



August 3, 2015

Reply to Attn of:

12

TO: 12/Research and Development Contracting Branch, Office of Procurement
Attn: C. Lynn Jenkins

FROM: 461/Russell H. Thomas, Aeroacoustics Branch, Research Directorate

SUBJECT: Justification for Exception to the Fair Opportunity Process (JEFOP) for
New Task Order entitled "Reducing Risk To Achieving the NASA N+2 Noise
Goal" with The Boeing Company on Contract NNL10AA05B, Total Estimated
Cost \$2.4M.

In accordance with FAR 16.505, the following information is provided to support this justification:

I. Recommendation

NASA Langley Research Center (LaRC) intends to initiate a new task order with Boeing under the Structures, Materials, Aerodynamics, Aerothermodynamics, and Acoustics Research and Technology (SMAAART) contract. The purpose of this new task order is to reduce the risk to achieving NASA Aeronautics Research Mission Directorate's (ARMD's) 42 decibels (dB) noise goal based on the most advanced, highest fidelity information in support of the Environmentally Responsible Aviation (ERA) Project. Although the ERA Project officially ends in September 2015, the results from this task order will be used by NASA in fiscal year (FY) 2016 for a post-ERA assessment which is intended to reflect the full extent of the knowledge gained from the final period of ERA.

Boeing is the sole source capable of performing the required effort based on the relevance of the Hybrid Wing Body (HWB) advanced vehicle concept to the ERA goals, Boeing proprietary information, and experience with NASA projects. This new proposed task order builds upon past Boeing efforts as described below.

Purchase Request (PR) 4200550101 has been generated to provide funding in the amount of \$2,400,000 for this task order. LaRC plans to utilize the SMAAART contract, which is a multiple award, indefinite delivery/indefinite quantity (IDIQ), cost plus fixed fee (CPFF) contract. The SMAAART contract period of performance is April 13, 2010 through October 12, 2015. All work under this task order will be completed by October 12, 2016.

II. Background

NASA ARMD is pursuing aggressive aircraft system level goals for fuel burn, noise reductions, and emissions reductions. NASA's ERA Project has focused on the mid-term goal set termed N+2¹. The fuel burn goal is a reduction of 50% relative to a best in fleet aircraft in 2005, the noise goal is 42 dB cumulative relative to the Federal Aviation Administration's Stage 4 requirement, and the emissions goal is for a reduction of 75% in nitrous oxide below the Committee on Aviation Environmental Protection Standard Number 6 (CAEP6). The target date is 2020 for key technologies to be at a technology readiness level of four to six (i.e., system or sub-system prototype demonstrated in a relevant environment). This corresponds to a projected aircraft entry into service no earlier than 2025. ERA has been authorized for a fixed six-year period that has been divided into two three-year periods (i.e., a Phase I (FY10 to FY12) and a Phase II (FY13 to FY15)). In Phase I ERA pursued a broader portfolio of projects while Phase II focused on a smaller number of larger projects.

During ERA Phase I, the Armstrong Flight Research Center (formerly Dryden Flight Research Center) solicited competitively under the NASA ARMD NASA Research Announcement (NRA) NNH10ZEA001N, Amendment 10, an effort entitled "Systems Analysis for Advanced Vehicle Configurations (AVC) under ERA". Three proposals were competitively selected under this AVC NRA and contracts were awarded to Lockheed Martin, Northrop Grumman, and Boeing. Each contractor performed assessments of its Preferred System Concept (PSC) aircraft relative to the ERA fuel burn, emission, and noise goals. Results of these three contracts were presented in a public special session at the American Institute of Aeronautics and Astronautics (AIAA) Aerospace Sciences Meeting held in Nashville, TN, in January 2012. The Boeing AVC contract was awarded under NASA Armstrong contract NND11AG03C (\$4.9M effort with a period of performance from December 2010 through December 2011). The HWB PSC proposed by Boeing was shown to meet simultaneously the ERA N+2 goals including the noise goal. This result was consistent with the results published by NASA.

