



Canadian Nuclear  
Safety Commission

Commission canadienne  
de sûreté nucléaire

## Record of Decision

DEC 19-H100

In the Matter of

Applicant Saskatchewan Research Council

Subject Application to Amend the Non-Power Reactor  
Licence for the SLOWPOKE-2 Reactor to  
Authorize Decommissioning

Public Hearing  
Date September 26, 2019

Record of  
Decision Date December 6, 2019

**RECORD OF DECISION – DEC 19-H100**

Applicant: Saskatchewan Research Council

Address/Location: 15 Innovation Boulevard, Saskatoon, Saskatchewan

Purpose: Application to Amend the Non-Power Reactor Operating Licence for the SLOWPOKE-2 Reactor

Application received: December 14, 2018

Date of public hearing: September 26, 2019

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

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<b>Intervenors</b>		
See Appendix A		

**Licence:** Amended

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## 1.0 INTRODUCTION

1. The Saskatchewan Research Council (SRC) has applied to the Canadian Nuclear Safety Commission<sup>1</sup> for the amendment of the Non-Power Operating Reactor Licence for its SLOWPOKE-2 reactor facility located at the SRC Environmental Analytical Laboratories complex in Saskatoon, Saskatchewan. The current licence, NPROL-19.00/2023, expires on June 30, 2023. SRC has requested an amendment of the licence to authorize the decommissioning of the SRC SLOWPOKE-2 reactor facility (SRCSF).
2. The current licence authorizes SRC to operate the SRCSF and to transition the reactor into a safe state, but does not authorize SRC to decommission the reactor. Prior to transitioning into a safe state, the SRCSF provided a source of neutrons for neutron activation analysis and isotope production. It was also used for teaching purposes in conjunction with the University of Saskatchewan.
3. SRC is seeking to decommission its SRCSF at this time because it has been able to replace the reactor's analytical capabilities with alternative technologies at SRC's environmental analytical laboratories. The proposed licence amendment would authorize SRC to decommission the SRCSF to achieve an end-state of unrestricted use. This includes dismantling the reactor, segregating and removing the materials for storage, and restoring the site to its original state.
4. In June 2019, up to \$15,000 in funding to participate in this licence amendment process was made available to Indigenous groups, not-for-profit organizations and members of the public through the CNSC's Participant Funding Program (PFP). A Funding Review Committee (FRC) – independent of the CNSC – recommended that up to \$14,714 in participant funding be provided to two applicants. These applicants were required, by virtue of being awarded participant funding, to submit a written intervention and/or an oral presentation at the public hearing commenting on SRC's application.

### Issues

5. In considering the application, the Commission was required to decide:
  - a) what environmental assessment review process to apply in relation to this application;
  - b) whether SRC is qualified to carry on the activity that the amended licence would authorize; and

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<sup>1</sup> 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.

- c) whether, in carrying on that activity, 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

6. On June 12, 2019, the Commission issued a notice of public hearing in writing for SRC's licence amendment application. Following its publication, the Commission received a request from the Canadian Environmental Law Association (CELA) on behalf of Northwatch, the Inter-Church Uranium Committee Educational Cooperative (ICUCEC) and the Concerned Citizens of Renfrew County and Area (CCRCA) to allow for oral interventions, a longer intervention submission period, and to offer participant funding in relation to SRC's application. Following the Commission's consideration of this request, the Commission, in recognition of demonstrated public interest in SRC's application, published a revised notice of public hearing on June 27, 2019 for an oral hearing. The revised notice provided for a 30-day period to seek intervenor status as per the *Canadian Nuclear Safety Commission Rules of Procedure*<sup>2</sup> (Rules of Procedure). Intervenors were provided an opportunity to intervene in writing and orally and were offered up to \$15,000 in participant funding through the PFP.
7. Pursuant to section 22 of the NSCA, the President established a Panel of the Commission to consider the information presented for a public hearing held on September 26, 2019 in Ottawa, Ontario. The public hearing was conducted in accordance with the Rules of Procedure. During the public hearing, the Commission considered written submissions and heard oral presentations from SRC (CMD 19-H100.1A) and CNSC staff (CMD 19-H100.A). The Commission also considered oral and written submissions from seven intervenors (see Appendix A for a list of interventions). The hearing was audiocast live via the CNSC website, and audio archives are available on the CNSC's website.

## **2.0 DECISION**

8. Based on its consideration of the matter, as described in more detail in the following sections of this *Record of Decision*, the Commission concludes that SRC is qualified to carry on the activity that the amended licence will authorize. The Commission is of the opinion that 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,

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<sup>2</sup> SOR/2000-211.

the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, amends the Non-Power Reactor Operating Licence issued to the Saskatchewan Research Council for its SLOWPOKE-2 reactor facility located in Saskatoon, Saskatchewan to authorize SRC to decommission the facility. The amended licence, NPROL-19.01/2023, remains valid until June 30, 2023.

