

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
JOHN C. STENNIS SPACE CENTER
STENNIS SPACE CENTER, MS 39529-6000
LIMITED SOURCE JUSTIFICATION**

1.0 AGENCY/CONTRACTING ACTIVITY:

National Aeronautics and Space Administration, John C. Stennis Space Center, Office of Procurement, Stennis Space Center, MS 39529, plans to contract by means other than full and open competition. This document sets forth the justification and approval for award of a Federal Supply Schedule on a limited source basis as required by FAR 8.405-6.

2.0 DESCRIPTION OF THE ACTION BEING APPROVED:

The action to be approved is the sole source procurement of two series 6000 Data Acquisition Systems from Pacific Instruments Incorporation, 4080 Pike Lane, Concord, CA 94520. This requirement is considered to be a commercial item. It is anticipated that this requirement will be provided under a Fixed Price Task Order GSA Contract under the authority of the Multiple Award Schedule Program.

3.0 DESCRIPTION OF SUPPLIES:

The SSC/EA21B at John C. Stennis Space Center, MS, has a requirement for two of the series 6000 Data Acquisition Systems that include: Model 6000U, Mainframe, 16-Slot USB, IRIG; Model 6095, Redundant Hard Drive for 6000U, 130GB; Model 6044 32-Bit Discrete cards; Model 6017-WB 32 Channel MUX Amp-Digitizer Cards, Model 6068-PF4/30K-BU6 2-Channel Transducer Amp with 6-Pole PF 4Hz-30KHz Butterworth with Strain Feature cards Model 6068-FC-1 with 4-step shunt and bridge completion; Model 6068-FC4 Feature cards with IEPE, AC coupled voltage mode; Model CDP-1, Control & Data Processor, Operators Workstation, Local or Remote. Each of the two systems are unique in the number of CDP units and PI6000U chassis due to the physical differences and unique channel counts in each location.

Each of the two systems should be configured with CDP units and 6000U chassis populated in accordance with current I/O DAS configuration. One system specifically requires 10 Pacific 16 slot chassis to accommodate necessary I/O design. There are 10-PI-6000U chassis and 4-CDP units (Control & Data Processors) that should be displaced between two separate buildings and connected via Ethernet network. This will make up one complete DAS system. The first building will serve as the primary DAS building where 6 of the PI 6000U chassis and 2-CDP units will occupy space. Four of the chassis will be configured with Analog cards where 19-32ch-6017 Analog mux cards & 35-2ch-6068 transducer amp cards will be populated with model 6068-FC-1 strain gage bridge completion cards. The 5th & 6th 6000U chassis will be connected along with the four units via USB databus and configured with 17-32ch-Discrete input cards. The 6 chassis just described will be controlled by a single CDP configured to control and capture data from the 6-6000U chassis. The 7th chassis of the Primary building will be populated with 16-2ch-6068 cards and will be controlled by a separate CDP which is connected via Ethernet for a total of 7-6000U chassis and 2-CDP units in the primary building. The second building of this system should be populated with 3 Pacific

Instruments 6000U chassis where they will be connected to the original 7-6000U units and 2-CDP's of the primary building via Ethernet network through the CDPs. One CDP will control a single PI 6000U chassis populated with 4-32ch-6017 Analog MUX cards and 9-32ch-6044 Discrete cards. This CDP will be connected into the Ethernet network along with all other CDP's in this system. The 2nd CDP will control 2-6000U chassis. One of the 6000U chassis will be populated with 14-32ch-6044 discrete cards and the second 6000U chassis will be populated with 7-32ch-6017 Analog MUX cards. These 4 CDP's units which are controlling their various PI-6000U chassis will be networked via Ethernet into a 5th CDP which will be configured as an Operator's Work Station. The Operators workstation will act as a remote CDP that controls the local CDP's connected to the PI-6000U chassis. All hardware described above will be designated into existing equipment bays.

A second system should consist of 5-PI6000U-16 slot chassis and 3-CDP units. One CDP will control 1-PI6000U chassis populated with 16-2ch-6068 cards. The second CDP will control 3-PI6000U-16 slot chassis populated with 20-32ch-6044 discrete cards among 2 of the chassis and 4-32ch-6017 Analog MUX cards populating the 3rd chassis. A 5th and final 6000U chassis will be controlled by a 3rd CDP and the chassis will be populated with 8-32ch-6017 Analog MUX cards. The three CDPs will be connected via Ethernet. A 4th CDP will be located in the TCC and configured as an Operator's Work Station. The Operators workstation will act as a remote CDP that controls the local CDP's connected to the PI-6000U chassis.

To accommodate the additional equipment described above in the second system, two new 19 inch rack enclosures will be located near existing equipment bays.

