Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant	Atomic Energy of Canada Limited
Subject	Application to renew the operating licence for the Dedicated Isotope Facilities at the Chalk River Laboratories
Dates of Hearing	June 22, 2007 and September 12, 2007

RECORD OF PROCEEDINGS

Applicant:	Atomic Energy of Canada Limited
Address/Location:	2251 Speakman Drive, Mississauga, Ontario L5K 1B2
Purpose:	Application to renew the operating licence for the Dedicated Isotope Facility at the Chalk River Laboratories
Application received:	March 5, 2007
Dates of hearing:	June 22, 2007 and September 12, 2007
Location:	Canadian Nuclear Safety Commission (CNSC) Public Hearing Room, 280 Slater St., 14th. Floor, Ottawa, Ontario
Members present:	L.J. Keen, Chair C.R. Barnes A.R. Graham M. J. McDill
Acting General Counsel:	S. Maislin Dickson
Secretary:	M. Leblanc
Recording Secretary:	S. Dimitrijevic

Applicant Represented By	**Document Number**
• D. Torgensen, Senior Vice-President and Chief Technology Officer • B. McGee, Vice-President and Chief Nuclear Officer • R. Cullen, Vice-President, Projects • J-P. Labrie, Director, Special Projects, Commercial and Client Interface • D. Taylor, Director, DIF Operations • A. Lee, Manager, MMIR Safety and Licensing • K. Wittann, DIF Project Director • L. Lupton, Deputy Project Director • R. Lalonde, Director, Commissioning	CMD 07-H16.1 CMD 07-H16.1A CMD 07-H16.1B
CNSC staff	**Document Number**
• B. Howden • B. Pearson • M. Santini • B. Benjamin • P. Wong • C. Carrier • É. Langlois	CMD 07-H16 CMD 07-H16.A CMD 07-H16.B
Intervenors	**Document Number**
See appendix A	

Licence: Renewed
Date of release of Decision: October 25, 2007

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Introduction

1. Atomic Energy of Canada Limited (AECL) has applied to the Canadian Nuclear Safety Commission[1] (CNSC) to renew the operating licences of the MAPLE 1 and MAPLE 2 nuclear reactors and the Nuclear Substance Processing Facility (NPF), located at the Chalk River Laboratories (CRL), Chalk River, Ontario. The current operating licences, NPROL-62.00/2007 and NSPFOL-03.00/2007, expire on November 30, 2007. AECL has requested that the licences be renewed for a period of 47 months, until October 31, 2011. AECL has also requested that the renewed licences be consolidated under a single Non-Power Reactor Operating Licence.

2. The MAPLE 1 and MAPLE 2 nuclear reactors and the NPF are referred to collectively as the Dedicated Isotope Facilities (DIF). The MAPLE reactors are 10 megawatts (MW) pool type, light water moderated and cooled radioisotope production reactors.

3. During 2006, after finalizing a contractual agreement with MDS Nordion, AECL took ownership of the DIF and incorporated it into the Nuclear Laboratories Business Unit (NLBU).

Issues

4. In considering the application, the Commission was required to decide, pursuant to subsection 24(4) of the *Nuclear Safety and Control Act*[2] (NSCA):

   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 at a public hearing held on June 22, 2007 and September 12, 2007 in Ottawa, Ontario. The public hearing was conducted in accordance with the *Canadian Nuclear Safety Commission Rules of Procedure*[3]. During the public hearing, the Commission received written submissions and heard oral presentations from CNSC staff (CMD 07-H16, CMD 07-H16.B) and AECL (CMD 07-H16.1, CMD 07-H16.1A, CMD 07-H16.1B). The Commission also considered written and oral submissions from 13 intervenors (see Appendix A for a detailed list of interventions).

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[1] The *Canadian Nuclear Safety Commission* is referred to as the "CNSC" when referring to the organization and its staff in general, and as the "Commission" when referring to the tribunal component.
[2] S.C. 1997, c. 9.
[3] S.O.R./2000-211.

