



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire

Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant Saskatchewan Research Council

Subject Application to Renew the Non-power Reactor
Operating Licence for the SLOWPOKE-2
Reactor at the Saskatchewan Research Council

Public Hearing
Date May 15, 2013

RECORD OF PROCEEDINGS

Applicant: Saskatchewan Research Council

Address/Location: 125 - 15 Innovation Blvd., Saskatoon, SK S7N 2X8

Purpose: Application to renew the Non-power Reactor Operating Licence for the SLOWPOKE-2 Reactor at the Saskatchewan Research Council

Application received: August 30, 2012

Date of public hearing: May 15, 2013

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

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Licence: Renewed

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1. INTRODUCTION

1. The Saskatchewan Research Council (SRC) has applied to the Canadian Nuclear Safety Commission¹ for the renewal of the operating licence for its SLOWPOKE-2 reactor located in Saskatoon, Saskatchewan. The current operating licence NPROL-19.04/2013 expires on June 30, 2013. The SRC has applied for the renewal of this licence for a period of 10 years.
2. The SRC SLOWPOKE-2 reactor is owned and operated by SRC, and was commissioned in March 1981. The reactor has been used primarily as a neutron source for activation analysis. To date, over 200 000 samples have been analyzed. More recently, the reactor has been increasingly used as a teaching tool in cooperation with the University of Saskatchewan.

Issue

3. 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 the SRC is qualified to carry on the activity that the licence would authorize; and
 - b) if, in carrying on that activity, the SRC 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

4. The Commission, in making its decision, considered information presented for a public hearing held on May 15, 2013 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 considered written submissions and heard oral presentations from CNSC staff (CMD 13-H10) and the SRC (CMD 13-H10.1). Oral and written interventions were allowed, but none were received.

2. DECISION

5. Based on its consideration of the matter, as described in more detail in the following

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 Statutes of Canada (S.C.) 1997, chapter (c.) 9.

³ Statutory Orders and Regulations (SOR)/2000-211.

sections of this *Record of Proceedings*, the Commission concludes that the SRC is qualified to carry on the activity that the licence will authorize. The Commission is of the opinion that the SRC, 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 the SRC's Non-Power Reactor Operating Licence for its SLOWPOKE-2 Reactor located in Saskatoon, Saskatchewan. The renewed licence, NPROL-19.00/2023, is valid from July 1, 2013 to June 30, 2023.

6. The Commission includes in the licence the conditions as recommended by CNSC staff and set out in the draft licence attached to CMD 13-H10.
7. The Commission also accepts CNSC staff's recommendation regarding the delegation of authority in the Licence Conditions Handbook (LCH). The Commission notes that CNSC staff can bring any matter to the Commission as applicable. The Commission directs CNSC staff to inform the Commission on an annual basis of any changes made to the LCH.
8. With this decision, the Commission directs CNSC staff to provide annual reports on the performance of the SRC's SLOWPOKE-2 reactor. CNSC staff shall present these reports at public proceedings of the Commission.

3. ISSUES AND COMMISSION FINDINGS

9. In making its licensing decision, the Commission considered a number of issues relating to the SRC'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.

3.1 Management System

10. The Commission examined the SRC's Management System which covers the framework that establishes the processes and programs required to ensure the organization achieves its safety objectives, continuously monitors its performance against these objectives, and fosters a healthy safety culture.
11. The SRC reported that quality management at the facility is governed by the SRC *Environmental Analytical Laboratories Quality Manual*, which follows guidelines set out in ISO standard 17025, *General requirements for the competence of testing and calibration laboratories*. The SRC added that the laboratory has a continuous improvement program to routinely examine current systems, identify actual and

potential non-conformances, and identify areas where efficiencies can be found. The Canadian Association for Laboratory Accreditation conducts external audits on a biannual basis. This association also audited this laboratory in September 2011 where it issued a certificate valid until July 4, 2014.

12. CNSC staff reported that, at the licence renewal in 2003, while CNSC staff was satisfied with the management system and processes in place, the documentation of these processes required improvements to fully meet CNSC requirements. CNSC staff added that the SRC reviewed its processes and quality assurance documentation against the CNSC quality assurance (QA) principles and elements for nuclear facilities and submitted its QA program in 2008. CNSC staff provided comments in 2009, stating that some documented processes needed further improvements. The SRC revised its QA program and associated procedures to meet CNSC staff's expectations.
13. The SRC indicated that improvements over the licence period include the implementation of programs for formal training of new reactor operators and aging management, and becoming accredited by the Canadian Association for Laboratory Accreditation.
14. The SRC explained the management structure at the facility, and provided details on succession planning.
15. CNSC staff reported that they verified some documentation related to the management system during routine compliance inspections and found them to be satisfactory. In 2012, CNSC staff also performed an inspection of the SRC's QA program. CNSC staff noted some areas for improvement and made some recommendations. CNSC staff stated that the findings from this inspection were minor and did not significantly impede the safe operation of the facility. CNSC staff noted that SRC had submitted a corrective action plan that was accepted.
16. Based on its consideration of the presented information, the Commission concludes that the SRC has appropriate organization and management structures in place and that the operating performance at the SLOWPOKE-2 facility provides a positive indication of SRC's ability to adequately carry out the activities under the proposed licence.