9. The Commission is satisfied that an environmental assessment (EA) under the *Canadian Environmental Assessment Act, 2012*<sup>3</sup> (CEAA 2012) was not required in this matter and considers the environmental protection review that was conducted by CNSC staff to be acceptable and thorough.
10. The Commission amends Part IV a) of SRC's licence as recommended by CNSC staff in CMD 19-H100, to authorize SRC to decommission the SRCSF.
11. The Commission does not amend the licence period as recommended by CNSC staff in CMD 19-H100. The Commission is satisfied that the start date of the licence need not change. The licence period shall remain as "July 1, 2013 to June 30, 2023" with the authorization to decommission taking effect as of the date of this decision.
12. The Commission anticipates that, following its decision in this matter, CNSC staff will update SRC's Licence Conditions Handbook (LCH) to include references to the Detailed Decommission Plan (DDP) and other documents as presented during this hearing. A draft amended LCH was not included in the hearing materials as is usual; CNSC staff will update it following this decision.
13. The Commission would like to note its displeasure that, during the hearing, it did not receive satisfactory information about how the waste would be characterized during the decommissioning of the SRCSF or about the specific radionuclide activities data. Should SRC submit an application to abandon the SRCSF, the detailed waste characterization data and a confirmation of the accuracy of the estimates will be required to be submitted by SRC, and reviewed by CNSC staff.

### **3.0 ENVIRONMENTAL ASSESSMENT**

14. In coming to its decision, the Commission was first required to determine whether an EA was required.
15. SRC's application was made December 14, 2018, at which time CEAA 2012 and its regulations provided the requirements for EA for nuclear projects. The decommissioning of an existing nuclear reactor is not included on the Designated Project list for an EA, as decommissioning is not an activity identified in the *Regulations Designating Physical Activities*.

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<sup>3</sup> S.C. 2012, c. 19, s. 52

16. The *Impact Assessment Act*<sup>4</sup> (IAA) came into force August 28, 2019. Under the IAA and the *Physical Activities Regulations*<sup>5</sup> made under it, impact assessments (IA) will be conducted on projects identified as having the greatest potential for adverse environmental effects in areas of federal jurisdiction. While CEAA 2012 and not the IAA applies to this project, the Commission notes that the decommissioning of an existing reactor is not an activity identified in the regulations for an IA under the IAA.
17. The Commission considered the completeness and adequacy of the environmental protection review under the NSCA and its regulations that CNSC staff conducted for this licence amendment. CNSC staff findings for the proposed SRCSF decommissioning included, but were not limited to:
  - Radiation doses to the public resulting from decommissioning activities are estimated to be 0.1 mSv, well below the regulatory dose limit for members of the public of 1.0 mSv;
  - Air will be continuously monitored and any radioactive or hazardous substances will be captured using high efficiency particulate air filters to ensure that no airborne contaminants are released into the environment;
  - Liquid effluents would be treated using a container water deionizer system to meet the release criteria specified by the CNSC and the City of Saskatoon.
18. The Commission is satisfied that the environmental protection review conducted by CNSC staff was appropriate for this licence amendment and that the NSCA provides a strong regulatory framework for environmental protection.
19. Based on the information provided for this hearing, the Commission concludes that the licence amendment is not a designated project under CEAA 2012 and that an EA under CEAA 2012 is not required prior to its approval. Further, the Commission is satisfied that SRC has made, and will continue to make, adequate provision for the protection of the environment throughout the decommissioning activities to be authorized by this amendment.

#### **4.0 ISSUES AND COMMISSION FINDINGS**

20. In making its licensing decision, the Commission considered a number of issues and submissions relating to SRC's qualification to carry out the licensed activities that the amended licence would authorize. The Commission also considered 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.
21. SRC submitted a licence amendment application for the SRCSF on December 14, 2018. In its consideration of this matter, the Commission examined the completeness of the application and the adequacy of the information submitted by the SRC, as

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<sup>4</sup> S.C. 2019, c. 28, s. 1

<sup>5</sup> SOR/2019-285

required by the NSCA, the *General Nuclear Safety and Control Regulations*<sup>6</sup> (GNSCR) and other applicable regulations made under the NSCA.

22. In CMD 19-H100.A, CNSC staff provided responses to some of the questions and issues raised by intervenors. This *Record of Decision* reflects the Commission's consideration of matters as discussed during the hearing and as raised in written submissions.