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 of the opinion 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*, renews AECL's MAPLE 1 and MAPLE 2 reactors Non-Power Reactor Operating Licence, NPROL-62.00/2007, and New Processing Facility Nuclear Substance Processing Facility Operating Licence, NSPFOL-03.00/2007. The renewed licences are combined under a Non-Power Reactor Operating Licence for the operation of AECL's Dedicated Isotope Facilities located at the Chalk River Laboratories, Chalk River, Ontario. The licence, No. NPROL-62.00/2011, is valid from December 1, 2007 until 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 07-H16.B, with modifications to the licence conditions 4.1, 4.2, 10.1, 10.2, 10.4, 11.1 and 11.2. The Commission will consider on a case-by-case basis the delegation of its authority to CNSC staff to approve any activity that, pursuant to these licence conditions, requires the prior written approval of the Commission or by a person authorized by the Commission. Thus, licence conditions 4.1, 4.2, 10.1, 10.2, 10.4, 11.1 and 11.2 will be modified to indicate that the relevant activity shall not be carried out without the prior written approval of the Commission or, when specified by the Commission, by a person authorized by the Commission.

8. With this decision, the Commission establishes a framework for licensing consideration and reporting purposes. The framework includes, but is not limited to, the following Commission proceedings: One-Day public hearings to be held at the hold points to consider AECL's request for the transition of MAPLE 1 and MAPLE 2 reactors respectively from commissioning to in-service status; and public meetings for the presentation of progress reports on resolving the positive power coefficient of reactivity (PCR) issue and updates on other relevant issues, the first of which should be held on or before the end of the second quarter of 2008. The Commission also requests a mid-term status report on the commissioning activities and on the performance of the facility to be presented at a public proceeding following the midpoint of the licence period, in approximately October 2009. The Commission outlines in its Conclusion issues of particular note for this licence period.

Issues and Commission Findings

9. In making its licensing decision, the Commission considered a number of issues relating to AECL's qualification to carry out the proposed activities and the adequacy of the proposed measures for protecting the environment, the health and safety of persons, national security and international obligations to which Canada has agreed.

10. The findings of the Commission, presented below, are based on the Commission's consideration of all of the information and submissions available on the record for the hearing.

Radiation Protection

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

12. AECL informed the Commission that the activities at the DIF fall within the scope of the CRL site-wide Radiation Protection Program. The implementation of this program is ongoing but not yet completed. As the commissioning and initial operations of the MAPLE facilities are expected during the proposed licence period, the implementation of the Radiation Protection Program will need to be carefully monitored.

13. With respect to the protection of workers from radiation, AECL reported that the Radiation Monitoring Systems in the DIF operated as expected throughout the current licence period. There were no changes to the equipment and no new procedures were implemented. Due to the limited level of operation, the recorded low workers' doses were not reflective of the performance expected during full operational level.

14. CNSC staff reported that it had inspected radiation protection and monitoring activities at the MAPLE facilities and found the implemented monitoring and sampling program to be acceptable.

15. In their interventions, the Canadian Nuclear Workers' Council and MDS Nordion expressed the view that radiation protection, health and safety culture were effectively established and promoted by AECL.

16. Based on the information received, the Commission is of the opinion that AECL has made, and will continue to make, adequate provision for the protection of persons from radiation.

Conventional Health and Safety

17. AECL noted that industrial safety for the DIF organization is covered by the CRL site Occupational Safety and Health Program which is fully implemented within DIF.

18. AECL informed the Commission that, during the current licence period, there were no lost-time accidents at the MAPLE reactors and one lost-time accident at the NPF. In the latter case, the CRL accident reporting process was followed and an accident report was prepared and issued.

19. CNSC staff confirmed that industrial safety for the DIF is covered by the CRL site-wide Occupational Safety and Health Program and stated that both the program and its implementation meet requirements.

20. The Canadian Nuclear Workers' Council (CNWC), in its intervention, expressed satisfaction with AECL's commitment towards meeting industry best practices, including ongoing reduction in the frequency and severity of lost time injuries.

21. Based on this information, the Commission is of the opinion that AECL has made, and will continue to make, adequate provisions for the protection of workers from conventional hazards at the DIF.

Environmental Protection and Monitoring

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

23. AECL informed the Commission that the DIF operation is fully integrated with the CRL site Environmental Protection program. During the current licence period, the DIF remained consistently below regulatory Action Levels and the Derived Release Limit (DRL). AECL noted that, as the DIF is not yet fully operational, data pertaining to solid, liquid, and gaseous emissions are not reflective of the performance expected when full operations come into effect. However, AECL further noted that the DIF operations have fully implemented an environmental protection program such that effective environmental monitoring is in place.

24. AECL further informed the Commission that an internal audit of the implementation of the AECL Environmental Protection Program at the facilities at Chalk River Laboratories had been conducted in January 2007. There were no deficiencies identified against the DIF during this audit.

