

# Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant Atomic Energy of Canada Limited

Subject Application for the Renewal of the Chalk River  
Laboratories Nuclear Research and Test  
Establishment Operating Licence

Hearing Dates April 26, 2006 and June 28, 2006

**RECORD OF PROCEEDINGS**

Applicant: Atomic Energy of Canada Limited

Address/Location: 2251 Speakman Drive, Mississauga, Ontario, L5K 1B2

Purpose: Application for the renewal of the Chalk River Laboratories Nuclear Research and Test Establishment Operating Licence

Application received: December 16, 2005

Date(s) of hearing: April 26, 2006 and June 28, 2006

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

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C.R. Barnes  
J.A. Dosman  
M. J. McDill

Secretary: M.A. Leblanc

Recording Secretary: P. Bourassa

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<b>Intervenors</b>			<b>Document Number</b>
See appendix A			

**Licence:** Renewed  
**Date of Decision:** June 28, 2006

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## **Introduction**

1. Atomic Energy of Canada Limited (AECL) has applied to the Canadian Nuclear Safety Commission (CNSC<sup>1</sup>) for the renewal of the Nuclear Research and Test Establishment Operating Licence for the Chalk River Laboratories for a period of 63 months. The current operating licence NRTEOL-01.04/2006 expires on July 31, 2006.
2. The Chalk River Laboratories (CRL) is a nuclear research and test establishment located on the south shore of the Ottawa River near Chalk River, Ontario. The site is comprised of a number of nuclear and non-nuclear facilities and activities. The main nuclear facilities include: the NRU (Nuclear Research Universal) Reactor (currently used for research purposes and radioisotope production); shielded facilities (Universal Cells, Fuels and Materials Cells); the Molybdenum-99 Production Facility; Nuclear Fuel Fabrication Facilities; and several radioactive waste management areas and facilities. The CRL site also includes a number of operating facilities that are currently shutdown.
3. The Dedicated Isotope Facilities (DIF) which include the MAPLE reactors and the New Processing Facility (NPF) are licensed separately from those of the CRL site. The DIF operating licences were renewed for a two-year period, following public hearings held on August 18 and October 18, 2005.

## Issue

4. In considering the application, the Commission was required to decide, pursuant to subsection 24(4) of the *Nuclear Safety and Control Act*<sup>2</sup>:
  - a) if AECL is qualified to carry on the activity that the licence would authorize; and
  - b) if, in carrying on that activity, AECL would make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

## Public Hearing

5. The Commission, in making its decision, considered information presented for a public hearing held on April 26, 2006 and June 28, 2006 in Ottawa, Ontario. The public hearing was conducted in accordance with the *Canadian Nuclear Safety Commission*

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<sup>1</sup> 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.

<sup>2</sup> S.C. 1997, c. 9.

*Rules of Procedure*<sup>3</sup>. During the public hearing, the Commission received written submissions and heard oral presentations from CNSC staff (CMD 06-H9, CMD 06-H9.A and CMD 06-H9.B) and AECL (CMD 06-H9.1, CMD 06-H9.1A, CMD 06-H9.1B, CMD 06-H9.1C, CMD 06-H9.1D, CMD 06-H9.1E, CMD 06-H9.1F, CMD 06-H9.1G and CMD 06-H9.1H). The Commission also considered oral and written submissions from 37 intervenors (see Appendix A for a detailed list of interventions).

## **Decision**

6. Based on its consideration of the matter, as described in more detail in the following sections of this *Record of Proceedings*, the Commission concludes that AECL is qualified to carry on the activity that the licence will authorize. The Commission is satisfied that AECL, in carrying on that activity, will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed. Therefore,

the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, issues Nuclear Research and Test Establishment Operating Licence NRTEOL-01.00/2011 to Atomic Energy of Canada Limited, Mississauga, Ontario, for the Chalk River Laboratories. The licence is valid from August 1, 2006 to October 31, 2011.

7. The Commission includes in the licence the conditions recommended by CNSC staff, as set out in the draft licence attached to CMD 06-H9.B. However, the Commission does not delegate the authority to staff to make approvals as proposed in Table 8.1 of CMD 06-H9.B; rather the Commission requests that delegations of authority to staff be exercised on a case-by-case basis as subject matters arise.
8. The Commission requests CNSC staff to present a status report to the Commission on the performance of the facility during the first half of the licence term. The status report is to be presented at a public proceeding of the Commission as soon as practical following the receipt of the report at the mid-point of the licence term (approximately May 2009).

## **Issues and Commission Findings**

9. In making its licensing decision under section 24 of the *Nuclear Safety and Control Act*, the Commission considered a number of matters relating to AECL's qualifications to carry out the proposed activities, and the adequacy of the proposed measures for

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<sup>3</sup> SOR/2000-211.

protecting the environment, the health and safety of persons, national security and international obligations to which Canada has agreed. The Commission's findings on these issues are summarized in this section.

10. The Commission notes that many of the issues examined are interdependent. For example, determining the adequacy of performance in a specific safety area often requires an examination of the licensee's past and current performance in that area, together with the relevant aspects of performance assurance and design adequacy that will affect future performance. As such, the findings of the Commission presented below are based on the Commission's consideration of all of the information and submissions available for reference on the record for the hearing.

### **Radiation Protection**

11. As part of its evaluation of the adequacy of provisions for protecting the health and safety of persons, the Commission considered the past performance and future plans of AECL in the area of radiation protection.

#### *Protection of Workers from Radiation*

12. AECL stated that it fulfils its regulatory requirements, pursuant to the *Radiation Protection Regulations*<sup>4</sup>, through the development and implementation of its Radiation Protection Program. AECL noted the continuous improvements made since 1993 to ensure that it incorporates the latest standards and international recommendations into its program while continuing to meet regulatory requirements. In this respect, AECL has implemented a formal ALARA (as low as reasonably achievable) Program, benchmarked with industry best practices and made improvements to its Radiation Protection Training Program. Improvements were also made in the area of dosimetry and in the installation of additional monitors in several facilities at the CRL site.
13. As an indication of the improvements made in the area of radiation protection, AECL reported that the average whole-body doses to workers have decreased by approximately 50% since 1993 and that the number of employees who have received a dose in excess of 20 millisievert (mSv) was reduced to 49 in 2005, compared to 106 in 1996. Overall, AECL reported that there was no regulatory dose exceedance during the licensed period. However, AECL reported that three unplanned events in 2004 resulted in exposures exceeding the dose action level, as set by AECL.
14. CNSC staff stated that the CRL Radiation Protection Program, and its implementation, meets regulatory requirements. CNSC staff also stated that the ALARA Program implemented for the CRL site is acceptable. Furthermore, all items identified in a comprehensive audit performed by CNSC staff in 2002 are now closed. CNSC staff reported that doses to *Nuclear Energy Workers* during the current licensing period

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<sup>4</sup> SOR/2000-203.

remained well below regulatory limit and within the range observed in the last five years.

15. The Commission asked if the relatively higher effective whole-body doses reported for the NRU maintenance personnel were consistently received by the same workers and, if this was the case, sought information on what was being done to prevent excessive accumulation over the years. In response, AECL stated that the NRU has a dedicated maintenance crew, and thus it would in effect be most of the same workers receiving these higher doses. Although the doses remain below regulatory requirements, AECL noted that it was pursuing its efforts in this area to improve its practices in dose control to protect its workers.
16. The Canadian Nuclear Workers Council (representing several of the unions present at CRL) noted its support of the CRL Radiation Protection Program and attested to the on-going improvements currently occurring at the site in the area of safety culture and in workers awareness of safety programs.
17. The National Research Council, in its intervention, stated that its employees who work at the CRL site are required to follow the same radiation protection training and to practice the same radiation protection procedures as AECL staff.

