Agenzia Spaziale Italiana

Il Direttore Generale

Ispace Europe SA
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Charlotte Nassey
Senior Government Affairs & Policy Officer

Subject: Request for Quotation for the Launch and Transfer services to the Moon surface for the ASI payload "LaRA2"

The instrument "LaRA2 (Lase Reflector Array)" is an array of laser retroreflectors for planetary exploration and scientific purposes, part of the deliverables of the ASI-INFN Implementation Agreement n.2023-59-HH.0 "LaGREx Laser Retroreflectors". The LaGREx Project aims to demonstrate the feasibility of accurate positioning via laser retroreflectors based on different designs, deployed in lunar orbit and on the lunar surface. LaRA2 instrument will be delivered to ASI in the Q1 2025, to be accommodated on a surface element for a flight opportunity to the Moon.
Therefore, we ask you to elaborate and issue you best Quotation for the launch and transfer services for the LaRA2 in the frame of the ispace M3 mission, planned for 2026.

The Quotation is expected to be prepared in accordance with the Statement of Work attached to this letter and cannot exceed the maximum total amount of € 350,000.00 (excluding VAT). It will be addressed to the Head of the ASI Procedure, Raffaele Mugnuolo - Via del Politecnico s.n.c. 00133 Rome - in 20 calendar days from the date of receipt of this letter.

It should be noted that this request for quotation shall not be considered a contractual proposal or a purchase order. It does not bind ASI to follow up on it, to sign any agreement, to remunerate any activity carried out, or to reimburse any expenses related to the quotation. This request is not legally binding and / or does not constitute a title to advance rights and / or claims of any kind.

Best Regards,

Luca Vincenzo Maria SALAMONE

Annex: Statement of work

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08/05/2024	First emission	A

ANNEXES:

See INDEX

DISTRIBUTION OF THE DOCUMENT:

Attached to the Request for Quotation

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PURPOSE AND FIELD OF APPLICATION

This document represents the Statement of Work attached to the Request for Quotation of the Italian Space Agency (ASI) for the commitment to the industrial provider responsible for the launch and transfer services of the mission “LaRA2”.

The requirements specified in the present document shall be made applicable to all the parties involved in the Request for Quotation process.

DEFINITIONS AND ACRONYMS

DEFINITIONS

The definitions listed in the standard ECSS-P-001 are applicable.

Following, the definitions frequently used in the process:

- Payload: the instrument to be launched
- System: group of elements of the flight and Ground segment that make the achievement of the mission objectives possible.
- Architecture: high level structure that makes the system, providing a set of rules, guidelines and constraints to make it coherent and cohesive.
- Platform: robotic element that is delivered onto the surface of other celestial bodies that can host scientific and technological payloads

ACRONYMS

AFE	Agency Furnished Equipment
AFI	Agency Furnished Item
AIT	Assembly Integration Testing
AIV	Assembly Integration and Verification
ASI	Italian Space Agency
CGA	Capitolato Generale dell’ASI
CC	Configuration Control
COTS	Commercial Off The Shelf
DA	Applicable Document
DR	Reference Document
ECSS	European Community Specification Standard
FM	Final Meeting
HW	Hardware
ICD	Interface Control Document
ITAR	International Traffic in Arms Regulation
LLI	Long Lead Item
MCS	Mission Control System
MGSE	Mechanic Ground Support Equipment

MOC	Mission Operations Centre
N/A	Not Applicable
NCR	Non-Conformance Report
PA	Product Assurance
PLM	Payload Module
PM	Progress Meeting
RfQ	Request for Quotation
QA	Quality Assurance
S/C	Spacecraft
SOI	Statement of Intent
SOW	Statement of Work
WP	Work Package
WBS	Work Breakdown Structure

APPLICABLE AND REFERENCE DOCUMENTS

All the requirements included in the section "Applicable Documents", even if not explicitly mentioned in the text of the present document, make the complete set of Requirements which the Contractor shall consider as applicable to the Request for Quotation of the Italian Space Agency (ASI) for the activities needed to fulfil the objectives of the program.

If the "Applicable Documents" contained contradictory requirements, the Contractor shall notify them to ASI and propose options to solve the contradiction. In case no notification is provided, the most stringent requirement is considered as applicable.

For those documents where no issue is specified, the latest available issue is considered as applicable.

APPLICABLE DOCUMENTS

The following documents are an integral part of the Statement of Work according to the priority defined in the following paragraph **Errore. L'origine riferimento non è stata trovata.** "Priority Order"; they should be applied by the Contractor in the development of the Quotation.