#### **4.1 Human Performance Management**

23. The Commission assessed SRC's human performance management programs which encompass activities that enable effective human performance through the development and implementation of processes that ensure that SRC staff are sufficient in number in all relevant job areas and have the necessary knowledge, skills, procedures and tools in place to safely carry out their duties. During the current licence period, CNSC staff rated SRC's performance in this safety and control area (SCA) as "satisfactory."
24. The Commission examined the information submitted by SRC regarding its human performance program. SRC submitted that the SRCSF decommissioning project included work that its personnel did not normally perform and, therefore, the decommissioning work would be contracted to and carried out by Candu Energy Inc. (Candu Energy), which has specific training and experience for these types of projects.
25. The Commission considered the information submitted by SRC about its personnel training programs, noting that SRC's programs met the specifications of REGDOC-2.2.2, *Personnel Training*.<sup>7</sup> SRC submitted information about its decommissioning training program, which applies to all workers and contractors who are required to perform work, as set out in SRC's *Decommissioning Training Plan for SRC SLOWPOKE-2 Facility*.<sup>8</sup>
26. SRC reported that all Candu Energy staff were required to complete basic industrial safety and radiological training and that all personnel in direct operating positions would be trained in accordance with Candu Energy's Systematic Approach to Training (SAT) program, unless their current CNSC certification covered the activities to be performed during decommissioning. SRC further reported that a review of training and qualifications would be conducted for employees assigned to work at the SRC facility, noting that, as part of the SAT process, a Training Needs Analysis was conducted to examine the tasks involved and the qualification of the personnel assigned to perform the tasks. SRC reported that this analysis produced a matrix which showed the

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<sup>6</sup> SOR/2000-202.

<sup>7</sup> CNSC Regulatory Document REGDOC-2.2.2, *Personnel Training*, 2016.

<sup>8</sup> SRC, SLOWPOKE-2 Detailed Decommissioning Plan, March 04, 2019.

additional training modules or courses were required to fill any gaps in a worker's required knowledge and skills.

27. CNSC staff reviewed the SRC's detailed training plan, including the advanced training schedule, which provides timelines for all tasks requiring training as identified in the job and task analysis. From this review, CNSC staff were satisfied that the decommissioning training and evaluation program met expectations.
28. The Commission enquired as to whether workers assigned to the decommissioning of the SRCSF were also involved during the decommissioning of the University of Alberta (U of A) SLOWPOKE-2 reactor. An SRC representative responded that, although not all of the workers present during the U of A decommissioning project were working on the SRCSF decommissioning, several were.
29. The Commission assessed the SRC's programs for the certification of employees in certain positions at the SRCSF. SRC submitted that, under its operating licence and pursuant to the *Class I Nuclear Facilities Regulations*<sup>9</sup> (Class I Regulations), the positions requiring a valid CNSC certification included: reactor operator, reactor engineer, and reactor technician.
30. CNSC staff submitted that there were three SLOWPOKE-2 reactor operators employed by SRC who were certified by the CNSC, and the reactor engineer and the reactor technician were Candu Energy employees, who were also certified by the CNSC to work on the SRC SLOWPOKE-2 reactor.
31. Based on the information presented during this hearing, the Commission is satisfied that SRC has appropriate training and certification programs in place at the SRCSF for carrying out the decommissioning of the SRCSF. The Commission is also satisfied that SRC's programs meet the objectives of REGDOC-2.2.2.
32. The Commission is satisfied that appropriate programs are in place for contracted Candu Energy workers.
33. Based on its consideration of the information presented on the record for this hearing, the Commission concludes that SRC has appropriate programs in place and that current efforts related to human performance management provide a positive indication of SRC's ability to adequately carry out the proposed decommissioning activities at the SRCSF.

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<sup>9</sup> SOR/2000-204

## 4.2 Radiation Protection

34. As part of its evaluation of the adequacy of the measures for protecting the health and safety of persons, the Commission considered the performance of SRC in the area of radiation protection. The Commission also considered how SRC's radiation protection program specified that radiation doses to persons and contamination would be monitored, controlled and kept as low as reasonably achievable (ALARA), with social and economic factors taken into consideration, during the decommissioning of the SRCSF. Throughout the current licence period thus far, CNSC staff rated SRC's performance in this SCA as "satisfactory."
35. The Commission considered the information provided by SRC and CNSC staff to assess whether the SRC radiation protection program satisfied the requirements of the *Radiation Protection Regulations*.<sup>10</sup> SRC submitted that Candu Energy's Radiation Protection Plan for the decommissioning of the SRCSF was based on Candu Energy's radiation protection program requirements used at CANDU licensed sites and would see to it that doses to workers would remain below regulatory limits during the decommissioning project.
36. SRC submitted that, in order to keep doses ALARA, a radiation protection surveyor would provide oversight throughout the decommissioning work and that workers would perform decommissioning work at a safe distance from the radiation source using cranes and extension tools. SRC further submitted that the use of personal dosimetry in radiological work zones to control the spread of contamination would be utilized.
37. CNSC staff submitted that, throughout the current licence period, SRC had implemented an appropriate and effective radiation program at the SRCSF that satisfied the regulatory requirements set out in the *Radiation Protection Regulations*. CNSC staff also reported that SRC used a licensed dosimetry service to monitor, assess, record and report doses received by workers, noting that the workers in the SRCSF were not designated as nuclear energy workers (NEWs). CNSC staff further submitted that doses to public and the workers during the current licence period were well below the public annual whole-body regulatory dose . CNSC staff noted that the maximum effective dose to an SRC worker during the current licence period was 0.28 mSv, well below the 1 mSv regulatory dose limit.
38. CNSC staff reported that radioactive fields to which workers may be exposed during the decommissioning project were estimated to be between 0.30  $\mu\text{Sv/h}$  and 0.37  $\mu\text{Sv/h}$ . CNSC staff further submitted that, based on previous decommissioning projects, SRC established action levels<sup>12</sup> for the decommissioning project of 1 mSv effective dose, 50