#### *Protection of the Public from Radiation*

18. AECL noted that the results of effluents and radioactivity monitoring in the environment at and surrounding the CRL site confirm that radiation doses to the public are below regulatory limits and below typical background radioactivity for this area.
19. CNSC staff explained that the controlled and uncontrolled releases from the CRL site contribute to the radiation dose received by the local population. In this respect, CNSC staff reported that the doses to critical groups remain well below the regulatory limit of 1 mSv/yr or 1000 microsievert per year (1000  $\mu$ Sv/yr) and within the range observed in last five years. CNSC staff noted that it has proposed a licence condition requiring the review and, if necessary, the revision of AECL's document that describes the method used to calculate the dose to the public.

#### *Conclusion on Radiation Protection*

20. Based on the information provided, the Commission concludes that AECL has made, and will continue to make, adequate provision for the protection of workers and the public from the effects of radiation from CRL. For further discussions of the Commission's findings in related areas, see the sections on Environmental Protection and Safety Culture.

### **Conventional Health and Safety**

21. With respect to the protection of persons from non-radiological hazards, AECL stated that the activities and operations at the CRL site comply with all applicable federal and provincial health and safety requirements. These include, in addition to the NSCA, the *Canada Labour Code Part II*, *Canada Occupational Health and Safety Regulations*, *Hazardous Products Act*, *Controlled Products Regulations*, and *Workplace Hazardous Materials Information System (WHMIS) Regulations*. AECL reported that lost time accidents are decreasing and that there has been a consistent improving trend in this area as a result of AECL staff, union and management efforts towards continuous improvement.
22. CNSC staff reported that the CRL Occupational Health and Safety Program, and its implementation, meets expectations. CNSC staff noted that progressive improvements in lost-time incidents demonstrate the successful implementation of the program. CNSC staff noted that AECL delivers safety-related training courses, in areas such as Work Permit System, WHMIS and Safety Management Systems. CNSC staff further noted that the accident frequency and severity at the CRL site is below industry average, with an all-time low reported in 2005 of 0.42 recordable lost-time injuries per 200,000 person-hours and 2.5 work days lost as a result.
23. The Canadian Nuclear Workers Council, in its intervention, attested to the effectiveness of the active joint *Safety and Health Committee* at CRL. The intervenor noted that workers understand and exercise their health and safety rights under the legislation thus contributing to a healthy workplace.
24. Based on this information, the Commission is satisfied that AECL has made, and will continue to make, adequate provisions for the protection of workers from conventional hazards at CRL.

### **Environmental Protection**

25. To determine whether AECL will make adequate provisions to protect the environment while carrying out the proposed activities at the CRL, the Commission considered the potential for the facility operations to adversely affect the environment.

#### *Environmental Monitoring Program*

26. CNSC staff stated that the Environmental Protection Program at CRL meets requirements, but its implementation, although well established, is not yet complete for all facilities at the site. In this regard, CNSC staff proposed a licence condition so that AECL would be required to implement an environmental monitoring program that is comprehensive for the whole CRL site and that includes a site-wide groundwater monitoring program.

27. CNSC staff noted that AECL's groundwater monitoring program is adequate to monitor the concentration changes and releases from the various areas and facilities being monitored. In November 2005, CNSC staff initiated a comprehensive and ongoing review to further assess the adequacy of the program. The main objectives of the review were to verify that all existing and potential groundwater contaminant sources have been adequately identified and characterized, assess the adequacy of current monitoring programs and ensure that adequate remedial actions are being developed and implemented. CNSC staff concluded that there seemed to be a lack of consistency in the methods and approaches that were being used for the collection, interpretation and reporting of the data. CNSC staff also noted that the regulatory approach to environmental monitoring had changed since the groundwater program was initially accepted in a matter that now required the licensee to have an auditable program, including quality assurance and quality control measures, to ensure that what is being reported is accurate and reliable. Thus, CNSC staff recommended that current groundwater monitoring activities be grouped under a consistent site-wide groundwater monitoring program and that the program be redesigned as appropriate to ensure it adheres to AECL's quality assurance principles.
28. AECL reported that it had obtained certification under the Environmental Management System Standard ISO 14001:2004. CNSC staff acknowledged that the current CRL Environmental Protection Program met the ISO standard and proposed a licence condition that would require AECL to ensure that the program also conforms to the recently issued CNSC Regulatory Standard S-296, *Environmental Protection Policies, Programs and Procedures at Class I Nuclear Facilities and Uranium Mines and Mills*.
29. CNSC staff reported on a number of site inspections conducted during the licensed period. Overall, CNSC staff noted the need to reinforce and clarify certain requirements; as a result, relevant action items are being addressed in the NRU and Site Compliance Programs. With respect to the environmental assessment follow-up program for the continued operation of the NRU reactor, CNSC staff noted that the control systems identified in the screening report are in place and are effective.
30. The Commission questioned the adequacy of the current practice of monitoring wells to understand the progression of the plumes over time. In this regard, the Commission asked if alternate monitoring methods had been considered. AECL noted that it had consulted hydrogeologists in establishing the current monitoring program and expressed the view that the practice provides a systematic measurement of the level of contamination. AECL pointed out that, in addition to monitoring wells, the surface water body where the groundwater expresses itself is also monitored.
31. In this respect, CNSC staff further noted that a redesign of AECL's Groundwater Monitoring Program may be needed in order to meet regulatory requirements. AECL stated that it was in agreement with the objectives laid out by CNSC staff in the proposed licence.

*Controlled Point-sources of Radioactive Emissions*

32. With respect to environmental releases during the current licence period, AECL stated that its own environmental monitoring and release measurements, supported by independent measurements, confirm that the impact on the environment of operating the CRL is low and well within regulatory limits. In support of this submission, AECL reported that the 2005 average airborne release of 11.2% of the allowable derived release limit (DRL) is consistent with past years, the large majority of which is the result of Argon-41 emissions from the NRU and DIF. Similarly, all radioactive liquid emissions have been very small fraction of the respective DRLs, representing on average 0.26% of the DRL. Releases of radioactivity in groundwater represented about 0.50% of total liquid emissions.
33. CNSC staff stated that it was satisfied with the overall management of controlled releases at the CRL site, noting that the liquid releases are not expected to be harmful to the environment. CNSC staff concurred with AECL's statement that the radioactive emissions resulting from the operations of the CRL have remained below regulatory limits and below 1% of the DRL.
34. CNSC staff proposed a licence condition with respect to the monitoring of Argon-41, given that this is a substantial ongoing release that accounts for 90% of the site releases and contributes to the majority of the dose received by the critical groups. In this regard, AECL would be required to install a real-time sampling and monitoring system on the main stack in order to verify the release measurements.
35. The Ottawa Riverkeeper expressed concern over the impact the discharges from the process sewer may have on the Ottawa River. The Commission sought the position of CNSC staff on this matter. In response, CNSC staff noted that the relevant studies carried out over the years, including an Environment Canada investigation and AECL's Ecological Effects Review, have indicated that in terms of impacts on human health, the levels of contaminants are not posing a health risk and are well below the Canadian drinking water guidelines<sup>5</sup> set by Health Canada. CNSC staff is satisfied with AECL's plans for remediation and mitigation in this area but notes that immediate action is not necessary because there is limited risk. AECL stated that it would continue to look at various approaches to further decrease releases to the environment as part of its overall commitment to the protection of the environment, health and safety of the public.
36. Although recognizing that releases remained below regulatory limits during the licence period, the Commission, in consideration of legislative and regulatory requirements and the ALARA principle, sought further information on AECL's effort to further reduce its emissions. With respect to the argon emissions, AECL noted that it had performed an ALARA review and the resulting recommendations were implemented in

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<sup>5</sup> Guidelines for Canadian Drinking Water Quality - Summary Table, Prepared by the Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment, dated March 2006.

the short-term while longer-term options were still being evaluated, taking into account their technical and economical feasibility. In general, AECL stated that it continues to look at options to further reduce emissions overall as a result of the operations of the CRL facilities.

