NATIONAL AERONATUTICS AND SPACE ADMINISTRATION
JOHN F. KENNEDY SPACE CENTER, FLORIDA

JUSTIFICATION FOR OTHER THAN FULL AND OPEN COMPETITION
(BRAND NAME DETERMINATION)

Revitalize Medium Voltage Systems, Industrial & Payload Areas, PCN 98860

ESTIMATED ITEM VALUE OF LOGIC CONTROLLER: $15,880 per assembly
ESTIMATED TOTAL VALUE OF SINGLE MANUFACTURER ITEMS: $31,000

1.) Based on the justification provided herein, I recommend that an acquisition be made by other than full and open competition for the contract action described below:

2.) This contract action includes the acquisition and installation of a programmable logic controller (PLC) assembly from the Quantum PLC line including, but not limited to, backplane, central processing unit (CPU), input/output (I/O), communications module, and power supply. The manufacturer of this equipment is Modicon of Schneider Electric. The Modicon Quantum PLC is a highly specialized product line used by KSC to perform data collection, signal conditioning, energy management and process control associated with the control and monitoring of all of the KSC facility subsystems (power, water & waste, pneumatics, and heating, ventilation and air-conditioning[HVAC]) as a part of the Kennedy Complex Control System (KCCS).

3.) Design and installation of the KCCS began in 1998 and is the KSC standard for centralized monitor and control of facility subsystems. It has been deployed in over 25 facilities across the center and monitors approximately 150,000 individual facility status points. The KCCS is KSC's replacement for the legacy facility control and monitoring system which relied on a custom, proprietary architecture consisting of Checkout Control & Monitor Subsystems (CCMS) hardware and a unique software instruction set known as GOAL programming. While the legacy CCS met the basic functional needs of facilities monitoring & control, the cost of system maintenance was very high and system interface capability was restricted due to the custom nature of the launch processing system (LPS) system. The new KCCS system, which is based upon industry standard open protocols, has eliminated those restrictions. The KCCS system uses commercial off the shelf (COTS) PLCs and human machine interface (HMI) software. Both the PLC and HMI software were selected based on technical suitability, cost, and industry share determined through extensive market surveys and industry benchmarking with the goal of reducing future system maintenance. The KCCS system uses Modicon PLCs exclusively and system hardware replacement is accomplished by the use of readily available, commercially produced replacement parts (personal computers [PCs], PLCs, etc). The device described in this action is the Quantum model PLC assembly manufactured by Modicon including CPU, I/O modules,

communication modules and power supply. The total estimated cost of the PLC assembly is $15,500. There are 2 units needed for this contract action for a total cost of $31,000. This programmable logic controller assembly is the only equipment capable of full and complete integration within the KCCS hardware, software and HMI environment.

4.) Contracting without full and open competition is permitted pursuant to 10 U.S.C. 2304 (c) (1) because the equipment required by KSC is available from one responsible manufacturer and no other type of equipment will fully satisfy our requirements. There is a reasonable basis to conclude that KSC's minimum requirements can only be satisfied by the unique equipment available from Modicon. The Quantum PLC hardware represents the only device capable of full compatibility with the existing KCCS at KSC.

a. The KCCS system is KSC's central facility monitoring platform. The network protocol standardized for use in KCCS is the Modbus transmission control protocol/internet protocol (TCP/IP) over Ethernet. The Modicon Quantum PLC uses this protocol as its native communication interface. KCCS polls these PLCs providing KSC facility subsystem status to the Complex Control Center (CCC) located in the Launch Control Center (LCC). Data provided by these controllers is monitored 24 hours a day by the KCCS consoles in the LCC and the KSC Utility Plants and is used to ensure all of the facility subsystems are functioning properly.The Modbus TCP/IP driver used to communicate with its field controllers was originally developed by the KCCS system's manufacturer for interface with Quantum PLC. The KCCS interface to the Quantum PLC has been extensively tested and refined by the government to meet operation need. Further, the government, at its expense, has developed interface software within the KCCS system around the Quantum PLC's architecture, register map, and network adapter settings. The use of any other manufacturer's equipment would drive the government to develop a similar interface for another hardware type at a significant cost to the government.