25. CNSC staff stated that the AECL Environmental Protection Program and its implementation at CRL meet requirements. CNSC staff based this rating on the results of the monitoring program which showed no releases of nuclear substances nor hazardous substances that posed a significant risk to the environment.

26. CNSC staff reported to the Commission that AECL had implemented operational controls of significant environmental aspects. In order to verify these improvements, CNSC staff inspected the effectiveness of the implementation at the DIF in July 2007 and did not identify any significant non-compliance events. The review included document control, calibration, maintenance of records and verification of the airborne and other effluent monitoring systems. Although a number of action notices and recommendations have been issued the general conclusion was that the facility was properly monitored for the actual status of operation. However, since the DIF is not fully operational, its environmental impact component is not yet evident and it will require careful monitoring during the proposed licence period.

27. The intervenors, Renfrew County Catholic District School Board, Pembroke Regional Hospital, County of Renfrew and United Way/Centraide of the Upper Ottawa Valley Inc., stated that AECL has been taking seriously matters of health, safety and environmental protection.

28. Taking into consideration the information presented, the Commission is of the opinion that AECL is making, and will continue to make adequate provisions for the protection of the environment.

Operational Performance

29. AECL's Continuous Improvement Program (CIP), launched in 2005 to improve its operational performance, is rated by CNSC staff as meeting requirements while its implementation has been rated as below requirements. CNSC staff informed the Commission on the various areas where AECL needs to improve, including decreasing the frequency and significance of events and the manner in which it manages revisions to key documents.

30. The Commission sought assurances that AECL and CNSC staff were in agreement on the expectations regarding the implementation of a new process entitled Improvement Action (ImpAct). In response, AECL noted that, although it is of the opinion that this new initiative for resolving process-related and performance-related issues has demonstrated significant progress in operating performance, it also agreed with CNSC staff's assessment that further improvements to the process are needed. CNSC staff responded that it recognizes AECL's progress in adopting this nuclear industry-wide process. CNSC staff has prepared an action notice in order for AECL to make further improvements to increase the effectiveness of the process.

31. CNSC staff reported on events which were identified as being reportable to the CNSC, and discussed several serious events related to human performance.

32. The Commission sought more information on the increased number of reported events, compared with earlier periods. AECL explained that the increase was a consequence of increased activities at the facility as well as of a new policy to encourage reporting of low level events. AECL stated that high significance level events represented only 5% to 10% of total events.

33. Noting that there were repeated occurrences of several hardware-type failures of known problems, the Commission asked about the existence of maintenance or quality assurance programs that would assist in reducing this type of events. AECL responded that it has the programs in place to safely operate the facility, such as operator routines, surveillance testing programs and maintenance programs that include preventive maintenance activities. AECL noted that lower level issues are identified so that they can be used to improve the quality of its programs and ensure there are fewer significant level events.

34. The Town of Petawawa, in its intervention, stated that it does not have concerns with respect to the operation of the MAPLE reactors and NPF.

35. The Commission considered AECL's response to the operational issues encountered during the existing licence period and took account of a continuous improvement trend in program implementation. The Commission is of the opinion that the activities planned for the proposed licence period would not pose an unreasonable risk.

Performance Assurance

36. The Commission examined performance assurance, particularly aspects of the quality assurance (QA) program and training and certification engagement.

37. AECL presented the results of three internal evaluations of the DIF operations, in line with the DIF Operations Audit Program Plan. A total of three non-conformities and sixteen actions have been identified. All of the issues have been addressed and about half are completed.

38. CNSC staff has rated the performance assurance program as meeting requirements, but its implementation has been rated below requirements. During the last commissioning quality assurance program audit, CNSC staff has observed significant improvements in the implementation of the quality assurance programs, in particular for the MAPLE reactors.

39. CNSC staff presented the results of audits carried out on the two key quality assurance programs - commissioning and operations - and on a follow-up audit. Commissioning completion assurance was one of the main observed deficiencies and AECL carried out a Commissioning Demonstration of Design Intent (CDDI) process to address this issue. CNSC staff was satisfied with this process. Samples of this CDDI process were evaluated during the follow-up audit. CNSC staff further noted that the actions taken to fill the identified gaps were found to be adequate.

40. The Commission queried into the organisation and division of responsibilities between the Nuclear Laboratory Business Unit (NLBU) and the Projects Business Unit. AECL responded that the NLBU has the role of owner/operator and licence holder, responsible for safe construction and operation, while the Projects Business Unit is involved in commissioning activities, safety analyses and in design and construction-related activities.

