

Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant Atomic Energy of Canada Limited

Subject Environmental Assessment Screening
Regarding the Proposal to Decommission the
Pool Test Reactor at the Chalk River
Laboratories

Date of
Hearing February 7, 2007

RECORD OF PROCEEDINGS

Applicant: Atomic Energy of Canada Limited

Address/Location: Chalk River Laboratories, Chalk River, Ontario, K0J 1J0

Purpose: Environmental Assessment Screening regarding the proposal to decommission the Pool Test Reactor at the Chalk River Laboratories

Application received: January 3, 2007

Date(s) of hearing: February 7, 2007

Location: Canadian Nuclear Safety Commission (CNSC), 280 Slater St., 14th. Floor, Ottawa, Ontario

Members present: L.J. Keen, Chair
J.A. Dosman
M.J. McDill

Secretary: M.A. Leblanc

Recording Secretary: M. Young

Legal Counsel: J. Lavoie

Applicant Represented By	Document Number
<ul style="list-style-type: none">• B. Lange, Senior Director of Decommissioning and Waste Management• S. Kenny, Acting Director of Waste Management and Decommissioning Operations• M. Klukas, Section Head for the Environmental Assessment Section at Chalk River	
CNSC staff	
<ul style="list-style-type: none">• C. Taylor• M. Santini• K. Francis	CMD 07-H102.A CMD 07-H102

Date of Decision: February 7, 2007

Table of Contents

Introduction	1
Decision	2
Issues and Commission Findings	3
Completeness of the Screening Report	3
Likelihood and Significance of Environmental Effects	4
<i>Adequacy of the Assessment Methods</i>	4
<i>Effects of the Project on the Environment</i>	5
<i>Effects of the Environment on the Project</i>	6
<i>Effects of Accident and Malfunction Events</i>	6
<i>Cumulative Effects</i>	7
<i>Follow-Up Program</i>	8
<i>Conclusions on the Likelihood and Significance of Adverse Environmental Effects</i>	8
Nature and Level of Public Concern	8
Conclusion	9

Introduction

1. Atomic Energy of Canada Limited (AECL) has applied to the Canadian Nuclear Safety Commission (CNSC¹) to seek approval for the decommissioning of the Pool Test Reactor at the Chalk River Laboratories (CRL), located in Chalk River, Ontario.
2. The authorization of this activity requires an amendment to AECL's Nuclear Research and Test Establishment Operating Licence, NRTEOL-01.00/2011, pursuant to subsection 24(2) of the *Nuclear Safety and Control Act*² (NSCA).
3. Before the Commission can decide on the proposed licence amendment, the Commission must, in accordance with the requirements of the *Canadian Environmental Assessment Act*³ (CEAA), make a decision on an Environmental Assessment (EA) screening of the proposal. The Commission and Natural Resources Canada (NRCan) are the responsible authorities for the EA.
4. The EA Guidelines were approved by a Designated Officer on July 26, 2005. The EA Guidelines were used in delegating the conduct of technical studies for the screening of this project to AECL, pursuant to section 17 of the CEAA. AECL provided the technical studies which underwent a review by experts at the CNSC and other relevant government departments. The resulting EA Study Report was then used by CNSC staff for the preparation of the draft EA Screening Report (Screening Report). Stakeholders, including the federal authorities, were provided an opportunity to review the draft Screening Report prior to its finalization and submission to the Commission for this hearing and decision.
5. This *Record of Proceedings* describes the Commission's consideration of the Screening Report and its reasons for decisions on the results. The Screening Report of AECL's proposal to decommission the Pool Test Reactor at the CRL site is attached as an appendix to CMD 07-H102.

Issues

6. In considering the Screening Report, the Commission was required to decide:
 - a) whether the Screening Report is complete; that is, whether all of the factors and instructions set out in the approved EA Guidelines and subsection 16(1) of the CEAA were adequately addressed;
 - b) whether the project, taking into account the mitigation measures identified in the Screening Report, is likely to cause significant adverse environmental effects;

¹ In this *Record of Proceedings*, the *Canadian Nuclear Safety Commission* is referred to as the "CNSC" when referring to the organization and its staff in general, and as the "Commission" when referring to the tribunal component.

² S.C. 1997, c. 9

³ S.C. 1992, c. 37.

- c) whether the project must be referred to the federal Minister of the Environment for referral to a review panel or mediator, pursuant to paragraph 20(1)(c) of the CEAA; and
- d) whether the Commission will proceed with its consideration of an application for a licence under the *Nuclear Safety and Control Act*, consistent with paragraph 20(1)(a) of the CEAA.