3.2 Human Performance Management

17. Human performance management encompasses activities that enable effective human performance through the development and implementation of processes that ensure the licensee's staff has the necessary knowledge, skills, procedures and tools in place to safely carry out their duties.
18. The Commission enquired on the impact of authorized users turnover on the safety and future operations of the reactor. The SRC representative responded that analyzing samples is not a full-time job and this work is therefore performed by a chemical

technologist who has other duties in environmental analytical laboratories. The chemical technologists are already trained in radiation protection when starting their jobs and can be quickly trained to analyze samples.

3.2.1 Training

19. The SRC reported that several levels of training programs are in place at the laboratory. The training provided is in accordance with the extent to which an employee's job requires his or her presence at the facility, use of irradiation systems and the operation of the reactor. The SRC further noted that all staff receives site specific training which includes basic radiation safety. Authorized users are also required to complete the SRC training program specific to them.
20. CNSC staff reported that the SRC was required to update its training program to be consistent with a Systematic Approach to Training (SAT) approach. The SRC developed its training program according to this approach, and CNSC staff accepted it in 2009.
21. CNSC staff indicated that they performed a focused inspection in November 2012 to assess the effectiveness of the training processes being used on-site and to gauge the progress and the results of implementing the SAT program. Two action notices were issued, which CNSC staff consider minor and not affecting the safe operation of the facility. CNSC staff reported that one corrective action has been completed and the other one is scheduled to be completed by the end of December 2013. Overall, CNSC staff considers that the performance of the SRC in this area is satisfactory.

3.2.2 Examination and Certification

22. The SRC noted that candidates for becoming a certified reactor operator (either in manual or automatic mode) are trained according to the training program in place at the facility, which was developed using a systematic approach to training. The SRC declared that this program incorporates all of the requirements set out in the current licence. Certified operators also have to maintain their status by fulfilling the requirements for continuous training as described in the current licence. CNSC staff noted that there are 3 certified operators at the facility.
23. The SRC indicated that training for the positions of reactor technician and reactor engineer is not done at the facility as it does not employ any personnel in these positions. Work which requires a certified reactor technician or engineer is contracted out to Atomic Energy of Canada Limited (AECL), which is the SLOWPOKE reactor manufacturer and supplier and provides nuclear servicing and maintenance. CNSC staff concurred with the SRC.
24. The Commission enquired if there is a minimum complement of operators for SLOWPOKE reactors and sought information on the requirements to maintain

qualification as an operator. CNSC staff responded that the minimum staffing requirement at a SLOWPOKE facility is one person. CNSC staff noted that the licence conditions allow the reactor to be operated remotely for up to 24 hours. CNSC staff further responded that operators can maintain certification by continuing their training program which involves carrying out weekly maintenance checks, as well as restarting and shutting down the SLOWPOKE reactor periodically.

25. The Commission enquired if CNSC certification is a prerequisite to be appointed as a reactor engineer or technician at a SLOWPOKE reactor facility. CNSC staff responded that certification is a prerequisite and that individuals must be certified before they are appointed.
26. CNSC staff considers that the SRC's performance in the personnel certification area meets requirements.

3.2.3 Conclusion on Human Performance Management

27. Based on its consideration of the presented information, the Commission concludes that the SRC has appropriate programs in place and that current efforts related to human performance management provide a positive indication of the SRC's ability to adequately carry out the activities under the proposed licence.

3.3 Operating Performance

28. Operating performance includes operating policies, reporting and trending, and application of operating experience that enable the licensee's effective performance, as well as improvement plans and significant future activities.

3.3.1 Conduct of Operations

29. The SRC stated that the facility has successfully operated under the conditions and operating limits specified in the current licence. The SRC added that evidence that the SRC has complied with requirements specified in the licence is contained in reactor logs, annual compliance reports and documents supporting the application for licence renewal.
30. CNSC staff reported that the SRC has submitted annual compliance reports as required. CNSC staff reviewed these reports and did not identify any issues relating to safe operations.
31. The SRC reported that its corporate policies and procedures establish the expected organizational behaviour in line with organizational objectives and core values. The SRC added that facility specific procedures are written in accordance with procedures from the reactor supplier. The SRC noted that a continual systematic review and updating of policies, procedures and manuals was performed over the current licensing

period. An aging management program was also implemented.

32. CNSC staff confirmed the adequacy of the facility's programs related to operation and maintenance of the facility as assessed through routine compliance inspections and desktop reviews.
33. The Commission sought information on the consistent satisfactory ratings the SLOWPOKE-2 reactors received across all 14 Safety and Control Areas (SCA) and the differences amongst facilities. CNSC staff responded that the rating system was systematically applied to all of the SLOWPOKES for the first time for the purpose of the licence application assessments, and explained that in the absence of previous data with respect to the ratings for these facilities, it is difficult to differentiate between a satisfactory and fully satisfactory rating. CNSC staff further responded that there are no significant differences between the SLOWPOKE-2 reactors in terms of design and safety.
34. CNSC staff stated that the facility operated safely and in compliance with the CNSC regulatory requirements during the licence period.

3.3.2 Event Reporting

35. CNSC staff reported that, during the current licence period (January 2010), the SRC reported a minor non-conformance with the procedure for purging of reactor head space. CNSC staff reviewed the proposed corrective action plan and found it satisfactory. CNSC staff confirmed the proper purging operation during recent inspections.

