

**National Aeronautics and Space Administration
Dryden Flight Research Center
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**Justification for Other than Full and Open Competition
10 U.S.C. 2304(c)(1) FAR 6.302-1**

1. This document is a justification for other than full and open competition prepared by NASA's Dryden Flight Research Center (DFRC).
2. This justification provides the rationale for contracting by other than full and open competition for the acquisition of innovative technologies to assess the structural health of thermal protection systems for reentry aerospace vehicles. The resulting new contract will be with Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) Materials Science & Engineering, Sydney, Australia. CSIRO is Australia's national science agency and one of the largest and most diverse research agencies in the world. It is registered in the Central Contractor Registration (CCR) as a Foreign Government organization.
3. The overall goal of this research and development activity is to develop and demonstrate a structural health monitoring system for thermal protection systems (TPS) that incorporates CSIRO-proprietary topology, sensors and networks, to detect the occurrence and location of damaging impacts. Such technology is uniquely suited to integrate with an optical fiber Bragg grating (FBG) system developed by NASA-DFRC to evaluate the effect of detected damage on the thermal conductivity of the TPS material. This procurement is planned as a five-year IDIQ contract with the value of the first year of \$50K, and a total value of \$500K.
4. Statutory authority permitting other than full and open competition: 10 U.S.C. 2304 (c)(1), Only One Responsible Source
5. The work defined is critically based on previous specific advances in the state-of-the-art made by CSIRO in the development of proprietary architecture. The initial effort is based on CSIRO intellectual property for a fiber Bragg grating network. The proposed network, the electronic control, data acquisition and processing system is based on a CSIRO-specific architecture of a distributed multi-agent system. Such a system has already been developed and demonstrated for detection and diagnosis of impact damage, as part of collaboration between NASA and CSIRO since 2001. Results from the first year of the contract will serve as the main thrust for the four remaining phases of work.
6. The proposed acquisition will be advertised to the public using the Government-wide point of entry (GPE) notice as required by Subpart 5.2. Any inquiries received in response to this public posting will be assessed to determine if there may be adequate

competition available. This JOFOC will be amended to include the assessment made in response to the public posting. A review of the Consolidated Contracting Initiative (CCI) Page did not reveal any contracts that could be used. We did not post this acquisition to the CCI Acquisition Forecast because of the high barriers that are inherent in contracting with a foreign government agency.

7. Market research was conducted and did not result in identification of other potential sources that could satisfy the Government's need. NASA has done research previously with CSIRO that utilizes CSIRO proprietary property integrated with NASA fiber optic technology. Our research did reveal that there are commercial firms that deal with Fiber Bragg grating but the products were limited in scope. The previous use of the CSIRO property with NASA systems would be a unique capability that would take much time and effort to replicate and could not be recovered through competition. As noted earlier, CISRO has proprietary rights that prevent the development of technical data packages, specifications, engineering descriptions, statements of work, or purchase descriptions suitable for full and open competition.

8. Other facts supporting the use of other than full and open competition.

NASA has been engaged with CSIRO starting in 2001 with the last effort being in 2006. In this time period, NASA has issued six purchase orders worth a total of \$404,370 resulting in the issuance of seven technical reports. This does not reflect the investment of resources by CISRO in its technology that it reports as close to \$2 million dollars. The results of the research with CSIRO are being used as the first stage to develop a health monitoring system for the Thermal Protection Systems (TPS) that enable a vehicle to safely re-enter the Earth's atmosphere. The design that NASA is considering is a fiber optic systems built around CISRO's patented network concepts. The investment to reproduce the highly specialized technology products and CSIRO-unique research concepts that NASA requires in order to leverage its research reflect not only the costs previously incurred but also the time invested by both NASA and CISRO personnel since 2001 in integrating the systems and concepts together.

9. The estimated cost of \$500K is the maximum for the IDIQ contract which the contracting officer has determined to be fair and reasonable. Prices will be negotiated at the task order level. While the amounts of the task orders may not normally require a cost analysis, we will request a full review by the Pricing Analyst for each task order in addition to the technical evaluation. Because CSIRO is a foreign government agency, we believe the extra review is needed to determine that the price is fair and reasonable.

10. No other sources have expressed a written interest in the acquisition.

11. Commercial firms can not currently match the systems or concepts required by NASA for this project. Investment over several years to approximate the current concepts and technology currently owned by CSIRO would be required to remove or overcome any barriers to competition before any subsequent acquisition.

TECHNICAL DIRECTORATE: I certify that the facts presented in this justification are accurate and complete.

William Roberts
Signature

April 26, 2010
Date

CONTRACTING OFFICER: I certify that this justification is accurate and complete to the best of my knowledge and belief.

Curtis Paul
Signature

4/26/10
Date