

Advance Contract Award Notice (ACAN)

23-58245

Design and optional fabrication of a full-scale pipeline testing apparatus

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 National Research Council (NRC) Energy, Mining and Environment has a requirement for the design and optional fabrication of a new and highly specialized testing apparatus to conduct a variety of research on gas pipeline materials and infrastructure components to support the adoption of hydrogen and other renewable fuels. This must include the supply of a high-level design engineering package and dimensioned fabrication drawings of a full-scale pipeline testing apparatus allowing the NRC to conduct a wide range of material compatibility and durability tests using gas pipeline materials and sizes typically used in existing gas distribution systems, and under varying environmental conditions. The NRC requires a specialized testing apparatus designed for experimental research on the performance of various natural gas distribution pipe materials, pipe sizes, and pipe temperatures with varying concentrations of hydrogen and natural gas, from 0-100% of each, respectively, and at variable operating temperatures from -20°C to +30°C, and at cyclic operating pressures up to 500 psig.

The pipeline testing apparatus designed and drawn must be able to test various gas pipeline materials and sizes used in existing gas distribution systems to assess their suitability for transporting gaseous fuel mixtures containing hydrogen, up to and including burst pressures.

Phase 1: Conceptual system design

- To provide the NRC system and mechanical design consulting services such that a process flow diagram (PFD) and concept of

operations (ConOps) description is generated for a new testing apparatus requested by the NRC.

- Battery limits and safety-related requirements must be defined to enable the suitable site preparations and utility interfaces at the NRC's installation facility to be engineered and prepared.
- Top-level and sub-system design requirements must be defined to guide Phase 2 activities and allow for parallel development work to be completed by other NRC or external resources.
- A Responsibility, Accountability, Consulted, informed (RACI) matrix to guide Phase 2 activities must be defined to ensure clarity of roles and responsibilities of all project stakeholders.

Phase 2: Development of detailed system design documents and creation of fabrication drawings

- A Piping and Instrumentation Diagram (P&ID) and a complete control philosophy description with sequence of operations, alarm threshold values and interlocks, and state machine descriptions must be created. These design documents must be sufficient to perform a Hazardous Operations (HazOp) design review by NRC and all relevant stakeholders.
- A system design package with equipment and ancillary systems specified meeting all NRC technical requirements by NRC with support and input from Aggressive Tube Bending Inc. (ATB Inc.) must be created.
- A complete set of fabrication drawings, including dimensional tolerances, assembly instructions, weld details, material quantities and grades, rigging specifications, and full bill of materials, including for ancillary systems must be created by ATB Inc.

Phase 3: System fabrication and supply to NRC

- The fabrication and delivery of the main mechanical apparatus consisting of the pipeline testing system designed in Phase 2 must be provided to the NRC at its delivery point of 4250 Wesbrook Mall, Vancouver, BC, V6T 1W5.
- The scope of this goods supply will be fully detailed at the end of Phase 2, and is not expected to include the thermal management subsystem(s), control and instrumentation subsystem(s), nor installation or commissioning activities, as these are expected to be provided by other specialized providers and/or the NRC.

3. Criteria for assessment of the Statement of Capabilities (Minimum Essential Requirements)

The work will involve the following:

Tasks and Deliverables

Phase 1:

- Initial kick-off meeting is held in-person at ATB Inc. in Surrey, BC
- Weekly design meetings are held, more often as needed on an ad-hoc basis
 - Review design intent and initial conceptual design
 - Formalize design requirements, including but not limited to: test pipe sizes, pressures, temperatures, concept of operations, and safety requirements
 - Design requirements must consider utility and process details and specifications for integration at NRC facility.
 - Develop process flow diagram
 - Define “battery limits”¹ of each subsystem or unit function and develop a RACI² matrix to clarify design scope and to schedule when subsystem design requirements or specifications are needed to support sequenced design steps
- Weekly design meetings are held via MS Teams, with an agenda planned in advance, and each party expected to have prepared their deliverables or “homework” prior to each meeting. Meeting minutes to be prepared and distributed by NRC within 48hrs after each meeting.

