



Advance Contract Award Notice

TITLE: Independent Review of Leak-Before-Break Assessment of Dissimilar Metal Weld of Outlet Feeders

1.0 Introduction

The Canadian Nuclear Safety Commission (CNSC) has a requirement to obtain an independent, third-party evaluation of the documents of the leak-before-break (LBB) assessment for the Dissimilar Metal Welds (DMWs) in specific CANDU units. The purpose of this advance contract award notice (ACAN) is to signal the CNSC's intention to award a contract for these services to:

Pacific Northwest National Laboratory - Operated by Battelle Memorial Institute
P.O. Box 999, NSIN K9-69
Richland, Washington, USA
99352

Before awarding a contract, however, the CNSC would like to provide other suppliers with the opportunity to demonstrate that they are capable of satisfying the requirements set out in this ACAN, by submitting a statement of capabilities within the posting period for this ACAN, which is 15 calendar days.

If, during the posting period, other potential suppliers submit a statement of capabilities that meets the requirements set out in this ACAN, the CNSC may proceed to a full tendering process via the Government Electronic Tendering Service or by inviting bids directly from suppliers.

If no other supplier submits, on or before the closing date, a statement of capabilities meeting the requirements set out in the ACAN, a contract will be awarded to the above-noted supplier.

2.0 Background

The Dissimilar Metal Welds (DMWs) between carbon steel and alloy 600 flow devices are used in a number of outlet feeders in some CANDU reactors. World-wide PWR operating experience has proved welds containing alloy 600 and its weld equivalents to be potentially susceptible to primary water stress corrosion cracking (PWSCC). However, the volumetric inspection on the DMWs in accordance with the requirements of CSA N285.4 is difficult to perform due to high dose rates and access limitations.

A licensee has requested an alternative approach from the volumetric inspection of the DMWs. It has proposed leak-before-break (LBB) assessments for the DMWs instead of performing the inspections. The licensee provided a preliminary LBB assessment in 2010, and committed to further laboratory studies and more analytical assessments to improve the assessment methods and validate the assessment results. The exemption from the volumetric inspection of feeder DMWs is subject to the CNSC staff's acceptance of the refined LBB assessment of the DMWs. The licensee has finalized the LBB assessment for DMWs using deterministic and probabilistic approaches which supplement and complement each other. In addition to the preliminary LBB



Advance Contract Award Notice

assessment in 2010, the licensee has submitted all the documents of the LBB assessments at the end of 2016.

This is the first time that the LBB methodology has been applied in an assessment for fitness for service for feeders. Due to the complexity of the LBB assessment, a third party's opinion is requested to provide insight and comments on the licensee's final submission.

The CNSC has a requirement to obtain an independent, third-party evaluation of the documents of the leak-before-break (LBB) assessment for the Dissimilar Metal Welds (DMWs) in specific CANDU units. The work will involve the following:

3.0 Scope of Work

The contractor will carry out a technical evaluation of the LBB assessment documents submitted by a licensee. These documents are listed below:

- i. Deterministic Leak-Before-Break Assessment of DMWs in (the) Outlet Feeders, COG-JP-4401-V06 R1, October 2012, E-DOCS-#4919456.
- ii. Probabilistic Leak-Before-Break Assessment of DMWs in (the) Outlet Feeders, COG-JP-4401-V26-R0, October 2012 - E-DOCS-#4919385
- iii. Natural PWSCC Crack Growth Analysis for Circumferential Crack in (the) Feeder Dissimilar Metal Weld, COG-11-4056, August 2012 (interim report for Advanced Finite Element Analysis) - E-DOCS-#4919519
- iv. Modeling of Natural Crack Growth with XFEM in Feeder DMW E20E, CEI Report 38-33160-ASD-006 R0, December 2016, E-DOCS-#5316378
- v. Welding Residual Stress Summary Report for Dissimilar Metal Welds of DNGS Feeders, CEI Report 38-33160-ASD-003 R0, November 2016, E-DOCS-#5316408
- vi. Summary Memorandum- Outlet Feeder Dissimilar Metal Weld (DMW) Leak-Before-Break (LBB) Assessment, NK38-CORR-33160-0625258/NK38-33160-LOF, December 2016, E-DOCS #5377551

Following a review of these documents, the contractor shall provide comments/conclusions on:

- whether the LBB assessment using each of the deterministic and probabilistic approaches has been properly conducted
- whether the collective use of these approaches is sufficient to demonstrate LBB for the CANDU outlet feeder DMWs with the potential PWSCC degradation
- Comparison the licensee LBB assessment methodologies and the proposed application (to exempt inspection) to the LBB implementations made under other nuclear regulatory authorities
- any gaps to be addressed in the LBB assessment



Advance Contract Award Notice

This work is scheduled to start on contract award and completed within 6 months. Before finalizing its report, the contractor will make a presentation to CNSC staff.

4.0 Deliverables

All deliverables are to be submitted in English. All deliverables are to be submitted to both the Project Authority and Technical Authority.

4.1 Start-up Meeting

Date: Within two weeks of contract award

Location: via Tele/Videoconference

Purpose: To discuss and clarify the proposed approach, work plan and schedule.