37. Based on this information, the Commission is satisfied that the controlled point-source releases of radioactive substances to the environment are being adequately monitored and that the emissions and effluents have been, and continue to be, within the limits set out in the site licence.

#### *Environmental Effects of Non-Radiological Emissions*

38. With respect to the releases of hazardous substances, CNSC staff noted that controls are in place and provide reasonable protection to the environment against airborne emissions including CO, CO<sub>2</sub>, NO<sub>x</sub>, and SO<sub>2</sub>, as well as liquid effluents. CNSC staff is satisfied with the continuing reduction of mercury discharges but recommended, as a proposed licence condition, that a mercury mass balance be performed on the Molybdenum-99 Production Facility, as the largest user of mercury on the CRL site.
39. With respect to the carbon monoxide and carbon dioxide emissions, AECL noted that numerous initiatives had been taken over the years to reduce the emissions that are currently comparable with industry average.
40. Based on this information, the Commission is satisfied that AECL is in compliance with respect to the release of non-radiological contaminants from the CRL site and that those emissions and effluents are being adequately monitored.

#### *Uncontrolled Releases*

41. CNSC staff expressed concern with AECL's management of uncontrolled releases of radionuclides and hazardous substances to the environment. CNSC staff noted that uncontrolled releases, largely resulting from the waste management areas and the NRU reactor bay, are difficult to estimate and may in fact be larger than the controlled releases. Thus, CNSC staff is recommending that AECL report controlled and uncontrolled releases separately so that a clear understanding of the size of the release components can be made. CNSC staff pointed out, however, that the Ecological Effects Review report concluded that the uncontrolled contaminant releases are not harmful to the environment.
42. The Commission sought further clarification with respect to the uncontrolled releases of tritium and specifically on the timelines being established to remedy the situation. CNSC staff, with the concurrence of AECL, explained that there is a need for a better understanding of the source term in order to monitor the situation; this includes addressing both legacy issues and current operations. AECL stated that it is currently

focusing on treating the contaminated groundwater. AECL has not yet established timelines to address the issue considering that the situation is complex and that the ALARA principle must be taken into account for these low emission levels that have minimal impact on the environment. CNSC staff also attested that the discharges do not cause significant effects on the environment and is confident that AECL is taking the appropriate approach towards mitigation and remediation.

43. Intervenors expressed their view that the uncontrolled releases are unacceptable as they are contributing an excessive amount of tritium, and perhaps other contaminants, to the Ottawa River. Sierra Club of Canada further proposed that the CRL site licence should not be renewed until the source of the leak at the NRU rod bays is found and fixed and that there is commitment from AECL to fix all other leaks at the site.
44. The Commission also expressed concern over the reported leak rate from the NRU rod bays. The Commission sought assurances that the overall impact offsite remained acceptable and that efforts were being made to address the issue. In response, AECL noted that it has a systematic plan in place to isolate the source of the leak once it has been identified. However, AECL has not been able to locate the source, and thus it has not yet established a timeline to remediate the situation.
45. With respect to the impact on the environment, AECL noted that the plume associated with the NRU bays is currently impinging on the Ottawa River. On Day-Two of the hearing, AECL pointed out that a number of other radioactive contaminants are likely to have accompanied the tritium into the ground at the point(s) of leakage from the NRU bays. However, due to the chemical characteristics of the contaminants other than tritium, AECL explained that the contaminants are unlikely to have moved more than a few metres from the point(s) of release from the NRU bays to the ground. Thus, radioactive contaminants (other than tritium) from the NRU bays are not being released into the Ottawa River. CNSC staff noted that concentrations of tritium at the point at which the process sewer releases into the Ottawa River remain constant at approximately 4 becquerels per litre which is well below the 7,000 becquerels per litre for the Canadian drinking water guidelines.

#### *Radioactively Contaminated Groundwater Plumes*

46. AECL provided a brief description of the plumes and their locations on the CRL site. AECL reported on the five on-going monitoring programs in place, noting that it has submitted an action plan to the CNSC to further address the issues with respect to groundwater contamination.
47. CNSC staff noted that AECL's groundwater monitoring is extensive but lacks consistency in both methodology and approaches for the collection, interpretation and reporting of data. In this respect, CNSC staff reiterated the need for a site-wide environmental monitoring program, as discussed in paragraph 26.

48. Several intervenors, including Ottawa Riverkeeper, Sierra Club of Canada and Concerned Citizens of Renfrew County, expressed their concern with the groundwater plumes resulting in significant potential contamination of the Ottawa River. The intervenors questioned AECL's mitigation strategies to address this issue.
49. In response to the intervenors' concern and at the request of the Commission, AECL stated that, considering it has been characterizing the plumes for a number of years now, it felt it was in a good position to address a proposed licence condition dealing with this issue. This condition includes requirements to characterize the plumes, assess the resulting environmental impacts, and implement remediation and reduction activities, as appropriate. In this regard, AECL noted certain improvement activities it has undertaken or plans to undertake, including the implementation of a groundwater monitoring program, the removal of source terms such as the glass blocks and the drainage of the NRX bays, and the construction of groundwater treatment facilities to extract or significantly reduce the radionuclides from the water before its release.
50. CNSC staff noted that AECL's strategy for managing the various plumes, as outlined in the Comprehensive Preliminary Decommissioning Plan (CPDP), is based on a continuous long-term monitoring approach designed to confirm that the plumes are evolving as expected and that associated impacts remain acceptable. The intent is to develop and implement remediation actions on an as-needed basis. CNSC staff noted that this risk-informed approach is appropriate.
51. Although concerned with the contaminated groundwater plumes, the Commission is satisfied that AECL is taking appropriate measures to contain and control the environmental impacts until the task of remediation of the sources of the contamination and affected areas can be planned and carried out.
52. As acknowledged in past licensing decisions, the Commission recognizes the complexity of the current operations at the CRL site along with the added issues related to the legacy waste. As noted in the Record of Proceeding, including Reasons for Decision following the 2003 hearing on the CRL licence renewal: "The Commission recognizes that the history of CRL has been long – longer than any other nuclear facility in Canada - and that there has been a dramatic evolution of environmental standards during that history. The Commission requires that any locations adversely affected by such past practices be managed appropriately until they can be remediated, replaced or permanently decommissioned so that they do not pose an unreasonable risk to the environment, the health and safety of persons or national security in the interim."<sup>6</sup> In this respect, the Commission is satisfied that the programs in place, when considered in conjunction with AECL's plans to address the issues identified by CNSC staff, are adequate for the protection of the environment and the public.

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<sup>6</sup> See Record of Proceedings, including Reasons for Decision, on the matter of the *Application for the renewal of the Chalk River Laboratories Nuclear Research and Test Establishment Operating licence*, dated May 27, 2003.

*Waste Management*

53. AECL provided information on its 10-year waste management plan. AECL noted that a waste storage space assessment indicates there is sufficient waste storage for the next six to seven years. AECL explained that waste being sent to the Waste Management Areas (WMAs) is expected to decrease as a result of the Waste Analysis Facility aiding in the development of a “likely clean” program. AECL also provided information on the several projects planned or underway, which includes the construction of additional storage facilities and upgrades to existing treatment facilities.
54. With respect to the liquid radioactive waste, CNSC staff stated that this waste would continue to be adequately managed.
55. With respect to the leakage of contaminants from the existing liquid waste storage tanks, the Commission sought further information on the status of AECL’s plan to address this legacy issue. In response, AECL noted that although it has an active program in this area, it has needed to establish its project priorities on a risk-informed basis. However, AECL noted that following the environmental assessment for the proposed Liquid Waste Storage Facility<sup>7</sup> project, it anticipates that the storage tanks will be emptied within the next six years and replaced with a facility that meets modern standards. In conclusion, AECL noted that it would not be generating liquid wastes in the future, as a result of significantly altering the way it will now deal with liquids at the CRL site.
56. CNSC staff noted AECL’s plans to construct storage facilities to address the continuing increase of solid radioactive waste at the CRL site. However, CNSC staff expressed its concern that there were no contingencies beyond the year 2010 for the continued safe storage of solid radioactive waste.
57. The Commission asked AECL for further details on whether there was sufficient storage capacity to handle the waste at the CRL site. AECL responded that it had systematically looked at the waste generation and existing and planned capacity at the site and concluded that there is sufficient space for the proposed licence period. AECL also described the proposed Shielded Modular Above Ground Storage (SMAGS) buildings<sup>8</sup> that would provide an additional 20 years of storage for low- and intermediate-level waste. Furthermore, AECL noted that it had done a conservative analysis of the situation and did not credit certain practices, such as processing, incinerating and compacting waste, that would assist in decreasing the volume of waste to be ultimately stored. Further discussion in this regard is found in paragraphs 105 to 111.