Deliverables

PFD and Concept of Operations diagrams / flow-charts; battery limits and safety-related requirements defined; top-level and sub-system design requirements; RACI matrix to guide Phase 2 activities

Phase 2:

- Phase 2 kick-off meeting is held in-person at ATB Inc. in Surrey, BC.
- Weekly design meetings are held, more often as needed on an ad-hoc basis
 - A schedule for detailed design and drafting development (to structure activities and track progress) with associated RACI matrix
 - Detailed P&ID with identified subsystem battery limits

¹ <http://www.interfacemanagement.org/battery-limit-definition.html>

² https://en.wikipedia.org/wiki/Responsibility_assignment_matrix

- System integration plan and definition of site requirements at NRC facility, including but not limited to defining point loads for mounting pad, general rigging provisions, and anchoring requirements
- Equipment and ancillary system specifications meeting all Phase 1 requirements
- Detailed fabrication drawings generated and sealed by a B.C. registered P.Eng.
Drawing package to include full ASME design calculations (as required), weld details, materials specifications, and bill of materials.

Deliverables

- P&ID and detailed control philosophy description and a complete control philosophy description documenting sequence of operations, alarm threshold values and interlocks, and state machine descriptions.
- In-person or on-line participation in a comprehensive HazOp design review facilitated by NRC and attended by all relevant stakeholders.
- A system design package with equipment and ancillary systems specified meeting all requirements.
- A complete set of fabrication drawings, including dimensional tolerances, assembly instructions, weld details, material quantities and grades, rigging specifications, and full bill of materials, including for ancillary systems.

Option for fabrication and delivery of the main mechanical apparatus to NRC facility in Vancouver, BC by March 31, 2025. Any interested supplier must demonstrate by way of a statement of capabilities that it meets the following requirements:

- Experience
 - At least 35 years of mechanical design AND fabrication experience directly related to the fabrication and maintenance of pressure vessels, heat exchangers, boilers and piping systems for diverse research and industrial applications that include natural gas, wood treatment, essential oils and food processing, pulp mills, high pressure natural gas filling stations, steam headers and industrial process piping. Proven experience and expertise with pipe, tube, and structural forming, precision fabrication, and in-house machining. Extensive experience designing AND fabricating equipment and pressure chambers with quick-opening doors, hyperbaric chambers, and heavy equipment conveyance methods.
 - Manufacture of a new treating cylinder for vulcanizing and curing re-tread tires for large dump trucks in the mining industry;

- Lumber industry treating cylinders ranging in sizes from 72” to 120” in diameter with lengths spanning up to 130 feet;
- High-pressure chamber (1500psi, 103 bar) for an oil and gas products research facility;
- Chamber for testing wetness of wood for a research facility, which used both steam and electrical heating to measure drying rates for different types of wood;
- Upgrades and re-certification to an existing vessel used in testing food processing.
- Repair and re-certification of sterilizing cylinders for bio-hazardous waste;
- Design and fabrication of two hyperbaric chambers for low-pressure, low-duration-time recovery for injured animals.
- Knowledge and understanding of Natural gas industry requirements and typical construction practices; specialized instrumentation types and methods used for experimental research facilities; high-efficiency methods and strategies for varying process temperature within a pressurized chamber containing combustible / explosive gasses.
- Professional designation, accreditation, and/or certification Compliance with quality standards including ISO 9001:2015 or better. Certified to CWB, AWS, A Contractor and ASME U and S Boiler and Pressure Vessel Codes.

4. Applicability of the trade agreement(s) to the procurement

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

- *Canadian Free Trade Agreement (CFTA)*
- *Revised World Trade Organization - Agreement on Government Procurement (WTO-AGP)*
- *Canada-European Union Comprehensive Economic and Trade Agreement (CETA)*
- *Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)*
- *Canada-Chile Free Trade Agreement (CCFTA)*
- *Canada-Colombia Free Trade Agreement*
- *Canada-Honduras Free Trade Agreement*
- *Canada-Korea Free Trade Agreement*
- *Canada-Panama Free Trade Agreement*
- *Canada-Peru Free Trade Agreement (CPFTA)*
- *Canada-United Kingdom Trade Continuity Agreement (Canada-UK TCA)*
- *Canada-Ukraine Free Trade Agreement (CUFTA)*

5. Set-aside under the Procurement Strategy for Aboriginal Business.

Not applicable

6. Comprehensive Land Claims Agreement(s)

Not applicable

7. Justification for the Pre-Identified Supplier

Due to highly specialized design and manufacturing experience, the pre-identified supplier, Aggressive Tube Bending Inc. (ATB Inc.), is required to provide input into the practical design of the specialized test apparatus the NRC wishes to build:

ATB Inc. has highly specialized design and manufacturing experience in pressure vessels, heat exchangers, hyperbaric chambers, and industrial process equipment and reactors.