4.2 Progress Meetings

Dates: Monthly

Location(s): The CNSC Head Office, Ottawa or via Tele/Videoconference

Purpose: To assess the degree to which the agreed project objectives are being achieved. To provide contractor direction on any new issues that may arise within the scope of this work. To monitor and if required make changes to the delivery schedule

If acceptable to the parties, the monthly meeting may be deferred and be replaced with a status report.

4.3 Formal Progress Report

Due Date: Within 3 months of contract award

Copies: Electronic copy via email per format requirements stated in 4.6

Format and style requirements: As specified in 4.6 below.

4.4 Draft Final Report

Due Date: Within 5 months of receipt of contract award

Copies: Electronic copy via email

Format and style requirements: As specified in 4.6 below



Advance Contract Award Notice

4.5 Presentation to CNSC

Due Date: Two weeks after the delivery of the Draft Final Report or determined by the CNSC

Location: The CNSC Head Office, Ottawa

Purpose: To present the project findings, conclusions and recommendations documented in the Draft Final Report to the CNSC.

Copies: Presentation material (PowerPoint) to be retained by the CNSC.

4.6 Final Report

Due Date: Within 2 weeks of presentation to CNSC

Copies: -One electronic copy in both MS Word and pdf via email

Format & Style Requirements

- The font Times New Roman 12 is to be used. Electronic copies must be provided in both a format readable by Word 2010 with minor formatting changes and pdf version. Any electronic files that cannot be read or require major formatting changes when opened are not acceptable and may be returned to the contractor for correction. The CNSC reserves the right, at its own discretion, to have the final report printed under CNSC cover, and to distribute it publicly. Translation of the abstract into French or English, CNSC report covers and the publication number will be provided by the CNSC.

The Report must have an Executive Summary and should contain a Table of Contents. A 300 word abstract must also accompany the Final Report. The CNSC reserves the right, at its own discretion, to have the final report printed and distributed publicly.

The following Disclaimer shall be included:

DISCLAIMER

The Canadian Nuclear Safety Commission is not responsible for the accuracy of the statements made or opinions expressed in this publication and do not assume liability with respect to any damage or loss incurred as a result of the use made of the information contained in this publication.

The proposed contract is for a period of approximately 6 months from contract signature.



Advance Contract Award Notice

The estimated value of the contract is from \$130,000 to \$150,000 USD. Applicable taxes are extra.

5.0 Minimum Mandatory Requirements

Any interested supplier must demonstrate by way of a statement of capabilities that it meets the following requirements:

- The contractor must demonstrate that they hold a government security clearance to bid (personnel & document safeguarding)
- The contractor must be independent from the Canadian nuclear industry. Independent in this context is defined as having no involvement in the development of the COG documents listed under section 3.0, and having no commercial interest in promoting the acceptance of the approaches proposed.
- The contractor must demonstrate the ability to complete the work within the next 6 months
- Experience – The principal investigator must have:
 - over 20 years' experience conducting technical reviews in the nuclear sector
 - significant experience conducting reviews for a nuclear regulator
 - experience in the engineering assessment using fracture mechanics solutions for components with primary water stress corrosion cracking susceptibility.
 - demonstrated experience in the development of Probabilistic Fracture Mechanics (PFM) codes used in nuclear industries.
- Knowledge and understanding of fracture mechanics and primary water stress corrosion cracking mechanism.
- Academic qualifications - minimum Master's in Science or Engineering

6.0 Justification for the Pre-selected Supplier

Pacific Northwest National Laboratory meets the requirements identified in section 5. Also in the absence of other qualified bidders from two recent competitive attempts

- Pacific Northwest National Laboratory is recognized a subject matter expert in the nuclear industry
- Staff from Pacific Northwest National Laboratory have significant publications which highlight their expertise
- Security clearance has been a major roadblock in getting this project underway, as such Pacific Northwest National Laboratory is a US national lab with government security clearance



Advance Contract Award Notice

7.0 Intellectual Property

Canada intends to retain ownership of any foreground intellectual property arising out of the proposed contract as statutes, regulations, or prior obligations of the Crown to a third party or parties preclude contractor ownership of the Foreground information.

8.0 Statement of Capabilities

Suppliers who consider themselves fully qualified and available to meet the specified requirements may submit a statement of capabilities in writing to the contracting authority 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.

The closing date and time for accepting statements of capabilities is February 1, 2018 at 2:00 p.m. EST.

9.0 Contact Information

Inquiries and statements of capabilities are to be directed in writing to:

Dan Simard
Senior Contracting Officer
280 Slater Street
P.O. Box 1046, Station B
Ottawa ON K1P 5S9
Canada

Telephone: 613-996-6784
Fax: 613-995-5086
Email: dan.simard@canada.ca

10.0 Policy Information

Government Contracts Regulations: section 6(c)

- the nature of the work is such that it would not be in the public interest to solicit bids;

Subject to the North American Free Trade Agreement (NAFTA) – 1016.2 (a)

- in the absence of tenders in response to an open or selective tender, or where the tenders submitted either have resulted from collusion or do not conform to the essential requirements of the tender documentation, or where the tenders submitted come from suppliers that do not comply with the conditions for participation provided for in accordance with this Chapter, on condition that the requirements of the initial procurement are not substantially modified in the contract as awarded.



Advance Contract Award Notice

Subject to the Canadian Free Trade Agreement (CFTA) – 513 1(a) (ii)

- no tenders that conform to the essential requirements of the tender documentation were submitted