

Servicing RFI 2009

This Request For Information closed Friday January 15th, 2010

FEASIBILITY OF USING HUMAN SPACEFLIGHT OR ROBOTIC MISSIONS FOR SERVICING EXISTING AND FUTURE SPACECRAFT

Solicitation Number:

NNG10FC43-RFI

Notice Type:

Sources Sought

Description

The National Aeronautics and Space Administration (NASA) is soliciting information through this Request for Information (RFI) to improve its understanding of how currently planned and future human spaceflight systems and/or robotic technologies can be used effectively to service a wide range of existing and potential future missions. Opportunities will also be identified for appropriate ground-based activities, in-space development and demonstration activities involving the Space Shuttle and the International Space Station (ISS) that would lead to deployment of currently planned and future human spaceflight-based systems or robotic-based systems. NASA is broadly seeking information concerning technologies, missions, and architectures relevant to on-orbit servicing of spacecraft designed to operate in Low-Earth Orbit (LEO), at Geosynchronous Earth Orbit (GEO), or in the near-Earth environment, including Lagrange points.

Background and Study Plan

NASA has undertaken a study to assess the feasibility, practicality, and cost of servicing satellites using elements of currently planned and future NASA human spaceflight systems and/or robotic technologies. NASA will fully utilize the unique core expertise and competencies for in-space servicing (human and robotic) developed by the NASA Goddard Space Flight Center (GSFC), other NASA Centers, the private sector, other government agencies, and academic partners to meet the objectives of the study. This RFI is the first step in identifying additional relevant expertise and interested partners. NASA will execute a robust study, led by Goddard Space Flight Center under the direction of the Space Operations Missions Directorate (SOMD). The planning activity began in May 2009 and a final report to Congress is due in September 2010.

Potential applications and capabilities for on-orbit servicing, both human and robotic, will be assessed by considering several notional missions selected to represent the range of possible current and future servicing missions. Elements described in the RFI responses will serve as the starting point for defining the notional missions.

In conjunction with this RFI, NASA will conduct an open workshop tentatively scheduled for February 16-18, 2010 to bring potential users and providers of on-orbit servicing capabilities together with the NASA study team. The study team will present the notional mission definition process and the first draft of the notional mission suite. RFI responders will have an opportunity to present ideas, technologies and capabilities as well as forecast existing and planned spacecraft/observatories that would benefit from on-orbit serviceability. The study team will then finalize the notional missions based on the RFI responses and the presentations and discussions at this workshop.

Notional missions might include (but are not limited to) currently planned and future human spaceflight or robotic servicing of space assets to: a) assemble an observatory or spacecraft too large or too fragile to launch; b) replace scientific, communications, or other instruments; c) replenish consumables such as propellant or coolant; d) repair or replace failed or under-performing components; e) dispose of space vehicles at the end of their operational life.

Technologies and concepts considered for a notional mission may include, but are not limited to, a) scientific, communications, or other payloads enabled by on-orbit servicing or assembly; b) relative navigation and machine vision sensors and algorithms; c) robotic systems for on-orbit repair; d) systems for on-orbit fluid transfer; e) vibration or jitter isolation technology; etc.

Once the notional mission suite is defined, for each notional mission the study team will develop a mission concept sufficient to complete an assessment in the GSFC Integrated Design Center (IDC). RFI responders and partners who contribute key ideas used in a notional mission will be invited to participate in this process.

The NASA study team will use the developed mission concept for each of the notional missions to address the questions the study was designed to answer. The feasibility of using the currently planned and future human spaceflight systems for servicing will be assessed by reviewing planned human spaceflight capabilities, identifying potential modifications and enhancements necessary for servicing and then performing a qualitative appraisal of the cost benefit trade space. For all servicing architectures and applications, technology assessments will be performed and a Technology Roadmap will be developed that identifies the performance required for a successful servicing architecture and the current Technology Readiness Levels (TRLs). The Technology Roadmap will identify opportunities for appropriate ground-based activities, in-space development and demonstration activities involving the space shuttle and the International Space Station (ISS) that would lead to deployment of human spaceflight-based or robotic-based systems. The opportunities for building on existing NASA infrastructure, capabilities and operational experience will be assessed. All findings will be reported to NASA Headquarters for disposition at the end of the study period.