For both systems the local operator's control, located within the racks near the PI-6000U chassis, should be networkable to preexisting assets and a remote Pacific Instruments model CDP operator control unit located approximately 1000 feet away within the facility's Test Control Center. The equipment should be networkable through Gbit Ethernet switches with fiber interface. The discrete channels and the analog channels should be connected into the facility's existing BNC and WAGO terminal interface with the custom built DB50 to BNC cables.

4.0 ESTIMATED DOLLAR VALUE:

The total estimated cost of this effort is [REDACTED]

5.0 STATUTORY AUTHORITY:

This recommendation is made pursuant to FAR 8.405-6(b), for the acquisition of supplies or services restricted only to the item peculiar to one manufacturer (e.g. brand name)."

6.0 NATURE OF THE ACTION THAT REQUIRES USE OF THE AUTHORITY CITED:

- 1) The existing Low Speed Data Acquisition Systems within the E-complex test facilities at SSC are currently operating beyond anticipated life expectancy and the equipment is no longer being supported by the manufacture. The test complex Data Acquisition Systems are significantly degrading, and spare parts have been depleted. Data Acquisition Systems equipment is presently being removed from empty test cells for maintaining failing equipment in support of current test programs. This has left parts of the E-Complex DAS inoperable, and it has elevated the risk of

significantly impacting a test program. Consequently, existing Data Acquisition Systems equipment will need to be replaced in order to maintain current and future test activities. The E2 & E3 DAS Upgrades Project is in progress to economically replace the aging equipment in E2 Cell 1 and E3 test complex Low and High Speed Data Acquisition Systems with commercial-off-the-shelf hybrid systems. The equipment listed herein will alleviate the aging Data Acquisition System issues. The procurement will provide comparable systems for the E2 Cell 1 and E3 that are identical to the equipment recently installed into E1 Cell 1, Cell 2, Cell 3, Facility and Dacs Lab Data Acquisition Systems as part of the E1 DAS Upgrades project. As part of the E1 DAS Upgrades Project the Pacific Instruments PI660-XPS site-license off-the-shelf software was purchased with unlimited use on-site at SSC. The PI660-XPS software provides turn-key operation of the PI 6000U data acquisition system hardware and as such there is no need to purchase this software again. Available hardware options for replacing obsolete equipment were evaluated, and the design configuration at the E-Complex was assessed with deliberation made for existing hardware, capability, and in-house cost for integration of upgraded components. Compatible Data Acquisition System suppliers were then considered; cost versus compatibility and capability of each. The Pacific Instruments Series 6000 Data Acquisition System was identified as the suitable off-the-shelf replacement with comparable capability. Employing other systems will result in a significant schedule increase with notable impacts to current and planned test programs.

- 2) Currently, the test complex utilizes and intends to continue the employment of an estimated value of ██████████ in preexisting Pacific Instruments signal conditioning amplifier equipment. These assets interconnect instrumentation to the Low Speed and High Speed Data Acquisition Systems. The Pacific Instruments Series 6000 Data Acquisition System equipment listed herein can be employed in a manner for continuing to utilize the preexisting Pacific Instruments signal conditioning amplifier assets. No other supplier provides Data Acquisition System equipment more suitable for use with the existing Pacific Instruments equipment.
- 3) The Pacific Instruments Series 6000 Data Acquisition Systems are in accordance with maintaining commonality with other SSC propulsion test complex systems in existence across SSC and with other NASA center test facilities. The new SSC A3 test facility is currently outfitted with Pacific Instruments Data Acquisition Systems and a system is also currently in use at the SSC A1 test facility for the RS25 project. NASA Marshall Space Flight Center has also retrofitted its propulsion test facility with Pacific Instruments Series 6000 Systems, and the White Sands Test Facility also utilizes a large quantity of Pacific Instruments Series 6000 Systems. The data acquisition equipment is currently accepted as reliable throughout the propulsion test community. The equipment listed herein is controlled, operated, and maintained likewise. This commonality permits personnel from across the center to be intricately familiar with the equipment which intern reduces cross-training, promotes support across test facilities, provides hardware interchangeability, and establishes a more knowledgeable test community.
- 4) The Pacific Instruments Series 6000 Data Acquisition Systems listed herein are manufactured in a way that will minimize replacing existing facility cabling while enhancing the manageability of the current test facilities data acquisition systems; calibrations, data collection, data processing, data distribution to display systems. The electrical characteristics and equipment configuration will allow the systems to be installed without significantly effecting current hardware arrangements. Additionally, the Series 6000 systems are the only comparable systems identified with the capability for reducing the overhead cost associated with the DAS operation. The

systems can be integrated without impacting current pretest setups, test calibrations and post test data processing processes.

