PR:

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GEORGE C. MARSHALL SPACE FLIGHT CENTER

JUSTIFICATION FOR OTHER THAN FULL AND OPEN COMPETITION

I recommend that NASA, George C. Marshall Space Flight Center negotiate with Teledyne Brown Engineering, Incorporated (TBE), only for all deliverables associated with the Materials Science Research Rack (MSRR), the Microgravity Science Glovebox (MSG) projects, and the International Space Station (ISS) SERVIR Environmental Research and Visualization System (ISERV) Pathfinder. The total estimated cost of this effort is $25M and the estimated period of performance is four years.

This JOFOC proposes to continue the sustaining engineering and integration work for MSRR, MSG, and ISERV currently provided under the Systems Development & Operations Support (SDOS) contract (NAS8-02060) with TBE which is scheduled to end December 31, 2013. It is intended that any new work outside the scope of this JOFOC formerly being performed under the SDOS contract will be competed under Marshall Space Flight Center's (MSFC) Engineering Solutions and Prototyping (ESP) contract.

In order to replace MSRR, MSG, and ISERV work currently being performed under TBE's SDOS contract with a new business entity in this environment will require an estimated $1.66M in duplicated cost to the Government, that would not be expected to be recovered through competition, to bring the new contractor up to speed with the operating hardware. This training and preparation will be required before the new contractor can contribute effectively to the International Space Station (ISS) Program.

The Materials Science Research Rack (MSRR) was launched aboard space shuttle Atlantis on STS -128 on August 28, 2009 and installed on the ISS. MSRR allows for study of a variety of materials including metals, ceramics, semiconductor crystals and glass aboard the ISS. MSRR is housed in the U.S. Destiny Laboratory Module. Materials science is an integral part of development of new materials for everyday life here on Earth. The development of the research rack was a cooperative effort between the Marshall Center and the European Space Agency (ESA). New Sample Cartridge Assemblies (SCAs) are planned for the MSRR. These are joint efforts between NASA and TBE. Working from an original TBE design, NASA will develop a final SCA design, which TBE will build and deliver for use in the MSRR. The SCAs provide containment for samples processed in the MSRR. To date, all SCAs have been built by ESA. This joint effort between NASA and TBE will provide American-produced SCAs that will expand the opportunities for Principle Investigators (PI) from the United States. As previously mentioned, the new SCAs derive their heritage from a former (2004 timeframe) TBE SCA design. MSFC is providing the design work and TBE will provide the hardware and integration effort.

The Microgravity Science Glovebox (MSG), also housed in the US Laboratory, Destiny, enables scientists from multiple disciplines to participate actively in the assembly and operation

of experiments in space with much the same degree of involvement they have in their own research laboratories. Developed by the ESA and managed by NASA's Marshall Space Flight Center (MSFC), the MSG was launched on the Space Shuttle Endeavor, STS-111, ISS Flight UF2, in June 2002. TBE designed and built MSG's Video Upgrade Equipment (VUE) as well as the Life Sciences Ancillary Hardware (LSAH) for NASA. The MSG facility offers an enclosed 255-liter (9 cubic foot) work area accessible to the crew through glove ports and to ground-based scientists through real-time data links and video. Because the work area is sealed and held at a negative pressure, the crew can manipulate experiment hardware and samples without the danger of small parts, particulates, fluids, gasses, or biological material escaping into the open laboratory module.

The ISERV Pathfinder is a camera currently operating onboard the ISS within the Window Observational Research Facility. ISERV provides unique images for disaster monitoring and assessment and environmental decision making. ISERV will aid in delivering imagery and data to officials in developing nations in order to monitor impacts of disasters such as floods, landslides, and forest fires; and help decision makers address other environmental issues as well. TBE was involved in the ISERV project from the start and is the sole developer of ISERV's flight and ground software.

Only TBE has the required skill set to allow the current sustaining engineering and integration work to continue on schedule. Proceeding with TBE allows science from the ISS to continue unabated through the timeframe when the U.S. Government will be reviewing the efficacy of the ISS Program in order to determine whether the life of the ISS should be extended into 2028.

This recommendation is made pursuant to FAR 6.302-1 which implements 10 U.S.C. 2304(c)(1) for acquisition of supplies or services from only one source and no other supplies or services will satisfy agency requirements. Competition is impractical for the following reasons:

1. TBE, under SDOS, and in collaboration with NASA designed the MSRR. They also developed, built and delivered significant components of the MSRR. The knowledge base constructed by TBE during the design and build phase and over the past four years of sustaining engineering cannot be quickly replicated elsewhere. TBE has managed and conducted all activities related to the manufacture, assembly, verification, and test for the MSRR project. This has encompassed the development, fabrication, assembly, verification, and test activities of the various items constituting the MSRR Experiment Carrier (EC) and its direct interfaces. This included the physical integration of the ESA Materials Science Laboratory (MSL) and Furnace Inserts [Solidification and Quench Furnace (SQF), and the Low Gradient Furnace (LGF)] into the EC, and verification of resulting MSRR Facility capabilities and interfaces. This also included establishing and verifying the baseline ISS to MSRR interfaces. In order to replace TBE with a new business entity in this environment would require an estimated delay of three months for training and preparation for the new contractor. It is estimated that it would cost $180,000 in duplicated cost to the Government, which would not be expected to be recovered through competition, in order to bring the new contractor up to speed with the operating MSRR hardware.