NASA has conducted several aircraft N+2 system noise assessments. The HWB concept has been shown to have a logical technical path to reaching the noise goal. However, the noise reduction technology required, the technical modeling assumptions, and the uncertainties also show that reaching the noise goal is a significant challenge. These issues have become more apparent as the fidelity of the NASA assessments has improved over the recent years. NASA has participated in a detailed and updated noise assessment of the Boeing HWB AVC noise assessment that was published as AIAA paper number 2014-0365 (authored by Guo, Burley, and Thomas) including a comparison with the best prior NASA noise assessment. This joint study highlighted several issues that impact reaching the goal. In addition, from 2008 to 2011, The Boeing Company performed work on contract NNL07AA54C resulting from a competitive NASA NRA award. This contract was entitled "Acoustic Prediction Methodology and Test Validation for an Efficient Low Noise Hybrid Wing Subsonic

¹ NASA's research focuses on future aircraft design concepts and technology that could be introduced into service in 2020, 2025 and 2030. The first "next" generation—for 2020—is referred to as "N+1." The second generation is "N+2." The third and farthest out generation is "N+3." Each design generation offers technology features more sophisticated than those of the generation before.

Transport” and resulted in an HWB aircraft concept design termed the N2A. NASA followed this work with a high fidelity aeroacoustic validation experiment in the NASA Langley 14x22 Subsonic Wind Tunnel using the Boeing designed N2A HWB model. In reporting on the ERA FY 2013 Annual Performance Goal (APG), the NASA team described the noise assessment conducted with the N2A HWB aircraft. The APG study found this particular HWB design and set of technology assumptions to assess lower than the noise goal for a number of reasons. Results were published in June 2014 in AIAA paper number 2014-2626.

By reviewing the best available noise assessments to date, NASA has identified four critical areas, discussed below, needed to improve NASA’s current system noise assessment methodology. Also, investigation of noise reduction approaches in these same four areas will result in higher confidence noise assessments relative to reaching the noise goal.

Additionally, under a sole source award to Boeing on SMAAART task order NNL13AB86T, Boeing is currently working with an updated and proprietary design of its HWB PSC aircraft with improved design features including, for example, a Krueger flap leading edge, an improved engine selection, and engine/airframe integration. This task order NNL13AB86T is one of the tasks in ERA’s Phase II. The HWB PSC geometry, aircraft definition, and other proprietary information make this vehicle the best overall HWB information to work with in performing the high fidelity work on this proposed new task order. This fact is key to contributing the most relevant information to the final FY 2016 a post-ERA assessment.

III. Nature and/or Description of Required Supplies/Services

This proposed new task order includes work in the following four technical areas: (1) high fidelity ultra-high bypass (UHB) fan noise shielding effectiveness, (2) airframe system noise database with component noise ranking, (3) Krueger flap noise, and (4) flight path and system noise optimization. To accomplish the objectives for these four areas, the Statement of Work (SOW) requirements include high fidelity computational aeroacoustic simulations, design of three-dimensional and two-dimensional airframe components, analytical modeling, and analysis of existing experimental databases. In order to meet the SOW requirements, extensive expertise in multiple aspects of the HWB aircraft concept such as airframe design, aircraft performance, flight dynamics, and aeroacoustics are required, which only Boeing possesses.

In order to meet the objective of contributing to the post-ERA assessment, this proposed new task order needs to be completed by the end of September 2016. The period of performance for this proposed task order is anticipated to be from award to the end of September 2016.

The estimated value of this proposed new task order is \$2.4M. This new task order fits within the scope of the SMAAART contract SOW under 3.1.1 Configuration Aerodynamics, 3.1.2 Computational Modeling and Simulation, and also under 3.1.4 Aircraft and Spacecraft Noise Prediction and Control. Further, this proposed new task order falls within the SMAAART contract performance period and within the maximum contract value.

IV. Identification of the Exception to Fair Opportunity and Supporting Rationale

FAR 16.505(b)(1)(i) requires the Contracting Officer provide each awardee under a multiple award contract, a fair opportunity to be considered for each order exceeding \$3,000 unless a statutory exception applies. Specifically, the exception that precludes the fair opportunity process for this acquisition is FAR 16.505(b)(2)(i)(B), which states that "Only one awardee is capable of providing the services or supplies required at the level of quality required because the service or supplies ordered are unique or highly specialized".

The work in this proposed new task order builds upon extensive past efforts with Boeing on their proprietary HWB aircraft concept. Specifically, the HWB AVC developed by Boeing under the prior, competitively awarded Armstrong contract NND11AG03C and the sole source award to Boeing on SMAAART task order NNL13AB86T that resulted from the extensive market research activity by the ERA Project.