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<sup>7</sup> See Record of Proceedings, including Reasons for Decision, on the matter of the *Screening Environmental Assessment for the Liquid Waste Storage Facility Project at Chalk River Laboratories*, dated April 13, 2006.

<sup>8</sup> A Commission hearing was held on April 27, 2006 to consider a screening environmental assessment of this project. See Record of Proceedings, including Reasons for Decision on the matter of the *Screening Environmental Assessment for the Proposed Shielded Modular Above-Ground Storage at the Chalk River Laboratories*, dated May 25, 2006.

58. Several intervenors expressed their concern over the long-term plans for waste management that may include the construction of a shallow rock cavity at the CRL site. Some of the concerns were directed at the need for transparency in the consultation process on relevant proposed projects, and the need to carry out an independent environmental panel review. Further discussion in this regard is found in the sections on the Application of the *Canadian Environmental Assessment Act* (paragraphs 141 to 148) and on the Decommissioning and Financial Guarantee (paragraphs 123 and 124).
59. With respect to intervenors' concerns and in reference to the proposed licence condition requiring AECL to produce a waste management framework document, the Commission enquired as to how this document would take into account legacy waste in addition to the waste produced by the current operations. CNSC staff explained that the objective of this particular condition is to characterize the radioactive and hazardous wastes that would be produced over the next licensing period at the CRL site and the waste received from AECL's external clients. This would ensure that the waste is properly stored in approved waste management areas capable of handling the specific types of material. CNSC staff noted that the facilities in place to manage the existing waste are governed under a facility authorization which includes operating limits and conditions for safe operation. Waste issues pertaining to decommissioning activities are covered in the Comprehensive Preliminary Decommissioning Plan.
60. Further to intervenors' concerns, the Commission sought information with respect to AECL's plan to address onsite subsurface disposal of intermediate-level waste. AECL explained that it was currently reassessing the relevant data collected over the last several years and would develop a safety assessment based on the geological considerations of this site. AECL noted that this process will span over several years and, based on the results obtained, it would engage the CNSC in evaluating any proposed solution. Any proposed project would be subject to the requirements of the *Canadian Environmental Assessment Act* (CEAA) and the NSCA. In this regard, the Commission notes that the processes under these regulatory requirements include opportunities for public consultation and participation at various stages.
61. The Commission, although concerned with the level of planning for long-term waste management, finds the proposed measures effective for the purpose of the proposed licence period.

#### *Conclusions on Environmental Protection*

62. The Commission is satisfied with AECL's progress to address deficiencies in the CRL Environmental Protection Program and monitoring programs to ensure a site-wide, integrated approach to environmental monitoring.
63. Based on the reported low levels of emissions and effluents from the site, the Commission is satisfied that the facilities and activities at CRL are not posing an

unreasonable risk to the health and safety of persons or the environment.

64. Based on the above information and considerations, the Commission concludes that AECL is making, and will continue to make, adequate provisions for the protection of the environment at CRL.

### **Operating Performance**

65. The Commission considered the operating performance at CRL as a further indication of AECL's qualifications to continue operating CRL and, in doing so, provide adequate protection for the environment, and the health and safety of persons. In the area of operating performance, the Commission examined: the conduct of operations, the reporting of events, and the management and organizational structure at CRL. The Commission also considered AECL's pressure boundary compliance.

#### *Conduct of Operations*

66. CNSC staff reported that, overall, the conduct of operations at the CRL meets requirements. Based on field compliance inspections it carried out at various facilities at the CRL, CNSC staff stated that no significant non-compliances were identified throughout the licence period. CNSC staff noted that AECL addressed action items and recommendations raised by CNSC staff in a satisfactory and timely manner.

#### *Reportable Events*

67. CNSC staff stated that AECL has reported events in a satisfactory manner during the current licence period. CNSC staff noted that apart from the operations of the NRU reactor and the Nuclear Fuel Fabrication Facility (NFFF), routine operations have been uneventful. With respect to the unplanned events at the NRU and NFFF, the causal factors have been linked to weaknesses in the operations quality assurance program.
68. AECL noted that the number of reportable events has increased in the last years as a result of a work culture that encourages workers to report events. CNSC staff concurred that the increased number of reports is mostly attributable to the rigorous reporting requirements for the OPEX program. Further discussion on this matter is found in the section below on Performance Assurance.
69. CNSC staff reported that of the reportable events tabulated from 2002 to date, 19 were security-related, 14 occurred at the NRU Reactor, 14 occurred at the NFFF, and the rest were spread over eight other facilities and programs. With input from CNSC staff, AECL has taken an initiative to thoroughly investigate the root causes of the large number of events for the NFFF and thus implement corrective actions to reduce that number significantly.

70. CNSC staff provided a follow-up to an extremity dose event that involved a worker at the NFFF<sup>9</sup>. CNSC staff concluded that AECL has been in compliance with conditions associated with the return to work of the person in question. CNSC staff noted that AECL will continue to monitor the situation and report to the CNSC as required.
71. With respect to the reportable events at the NRU reactor facility, CNSC staff noted that events over the last two years were reported in the significant development reports presented at Commission meetings. CNSC staff provided a summary of more recent events. In this regard, CNSC staff noted that following the discovery that the U-2 loop pipe supports were inoperative, operational constraints have been put in place for both loops. AECL will submit follow-up technical reports to CNSC staff for review. Two other events reported pertained to the activation of the fuel rod high power alarm and reduced wall thickness in the process water piping. CNSC staff did not raise any significant safety concerns with these events.

#### *Management and Organizational Structure*

72. AECL described several improvement initiatives taken over the last year to realign the organization and focus on operational performance and safety. AECL further noted the establishment of the Performance Improvements and Nuclear Oversight (PINO) unit, independent of line organizations and operations. AECL noted that this new structure will help it achieve further improvements in organizational safety culture, overall operational safety and performance excellence.
73. With respect to the NRU reactor facility, CNSC staff noted that AECL's NRU Organizational Review and Implementation Plan includes a recommendation to reorganize the management structure and include six functionally-based managers at the facility. CNSC staff considers this approach, which is in line with other research facilities and nuclear power plants, an improvement to the existing structure.
74. In response to the Commission's concern with what appears to be a large management task for the Vice-President of the Nuclear Laboratories, AECL stated that the organizational structure has been established to provide the Vice-President with the opportunity to work closely and have direct involvement with the fundamental areas and to develop greater leadership capability at the site. AECL expressed the view that this type of structure is needed in the short-term to enable the organization to reach its performance objectives. Eventually, AECL will adjust the organizational structure to allow a narrower span of control.
75. Further discussion of some of these management and organizational changes, particularly in the area of Quality Assurance, is contained in the following section on Performance Assurance.

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<sup>9</sup> The incident was first reported at the Commission meeting held on January 12, 2005 and was further considered by a Commission panel on June 6, 2006.

*Conclusions on Operating Performance*

76. Based on this information, the Commission is satisfied that the operating performance at CRL has been, and will continue to be acceptable over the proposed licence period.