Hearing

- 7. Pursuant to section 22 of the NSCA, the President of the Commission established a Panel of the Commission to hear this matter.
- 8. The Panel of the Commission (hereafter referred to as the Commission), in making its decision, considered information presented for a hearing held on February 7, 2007 in Ottawa, Ontario. During the hearing, the Commission received a written submission and an oral presentation from CNSC staff (CMD 07-H102 and CMD 07-H102.A). Representatives from AECL were present via videoconference.

Decision

- 9. Based on its consideration of the matter, as described in more detail in this *Record of Proceedings*, the Commission decides that:

- a) the Environmental Assessment Screening Report appended to CMD 07-H102 is complete; that is, the scope of the project and assessment were appropriately determined in accordance with section 15 and 16 of the *Canadian Environmental Assessment Act*, and all of the required assessment factors were addressed during the assessment;
- b) the project, taking into account the mitigation measures identified in the Environmental Assessment Screening Report, is not likely to cause significant adverse environmental effects;
- c) it will not refer the project to the federal Minister of the Environment for his referral to a federal Environment Assessment review panel or mediator;
- d) it will proceed to consider the application for licence amendment under the provisions of the *Nuclear Safety and Control Act*, consistent with paragraph 20(1)(a) of the *Canadian Environmental Assessment Act*.

Issues and Commission Findings

10. The findings of the Commission are based on the Commission's consideration of all the information and submission available for reference on the record for the hearing.

Completeness of the Screening Report

11. In its consideration of the completeness of the Screening Report, the Commission considered whether the assessment had adequately addressed an appropriately defined scope of project and assessment factors.
12. CNSC staff stated that the Screening Report contained information on the full scope of the project and for all of the factors required for a screening EA under section 16 of the CEEA and as set out in the EA Guidelines.
13. CNSC staff further reported that the following expert federal authorities were notified of the project pursuant to the CEEA *Regulations Respecting the Coordination by Federal Authorities of Environmental Assessment Procedures and Requirements*⁴: NRCAN, Health Canada, Environment Canada, Fisheries and Oceans Canada (DFO), and Indian and Northern Affairs Canada (INAC). CNSC staff noted that these federal authorities were provided with the opportunity to participate in the preparation of the draft EA Guidelines and the draft EA Screening Report, and comments were received from Health Canada, Environment Canada, and INAC.
14. CNSC staff further discussed NRCAN's status as a RA for the project. CNSC staff stated that NRCAN initiated the Nuclear Legacy and Liabilities Program (NLLP) where it will be actively involved in overseeing and making decisions on the planning, implementation, reporting and administration of the project, as well as funding the work completed. CNSC staff stated that this gives rise to the funding trigger under section 5 of the CEEA. CNSC staff noted that NRCAN was provided with the draft EA Guidelines for review and no comments were received. Further to NRCAN's involvement with the EA, CNSC staff explained that each federal RA is responsible for making its own decision on the EA screening report, and NRCAN will use the screening report prepared by CNSC staff.
15. CNSC staff stated that the Ontario Ministry of the Environment was also provided with the opportunity to participate in the preparation of the draft EA Guidelines and the draft EA Screening Report. The Ontario Ministry of the Environment determined that there are no provincial environmental assessment requirements under the *Ontario Environmental Assessment Act*⁵ for this project.

⁴ S.O.R./97-181.

⁵ R.S.O. 1990, c. E.18.

16. In addition to the federal and provincial government, other stakeholders were provided with the opportunity to comment on the EA Guidelines. CNSC staff noted that comments were received from the Sierra Club of Canada.
17. Based on the Commission's review of the EA Guidelines and Screening Report, the Commission concludes that the scope of the project and the scope of the factors for the assessment are appropriate and that all of the required factors were addressed during the assessment.
18. The Commission also concludes that the EA Screening Report is complete and compliant with the requirements of the CEAA.

Likelihood and Significance of Environmental Effects

19. This section contains the Commission's findings with respect to whether the project is likely to cause significant adverse environmental effects, taking into account the identified mitigation measures.

Adequacy of the Assessment Methods

20. In its submission, CNSC staff outlined the methodology used in the assessment of the direct and indirect effects of the project on the environment. CNSC staff noted that the assessment of likely effects of the project on the environment was carried out in a step-wise manner, and considered activities related to the normal operations and the effects of probable malfunctions and accidents.
21. CNSC staff explained that the assessment of likely effects of the project on the environment was conducted in the following manner:
 - establish study boundaries and criteria for the assessment;
 - identify Valued Ecosystem Components (VECs);
 - identify potential interactions between the project activities and the existing environment;
 - determine which chemical constituents, radionuclides or trace elements may be released as a consequence of the project and require assessment;
 - examine potential adverse effects and identify likely direct or indirect effects on the environment, including the VECs;
 - identify mitigation measures for adverse effects where feasible and determine any residual adverse effects, including cumulative effects, that would remain after mitigation; and
 - assess the significance of any residual adverse effects.
22. Based on its review of the Screening Report and the above information, the Commission concludes that the EA methods were acceptable and appropriate.