b. The Concept application programming software, currently in use throughout KSC, is the PLC programming tool used by the KCCS developers to program and configure the Quantum PLC controllers. Concept, manufactured by Modicon Inc., allows KSC personnel to program the facility controllers to monitor, control and troubleshoot facility subsystems throughout KSC. This software is tailored for the Modicon line of PLCs and cannot be used to integrate other manufacturer's products. Under this agreement, any and all KSC personnel are licensed to use multiple copies of the programming utility through FY 2015. The government has made a significant investment in the software licensing of the Concept programming tool. The use of another manufacturer's product would drive KSC to develop a similar

development platform around another manufacturer's product line at significant cost to the government.

c. The government has made a significant investment in the KCCS development lab that is used to test new control programs and firmware upgrades prior to deployment on live control systems. The lab is populated with several full rack configurations of Quantum PLC assemblies so it can replicate the existing PLC systems installed across KSC. Substitution of another manufacturers PLC would require building and maintaining a second KCCS development lab at a significant cost to the government.

d. More than 20 KSC onsite NASA and prime contractor personnel have received certified Modicon training on the Quantum PLC and its development platform, the Concept application programming software, for a total cost in excess of $30,000.00. The use of any other manufacturer's equipment would drive the government to develop a comparable level of competence on that device type in addition to maintaining its current competence on the Modicon product.

e. The controllers interface with facility critical systems. Currently, electrical and mechanical construction projects replacing or upgrading facility systems use PLC controllers to automate the facility controls that interface with these critical systems. Controllers used in these applications must be investigated and tested by the government prior to commissioning. The Modicon Quantum PLC has been tested and fully validated for use in process critical applications at the government's expense. This testing includes communications interface testing, vibration tolerance testing, and electromagnetic interference testing. The highly specialized nature of the KSC environment would require a similar level of testing if any other manufacturer's product line was used. The cost to the government to repeat these tests on another manufacturer's PLC would be significant.

f. The government also, as a part of the KCCS project, has repair/exchange agreements and procedures with an authorized Modicon distributor to accommodate equipment service and repair. These contracted agreements and approved operating procedures were developed based on the large number of Modicon items purchased through GSA and are extremely cost effective. The government has invested $34,912.50 in site service agreements. The procurement of any other manufacturer's product line would drive the government to seek similar maintenance agreements with that manufacturer and thus duplicate the government's cost. Due to the smaller quantities involved, these agreements would, likely, not result in repair agreements as financially attractive to the government.

5.) Efforts will be made to ensure that offers are solicited from as many potential sources as practicable. The project specifications for the Modicon PLC, written to

fully explain the government's requirements regarding PLCs that interface with the KCCS, will be included in the solicitation specifications. Additionally, this Brand Name Determination will be posted with the solicitation on the Federal Business Opportunities website at www.fbo.gov.

6.) It is determined that the price of the prime contract, including the price of the Quantum PLC, will be fair and reasonable. The overall competitive nature of this low price technically acceptable procurement will entice bidders to seek the most advantageous pricing from Modicon authorized distributors and supply houses as well as reasonable pricing from all other equipment and material suppliers.

7.) Significant market research was conducted during the period of September 1998 through March 1999 by the KCCS development team. A formal Sources Sought Synopsis was published in Commerce Business Daily from September 1998 through October 1998 to identify commercial vendors capable of satisfying the government's KCCS requirements. An industry trade show was attended in October 1998 to locate additional suitable vendors and products. Interchange meetings were conducted with industry during December 1998 and January 1999. At these meetings, vendors were invited to demonstrate their products and address specific KCCS requirements. Vendors provided product literature and technical information to assist the KCCS team in product comparison. Based on a comparison of the leading manufacturers, NASA determined that the Modicon Quantum best suited the needs of the government.

8.) Future actions to remove barriers to competition will include continued efforts to reach out to other manufacturers for compatible programmable logic controllers in order to reduce the amount of equipment that must be procured on a single manufacturer basis.

Pursuant to FAR 6.303-2(c), I hereby certify that the supporting data furnished in support of contracting by other than full and open competition, under 10 U.S.C. 2304(c) (1), with Modicon of Schneider Electric for the purchase of programmable logic controllers is complete and accurate to the best of my knowledge and belief.

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