- GENERAL

[DA 01] Operative instruction "Preparazione e trasmissione dell'Offerta all'ASI" – Doc. OP-2016-004

[DA 02] ASI's "Capitolato Generale" available at: https://bandiasi.almaviva.it/sites/default/files/attach/pagina/capitolato_generale_per_i_contratti_industriali_di_servizi_di_ricerca_e_sviluppo.pdf

[DA 03] Operative instruction "Linee guida per il Tailoring delle norme ECSS" - Doc. OP-QTA-2012-003

[DA 04] Operative instruction "Tailoring per Space Engineering Software e Software Product Assurance" – Doc. OP-QT A-20 I 2-004

[DA 05] Operative instruction "Norme per la redazione del Piano di Assicurazione del Prodotto (PA Plan)", - Doc. OP-QT A-20 12-005

MANAGEMENT

[DA 06] ECSS-S-ST-00-01C, "ECSS Glossary" (*)

[DA 07] Istruzione Operativa "Requisiti per la preparazione della Work Breakdown Structure (WBS)" - Doc. OP-IPC-2005-002

[DA 08] Istruzione Operativa "Capitolato gestionale delle Richieste d'Offerta dell'ASI" –Doc. OP-IPC-2005-010

[DA 09] ECSS-M-ST-10C Rev 1- Project planning and implementation (*)

[DA 10] ECSS-M-ST-40C - Configuration and information management (*)

[DA 11] ECSS-M-ST-60C - Cost and schedule management (*)

[DA 12] ECSS-M-ST-80C - Risk management (*)

ENGINEERING

[DA 13] M20-LRA-E-DWGP-001-1 INFN "LaRA Drawings pack" (this document reports the mechanical features and interfaces of the LaRA instrument, accommodated on the NASA Insight mission. LaRA2 is manufactured and verified/tested based on the same design and drawings of LaRA).

PRODUCT ASSURANCE

[DA 14] PA Requirements - DC-UPQ-20 16-005

[DA 15] Istruzione Operativa "Norme per la redazione del Piano di Assicurazione del Prodotto (PA Plan)" OP-QTA-2012-005 "Sistemi di Gestione per la Qualità", doc. UNI EN ISO 9001:2008

[DA 16] ECSS-Q-ST-10C - Product assurance management (*)

[DA 17] ECSS-Q-ST-20C - Quality assurance (*)

[DA 18] ECSS-Q-ST-30C – Dependability (*)

[DA 19] ECSS-Q-ST-40C – Safety (*)

[DA 20] Materials, Mechanical parts and processes-ECSS-Q-ST-70C Rev 2(*) (*)

(*) available in the latest updated and applicable version on the ECSS website at: www.ecss.nl

3.2 REFERENCE DOCUMENTS

The reference documents listed below shall be used by the Contractor as guidelines, for the better understanding of the requirements, management, examples, etc. In case some specific requirements are missing, the reference documents shall constitute the element of technical, operative and management comparison upon which the Contractor shall realize its contractual activities.

[DR 1] ECSS-M-ST-80C, Risk Management (*)

[DR 2] ECSS-M-ST-10C Rev.1, Project planning and implementation (*)

[DR 3] ECSS-M-ST-60C, Cost and schedule management (*)

(*) available in the latest updated and applicable version on the ECSS website at: www.ecss.nl

3.3 PRIORITY ORDER

The priority order among the applicable documents to the present RfQ is the following:

4 RfQ letter

5 CGA

6 The present Statement of Work

7 The Applicable Documents listed in Section 0

8 All the documents generated by ASI and accepted by the Contractor.

In case of conflict between the requirements, the most stringent one prevails.

The Contractor shall highlight every possible conflict between the requirements and ask ASI for its resolution.

9 CONTEXT, OBJECTIVES AND ACTIVITIES

4.1 REFERENCE CONTEXT

The Robotic Exploration of the Moon is becoming significantly central in the "Moon to Mars" strategy defined by NASA, that is considered as a reference for all the main Countries currently involved in the robotic and human exploration of the Moon with the long-term objective of planning the first-ever human mission on Mars.

In this scenario it is important to note how robotic exploration of the Moon is no longer just the prerogative of the main agencies, but also of private entities. The Commercial Lunar Payload Services (CLPS) program promoted by NASA is in fact aimed at the American industrial sector to develop commercial landers on which embark payloads of different nature (technological demonstrators, scientific instruments, rovers of different sizes, elements of alternative mobility). The objective is to support the Artemis program in the acquisition of scientific data to increase the knowledge of the lunar environment in view of future manned missions, and at the same time allow the acquisition of the necessary knowledge to make the Moon more and more easily accessible.