**Performance Assurance**

77. CNSC staff reported that the Performance Assurance program and its implementation were below requirements. This is mainly due to the rating given to the quality management program, detailed in the following section. Nevertheless, CNSC staff felt that progress had been made in both the areas of training and quality management, and this improvement was noted as an upward trend.
78. CNSC staff explained that a program that was below requirements would have a moderate risk of failure. The idea of defence-in-depth is supported by that program being one of many programs within the organization. The combination of the quality assurance, training and operational experience programs provide defence-in-depth for AECL. Therefore, a deficiency in a program such as quality assurance would not necessarily result in the safety margins being compromised because there would be other barriers in place. In the case of a deficiency, there would have to be a sense of urgency to fix a deficiency in order to return all the barriers to their full effectiveness. Overall, CNSC staff observed a positive effort in the area of performance assurance at AECL. When deficiencies were found, their significance was identified such that interim measures could be put in place.
79. As part of its progress, AECL implemented the PINO program, as mentioned in paragraph 73. PINO consists of performance audits and assessments, operating experience and corrective action, safety culture and human performance, and quality assurance and quality control. AECL indicated that the PINO organization was central to the performance assurance improvements that AECL had underway to meet requirements. AECL stated that it expected to reach that goal within two years.
80. CNSC staff noted that it was very important that AECL continue to work on performance assurance improvements. In this regard, CNSC staff stated that it required detailed corrective plans, which were risk-based, from AECL. CNSC staff noted that additional regulatory oversight was also required and committed to providing that oversight to ensure that the facility will continue to be operated safely.
81. The Commission is satisfied that the improvements being made to the Performance Assurance program by AECL are an indication that the CRL site will continue to be operated safely and that the program should meet requirements in the near future. The Commission asks that the issue of performance assurance be specifically addressed in the mid-term report.

*Quality Management (Quality Assurance (QA) Program)*

82. CNSC staff reported that the Quality Management program did not meet the expectations that it would conform to all of the requirements of the Canadian Standards Association CSA N286 series of standards. The program and implementation were both below requirements, although CNSC staff noted that the program and implementation were improving. CNSC staff indicated that AECL had been taking measures to improve the managed processes and to apply greater management oversight at CRL.
83. A previous licence condition accepted by the Commission required AECL to demonstrate that all seven NRU upgrades would be operational by December 31, 2005. Following AECL's declaration that the upgrades were operational, CNSC staff conducted an audit to assess the adequacy and completeness of the managed processes used to control the design, procurement, construction, commissioning, maintenance, and operation of two of the seven upgrades; specifically the emergency back-up systems Liquid Confinement/Vented Confinement and Emergency Power Supply. The reliability of the upgrades is critical for such standby systems as dormant defects are not easily detected. CNSC staff noted that the preliminary results from the audit indicated that there were significant deficiencies in the outputs from the design, procurement, construction, and commissioning of these two upgrades. CNSC staff's initial conclusion from these deficiencies was that a number of quality processes were not followed for the upgrades project. As a result, there was a lack of assurance that the safety upgrades possessed the physical, functional, and performance characteristics to meet their design objectives with high reliability.
84. CNSC staff explained that the design, procurement, construction and commissioning QA programs together with the operations QA program form the overall QA programs required for AECL. The quality programs and the managed processes used for the NRU Upgrades Project were the same as those used by the CRL site. The deficiencies identified during the NRU Upgrades audit were therefore inherent in these site-wide quality programs and the managed processes. CNSC staff noted that these quality programs and the managed processes could lead to similar deficiencies if applied at other CRL facilities. In order to address the deficiencies, AECL committed to a detailed corrective action plan.
85. The system adopted by AECL for its QA program would direct the design, procurement, construction and commissioning activities to their individual QA programs where the detailed processes are defined. CNSC staff stated that this was an acceptable system and in line with the CSA N286 series of standards. CNSC staff recognized that AECL had been taking measures to improve the managed processes and to apply greater management oversight at CRL and expected an improving trend in the QA program and its implementation during the proposed licence period.

86. The Commission is satisfied that the improvements being made to the QA program and implementation by AECL are an indication that the CRL site will continue to be operated safely and that the program should meet requirements in the near future.

*Event Reporting Requirements and Operating Experience (OPEX)*

87. AECL reported an increase in the number of unplanned events reported to the CNSC for CRL over the last four years. This increase was explained by AECL as being the result of AECL's continuing initiative to be more vigilant in identifying reportable events. In addition, some events had been reclassified as reportable, leading to a further increase.
88. CNSC staff indicated that there were concerns about AECL's events investigation process. This includes an insufficient number of qualified staff for the OPEX program, OPEX program documents not being current with industry best practices, and failure to complete corrective actions in a timely manner.
89. In order to address these issues, AECL submitted an OPEX Improvement Initiative Plan in early 2006, the implementation of which AECL stated would be complete by September 2006. CNSC staff stated that it intends to conduct a Type I inspection (audit) of AECL's events investigation process after AECL completes all but one of the OPEX initiatives. During this inspection, CNSC staff plans to assess the suitability and effectiveness of these initiatives.
90. CNSC staff reported that the OPEX program met requirements while the implementation of the OPEX program was below requirements. CNSC staff indicated that the trend was upward and the ongoing initiatives of both AECL and CNSC staff should ensure that both the program and its implementation should meet requirements early in the proposed licensing period and continue to do so for the duration of that period.
91. The Commission is satisfied that the improvements being made to the OPEX program and the events investigation process by AECL is an indication that the CRL site will continue to be operated safely and that the implementation of the program should meet requirements in the near future.

*Training*

92. CNSC staff expects licensees to have an established Systematic Approach to Training (SAT) training program in effect at Class I nuclear facilities to ensure that only qualified staff carry on the licensed activities. The current CRL operating licence, NRTEOL-01.04/2006, did not have a licence condition requiring the establishment of such a SAT-based training program. As a first step, CNSC staff added this requirement for the NRU facility in the proposed licence. During the current licensing period,

numerous consultations were held to clarify requirements, expectations and deliverables from AECL. AECL had successfully resolved all deficiencies by December 2005 and shifted its focus to the implementation of the training program.

93. CNSC staff reported that the training program meets expectations, although the implementation of the program is below expectations because SAT-based training programs were not yet fully implemented in the NRU reactor facility. In order to meet this requirement, AECL submitted a training schedule with deliverable dates.
94. CNSC staff reported that it would continue to monitor the licensee's progress and that it was optimistic about AECL establishing a detailed implementation plan. It was also noted that CNSC staff intended to extend the requirement for SAT-based training to other facilities on the CRL site.
95. CNSC staff also noted that despite not having yet fully implemented SAT-based training, AECL's staff is experienced and well-trained and has operated CRL's facilities within their respective safety envelopes.
96. The Commission is satisfied that the improvements being made to the SAT-based training program implementation by AECL are an indication that the CRL site will continue to be operated safely and that the implementation of the program should meet requirements in the near future.

#### *Conclusions on Performance Assurance*

97. Based on the progress made by AECL as well as CNSC staff's assurance that it will continue to provide appropriate regulatory oversight, the Commission is satisfied that the performance assurance at CRL will continue to improve and be acceptable over the proposed licence period.

#### **Design Adequacy**

98. Many of the provisions for protecting the environment and the health and safety of persons are inherent in the design of a facility. The Commission therefore examined the following issues related to the current status of the facility designs at CRL: (1) NRU reactor facility upgrades and safety evaluation, and (2) integrity of waste management facilities.

#### *NRU Reactor Facility*

99. Recently, AECL carried out a safety review as a means to provide a comprehensive safety assessment that would demonstrate the safety of NRU for continued operation. A comparison of the NRU design and new research reactors showed that the NRU

design fell below current standards and practices, in particular in the design of defence-in-depth barriers such as for shutdown, emergency core cooling and confinement. Furthermore, it was not clear whether the design requirements for separation, reliability, availability, performance, functionality and surveillance were met.

