

Record of Proceedings, Including Reasons for Decision

In the Matter of

Proponent Atomic Energy of Canada Limited

Subject Environmental Assessment of the proposed
continued operation of the National Research
Universal (NRU) Reactor at Atomic Energy of
Canada Limited's Chalk River Laboratories

Date August 11, 2005

RECORD OF PROCEEDINGS

Proponent: Atomic Energy of Canada Limited

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

Purpose: Environmental Assessment of the proposed continued operation of the National Research Universal (NRU) Reactor at Atomic Energy of Canada's Chalk River Laboratories

Date(s) of hearing: June 29, 2005

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

Members present: L.J. Keen, Chair A.R. Graham
 C.R. Barnes M. J. McDill
 J.A. Dosman M. Taylor

General Counsel: J. Lavoie
 Secretary: M.A. Leblanc
 Recording Secretary: S. Gingras

Applicant Represented By	Document Number
<ul style="list-style-type: none"> • B. Van Adel, President and CEO • D. Torgerson, Senior Vice-President, Technology and Chief Technology Officer • P. Fehrenbach, Vice-President of the Nuclear Laboratories Business Unit • B. Shorter, Director of Reactor Operations and Facility Authority for National Research Universal (NRU) • R. Lambert, Director of Safety and Environment • P. Lafrenière, Site Licence Holder and General Manager of Facilities & Nuclear Operations 	CMD 05-H12.1
CNSC Staff	Document Number
<ul style="list-style-type: none"> <li style="width: 50%;">• B. Howden <li style="width: 50%;">• G. Lamarre <li style="width: 50%;">• C. David <li style="width: 50%;">• P. Thompson <li style="width: 50%;">• G. Bird <li style="width: 50%;">• C. Purvis 	CMD 05-H12 CMD 05-H12.A
Intervenors	Document Number
See Appendix A	

Date of Decision: June 29, 2005

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1. Introduction

Atomic Energy of Canada Limited (AECL) has applied to the Canadian Nuclear Safety Commission (CNSC¹) for authorization to continue operating the National Research Universal (NRU) Reactor beyond its currently scheduled shutdown on December 31, 2005.

The NRU reactor forms part of AECL's Chalk River Laboratories (CRL). CRL is a nuclear research and test establishment located on the south shore of the Ottawa River, approximately 200 km northwest of the City of Ottawa. Condition 13.1 of the operating licence for CRL stipulates that, unless approved by the Commission, the NRU reactor may not operate beyond December 31, 2005.

Before the Commission may decide on the proposed licence amendment, the Commission must, in accordance with the requirements of the *Canadian Environmental Assessment Act* (CEAA)², make a decision on an environmental assessment (EA) screening of the proposal. This *Record of Proceedings* describes the Commission's consideration of the EA Screening Report and its reasons for decisions on the results. The Commission is the sole responsible authority for the EA³.

The guidelines for this EA (EA Guidelines), including definitions of the scope of the project and scope of the assessment, were established by the CNSC on March 30, 2005. The EA Guidelines were used by CNSC staff in preparing the EA Screening Report. Expert federal authorities and various stakeholders were provided opportunities to comment on the EA Guidelines and on the draft Screening Report. The Screening Report and CNSC staff's disposition of comments from stakeholders and federal authorities are attached as Appendix 1 and 3 to CMD 05-H12.A respectively.

Issues:

In considering the Screening Report, the Commission was required to decide:

1. whether the Screening Report is complete;
2. whether the project, taking into account the mitigation measures identified in the Screening Report, is likely to cause significant adverse environmental effects;
3. whether the project will be referred to the federal Minister of the Environment for referral to a review panel or mediator (i.e., pursuant to paragraph 20(1)(c) of the CEAA); and

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.,(1992). c.37

³ Responsible Authority in relation to an EA is determined in accordance with subsection 11(1) of the CEAA.

4. whether the Commission will proceed with its consideration of the application for a licence amendment under the *Nuclear Safety and Control Act* (NSCA) (i.e., consistent with paragraph 20(1)(a) of the CEAA).

