REQUEST FOR INFORMATION (RFI) 87055-16-0113

Date: July 13, 2016 **File # R660.1**

Subject: Request for Information (RFI) regarding Project ***"Radioactive Material Transport Risk Assessment"***

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).

The objective of this project is to develop a Transport Risk Assessment (TRA) methodology to complement the review of radioactive material transported in Canada.

While Canadian regulations for the transportation of radioactive material are adequate to ensure protection of the environment and the health and safety of people, the TRA methodology is expected to provide confirmation that estimated radiological risks from radioactive material transportation conducted in compliance with Canadian regulations are low and the safety of packages is high.

It will also improve public understanding of in regards to the transport of radioactive material and provide a useful tool for communicating the relative risks related to the transport of radioactive material.

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:

Contracting Authority: Nathalie Arbour
Email Address: nathalie.arbour@canada.ca
Telephone: (613) 996-6767

4. Response Costs

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

5. Treatment of Responses

a) **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.
b) **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.
c) **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

1) 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?
2) Could the work be completed within the estimated dates related to the deliverables/milestones in the SOW and an estimated budget of $50,000.00 Canadian dollars, excluding applicable taxes but all-inclusive of travel etc.?
3) What would the estimated level of effort be to complete the work (in person days)?
4) What types of resources (human and otherwise) are required to complete the work including experience and qualifications?
5) Is the Statement of Work clear and reasonable?
6) 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

a) **Closing Date for Submission of Responses:** Suppliers interested in providing a response should deliver it by email to the Contracting Authority identified above by **August 10, 2016**.

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

c) **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:

Contracting Authority:	Nathalie Arbour
Email Address:	nathalie.arbour@canada.ca
Telephone:	(613) 996-6767

ANNEX "A" - WORK STATEMENT

1.0 Background

There are over one million packages containing radioactive material being safely transported in Canada every year. While this activity has been well regulated for many years, there is increasing public focus on the shipment of dangerous goods in Canada.

In addition, the safe management of radioactive waste, driven through both the Deep geologic Repository (DGR) and Nuclear Waste Management Organization (NWMO) initiatives, as well as preparation for the eventual decommissioning or dismantling of some of Canada's nuclear facilities, necessitates a review of modern approaches to assessing, and effectively communicating, risks associated with the transport of radioactive material.

As a result, the CNSC initiated a review of the potential use of quantitative risk assessment methods for transport or radioactive material. As a starting point, an initial review of work related to risk assessment in transport at the international level was conducted.

In 2003, the International Atomic Energy Agency (IAEA) issued a report following the completion of a coordinated research project that took place from 1996–2000, titled "Input data for quantifying risks associated with the transport of radioactive material" (IAEA-TECDOC-1346). In addition, a number of presentations and technical papers have been made over the years at the Packaging and Transportation of Radioactive Materials (PATRAM) Conferences on the subject of risk assessment in transport with a main focus on transport of used nuclear fuel. One of the most recent studies was performed by the U.S. Nuclear Regulatory Commission (U.S. NRC) under NUREG-2125 Spent Fuel Transportation Risk Assessment, published in 2012 [1].

Recognizing that the current regulatory regime remains effective for overseeing the safe transport of radioactive material, the CNSC have identified a strategy to develop a Transport Risk Assessment (TRA) methodology that complements the current review of radioactive material transported in Canada by quantitatively assessing the risk associated with this activity.

2.0 Objectives

The objective of this project is to develop a Transport Risk Assessment (TRA) methodology to complement the review of radioactive material transported in Canada.

While Canadian regulations for the transportation of radioactive material are adequate to ensure protection of the environment and the health and safety of people, the TRA methodology is expected to provide confirmation that estimated radiological risks from radioactive material transportation conducted in compliance with Canadian regulations are low and the safety of packages is high.

It will also improve public understanding of in regards to the transport of radioactive material and provide a useful tool for communicating the relative risks related to the transport of radioactive material.

3.0 Scope of Work

The TRA will be modelled with a probabilistic approach building on logic event trees such as the study performed by the USNRC (NUREG-2125), using Canadian statistics for road accidents, and cover transport of radioactive material in certified Type B packages rather than only used nuclear fuel. Rail accidents will be investigated at a later date and are not part of this analysis.

4.0 Tasks to be Performed

This requirement is for the first phase of the project, the main task of which is to develop "event trees" to estimate probabilities of road accident conditions in Canada, similar to those used by the USNRC in NUREG-2125, Spent Fuel Transportation Risk Assessment [1], to support the review of used nuclear fuel shipments, which were developed in a subsidiary report by Mills et al. (2006) [2].

Specifically, a report similar in structure to the Mills report will be produced, addressing the following main topics;

- Introduction describing the origin of the data analysed, the bounding assumptions of the analysis, the overall approach to developing the event trees, and any limitations of the data analysed
- Road Accident Event Trees broken down into type, object struck, speed distribution, surface struck and probability, similar to Figure 3 of the Mills report, for the provinces of British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec and New Brunswick, as well as nationally
- Detailed discussion of the accident databases reviewed
- Detailed description of how the probabilities were determined
- Listings of the raw data from which the probabilities were determined (this can be provided electronically in a separate file format if too large to include in the report)
- Conclusions of the report
- Recommendations for further investigation

Subsequent phases of the project, to be contracted at a later date, will include;

1. Developing event trees for rail transport.

2. Calculating accident dose risks for representative shipments in Canada. This will require analysis of representative packaging to impact and thermal accident conditions, and will be based on the approach used in NUREG-2125.

3. Inclusion of used fuel transport once the NWMO is into their process for the site selection, mode of transport and design of package to be used for transport.

5.0 Deliverables

All deliverables are to be submitted to the Technical Authority.

5.1 Start-up Meeting

Date: November 2016

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

Purpose: To discuss and clarify 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: Monthly

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

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 Progress Report

Due Date: February 28, 2017

Copies: One electronic copy via email to the Project Authority

Progress report is to be submitted via electronic mail, to the Project Authority. It is to include a summary description of:

- The work completed since the last report;
- Work planned to be performed during the next reporting period;
- Identification of any potential problems and proposed course of action; and
- Update on project schedule and when delayed, propose a new deliverable schedule

5.4 Draft Final Report

Due Date: June 2017

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: July 2017

Location: CNSC Head Office, Ottawa

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

5.6 Final Report

Due Date: August 2017

Copies: One electronic copy via email to the Project Authority

Format & style requirements:

To be specified by the Project Authority. The font Times New Roman 12 is to be used. Electronic copies must be provided in a format readable by Word 2003 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.

The Report must have an Executive Summary (or Abstract) and should contain a Table of Contents. The CNSC reserves the right, at its own discretion, to have the final report printed and distributed publicly.

6.0 References

1. Cook, J., United States Nuclear Regulatory Commission Report, “Spent Fuel Transportation Risk Assessment Final Report”, NUREG-2125, January 2014, ADAMS Accession No. ML14031A323.

2. Mills, G.S., J.L. Sprung, and D.M. Osborn, Sandia National Laboratories Report, “Tractor/Trailer Accident Statistics”, SAND2006-7723, December 2006, ADAMS Accession No. ML12124A125.