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Contract Opportunity

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Mars Ascent Vehicle Integrated System (MAVIS)

 ACTIVE

Contract Opportunity


Notice ID
80MSFC20ST0312

Related Notice

Department/Ind. Agency
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Sub-tier
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Office
NASA MARSHALL SPACE FLIGHT CENTER

General Information

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Contract Opportunity Type: Sources Sought (Updated)
All Dates/Times are: (UTC-05:00) CENTRAL STANDARD TIME, CHICAGO, USA
 **Updated Published Date:** Jun 11, 2021 08:36 am CDT
Original Published Date: Mar 12, 2020 03:17 pm CDT
Updated Response Date: Jun 21, 2021 12:00 pm CDT
Original Response Date: Apr 13, 2020 10:00 am CDT

Inactive Policy: 15 days after response date

Updated Inactive Date: Jul 06, 2021

Original Inactive Date: Apr 28, 2020

Initiative:

- None

Classification

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Original Set Aside:

■ **Product Service Code:** AR14 - Space R&D Services; Space flight, research and supporting activities; R&D Administrative Expenses

NAICS Code: 336414 - Guided Missile and Space Vehicle Manufacturing

Place of Performance:

■ Description

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Amendment 01 on June 11, 2021

This is Amendment 01 to 80MSFC20ST0312. The purpose of Amendment 01 is the following:

The National Aeronautics and Space Administration (NASA) Marshall Space Flight Center (MSFC) is seeking capabilities from all categories of Small Businesses and HBCU/MSIs for the purpose of determining the appropriate level of competition and/or Small Business and HBCU/MSI subcontracting goals for this requirement.

The North American Industry Classification System (NAICS) Code and Size Standard are 336414, Guided Missile and Space Vehicle Manufacturing and 1,250 employees, respectively.

**Please note: the information provided describes only the currently contemplated possible scope of services and may vary from the work scope in a final Performance Work Statement (PWS) included in any Request for Proposals (RFP).*

Description of Requirement: The Jet Propulsion Laboratory (JPL) has tasked Marshall Space Flight Center (MSFC) with producing the Mars Ascent Vehicle (MAV). This vehicle is required to propel samples of Martian soil into a Martian orbit to rendezvous with an

orbiter for transit back to Earth. MAV consists of a two-stage vehicle and requires first stage and second stage solid rocket motors of different designs. Mars environments will be a significant factor in environmental testing. Planetary protection to Mars and returning is a significant factor in processing and handling of engineering development and flight hardware. The MAV will be integrated on a Sample Return Lander at the Kennedy Space Center (KSC) prior to a tentative launch scheduled for 2028.

This new procurement will be for systems engineering, integration, design, analysis, assembly, and test of the MAV subsystems and integrated vehicles: Engineering Model (EM), Flight Tests (FTs), Flight Model (FM), and Assembly, Test, and Launch Operations (ATLO). The procurement will also include verification and validation of subsystems and integrated EM, FTs, FM, and ATLO vehicles. The Mars Ascent Vehicle Integrated Systems (MAVIS) contract procurement also includes designing and building ground support equipment, test support equipment, handling hazardous materials, transportation logistics, and implementation of planetary protection and contamination control requirements. The MAVIS contract will also include design of the Reaction Control System, Thermal Control System, Avionics, Power, Electrical, and Structures.

Please review the attached DRAFT Performance Work Statement (PWS) and complete the attached table below by Noon CST on 21 June 2021, along with any specific comments to the DRAFT PWS.

No solicitation exists; therefore, do not request a copy of the solicitation. If a solicitation is released, it will be synopsized on SAM at SAM.gov. It is the potential offeror's responsibility to monitor this site for the release of any pre-solicitation synopsis and solicitation.

The requirement is not considered a commercial type service. This is for information and planning purposes and is not construed as a commitment by the Government nor will the Government pay for information solicited. Respondents will not be notified of the results of the evaluation. All responses shall be submitted in writing to Melody Hinkle, at melody.f.hinkle@nasa.gov.

Update 3/20/2020 - Questions and Answers

Question 1: Is there an incumbent contract/contractor currently fulfilling these services? If so, would it be possible to get the contract number, duration and value?

Answer to Q1: There is not an incumbent contract/contractor currently fulfilling these services.