Public Hearing:

The Commission, in making its decision, considered information presented for a public hearing held on June 29, 2005 in Ottawa, Ontario. The public hearing was conducted in accordance with the *Canadian Nuclear Safety Commission Rules of Procedure*. During the public hearing, the Commission received written submissions and heard oral presentations from CNSC staff (CMD 05-H12 and 05-H12.A) and AECL (CMD 05-H12.1). The Commission also considered oral and written submissions from six intervenors. Refer to Appendix A for a list of the interventions.

2. Decision

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

- a) the Screening Report is complete; that is, the scope of the project and assessment were appropriately determined in accordance with sections 15 and 16 of the CEAA, and all of the required assessment factors were addressed during the assessment;
- b) the project, taking into account the mitigation measures identified in the Screening Report, is not likely to cause significant adverse environmental effects;
- c) the Commission will not refer the project to the federal Minister of the Environment for his referral to a review panel or mediator; and
- d) consistent with paragraph 20(1)(a) of the CEAA, the Commission will proceed to consider the licence application from AECL for the continued operation of the NRU Reactor beyond its currently scheduled shutdown on December 31, 2005.

3. Issues and Commission Findings

The Commission addressed the four issues identified in section 1 above under three main headings: (1) the completeness of the Screening Report, (2) the likelihood and significance of the environmental effects, and (3) the nature and level of public concern. The Commission's findings in each of these areas are summarized below.

3.1 Completeness of the Screening Report

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.

CNSC staff reported that, on March 30, 2005, it established EA Guidelines, including statements of project scope and scope of the assessment factors as required by sections 15 and 16 of the CEAA. CNSC staff stated that, in its opinion, the Screening Report contains information on the full scope of the project and for all of the factors required for a screening EA under section 16 of the CEAA and as set out in the EA Guidelines.

CNSC staff further reported that the following expert federal authorities were notified of the project pursuant to the CEAA *Federal Coordination Regulations*: Natural Resources Canada, Fisheries and Oceans Canada (DFO), Environment Canada, Health Canada and Indian and Northern Affairs Canada. These federal authorities also participated in the preparation of the EA Guidelines and were provided with the opportunity to comment on the draft EA Screening Report. Those federal authorities have expressed satisfaction with the EA process, including with respect to the follow up activities currently underway on identified issues.

Based on this information and 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 were appropriate and that all of the required factors were addressed during the assessment. The Commission therefore concludes that the Screening Report is complete and that it is able to proceed to its consideration of the likelihood and significance of the environmental effects of the project, the adequacy of the proposed mitigation measures, and the public concerns about the project.

3.2 Likelihood and Significance of Environmental Effects

This section contains the Commission findings with respect to whether the project, taking into account the identified mitigation measures, is likely to cause significant adverse environmental effects. In examining this question, the Commission first considered the adequacy of the study methods used to identify and evaluate the potential environmental effects, followed by a consideration of the predicted effects on the relevant components of the environment.

3.2.1 Adequacy of the Assessment Method

With respect to the assessment methods, CNSC staff reported that it had conducted the assessment in accordance with the methods for technical study and stakeholder consultation specified in the EA Guidelines.

CNSC staff reported that it did not delegate the conduct of technical studies for the assessment to AECL. Such delegation of work is permitted under subsection 17(1) of the CEAA and is a normal part of the CNSC's EA process. In explaining this departure from the usual EA process,

CNSC staff stated that it had sufficient detailed information about the facility and surrounding environment to complete the EA without such delegation.

In its intervention, Concerned Citizens of Renfrew County (CCRC) objected to the lack of delegation of the EA studies to AECL. Furthermore, CCRC, noting that CNSC staff and AECL met and exchanged information on several occasions during the course of the assessment, suggested that AECL may have unduly influenced the outcome of the CNSC staff's study. CCRC expressed the view that the modified process is not consistent with the spirit of CEAA in that, in CCRC's view, it lacked transparency and did not provide for adequate engagement of the public.