41. In response to the Commission's request, AECL presented a detailed organisational scheme showing operations oversight and functional linkage of the DIF within the overall structure of AECL.

42. In order to ensure that AECL provides an appropriate level of oversight and importance to quality assurance, the Commission inquired whether the QA Manager should be reporting to senior management. AECL explained that the QA Manager reports directly to the Director of DIF Operations and that there is also a functional relationship with the Corporate Compliance Organization so that quality assurance-related issues receive the level of attention necessary. AECL noted that quality assurance for the DIF Operations is incorporated in the CRL site integrated QA program and involves oversight and audit functions. CNCS staff noted that it does not prescribe an explicit acceptable organizational structure but focuses on the effectiveness of the organization and whether the individuals provide the necessary oversight and have the necessary authority to be able to discharge their responsibilities without any undue pressure. In this respect, CNSC staff finds the current organizational structure at the DIF acceptable but will continue to monitor its ongoing conduct.

43. AECL informed the Commission about the DIF specific training programs in effect for both the MAPLE reactors and the NPF.

44. CNSC staff informed the Commission that specific training programs have been implemented for the operating staff of the MAPLE 1 reactor as well as for the support personnel for these facilities.

45. CNSC staff further noted that AECL has developed a training program supporting the operation of the DIF in accordance with its Systematic Approach to Training (SAT) and as described in the AECL's Nuclear Training Procedures.

46. Based on the information received, the Commission is of the opinion that AECL has an acceptable program in place with respect to performance assurance and is taking the appropriate action regarding expected improvement in program implementation.

Update on Commissioning

47. AECL in its application indicated its intention to have the DIF, including the two MAPLE reactors, in full operation during the next licence period. At this time, the MAPLE reactors are at the testing stage and would require further Commission approval prior to operation.

48. CNSC staff provided the Commission with its viewpoint as to the status of commissioning activities and future steps regarding the components of the DIF. Under extensive questioning, AECL outlined their plans which concurred with CNSC staff's opinion. CNSC staff informed the Commission that it had reviewed and accepted the Commissioning Plan developed for the MAPLE reactors and the Commissioning Plan developed for the NPF. Condition 10.1 of the proposed operating licence requires AECL to commission the MAPLE reactors and NPF in accordance with the approved plans.

49. AECL has completed the MAPLE 1 commissioning activities, up to those specified for 8 MW operation. Commissioning activities have been suspended for the MAPLE 1 reactor, to address the issue of positive power coefficient of reactivity (PCR), as discussed further in the section entitled Outstanding Licensing Issues of this *Record of Proceedings*.

50. The MAPLE 2 reactor is in the Alternate Guaranteed Shutdown State (GSS) in accordance with the approved Operational Limits and Conditions (OLC) document, and will remain in this configuration until the refuelling. CNSC staff noted that condition 11.2 of the proposed operating licence prohibits the removal of the reactor from the GSS without prior written approval of the Commission or a person authorized by the Commission.

51. The Commission sought more information on the commissioning status of the NPF. AECL is performing inactive work to address the findings of Inactive Integrated Testing (NIIT) and to improve the operability of the facility. Active commissioning, planned for the current licence period, would now be done during the period of the requested licence, and the previously submitted schedule would have to be adjusted accordingly.

52. In response to the Commission's request, during Day Two of the Public Hearing AECL presented detailed charts with information on MAPLE 1, MAPLE 2 and NPF active commissioning with milestone schedules and information on preparation for in-service operation throughout the proposed licence period.

53. The Commission expressed concerns to AECL with respect to design integrity and control and whether the application of knowledge management was sufficiently rigorous and broad to include every aspect of this project since its conception. The Commission sought assurance from AECL that future communication to the CNSC staff and to the Commission will be based on a common overall approach to knowledge management that would take note of the original design intent and relate the progression of this project to this broader perspective.

54. In its response, AECL noted that it is using knowledge management and configuration management on this project. AECL assured the Commission that, before applying for commercial operation, it will submit verification that the facility, as built, meets the design intent.

55. CNSC staff underlined the following three main aspects of the knowledge management for this project: original safety analysis report which was accepted based on the proposed design, quality management with CNSC staff's focus on demonstration that the design intent has been met, and continuity in following the history of this project.

Outstanding Licensing Issues

56. CNSC staff reported that AECL has recently changed its strategy for resuming the commissioning of the MAPLE 1 reactor, and much of the proposed approach is highly dependent on the revised safety cases that the licensee will be putting forth. The source of the positive PCR has not yet been determined. However, AECL believes that sufficient information has emerged from its activities to provide confidence that the behaviour could be conservatively accounted for in its new safety analyses.