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<sup>10</sup> SOR/2000-203

<sup>11</sup> SOR/2000-203, subsection 13(1)

<sup>12</sup> The *Radiation Protection Regulations* define an "action level" as a specific dose of radiation or other parameter that, if reached, may indicate a loss of control of part of a licensee's radiation protection program and triggers a requirement for specific action to be taken.

mSv for skin dose and 50 mSv for extremities. CNSC staff submitted that there would be real time monitoring of alpha, beta, and gamma radiation using Improved Chemical Agent Monitors (ICAM).

39. The Commission asked for information in regard to a concern raised by the National Council of Women of Canada with respect to the estimated collective dose for the decommissioning of the SRCSF. A Candu Energy representative responded that the total dose received by workers in the three-month duration of the U of A decommissioning was 0.26 mSv and that Candu Energy was anticipating a similar collective dose for the SRCSF decommissioning. The Candu Energy representative added that for the activities that Candu Energy had carried out at SRCSF to date (including the removal and shipment of the fuel from the reactor), the collective dose was 0.165 mSv.
40. The Commission asked SRC to opine on which decommissioning activity was considered the most hazardous from a radiological perspective. A Candu Energy representative responded that the removal of the beryllium annulus was the most hazardous activity with respect to radiation, as the beryllium annulus had to be brought up to the surface of the reactor pool and stored in a shielding container while workers were present.
41. Further on that topic, the Commission asked about what was considered to be the worst case scenario during the SLOWPOKE-2 decommissioning and what controls were in place to prevent such an accident from occurring. The Candu Energy representative responded that the worst case scenario would be a worker standing near the beryllium annulus for an extended duration of approximately four hours which would result in a regulatory dose limit for a member of the public of 1 mSv. The Candu Energy representative added that, in order to prevent this from occurring, radiation detectors to monitor radiation levels, and radiation protection personnel to monitor doses to workers, were in place. The Commission was satisfied with the information provided.
42. Following the concerns about alpha hazards expressed in the intervention from the National Council of Women of Canada, the Commission asked if alpha radiation hazards were anticipated during the decommissioning of the SRCSF and whether SRC's radiation protection program would adequately provide for protection in regard to such hazards. CNSC staff responded that, although there were alpha hazards present in the SRCSF, SRC had provisions in place such as contamination monitoring; real-time monitoring of alpha, beta, and gamma radiation; and the use of personal protective equipment such as respiratory systems and radiation protection coveralls to limit the intake of alpha particles.
43. The Commission asked for information regarding the methodology that was used to determine that five samples from the pool floor would be adequate to ensure that no contamination would be left behind in the SRCSF. A Candu Energy representative responded that the samples were to confirm the computer model prediction that provided the activity on the reactor pool floor. The Candu Energy representative added

that once the results were validated, they would know exactly how much concrete would need to be removed from the reactor pool to ensure that there will be no contamination left behind in the SRCSF.

44. Based on the information considered for this hearing, the Commission is satisfied that the ALARA concept is adequately applied to all SRCSF activities.
45. Based on the information provided on the record for this hearing, the Commission concludes that, given the mitigation measures and safety programs that are in place and will be in place to control radiation hazards, SRC provides for, and will continue to provide for, the adequate protection of the health and safety of persons and the environment throughout the decommissioning of the SRCSF.
46. The Commission is satisfied that SRC's radiation protection program at the SRCSF will continue to meet the requirements of the *Radiation Protection Regulations* during the decommissioning of the facility.

### **4.3 Environmental Protection**

47. The Commission examined SRC's environmental protection programs at the SRCSF, which are intended to identify, control and monitor all releases of radioactive and hazardous substances, and aim to minimize the effects on the environment which may result from the licensed activities. These programs include effluent and emissions control, environmental monitoring and estimated doses to the public. CNSC staff rated SRC's performance in this SCA as "satisfactory" during the current licence period.
48. The Commission considered whether the SRCSF environmental protection programs adequately met the specifications of REGDOC-2.9.1, *Environmental Protection Policies, Programs and Procedures*.<sup>13</sup>
49. CNSC staff reported that SRC's environmental protection program met the requirements of the Class I Regulations and that radiological and non-radiological releases at the SRCSF remained below regulatory limits during the current licence period.
50. The Commission considered SRC's programs to control the release of effluents and emissions from the SRCSF to the environment. In its written submission, SRC submitted that the release of radioactive material was expected to be below the regulatory limits and that airborne emissions would be continuously monitored and filtered using high efficiency particulate air filters prior to being released into the environment during the decommissioning of the SRCSF.