In response to these concerns expressed by CCRC, the Commission notes that the delegation of studies pursuant to subsection 17(1) of the CEAA is optional. Therefore, a decision of a responsible authority to not delegate is entirely within the requirements and spirit of the CEAA. Furthermore, the Commission was not persuaded by CCRC's unsubstantiated allegation that the gathering of information by CNSC staff from AECL during the course of the assessment was inappropriate. The Commission notes that licensees have intimate knowledge of the physical and operational characteristics of their facilities and the natural and human environments in which they are located. The Commission considers it appropriate and necessary for the CNSC staff to work closely with the licensee in gathering relevant information for an EA. The Commission also does not consider that all such technical fact-finding needs to be conducted in a public forum. Furthermore, as noted in section 3.3 below, the Commission is satisfied that there was sufficient public involvement in this EA process.

CCRC also expressed its view that the CNSC staff's conclusions are not supported by evidence presented in the Screening Report. CCRC considers that the report lacks quantitative data on emissions and waste volumes associated with the proposed project's duration and, therefore, it fails to fulfill the EA Guidelines.

In response to this statement of the CCRC, CNSC staff expressed the view that the EA Screening Report does fulfill the requirements of the CEAA and EA Guidelines. CNSC staff further noted that the assessment was based on a considerable volume of quantitative information on the actual performance of the NRU over several decades. The Commission concurs that the Screening Report contains sufficient quantitative information in support of the conclusions presented.

Based on its review of the Screening Report and the above information and considerations, the Commission concludes that the EA methods were acceptable and appropriate, and that the Screening Report is complete and compliant with the requirements of the CEAA.

3.2.2 Effects of the Project on the Environment

CNSC staff stated its conclusion that the operation of the NRU Reactor beyond its currently scheduled shutdown on December 31, 2005, including a range of potential malfunctions and accidents, is not likely to cause significant adverse environment effects, taking into account the identified mitigation measures.

CNSC staff explained that it arrived at this conclusion through a systematic evaluation of all potential interactions between the facility (normal and abnormal operation) and the various components of the environment. CNSC staff noted that a total of 86 such interactions were initially identified. CNSC staff concluded from an assessment of each of those interactions that no likely significant adverse environmental effects are expected to occur as a result of extending the operating life of the NRU Reactor, facilities and systems.

With reference to one interaction that is currently causing fish mortality at the cooling water intake screen in the Ottawa River, the Commission questioned why no action had yet been taken to prevent or mitigate that impact. In response, CNSC staff explained that the relatively small numbers of fish being killed have a negligible effect on the large aquatic system in the Ottawa River. AECL added that discussions were ongoing with Fisheries and Oceans Canada (DFO) to address the issue in respect of the requirements of the *Fisheries Act*, and that various mitigation options are being evaluated. DFO has advised CNSC staff that discussions with AECL regarding the issue of the CRL site water intake pipe in the Ottawa River are progressing to DFO's satisfaction.

The Commission also sought further information on the identified tritium contamination in groundwater near the Power House. In response, AECL reported that, following more detailed sampling of the contaminant plume, the release represents a very small fraction of the derived release limits for CRL. AECL also noted that the activity levels have decreased significantly since about the time that the site active drain lines near NRU were repaired. AECL therefore believes that the source of the contamination may have been addressed. CNSC staff has concluded that the radiation dose from the plume would not be significant. This is based in part on the fact that the groundwater is not a drinking water source and therefore there would be no potential for significant exposure of the workers on site. The results of AECL's groundwater monitoring program are reported to the CNSC annually as part of compliance verification.

In response to the Commission's questions on the identified chlorine discharged to the environment, AECL explained that chlorine is used in the NRU water system to prevent fouling and the discharge to the process sewer is analyzed for total residual oxidant, including chlorine. AECL added that its chlorine management has been assessed by independent consultants and found it to be acceptable. CNSC staff noted that, since chlorinated waste water is a toxic substance⁴, it is monitored and its use must be optimized. Monitoring of chlorine releases to the environment was identified as an item in the proposed follow-up program to the environmental assessment.

With reference to the proposed follow-up program and AECL's environmental monitoring program in general, CCRC, in its intervention, expressed the view that AECL's environmental monitoring program has long contained critical gaps, lacks transparency and that the proposed follow-up activities will not adequately address these problems. In particular, CCRC recommended that the monitoring of Cs-137 levels in fish and Sr-90 levels in mussels in the Ottawa River should be added to the environmental monitoring program.