3.3.3 Conclusion on Operating Performance

36. Based on the above information, the Commission concludes that the operating performance at the facility provides a positive indication of the SRC's ability to carry out the activities under the proposed licence.

3.4 Safety Analysis

37. The Commission examined issues related to the program areas of Safety Analysis in order to assess the adequacy of the safety margins provided by the design of the facility.
38. Safety analysis is a systematic evaluation of the potential hazards associated with the conduct of a proposed activity or facility and considers the effectiveness of preventive measures and strategies in reducing the effects of such hazards. It supports the overall safety case for the facility.
39. The SRC indicated that the safety analyses for the reactor are described in the SRC *Site*

Description and Operating Manual, and that the analysis of the various internal and external hazards is provided in the SRC document *Site Description and Operating Manual*. CNSC staff concurred with the SRC.

40. The SRC stated that, when a project is initiated that is not covered by a standard test method, than an appropriate hazard assessment is covered as part of the project development process.
41. CNSC staff reported having conducted compliance inspections as planned. CNSC staff verified that the licensee has maintained all the safety barriers and protective systems as required.
42. CNSC staff concluded that the SRC has operated the facility safely and is performing satisfactorily with respect to this SCA.

3.4.1 Fukushima Follow-up Actions

43. CNSC staff indicated that the SRC has satisfactorily responded to the request from CNSC staff to review the lessons learned from the nuclear accident at the Fukushima Daiichi nuclear power plant and submit a report pursuant to subsection 12(2) of the *General Nuclear Safety and Control Regulations*. The SRC has reviewed the existing safety case and provisions in the case of an accident and concluded that adequate measures are in place for the prevention and mitigation of accidents that might impact the safety of the facility. CNSC staff reported having reviewed and accepted the conclusions of the SRC's assessments and concur that all required actions have been completed.

3.4.2 Conclusion on Safety Analysis

44. On the basis of the information presented, the Commission concludes that the systematic evaluation of the potential hazards and the preparedness for reducing the effects of such hazards is adequate for the operation of the facility and the activities under the proposed licence.

3.5 Physical Design

45. Physical design relates to activities that impact on the ability of structures, systems and components to meet and maintain their design basis given new information arising over time, planned modifications to the facility and taking changes in the external environment into account.
46. The SRC provided a detailed description of the facility, including the reactor structures and the safety features of the reactor. The SRC noted that information on the current status of the reactor systems is provided in annual compliance reports which are submitted to the CNSC in June of each year. This annual report also provides

information on reactor utilization, reflector shims, and the range of radioactivity levels in the reactor container water.

47. The SRC noted that measures to prevent nuclear criticality are inherent to the design of the reactor and include the negative power coefficient of the reactor, the inability of the operator to make significant reactivity insertions, automatic shutdown systems and the ability of the operator to use one of the two absorber systems to shut down the reactor.
48. CNSC staff confirmed that no changes to the physical design of the facility occurred during the licence period, but minor changes were made to improve the operation and maintenance of the facility, which were reported to CNSC staff through the annual compliance reports.
49. CNSC staff considers the SRC's performance with respect to this SCA to be acceptable.
50. The Commission asked SRC if they were considering changing the current highly enriched uranium (HEU) to low enriched uranium (LEU). The SRC representative responded that they were discussing with various Canadian and American authorities to determine any available funding for changing fuels and the approach to be taken.
51. The Commission sought information from CNSC staff on the design standards of the SLOWPOKE reactors that would enable common safety analyses, training development programs or aging management. CNSC staff responded that AECL was originally responsible for the development of the SLOWPOKE reactor safety analysis, and that specific safety analyses were developed to adapt to changes in each facility. CNSC staff also noted that aging management and training programs are specific to each SLOWPOKE facility. CNSC staff added that, in regards to the similarities in the licence applications, CNSC staff highly encouraged the SLOWPOKE licensees to use the application guides that follow the safety and control area framework to facilitate systematic evaluation by CNSC staff.
52. On the basis of the information presented, the Commission concludes that the design of the SLOWPOKE-2 reactor at the SRC is adequate for the operation period included in the proposed licence.

3.6 Fitness for Service

53. Fitness for service covers activities that are performed to ensure the systems, components and structures at the SRC continue to effectively fulfill their intended purpose.

3.6.1 Maintenance

54. The SRC reported that portable radiation survey meters are calibrated by the Radiation

Safety Institute of Canada.

55. The SRC noted that a systematic procedure was established in 2007 to ensure that all required routine monitoring, maintenance and inspection is done as per schedules.
56. CNSC staff considers that the facility has a well-established maintenance, calibration and testing program to ensure the reliability of the facility's systems and components. Routine maintenance is performed in accordance with the documented procedures and do not involve the opening of the reactor container. Maintenance activities requiring access to the reactor container (called nuclear maintenance) are performed by AECL employees.
57. CNSC staff noted that, during the licence period, the SRC has performed surveillance, on-demand maintenance and scheduled maintenance as required. CNSC staff stated that their review of the SRC annual compliance reports and results from the CNSC routine compliance inspections confirm the fitness for service of the SRC SLOWPOKE-2's systems and components.