Effects of the Project on the Environment

23. CNSC staff reported that there were several project activities expected to result in likely significant measurable effects requiring the consideration of mitigation measures, including:
 - removing the Pool Test Reactor systems, components and support structures;
 - draining the pool; and
 - removing the pool's water supply and purification system.
24. CNSC staff stated that these activities could result in conventional safety hazards, worker radiation doses, and surface water quality deterioration. CNSC staff noted that the full characterization of the radiation hazards will be completed after the water is removed from the pool, which will allow the segregation of the active waste from the inactive waste. CNSC staff stated that it is expected that the project will generate less than 1 cubic metre (m³) of low-level radioactive wastes (LLRW) and an estimated 8 m³ of nominally clean materials (materials that have not come into contact with radioactive contaminants).
25. CNSC staff stated that proposed mitigation measures to reduce or eliminate the expected adverse effects include:
 - discharge to the Sewage Treatment plant at 50 m³/day if the acceptance criteria for the water quality in the storm sewer is not met;
 - scaffolding and fall protection within the empty pool; and, if required,
 - radiological rezoning of the area and standard operational control measures.
26. The Commission sought further information about the acceptance criteria for the water quality in the storm sewer. AECL responded that the criteria being used are comparable to storm drain guidelines. AECL explained that those guidelines are based on two documents: the Ontario Ministry of the Environment Model Sewer Use Bylaw and the *Ontario Drinking Water Standards*⁶. AECL stated that the levels of all contaminants in the pool test reactor water are substantially below the storm drain guidelines.
27. The Commission inquired about the tritium levels in the pool. AECL responded that the current levels are approximately 1,800 Becquerels per litre (Bq/L), while the drinking water standard is 7,000 Bq/L. CNSC staff commented that, based on its assessment, the tritium levels do not pose a risk to the environment.
28. The Commission asked if it would be possible to remove the tritium from the water onsite as opposed to disposing it in the river. CNSC staff responded that the removal of tritium from light water is a very difficult process and the technologies are not reasonably or readily available for that. AECL added that this release of tritium will not have an adverse affect on the environment.
29. The Commission sought assurance that the reinforced concrete walls will be monitored as the pool is drained. AECL responded that as the water level is lowered, the wall will be inspected for any structural failure. AECL stated that it will conduct radiological surveys of the exposed surface and check for leakage as well.

⁶ O. Reg. 169/03

30. The Commission asked if AECL has a protocol to protect the health and safety of the workers who will be involved in managing the 1 m³ of low-level radioactive waste. AECL responded that the project will have a waste management plan prepared as part of the execution of the actual project. AECL explained that the waste management plan will detail the exact fashion in which the waste will be handled.
31. Based on its review of the Screening Report and the above-noted information and considerations, the Commission concludes that the proposed project, taking into account the identified mitigation measures, is not likely to cause significant adverse environmental effects.

Effects of the Environment on the Project

32. Naturally occurring events that can produce extreme conditions affecting the performance of project activities are assessed in this section. CNSC staff stated that it considered several manners in which the environment could adversely affect the project, including flooding, external fire, earthquakes and extreme winds and tornadoes.
33. CNSC staff stated that these events are addressed in the CRL Emergency Preparedness Program and no additional mitigation measures are required. CNSC staff reported that such events are not likely to affect the project such that significant adverse environmental effects would result.
34. Based on the above information, the Commission concludes that the environment is not likely to cause adverse effects on the project.

Effects of Accident and Malfunction Events

35. CNSC staff stated that two types of accidents are considered of importance to the EA: internal events, such as fire and failure of liquid confinement systems, and loss of service events, such as loss of power, ventilation and heating. CNSC staff noted that a complete review of events, the probability of these events and mitigation measures will be provided in regulatory documents to be submitted by AECL to the CNSC as a part of the licensing process.
36. CNSC staff explained that, due to the minor nature of the project, the expected consequences of these events would also be minor. CNSC staff stated that the AECL Emergency Preparedness Program, building emergency procedures and the CRL Fire Protection Program address these types of events, and therefore, no additional contingencies are required.
37. The Commission expressed concern that the installation of a removable cover over the pool opening, with an allowable floor loading of at least 50 pounds per square foot, would not be sufficient to support a person. AECL explained that the pool opening is elevated off the floor on a three-foot concrete wall, and that the cover will prevent dirt and debris from falling into the pool. AECL assured the Commission that the dust cover will not be used for storage or office space.