57. During the current licence period, AECL applied for approval to operate the MAPLE 1 reactor up to a nominal power level of 5 MW to conduct a series of tests to investigate/confirm the leading causes of the positive PCR. The proposed plan was acceptable to the CNSC staff and approved. AECL carried out the approved PCR testing in the presence of CNSC staff and concluded that the PCR value was in agreement with the measurements performed earlier and remained positive. CNSC staff carried out an independent assessment of the PCR data collected during these tests. The results and calculated PCR values were consistent with those obtained by AECL.

58. CNSC staff informed the Commission that the proposed DIF operating licence contains licence conditions that represent hold points in the licensing process. Licence condition 10.2(a) prohibits operation of the MAPLE 1 reactor above 8 MW without the prior written approval of the Commission or a person authorized by the Commission. Also, CNSC staff informed the Commission that it had defined acceptance criteria for the outstanding licence issues related to MAPLE 1 and 2, MIPF and NPF.

59. The Commission asked AECL if it agreed with the acceptance criteria for the resolution of the positive PCR issue. AECL confirmed that it did. The Commission enquired further whether it was acceptable that the completion of computer code validation be done only after 10 MW commissioning. CNSC staff explained that the validation work would need to be completed before AECL could bring the reactor in-service, and this would apply at any power level that AECL would request to go in-service, whether at 10MW or, as could be the case, 8MW.

60. The Commission sought more information on the applied procedures and progress of numerical analyses performed in support of the experimental work aimed at resolving the positive PCR issue. AECL explained the codes used for integration of influence of relevant factors contributing to the PCR value and stated that this computationally-intensive calculation is expected to be completed in December 2007.

61. AECL informed the Commission about the completion of a series of experiments that showed a decrease in the positive PCR value, identifying thus that the presence of molybdenum targets in the MAPLE reactor core accounts for 36 percent of the magnitude of the measured positive PCR. The other potential contributors are intended to be tested during the subsequent set of experiments planned for the proposed licence period.

62. The Commission further enquired on the activities aiming at resolving the issue of the positive PCR. The principal issue raised by the Commission was the relation between the original safety analysis, accepted at the beginning of the project and based on the design with negative PCR, and indication of acceptability of “low or negative PCR” as stated in the AECL’s Positive PCR Resolution Program”, which implied a possibility of operation with a positive PCR value.

63. CNSC staff stated that its position remains that AECL should be working towards a negative PCR value, in order to support the safety case presented in the original design.

64. AECL emphasized that its goal is to reduce and eliminate the positive PCR. However, AECL provided more details about its PCR Testing Logic Chart and concluded that in the event that all the safety analysis acceptance criteria are met for a value of PCR greater than zero, but acceptably low, an approval would be sought from the Commission to operate the reactor above 8 MW, until a long-term solution to achieve a negative PCR is developed.

65. The Commission noted that a possible request for operation with a positive PCR was new information in terms of the expected process and not noted in the licensing documentation. The Commission sought clarification on the potential implications of such an approach. AECL reconfirmed its belief that the value of the PCR could be reduced to zero or become negative. AECL stated that the safety analysis would be revised and updated based on the degree of reduction of PCR value. Such a safety analysis would be used to support a mode of operation with necessary solutions in

place to reduce the value of the PCR. AECL was not able to provide further information on how much reduction in PCR value could be expected and what value would be used in future safety analyses.

66. CNSC staff emphasized the importance of the measurements of the PCR values, but also the importance of conducting experiments with the aim to understand the phenomenon. CNSC staff explained that understanding the phenomenon allows predictability and modeling of the behaviour of the system, which can be used for safety analyses and accident assessments, resulting in higher level of confidence in building and presenting safety cases.

67. From a regulatory perspective, CNSC staff noted its position that the proposed licence and associated conditions are sufficient to provide for regulatory control and ensure that phases of the project only proceed once found safe and only upon prior approval.

68. The Commission sought more information regarding requirements for containment in light of the PCR value. In response, AECL explained that all the performed tests have been analysed with the assumption of a positive PCR and that it was demonstrated that for all loss of regulation accidents, the two safety systems could both effectively shutdown the reactor prior to any fuel failure occurring and therefore, the dose to the public from those events would be zero. As a result, there were no requirements to credit the use of containment. CNSC staff concurred that the combination of design features provided in the original design lead to the conclusion that confinement would be an appropriate measure to have in place.