3.6.2 Equipment Fitness for Service

58. The SRC also detailed the improvements made to the facility during the current licensing period. The SRC noted that the age of the reactor may make compatible replacement parts difficult to find. However, an inventory of original parts from decommissioned SLOWPOKES is being maintained by the existing SLOWPOKE facilities, and shared operational experiences between SLOWPOKE facilities identify suitable replacement. Parts could also be custom-built.
59. The Commission sought further information on inspections of the SLOWPOKE-2 reactors. CNSC staff responded that the licensee monitors the reactor on a regular basis and that CNSC staff perform regular visual inspections. CNSC staff added that only AECL staff, certified technicians and reactor engineers are authorized to open the reactor vessel to perform visual inspections and that CNSC staff coordinate their inspections to observe this activity.

3.6.3 Aging Management

60. Following a request from the Commission in 2003, the SRC indicated that, in 2012, an aging management program was developed to consolidate all aspects of aging management into a master document. CNSC staff reviewed the information submitted and found the plans submitted for continued operation acceptable. CNSC staff concludes that the SRC is taking proper consideration of materials and component aging in its maintenance and surveillance activities for the facility, and that safe and reliable operation can be expected over the next licensing period.
61. With regards to aging management, the Commission asked for information on the areas of concern with respect to the SLOWPOKE-2 reactor equipment and how these areas

are monitored. CNSC staff responded that the majority of the reactor components can be monitored directly or indirectly by certified staff during weekly maintenance where staff measure radiation fields and samples the reactor pool water. CNSC staff noted that HEU cores tend to be more porous, older and more susceptible to aging than LEU cores. CNSC staff added that there are no safety concerns with respect to the aging of the SLOWPOKE-2 reactor.

62. The Commission enquired as to what services AECL provides to SLOWPOKE reactors. CNSC staff responded that AECL provides two services including maintenance (addition of beryllium plates or shims) and refuelling the reactor core. CNSC staff noted that these services are administered by certified technicians and nuclear engineers. CNSC staff added that there would be no safety concerns if AECL no longer services the SLOWPOKE reactors in the future but that operations would be limited.
63. The Commission sought information regarding potential impacts on the operation of SLOWPOKE reactors if AECL discontinues their maintenance services. CNSC staff noted that they are monitoring the situation. CNSC staff also noted being satisfied with AECL's letter of commitment to service the SLOWPOKE reactor until 2019.
64. Relating to the maintenance of the reactor by AECL, the Commission enquired on the possibility of a hold point to be issued for 2019-2020. CNSC staff responded that it would be difficult to define a specific time with respect to a hold point as the remaining usage of the core depends on the frequency of operation. CNSC staff reiterated that there would not be any safety concerns if the reactor core's fuel is completely spent as the reactor could no longer be in operation. Also, CNSC staff noted that the lack of a maintainer such as AECL would not raise any safety concerns but would limit future operations. CNSC staff further responded that their planned annual reports to the Commission would serve as mechanism to provide updates on upcoming issues such as AECL's organization restructuring as well as fuelling and refueling requirements for each of the SLOWPOKE facilities.
65. The Commission enquired if a consulting advisory committee has been established amongst the SLOWPOKE facilities. The Commission was informed that there is a SLOWPOKE Users Group and that members of this group communicate several times a year by email and meet on occasion.

3.6.4 Conclusion on Fitness for Service

66. The Commission is satisfied with the SRC's programs for the inspection and life-cycle management of key safety systems. Based on the above information, the Commission concludes that the equipment as installed at the SRC is fit for service.
67. The Commission invites all SLOWPOKE owners to meet in order to determine the preferred method for ensuring the maintenance of these reactors once AECL's letter of commitment to service expires in 2019.

3.7 Radiation Protection

68. As part of its evaluation of the adequacy of the provisions for protecting the health and safety of persons, the Commission considered the past performance of the SRC in the area of radiation protection. The Commission also considered the SRC's program to ensure that both radiation doses to persons and contamination are: monitored, controlled, and kept as low as reasonably achievable (ALARA), with social and economic factors taken into consideration.
69. The SRC noted that its radiation safety program is based on the ALARA principle. The SRC detailed the measures taken to apply this principle at the facility. CNSC staff indicated that this program is designed for operators and the members of the public.
70. The SRC stated that regular reviews of the radiation protection program and the safety analysis of new activities will continue to be conducted to ensure that the program remains current.
71. CNSC staff have reviewed the radiation protection program at the SRC and concluded that appropriate measures are in place to monitor and control radiological hazards, including fixed area alarming monitors and the control of surface contamination.
72. The SRC noted that additional radiation detection equipment was added during the current licence period.
73. The SRC reported that the SRC Radiation Protection Committee reviews and examines issues related to radiation safety. Another committee, the SRC SLOWPOKE Committee, is a separate entity that advises and makes recommendations on operational practices, radiation protection procedures and administration of the facility.
74. The SRC noted that there are no persons classified as nuclear energy workers at the facility. CNSC staff concurred with the SRC. This determination was made according to criteria and process for designating persons as nuclear energy workers as described in the *Saskatchewan Research Council Radiation Safety Manual*. CNSC staff confirmed that the SRC has developed this manual to provide guidance to persons who intend to handle or use radioactive substances. CNSC staff has reviewed this manual and considers it acceptable.
75. The SRC stated that there were only two detectable doses received by facility personnel (over 312 measurements) during the current licence period, no personnel contamination events, and no exceedances of regulatory limits or action levels during the current licence period. CNSC staff concurred with the SRC.
76. The Commission noted that the worker radiation doses received are significantly lower than at other SLOWPOKE facilities and asked whether their accuracy have been verified. CNSC staff noted that the operating conditions of the facility have not

significantly changed and that the radiation dose measurements have been consistent over the years. The SRC representative stated that the numbers have been verified according to the QA program in place, and that they are considered accurate.

