



## COORDINATING RESEARCH COUNCIL, INC.

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August 22, 2019

In reply, refer to:  
CRC Project No. AV-28-19

Subject: CRC Request for Proposal AV-28-19, "Feasibility Analysis: Alternative Approaches to the Replacement of ASTM D909 Supercharge Rating"

Dear Prospective Bidder:

The Coordinating Research Council, Inc. (CRC) invites you to submit a written proposal on "Feasibility Analysis: Alternative Approaches to the Replacement of ASTM D909 Supercharge Rating," as described in the attached Statement of Work, Exhibit A.

Please indicate via letter, fax, or email by **September 5, 2019** whether or not you or your organization intends to submit a written proposal for the project. CRC will answer technical questions regarding the Request for Proposal if they are submitted in writing. CRC will then return written answers to all of the bidders, along with a copy of the original questions.

The CRC technical group composed of equipment, petroleum, and government representatives will evaluate your proposal. CRC reserves the right to accept or reject any or all proposals.

The reporting requirement will be text, data and charts to CRC in accordance with Exhibit A Statement of Work. A Final Report documenting the results of the study will be published by CRC. The reporting requirement is described in more detail in the attachment entitled, "Reports" (Exhibit B).

The "Intellectual Property Rights Clause" (Exhibit C) and "Liability Clause" (Exhibit D) will be a part of the agreement, which will be executed as a result of this Request for Proposal solicitation.

The proposal must be submitted as two separate documents. The technical approach to the problem including the proposed schedule of tasks and deliverables will be described in **Part One** and a cost breakdown that is priced by task will be described in **Part Two**. The cost proposal document should include all costs associated with conducting the proposed program.

CRC expects to negotiate either a cost reimbursable or a fixed price contract. Important selection factors to be taken into account are listed in Exhibit E. CRC evaluation procedures require the technical group to complete a thorough technical evaluation before considering costs. After developing a recommendation based on technical considerations, the costs are revealed, and the recommendation is modified as needed.

Electronic copies of the technical and cost proposals should be submitted to:

Mrs. Jan Tucker  
Coordinating Research Council, Inc.  
5755 North Point Parkway, Suite 265  
Alpharetta, GA 30022

Phone: 678-795-0506, Ext. 100  
Fax: 678-795-0509  
E-mail: [jantucker@crcao.org](mailto:jantucker@crcao.org)

The deadline for receipt of your proposal is **September 23, 2019**.

Sincerely,

Jan Tucker  
Committee Coordinator

## **EXHIBIT A**

### **STATEMENT OF WORK**

#### **CRC Project No. AV-28-19**

##### **Title**

Feasibility Analysis: Alternative Approaches to the Replacement of ASTM D909 Supercharge Rating

##### **Objective**

To review the requirements and conditions of the ASTM D909 Supercharge Octane Rating test and provide a feasibility analysis of potential alternative test methods to replace the ASTM D909 test method. The initial scope would include identifying and explaining the limitations, conditions, and rationale for the current test method, with consideration of both leaded and unleaded aviation gasolines and their associated chemical compositions. This would be followed by the identification and assessment of possible alternative test methods that would provide equivalent octane assessment of aviation gasolines.

##### **Background**

ASTM D909 has been used as one of the determining performance parameters for Aviation fuel since the 1940s. The engine knocking method is exclusively applied to Aviation gasoline fuels and does not enjoy wider application. Partly as a result of this limited market, concern exists regarding the future availability of ASTM D909 test engines and spare parts. Concern also exists with future availability of trained operators and the Tetra Ethyl Lead reference fuel.

The proposal is for the review of conditions, requirements, and rationale of the existing D909 method, and performance of a feasibility study for identifying or developing an alternative method or alternative methods, to predict detonation performance in fuel-rich, inlet-boosted conditions in large bore, relatively slow rotational speed aircraft engines and which would correlate with ASTM D909. It is expected that the execution of proving the alternative method or alternative methods and developing a correlation to ASTM D909 would be beyond the scope of this initial study and would potentially require a follow-up proposal.

##### **Project Goals**

- To summarize conditions, requirements, and rationale of the ASTM D909 Supercharge Octane Rating test and provide a feasibility analysis of potential alternative test methods to replace the ASTM D909 test method.
- To identify one or several replacement test methods to ASTM D909 that does not have the dependence on the ASTM D909 test engine or reference fuels containing tetra ethyl

lead but which can be correlated to the desired information collected using the D909 test method.

