VLBI Antenna Request For Information

Description

The National Aeronautics and Space Administration (NASA) Space Geodesy Project (SGP) is soliciting information to improve its understanding of the interest, capabilities, and Rough Order of Magnitude (ROM) estimates for planning the construction and deployment of up to three Very Long Baseline Interferometer (VLBI) antennas that will be part of a new NASA Space Geodesy Network (NSGN) and the VLBI2010 Global Observing System (VGOS).

In accordance with FAR 15.201(e), the information requested is for planning purposes only and does not constitute a commitment, implied or otherwise, that NASA will take procurement action in this matter. Further, neither NASA, nor the Government will be responsible for any costs incurred in furnishing this information.

Background

The SGP is responsive to two important reports from the National Research Council (NRC): 1) "Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond", a.k.a. the "Earth Science Decadal Survey"; and 2) "Precise Geodetic Infrastructure, National Requirements for a Shared Resource". These reports highlight the importance of maintaining and enhancing the geodetic infrastructure that enables modern geodesy and supports NASA's Earth Science missions.

Geodesy is the science of accurately measuring, with the highest precision, the Earth's geometric shape, gravity and orientation in space, including their evolution in time. Currently, the main space-geodetic systems used to observe the geodetic properties of the Earth are: Very Long Baseline Interferometry (VLBI), Satellite Laser Ranging (SLR), Global Navigation Satellite Systems (GNSS), and the French Doppler Orbitography and Radio-Positioning by Integrated Satellite (DORIS) System. These space-geodetic observations also provide the basis for the reference frame that is needed in order to assign coordinates to points and objects and thereby determine how those points and objects move over time.

The global geodetic infrastructure, with its terrestrial- and space-based assets, enables the realization of the Terrestrial Reference Frame (TRF), the foundation for virtually all airborne, space-based and ground-based Earth observations. Through its tie to the Celestial Reference Frame (CRF) by time-dependent Earth orientation parameters, it is also fundamentally important for interplanetary spacecraft tracking and navigation. The TRF

determined by geodetic measurements is the indispensable foundation for all geo-referenced data used by society. Furthermore, modern geodetic measurements are making fundamental contributions to mitigating the impact of geohazards such as earthquakes, volcanic eruptions, debris flows, landslides, land subsidence, seal level change, tsunamis, floods, storm surges, hurricanes and extreme weather. Geodesy is also at the heart of present day ocean studies and contributes to atmospheric science and hydrological studies.

In 2006, The International VLBI Service for Geodesy and Astrometry (IVS) defined the requirements for a next generation network (VGOS) of broadband VLBI antennas as described in technical memorandum number 2006-022v01 found on the IVS website at http://ivscc.gsfc.nasa.gov/publications/memos/index.html. NASA recently implemented the first broadband antenna in this new network at the Goddard Geophysical and Astronomical Observatory (GGAO) in Greenbelt, MD. NASA is also currently building a second station at the Kokee Park Geophysical Observatory (KPGO) on Kauai, HI in partnership with the United States Naval Observatory. Future NASA stations will be based upon the design of the KPGO station with only minor modifications that take into account advances in technology. The interface between the antenna and the Signal Chain Frontend for the KPGO station is documented in the Interface Control Document (ICD) SGP-VLBI-ICD-0002 found on the SGP website at http://space-geodesy.nasa.gov.

Additional information on the SGP can be found on the SGP website at http://space-geodesy.nasa.gov.

Requested Information

This RFI is limited to obtaining the information necessary to assess the interest and improve understanding of existing capabilities for manufacturing and deploying VGOS antennas. See the attached draft Statement of Work for the planned scope and requirements.

Disclaimer

It is not NASA's intent to publicly disclose vendor proprietary information obtained during this solicitation. 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 NOT a Request for Proposal, Quotation, or Invitation for Bid. This RFI is for information and planning purposes only, subject to FAR Clause 52.215-3 entitled "Solicitation for Information or Planning Purposes". This RFI is NOT to be construed as a commitment by the Government to enter into a contractual agreement, nor will the Government pay for information submitted in response to this RFI. No solicitation exists; therefore, do not request a copy of the solicitation. If a solicitation is released it will be synopsized 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. The Government reserves the right to consider a small business or 8(a) set-aside based on

responses hereto. All questions must be submitted in writing via e-mail to all the points of contact as outlined below. As part of its assessment of industry capabilities, the NASA/GSFC may contact respondents to this RFI, if clarifications or further information is needed.