77. The Commission asked if the total reported worker radiation doses included doses received by AECL workers on site. The SRC representative responded that the doses reported were only for SRC employees. CNSC staff concurred with SRC. CNSC staff commented that radiation doses measured are for a specific person and are not segregated by location.
78. CNSC staff reported having performed an independent assessment of the general public dose due to all gaseous releases from the SLOWPOKE-2 facilities, and that a very conservative evaluation of the dose to the public gives an estimate below 0.000085 mSv/year, which is well below the regulatory limit of 1 mSv/year for members of the public.
79. The Commission is of the opinion that, given the mitigation measures and safety programs that are in place or will be in place to control hazards, the SRC will provide adequate protection to the health and safety of persons, the environment and national security.

3.8 Conventional Health and Safety

80. Conventional health and safety covers the implementation of a program to manage workplace safety hazards. This program is mandatory for all employers and employees in order to reduce the risks associated with conventional (non-radiological) hazards in the workplace. This program includes compliance with Part II of the *Canada Labour Code*⁴ and conventional safety training.
81. The SRC reported that the Occupational Health and Safety Committee conduct regular internal inspections of the facility producing action items which, when completed result in improved safety at the facility. The SRC also noted that, as a result of these activities, no safety incidents have been reported over the current licence period. CNSC staff concurred with the SRC.
82. The SRC reported that the hazards related to this facility are similar to what can be expected in chemical analysis laboratories of similar size and type. CNSC staff concurred with the SRC.
83. CNSC staff concluded that the SRC is performing satisfactorily with respect to this SCA.
84. The Commission is of the opinion that the health and safety of workers and the public was adequately protected during the operation of the facility for the current licence

⁴ R.S.C., 1985, c. L-2

period, and that the health and safety of persons will also be adequately protected during the continued operation of the facility.

3.9 Environmental Protection

85. Environmental Protection covers the SRC's programs to identify, control and monitor all releases of nuclear substances and to minimize the effects on the environment which may result from the licensed activities. It includes effluent and emissions control, environmental monitoring, and estimated doses to the public.
86. The SRC reported that their environmental protection policy at the facility is to take reasonable measures to reduce the impact of the facility's operations on the environment.
87. CNSC staff considers that the SRC has effective programs and procedures to protect the environment, the health and safety of persons, including identifying and controlling the releases of radioactive and hazardous substances to the environment. CNSC staff considers that the SRC has a satisfactory overall performance in this area.

3.9.1 Environmental Management System

88. The SRC reported having an environmental protection program to monitor and control the release of any hazardous substances to the environment. The SRC added that procedures are in place to monitor and control the release of any radioactive or hazardous substances from the facility, as well as minimize any radioactive and hazardous waste. The SRC stated that there are no liquid radioactive releases at the facility. CNSC staff concurred with the SRC.
89. CNSC staff noted that the SRC's environmental management system for the SLOWPOKE-2 facility was developed to the appropriate extent to define environmental policies and associated environmental protection procedures. The policies and procedures are implemented to ensure environmental protection.

3.9.2 Effluent and Emissions Control

90. The SRC noted that releases from the facility are minimal and adequately reviewed and described in the annual compliance reports. The SRC added that no unusual trends have been identified and no additional environmental studies were undertaken.
91. The SRC explained that the replacement of the pool deionizer system in 2009 eliminated the need to maintain supplies of strong hydrochloric acid and sodium hydroxide in the facility for regeneration of the deionizer. The total amount of hazardous waste generated by the facility was then reduced. CNSC staff concurred with the SRC.

3.9.3 Conclusion on Environmental Protection

92. Based on the above information, the Commission is satisfied that, given the mitigation measures and safety programs that are in place to control hazards, the SRC will provide adequate protection to the health and safety of persons and the environment.

3.10 Emergency Management and Fire Protection

93. Emergency management and fire protection covers the provisions for preparedness and response capabilities which exist for emergencies and for non-routine conditions at the SRC. This includes nuclear emergency management, conventional emergency response, and fire protection and response.

3.10.1 Emergency Management

94. The SRC reported that evacuation drills are conducted on a quarterly basis. These drills are coordinated between the Environmental Analytical Laboratories response team, Innovation Place maintenance and alarm monitoring station, and Saskatoon Fire and Protective Services. Drills are evaluated and corrective actions are implemented if necessary.
95. The SRC indicated that management review of the emergency response plan is done as part of the overall review of the SRC Occupational Health and Safety Program.
96. CNSC staff reported having reviewed the documentation submitted by the SRC for its emergency response plan and procedures. During compliance verification activities, CNSC staff found one area of improvement related to the update of contact information during emergencies. The SRC provided a corrective action plan acceptable to CNSC staff. CNSC staff considers the SRC's emergency preparedness plan to be acceptable.
97. CNSC staff stated that the SRC has measures in place to address abnormal conditions and emergency events such as fire, and that the potential impact on the public and the environment from postulated emergency conditions is minimal.

