COORDINATING RESEARCH COUNCIL, INC.
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ALPHARETTA, GA 30022
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November 3, 2011
In reply, refer to:
CRC Project No. AV-16-11

Subject: CRC Request for Proposal AV-16-11, "Developing a Cold Fuel Flowability Test."

Dear Prospective Bidder:

The Coordinating Research Council, Inc. (CRC) invites you to submit a written proposal to provide a report for "Developing a Cold Fuel Flowability Test" as described in the attached Statement of Work, Exhibit A.

Please indicate via letter, fax, or email by **November 11, 2011** 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 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.
3650 Mansell Road, Suite 140
Alpharetta, GA 30022

Phone: 678-795-0506, Ext. 100
Fax: 678-795-0509
E-mail: jantucker@crcao.org

The deadline for receipt of your proposal is **December 3, 2011**.

Sincerely,

Jan Tucker
Committee Coordinator

EXHIBIT A

STATEMENT OF WORK

Developing a Cold Fuel Flowability test (CRC Project No. AV-16-11)

Relevant Strategic Objectives & Category (near, mid, long term impact): Critical item for Long Haul flight, Polar routes.

Background:
The IATA Technical Fuel Group did an industry survey on freeze point operational issues, since flight times over polar routes increased and temperatures got lower. It revealed that operating with Jet A gave an operational cold risk of about 1 flight in 1000 flights. Moving towards a FP of -45C would generate too much financial impact.

One of the survey conclusions was that the freeze point of fuel was not really a reliable parameter for predicting the actual cold flow characteristics experienced in service. Hence the request of IATA TFG to investigate and recommend actions. This is a follow-up of Project AV-11-09, as discussed at the CRC annual meeting 2011.

Project AV-11-09 concluded that at low temperatures down to below the freezing point to approximately the cloud point, a viscosity type measurement more accurately predicts pumpability from an aircraft fuel tank than freezing point. The report suggested that an initial specification limit whereby the 'status quo' will not change with respect to low temperature pumpability would minimize the risks of specification change for OEMs.

Project AV-11-09 also noted that although many fuels show some correlation between viscosity and freezing point, freezing point is most dependent on the concentration of the larger normal alkanes (C_{16} to C_{19}). Whereas, the viscosity and pumpability are mostly a function of the overall distribution of the normal alkanes. Therefore, freezing point does not predict low temperature flow for fuels with asymmetric n-alkane profiles and using viscosity instead of freezing point could allow more high molecular n-alkanes in jet fuel. Increased high molecular weight n-alkanes may be of concern to OEMs.

Project Objectives:

1. Determine a 'viscosity equivalent' of the current freezing point specification limits.
2. Quantify the possible changes in fuel chemistry of jet fuel if a viscosity specification limit replaces freezing point.
3. Note that the buy-in from the OEM's is essential to agree how such a test compares with their needs to set a pass/fail test.

Project Approach:

1. Using an appropriate test (such as ASTM D5133 or modified automatic scanning versions of ASTM D445 or ASTM D7042) carry out a survey of jet fuel low temperature viscosity measurements and compare with freezing points. Estimate a viscosity equivalent to current freezing point specification limits. Note that this work could link in directly with EI on measuring viscosity of aviation fuel at -40C.
2. Investigate how jet fuel n-alkane distribution affects the correlation between freezing point and low temperature viscosity to enable quantification of maximum possible increases in higher n-alkanes if a viscosity measurement replaces freezing point in specifications.

Project Deliverables & Schedule:

- The research should be ready by end of 2012.

Utilization of Deliverables:

- The research will be published as a CRC report and submitted to ASTM Subcommittee J and the Aviation Fuel Committee for guidance in setting jet fuel specifications.

EXHIBIT B

REPORTS

DRAFT AND FINAL REPORT

The contractor shall distribute for the CRC an electronic pdf-compatible copy of a 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 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 annual report, the contractor shall make the requested changes and deliver to CRC thirty (30) 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.

2) Previous performance on related research studies.

3) Personnel available for proposed study – related experience.

4) Timeliness of study completion.

5) Cost.