Instructions to Respondents

NASA appreciates responses from all capable and qualified sources including, but not limited to: NASA Centers, universities, university affiliated research centers, federally funded research and development centers, private or public companies, and government research laboratories.

Respondents are required to address the following items and must properly identify/mark any classified and proprietary information:

1. Describe any relevant interest, experience, and capabilities in serving as the developer and installer of VGOS Antennas.

2. Describe any relevant experience in doing business internationally, especially in antenna installations in remote international areas. Please list the countries and the work performed.

3. The government is exploring a hybrid Firm Fixed Price Core/Indefinite Delivery/Indefinite Quantity (IDIQ) contract vehicle that would be comprised of a core component of a fixed price delivery and installation of one VGOS antenna to the McDonald Observatory in Texas with possible tasks for up to two more antennas installed at international sites yet to be determined. The government is interested in finding out if potential contractors believe there are any significant issues with the use of the contractual vehicle and what are the pros and cons to such an approach. Please address in your RFI response.

4. Please provide comments on the attached draft Statement of Work that includes the antenna requirements. Of particular interest are recommended changes to the scope and/or requirements that would result in significant savings in cost and/or schedule.

5. The interface to the KPGO Signal Chain Front End is described in SGP-VLBI-ICD-0002. Please describe how you would adapt your standard designs to conform to this interface and any suggestions for modifying the interface to reduce cost.

6. The signal chain requires accommodation of a helium compressor above the azimuth cable wrap as described in SGP-VLBI-ICD-0002 (section 2.2.1). Please tell us your experience and recommendations in adapting your antenna designs to accommodate the cryogenic Front End hardware as described in the SGP-VLBI-ICD-0002. Please also provide any suggested changes to the interface and rational to simplify the interface, improve reliability, and reduce cost.

7. Describe any areas of technical/development, schedule, or programmatic risk associated with developing and installing the VGOS antennas.

8. Would your company be willing and capable of doing the site preparation for the VGOS antennas? This would include installation of the pad, power, telecommunications but not roads, tree clearing or extensive earth moving. Please answer for locations in the U.S. and for international sites.

9. Provide a rough order of magnitude (ROM) cost and schedule estimates, and identify any non-recurring engineering costs for the following:
    a. Development and deployment of the first, production-version VGOS antenna. For the purpose of the ROM estimate, assume the station must be installed and acceptance tests performed at the vendor's facility. After the first station has been accepted by the government, it should be deployed to the McDonald Observatory in Texas.
    b. Identify ROM costs and schedule for the relevant work packages for developing, integrating, installing, and performing on-site acceptance tests and delivery for the VGOS antenna that meet the requirements listed in the SOW and in the supporting documentation. The schedule should provide an optimal balance between cost and timeliness of system delivery.
    c. Identify ROM costs and schedule for delivery of two (2) optional VGOS antennas and its installation and acceptance testing at your facility. For the purpose of these estimates, assume the antennas will be deployed to sites in Tahiti and Brazil. Identify any potential cost savings and your production approach if these antennas are ordered together or at the same time as the first station.
    d. Identify ROM storage costs at the Vendor facility associated with each antenna should site preparations be delayed by 1-2 years.
    e. Identify ROM costs for supporting the commissioning period as described in the SOW during the field system operating the first VGOS Antenna at Ft. Davis, TX.
    f. Identify ROM costs, schedule, and risks for additional activities associated with the deployment of stations to Tahiti and Brazil, or another international

locations (assume NASA has existing international agreements and partnership arrangements in place for the partner stations).

g. Identify any areas where relaxing the system requirements (such as mean time between failures) would provide significant costs savings, shorten the delivery schedule, or minimize risk. Provide a ROM estimate for these savings.

h. Identify any areas where relaxing the programmatic requirements in the SOW would reduce the administrative burden and provide significant costs savings, shorten the delivery schedule, or minimize risk. Provide a ROM estimate for these savings.

10. Provide the following:
    a. Company name, name of corporate point of contact, telephone number, full mailing address, and e-mail address;
    b. Size of the company, whether small business or not (and include small business category), number of years in business; affiliate information (if applicable): parent company, joint venture partners, potential teaming partners, experience with international site construction;
    c. Corporate competencies;
    d. Past performance information which reflects the company's relevant capabilities, experience, facilities, and/or manufacturing within the last five years. Please provide a brief description of the topic/effort; the value of the action; if your company was the prime contractor or the subcontractor; and the point of contact information (POC) of the customer (name of the company/Agency, customer's name, phone number, and email address).