38. CNSC staff stated that the conclusion of the overall assessment is that the project is not likely to cause significant adverse effects on the environment, including VECs, with the implementation of mitigation measures identified in the EA Screening Report.
39. Based on the above information and considerations, the Commission concludes that accident and malfunction events are not likely to cause adverse effects on the environment. The Commission notes that appropriate precautions should be taken to ensure that no person walks on the dust cover.

Cumulative Effects

40. With respect to the requirement to also examine cumulative effects, CNSC staff stated that cumulative effects can only occur for environmental components for which residual effects have been identified. In the EA Screening Report, CNSC staff detailed the process used to determine any cumulative effects. CNSC staff reported that no significant cumulative effects were identified for the project.
41. The Commission asked whether the environmental considerations for this project would have any impact on the other decommissioning projects being conducted at the CRL site. AECL responded that the activities within the Pool Test Reactor have no relationship or interaction with the work that was being done elsewhere at the CRL site.
42. The Commission asked if there are any particular considerations that will require increased attention due to the active use of the site for ongoing operations being concurrent with the project. AECL responded that additional implications due to the decommissioning process are not associated with site operations. AECL explained that although it is sometimes necessary to consider issues such as steam lines that run through the facility and have to be rerouted, in this particular case the Pool Test Reactor is essentially separated from the rest of the site facilities. AECL noted that the only exception is a water purification system located in the same room as the Pool Test Reactor, which, as a result of the proposed decommissioning, had to be separated from use within the Pool Test Reactor itself.
43. CNSC staff stated that because of the considerable number of activities at the CRL site, it will monitor all activities as part of the cumulative effects assessment. CNSC staff noted that, for future environmental assessments, it will endeavour to provide a context for other projects at the CRL site and how they fit within the overall plan for decommissioning.
44. Based on the information received, the Commission concludes that, taking into account the identified mitigation measures, significant adverse cumulative effects are not expected to occur as a result of the project. The Commission notes that it expects AECL to present the project as a whole, with respect to how it fits in the overall CRL operations and timeframes, at the licensing stage.

Follow-Up Program

45. CNSC staff stated that if licensing approval is granted, the project will be monitored in accordance with CRL's Environmental Protection and Radiation Protection Programs. CNSC staff explained that these programs will serve to confirm that emissions are as predicted and that radiation dose to the workers remains well below regulatory limits. CNSC staff noted that due to the minor nature of the project, a separate follow-up project will not be required pursuant to the CEAA.
46. The Commission is satisfied that the CNSC licensing and compliance program responsible for ensuring the final design and implementation of the follow-up program will be adequate to verify and, if necessary, identify where additional mitigation measures may be required.

Conclusions on the Likelihood and Significance of Adverse Environmental Effects

47. Based on the considerations and reasons noted above, the Commission concludes that the proposed project is not likely to cause significant adverse environmental effects, taking into account the identified mitigation measures.
48. The Commission is also satisfied that the likelihood and significance of the effects have been identified with reasonable certainty.

Nature and Level of Public Concern

49. With respect to public concern as a factor in its consideration of whether to refer the project to the federal Minister of the Environment for a review panel or mediator, the Commission first examined whether the public had sufficient opportunity to become informed about the project and the Environmental Assessment, and express their views on it.
50. CNSC staff stated that the draft EA Screening Report was made available for review and comment from September 25, 2006 to October 27, 2006 to interested stakeholders and members of the public. CNSC staff reported that no comments were received from the public on the draft Screening Report. CNSC staff stated that no concerns were raised that would justify referring the project to the federal Minister of the Environment for a referral to a review panel or mediator.
51. The Commission therefore decides not to refer the project to the Minister of the Environment for referral to a review panel or mediator under paragraph 20(1)(c) of the CEAA.

Conclusion

52. The Commission concludes that the environmental assessment Screening Report attached to CMD 07-H102 is complete and meets all of the applicable requirements of the *Canadian Environmental Assessment Act*.
53. The Commission concludes that the project, taking into account the appropriate mitigation measures identified in the Screening Report, is not likely to cause significant adverse environmental effects.
54. Furthermore, the Commission also concludes that, at this time, it will not request the federal Minister of the Environment to refer the project to a review panel or mediator in accordance with the provisions of the CEAA.
55. Therefore, the Commission, pursuant to paragraph 20(1)(a) of the CEAA, decides to proceed with the consideration of a licence application under the *Nuclear Safety and Control Act* which, if approved, would allow the project to proceed. The Commission notes that it expects AECL to present the project as a whole, with respect to how it fits in the overall CRL operations and timeframes, at the licensing stage.

Linda J. Keen,
President,
Canadian Nuclear Safety Commission

Date of decision: February 7, 2007

Date of release of Reasons for Decision: May 11, 2007