In order to support the sole source award to Boeing on SMAAART task order NNL13AB86T, the ERA Project prepared for Phase II by engaging in a series of market research activities. These activities focused on identifying technologies that could be matured from a technical readiness level of four to six and that would also enable meeting the ERA Project goals simultaneously. As part of this market research, the three companies mentioned above were requested to provide a list of technologies and identify the research required to develop them. These efforts included publishing a Request For Information in FEDBIZOPPS and the NASA Acquisition Internet Site on February 24, 2012, which solicited extensive information including (1) recommendations of technologies associated with the technology focus areas ready to be incorporated in work packages and associated test campaigns and test assets to be completed by the end of FY 2015, raising technical readiness level to five or six and thereby advancing integration readiness level; and (2) product-focused transition plans associated with the identified technologies. In addition, the ERA Project conducted a Meeting Of Experts forum involving potential industry partners on March 29, 2012 to gather additional information to set its Phase II planning strategy. As part of these market research efforts, the ERA Project leadership engaged in discussions with Lockheed Martin, Northrop Grumman, and Boeing to explore whether there was interest in pursuing activities in Phase II as follow on work to the AVC contract mentioned above. At this point, only Boeing elected to move forward to participate in a follow-on study of its unique and highly specialized HWB concept.

Award to any source other than Boeing would require the development of a new source for HWB aircraft design or other aircraft concept to meet ERA goals simultaneously as well as extensive information regarding airframe noise of existing commercial transport aircraft. Even if this could be done, it would result in substantial duplication of cost to the Government that is not expected to be recovered through competition. Boeing's experience and performance under the prior two awards make it uniquely qualified for this highly specialized proposed new task order.

In addition, one of the SOW tasks (3.2 Airframe System Noise Database) in this proposed new task order also requires extensive proprietary knowledge and information of existing commercial aircraft transports. Boeing is the only manufacturer of large commercial aircraft transports in this country. As the manufacturer, Boeing is the only source of the proprietary information needed for this specialized work of this SOW.

V. **Determination by the Contracting Officer That The Anticipated Cost to the Government Will Be Fair and Reasonable**

The CPFF amount for this acquisition will be determined fair and reasonable by the Contracting Officer prior to award of this proposed new task order. Actions anticipated to ensure reasonableness will be accomplished using the procedures and criteria contained in the Federal Acquisition Regulation (FAR), NASA FAR Supplement (NFS), and other regulatory documents as applicable. Detailed documentation and justification of reasonableness will be disclosed in the Price Negotiation Memorandum (PNM) which will be prepared using the evaluation of the Boeing quoted pricing, compared to the Independent Government Estimate (IGE), and the pricing of previous similar efforts. Certified cost and pricing data will be obtained and used in determining a fair and reasonable cost.

VI. **Other Facts Supporting the Justification**

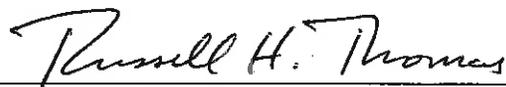
None.

VII. **Actions the Agency May Take to Remove or Overcome Any Barriers To Increasing Fair Opportunity Before Any Subsequent Acquisition For the Supplies or Services**

LaRC may have future requirements that can only be met by Boeing. However, the Contracting Officer will continue to scrutinize all SOWs received to ensure fair opportunity is appropriately given. LaRC typically looks for proactive steps that can be taken to eliminate barriers to competition for future requirements. Additionally, LaRC has no known future requirements for this technology at this time and lacks the ability to incentivize the other SMAAART contractors to invest the substantial sums that would be required to establish an alternate source for this service.

Technical Certification:

I certify that to the best of my knowledge and belief, the data furnished above is complete and accurate.



Russell H. Thomas
Project Engineer, Vehicle Systems Integration
ERA Project

8-3-15

Date

Contracting Officer Certification:

I certify that to the best of my knowledge and belief, the data furnished above is complete and accurate.



C. Lynn Jenkins
Contracting Officer

8-3-15

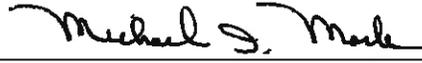
Date

Concurrence:



Roberta Keeter
Head, Research and Development Contracting
Branch, Office of Procurement

8/6/2015
Date



Michael I. Mark
Office of Chief Counsel

6 Aug 15
Date

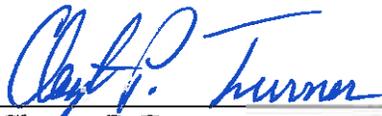


David H. Jones
Acting Procurement Officer

8-6-15
Date

Determination:

Based upon my review of the above, I have determined the exception that precludes the fair opportunity process for this acquisition as stated in paragraph IV applies to this task order.



Clayton P. Turner
Competition Advocate

August 6, 2015
Date

cc:
12/OP
30/OCC
12/C. L. Jenkins
461/R. H. Thomas

12/CLJenkins:bt 08/03/15 (43284)