NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LYNDON B. JOHNSON SPACE CENTER

JUSTIFICATION FOR OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO FEDERAL ACQUISITION REGULATION (FAR) 6.302-1(a)(2)(iii)

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

2. **The nature and/or description of the action being approved:** This justification provides the rationale for contracting by other than full and open competition for the acquisition of Low Speed Tunnel Testing at the Texas Engineering Experimental Station (TEES).

3. **Description of the supplies or services required, include an estimated value:** The NASA/JSC Aeroscience and Flight Mechanics Division (AFMD) requires access to low speed wind tunnel testing. These tests are essential for providing engineering data to support sudden program changes, such as crew egress modifications, assimilation of the drag chute into the Shuttle design, or design changes to the thruster motor covers. The low speed wind tunnel must be able to accommodate both the NASA/JSC Shuttle vehicle and test requirements for other proposed space transportation vehicles. Additionally, the tunnel must be able to test smaller component parts individually, i.e., the parachute systems, thruster motor covers, and release mechanisms. The contractor is required to operate the tunnel by installing the test model, acquiring data, reducing data, and removing the test model from the tunnel.

   It is unknown when tests will be needed, but once requested, there is often limited time required for the results. The AFMD requires the capability to acquire wind tunnel occupancy time on a very short notice to accomplish these types of requirements. In order for the tests to be performed in a timely manner, the AFMD requires the ability to rapidly and easily transport test models and personnel from NASA/JSC to the test facility. It is essential that the testing facility be in close proximity to JSC. This has proven important in efforts to develop crew egress systems, Shuttle design changes, thruster motor covers, and drop tests of flight vehicles.

   The estimated contract value of the proposed acquisition is $540,000. The period of performance is 5 years.

4. **Statutory authority permitting other than full and open competition:** In accordance with FAR 6.302-I(a)(2)(iii), when services required by the Agency are available from only one or a limited number of responsible sources, and no other type of services will satisfy Agency requirements, full and open competition need not be provided for.

5. **A demonstration that the proposed contractor's unique qualifications or the nature of the acquisition requires use of the authority cited:** TEES is in a unique position to provide the wind tunnel test hours required by this procurement. It is located in close

proximity to NASA/JSC and is the only known wind tunnel facility within a 200 mile radius that can rapidly and easily accomplish the AFMD's testing requirements. This means that testing can be accomplished without unacceptable delay. Other facilities located so far from JSC would require extended travel time and not allow for a short turn-around of test results.

For example, during the STS-117 Space Shuttle mission, a technique for repairing a damaged Orbital Maneuvering System pod thermal blanket needed to be tested quickly with like hardware before it was performed by the crew in orbit successfully. The TEES wind tunnel successfully performed the test during the Space Shuttle mission with extremely quick turnaround time (days), which enabled the safe return of the Space Shuttle Orbiter. JSC personnel (representatives from Engineering, Operations, Extra-Vehicular Activity, and the Flight Crew Office) were able to travel to the TEES wind tunnel quickly to support the test. The wind tunnel test model was driven from JSC to the TEES wind tunnel and the TEES onsite machine shop facility was able to make the modifications necessary to the model to enable a successful test. These test results were essential in determining if the repair technique would work on-orbit. If JSC had been unable to perform the testing on an extremely short turnaround basis such as this, the test results would not have been available in time to make the decision of whether or not the Space Shuttle Orbiter could reenter and land safely. Concerns associated with the lifted blanket included higher than accepted local heating rates as well as the chance the blanket could liberate and impact Orbiter hardware downstream, which could have had catastrophic consequences to both the vehicle and the crew.

TEES' low speed wind tunnel is the only wind tunnel in close proximity to NASA/JSC that can accommodate both the NASA/JSC Shuttle vehicle and test requirements for other proposed space transportation vehicles and can use smaller component parts individually, e.g., the parachute systems, thruster motor covers, and release mechanisms. TEES has the ability to accommodate wind tunnel testing in a test section comprised of a cross section of seven feet by ten feet. A test section of this size will accommodate many of the past Shuttle models used and various other conceptual space transportation vehicles.