- Additionally, an assessment of future viability of the ASTM D909 with reference to operators, engine and replacement part availability.

### **Project Approach**

Review and investigate the current ASTM D909 test method and utilize this information as basis for a new test method.

The CRC is open to different proposed methodologies from offerors, but for combustion test methods, the evolution of similar end-gas temperature / pressure relationships would appear to be one method of merit when trying to correlate with ASTM D909 results.

It is not seen as necessary to propose a test engine if other methodologies achieve the same result, but the offeror should consider that the test fuels may or may not contain hetero atomic species as well as the more conventional hydrocarbons typical of historic leaded Avgas formulations.

## **EXHIBIT B**

### **REPORTS**

#### **DRAFT AND FINAL REPORT**

The contractor shall submit to CRC an electronic Microsoft WORD draft final report after completion of the technical effort specified in the contract. The draft final report shall document, in detail, the test program and all of the work performed under the contract. The report shall include tables, graphs, diagrams, curves, sketches, photographs and drawings in sufficient detail to comprehensively explain the test program and results achieved under the contract. The report shall be complete in itself and contain no reference, directly or indirectly, to the progress report(s).

The draft report must have appropriate editorial review corrections made by the contractor prior to submission to CRC to avoid obvious formatting, grammar, and spelling errors. The report should be written in a formal technical style employing a format that best communicates the work conducted, results observed, and conclusions derived. Standard practice typically calls for a CRC Title Page, Disclaimer Statement, Foreword/Preface, Table of Contents, List of Figures, List of Tables, List of Acronyms and Abbreviations, Executive Summary, Background, Approach (including a full description of all experimental materials and methods), Results, Conclusions, List of References, and Appendices as appropriate for the scope of the study. Reports submitted to CRC shall be written with a degree of skill and care customarily required by professionals engaged in the same trade and /or profession.

The CRC Steering Committee shall furnish comments regarding the draft report to the contractor within one (1) month after the draft copy.

Within thirty (30) days after receipt of the approved draft copy of the report, the contractor shall make the requested changes and deliver to CRC ten (10) hardcopies including a reproducible master copy of the final report. The final report shall also be submitted as an electronic copy in a Microsoft WORD and a pdf or pdf-convertible file format. The electronic copy will be made available for distribution by CRC.

**EXHIBIT C**

**INTELLECTUAL PROPERTY RIGHTS**

Title to all inventions, improvements, and data, hereinafter, collectively referred to as (“Inventions”), whether or not patentable, resulting from the performance of work under this Agreement shall be assigned to CRC. Contractor X shall promptly disclose to CRC any Invention which is made or conceived by Contractor X, its employees, agents, or representatives, either alone or jointly with others, during the term of this agreement, which result from the performance of work under this agreement, or are a result of confidential information provided to Contractor X by CRC or its Participants. Contractor X agrees to assign to CRC the entire right, title, and interest in and to any and all such Inventions, and to execute and cause its employees or representatives to execute such documents as may be required to file applications and to obtain patents covering such Inventions in CRC’s name or in the name of CRC’s Participants or nominees. At CRC’s expense, Contractor X shall provide reasonable assistance to CRC or its designee in obtaining patents on such Inventions.

**EXHIBIT D**

**LIABILITY**

It is agreed and understood that \_\_\_\_\_ is acting as an independent contractor in the performance of any and all work hereunder and, as such, has control over the performance of such work. \_\_\_\_\_ agrees to indemnify and defend CRC from and against any and all liabilities, claims, and expenses incident thereto (including, for example, reasonable attorneys’ fees) which CRC may hereafter incur, become responsible for or pay out as a result of death or bodily injury to any person or destruction or damage to any property, caused, in whole or in part, by \_\_\_\_\_’s performance of, or failure to perform, the work hereunder or any other act of omission of Contractor in connection therewith.

**EXHIBIT E**

**PROPOSAL EVALUATION CRITERIA**

- 1) Merits of proposed technical approach (Part One).
- 2) Previous performance on related research studies (Part One).
- 3) Personnel available for proposed study – related experience (Part One).
- 4) Timeliness of study completion (Part One).
- 5) Cost (Part Two).