3.10.2 Fire Protection

98. The SRC indicated that a fire inspection program was implemented during the current licence period. CNSC staff confirmed that a fire protection program is in place to minimize both the probability of occurrence and the consequences of fire at the facility, which complies with applicable regulations. CNSC staff noted that the compliance inspections led them to conclude that the SRC was in compliance with their fire protection program.
99. The SRC noted that fire extinguisher training is offered annually by SRC Safety Services, and that the Environmental Analytical Laboratories ensures that several

workers receive the training each year.

100. The SRC stated that, prior to 2010, fire inspections at the facility were conducted as part of the overall fire inspection of all SRC facilities, and that there was no scheduled frequency for fire inspections at the reactor. Annual inspections at the facility were initiated in January 2010. All action items raised during these inspections were addressed in a timely manner. Also, the SRC noted that all smoke detectors are inspected annually and fire extinguishers are also serviced annually.

3.10.3 Conclusion on Emergency Management and Fire Protection

101. Based on the above information, the Commission concludes that the fire protection measures and emergency management preparedness programs in place, and that will be in place, at the facility are adequate to protect the health and safety of persons and the environment.

3.11 Waste Management

102. Waste management covers the licensee's site-wide waste management program. CNSC staff evaluated the SRC's performance with regards to waste minimization, segregation, characterization and storage.
103. CNSC staff indicated that the SRC has a waste management program in place at the facility.
104. The SRC reported that all irradiated samples are stored for at least six months before disposal. The levels of radiation found in samples are normally indistinguishable from background, and therefore, the samples may be disposed of with regular waste. Samples with naturally occurring radioactive materials, such as uranium, are returned to the client or sent to an approved facility for disposal. CNSC staff concurred with the SRC. CNSC staff noted that there is no unused or spent fuel at the facility.
105. The SRC provided details on the hazardous substances present at the facility, and noted that there are no known hazardous substance contained in the building structures. The SRC also noted that current practices are minimizing the amount of waste produced at the facility.
106. CNSC staff is satisfied with the SRC's waste management practices, and considers the SRC's performance in this SCA to be satisfactory.
107. Based on the above information and considerations, the Commission is satisfied that the SRC is safely managing waste at its facility.

3.12 Security

108. The SRC reported that measures to prevent theft, loss or illegal use of nuclear substances and prescribed equipment are in place, and include the access control measures, the security system, and the updated security measures. Procedures for the response of threatening incidents are also in place.
109. The SRC stated that the only Category III nuclear material (as defined in the *Nuclear Security Regulations*⁵) present at the facility, which require security measures in place, is the reactor core. The SRC detailed the measures in place to protect the core.
110. CNSC staff reported that the SRC has a security program in place for its facility in accordance with regulatory requirements. CNSC staff has reviewed the security plan and considers it satisfactory. CNSC staff noted that the facility has had 5 security inspections during the current licence period and that all findings have been subsequently resolved.
111. The Commission is satisfied that the SRC's performance with respect to maintaining security at the facility has been acceptable.
112. The Commission concludes that the SRC has made adequate provisions for ensuring the physical security of the facility, and is of the opinion that the SRC will continue to make adequate provisions during the proposed licence period.

3.13 Safeguards

113. The CNSC's regulatory mandate includes ensuring conformity with measures required to implement Canada's international obligations under the Treaty on the Non-Proliferation of Nuclear Weapons. Pursuant to the Treaty, Canada has entered into safeguards agreements with the IAEA. The objective of these agreements is for the IAEA to provide credible assurance on an annual basis to Canada and to the international community that all declared nuclear material is in peaceful, non-explosive uses and that there is no undeclared nuclear material or activities in this country.
114. CNSC staff considers that the SRC SLOWPOKE facility has an effective and acceptable safeguards program in place, which complies with regulatory and licence requirements, and that the SRC is performing satisfactorily with respect to this SCA.
115. The SRC declared that, since the coming into force in January 1, 2011 of Regulatory Document RD-336, *Accounting and Reporting of Nuclear Material*, nuclear material reporting forms have been submitted as required. Prior to January 1, 2011, a physical inventory book was maintained, recording the facility's fuel inventory on an annual basis. The SRC added that annual updates are submitted under the IAEA Additional Protocol.

⁵ SOR/2000-209

116. The SRC noted that physical inventory inspections were conducted by the IAEA in September 2004 and October 2011. CNSC staff stated that, during the licence period, the SRC provided the CNSC staff IAEA with all reports and information necessary to comply with the safeguards regulatory requirements. The SRC also provided necessary access and assistance to perform the activities and complied with all regulatory requirements. There were no reportable events or action notices as a result of these inspections.
117. Based on the above information, the Commission is satisfied that the SRC has made and will continue to make adequate provisions in the areas of safeguards and non-proliferation at the facility that are necessary for maintaining national security and measures necessary for implementing international agreements to which Canada has agreed.

