NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
JOHN C. STENNIS SPACE CENTER
STENNIS SPACE CENTER, MS 39529-6000

JUSTIFICATION FOR OTHER THAN FULL AND OPEN COMPETITION

1.0 AGENCY/CONTRACTING ACTIVITY

National Aeronautics and Space Administration, John C. Stennis Space Center, Office of Procurement, Stennis Space Center, MS 39529

2.0 DESCRIPTION OF THE ACTION BEING APPROVED

The action to be approved is the sole source procurement of two High Pressure Liquid Nitrogen Pump Skids from Pittsburgh Cryogenics Inc. (PCS) (Imperial, Pa). This contract will be a firm fixed price contract. The period of performance for delivery is 20 weeks after award for the first pump skid and 26 weeks for the second pump skid.

3.0 DESCRIPTION

This procurement is for two Liquid Nitrogen Pump Skids to be installed at Stennis Space Center's (SSC) High Pressure Gas Facility (HPGF). These pumps augment the capacity of the existing pump skid that was developed under Cooperative Agreement NNS07AA36A with Airco Cryogenic Division (ACD) (Santa Ana, CA). This equipment is used to provide the high purity nitrogen that is critical to propulsion testing and test operations on a daily basis. Each pump skid is capable of providing 45 gallons per minute of liquid nitrogen at pressures up to 4,500 psig. The pump skids shall conform in all aspects to the drawing package developed as a part of the above referenced Cooperative Agreement.

Required Devices:

Model	Quantity
5SLSHD Liquid Nitrogen Pumping Skid 2.00" Dia.Bore x 2.25" Stroke	2

Total: 2 Pump Assembles

4.0 STATUTORY AUTHORITY

The statutory authority permitting other than full and open competition is FAR 6.302-1(a)(2)(i)(b) and 10 U.S.C. 2304(d)(1)(a), as there is only one responsible source and no other suppliers will satisfy agency requirements.

5.0 NATURE OF THE ACTION THAT REQUIRES USE OF THE AUTHORITY CITED

The pump skid configuration and connecting facility system were developed under a Cooperative Agreement that modified a general application liquid nitrogen pump skid design in order to achieve the highest possible fluid efficiency and provide the required pressure and flow rate without contamination of the fluid being pumped. The requested equipment is specifically designed to be compatible with facility infrastructure (vessels, piping, vaporizers and controls) located at the SSC High Pressure Gas Facility. This equipment represents a design that has been developed at significant cost to NASA, has been installed and has demonstrated that it meets or exceeds all requirements for the application. Additionally the pump skids were designed to allow certain adaptations including larger motors and larger capacity cold ends that provide a capability to increase the capacity of the skids in regard to flow and/or pressure should future NASA testing activities make it necessary. The pump skid and facility system to which it is integrated is designed to allow a very high level of automation and minimum human intervention during operation. The equipment requested adapted from a mobile configuration commonly used in the petroleum industry where product purity is not an issue to a stationary configuration suitable for pumping high purity liquid nitrogen.

There are attributes and/or features of the equipment requested that represent proprietary knowledge privileged to ACD and Pittsburgh Cryogenics, Inc (PCS). No other supplier can provide the required equipment in the exact configuration as existing installed equipment without access to proprietary information residing within ACD & PCS. ACD and PCS is owned by Cryogenics Industries Group. ACD is the equipment manufacturer and PCS is the serving center. PCS facilities offers the necessary space needed to assemble the skids. ACD will continue to work with PCS in the assembly of the two additional pump skids.

6.0 SOLICITATION EFFORTS

On June 5, 2009 a synopsis was posted to on the NASA Acquisition Internet Service (NAIS) Business Opportunities and Federal Business Opportunities (FedBizOps) websites requesting companies that are interested in providing high pressure liquid nitrogen pump skids to submit a Statement of Capability (SOC). The synopsis closed on June 22, 2009 with (2) two SOC's received from L&S Cryogenics, Inc and PCS. DZ Atlantic and Longhorn West also inquired about the specification; however, they did not provide a SOC.

7.0 COST CERTIFICATION

Historical pricing and market research information shall be used to determine that the proposed price is fair and reasonable. SSC has purchased other reciprocating cryogenic pumps in the past that can be used as a fair basis for cost comparison (if adjusted for year of purchase, flow and pressure capacity, etc.).