The technical quality of the facility is excellent and consistently qualifies to test the Agency's complex space transportation problems accurately. TEES has maintained quality in repeated tests and calibrations by producing consistently smooth flow fields. The flow angularities and velocity profiles in the test section have been mapped, designating the smoothest regions of the test section. This means that risk is reduced because tests can be performed more quickly and with greater accuracy in this facility than in facilities characterized by flow fields that must be accounted for before their impact on test validity can be measured.

6. **Description of the efforts made to ensure that offers are solicited from as many potential sources as practicable:** A synopsis was posted on Fedbizopps.gov on July 27, 2010. No responses were received. The procurement was also posted on the Consolidated Contract Initiative website on July 27, 2010.

7. **Determination by the Contracting Officer that the anticipated cost to the government will be fair and reasonable:** The anticipated costs to the Government are expected to be fair

and reasonable based on historical data from previous market research. Previous contacts with other knowledgeable Government personnel revealed that in comparison with subsonic wind tunnels throughout the country, the cost is reasonable. Previous experience gained with wind tunnel testing during the X-38 program, the Space Shuttle Return-to-Flight efforts, and the Space Shuttle Program also resulted in historical indications of fair and reasonable costs.

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

   A market research was completed. While multiple other low wind speed tunnel test facilities were found across the United States, none were located within a close proximity to NASA/JSC. Therefore, these facilities would not allow for a short turn-around of test results. The AFMD would be required to pay the cost of flying these items to these facilities or take the time needed to drive larger items that would not be able to be taken on airplanes for testing.

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

   Due to the short turn-around cycle for testing, award to any other source would result in unacceptable delays in fulfilling Agency requirements. Some of the items which require short turn-around cannot be flown to another wind tunnel testing location to support the timeframe needed. Other locations will require extended flights because they are so far from JSC. TEES' location within close proximity of JSC allows AFMD's tests to be conducted without extended travel time, thus saving the Government time.

   The relationship of the University to the facility is also a very important factor in the wind tunnel's unique qualifications. NASA/JSC has relied on the strong aerodynamic backgrounds of Texas A&M's faculty and wind tunnel staff. The faculty and staff represent a wide variety of practical aeronautical experience and up-to-date knowledge of current study and research efforts throughout the country. This expertise has supplemented the experience of NASA/JSC engineers in their investigations and testing of aerodynamic modifications and new configurations of vehicles.

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

    No other sources have expressed interest in this requirement. If any potential sources express interest in this procurement prior to award, they will be evaluated against the requirements of the Statement of Work to determine if their capabilities meet the requirements.

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

    The AFMD will continue to conduct market research to look for other low speed wind tunnels that are near NASA/JSC.

Title of Procurement: Low Speed Wind Tunnel Testing

Technical Officer: I certify that the supporting data presented in this justification are accurate and complete.

Katie A. Boyles, COTR — Date

Contracting Officer: I hereby determine that the anticipated cost to the Government will be fair and reasonable and certify that this justification is accurate and complete to the best of my knowledge and belief.

Adrian D. Clayton, Contracting Officer — Date

Title of Procurement: Low Speed Wind Tunnel Testing

Technical Officer: I certify that the supporting data presented in this justification are accurate and complete.

ORIGINAL SIGNED BY

Katie A. Boyles, COTR — Date: SEP 13 2010

Contracting Officer: I hereby determine that the anticipated cost to the Government will be fair and reasonable and certify that this justification is accurate and complete to the best of my knowledge and belief.

Adrian D. Clayton, Contracting Officer — Date: 9-10-10

BH2/AJackson:cc:9/10/10:27522

CODE	BH2/ADC	BH2/RJ	BH/MLI	BH/HB	BD/DRS	AL/RAT	BA/LAK	BA/JMC	
CONCUR	ADC	RJ		HB	DRS				
DATE	9-10-10	9/10/10		9/13/10	9/28/10				

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