4.2 PROVISION OBJECTIVES

The objective of the current initiative is to procure the “Launch and Transfer Services” for the ASI-provided payload LaRA2 for the lunar surface on its platform (lander/rover) in one of the available opportunities.

The instrument “LaRA2 (Lase Reflector Array)” is a laser retroreflector with the same design of the first flight model LaRa, delivered on the surface of Mars by the NASA InSight - Mars2020 mission.

The LaRA2 laser retroreflector is part of the Deliverables of the ASI-INFN Implementation Agreement n.2023-59-HH.0 “LaGREx Laser Retroreflectors”; the Project aims to demonstrate the feasibility of accurate laser positioning for lunar exploration, both via laser retroreflectors deployed in lunar orbit and via laser retroreflectors deployed on the lunar surface.

4.3 PROVISION DESCRIPTION

ASI will procure from the Contractor the launch and transfer services to embark the payload LaRA2 on its mission towards the lunar surface.

4.4 DESCRIPTION AND REQUIREMENTS OF THE ACTIVITIES

ASI will deliver Payload LaRA2 Flight Model to the Contractor, to be integrated onboard the platform that will be transferred to the Moon.

In this frame, the Contractor shall:

- Launch and transport of the LaRA2 payload to the lunar surface in an area with wide visibility, so that the instrument is a future target of laser signals
- Define and manage the interface requirements, in compliance with the payload design and needs
- Define the environmental requirements to be used for the Payload design qualification (e.g. mechanical qualification levels and thermal qualification range for the payload)
- Create the Payload AIT Plan, with input from ASI
- Provide CAD models depicting, at a minimum, global Payload position on the platform. Other CAD components or features may be redacted at the discretion of the Contractor
- Manage the interfaces towards the Launch Service Provider for the entire mission preparation and implementation
- Follow all applicable export control regulations pertaining to physical and/or data exchanges throughout the program
- Provide inputs and generate documents according to the proposed timeline.
- Maintain configuration control of released documentation exchanged throughout the program
- Manage pre-launch activities (acceptance, inspection, installation, verification)

- Accommodate up to three (3) in-person ASI representatives to witness Payload integration
- Notify ASI TBD days prior to the start of physical Payload integration activities
- Notify ASI of any changes to released documents or models involving both parties described herein
- Conduct checkouts after installation. Detailed scope of this testing will be coordinated after contract initiation
- Provide post-landing data (in this case, being a passive instrument, accurate data on the position of the platform on the lunar surface)

4.4.1 Planning

The services included in the quotation shall comprehend all of those required for the success of the mission, from the integration on the launch to the identification of the payload on a precise position on the lunar surface. Therefore, the present activity shall cover a period of 36 months, assuming a signature in Q2 2024.

4.4.2 Mission Requirements

The following requirements shall be satisfied by the Contractor:

[REQ_01] The platform shall accommodate a NTE Payload mass of 25 grams.

[REQ_02] The platform shall accommodate an envelope dimension volume of 110 mm diameter x 55mm height.

[REQ_03] The platform shall accommodate TBD mounting hole positions, as per DA 13.

[REQ_04] The platform shall mount the payload in a location that provides an unobstructed 60-degree [full or half] cone field of view (exception if during the first lunar day after landing in case other elements could be momentarily obstructing the view);

[REQ_05] The platform shall control the temperature of the mechanical interface between the Payload and lander within [-TBD °C to +TBD °C] throughout all phases of the mission after launch.

[REQ_06] The accommodation shall be compatible with the interfaces specified in DA 13

10 PLANNING AND ACTIVITIES: PHASES AND KEY-POINT EVENTS

The present activity shall cover a period of 36 months measured from the Kick-Off Meeting.

The implementation of the activities must take place ensuring continuity from the Kick-Off Meeting up to the final meeting. The following key events are identified in this period:

Table 1 – Key Events

EVENT	DESCRIPTION	DATE
KOM	Kick-Off Meeting	T_0
PM	Progress Meeting	T_0 + 10 months
FM	Final Meeting	T_0 + 36 months

In the process of drawing up the quotation, the Contractor may propose a plan that is more in line with the organization of the activities. In any case, the planning of events will be established during the signing of the contract.

