – (1 mark) - RF Cables - Low loss flexible cables – (1 mark) - RF Power meter - Frequency range from 10 KHz to 18GHz; -65dBm to +20dBm- (1 mark) - Spectrum Analyzer -frequency range from 50Hz to 18 GHz (1 mark)		
F.	Design guidelines: Documents to be provided in Aerospace/Space systems - EMI-EMC design/guidelines/mitigation documents - (1 mark) - ESD audit records/ Training records of the personnel regarding ESD - (1 mark)	2	Submit suitable documentary proof (ESD Audit records of facilities, EMI-EMC design guidelines/documents)
G.	Technical Skill set: - Mechanical/Aerospace Engineers, who have worked on system level AIT activities on any Aerospace, Space or Defense system - 5 to 10 Engineers (2 marks) - 11 and above Engineers (4 marks) - Mechanical/Aerospace Diploma holders, who have worked on system level AIT activities on any Aerospace, Space or Defense system	20	Form D, E, F and G

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

S. No	Criteria	Marks	Response form
	- 5 to 10 Diploma holders (2 marks) - 11 and above Diploma holders (4 marks) • Mechanical ITI (Industrial Training Institute) trade certificate holders who have worked on system level AIT activities on any Aerospace, Space or Defense system - 5 to 10 ITI (Industrial Training Institute) trade certificate holders (2 marks) - 11 and above ITI (Industrial Training Institute) trade certificate holders (4 marks) • Electrical/Avionics/Electronics Engineers, who have worked on system level AIT activities on any Aerospace, Space or Defense system - 5 to 10 Engineers (2 marks) - 11 and above Engineers (4 marks) • Electrical/Electronics ITI (Industrial Training Institute) trade certificate holders who have worked on system level AIT activities on any Aerospace, Space or Defense system - 5 to 10 ITI holders (2 marks) - 11 and above ITI holders (4 marks)		
H.	Quality Management Standards • Aerospace Systems development document - 1 to upto 3 numbers (1 mark) - 4 numbers and above (2 marks) • Aerospace Systems Design review minutes - 1 to upto 3 numbers (1 mark) - 4 numbers and above (2 marks)	10	Form H

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

S. No	Criteria	Marks	Response form
	• Test and evaluation documents for Aerospace systems. - 1 to upto 3 numbers (1 mark) - 4 numbers and above (2 marks) • Anomaly/Observation review board minutes of the meeting for Aerospace systems. - 1 to upto 3 numbers (1 mark) - 4 numbers and above (2 marks) • IPC-WHMA-620 or equivalent certified technicians/operators for fabrication activities - 1 to upto 5 numbers (1 mark) - 6 numbers and above (2 marks)		
I.	Total Marks	100	

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

13 Response Forms

Form – A: General details of the industry

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 manufacturing and/or operational setup in India (highlight the address where URSC representative will visit for audit)	1. 2.
7	Corporate website URL:	

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

Form B – Know-how in Aerospace sector: In case the industry is having/had any Purchase order/work order/contract (not more than 6 Purchase orders) in Skilled manpower engaged for Spacecraft Integration and Testing activities, provide the details in the specified format for each work order.

Document-1

Name of the Aerospace Industry	
Scope of work	
PO Details	
Present Status of the PO	
Spacecraft Assembly Integration & Testing Activities	
Realization of Aerospace systems*	
Application **	
In any part of the above work subcontracted to other industries? If yes provide the details	
Name of the sub-contracts	Description of activity outsourced to sub-contractors

*Indicate whether it is electronics/electrical/mechanical/propulsion/ software or any other system

** mention if the system is for on-board or ground or any other use

Note: The copies of above purchase orders to be enclosed as Annexure

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

Form C:

SI.NO.	Name & Model number of Infrastructure/ Facility/Instrument	Year of Procurement	Applicable Project	Utilization factor (%)**

Photographs/brochure of above listed facilities may be provided as Annexure.

*** no of days utilized/year*

Industry Expert Manpower

Form D: Manpower Strength (on the rolls of industry /lead industry in case of consortium) in the following Streams/Disciplines.

SI No.	Streams/discipline	Engineering	Diploma	ITI
1.	Mechanical Engineering or equivalent			
2.	Electronics and Communications or equivalent			
3.	Total			

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

Form E: Mention the levels of technical hierarchical structure (from entry level to highest cadre) of your organization.

Form F: Whether the Industry has provided technical/skilled manpower support to any Government/Public sector Industry (Aerospace Sector). If yes provide the following details

SI No	Name of the organization supported	Scope of work	No. of manpower deployed	Remark
1				
2				

Form G: Provide the following details about the minimum % of marks for joining your company and average salary for entry level

Sl. No	Category of employees	Minimum % of marks for joining the company	Average salary per year per employee (in Rs)
1.	Engineer		
2.	Diploma		
3.	ITI		

STATEMENT OF WORK FOR THE EXECUTION OF SPACECRAFT INTEGRATION ACTIVITIES

Form H: Quality Management:

1	State the quality policy of the industry (max in 200 words)	(type overall quality management system and mention about quality department reporting, non-conformance management system, quality control practices, records maintenance, onsite activity QMS, internal review mechanism)	
2	Quality standards / certification obtained by the Industry [Tick the appropriate box]	AS9100D	Applicable as per ISO 9001 standard