The National Aeronautics and Space Administration (NASA) George C. Marshall Space Flight Center (MSFC) is seeking information from industry that can provide launch vehicle assembly, integration, and test services (AI&T) for the Mars Ascent Vehicle (MAV) project.

As a proposed part of the potential Mars Sample Return (MSR) campaign, the MAV will launch off the Mars Sample Return Lander (SRL) and transport Mars samples in its MAV Payload Assembly (MPA) from the Martian surface into Mars orbit for rendezvous with an awaiting spacecraft.

Currently, the MAV is anticipated to be a two-stage solid rocket vehicle roughly 3 meters in length, 0.5 meters in diameter, and 525 kg in gross liftoff mass. Both stages feature a thrust vector control (TVC) system. The second stage carries the bulk of the MAV avionics, as well as the hydrazine-based reaction control system (RCS).

The MAV project and its design will be managed and conducted by NASA MSFC. As for the integration and testing of the MAV vehicle units, it is assumed that – for planning purposes – AI&T services will be needed for four MAV units plus a shipset of spare parts (total number of vehicle units to be baselined at a later date), including:

- MAV-EM: Engineering model unit used for integrated vehicle qualification testing. This vehicle unit will have inert motors and no ordnances/hazardous materials and require full forward planetary protection controls and measures during its AI&T process.
- MAV-FT: Flight test model unit used to perform a flight test on Earth. This vehicle unit will have live motors with ordnances/hazardous materials.
- MAV-Flight: Flight model unit used to perform the Mars mission. This vehicle unit will have live motors with ordnances/hazardous materials and will require full forward planetary protection controls and measures during its AI&T process.
- MAV-ATLO: A combination of the MAV-Flight's forward structure element and the MAV-EM's propulsion element. This hybrid vehicle's purpose is to support the SRL in performing integrated SRL/MAV acceptance testing where the MAV's flight model avionics is necessary, but necessitating the exclusion of the live flight model motors.
- MAV-Spare: This unit will consist of a complete, unassembled shipset of spare parts. Some of the parts will be assembled into major assemblies for rapid line replacement if needed.

Specifically, NASA MSFC is looking for interested sources with the following capabilities:

- **Part I – Vehicle Assembly and Integration:**
 - Planning and execution of the physical assembly and integration of the MAV-EM, MAV-FT, MAV-Flight, and MAV-ATLO vehicle component

assemblies onto the primary structure of the vehicle, as well as the integration of the stages of the vehicle into an integrated vehicle. Assembly and integration activities include but is not limited to receiving and processing component assemblies prior to vehicle integration; cabling, wire harnesses, and sensors routing and mounting; thermal protection system (TPS) installation and closeouts; secondary structure and mechanisms integration onto the primary structure; and pre-ship and post-ship processing of the vehicle units. Forward planetary protection procedures must be applied during assembly of the MAV-EM, MAV-Flight, and MAV-ATLO vehicle units. This includes planning and execution of the physical assembly and integration of major assemblies from the MAV-Spare shipset spare parts as needed to recover from off-nominal occurrences during the AI&T process.

- Planning and execution of integrating the MPA onto the integrated MAV-EM vehicle.
- Participate in MAV design and development processes to ensure manufacturability, storability, transportability, accessibilities, and other AI&T supportability qualities in the MAV unit design.
- Provide auxiliary support in the planning and execution of integrating the MAV-ATLO and MAV-Flight vehicle onto the SRL.
- Provide auxiliary support in the planning and execution of integrating the MAV-FT vehicle onto the Flight Test System (FTS).
- **Part II – Vehicle Tests and Test Support:**
 - Planning and execution of integrated MAV-EM, MAV-FT, MAV-Flight, and MAV-ATLO vehicle physical and electrical functional checkouts and acceptance testing to ensure that the integrated vehicle is assembled and integrated correctly. These functional checkout tests include but are not limited to avionics and power, TVC system, RCS, and thermal functional checkouts. This also includes mass properties measurements of the vehicle units. These tests do not include any subsystem or component qualification testing.
 - Planning and execution of the integrated MAV-EM qualification tests including environmental tests (e.g. thermal-vac, vibe and shock, acoustics, electromagnetic interference and compatibility, etc.) to ensure that the integrated vehicle design is able to survive and operate under designed-to mission environments.
 - Provide auxiliary support for integrated, MAV-only systems development testing, including subsystem development tests requiring the use of a prototype or more mature MAV vehicle. This also includes any necessary trips to testing facilities for test support and oversight. This element also includes any retesting necessary and facility costs for the activities.
 - Provide auxiliary support for integrated SRL/MAV development testing, including integrated structural, interface, launch, and thermal testing. This

