

Solicitation Number: 21-58002**Feasibility Study for a Megawatt-Scale Hybrid-Electric Propulsion Testing Facility****1. Advance Contract Award Notice (ACAN):**

An ACAN is a public notice indicating to the supplier community that a department or agency intends to award a contract for goods, services or construction to a pre-identified supplier, thereby allowing other suppliers to signal their interest in bidding by submitting a statement of capabilities. If no supplier submits a statement of capabilities that meets the requirements set out in the ACAN on or before the closing date stated in the ACAN, the contracting officer may then proceed with the award to the pre-identified supplier.

2. Definition of the requirement:

The proposed work involves the following:

1. Executing services to complete a feasibility study for the implementation of a new Megawatt-Scale Hybrid-Electric Research and Testing Facility for aircraft propulsion. This feasibility study includes electric propulsion technology analysis, evaluation of the market needs for such a facility in Canada, capital cost estimations for the facility, economic viability of the facility based on estimation of operational costs and potential impacts, benefits and risks associated with the new facility within the government objective of making Canada a world leader in clean technology. The Feasibility study must include the following items:
 - i. Defining the required technological features and performance capabilities for the Hybrid-Electric Propulsion Testing and Reserach Facility.
 - ii. Providing a conceptual description and block diagrams of the facility
 - iii. Providing a comprehensive market analysis; including Canadian and international players; identifying potential clients, competitors and risks.
 - iv. Providing an estimate of capital investment cost and a schedule to implement the facility.
 - v. Providing an estimation of operational cost of the facility per year.

All the parts of the Feasibility Study must be consolidated in a final report to be delivered to the NRC according to the project schedule.

Criteria for assessment of the statement of capabilities (minimum essential requirements):

Any interested consultant must provide a statement of capabilities that demonstrates and provides evidence that they meet the following requirements:

- Minimum of 25 years of experience in the execution of engineering, procurement and construction of projects for large-scale facilities and systems for testing gas turbines for aircraft propulsion in Canada and around the world.
- Proven expertise in sustainable energy solutions that include energy storage, solar and heat recovery that can be implemented to optimize the energy consumption of the aircraft engine testing facility and reduce its carbon emissions.
- Specific experience in the development of technical and economic proposals and design of testing facilities for electrified aircraft propulsion systems in the “Megawatt” power range for major aircraft propulsion system manufacturers and/or major aircraft manufacturers.
- Accessible client base formed by aircraft propulsion system manufacturers, gas turbine engine manufacturers and aircraft manufacturers in Canada and around the world that allows assessing their current and future needs for testing, R&D and certification of electrified aircraft propulsion systems.
- Having a portfolio of sustainable solutions at Technology Readiness Level (TRL) 4 or above, designed for aircraft propulsion testing, that must include, but is not limited to, providing the capability of recovering the kinetic energy produced by the propulsion system under test.
- Specific expertise in dynamometer control technologies that allows the simulation of inertia, suitable for applications in electrified propulsion systems for Urban Air Mobility (UAM) vehicles and Vertical Take-off and Landing (VTOL) aircraft.

3. This procurement is subject to the following trade agreement(s):

- Canadian Free Trade Agreement (CFTA)
- World Trade Organization - Agreement on Government Procurement (WTO-AGP)WTO-GAP

4. Justification for the pre-identified supplier:

MDS Gas Turbine Engine Solutions has been providing testing capabilities for multiple types of aviation and industrial gas turbine engines worldwide since 1985. MDS has performed over 15 large projects where they have delivered performance specifications, cost estimations, management and engineering for testing facilities and testing systems for major turbomachinery OEMs. Some of these projects have been performed for clients that are major aircraft propulsion engine manufacturers in Canada, Europe and the United States of America.

Among MDS capabilities are technology analysis and solutions for aircraft engine testing facilities and their commercial models. The company has a business development team and a

customer base that allows them to perform market analysis in the field of testing needs for aircraft propulsion systems.

MDS Aero Testing Solutions has over 25 years of experience defining the concepts of the aircraft propulsion testing facilities, design, management and implementation of the projects through the integration of different engineering disciplines for complex aircraft engine testing facilities. Among the disciplines that make integral part of MDS's engineering capabilities are aerodynamics, mechanical design, fluids systems, instrumentation, controls and software engineering.

MDS has demonstrated competency and experience in the preparation of proposals and design of testing systems for electrified aircraft propulsion. This is supported by the fact that MDS was awarded in 2018 a contract with a Recognized Global Airframe provider, an international leader in designing and manufacturing commercial aircraft. MDS contract deliverables included the design and implementation of specific work packages for the Test Bench for the hybrid-electric technology demonstrator at a Megawatt power scale. MDS completed the design of the systems for this project.

MDS owns a patent and has developed to TRL 4 a design for a device that recovers kinetic energy from airflow of exhaust gas that can be implemented to optimize the energy consumption of the testing facility and reduce its carbon emissions.

MDS has exclusive access to an inertia simulation technology that allows different propeller or fan configurations without the requirement of changing flywheels to increase or decrease inertia. Additionally, this technology is capable of regenerating the absorbed power back on the facility power grid and can be used to drive the device under test, reducing the power required for operation.

5. Exclusions and/or limited-tendering reasons:

The following exception(s) to the Government Contracts Regulations is (are) invoked for this procurement under subsection 6(d) - "only one person is capable of performing the work".

6. Ownership of intellectual property:

Due to the nature of the project it is considered unlikely that the service under this Advanced Contract Award Notice will generate intellectual property. In the case that a foreground "technological innovation" or "technological invention" arises out of the proposed contract it will be managed as follows:

In the case that the "technological innovation" or "technological invention" is proposed and developed independently by the service provider, the Intellectual Property will vest in the service provider.

In the case that the “technological innovation” or “technological invention” is proposed and developed independently by the NRC, the Intellectual Property will vest in the NRC.

In the case that the “technological innovation” or “technological invention” is proposed by any of the two parties and co-developed in any way by a collaboration of the NRC and the service provider, the Intellectual Property will vest in the NRC and the service provider. For this case, both parties agree that a separate Intellectual Property agreement, will be made.

7. Period of the proposed contract or delivery date:

The proposed contract is from April 2021, to March 31, 2022. The National Research Council Canada reserves the right to negotiate a long-term service agreement with the proposed contractor subject to the terms and conditions of the Government of Canada.

8. Cost estimate of the proposed contract:

The estimated value of the contract, excluding option(s), is CAD \$300,000. NRC reserves the right to negotiate follow-on contracts of similar complexity and value for the next 5 years.

9. Name and address of the pre-identified supplier:

MDS AERO Support Corporation
1220 Old Innes Road
Ottawa, Ontario
K1B 3V3

10. Suppliers' right to submit a statement of capabilities:

Suppliers who consider themselves fully-qualified and available to provide the goods, services or construction services described in the ACAN may submit a statement of capabilities in writing to the contact person identified in this notice on or before the closing date of this notice. The statement of capabilities must clearly demonstrate how the supplier meets the advertised requirements.

11. Closing date and time for a submission of a statement of capabilities:

The closing date for accepting statements of capabilities is April 30, 2021, at 14h00 EDT.

12. Inquiries and statements of capabilities are to be directed to:

NRC Contracting Officer: Collin Long
National Research Council Canada
Email: Collin.Long@nrc-cnrc.gc.ca