69. The Commission asked AECL how realistic were the proposed schedules and time-lines. AECL stated that its main goal was to execute the PCR test plan and that the schedule of other activities depends on the outcome of these tests. The other parts of the schedule had been primarily established for business and financial planning and for decision making purposes.

70. The Commission sought more information on the need to seek external advice and the value of external reviews. AECL responded that the results of external evaluations had been valuable and noted that they were congruent with its own results, confirming the adopted approach to resolve the PCR issues.

71. The Commission asked if CNSC staff had access to the results of the external evaluations and whether there was a potential need for CNSC staff to seek external advice regarding its role in the process of resolution of the positive PCR issue. CNSC staff responded that it has full access to the results of external evaluations commissioned by AECL and that it also has had meetings with the consultants hired by AECL. CNSC staff stated that it has done extensive research with respect to how other regulators in the world regulate a positive PCR value. Although CNSC did engage an independent consultant at the time the positive PCR issue was first raised, CNSC staff was of the view that additional external advisors were not considered necessary at this time, but would be considered if AECL were to request approval to operate with a positive PCR.

72. The Commission expresses its concern with the unresolved PCR issue and the relevant challenges that it poses with respect to the overall licensing approach. The Commission is of the view that the licensee should, as it has stated, focus on solving the issue and understand the phenomenon and causes for the positive PCR value. In the hypothesis that AECL intends to move in-service with a positive PCR, the Commission notes that the overall approach to the approval process for the DIF will require reconsideration and that the matter will need to be presented to the Commission for consideration in the context of a separate public hearing.

Emergency Preparedness and Fire Protection

73. AECL indicated that during the current licence period, both Emergency Preparedness and Fire Services conducted three successful drills. Three improvement actions have been identified and completed as a result of these drills.

74. CNSC staff noted that the DIF is fully integrated within the CRL site-wide program for emergency preparedness. The emergency preparedness program and its implementation were rated as meeting requirements.

75. AECL informed the Commission that there were no fire incidents during the current licence period and that fire drills were conducted with no issues found.

76. AECL further informed the Commission that two separate third party independent reviews of the DIF fire protection system have been conducted. In addition to these independent reviews, DIF undergoes a monthly Fire Prevention Inspection performed by Fire Prevention Officers.

77. The Commission sought more details on the fire protection program and its implementation. AECL responded that the rating of this area was satisfactory throughout the licensing period. CNSC staff confirmed and stated that the situation is continuously monitored.

78. The Fire Department of the Corporation of the Town of Laurentian Hills, in its intervention, emphasized the good collaboration between the Fire Department and the CRL site and the active participation of AECL staff in Nuclear Emergency Planning and Municipal Emergency Planning.

79. Based on this information, the Commission concludes that emergency preparedness and fire protection at the DIF facilities are adequate for the proposed licence renewal period.

Security

80. The Commission considered in a closed session a separate, protected CMD on security issues. Based on the information provided, the Commission concludes that AECL has made, and will continue to make, adequate provisions for ensuring the physical security of the facility.

Safeguards and Non-Proliferation

81. CNSC staff noted that the DIF is fully integrated within the CRL site-wide program for Safeguards and Non-Proliferation and rated both the program and its implementation as meeting requirements. CNSC staff also confirmed that staff is present at the site to carry out safeguards activities.

82. The Commission inquired on how the safeguard efficiency might be influenced by the design of the facility. In its response, CNSC staff noted that certain features can be built into the design of a facility to make safeguard activities more efficient. CNSC staff also noted that safeguards instrumentation has been implemented at the facility to monitor the flow of nuclear material from the facility to the waste site.

83. In response to the Commission's enquiry on the applicability of integrated safeguards at the DIF, CNSC staff also responded that, due to direct use of nuclear material at the site, it has been deemed that traditional safeguards measures in most part would be applied. However, certain elements of an integrated safeguards approach, such as random inspections, unannounced or short-notice inspections could also be applied.

84. Based on the information received, the opinion of the Commission is that AECL has made, and will continue to make, adequate provisions in the areas of safeguards and non-proliferation at the DIF that are necessary for maintaining national security and measures necessary for implementing international agreements to which Canada has agreed.

Preliminary Decommissioning Plan and Financial Guarantee

85. Following a public hearing[4] held on April 26 and June 28, 2007, the Commission concluded that the decommissioning financial guarantee and the Comprehensive Preliminary Decommissioning Plan (CPDP) for the CRL site were acceptable.

