REQUEST FOR INFORMATION (RFI)

Date: August 19, 2015 **File 87055-15-0141(R604.1)**

Subject: Request for Information (RFI) regarding Project R604.1 ***"Investigation of international experience on regulatory and licensee use and application of Probability Safety Assessment (PSA)"***

1. Background and Purpose of this RFI

The purpose of this RFI is to obtain information before finalizing the requirements definition and procurement strategy for the subject project which is being carried out by the Canadian Nuclear Safety Commission (CNSC).

This research project seeks to gather and assess the current status of PSA use and application as it applies to licensees and regulators of major nuclear power generating countries. Based on the assessed advantages and disadvantages of different approaches, expert recommendations are being sought concerning the path forward for PSA use and application as it applies to CNSC's regulatory framework and Risk Informed Decision Making (RIDM) process.

This project is being undertaken to potentially enhance CNSC's regulatory framework and regulatory requirements for nuclear power plants by investigating international and domestic experience in risk informed decision making (RIDM), especially through PSA application.

The details of the project and requirements are further outlined in Annex "A" – Work Statement to this RFI.

2. Nature of this RFI

This RFI is not a solicitation and there is no commitment with respect to future purchases or contracts.

Potential suppliers of the services described in this RFI should not reserve stock or facilities, nor allocate resources as a result of any information contained in this RFI. The procurement of any services described in this RFI will not necessarily follow this RFI. This RFI is simply intended to solicit feedback from industry with respect to the matters described in this RFI.

3. Nature and Format of Responses Requested

Respondents are requested to provide their responses to questions in Section 6.

Responses are to be sent by email to:

Alex Cassol, Senior Contracting Officer
E-mail: alex.cassol@cnsc-ccsn.gc.ca
Telephone: 613-996-6638
Fax: 613-995-5086

4. Response Costs

CNSC will not reimburse any respondent for expenses incurred in responding to this RFI.

5. Treatment of Responses

- **Use of Response:** Responses will not be formally evaluated. However, the responses received may be used by CNSC to develop or modify procurement strategies or any draft documents contained in this RFI. CNSC will review all responses received by the RFI closing date. CNSC may, in its discretion, review responses received after the RFI closing date.
- **Confidentiality:** Respondents should mark any portions of their response that they consider proprietary or confidential. CNSC will handle the responses in accordance with the Access to Information Act.
- **Follow-up Activity:** CNSC may, in its discretion, contact any respondents to follow up with additional questions or for clarifications of any aspect of a response.

6. Questions to Interested Parties of this RFI

- Would you/your organization be able to provide the services outlined in Annex "A" – Statement of Work (SOW) and be interested in bidding on any solicitation that may be issued related to the SOW?
- Could the work be completed within the estimated dates related to the deliverables/milestones in the SOW and an estimated budget of $75,000.00 Canadian dollars, excluding applicable taxes but all-inclusive of travel etc.?
- What would the estimated level of effort be to complete the work (in person days)?
- What types of resources (human and otherwise) are required to complete the work including experience and qualifications?
- Is the Statement of Work clear and reasonable?
- Do you have any general comments or concerns regarding the SOW and/or suggestions for improvements to the SOW?

7. Submission of Responses to Questions to Interested Parties

- **Closing Date for Submission of Responses:** Suppliers interested in providing a response should deliver it by email to the Contracting Authority identified above **by September 4, 2015.**

- **Responsibility of Timely Delivery:** Each respondent is solely responsible for ensuring its response is delivered on time per the instructions specified in this RFI.

- **Language of Response:** Responses may be in English or French at the preference of the respondent.

8. Enquiries

Because this is not a bid solicitation, CNSC will not necessarily respond to enquiries in writing or circulate answers to all potential suppliers/respondents. However, respondents with questions regarding the RFI may direct their enquiries by email to:

Alex Cassol, Senior Contracting Officer
E-mail: alex.cassol@cnsc-ccsn.gc.ca
Telephone: 613-996-6638
Fax: 613-995-5086

ANNEX "A" - WORK STATEMENT

1.0 Background

The regulatory standard S-294 "Probabilistic Safety Assessment (PSA) for Nuclear Power Plants" was first issued by the Canadian Nuclear Safety Commission (CNSC) in April 2005 and was later incorporated in the licensees Power Reactor Operating Licence (PROL). The standard sets high level requirements for the conduct of Level 1 and Level 2 PSAs which include the consideration of internal and external events for at-power and shutdown operational states.

In May 2014, the regulatory standard S-294 was amended and issued as REGDOC 2.4.2. Both the previous S-294 and the updated REGDOC 2.4.2 versions focus on the development of PSA methodology, not on PSA use and application.

Thus far, most Nuclear Power Plant (NPP) licensees in Canada have submitted their PSAs to the CNSC. With this in mind, licensees are using their PSA results and insights to support operational needs and to respond to regulatory requests. The industry has already proposed some potential PSA applications such as Risk Informed In-service Inspection (RI-ISI) and Risk Informed Fitness for Service (RI-FFS).

On the international level, PSA has evolved to the point that it is increasingly used as a tool in regulatory decision making, to the extent supported by the state-of-the-art in PSA methods and data in a manner that complements the deterministic approach.