Following, a brief description of the events:

- **Kick-Off Meeting:** The purpose of the kick-off meeting is to ensure that the contractual objectives are well understood by all project participants, as well as that responsibilities and outputs are clear. In this phase the Contractor presents the temporal programmatic plan that he intends to pursue, the working groups associated with each WP, the summary of the activities to be carried out.
- **Progress Meeting:** The purpose of this progress meeting is to assess the status of ongoing activity related to the integration of the payload onboard the platform.
- **Final Meeting:** The purpose of this meeting is to assess that the objectives of the mission are reached and the data related to the payload onboard the lander are correctly provided by the Contractor to ASI.

11 PROVISION UNDER ASI’S RESPONSIBILITY

6.1 HW/SW

ASI will deliver the Corner-Cube Reflector LaRA2 Flight Model in accordance with the planning proposed by the Contractor to allow tests and integration on the platform.

6.2 DOCUMENTATION

ASI will deliver the datasheet of the Corner-Cube Reflector LaRA2, comprehensive of all the information requested by the Contractor for the acceptance of the payload prior its integration onboard the platform.

7 CONTRACTUAL PROVISION

7.1 MATHEMATICAL MODELS, ALGORITHMS

It is not foreseen the provision of any mathematical model or algorithm.

7.2 PROVISION MANAGEMENT

Each contractual supply element must be documented and identified to allow both identification and acceptance by the Client in accordance with what is identified in this document.

All items of supply transmitted, stored and/or transported shall be treated and protected in accordance with industrial security standards to prevent unauthorized access. For classified elements, the laws and regulations in force apply.

7.3 INTELLECTUAL PROPERTY

Intellectual Property, know-how, patents, rights, future use and licenses must be regulated as established in [DA 02], art.33.

7.4 HW/SW

No provision of HW/SW are expected.

7.5 DOCUMENTATION

The documentation to be delivered at the time of the Quotation is shown in Attachment 2.

The documentation shown in Attachment 3 is considered as the indicative one to be delivered according to the identified planning and the Contractor is required, at the time of the offer, to draw up the list of documents provided and the necessary ones which will be submitted to the ASI for approval.

The table below shall be filled in and attached to the RfQ according to what indicated in Section 7.4

Agenzia Spaziale Italiana	**PROJECT “LaRA2”** **DELIVERABLES HARDWARE AND SOFTWARE**					
PRODUCT	**QUANTITY**	**MODEL**	**REFERENCE WP**	**EVENT**	**LOCATION**	**NOTES**

N/A in this case

The table shows the minimum documentation to be delivered in the quotation document package

Agenzia Spaziale Italiana

PROJECT "LaRA2"

Deliverable Documents expected in the Quotation package

CODE	TITLE	ASI / RESP	DELIVERY EVENT	RIF
DEL 001	Quotation (main document)		Quotation	
DEL 002	Work Breakdown Structure		Quotation	
DEL 003	Work Package Description		Quotation	
DEL 004	Statement Of Compliance to the technical requirements		Quotation	
DEL 005	Industrial Structural Organization		Quotation	
DEL 006	Configuration and Data Management Plan		Quotation	
DEL 007	Procedure for the handling of ASI's provisions		Quotation	
DEL 008	Contractor-Statement of Work		Quotation	

Minimum list of documents expected to be delivered by the Contractor over the course of the Project.

Agenzia Spaziale Italiana

PROJECT "LaRA2"

Deliverable Documents expected over the course of the Project

(minimum package)

CODE	**TITLE**	**DELIVERY EVENT**	
		PM	**FM**
LaRA2 001	Project Management Plan	P	F
LaRA2 002	Product Assurance Plan	P	F
LaRA2 004	Risk Management Plan	P	F
LaRA2 005	Integration and Test Procedures package	F	F
LaRA2 006	Integration and Test Reports package	P	F
LaRA2 007	Final Report(*)		F

Where:

P: Preliminary Version

U: Update Version

F: Final Version

(*) The Final Report shall be comprehensive of all the necessary data for the localization of the payload on the lunar surface

WPD form, to be used for the Quotation

WORK PACKAGE DESCRIPTION (WPD)			
Project: LaRA2			
Type of Activity: ……			
Work Package ID	Title	Industry / Organization	WP Responsible (Name)
……..	……..	……	……
Initial Event	Final Event	Links to other WP (if applicable) Reference to Work Package ID	
T_0 + …	**T_0 + …**	……..	
INPUT			
DESCRIPTION OF THE ACTIVITY			
Included activities: Excluded activities			
OUTPUT (DOCUMENT/SOFTWARE/HARDWARE)			