3.14 Packaging and Transport

118. Packaging and transport covers the safe packaging and transport of nuclear substances to and from the SLOWPOKE facility. The SRC must adhere to the *Packaging and Transport of Nuclear Substances Regulations*⁶ and Transport Canada's *Transportation of Dangerous Goods Regulations*⁷ for all shipments leaving the site. The *Packaging and Transport of Nuclear Substances* apply to the packaging and transport of nuclear substances, including the design, production, use, inspection, maintenance and repair of packages, and the preparation, consigning, handling, loading, carriage and unloading of packages containing nuclear substances.
119. The SRC reported that very few nuclear substances are loaded, packaged, received or shipped by the facility. The SRC added that all samples for testing are received through the Environmental Analytical Laboratories. Nuclear substances are received under the SRC's Nuclear Substance and Radiation Device Licence. The SRC noted that the Environmental Analytical Laboratories receiving and shipping departments have personnel trained to receive and ship class 7 dangerous goods under the *Transport of Dangerous Goods Regulations*⁸. CNSC staff concurred with the SRC.
120. CNSC staff reported that there were no reported packaging and transport related incidents during the current licence period, and that routine non-compliance activities identified no issues of non-conformance. CNSC staff stated that overall, the SRC has demonstrated compliance with all relevant requirements.
121. Based on the above information, the Commission is satisfied that the SRC is meeting regulatory requirements regarding packaging and transport.

⁶ SOR/2000-208

⁷ SOR/2001-286

⁸ SOR/2001-286

3.15 Application of the *Canadian Environmental Assessment Act*

122. Before making a licensing decision, the Commission must be satisfied that all applicable requirements of the *Canadian Environmental Assessment Act, 2012*⁹ (CEAA 2012) have been fulfilled.
123. CNSC staff reported that it had completed an Environmental Assessment (EA) determination under the CEAA 2012. CNSC staff stated that the proposed licence renewal is not classified as a “designated project” pursuant to the *Regulations Designating Physical Activities* made under paragraph 84(a) of the CEAA 2012. Therefore, the CNSC is not considered a responsible authority pursuant to paragraph 15(a) of the CEAA 2012 and no federal EA is required.
124. The Commission is satisfied that no federal EA is required in this case. The Commission notes that the NSCA provides a strong regulatory framework for environmental protection. Whether an EA is required or not, the CNSC regulatory system ensures that adequate measures are in place to protect the environment and human health in accordance with the NSCA and its Regulations.

3.16 Aboriginal Engagement

125. The common law Duty to Consult with Aboriginal communities and organizations applies when the Crown contemplates actions that may adversely affect established or potential Aboriginal or treaty rights.
126. CNSC staff reported having conducted research that lead to a preliminary list of First Nation and Métis groups and organizations that may have interest in the licensing decision. CNSC staff identified 7 First Nation and Métis groups and organizations. CNSC staff stated that they have sent notification letters to the identified groups, which included information on the licence application and the public hearing process. First Nations and Métis groups were encouraged to participate should they have interest in this licence renewal. Follow-up calls were made to ensure letters were received and to answer questions.
127. CNSC staff is of the opinion that activities related to the non-power reactor operating licence is not expected to cause an adverse impact to any potential or established Aboriginal or treaty rights.
128. Based on the information provided, the Commission acknowledges the efforts made in relation to the CNSC’s obligations regarding Aboriginal consultation and the Legal Duty to Consult.

3.17 Public Information

⁹ S.C. 2012, c. 19, s.52

129. A public information program is a regulatory requirement for licence applicants and licensed operators of Class I nuclear facilities, such as SLOWPOKE-2 reactors. Paragraph 3(j) of the *Class I Nuclear Facilities Regulations*¹⁰ requires that licence applications include “*the proposed program to inform persons living in the vicinity of the site of the general nature and characteristics of the anticipated effects on the environment and the health and safety of persons that may result from the activity to be licensed.*”
130. The SRC reported that an initial draft of the Public Information and Disclosure Program, aiming to meet the requirements of CNSC Regulatory Document RD/GD 99.3, *Public Information and Disclosure*, was sent to CNSC staff in December 2012. The SRC anticipates being compliant with this Regulatory Document within one year of licence renewal. CNSC staff confirmed that the SRC is currently updating its program to meet the applicable sections of RD/GD 99.3. CNSC staff will continue to monitor the SRC’s process and compliance with the applicable requirements of this regulatory document.
131. CNSC staff reported that a number of publication about the SRC SLOWPOKE facility appeared in the media, and that all the requests coming from the media are directed through SRC Communications. CNSC staff added that tours of the facility are being offered, at time in conjunction with tours of the other SRC facilities. CNSC staff indicated that the SRC makes the information on the facility available to the public, including the impact of the facility on the environment. The SRC also has a web site that provides information on its SLOWPOKE-2 reactor.
132. The Commission expressed the view that the public information program seems incomplete, and asked for opinions on this topic. The SRC representative responded that they are developing a public information program in cooperation with CNSC staff. The SRC representative detailed some of the public information activities in place, including a video on the facility that is on YouTube. The SRC representative noted that they are also providing the local Aboriginal communities with information on various sources of energy, including nuclear energy. CNSC staff commented that RD/GD 99.3 was a generic document, and that they have worked with the CNSC communications group to better define their expectations in this regard for each category of licensee, with the implementation of new requirements following a graded approach.
133. Based on this information, the Commission is satisfied that the SRC’s public information activities are acceptable. The Commission acknowledges the efforts by the SRC to comply with RD/GD 99.3 and to make this program fully meeting regulatory requirements.