100. CNSC staff reported that AECL should revisit the issue of design adequacy of NRU safety systems. AECL committed to review the results of the updated Safety Analysis Report (SAR), the Probabilistic Safety Assessment and the Severe Accident Analysis in order to determine if there were cost-effective enhancements that could be made that would further enhance the safety of the NRU reactor. AECL committed to the implementation of design changes held to be beneficial and practicable in a timely fashion.
101. CNSC reported that the timely implementation of the above commitments was an acceptable means to address the design adequacy issue. CNSC staff requested that AECL submit details of this proposed initiative as part of an overall action plan to resolve the outstanding NRU design adequacy issues.
102. AECL's SAR indicated that the present NRU design, including the recently completed safety upgrades, provided adequate protection. Accident consequences were within applicable limits and the overall risk associated with the facility met widely accepted risk-based criteria. AECL reported that the present design of NRU, complemented by an effective Aging Management Program, would support continued operation for a prolonged period. AECL stated that NRU had operated safely in the past, its design had proven to be robust, and the disciplined operation of the facility had succeeded in preventing the occurrences of abnormal incidents. The upgraded NRU would not pose an unacceptable risk to the public because the overall risk of NRU operation was very small and there was no fundamental weakness in the design.
103. CNSC staff reported that it was in the process of re-assessing the NRU SAR to ensure that design adequacy was demonstrated for the life extension of the NRU reactor. CNSC staff reported that the NRU SAR contained an unjustified bias applied to the safety margin calculations. The removal of this bias resulted in unacceptable safety margins indicating potential fuel failure for some design basis events. CNSC staff considered this to be a significant safety issue, and addressed the issue through the NRU licensing strategy. CNSC staff proposed a licence condition that required the review and revision of the facility final SARs to be completed every five years.
104. Based on this information, the Commission is satisfied that AECL is taking appropriate action to address the issues concerning the design adequacy of the NRU reactor and that safe operation of the NRU reactor will continue.

#### *Waste Management Facilities*

105. Solid radioactive waste produced at CRL from operational and decommissioning

activities and from offsite organizations is currently placed in interim storage at WMAs B and H. Radioactive liquid waste is collected and transferred to the Waste Treatment Centre (WTC) where it is processed prior to release in the process sewer. WMA C continues to receive packaged dewatered sewage sludge.

106. AECL reported that it has assessed the anticipated volumes of waste arising at CRL over the next five years to determine if the current and planned waste facilities would be adequate to cope with the projected waste volumes. AECL stated that WMA B is currently undergoing construction of additional tile holes to provide additional storage capacity until approximately 2010. These tile holes are expected to be in operation by December 2006.
107. In addition, WMA H is undergoing the construction of the SMAGS, which would provide storage capacity for approximately 20 years. These new structures are expected to be in operation by the end of September 2006. AECL proposed that a temporary storage structure consisting of aluminium frame covered with a polymer membrane be used in WMA H in the case that the Modular Above-Ground Storage buildings are full before the SMAGS buildings are available.
108. On the matter of liquid waste, AECL reported that it was in the third year of a five-year schedule to design, construct and commission the systems required to transfer, store and condition the stored liquid waste. Dewatered sludge sewage is presently stored in marine-type containers, which would be removed and the contents disposed in the new sewage sludge repository.
109. CNSC staff reported that with the addition of newly commissioned storage tanks, the WTC can adequately manage all of the radioactive liquid waste at the CRL site.
110. The Commission sought confirmation that the temporary storage facilities would be acceptable. CNSC staff assured the Commission that they would be, provided that they met the existing safety requirements.
111. The Commission is satisfied that the design of the waste management facilities at CRL is adequate for the licensing period.

### **Emergency Preparedness and Fire Protection**

112. AECL described the elements of its emergency preparedness program that ensures AECL is prepared to respond to an emergency onsite or offsite, in the event of a transportation accident or if called upon under the Federal Nuclear Emergency Plan. In addition to its trained staff, AECL noted that the CRL site has continuous emergency response capability through on-site firefighters, on-site security, on-call Radiological Assessment Team and on-call Environmental Field Teams. AECL further noted that it continues to work cooperatively with the Chalk River Regional Emergency Preparedness Committee and Emergency Management Ontario.

113. Following a May 2006 inspection of AECL Emergency Preparedness Program for the CRL site, CNSC staff reported that the program and its implementation meet CNSC expectations and requirements. CNSC staff concluded that AECL continues to demonstrate its ability to effectively manage and implement emergency preparedness activities at the CRL.
114. With respect to fire protection, AECL outlined the numerous initiatives it has taken to improve its fire protection program at the CRL site. These improvements initiatives include the development of an action plan for completion of fire hazard assessments for all existing buildings housekeeping, overall housekeeping and fire safety improvement of the NRU building and the initiation of a Fire Issue Resolution Effort Project. AECL stated that it had completed a comprehensive review of the Fire and Emergency Services procedures and, as a result, revised or created new procedures as necessary.
115. AECL also noted that independent third-party reviews of AECL's fire protection program are conducted every year. An action plan to address the findings from these inspections is being implemented.
116. CNSC staff noted that it has accepted AECL's corrective action plans developed to address the weaknesses identified following a CNSC fire protection inspection performed in 2004. CNSC staff, through its ongoing monitoring of AECL's progress in this respect, reported that AECL now has effectively implemented the fire protection program elements reviewed during recent field inspections. In accordance with AECL's corrective action plans, CNSC staff noted that the remaining elements are expected to be completed in the next two years and the required fire hazard analyses are expected to be completed in six years.
117. CNSC staff concluded that AECL's fire protection program and its implementation meet expectations.
118. Based on this information, the Commission is satisfied with the measures in place for fire protection at CRL.

### **Decommissioning Plan and Financial Guarantee**

119. In order to ensure that adequate resources will be available to meet the same regulatory requirements for safety, environmental protection and security during the future decommissioning of the CRL site, the Commission requires that adequate plans and financial guarantees for decommissioning and long-term management of waste be put in place and maintained in a form acceptable to the Commission.
120. AECL submitted that the following comprehensive documents provide sufficient information for an adequate decommissioning plan and financial guarantee:

- *Comprehensive Preliminary Decommissioning Plan for AECL's Chalk River Laboratories*<sup>10</sup>,
- *Basis of the Cost Estimate for the Chalk River Laboratories Decommissioning Liability*<sup>11</sup>,
- *Conceptual Long-Term Conceptual Long-Term Technical Strategy for the Management of Nuclear Legacy Liabilities on AECL Sites: Five Year Operational Implementation Plan – Chalk River Laboratories*<sup>12</sup>, and
- *AECL, Framework for a Communication and Public Consultation Plan, Periodic Updating of the Public on the Comprehensive Preliminary Decommissioning Plan for Chalk River Laboratories*<sup>13</sup>.

121. CNSC staff stated that it had reviewed the above-noted documents and was satisfied that the information, considered along with AECL's communication and public consultation plan, provides a sound basis for the eventual decommissioning of the CRL site and the financial guarantee for decommissioning. CNSC staff also noted that the information provided so far, although acceptable, is considered preliminary and is expected to undergo several revisions throughout the operational life of the CRL site. With each revision, CNSC staff stated its expectations that assumptions and uncertainties in the CPDP would be diminished and eventually resolved.
122. The Commission notes that a public hearing was held on September 16, 2004 and May 20, 2005 to consider AECL's proposed financial guarantee and Comprehensive Preliminary Decommissioning Plan (CPDP). After consideration of the information provided at that hearing<sup>14</sup>, the Commission decided to adjourn until a complete CPCP in support of the proposed financial guarantee, including decommissioning cost estimates, was available for consideration. Although the Commission did not make a decision on the financial guarantee and CPDP at that time, the Commission did consider all the information submitted for the hearing, including the intervenors' submissions. In this regard, the Commission notes that most of the intervenors' concerns on AECL's proposed financial guarantee, raised in this CRL licence renewal hearing, have already been addressed in the hearing that concluded on May 20, 2005. This includes concerns with respect to the characterization and inventory plan and requests that the CPDP be considered by a review panel under the CEAA.
123. In consideration of some intervenors' request for a site-wide environmental assessment of the decommissioning plan by a panel review, the Commission sought CNSC staff's understanding of the application of the CEAA in this respect. CNSC staff noted that the preliminary decommissioning planning, as required by the CNSC and as submitted by AECL, does not constitute proposed undertakings to be carried out. Furthermore, CNSC staff stated that at this stage there are no triggers for an environmental

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<sup>10</sup> No. CPDP-01600-PDP-02, Revision R0, dated 2005 March.