RFI and Study Logistics

Descriptions of notional missions and currently planned and future human spaceflight architectures will also be posted to the website. This website will also serve as the repository for all open information submitted and collected during this study. All dates contained in this RFI are tentative. Please consult the website for actual dates and times. Please notify NASA of your intent to participate in these workshops by responding via the website.

RFI Assessment Criteria

The NASA study team will consider the following questions in reviewing RFI responses and selecting the elements that will be included in notional missions.

1. How does servicing using currently planned and future human spaceflight or robotic systems make a previously impossible mission technically feasible?
2. How does servicing using currently planned and future human spaceflight or robotic systems reduce mission risk?
3. How does servicing using currently planned and future human spaceflight or robotic systems offer a significant reduction in the cost of accomplishing the mission?
4. What life-extension or performance enhancements are enabled by servicing using currently planned and future human spaceflight elements or a robotic system?
5. What modifications or enhancements to currently planned human spaceflight systems would further enable servicing?
6. What core technologies enable servicing for more than one architecture? What other applications exist for this technology? How could the ISS be used to further the development of this technology?
7. What architectures enable servicing of multiple missions?

Requested Information

Statements shall be submitted via email, in PDF format, to the following e-mail address: Nylsevalis.Ortizcollazo-1@nasa.gov

Please, make sure that the RFI number is stated in the subject line.

It is NASA's intent to publicly disclose information obtained through this RFI and to incorporate relevant portions in the report to be submitted to NASA Headquarters. Also, the study team will include support contractors from several different companies. Proposers shall not submit proprietary information, export controlled information (including ITAR restricted information) or confidential information in response to this RFI.

In addition to whatever information the responder chooses to provide, each RFI response shall include a cover sheet with the following information:

RFI Response Number and Title:

Responding Organization:

1. Category: List all applicable and provide brief description in less than 20 words.

___ A customer, e.g., science mission enabled by on-orbit servicing or assembly, a satellite in need of refueling, etc.

___ An enabling technology for on-orbit servicing Technologies at TRL 5 or above
Technologies at TRL 4 or below

___ A mission architecture concept

___ Comments/Information on currently planned and future NASA human spaceflight systems

___ Other

2. What is the format of the information you are sending (e.g., brochure, presentation charts, technical paper, etc)?

3. Will you be willing to participate and present your proposed idea at the workshop if invited?

4. Will you be willing to showcase your capabilities to the NASA study team at your location?

5. Is your organization willing to engage in and contribute to developing/enhancing technologies for on-orbit servicing? With NASA only or with other partner organizations?

6. Does your organization have any controlled information (e.g., ITAR, proprietary, competition sensitive) that might be useful for this exercise? If so, are you willing to discuss this information with the civil servant members of the team, if proper

arrangements can be made to protect the information?

7. Provide contact information (organization, name and positions, email, phone number).

No solicitation exists; therefore, do not request a copy of the solicitation. If a solicitation is released it will be synopsisized in FedBizOpps and on the NASA Acquisition Internet Service. It is the potential offeror's responsibility to monitor these sites for the release of any solicitation or synopsis. This synopsis is for information and planning purposes, subject to FAR Clause 52.215-3 entitled "Solicitation for Information or Planning Purposes," and is not to be construed as a commitment by the Government nor will the Government pay for information solicited.

Questions and comments are welcome and e-mail communication is preferred. For Technical related questions please contact Jackie Townsend at jackie.townsend@nasa.gov. For other related questions or comments please contact the Contracting Officer for this action.

Contracting Office Address:

NASA/Goddard Space Flight Center, Code 210.S, Greenbelt, MD 20771

Point of Contact(s):

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