[4] Refer to the *Record of Proceedings, including Reasons for Decision* in the Matter of Atomic Energy of Canada Limited's Application for the Renewal of the Chalk River Laboratories Nuclear Research and Test Establishment Operating Licence, dated July 28, 2006.

86. The Commission is of the opinion that the decommissioning financial guarantee and the CPDP for the CRL site, which includes the DIF, remain acceptable for the purpose of the proposed licence.

Public Information Program

87. AECL informed the Commission that CRL site-wide Public Information Program applies to the operation of the DIF. Environmental performance information is regularly updated on the AECL Web site showing public exposure and radiological and non-radiological effluent releases from the site as well as employee safety performance.

88. An information newsletter is delivered to all residents of both Renfrew and Pontiac Counties containing information on projects initiatives, and a regional public consultation program is run by CRL to obtain public feedback on new projects development.

89. AECL noted that the Environmental Stewardship Council has been established in 2006 and involves regional interest groups, various levels of government officials and representatives from the First Nations.

90. J.A.G. Severin, in his intervention, emphasized the cooperation and transparency in communication between AECL and the Environmental Stewardship Council and the Pembroke community.

91. The Town of Petawawa, County of Renfrew and United Way/Centraide of the Upper Ottawa Valley Inc., in their interventions, noted that AECL maintains good communication with the neighbouring communities with respect to future plans, operation of the facility and potential impact on the communities. AECL keeps informed the communities about its activity through meetings, invited presentations, tours and project-related consultation programs.

92. The Renfrew County District School Board, in its intervention, stated that AECL participates in several educational programs, provides Seminar for Science Educators and participates in co-op placement programs for students.

93. The Commission is satisfied that the public information program is effective in keeping the public informed of the effects of the operations of the facility.

Cost Recovery

94. CNSC staff reported to the Commission that the applicant is in compliance with the *Canadian Nuclear Safety Commission Cost Recovery Fees Regulations*[5].

Application of the *Canadian Environmental Assessment Act*

95. Before making a licensing decision, the Commission must be satisfied that all applicable requirements of the *Canadian Environmental Assessment Act* (CEAA) have been fulfilled.

96. The licence renewals involve the continued operation of the existing physical works and therefore there is a "project" that meets the definition of section 2 of the CEAA. However, subsection 24(2) of the NSCA is not listed as a "trigger" under the *Law List Regulations* of the CEAA with respect to the renewal of a licence.

97. The CNSC is, therefore, not required to ensure the conduct of an environmental assessment before the licence renewal decision may be made pursuant to the NSCA.

98. The Commission notes that if the licensee wishes to pursue an approach other than a negative PCR value that is outside the accepted safety case, (discussed in paragraph 72 of this *Record of Proceedings*), a further determination under CEAA may be required.

Licence Length and Interim Reporting

99. AECL has applied for a 47-month licence period to align the DIF licence term with the CRL site licence term and facilitate its intended request to include the DIF within the CRL site licence NRTEOL-01.00/2011 when this licence comes up for renewal in the fall of 2011.

100. CNSC staff supported the requested for 47-month licence period for the DIF and proposed two hold points for the Commission's consideration and approval. CNSC staff was of the view that the MAPLE 1 and MAPLE 2 transition from commissioning status to in-service status would be major milestones. Thus CNSC staff recommended that the request for approval to go in-service should be considered by the Commission at public hearings.

101. All intervenors supported AECL's application to renew its licence for a 47-month period. Based on past performance records, intervenors expressed their confidence in AECL's safe operation of the DIF.

[5] S.O.R./2003-212.

102. The Commission considered the information regarding licence length and reporting. Based on this information, the Commission accepts CNSC staff's recommendation for a 47-month licence. The Commission expects that this licence period would allow important stages of the operational and commissioning activities to be carried out. The Commission also notes that the decision to accept a 47-month period should not be interpreted as an indication on how the Commission will make a determination if it receives an application for a combined licence for the CRL site and DIF operations.

103. The Commission also decides that the proposed mid-term performance report recommended by CNSC staff would be appropriate.