<sup>11</sup> No. 3611-01512-AB-001, Revision R0, dated 2005 November.

<sup>12</sup> No. 3600-01620-067-003, Revision 0, dated 2006 February.

<sup>13</sup> 3600-07440-PLA-001, Revision 1, dated December 2005, CNSC document number 915486.

<sup>14</sup> See the Record of Proceedings, including Reasons for Decision, on the matter of the *Financial Guarantee for the Decommissioning of Atomic Energy of Canada Limited's Chalk River Laboratories Site*, dated July 12, 2005.

assessment on projects that are outlined in AECL's five-year decommissioning plan. CNSC staff noted that it would determine the need for an environmental assessment for project specific requests such as when a letter of intent or application is submitted by the proponent for a facility decommissioning approval or amendment, or a decommissioning licence. Further discussion on the CEEA requirements are found in the section on the Application of the *Canadian Environmental Assessment Act*.

124. The Commission sought further information on the type of work associated with the costs allocated for the next five years and whether it would include work associated with the near surface intrusion resistant underground structure (IRUS) or a deep repository. AECL responded that, for the next several years, it would focus on the completion of assessments of such potential projects. CNSC staff noted it was satisfied with AECL's five-year operational plan and would provide the necessary regulatory oversight to ensure progress is made according to the plan. CNSC staff also confirmed that any project would be subject to licensing action, pursuant to the NSCA, and to an environmental assessment, pursuant to CEEA, as applicable.
125. With respect to the proposed five-year review of the CPDP, the Commission expressed its expectation that, if the licence were to be renewed for a five-year period, that the CPDP be revised prior to the next licensing hearing to ensure that a most up-to-date version can be considered by the Commission at that time. In this regard, AECL noted that the revision could be planned as suggested by the Commission.
126. At the public hearing held on September 16, 2004 and May 20, 2005 (as noted in paragraph 123), the Commission concluded that AECL's Communications and Public Consultation Plan for the CPDP was not acceptable. In this regard, the Commission considered the revised plan submitted as part of AECL's application for the CRL licence renewal. The Commission acknowledges AECL's progress to develop and build public trust and is satisfied with the plan.
127. The Commission notes that the CPDP is expected to undergo several revisions throughout the operational life of the CRL site. The Commission also expects that assumptions and uncertainties in the CPDP, including those used in establishing the cost estimates, will diminish with each revision and eventually be resolved.
128. The Commission concludes that the decommissioning financial guarantee and the CPDP for the CRL site are acceptable for the purpose of the licence renewal.

### **Public Information**

129. AECL outlined the various aspects of its public information program that it revised to implement the recommendations from past Commission hearings. The program includes such elements as stakeholder briefings, tours, public consultation on specific projects and the creation of the Environmental Stewardship Council. AECL also noted that it has reinstated the community newsletter that includes environmental

monitoring results and a Question & Answer section. The AECL Web site was also expanded to include the Ecological Effect Review report, the CPDP and annual environmental monitoring reports.

130. CNSC staff stated that AECL's public information program is acceptable for the purpose of the proposed licence period. CNSC staff acknowledged that AECL has taken initiatives to enhance its program such as providing environmental data on the AECL Web site. However, there still remain some deficiencies that must be addressed during the next licensing period, especially in the provision of information on the environmental, health and safety performance at the CRL site.
131. The Commission sought further information on the Environmental Stewardship Council to be implemented by the proponent. AECL provided additional details on this initiative which, as stated by AECL, is part of its efforts to improve communications with communities and interest groups. AECL described its approach to setting up the membership of the Council and listed the confirmed and potential members to date. AECL noted that several aspects of the Council, including the terms of reference, objectives and reporting structure, are still at the draft stage. This is to give the members an opportunity to participate in the creation of a council that would best meet their needs. AECL further noted its view that the Council would function as an advisory group where recommendations to be considered as part of AECL's decision-making process would be made to AECL's Vice-President of Nuclear Laboratories, as a Council member. AECL stated that meeting minutes would be publicly available and provided to the CNSC.
132. The Mayor of the County of Renfrew attested to the openness of AECL's communication and information program.
133. Based on this information, the Commission is satisfied that AECL's information program meets the regulatory requirements. The Commission notes, however, that it is in agreement with CNSC staff's view that additional improvements are needed to ensure the program is as effective as possible in keeping the public in the vicinity informed of the effects of the CRL operations. In this regard, the Commission expects that the deficiencies identified by CNSC staff be resolved during the proposed licence period.

### **Security**

134. AECL stated that it fully complies with the *Nuclear Security Regulations*<sup>15</sup> and has met the requirements of the CNSC Regulatory Standard S-298, *Nuclear Response Force Standard*.
135. CNSC staff reported it actively oversees the physical protection program at the CRL site.

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<sup>15</sup> SOR/2000-789.

136. While it would not be appropriate for the Commission to discuss security matters in detail in a public document, such as this *Record of Proceedings*, the Commission considered the information provided on this matter and is satisfied that AECL's performance with respect to maintaining security at the facility has been acceptable.
137. The Commission concludes that AECL has made, and will continue to make, adequate provisions for ensuring the physical security of the CRL site.

### **Non-Proliferation and Safeguards**

138. Based on inspections and reviews of CRL submissions, CNSC staff reported that AECL meets the requirements for safeguards and non-proliferation at CRL. AECL provided CNSC staff and the International Atomic Energy Agency (IAEA) with all reports and information necessary for safeguards and fully complied with CNSC and IAEA requests during the licence period.
139. Based on this information, the Commission is satisfied that AECL has made, and will continue to make, adequate provisions in the areas of safeguards and non-proliferation at CRL that are necessary for maintaining national security and measures necessary for implementing international agreements to which Canada has agreed.

### **Application of the Canadian Environmental Assessment Act**

140. Before making a licensing decision, the Commission must be satisfied that all applicable requirements of the *Canadian Environmental Assessment Act* (CEAA) have been fulfilled.
141. In this case, CNSC staff stated that no environmental assessment is required under the CEAA because the proposed continued operation of CRL is the same as that previously assessed under the CEAA. CNSC staff further noted that the *Exclusion List Regulations* under the CEAA apply in such instances.
142. CNSC staff submitted that the CEAA applies when the CNSC needs to exercise its authority under section 24 of the NSCA, and therefore a letter of intent or an application is needed from a proponent for a project that would require an approval or an amendment of a licence. CNSC staff then determines, pursuant to the CEAA and applicable regulations, the type of environmental assessment that would apply, either a screening level environmental assessment or a comprehensive study level assessment. In order for the Commission to refer the project to the federal Minister of the Environment for referral to a review panel or mediator, there are three factors that the Commission would need to consider: (1) whether the project is likely to cause significant environmental effects and the project is justified, (2) that the anticipated environmental impacts are uncertain and the project is warranted, and (3) public

concerns and whether public concerns can be addressed or not through the type of applicable environmental assessment.

