

**National Aeronautics and Space Administration  
Lyndon B. Johnson Space Center  
Houston, Texas**

**JUSTIFICATION FOR OTHER THAN FULL AND OPEN COMPETITION (JOFOC)  
Pursuant to 10 U.S.C 2304(c)(1) and FAR 6.302-1**

**Cascade Distillation System (CDS) Development Contract Not-To-Exceed (NTE) Increase**

**1. This document is for the Justification for Other than Full and Open Competition prepared by NASA Lyndon B. Johnson Space Center (JSC).**

**2. The nature and/or description of the action being approved:**

This justification provides rationale for contracting by other than full and open competition with Honeywell International, Inc. (Honeywell) under the CDS contract NNJ12HC22B, for tasks to support the technology development of the Cascade Distillation System (CDS).

A JOFOC for the current CDS contract, NNJ12HC22B, was approved on March 5, 2012. The CDS contract, a Time and Materials (T&M) Indefinite Delivery/Indefinite Quantity (IDIQ) contract, was awarded to Honeywell Inc., with a period of performance of May 15, 2012 through September 30, 2014 and a not-to-exceed (NTE) value of \$1,500,000.00 to support the Crew and Thermal System Division (CTSD) for the NASA Advanced Exploration Systems (AES) organization.

The NTE value was increased by \$500,000.00 to \$2,000,000.00 and the period of performance was extended through March 31, 2015 via modification 16 to the current contract. This increase and extension was needed to continue necessary support required by the AES Program.

This document seeks to obtain approval to increase the NTE value by \$600,000.00, from \$2,000,000.00 to \$2,600,000.00, with Honeywell for the continued acquisition of services to support the technology development of the CDS. The CDS is a wastewater processing subsystem based on centrifugal vacuum distillation and uses an efficient multistage thermodynamic process to produce purified water. The NASA Advanced Exploration Systems organization has identified the development of CDS as a JSC/EC3 water technology development task for fiscal years (FY) 2012-15.

This increase in value is based on the NASA JSC's Crew and Thermal System Division's need to cover the necessary continuing support required by the Advanced Exploration Systems (AES) Program.

**3. Description of the supplies or services required, included an estimated value:**

The technology development task for FY12-14 included the teardown of the CDS thermoelectric heat pump (THP) to define its electrical and mechanical design. This work was then integrated into a NASA-

led trade study that will evaluate the relative benefit of various THP redesign efforts. Following the trade study, NASA undertook efforts to redesign the THP with Honeywell support.

Following completion of the above effort, Honeywell tested the CDS with new bearings (improved in a previous procurement), provided support for testing of the CDS with various waste water streams at JSC, and began design of the next generation cascade distiller.

The additional scope being added to this technology development task for FY15 is to begin with fabrication of the second generation Cascade Distiller (CD). This distiller will be assembled and tested by Honeywell and then delivered to NASA for integration into the CDS test stand and additional testing. In parallel, Honeywell will continue CD development work on the pitot pumps and bearings and provide limited support for design and testing of the CDS at JSC.

The current NTE value will be increased by \$600,000.00, increasing the NTE value under this contract to \$2,600,000.00, with a 3-year period of performance.

#### **4. Statutory authority permitting other than full and open competition:**

The statutory authority permitting other than full and open competition is FAR 6.302-1(a)(2)(iii)(A), which states, "services may be deemed to be available only from the original source in the case of follow-on contracts for the continued provision of highly specialized services when it is likely that award to any other source would result in substantial duplication of cost to the Government that is not expected to be recovered through competition".

Honeywell has unique qualifications that make them the only viable source capable of performing this effort. As the designer and the developer of the CDS technology, Honeywell has unique and proprietary knowledge and extensive operational experience with the CDS. The CDS hardware is owned by Honeywell and currently maintained at Honeywell facilities. Specific design information required for the requested tasks resides within Honeywell. Because previous grants and contracts were for the sole purpose of testing to determine the system's efficiency relative to similar technology, the Government has no existing rights to the CDS hardware or technology.