3.18 Decommissioning Plans and Financial Guarantee

¹⁰ SOR/2000-204

134. The Commission requires that the licensee has operational plans for decommissioning and long-term management of waste produced during the life-span of the facility. In order to ensure that adequate resources are available for a safe and secure future decommissioning of the SRC SLOWPOKE facility, the Commission requires that an adequate financial guarantee for realization of the planned activities is put in place and maintained in a form acceptable to the Commission throughout the licence period.
135. The SRC reported that a Preliminary Decommissioning Plan was prepared for the facility. CNSC staff concurred with the SRC. CNSC staff has reviewed this plan and concludes that it meets the requirements of CSA standard N294-09. *Decommissioning of Facilities Containing Nuclear Substances*.
136. The SRC reported that it submitted a proposal for a financial guarantee in June 2012, and that on February 14, 2013, the CNSC issued a letter to SRC, confirming their approval of the SRC financial guarantee. CNSC staff confirmed that, in 2011, the SRC proposed a financial guarantee cost estimate increase of \$3.96 million CAD, to the amount of \$5.76 million CAD. The plan and the cost estimate are prepared based on a prompt decommissioning strategy. CNSC staff noted that the financial guarantee is in the form of Trust and Financial Security and Access Agreements. CNSC staff is satisfied that the SRC's financial guarantee is consistent with the criteria set out in the CNSC Regulatory Guide G-206, *Financial Guarantees for the Decommissioning of Licensed Activities*.
137. Based on this information, the Commission considers that the preliminary decommissioning plans and related financial guarantee are acceptable for the purpose of the current application for licence renewal.

3.19 Nuclear Liability Insurance and Cost Recovery

138. The SRC declared that it is carrying the required nuclear liability insurance. CNSC staff concurred with the SRC.
139. CNSC staff reported that the SRC is in good standing with respect to *Cost Recovery Fees Regulations*¹¹ for the SLOWPOKE facility.
140. The Commission notes that, on April 30, 2013, following a one-day hearing, the Commission exempted the SRC from the CNSC's *Cost Recovery Fees Regulations*, effective April 1, 2013.

3.20 Licence Length and Conditions

141. The SRC requested the renewal of the current operating licence for a period of 10 years. CNSC staff recommended the renewal of the licence for a period of 10 years,

¹¹ SOR/2003-212

stating that the SRC is qualified to carry on the licensed activities authorized by the licence.

142. CNSC staff has also proposed a licence format with a Licence Conditions Handbook (LCH). CNSC staff stated that this would ensure a clear understanding for each regulatory requirement specified by the Commission.
143. The Commission sought comments from SLOWPOKE licensees on the CNSC's transition from licence conditions to the LCH. The Commission was informed that the SLOWPOKE facilities had the opportunity to review three draft LCHs and found that, while they find the LCH useful in detailing how to meet regulatory requirements and intend on doing their best to comply with the LCH, this document was overwhelming and the administrative and technical conditions and requirements are complex and not necessarily applicable to the SLOWPOKE facilities. CNSC staff further noted that the graded approach was applied to the development of the LCH to specify exact licence conditions that apply to each specific licensee.
144. The Commission sought comments on the references in the LCH to documents from the past and asked if updating was required. CNSC staff responded that SLOWPOKE facilities do not tend to change significantly over time. CNSC staff noted that it is common that SLOWPOKE licensees have complimentary documents to reflect updates to the SLOWPOKE facilities' maintenance and operations as required.
145. Based on the information received during the course of this hearing, the Commission is satisfied that a 10-year licence is appropriate. The Commission accepts the licence conditions as recommended by CNSC staff. The Commission also accepts CNSC staff's recommendation regarding the delegation of authority, and notes that it can bring any matter to the Commission as applicable.
146. The Commission notes the concerns expressed by the SLOWPOKE licensees regarding the length and complexity of the LCH, and invites them to submit proposals to CNSC staff in order to simplify this document.

4.0 CONCLUSION

147. The Commission has considered the information and submissions of CNSC staff, the applicant and all participants as set out in the material available for reference on the record, as well as the oral and written submissions provided or made by the participants at the hearing.
148. The Commission concludes that an environmental assessment of the proposed continued operation of the facility, pursuant to the *Canadian Environmental Assessment Act*, is not required.
149. The Commission is satisfied that the applicant meets the requirements of subsection

24(4) of the *Nuclear Safety and Control Act*. That is, the Commission is of the opinion that the applicant is qualified to carry on the activity that the proposed licence will authorize and that the applicant 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.

150. Therefore, the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, renews the Saskatchewan Research Council's Non-Power Reactor Operating Licence NPROL-19.04/2013 for its SLOWPOKE-2 reactor located in Saskatoon, Saskatchewan. The licence NPROL-19.00/2023 will be valid from July 1, 2013 to June 30, 2023.
151. The Commission includes in the licence the conditions as recommended by CNSC staff and set out in the draft licence attached to CMD 13-H10.
152. The Commission also accepts CNSC staff's recommendation regarding the delegation of authority in the Licence Conditions Handbook (LCH). The Commission notes that CNSC staff can bring any matter to the Commission as applicable. The Commission directs CNSC staff to inform the Commission on an annual basis of any changes made to the LCH.
153. With this decision, the Commission directs CNSC staff to provide annual reports on the performance of the SRC's SLOWPOKE-2 reactor. CNSC staff shall present these reports at public proceedings of the Commission.



JUN 26 2013

Michael Binder
President,
Canadian Nuclear Safety Commission

Date