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<sup>13</sup> CNSC Regulatory Document REGDOC-2.9.1, *Environmental Protection Policies, Programs and Procedures*, 2013.

51. The Commission assessed SRC's programs to mitigate risk to members of the public from hazardous substances discharged from the SRCSF. CNSC staff submitted that airborne releases from the SRCSF were below regulatory limits and that the dose to the public was estimated to be 0.010 mSv as compared to the regulatory limit for the dose to a member of the public of 1 mSv. SRC submitted that it would have mitigation measures in place to ensure that airborne emissions are minimal and that operating experience had shown no instances where airborne radioactivity was detected.
52. In its written submission, SRC submitted that approximately 28,380 L of contaminated reactor pool water to be disposed of during the decommissioning process will be treated using a container water deionizer system prior to release into the City of Saskatoon sewer system. SRC further submitted that the level of activity in the pool water would be subject to CNSC release criteria as detailed in the *Nuclear Substances and Radiation Devices Regulations*<sup>14</sup> (NSRDR) and City of Saskatoon by-laws for hazardous substances.<sup>15</sup>
53. In consideration of concerns raised by the National Council of Women of Canada regarding the release of liquid waste into the City of Saskatoon sewage system, the Commission asked CNSC staff to elaborate on the type of assessment that was conducted with respect to the cumulative risks to the environment associated with SRC's liquid waste disposal proposal. CNSC staff stated that, when assessing whether liquid waste could be released into the municipal sewage system, it had to be ascertained that the waste was below the clearance levels set out in Appendix R of REGDOC-1.6.1, *Licence Application Guide: Nuclear Substances and Radiation Devices*, Version 2<sup>16</sup>, and IAEA-TECDOC-1000, *Clearance of Materials Resulting from the Use of Radionuclides in Medicine, Industry and Research*.<sup>17</sup> CNSC staff further added that these clearance levels were derived to ensure that no member of the public received an annual dose of more than 0.01 mSv.
54. Based on the assessment of the application and the information provided on the record at the hearing, the Commission is satisfied that, given the mitigation measures and safety programs that are in place to control hazards, SRC will provide adequate protection to the health and safety of persons and the environment throughout the decommissioning activities.
55. The Commission is satisfied that the SRCSF environmental protection programs continue to meet the specifications of REGDOC-2.9.1.

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<sup>14</sup> SOR/2000-207

<sup>15</sup> <https://www.saskatoon.ca/services-residents/power-water/water-wastewater/sewer-use-bylaw>

<sup>16</sup> CNSC Regulatory Document REGDOC-1.6.1, *Licence Application Guide: Nuclear Substances and Radiation Devices*, Version 2

<sup>17</sup> INTERNATIONAL ATOMIC ENERGY AGENCY, *Clearance of Materials Resulting from the Use of Radionuclides in Medicine, Industry and Research*, IAEA-TECDOC-1000, IAEA, Vienna (1998).

#### 4.4 Waste Management

56. The Commission assessed SRC's site-wide waste management program. During the current licence period, CNSC staff assessed SRC's performance in this SCA, including waste minimization, segregation, characterization, and storage programs, as "satisfactory."
57. SRC submitted that waste generated at the SRCSF could be categorized as radioactive waste, non-radioactive hazardous waste, and non-radioactive and non-hazardous waste. SRC further submitted that it has an effective waste management plan and that all waste generated during the SRCSF's decommissioning would be managed in accordance with licensing requirements.
58. SRC provided the Commission with information regarding its waste minimization strategy reporting that, in order to minimize waste, SRC would decontaminate, segregate, reuse and recycle non-radioactive waste material to the extent possible and that the remaining waste will be shipped to either a landfill disposal site or a licensed waste management facility.
59. SRC submitted that non-radioactive chemical waste would be sent to a licensed hazardous waste management facility and that demolition debris that is determined to be below the release limits would be sent to a landfill that is authorized to receive the waste. SRC further submitted that all waste would be transported in accordance with the *Transportation of Dangerous Goods Regulations*.<sup>18</sup>
60. CNSC staff reported that SRC's Decommissioning Waste Management Plan (DWMP) met the specifications of CSA N292.3-08, *Management of low and intermediate-level radioactive waste*,<sup>19</sup> and N292.0-14, *General principles for the management of radioactive waste and irradiated fuel*.<sup>20</sup> CNSC staff submitted that SRC's DWMP and supporting documents were satisfactory and met licensing requirements.
61. SRC reported that the reactor core containing the used highly enriched uranium fuel had been transported from the SRCSF to Savannah River, South Carolina, in accordance with the Canada-US agreement to return highly enriched uranium fuel to the country of origin. SRC further reported that the fuel had been transported in accordance with a CNSC-issued transportation licence in a Type B container, specifically an F-257 flask which had been certified by the CNSC.
62. The Commission enquired as to the volume of non-radioactive hazardous waste that is expected from the proposed decommissioning project. An SRC representative responded that the amount of non-radioactive hazardous waste would be minimal, approximately three car batteries that would be sent for recycling.