2. TBE, under SDOS, has worked very closely with Astrium (Astrium is an aerospace subsidiary of the European Aeronautic Defense and Space Company (EADS)) in association with the MSG. Astrium produced the MSG for ESA. The Video Upgrade Equipment has a facility upgrade that is scheduled to fly on SpaceX 4 in May 2014. The Life Sciences Ancillary Hardware is ancillary hardware and is scheduled to fly on Orbital-1in December 2013. MSG hardware is currently operative aboard the ISS and any perturbation in project flow will directly disturb the flow of science coming from the ISS program. A case in point is the rodent research currently scheduled to begin in MSG in December 2014. This research represents the first animal research performed aboard the ISS. The tissue sampling is essential to biological science and has broad applications to human health. The LSAH hardware is required to be installed, verified operationally, and ready for service before the rodent research can take place. In order to replace TBE with a new business entity in this environment would require an estimated delay of three months for training and preparation for the new contractor. It is estimated that it would cost $1,053,600 in duplicated cost to the Government, which would not be expected to be recovered through competition, just to bring the new contractor up to speed with the operating hardware.

3. TBE, under SDOS, has worked very closely with Astrium EADS in association with the MSRR as well. Astrium performed all the analytical integration work for the MSRR's MSL. Astrium built and delivered the MSL for ESA, designed and builds the ESA SCAs, develops the processing profiles in conjunction with the Principle Investigator, provides (through ESA) the verifications required for flight readiness, provides real-time support to MSL operations, and provides trouble-shooting for on-orbit problems related to MSL. The combination of knowledge between TBE and Astrium gives MSFC the full corporate knowledge of the MSRR/MSL. TBE has used Astrium's drawings and documentation and understands their design. TBE and Astrium have an excellent working relationship spanning the conception, build, test, launch, and on-orbit operation of the rack.

4. MSG has been approved by the ISS Program to implement a new modular front window. The modular front window is removable and will allow hardware to enter and exit through a much larger opening. TBE has a long established relationship working with the foreign national vendor, MOOG Bradford (Heerle, The Netherlands), which is building the window. TBE's use of the vendor's documentation as well as their understanding of Bradford processes was instrumental in gaining ISS approval for this modification. Because the vendor does business in a different culture, the elements of communication can be challenging. TBE personnel have established credibility and gained the trust of MOOG Bradford personnel, in a one-on-one manner, to elicit this unique capability.

5. The new MSFC SCA design has been developed using a TBE design from a previous project. TBE, under SDOS, has manufactured and integrated the thermal probe SCAs that will be used for thermal development testing as well as other hardware to be used during the SCA development and qualification campaigns. TBE, under SDOS, has manufactured many of the parts that make up the SCAs as well as procured long-lead

items that are required for the SCA project to remain on schedule. TBE will perform the integration of the science experiments into the SCAs and their knowledge of the MSRR design and operations will result in efficiencies to the Government. In order to replace TBE with a new business entity in this environment would require an estimated delay of three months for training and preparation for the new contractor. It is estimated that it would cost $381,000 in duplicated cost to the Government that would not be expected to be recovered through competition, just to bring the new contractor up to speed with the new hardware and to enable the new contractor to perform its role assisting with the operation of the hardware.

6. TBE under SDOS and in collaboration with MSFC designed, built, tested, delivered, and supports the ISERV. Flight and ground software are unique applications critical for successful operations of the ISERV Pathfinder. As the sole developer of this software and with the in depth knowledge of the ISERV instrument, TBE possesses the critical experience necessary for ISERV operations and its ability to successfully meet mission objectives. In order to replace TBE with a new business entity in this environment would require an estimated delay of three months for training and preparation for the new contractor and it is estimated that it would cost $45,000 in duplicated cost to the Government, that would not be expected to be recovered through competition, in order to bring the new contractor up to speed with the operating hardware.

Pursuant to NFS 1804.570, this proposed contract action will be published on the NASA Acquisition Internet Service (NAIS), and pursuant to FAR 5.201, this proposed contract action will be synopsized in the Federal Business Opportunities. The results received in writing will be added to this document by addendum.

Market research was conducted per FAR 10.002. This research was performed using internet searches and information gained by talking to fellow NASA employees knowledgeable in MSG, MSRR, and ISERV construction and maintenance. As noted above, while other contractors exist that could produce the needed products - given a lengthy learning cycle, these firms could not produce these products without unacceptable delays in fulfilling the agency's requirements. Additionally, as the estimates of additional cost noted above indicate, there would be substantial duplication of cost to the Government that would not be expected to be recovered through competition.

Technical data packages, specifications, engineering descriptions, statements of work, or purchase descriptions suitable for full and open competition are available; however, competition is impractical for the reasons cited above.

Due to the specialized nature of the requirement, there are no known actions which the agency may take to remove or overcome barriers to competition before any subsequent acquisition for the effort required.

For the above reasons, full and open competition is not feasible. Therefore, purchase of this effort from TBE is the only practical approach.

I hereby certify the facts in this justification and any supporting data used for this justification are accurate and complete to the best of my knowledge.

ORIGINAL SIGNED BY:

Jody A. Singer — Date: 11/12/2013
Manager of the Flight Programs and Partnerships Office

I hereby certify that the above justification is complete and accurate to the best of my knowledge and belief. In addition, I hereby determine that the anticipated cost to the Government will be fair and reasonable.

ORIGINAL SIGNED BY:

Melinda E. Swenson — Date: 11/12/13
Office Manager, Science & Space Systems Support Office

Concurrence:

ORIGINAL SIGNED BY:

Kim E. Whitson — Date: Dec 12, 2013
Procurement Officer

ORIGINAL SIGNED BY:

L. Dale Thomas — Date: Dec. 13 '13
Center Competition Advocate

Approved:

ORIGINAL SIGNED BY:

Patrick E. Scheidermann — Date: 12/16/13
Director