8.0 MARKET SURVEY

Two SOC were received in response to the synopsis posted June 5, 2009. The SOC's were reviewed for capability to conform to the specification. It was noted that the SOC from L&S Cryogenics could provide a triplex cryogenic pump; however, the specification requires a quintuplex cryogenic pump. The SOC from PCS could provide the quintuplex cryogenic pump. DZ Atlantic and Longhorn West expressed an interest in the requirement; however after review of the specification, they either did not submit a SOC or submitted a reply that they could not provide the requested product.

Between 2006 and 2008 NASA/SSC sought interest from cryogenic pump manufacturers beginning with companies that have already provided similar equipment to SSC. Other NASA Centers were contacted or visited to investigate whether or not they had identified improved technologies for this purpose or identify companies that have demonstrated their capability in this field. SSC engineers also conducted extensive searches in general industry for manufacturers of high pressure positive displacement cryogenic pumps who offered equipment suited for the application at the HPGF. SSC personnel attended the Offshore Technology Conference (OTC) in Houston, Texas for two consecutive years (June 2006 & June 2007) with one of the specific goals being to identify manufacturers of cryogenic pumps or pump technology that might be suitable or adaptable for the application at SSC. It was at the OTC that SSC representatives identified a cryogenic pump design used in the petroleum industry that had many features desired for the HPGF installation. Some of these features included:

- extremely heavy-duty drive assembly
- proven cold end design
- forced lubrication system
- dry sump drive assembly
- widespread use and good service history in industry applications
- low speed operation
- expandable platform
- a configuration that could be precision cleaned and provide clean product
- highly robust and fluid efficient compared to similar pumps

9.0 OTHER SUPPORTING FACTS

In the mid 1990s SSC and Marshall Space Flight Center (MSFC) procured Liquid Nitrogen (LN) pump systems intended to satisfy the current requirement. Both Centers were completely unsuccessful in achieving a viable pump system that satisfied daily nitrogen production needs at the respective facilities. This effort took several years and represented a combined cost of several million dollars. Neither SSC nor MSFC currently use the pumps procured in that effort. Only some of the ancillary equipment procured during that effort (vessels, piping, electrical components, etc.) were retained and at least partially utilized. During that effort MSFC suffered a gross and costly contamination of their site wide nitrogen system that was attributed to a defect in the design of the pump drives. These unsuccessful efforts prompted SSC to pursue a viable pump skid and system design as a development project that would identify the best available technology, adapt it as necessary to fit the

application requirements and demonstrate it fully satisfied the need. These goals were achieved as a result of the pump skid that was developed under the afore mentioned Cooperative Agreement.

10.0 SOURCES EXPRESSING AN INTEREST IN THIS PROCUREMENT

L&S Cryogenics, Inc
Pittsburgh Cryogenics, Inc
DZ Atlantic
Longhorn West

11.0 AGENCY ACTIONS TO REMOVE BARRIERS

No additional procurements of this equipment (quintuplex pump) at SSC are anticipated. However, in the event of the need of a subsequent acquisition of this equipment, Engineering & Test Directorate will continue to review changing market conditions and advanced cryogenic pumps and technology to ensure all potential offerors are afforded an opportunity to provide this type of requirement. Market research will be performed to satisfy the Competition in Contracting Act for potential future requirements.

12.0 CONTRACTING OFFICER CERTIFICATION

I do hereby certify that the support data under my cognizance that are included in this justification are accurate and complete to the best of my knowledge and belief. In addition, I certify that the anticipated price to the Government will be thoroughly evaluated to ensure that it is fair and reasonable prior to award.

Lawrence Haynes Haselmaier, Sr.
Project Lead
Engineering and Test Directorate

7/10/09
Robert Harris
Contracting Officer / DA00

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.

Pursuant to FAR 5.201, a synopsized was posted in the Government wide point of entry (GPE) (FedBizOpps).

CONCURRENCE: _____ 7/10/09
Susan D. Dupuis — Date
Procurement Officer / DA00

APPROVAL: _____ 7-17-09
~~Patrick E Scheuermann~~ RICHARD J GLADECH — Date
Center Competition Advocate / AA00