National Aeronautics and Space Administration
Ames Research Center
Moffett Field, California 94035-1000

Justification for Other than Full and Open Competition

[FAR 6.303-2(a)(1)]

Summary Information:

Initiating Office:	NASA Ames Research Center Space Technology Division (Code TS)
Purchase Request No.:	4200416259
Procurement Title:	Thermo Structural Analysis Support and Insight/Oversight for Multipurpose Crew Vehicle (MPCV) / ORION Thermal Protection System and Structures
Total Estimated Value:	**FOIA Ex. 5** (Base plus Options)
Period of Performance:	April 1, 2012 thru October 31, 2014 (Including Option Periods)
Statutory Authority: [FAR 6.303-2(a)(4)]	10 USC 2304(c)(1), *Only One Responsible Source and No Other Supplies or Services Will Satisfy Agency Requirements*

This Justification for other than full and open competition has been prepared in accordance with the requirements of Federal Acquisition Regulation (FAR) 6.303 and NASA FAR Supplement 1806.303.

Detailed Information:

A. Nature and/or description of the action being approved. [FAR 6.303-2(a)(2)]

NASA Ames Research Center (ARC) proposes to negotiate a sole source contract with Neerim Corporation, of Mountain View, CA, as the only responsible source to lead the ORION Main Heatshield ablator and compression pad thermo-structural independent analysis and oversight for NASA. This effort will support the MPCV/ORION Thermal Protection System (TPS) and Structures Subsystems in preparation and support of Exploration Flight Test (EFT-1). This effort will also support post flight test data reduction, evaluation, and correlation with analysis predictions. This requirement also covers participation in the thermo-structural independent analysis effort of the ORION TPS for the ORION Backshell. EFT-1 is currently scheduled for early 2014. Options to extend this contract have been included to cover potential Government delays in the current flight test schedule.

B. Description of the supplies or services required to meet the agency's needs (including estimated value). [FAR 6.303-2(a)(3)]

Task 1 deliverables required to support MPCV/ORION I/O and EFT-1 are summarized by the following specific items:

1. Lead the Heatshield and Backshell thermo-structural analysis team for NASA and Lockheed Martin in support of the MPCV/ORION Exploration Flight Test (EFT-1) including:

a. Perform detailed analyses and flight test predictions in cooperation with NASA personnel and LM personnel of the AVCOAT® ablator TPS system.
b. Lead efforts in independent stress analysis for the AVCOAT® ablator on the main heatshield, ceramic tiles on the Backshell, including calculation of margins of safety for all critical and flight test load cases.
c. Lead efforts in stress analysis for the Compression Pad thermo structural design including calculation of margins of safety for all critical and flight test load cases.
d. Provide recommendations for design improvements for the main Heatshield AVCOAT® ablator, Backshell ceramic tiles, and compression pad carbon phenolic TPS systems.
e. Track progress of the thermo structural analysis team via weekly teleconferences.
f. Update MPCV/ORION TPS and Structures management via weekly minutes, charts, and/or reports.
g. Provide a design overall task status report to MPCV/ORION TPS and Structures management monthly.
h. Provide presentations as required to support MPCV/ORION EFT-1 flight test planning and preparation.
i. Provide reports and presentations as required documenting data recovery, correlation and validation from EFT-1 as compared to analysis predictions.
j. Provide final documentation of the studies, analyses, and processes described above.
k. Attend review meetings and Technical Interchange meetings at contractor facilities and other NASA locations.

2. Participate in TPS subsystem thermo-structural independent analysis and insight/oversight effort for NASA in preparation for the MPCV/ORION Exploration Flight Test (EFT-1):

a. Review the LM developed and implemented Thermo-structural analysis plans and processes for the MPCV/ORION main Heatshield and Backshell.
b. Participate in detailed design evaluations in cooperation with NASA personnel and LM personnel of the main Heatshield (AVCOAT® ablator) TPS system and the Backshell TPS (ceramic tile based) system.
c. Provide support to MPCV/ORION Structures Team in the area of Water Landing Analysis and Model Correlation/Validation.
d. Update MPCV/ORION TPS and Structures management via weekly minutes, charts, and/or reports.
e. Provide a design status report to MPCV/ORION TPS and Structures management monthly.
f. Provide presentations as required to support MPCV/ORION EFT-1 flight test planning and preparation.
g. Provide final documentation of the studies, analyses, and processes described above.
h. Attend review meetings and Technical Interchange meetings at contractor facilities and other NASA locations.

The anticipated period of performance for this procurement is April 1, 2012 thru October 31, 2014 if all options are exercised. The Base Period and Option timelines are as follows:

Performance Periods: 04/01/2012 – 10/31/2012, Base Period
11/01/2012 – 10/31/2013, Option Period 1
11/01/2013 – 10/31/2014, Option Period 2

The option periods have been established to account for potential delays in the EFT-1 schedule and to minimize risk to the Government.