With respect to the CNSC, a strategic plan has been developed in order to move towards modern regulation. This strategic plan directs CNSC staff to develop a common understanding and consistent approach to "risk-informed" for both licensing and compliance verification. Although CNSC has developed a high level internal process known as Risk Informed Decision Making (RIDM) in 2009 for trial use and some attempts have been made to incorporate the PSA results in the decision making, the risk informed regulatory framework still needs to be established to clearly reflect CNSC organizational goals. It is also important to develop necessary regulations and guidance for both CNSC staff and the licensees in the use of PSA for the RIDM.

The purpose of this research project is to provide information on RIDM and PSA applications in other countries, including the regulatory framework (regulations and guidance) and examples, in order to help CNSC staff to propose a structure and approach for Canadian risk informed regulatory framework to the CNSC.

2.0 Objectives

The objectives of this research project is to investigation the current status (and possible path forward, if the information is available) of RIDM and PSA applications in major nuclear power generating countries (USA, France, Japan, Korea, and other European countries, etc.). This research project also evaluates and assesses the different approaches on RIDM and PSA applications of different countries in order to provide recommendations to CNSC on the path forward of the development of Canadian risk informed regulatory framework.

This research project also aims to compare some new Canadian PSA applications that are being introduced in the Canadian Regulatory framework, such as CSA standard "Technical requirements for in-service evaluation of zirconium alloy pressure tubes in CANDU reactors" and also proposed RI-ISI with international practice.

3.0 Scope of Work

The scope of work includes a review and assessment of international PSA applications concerning nuclear power plants and also compares some new Canadian PSA applications to international practice. This work is to consider the regulatory framework and practice of major nuclear power generating countries (identified in Task 4.1).

4.0 Tasks to be Performed

4.1 Perform a literature review and summarize PSA use and application as it applies to licensees and regulators of select nuclear power generating states (United States, United Kingdom, France, Germany, Nordic countries, Japan and Korea), considering the following areas:

- Policies on risk informed decision making using PSA, including acceptance criteria.
- Use of PSA by regulators.
- PSA use and application by licensees, acceptance criteria
- Regulations and/or guidance concerning PSA use and application.
- Successful examples of PSA applications.
- Pros and Cons of PSA applications.
- Current consideration of PSA use and application after the Fukushima accident.

The source of the literature shall include:

- Publications from international organizations such as the International Atomic Energy Agency (IAEA) and Organization for Economic Cooperation and Development (OECD) Nuclear Energy Agency.
- Publications, documents from regulatory authorities, such as the U.S. Nuclear Regulatory Commission (U.S. NRC).
- Proceedings and papers from international conferences and workshops.
- Journal papers.

4.2 Review the two Canadian risk informed applications currently being developed (CSA 285.8-10 and proposed RIISI) (to be provided) and compare with international practice.

4.3 Based on the information compiled from Tasks 4.1 and 4.2 consider the advantages and disadvantages of the different approaches that were studied.

4.4 Based on the completion of Tasks 4.1 through 4.3, recommend:

- Areas that PSA use and application should be encouraged in Canada.
- Advancement of the CNSC regulatory framework, (which areas need to be developed and recommendation for the mechanisms to use (guidance, policy, regulatory document…)
- Discuss the areas or limitations of PSA applications where the use of PSA applications should be limited/avoided in regulatory decision making
- Discuss, the current international practices in blending PSA applications and other approaches (deterministic, etc.) in RIDM

5.0 Deliverables

All deliverables are to be submitted to the Project Authority.

5.1 Start-up Meeting

Date: Within 2 weeks of contract award

Location: CNSC Head Office in Ottawa or Via Tele/Videoconference

Purpose: To discuss the proposed approach, work plan and schedule to ensure achievement of the contract objectives. The contractor shall make a presentation with the above purpose in mind.

5.2 Progress Meetings

Due date: 3, 6 and 9 months after contract award

Location: The CNSC Head Office, Ottawa or teleconference

Purpose: To assess the degree to which the agreed project objectives are being achieved as planned and thus to facilitate timely adjustments (if necessary) to ensure the project success.

5.3 Preliminary Assessment Report (subject to CNSC review and acceptance)

This report shall address the literature review of RIDM and PSA applications as it applies to licensees and regulators of select nuclear power generating states, summarizing:

a. Policies on risk informed decision making using PSA, including acceptance criteria.
b. Use of PSA by regulators.
c. PSA use and application by licensees.

Due Date: 6 months after contract award

Copies: One electronic copy via email to the Project Authority

Format and style requirements: As specified in the Final Report.

5.4 Draft Final Report (Subject to CNSC review)

This report shall address the completion of all tasks, and include a discussion of all findings, conclusions and recommendations.

Due Date: 9 months after contract award

Copies: One electronic copy via email to the Project Authority

Format and style requirements: As specified in the Final Report.

5.5 Presentation

Due Date: 11 months after contract award

Location: CNSC Head Office, Ottawa

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

5.6 Electronic Files used to support the research project

This deliverable shall provide the all the electronic files associated with the projects analysis and results.

Due Date: 12 months after contract award

Copies: One electronic copy to the Project Authority

5.7 Final Report (Subject to CNSC review and acceptance)

The Final Report deliverable shall address any comments and recommended edits supplied by CNSC as it pertains to the Draft Final Report.

Due Date: 12 months after contract award

Copies: One electronic copy via email to the Project Authority and one bound copy

Format & style requirements:

The font Times New Roman 12 is to be used. Electronic copies must be provided in a format readable by Word 20010 with minor formatting changes. 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.