⁴ as prescribed under the *Canadian Environmental Protection Act* (CEPA); Order P.C. 2002-2149, December 12, 2002.

In response to the CCRC's concerns about the transparency of the program, AECL stated that all of the monitoring information is assessed and collected annually into detailed summary reports, and that those reports are available to the public. AECL, noting that the monitoring program is independently assessed and verified, expressed disagreement with Concerned Citizens of Renfrew County's contention that it contains significant gaps. CNSC staff also confirmed that it reviews and audits the monitoring program annually, and that the program meets the requirements of the CNSC. CNSC staff also considers that the proposed follow-up program would be adequate for determining if the effects of the project are as predicted in the EA Screening Report. Furthermore, CNSC staff noted that the Environment Canada Investigation Group performed a study on releases from the Chalk River Laboratories site. This Investigation Group concluded that, although there were measurable releases from the site, the level of these contaminants do not constitute a violation of the *Fisheries Act* and do not pose a risk to biota. CNSC staff concluded therefore that the additional monitoring of mussels and fish, as recommended by CCRC, would not provide additional value to the data already being collected. CNSC staff further noted that the use of mussels as a regular monitoring control has significant limitations.

In his intervention, W. Henry reported that the people in the neighbouring communities in West Quebec have concerns about the cancer risks associated with CRL and its emissions. W. Henry pointed to what he considers to be an abnormally high incidence of cancer in the area of Chapeau, Quebec as justification for these concerns. W. Henry requested therefore that air quality monitors be installed in those communities to better measure the amount of public exposure to the contaminants released from CRL, including those that may result when the MAPLE reactors begin operation.

In response to this intervention, AECL explained that the monitoring in the neighbouring areas of both Ontario and Quebec is performed continuously, and that no significant changes in contaminant releases to the atmosphere would be expected even with the operation of the MAPLE reactors. AECL stated that the health studies performed in the area identify lifestyle conditions as the predominant driver for the incidence of cancer rather than radiation exposure from CRL operations. CNSC staff concurred with this statement. CNSC staff further commented that it expects no variation in accumulation of radionuclides in the Chapeau area over time (including the potential operation of the MAPLE reactors), and therefore changes or additions to the monitoring program in that area are not necessary.

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. The Commission is satisfied that the projected emissions and effluents from the project, including from the bounding accidents, are acceptable and will be maintained as low as reasonably achievable. The Commission accepts the proposed framework for the follow-up program and, in particular, requests CNSC staff to perform a thorough follow-up of the issue of fish killed at the cooling water intake in consultation with AECL and the other applicable authorities. The Commission also expects information on this issue to be part of AECL's public information program for the CRL site. The Commission also notes that if the project is allowed to proceed,

the items identified in the follow-up program would be part of the licensing and compliance program for the CRL site.

3.2.3 Effects of the Environment on the Project

In addition to a consideration of how the project could adversely impact on the environment (as described in the previous section of this *Record of Proceedings*), the CEEA requires that the scope of the assessment include an examination of how the environment itself could adversely impact on the project.

In this regard, CNSC staff reported that the EA examined how severe weather, flooding and seismic events could adversely affect the project. CNSC staff concluded that the design and operation measures to reduce potential environmental effects from such interactions have been implemented and will continue to be developed. CNSC staff added that since the probabilities and consequences of any such events are very low, no measurable effects are expected from natural events.

Based on the above information, the Commission concludes that the environment is not likely to cause significant adverse effects on the project.

3.2.4. Effects on Renewable and Non-Renewable Resources

With respect to the adverse effects of the NRU life extension on the sustainability of renewable resources, CNSC staff reported that it concluded in the EA that no measurable effects are expected.

Based on this information, the Commission concludes that the project is not likely to have a significant adverse effect on the sustainability of renewable resources.

3.2.5 Malfunctions and Accidents

With respect to the adverse effects of the project on the environment caused by malfunctions and accidents, CNSC staff concluded from its assessment that the impact of such events would not be significant. Therefore, no measurable effect is expected.