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<sup>18</sup> SOR/2001-286

<sup>19</sup> N292.3, *Management of low and intermediate-level radioactive waste*, CSA Group, 2008 and 2014.

<sup>20</sup> N292.0-14, *General principles for the management of radioactive waste and irradiated fuel*, CSA Group, 2014.

63. On an issue raised by the Concerned Citizens of Renfrew County and Area (CCRCA), that radioactive waste resulting from the decommissioning of the SRCSF would be transported to the Canadian Nuclear Laboratories (CNL) site in Chalk River, Ontario, the Commission enquired about whether SRC would have any liability in respect of the waste once the title of the waste was transferred to CNL. CNSC staff responded that once the waste has been accepted by CNL, CNL will be the owner of the waste. An SRC representative further added that SRC would not hold any long-term liability in regard to the SRCSF radioactive waste following its transfer to Chalk River Laboratories (CRL). The Commission was satisfied with the information provided.
64. Noting the interventions submitted by CCRCA, Northwatch and the National Council of Women regarding alternative decommissioning options, the Commission asked SRC if the removal of the reactor concrete pool in its entirety had been considered. A Candu Energy representative responded that the general practice in decommissioning SLOWPOKE-2 reactors is to survey and remove concrete wherever there is contamination above unconditional clearance levels as specified in the NSRDR. The Candu Energy representative added that although it was possible to remove the entire reactor pool, it is not the general practice as there is no benefit of removing concrete that is below the clearance levels.
65. On a concern raised by Nuclear Waste Waste + Inter-Church Uranium Committee Educational Cooperative (NWW + ICUCEC), the Commission requested details about Canada's regulatory framework for the decommissioning of nuclear facilities. CNSC staff responded that the high-level requirements are set out in the regulations and the policy for waste management and decommissioning is set out in Natural Resources Canada's (NRCAN) *Radioactive Waste Policy Framework*<sup>21</sup> and CNSC regulatory document REGDOC-2.11, *Framework for Radioactive Waste Management and Decommissioning in Canada*.<sup>22</sup> CNSC staff added that there is a Regulatory Guide G-219, *Decommissioning Planning for Licensed Activities*,<sup>23</sup> for decommissioning, and CNSC staff is currently in the process of developing regulatory documents for both waste management and decommissioning.
66. The Commission requested information on the concerns expressed by NWW + ICUCEC, Northwatch and CCRCA that the U of A SLOWPOKE-2 reactor was abandoned without having removed all the radiological hazards. A Candu Energy representative responded that the initial post-decommissioning measurements had shown that radiological hazards were still present and that further decontamination had to be done. CNSC staff confirmed this to be the case and reported that, when CNSC staff carried out the final surveys as part of the end-state inspection, dose rates were below the industry standard clearance level of 0.5 µSv/hour.

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<sup>21</sup> Retrieved from <https://www.nrcan.gc.ca/energy/energy-sources-distribution/uranium-nuclear-energy/radioactive-waste/radioactive-waste-policy-framework/7725>

<sup>22</sup> CNSC Regulatory Document REGDOC-2.11, *Framework for Radioactive Waste Management and Decommissioning in Canada*, 2018.

<sup>23</sup> CNSC Guidance Document G-219, *Decommissioning Planning for Licensed Activities*, 2000.