#### **5. Demonstration that the proposed contractor's unique qualifications or the nature of the acquisition requires use of the authority cited:**

Recovery of potable water from wastewater is essential to the success of long-duration human spaceflight. In 2004, NASA grant NNJ04HF81G was awarded to Honeywell to improve upon the CDS, which is owned and maintained solely by Honeywell. The Honeywell CDS grant resulted in substantial testing through 2009 of a Honeywell-provided CDS test stand at the JSC Advanced Water Recovery Systems Development Facility (AWRSDF). In 2009, U.S. Patent #7610768 entitled "Apparatus and Methods for Water Regeneration from Waste" was awarded in relation to CDS. In 2010, a NASA-sponsored distillation technology down-select committee reviewed CDS results to date, along with other distillation technologies, and recommended NASA continue further development of the CDS. The Honeywell grant concluded in 2010. Honeywell is uniquely qualified to meet the Statement of Work

requirements as the company has previous knowledge in the design, development, and testing of the CDS. Honeywell has conducted testing of the CDS hardware at Honeywell facilities and extensively supported testing of the CDS test stand at the NASA JSC AWRSDF. Honeywell possesses extensive experience with CDS performance data, test results, and hardware performance. Honeywell's qualifications, knowledge, and experience are required for the successful, timely, cost-effective completion of the requested tasks.

**6. Description of the efforts made to ensure that offers are solicited from as many potential sources as practicable:**

In accordance with the requirement at FAR 5.201, a synopsis for this effort was issued on the NASA Acquisition Internet Service on December 18, 2014 and closed on January 5, 2015. The Government solicited interested organization's capabilities and qualifications to determine other possible sources for the requirement.

No responses were received in response to the synopsis.

**7. Determination by the Contracting Officer (CO) that the anticipated cost to the Government will be fair and reasonable:**

The anticipated cost to the Government is determined to be fair and reasonable based on the negotiated rates already set forth in the contract.

Work will be initiated by task/delivery orders under the contract. Prior to the award of any order, a price analysis will be performed and documented to sufficiently determine that the order represents the best value and results in the lowest overall cost alternative to meet the Government's needs. The labor hours and skill mix will be evaluated and approved by the CO's Technical Representative. The CO will then ensure that task order prices are fair and reasonable before award of an order.

**8. Description of the market survey conducted, and the results, or a statement of the reasons a market survey was not conducted:**

From the experience and knowledge of Advanced Water Recovery and Life Support experts in the JSC Crew and Thermal Systems Division and the Contracting Officer's Representative, Honeywell is the unique developer of the CDS technology to its current stage of development for potential NASA-related applications. Honeywell also retains proprietary information rights related to the technology and required for the support of the requested tasks. Honeywell further developed CDS technology to its current stage of development and possesses unique experience and knowledge required for completing the requested tasks. Based on the above information, Honeywell is the only known vendor suitable for the requested tasks.

**9. Other facts supporting the use of other than full and open competition:**

In order to determine the optimal distiller design for the CDS to meet the Government's CDS operation requirements, the experience, expertise, and knowledge acquired from previous CDS technology refinement must be used again.

The cost and schedule impacts related to another source developing the expertise, hardware, knowledge, and experience to design and fabricate a new distiller are prohibitive and not in the best interest of the Government. Extensive time and duplicate costs would be required for any vendor to complete the required research and gain the required knowledge. Honeywell also controls the patent and the only known CDS hardware which is critical to the further development of CDS technology.

Without increasing the NTE for the CDS contract, the tasks described above, along with all other services, will not be possible in FY15 until a new contract is awarded. Furthermore, failure to increase the NTE limit of this contract would result in an undesirable interruption in the development of water processing systems for exploration initiated at the onset of the current contract.

Any course of action other than increasing the NTE limit would severely impact state-of-the-art advances innovated by the performance/services of the CDS Contract. This will disrupt all the on-going services and interrupt final deliveries of critical research solutions and services, thereby posing significant technical risk to NASA's CTSD research.

**10. A listing of the sources, if any, that expressed, in writing, an interest in the acquisition:**

No other sources have expressed interest in this acquisition.

**11. The actions the Agency may take to remove or overcome any barriers to competition before any subsequent acquisition for the supplies or services required:**

The knowledge, expertise, experience, hardware ownership, and propriety rights possessed by Honeywell place them in a unique and solely qualified position for CDS technology development at this time. The current contract includes the appropriate data rights and intellectual property clauses. This will ensure Government rights to any technology that is developed under the performance of this contract and may allow competition for future acquisitions.

The Government will continue to assess the market for any new technologies which may be utilized for future water recovery technology requirements. No additional actions to remove or overcome barriers to competition are anticipated.