7.0 SOLICITATION EFFORTS:

No other vendors are available for purchasing the Series 6000 Data Acquisition System from Pacific Instruments Inc, since they are the sole provider of the specific hardware.

8.0 COST CERTIFICATION:

Historical pricing shall be used to determine that the proposed price is fair and reasonable and that the order represents the best value consistent with FAR 8.404(d). Therefore, ordering activities are not required to make a separate determination of fair and reasonable pricing, except for a price evaluation as required by 8.405-2(d). By placing an order against a schedule contract using the procedures in 8.405, the ordering activity has concluded that the order represents the best value (as defined in FAR 2.101) and results in the lowest overall cost alternative (considering price, special features, administrative costs, etc.) to meet the Government's needs.

9.0 THE EFFORTS TO IDENTIFY ADDITIONAL SOURCES INCLUDING THE MARKET RESEARCH CONDUCTED:

Available hardware options for replacing obsolete Tustin Analog to Digital DAS equipment were evaluated. Initially, the design configuration at E-Complex was assessed with deliberation made for existing hardware, capability and in-house cost for integration of upgraded components. Compatible Data Acquisition System (DAS) suppliers were then considered; cost versus compatibility and capability of each. The NI PXI Express DAS and the RC electronics DTX-9000 DAS were identified as two of the leading competitor systems reviewed for consideration as replacement data systems. As part of the consideration of a new DAS system the approach was to keep with a plan to maintain commonality between SSC Test complex systems; to go with equipment that was reliable and serviceable. Thus, reviewing the equipment purchased for the new SSC A3 test facility and what some of our other sister NASA centers use, the path to hardware selection was influenced. The A1 installed PI equipment (loaned from A3) utilization for signal conditioning on the current RS25 project and the newly installed E1 PI6000 DAS systems have allowed hands-on site evaluation in addition to providing operational performance of the PI DAS system hardware. Having already purchased the PI660-XPS off-the-shelf software eliminates the need for additional software purpose. An early December 2012 site visit to MSFC also provided information and valuable feedback of a complete upgraded PI DAS system being operated on a test project. MSFC DAS engineers and operators discussed their likes and dislikes of the PI equipment as well as demonstrated their new PI DAS Equipment.

For Federal Supply Schedules, the requirement for a synopsis is waived based upon FAR 5.202(11). Also see 8.404(a).

10.0 OTHER SUPPORTING FACTS:

The market values of the PI DAS equipment were compared with the SSC NNS08AA99B "Low Speed Data Acquisition System" IDIQ with RC Electronics Inc. and the NI equipment list prices. Hence, the PI 6000 DAS equipment GSA pricing was deemed to be at a fair market value, and the

Pacific Instruments model 6000 equipment was identified as the required upgrade replacement hardware.

11.0 ACTIONS TO OVERCOME BARRIERS TO COMPETITION:

SSC/EA-31 and Office of Procurement will continue to review changing market conditions to ensure all potential offerors are afforded an equal opportunity to provide subject requirement and will perform market research as applicable to satisfy the Competition in Contracting Act.

12.0 TECHNICAL REPRESENTATIVE CERTIFICATION:

Based on the above, I recommend this acquisition be conducted on a limited source basis. I certify that technical data which form a basis for this justification, that are the responsibility of technical or requirement personnel are complete and accurate.



Scott Jensen/EA31
AST, Electronics Engineer

6/30/2014

Date

Based on the above, I recommend this acquisition be conducted on a limited source basis. I certify that technical data which form a basis for this justification, that are the responsibility of technical or requirement personnel are complete and accurate.



Dwayne Stockstill/EA21
AST, Electrical Engineer

6/30/2014

Date

13.0 APPROVE/DISAPPROVE:

I certify that this justification for other than full and open competition is accurate and complete to the best of my knowledge and belief. I further certify that the anticipated costs to the Government will be determined fair and reasonable prior to award in accordance with FAR 8.404(d).

SUBMITTED BY:


Gerald L. Norris
Contracting Officer and Division Chief / DA10

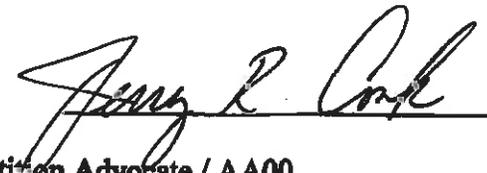
7-18-14
Date

CONCURRENCE:


Robert S. Harris
Procurement Officer / DA00

7/22/14
Date

APPROVAL:


Jerry R. Cook
Center Competition Advocate / AA00

7.22.2014
Date