The estimated costs, based on historical cost/price data, are:

POP	Months	Hours/month	Hourly rate	Subtotal	Travel/ODCs	Total
Base period	7	100	FOIA Ex. 5	FOIA Ex. 5	FOIA Ex. 5	FOIA Ex. 5
Option 1	12	100	FOIA Ex. 5	FOIA Ex. 5	FOIA Ex. 5	FOIA Ex. 5
Option 2	12	100	FOIA Ex. 5	FOIA Ex. 5	FOIA Ex. 5	FOIA Ex. 5
					TOTAL	FOIA Ex. 5

Although the Government estimate is based on hourly rates, our intent is to issue a firm fixed price contract.

C. An identification of the statutory authority permitting other than full and open competition. [FAR 6.303-2(a)(4)]

The primary authority sought for this justification is:

10 USC 2304(c) (1), *Only One Responsible Source and No Other Supplies or Services Will Satisfy Agency Requirements*

D. Demonstration of the proposed contractor's unique qualification or the nature of the acquisition requires use of the authority cited. [FAR 6.303-2(a)(5)]

This procurement is an outgrowth of highly specialized work currently being performed by Neerim Corporation under NASA Contract # NNA10DA49C (dated January 29, 2010). It is in NASA's best interests to continue contracting directly with Neerim Corporation in order to obtain the services only Neerim can provide. Neerim's personnel constitute the original and only source for this work. The continuation of these highly specialized services is necessary to support critical thermo-structural analysis and insight/oversight activities prior to and post EFT-1 for the MPCV/ORION Thermal Protection System (TPS) and Structures subsystems.

This critical support effort is anticipated for the period of April 2012 through October 2014. Options will be exercised as needed (through October 2014) to account for any slippage in the EFT-1 schedule and any post flight test data analysis and correlation activities required. Although it is possible that other organizations could develop similar expertise over an extensive period of time, only Neerim Corporation currently possesses the level of expertise necessary to support critical and near term design and development milestones necessary for this support to the MPCV/ORION TPS program and subsequent flight test.

As set forth below, the Neerim Corporation has gained its unique capabilities in supporting ORION Thermal Protection System and Structures through direct and intense involvement of its personnel in ORION TPS development activities to date. To transition the work activities to a new organization without the requisite knowledge of TPS systems and how these systems were designed and are expected to perform, would result in a clear and immediate impact to MPCV/ORION Exploration Flight Test. Neerim Corporation's support is of paramount importance for completion of tasks necessary to ensure that the ORION TPS subsystem and associated Structural components are ready for flight.

The Neerim Corp. has singular expertise in the design/analysis of the Avcoat ablator for the Main Heatshield, Compression Pads, ceramic tile TPS selected for the ORION Backshell, and the TPS structural design, analysis, and testing. With these unique skills and expertise, Neerim personnel have successfully led the thermo-structural analysis effort for the ORION Thermal Protection System ADP, beginning in 2005 through the ORION Subsystem Design Review (SSDR), Preliminary Design Review (PDR), Insight/Oversight effort in (Design Analysis Cycles) DAC-3 and DAC-4, Critical Design Review (CDR), and subsequent work to finalize the design resulting from the changing nature of the MPCV/ORION program. Neerim is also intimately familiar with analyses, testing, and design development currently being performed at Lockheed Martin and NASA, having worked directly with the all of the various TPS sub-contractors and NASA personnel at Ames, JSC, and Langley.

As a result of this design and analysis work, the Neerim Corporation has unique, significant and detailed knowledge in regards to the Avcoat thermo-mechanical properties and the sensitivity of these material properties to the behavior of MPCV/ORION Heatshield. They also have unique, significant and detailed knowledge of the interaction behavior between the Avcoat ablator and the underlying metallic carrier structure and the ORION vehicle structure itself. They also are fully, and uniquely, versed with the compression pad analyses and design, having guided the detailed thermo-structural analysis of this critical part through DAC-3, DAC-4, CDR, and subsequently. No other company possesses this expertise. Continued access to this specialized knowledge and capability is vital to the MPCV/ORION TPS subsystem design leading to the flight test in 2014.

Personnel at the Neerim Corporation have unique, significant and detailed knowledge of the entire Heatshield thermo-structural analysis process and analysis results, thermal behavior of Avcoat, and design aspects of Avcoat, compression pads, and Backshell tiles, as well as the underlying support structures developed over the past several years supporting the TPS ADP, ORION PDR and the subsequent ORION DAC 3 and 4, and CDR. Neerim Corporation's support is vital to the successful completion of the MPCV/ORION Exploration Flight Test. No other company has the required knowledge, skills or capability to fully support all these tasks and activities.