also includes any necessary trips to testing facilities for test support and oversight. This element also includes any retesting necessary. Some on-site support is anticipated to be needed at the Jet Propulsion Laboratory (JPL) in Pasadena, California.

- Provide auxiliary support for integrated MAV/MPA development testing, including integrated structural, interface, and thermal testing. This also includes any necessary trips to testing facilities for test support and oversight. This element also includes any retesting necessary and facility costs for the activities. Some on-site support is anticipated to be needed at JPL in Pasadena, California.
- Provide auxiliary support in the planning and execution of the integrated SRL/MAV-ATLO acceptance test program.
- Provide auxiliary support in the planning and execution of the flight test from a MAV-FT AI&T engineering standpoint.
- **Part III – Flight Vehicle Mission Support:** Provide auxiliary support for the planning and execution of the flight mission from a MAV-Flight AI&T engineering standpoint.
- **Part IV – AI&T Facilities in support of Part I and Part II:** This element includes planning, procuring, refurbishing, furnishing, and/or standing up facilities and related assets required for housing the AI&T activities for the MAV vehicles and performing the required qualification and acceptance tests. This also includes all necessary, supporting efforts, like required documentation, approval, and certification processes. This element is also responsible for setting up and maintaining planetary protection-level cleanliness and controlled environments for vehicle assembly of the MAV-EM, MAV-Flight, and MAV-ATLO vehicle units. This does not include facilities where the MAV vehicle unit is to be integrated with the SRL or FTS (e.g. facilities at KSC, Wallops Flight Facility, etc.), nor does it include facilities where integrated SRL/MAV development tests are to take place (e.g. facilities at JPL).
- **Part V – Vehicle Transportation in support of Part I and Part II:** This element includes planning, procuring, and managing transportation services for all the integrated MAV vehicles, line-replaceable units (LRUs), and major subassemblies. Transportation includes but is not limited to moving of MAV vehicle units and major subassemblies amongst integration facility site(s), test facility site(s), and NASA centers as needed. This element is also responsible for obtaining or producing all MAV vehicle transportation certifications, approvals, procedures, and any other related documentation, as well as perform all processes necessary to facilitate the safe transportation of the MAV integrated units and major subassemblies.

- **Part VI – Vehicle Ground Support Equipment (GSE) in support of Part I and Part II:** This element includes the planning, design, procuring, load testing, and managing GSE necessary to perform any of the other AI&T tasks specifically related to the MAV integrated units or its major subassemblies. This includes MAV vehicle carts, dollies, breakover and lifting equipment, measuring equipment, fixtures, containers, jigs, and other hardware needed to handle the MAV vehicle or its major subassemblies. This also includes providing engineering support to review, assess, and participate in MAV design work to ensure proper logistical and physical compatibility and operability between the GSE and the vehicle units and major subassemblies.
- **Part VII – RCS Assembly and Integration:** Planning and execution of the physical assembly and integration of the RCS components and subassemblies onto the primary structure of the MAV-EM, MAV-FT, MAV-Flight, and MAV-ATLO vehicle. This includes planning and execution of the physical assembly and integration of shipset spare RCS parts as needed to recover from off-nominal occurrences during the AI&T process.
- **Part VIII – Avionics Assembly and Integration:** Planning and execution of the physical assembly and integration of the avionics components and subassemblies onto the primary structure of the MAV-EM, MAV-FT, MAV-Flight, and MAV-ATLO vehicle. This includes planning and execution of the physical assembly and integration of shipset spare avionics parts as needed to recover from off-nominal occurrences during the AI&T process.
- **Part IX – Thermal Control System Assembly and Integration:** Planning and execution of the physical assembly and integration of the thermal control system components and subassemblies onto the primary structure of the MAV-EM, MAV-FT, MAV-Flight, and MAV-ATLO vehicle. This includes planning and execution of the physical assembly and integration of shipset spare thermal control system parts as needed to recover from off-nominal occurrences during the AI&T process.
- **Part X – Review Milestones Support:** Support NASA MSFC, MSR, SRL, and MAV major milestone reviews and technical interchange meetings, beginning with the MAV project's System Requirements Review (SRR) milestone. This includes all necessary travel, preparing and presenting data, and providing document and artifact deliveries in support of Parts I – IX.