67. The Commission notes the concerns raised by intervenors with respect to the abandonment of the U of A reactor facility and their uncertainty concerning the unconditional release levels at the time of abandonment of that facility. The Commission authorized the U of A to abandon its facility upon receipt of its application and the evidence that it had met the regulatory requirements. When SRC has completed its decommissioning activities, any licence application it makes to be authorized to abandon will be subjected to the same regulatory requirements. The Commission will require evidence to satisfy itself, before making a decision, of the completion of satisfactory decommissioning. That is not the subject of this application.
68. On an issue raised by Northwatch regarding the terminology used to describe the decommissioning of the SLOWPOKE-2 reactor, the Commission asked staff to clarify whether the proposed decommissioning project could be referred to as “entombment” or “*in situ* waste disposal”. CNSC staff responded that, as per international standards that speak to all options of decommissioning, “*in situ*” refers to leaving the reactor in place and that the decommissioning of the SRCSF could not be defined as “*in situ* waste disposal” as there will be no parts of the reactor left behind and the facility will be free of contamination. The Commission is satisfied with this information and does not consider the proposed decommissioning of the SRCSF to be an “*in situ* waste disposal” or “entombment.”
69. The Commission enquired as to how SRC would treat the liquid waste in the event that it is still radioactive after passing through the ion exchange column. An SRC representative stated that the radioactivity in the liquid waste has already been brought down to the unconditional release limits. A Candu Energy representative added that SRC had a backup ion exchange column that was always available in the event that the water had to be further processed in order to meet the release limits. The Commission was satisfied with the information provided.
70. Noting the concerns raised by the Nation Council of Women of Canada about the disposal of non-radioactive liquid waste in the City of Saskatoon’s landfill and municipal sewage system, the Commission enquired about the consultation that SRC had carried out with the City of Saskatoon in regard to sending non-radioactive waste materials to landfills and the sewage system. An SRC representative responded that SRC maintained an ongoing discussion with the City of Saskatoon on these issues.
71. On a concern raised by Northwatch, the Commission asked for clarification as to the criteria for the classification of radioactive waste as low or intermediate level. CNSC responded that there are a number of considerations that need to be taken into account when characterizing waste, such as the radioisotope and the decay scheme. CNSC staff added that upon reviewing SRC’s application to amend, some inconsistencies were found and were taken back to the licensee to address.

72. The Commission expressed concern as to whether processes are in place to ensure that waste is adequately characterized given the presence of hard to measure radionuclides. CNSC staff responded that waste is characterized based on the waste receivers' acceptance criteria and also in accordance with CSA N292.0-14. A Candu Energy representative responded that the presence of radionuclides in waste resulting from the SRCSF decommissioning had been estimated using an industry standard computation code and that the estimates would be validated as measurements were taken during the decommissioning process.
73. Further on that topic, the Candu Energy representative added that, although not all the radionuclides such as Nickel-59, Tritium, and Calcium-41 had been measured, the ones that were measured contributed to approximately 99% of the radionuclides with respect to the unconditional release limit. During the hearing, the Commission did not receive satisfactory confirmation that the waste would be adequately characterized and anticipates that reliable data will be available upon conducting decommissioning activities. Should SRC submit an application to abandon the SRCSF, the detailed waste characterization data and a confirmation of the accuracy of the estimates will be required to be submitted by SRC, and reviewed by CNSC staff.
74. The Commission enquired about the assessment that institutional control for the decommissioned SRCSF would not be required. CNSC staff responded that, because the proposed decommissioning strategy is for complete decommissioning, the SRCSF would be cleaned to below the unconditional release limits and therefore no CNSC regulatory control would be required, if the strategy materializes.
75. Based on the above information and consideration of the hearing materials, the Commission is satisfied that, according to SRC's decommissioning plans, there will be no waste left at the SRCSF and that SRC has appropriate programs in place to safely characterize and manage the waste generated at the SRCSF as part of decommissioning.

#### **4.5 Packaging and Transport**

76. The Commission examined SRC's packaging and transport program. Packaging and transport covers the safe packaging and transport of nuclear substances and radiation devices to and from the licensed facility. The licensee must adhere to the *Packaging and Transport of Nuclear Substances Regulations 2015* (PTNSR, 2015),<sup>24</sup> and Transport Canada's *Transportation of Dangerous Goods Regulations* for all shipments. During the licence period, CNSC staff rated SRC's performance in this SCA as "satisfactory."

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<sup>24</sup> SOR/205-145

77. On a concern raised by the Northwatch regarding the education and training for first responders, the Commission asked CNSC staff to comment on the training provided to first responders along the transportation route of radioactive waste, specifically, the rural and remote areas along the route. CNSC staff responded that all first responders in Canada receive HAZMAT training which includes radioactive material emergency management training. CNSC staff added that an emergency number through which any necessary information on the specific material being transported could be obtained in the event of emergency was required to be included in shipping documents. CNSC staff also stated that the CNSC has a duty officer and Transport Canada had the Canadian Transport Emergency Centre (CANUTEC) which are available at all times to provide technical information and guidance in the event of an emergency.
78. Noting that approximately 8 m<sup>3</sup> of radioactive waste would be generated through the decommissioning of the SRCSF, the Commission enquired as to how many shipments of radioactive waste would be sent to CRL. An SRC representative responded that it would be a single shipment of three Type A packages.
79. Based on the information presented on the record for this hearing, the Commission is satisfied that SRC is meeting, and will continue to meet, regulatory requirements regarding packaging and transport of waste generated during the decommissioning of the SRCSF.