Only a company with existing intimate knowledge and experience with the processes develop during the previous Thermal Protection System work and familiarity with the analyses performed in support of the design of the Avcoat ablator system for the MPCV/ORION Main Heatshield, the ORION Backshell, and the associated support structure, will be able to successfully complete the tasks required for prior to and post flight test. The current MPCV flight test schedule cannot accommodate bringing inexperienced personnel "up to speed" for all aspects described in the SOW.

The Neerim Corporation will fulfill this role and bring this expertise to bear in support of the tasks outlined above in Section B. In particular, the Neerim Corporation's experience will be directly applicable to the Avcoat ablator stress analysis and stress predictions, compression pad design and analysis, Backshell design and analysis, as well as attachment of these items to the ORION primary structure especially as related to critical loading cases such as water landing.

Based on the above, Neerim Corporation, is considered the only responsible source that can perform the requirements.

E. Description of efforts made to ensure that offers are solicited from as many potential sources as is practicable, including whether a notice was or will be publicized as required by FAR Subpart 5.2 and, if not, which exception under 5.202 applies. [FAR 6.303-2(a)(6)]

A synopsis was posted on the NASA Acquisition Internet System (NAIS) and the "FedBizOpps" Federal Business Opportunities Portal on February 2, 2012, to inform the public of NASA's intent to purchase the required services from Neerim Corporation. The synopsis provided instructions for interested organizations to submit capabilities and qualifications to perform the effort to the Contracting Officer. No capability statements were received in response to the synopsis.

F. A determination by the contracting officer that the anticipated cost to the Government will be fair and reasonable. [FAR 6.303-2(a)(7)]

The contracting officer's signature on this document indicates that the contracting officer has determined that the anticipated cost to the government will be fair and reasonable. Prior to execution of the contractual instrument, a proposal analysis will be performed in accordance with FAR 15.404. The proposal analysis will ensure that the final agreed-to price for the contract is fair and reasonable. Analysis will include price evaluation techniques as applicable. Pre-negotiation objectives will be prepared prior to the initiation of negotiations and will be approved in accordance with FAR 15.406 prior to the conduct of negotiations.

The specialized expertise of personnel at the Neerim Corporation has been provided to ARC through several contract instruments over the past decade. Neerim personnel have supported ARC as employees of ARC support service contractors and, after Neerim was established, through subcontracts to ARC support service contractors and direct contracts from ARC to Neerim. Contracting directly to the Neerim Corporation remains the most cost effective and efficient means for the Government to obtain these vital services, eliminating any unnecessary overhead and pass through costs that would result from obtaining these services via a directed subcontract under other existing NASA contracts.

G. Description of the market research conducted and the results or a statement of the reason market research was not conducted. [FAR 6.303-2(a)(8)]

Because of the highly specialized nature of this requirement, and because this is a continuation and outgrowth of work currently being performed, there are no other sources for this work.

The Avcoat TPS is only being developed by NASA, for use on ORION. There are no commercial uses for this TPS and there are no customers for Avcoat other than NASA. This development activity, as a whole, is unique.

The requiring organization has extensive knowledge of the current capability of industry and the availability of this highly specialized expertise. Therefore, the CO has determined that there is no source – other than Neerim – that can provide the highly specialized services now required.

H. Any other facts supporting the use of other than full and open competition. [FAR 6.303-2(a)(9)]

Facts supporting the use of other than full and open competition are set forth in paragraph D. of this document. Neerim personnel have been recognized by NASA and have received numerous awards for excellent performance over the past decade.

I. Listing of the sources, if any, that expressed, in writing, an interest in the acquisition. [FAR 6.303-2(a)(10)]

As set forth in paragraph E, a synopsis was posted on the NASA Acquisition Internet System (NAIS) and the "FedBizOpps" Federal Business Opportunities Portal on February 2, 2-12, for 15 calendar days to notify potential offerors of NASA's intent to enter into contract with Neerim Corporation. No other source expressed interest in this proposed contract modification.

J. Statement of 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. [FAR 6.303-2(a)(11)]

This is a specific requirement to provide on-going support MPCV/ORION development and specifically Exploration Flight Test (EFT-1). Upon completion of the EFT-1, there will be no subsequent acquisition for this specific requirement; therefore, no other non-competitive contracts will be awarded.

Signature Page

Requirement Initiator:
Kenneth R. Hamm, Jr.
Orion TPS Insight/Oversight.

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

Signature — Date: Feb 17 2012

Chief, Space Technology Division:
Dean Kontinos

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

Signature — Date: 2/28/12

Contracting Officer:
Manuel Herrada

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. [FAR 6.303-2(a)(12)]

Signature — Date: 28 FEB 2012

cc (after approval):
JAB/241-1