143. Some intervenors disagreed with this interpretation of the CEAA and requested that the Commission refer the matter to the Minister of Environment for a full panel review under the CEAA. The intervenors requested that that panel review consider the overall site conditions and decommissioning strategy, including for all nuclear facilities and site remediation. These intervenors expressed the view that the current plan to conduct individual screening assessments for the facility-specific decommissioning projects over time will result in a fragmented and piecemeal process that does not take account of the overall cumulative effects of the complete program.
144. In this regard, CNSC staff submitted that the CEAA does not apply to planned strategies or policies but applies to projects, physical works and undertakings. As part of its review of a project description provided by a proponent, CNSC staff noted that it looks at the links between the project and other areas on the site and added that it would proceed in this way with an application from AECL for the five-year or parts of the five-year implementation plan. In this respect, CNSC staff noted the likelihood that projects would be linked based on their interdependency and interrelation. CNSC staff concluded that environmental assessments cover the cumulative effects of the specific projects and in relation with other projects that are either underway or planned.
145. In response to further questions from the Commission on the application of the CEAA to the future decommissioning plans, CNSC staff replied that, as a responsible authority under the CEAA, the CNSC will continue to evaluate the triggers for assessments under the CEAA.
146. Based on this information, the Commission accepts CNSC staff's interpretation of the CEAA and concludes that the requirements under the CEAA have been fulfilled for the purpose of the current licensing decision.
147. The Commission concludes that it can consider and make a decision on AECL's licence renewal application under the NSCA.

### **Licence Length, Interim Reporting and Delegation of Approval**

148. AECL has applied to the CNSC for a 63-month renewal of its licence. With reference to the CNSC staff criteria for recommending licence duration (as described in CMD 02-M12), CNSC staff recommended that the Commission accept and grant the proposed 63-month term. CNSC staff proposed that a status report of the CRL be presented to the Commission at approximately the midpoint of the licence period.
149. Several intervenors including businesses, municipalities, community organizations, educational institutions and professional associations supported AECL's request, and CNSC staff recommendation, for a 63-month licence. Some of these intervenors,

including the Canadian Society of Nuclear Medicine and the Ontario Association of Nuclear Medicine, attested to the critical role played by the NRU reactor and production facilities at the CRL in the delivery of health care to Canadians.

150. Some intervenors opposed the 63-month term based on their view of the environmental legacy issues on the site, contaminant releases to the environment, and AECL's planning for the future decommissioning and remediation of the site. To address these issues, some intervenors recommended a shorter licence term of two years.
151. In response to the requests of the intervenors for shorter-term licences, the Commission is of the view that, while AECL's performance and certain programs remain below requirements in some areas, the Commission is satisfied with AECL's progress during the current licence period and its plans to address the deficiencies during the proposed licence term. The Commission is also satisfied that AECL's mitigating measures and CNSC staff's enhanced regulatory oversight, which is facilitated by the creation of a CNSC site office at the CRL, are in place to ensure no unreasonable risks arise from the identified deficiencies.
152. In its recommendations, CNSC staff also proposed that the Commission delegate the authority to CNSC staff to make an approval or similar decision under the proposed licence conditions that do not require a licence amendment, as presented in CMD 06-H9.B.
153. The Commission expresses its appreciation to CNSC staff in proposing a proactive approach to dealing with the delegation of authority and in identifying the person that could be authorized by the Commission to make a decision pursuant to a licence condition. However, the Commission is not ready at this time to confirm such broad delegated authority. The Commission is of the view that delegated authority be exercised on a case-by-case basis as set out in CMD 00-M18, *Approval Authority of Commission Staff*.
154. Based on this information, the Commission accepts CNSC staff's recommendation for a 63-month licence. The Commission also decides that the proposed mid-term performance report recommended by CNSC staff would be appropriate

### **Cost Recovery**

155. CNSC staff reported that AECL is currently in compliance with the CNSC's *Cost Recovery Fees Regulations*<sup>16</sup>.

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<sup>16</sup> S.O.R./2003-212.

## **Conclusion**

156. The Commission has considered the information and submissions of the applicant, CNSC staff and intervenors as presented in the material available for reference on the record.
157. The Commission concludes that AECL is qualified to carry out the activities that will be permitted under the renewed licence. Furthermore, the Commission concludes that in carrying out those activities, AECL should make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.
158. The Commission therefore issues, pursuant to section 24 of the Nuclear Safety and Control Act, Nuclear Research and Test Establishment Operating Licence NRTEOL-01.00/2011 to Atomic Energy of Canada Limited, Mississauga, Ontario, for the Chalk River Laboratories. The licence is valid from August 1, 2006 to October 31, 2011.
159. The Commission includes in the licence the conditions recommended by CNSC staff in the draft licence attached to CMD 06-H9.B.
160. With this decision, the Commission requests that CNSC staff present an interim report to the Commission on AECL's performance in the operation of the Chalk River Laboratories. The interim report will be presented at a public proceeding of the Commission as soon as practical after the mid-point of the licence term (i.e., approximately May 2009).

Marc A. Leblanc  
Secretary,  
Canadian Nuclear Safety Commission

Date of decision: June 28, 2006

Date of release of Reasons for Decision: July 28, 2006

## Appendix A – Intervenors

Intervenors	Document Number
County of Renfrew, represented by Mayor A. Aikens	CMD 06-H9.2 CMD 06-H9.2A
Corporation of the Town of Deep River, represented by Mayor A. Aikens	CMD 06-H9.3 CMD 06-H9.3A
City of Pembroke, represented by Mayor E. Jacyno	CMD 06-H9.4 CMD 06-H9.4A
MDS Nordion, represented by G. Malkoske	CMD 06-H9.5 CMD 06-H9.5A
Concerned Citizens of Renfrew County, represented by O. Hendrickson	CMD 06-H9.6 CMD 06-H9.6A
Canadian Nuclear Workers' Council, represented by D. Shier, D. Jamison and K. Philipose	CMD 06-H9.7
Ottawa Riverkeeper, represented by M. Brown	CMD 06-H9.8
L. Jones	CMD 06-H9.9
S. Faris	CMD 06-H9.10
Sierra Club of Canada, represented by Mr. Bennett	CMD 06-H9.11
Greenpeace Canada, represented by S-P Stensil	CMD 06-H9.12
Ducks Unlimited – Upper Ottawa Valley	CMD 06-H9.13
Ottawa Valley Tourist Association	CMD 06-H9.14
Renfrew County District School Board	CMD 06-H9.15
Renfrew County Catholic District School Board	CMD 06-H9.16
Corporation of the Town of Laurential Hills	CMD 06-H9.17
Town of Petawawa	CMD 06-H9.18
Deep River District United Way	CMD 06-H9.19
J. Yakabuski, M.P.P., Renfrew-Nipissing-Pembroke	CMD 06-H9.20
Canadian Nuclear Association	CMD 06-H9.21
United Way / Centraide of the Upper Ottawa Valley Inc.	CMD 06-H9.22
Upper Ottawa Valley and Area Chamber of Commerce	CMD 06-H9.23
Municipality of Rapides des Joachims	CMD 06-H9.24
Deep River and Science Academy	CMD 06-H9.25
Deep River and District Hospital	CMD 06-H9.26
Municipality of Chichester	CMD 06-H9.27
Municipality of L'Isle-aux-Allumettes	CMD 06-H9.28
Canadian Forces Base / Area Support Unit Petawawa	CMD 06-H9.29
CANDU Owners Group Inc.	CMD 06-H9.30
Pembroke Regional Hospital	CMD 06-H9.31
Algonquin College in the Ottawa Valley	CMD 06-H9.32
B.P. Bromley, Morgan Brown and Jeremy Whitlock	CMD 06-H9.33
Society of Nuclear Medicine	CMD 06-H9.34
National Research Council Canada, represented by J. Root	CMD 06-H9.35
P. Hagarty	CMD 06-H9.36

Canadian Society of Nuclear Medicine, represented by A. McEwan	CMD 06-H9.37 CMD 06-H9.37A
Ontario Association of Nuclear Medicine	CMD 06-H9.38