The rationale for this procurement is to provide the NRC R&D team with high-level design engineering and final drawings of the full-scale pipeline test apparatus, and optional shop fabrication of the unit, to conduct experimental research on the performance of various natural gas distribution pipe materials, pipe sizes, and pipe temperatures with varying concentrations of hydrogen and natural gas, ranging from 0-100% of each

The nature of the work requires the consulting design services provided by ATB Inc. and their experience in heavy industrial equipment manufacturing processes and the wide range of industrial components available for various applications. ATB Inc.'s direct experience with complex systems, combustible fuels, and hyperbaric chambers and their associated safety requirements allows them to provide unparalleled consulting design and prototyping services for the unique requirements of the specialized test equipment desired by the NRC. ATB Inc. is able to provide consulting design services based on their extensive manufacturing knowledge, allowing them to inform the design process with practical design details using proven and, where applicable, cost-effective off-the-shelf industrial solutions for various design requirements. ATB Inc. can guarantee immediate availability and affordability. The significant time required to research potential alternatives would result in delays and costs to NRC's internal resources.

8. Government Contracts Regulations Exception(s)

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

9. Exclusions and/or Limited Tendering Reasons

The following exclusion(s) and/or limited tendering reasons are invoked under the:

- a. Canadian Free Trade Agreement (CFTA) – Article 513 (1) (b) (iii): due to an absence of competition for technical reasons;
- b. World Trade Organization - Agreement on Government Procurement (WTO-AGP) – Article XIII (b) (iii): due to an absence of competition for technical reasons;
- c. Canada-European Union Comprehensive Economic and Trade Agreement (CETA) – Article 19.12 (b) (iii): due to an absence of competition for technical reasons;
- d. Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) – Article 15.10 (2) (b) (iii): due to an absence of competition for technical reasons;
- e. Canada-Chile Free Trade Agreement (CCFTA) – Article Kbis-16 (2) (c): necessary to protect intellectual property;
- f. Canada-Colombia Free Trade Agreement – Article 1409 (1) (b) (iii): due to an absence of competition for technical reasons;
- g. Canada-Honduras Free Trade Agreement – Article 17.11 (2) (b) (iii): due to an absence of competition for technical reasons;
- h. Canada-Korea Free Trade Agreement – referencing the WTO Protocol Amending the GPA, Article XIII (1) (b) (iii): due to an absence of competition for technical reasons;
- i. Canada-Panama Free Trade Agreement – Article 16.10 (1) (b) (iii): because of the absence of competition for technical reasons;
- j. Canada-Peru Free Trade Agreement (CPFTA) – Article 1409 (1) (b) (iii): due to an absence of competition for technical reasons;
- k. Canada-Ukraine Free Trade Agreement (CUFTA) – Annex 10-6 (2) (a): any form of preference, including set asides, to benefit micro, small and medium enterprises; and
- l. Canada-United Kingdom Trade Continuity Agreement: refer to CETA as the provisions of CETA are incorporated by reference into and made part of this Agreement. (CETA) Article 19.12 (b) (iii).

10. Ownership of Intellectual Property

- o Canada intends to retain ownership of any Foreground Intellectual Property arising out of the proposed contract on the basis that the Contractor declares in writing that he/she is not interested in owning the Foreground IP.

11. Period of the proposed contract or delivery date

NRC is expecting the service to be performed before March 31, 2025, based on the date of the contract. The NRC reserves the right, in its sole discretion, to award or negotiate Phase 3. The scope of Phase 3 is defined in section 2.

12. Name and address of the pre-identified supplier

Aggressive Tube Bending Inc.
9750 188th Street
Surrey, B.C.,
V4N 3M2

13. 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.

14. Closing date for a submission of a statement of capabilities

The closing date and time for accepting statements of capabilities is March 19, 2024 at 2:00PM EDT.

15. Inquiries and submission of statements of capabilities

Name: Roberta Ranaldi
Title: Procurement Officer
Organization: National Research Council Canada

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