The anticipated NAICS code for this requirement is 336414 “Guided Missile and Space Vehicle Manufacturing”.

**Please note: the information provided describes only the currently contemplated possible scope of services and may vary from the work scope in a final Performance Work Statement (PWS) included in any Request for Proposals (RFP).*

Statement of Capabilities:

NASA MSFC is seeking capability statements from all interested parties, regardless of business size or status, for the purposes of determining the appropriate level of competition for this requirement. Interested parties that have the experience base, expertise, and capabilities necessary to meet or exceed the stated requirements are invited to submit a response to this sources sought notice.

Response Instructions: We request responses no later than 10:00 a.m. on April 20, 2020 – in the form of written and illustrated concepts, ideas, and descriptions of capabilities. Responses shall be submitted via email to Cynthia Hubbard (cynthia.a.hubbard@nasa.gov). Phone calls will not be accepted. The subject line of the submission should be “RFI MAV AI&T” and attachments should be in Microsoft Word, PowerPoint, or PDF format. Files should not be greater than ten (10) pages (no less than 12-point font, except in figure captions) and contain the following information:

1. Name of submitter and contact information, phone number, email address, and address of firm
2. Identification of business size under anticipated NAICS code 336414
3. CAGE code/DUNs number
4. Number of years in business and list of customers for the past five years: The Government encourages respondents to provide a list of customers for the past five years that helps demonstrate the respondent firm's capabilities and experiences. (Interested parties may opt to present a subset of past customers that is most relevant to the requirement.)
5. Discussion of past experiences and performances relevant to the requirements above, including supporting evidence from past projects or programs
6. Statement of current capabilities and qualifications that address the respondent's ability to provide support which meets the requirements specified above

Place of Contract Performance:

No contractor personnel is expected to be located on-site at NASA MSFC, but they will travel occasionally to MSFC, the Jet Propulsion Laboratory (JPL), Kennedy Space Center (KSC), and possibly other NASA facilities to support reviews and technical

interchange meetings. Some activities will require the prime contractor to host government personnel at the prime contractor's facility.

Disclaimer:

It is not NASA's intent to publicly disclose vendor proprietary information obtained from this RFI. To the full extent that it is protected pursuant to the Freedom of Information Act and other laws and regulations, information identified by a respondent as "Proprietary or Confidential" will be kept confidential. It is emphasized that this RFI is for planning and information purposes only (subject to FAR Clause 52.215-3, "Request for Information or Solicitation for Planning Purposes") and is NOT to be construed as a commitment by the Government to enter into a contractual agreement, nor will the Government pay for information solicited. NASA will decide on whether to proceed with a procurement action, based on the responses received.





No solicitation exists; therefore, do not request a copy of the solicitation. If a solicitation is released, it will be synopsized in beta.sam.gov. It is the potential respondent's responsibility to monitor that site for the release of any solicitation or synopsis. The Government intends to review all responses submitted by Industry.

At our discretion, NASA may hold meetings with respondents as needed to clarify responses and obtain further details. No evaluation letters and/or results will be issued to the respondents.

Attachments/Links

Request Access  Download All Attachments/Links

Attachments

Document	File Size	Access	Updated Date
 Draft PWS_MAVIS.pdf	1 MB	 Public	Jun 11, 2021
 Table for Submission.pdf	40 KB	 Public	Jun 11, 2021


Contact Information

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History

-  Jun 11, 2021 08:36 am CDT
Sources Sought (Updated)
-  Jun 11, 2021 08:23 am CDT
[Sources Sought \(Updated\)](#)
-  May 05, 2020 10:55 pm CDT
[Sources Sought \(Inactive\)](#)
-  Mar 20, 2020 11:25 am CDT
[Sources Sought \(Updated\)](#)
-  Mar 12, 2020 03:17 pm CDT
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