The Commission questioned CNSC staff on whether the recent reportable incidents involving the NRU Reactor operations were considered in the accident scenarios. CNSC staff answered that the two accident scenarios detailed in the EA Screening Report are derived from the NRU Final Safety Analysis Report and are considered to be bounding (i.e., worst-case) scenarios. CNSC staff explained that the recent operating events at the NRU fall within the bounds defined by these two, more serious accident scenarios.

Based on this information, the Commission concludes that malfunctions and accidents that may occur at NRU are not likely to cause significant adverse environmental effects.

3.2.6 Cumulative Effects of the Project

With respect to the requirement to also examine cumulative effects, CNSC staff stated its finding that no cumulative effects to the environment under normal operating conditions were expected based on current releases to the environment, and that there is no need to apply mitigation measures beyond those that are already in place.

In its intervention, the CCRC expressed the view that the cumulative effects of long-lived isotopes that will persist into the environment should be assessed. More precisely, the intervenor suggested the EA include an assessment of cumulative effects of the additional intermediate and high-level waste, including the leaking of tile holes in Waste Management Area B. In response to this intervention, CNSC staff noted that it concluded from the cumulative effects assessment that there would be no expected measurable change in the overall CRL emissions, including from the waste management facilities. Those emissions are currently a small percentage of the CRL site Derived Release Limits (DRLs) and thus are not expected to result in significant environmental impacts over time.

Based on this information, the Commission concludes that significant adverse cumulative effects are not expected to occur as a result of the project.

3.2.7 Conclusions on the Likelihood and Significance of Adverse Environmental Effects

Based on the considerations and reasons noted above, the Commission agrees with CNSC staff's conclusion in the Screening Report that the proposed NRU life extension is not likely to cause significant adverse environmental effects, taking into account the identified mitigation measures.

The Commission is also satisfied that the likelihood and significance of the effects have been identified with reasonable certainty.

Furthermore, the Commission is satisfied that the proposed scope of the follow-up program will be adequate for verifying and, if necessary, identifying where additional mitigation measures may be required during the project implementation.

3.3 Public Concern

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.

The Commission is satisfied that AECL and CNSC staff consulted appropriately with the public, other interested stakeholders and First Nations in accordance with the direction set out in the EA Guidelines. The Commission is therefore satisfied that the public had adequate opportunity to become informed about the project and express any concerns.

Based on the information provided in the Screening Report and during this hearing, the Commission is satisfied that the public concerns raised during the EA process, including during this public hearing, have been adequately addressed. The Commission considers that the remaining concerns are of a nature that do not warrant a referral of the project to the Minister of the Environment for his referral to a review panel or mediation. The Commission is satisfied that the remaining issues can be addressed in the follow-up program and future consideration of the licence amendment application.

The Commission therefore decides not to refer the project to the Minister of the Environment for referral to a review panel or mediator on the basis of public concern (i.e., pursuant to subparagraph 20(1)(c)(iii) of the CEEA).

4. Conclusion

The Commission has considered the information and submissions of the proponent, CNSC staff and the intervenors as presented for reference on the record for the hearing.

The Commission concludes that the environmental assessment Screening Report attached to CMD 05-H12.A is complete and meets all of the applicable requirements of the *Canadian Environmental Assessment Act*.

The Commission concludes that the project is not likely to cause significant adverse environmental effects. Furthermore, the Commission decides not to refer the project to the Minister of the Environment for referral to a review panel or mediator on the basis of public concern.

Therefore, the Commission, pursuant to paragraph 20(1)(a) of the CEEA, decides to proceed with the consideration of a licence amendment application under the *Nuclear Safety and Control Act* which, if approved, would allow the project to proceed.

Marc A. Leblanc
Secretary,
Canadian Nuclear Safety Commission

Date of decision: June 29, 2005

Date of release of Reasons for Decision: August 11, 2005

Appendix A – Intervenors

Intervenors	Document Number
Concerned Citizens of Renfrew County, represented by O. Hendrickson	CMD 05-H12.2
Corporation of the Town of Laurentian Hills	CMD 05-H12.3
County of Renfrew	CMD 05-H12.4
Corporation of the Town of Deep River	CMD 05-H12.5
C. Gallant, M.P., Renfrew – Nipissing - Pembroke	CMD 05-H12.6
W. Hendry	CMD 05-H12.7 CMD 05-H12.7A