104. Considering the uncertainties associated with the level of operational activities during the next licence period, the Commission deems necessary to establish a framework for licensing consideration and reporting purposes. The framework includes, but is not limited to, the following Commission proceedings:

- two One-Day public hearings to be held at the hold points to consider AECL's request to transition the MAPLE 1 and MAPLE 2 reactors from commissioning to in-service status. The Commission notes that due to the high degree of uncertainty regarding the schedule of commissioning activities and resolving the positive PCR, the hold points, originally proposed for mid-2008 and mid-2009, cannot be temporally defined.
- one mid-term report to be presented on or about October 2009, and
- one or more, if necessary, public meetings for the presentation of information on the progress of resolving the PCR issue as well as updates on other relevant issues discussed during the hearing process. The first of these information items should be held on or before the end of the second quarter of 2008.

105. The Commission notes that the above framework for licensing considerations and reporting does not preclude that CNSC staff will report to the Commission on any significant event that may occur during the licence period.

Delegation of Authority

106. CNSC staff proposed that the Commission retains the authority to approve the safe operating envelope. Changes to the Operating Limits and Conditions document should be approved only through a licence amendment by the Commission. Similarly, approvals of changes to the commissioning plans would require a licence amendment that would need to be considered by the Commission.

107. CNSC staff proposed the delegation of authority to CNSC staff for changes that do not require a change in the safe operating envelope.

108. The Commission considered the recommendations by the CNSC staff. The Commission notes that all licence amendments applications are considered by the Commission and that these decisions are not delegated to CNSC staff.

109. Due to the high-level of uncertainties regarding the project, the Commission will consider on a case-by-case basis whether it will delegate its authority to CNSC staff to approve any activity that, pursuant to the licence conditions 4.1, 4.2, 10.1, 10.2, 10.4, 11.1 and 11.2, requires the prior written approval of the Commission or, when specified by the Commission, by a person authorized by the Commission. The Commission's decision to delegate its authority will depend on the information presented at the time of the request, including the progress made to date and the level of uncertainty of the predicted outcome.

Conclusion

110. The Commission has considered the information and submissions received from AECL, CNSC staff and intervenors as presented in the material on the record.

111. The Commission is of the opinion that AECL is qualified to carry on the activity that the licence will authorize. The Commission is also of the opinion 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.

112. The Commission therefore renews, pursuant to section 24 of the *Nuclear Safety and Control Act*, operating licence for the Dedicated Isotope Facility situated at the Chalk River Laboratories, as a single Non-Power Reactor Operating Licence No. NPROL-62.00/2011 for the Dedicated Isotope Facilities. The licence is valid until October 31, 2011.

113. The Commission includes in the licence the conditions recommended by CNSC staff, as set out in the draft licence attached to CMD 07-H16.B, with modifications to licence conditions 4.1, 4.2, 10.1, 10.2, 10.4, 11.1 and 11.2. The Commission will consider on a case-by-case basis the delegation of its authority to CNSC staff to approve any activity that requires the prior written approval of the Commission pursuant to these licence conditions.

114. The Commission notes that there are a number of outstanding licensing issues where AECL's performance remains below requirements. However, the Commission notes the improvement trends and is of the opinion that those issues do not pose an unreasonable risk to the environment, persons or security at this time. The Commission expects AECL to sustain its improvements throughout the licensing period.

115. Since the facility is not in operation, the Commission further notes that several areas, including radiation protection and environmental protection, will require close monitoring when the facility becomes operational.

116. The Commission establishes a framework for licensing consideration and reporting purposes, as listed in paragraph 104 of this *Record of Proceedings*. In order for the Commission to be kept informed on AECL's progress in a number of areas related to the facility during the term of the licence, the Commission does not delegate its authority as requested. The Commission further requests that a mid-term status report be presented to the Commission on the commissioning activities and on the performance of the facility on. The report will be presented at a public proceeding on or about, October 2009.

Linda J. Keen
President
Canadian Nuclear Safety Commission

Date of release of Decision: October 25, 2007

Appendix A – Intervenors

Intervenors	Document Number
Canadian Nuclear Workers' Council, represented by D. Shier and K. Philipose	CMD 07-H16.2
Corporation of the Town of Deep River, represented by Mayor A. Aikens	CMD 07-H16.3
MDS Nordion, represented by S. West and G. Malkoske	CMD 07-H16.4
Fire Department of the Corporation of the Town of Laurentian Hills	CMD 07-H16.5
Renfrew County Catholic District School Board	CMD 07-H16.6
Town of Petewawa	CMD 07-H16.7
City of Pembroke	CMD 07-H16.8
J.A.G. Severin	CMD 07-H16.9
Pembroke Regional Hospital	CMD 07-H16.10
Renfrew County District United Way	CMD 07-H16.11
Deep River District United Way	CMD 07-H16.12
County of Renfrew	CMD 07-H16.13