## **4.6 Indigenous Engagement and Public Information**

### *4.6.1 Participant Funding Program*

80. The Commission assessed the information provided by CNSC staff regarding public engagement in the licensing process as enhanced by the CNSC's Participant Funding Program (PFP). CNSC staff submitted that, in June 2019, up to \$15,000 in funding to participate in this licensing process was made available to Indigenous groups, members of the public and other stakeholders to review SRC'S licence amendment application and associated documents, and to provide the Commission with value-added information through topic-specific interventions.
81. A Funding Review Committee (FRC), independent of the CNSC, recommended that two applicants be provided with up to \$15,000 in participant funding. These applicants were required, by virtue of being awarded participant funding, to submit a written intervention and to make an oral presentation at the public hearing on SRC's licence amendment application.
82. Based on the information submitted for this hearing, the Commission is satisfied that Indigenous groups, members of the public and other stakeholders were encouraged to participate in this process.

#### 4.6.2 Indigenous Engagement

83. The common law duty to consult with Indigenous peoples applies when the Crown contemplates action that may adversely affect established or potential Aboriginal and/or treaty rights. The CNSC, as an agent of the Crown and as Canada's nuclear regulator, recognizes and understands the importance of building relationships and engaging with Canada's Indigenous peoples. The CNSC ensures that its licensing decisions under the NSCA uphold the honour of the Crown and consider Indigenous peoples' potential or established rights pursuant to section 35 of the *Constitution Act, 1982*.<sup>25</sup>
84. CNSC staff submitted that, because the proposed decommissioning activities would be conducted within the facility with no adverse impact to the surrounding environment, the duty to consult does not arise with respect to the proposed licence amendment. CNSC staff further submitted that the proposed activities would not have an impact on potential or established Indigenous and/or treaty rights.
- 85.
86. Based on the information provided for this hearing, the Commission is satisfied that Indigenous engagement activities carried out for this licence amendment were adequate.

#### 4.6.3 Public Information

87. The Commission assessed SRC's public information and disclosure program (PIDP) for the SRCSF. A public information program is a regulatory requirement for licence applicants and licensed operators of Class I nuclear facilities. Paragraph 3(j) of the *Class I Nuclear Facilities Regulations*<sup>26</sup> 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.”

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<sup>25</sup> *Constitution Act, 1982*, Schedule B to the *Canada Act 1982*, 1982, c. 11 (U.K.).

<sup>26</sup> SOR/2000-204.

88. The Commission also assessed how SRC's PIDP met the specifications of RD/GD-99.3, *Public Information and Disclosure*<sup>27</sup>. SRC provided the Commission with information regarding its PIDP including the mechanisms in place to provide the public information related to its operations and a dedicated web page for the decommissioning of the SRCSF. CNSC staff informed the Commission that SRC has undertaken a number of initiatives in support of its PIDP and added that there has been a very low level of public interest regarding the decommissioning of the SRCSF.
89. SRC submitted that it held a public meeting on December 5, 2018 to provide information to the public about its decommissioning plans and answer any questions that may arise. SRC further submitted that the interest from the public was minimal and that it would continue to share information via newsletters and invite members of the public to submit comments or concerns.
90. The Commission requested additional details about the public information forum held at the SRCSF on December 5, 2018, including attendance and the concerns that were raised. An SRC representative responded that approximately seven people came to the information forum, representing various groups and SRC's stakeholders, and that the concerns were similar to the concerns raised by intervenors in this hearing.
91. In consideration of a concern raised by NWW + ICUCEC, the Commission asked CNSC staff if there were lessons learned reports for the previous SLOWPOKE-2 decommissioning projects and if they were publicly available. CNSC staff responded that the lessons learned were a section of the end-state report that the licensee must submit upon the completion of decommissioning and that they were available to the public upon request. CNSC staff added that the end state reports for previous decommissioning projects were available, with the exception of University of Toronto, and that the lessons learnt from the University of Toronto decommissioning project were implemented in other projects such as the increased shielding of the beryllium package. An SRC representative reported that Candu Energy had conducted the decommissioning of the U of A and lessons learned from previous decommissioning projects were incorporated into the work plans developed for the decommissioning of the SRC SLOWPOKE-2 reactor. The Commission was satisfied with the information provided.
92. Based on the information presented for this hearing, the Commission is satisfied that SRC's PIDP has and will continue to communicate to the public, information about the health, safety and security of persons and the environment and other issues. This will continue throughout the decommissioning of the SRCSF.
93. Recognizing that parts of the end-state report may contain commercially sensitive information, and in anticipation of interest, the Commission expects that SRC share the publicly available portions of the end-state report with interested stakeholders if requested upon completion of the decommissioning project.

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<sup>27</sup> CNSC Regulatory/Guidance Document RD/GD-99.3, *Public Information and Disclosure*, 2012.

#### 4.6.4 Conclusion on Indigenous Engagement and Public Information

94. Based on the information presented, the Commission is satisfied that, overall, SRC's PIDP meets regulatory requirements and is effective in keeping Indigenous groups and the public informed of SRC's operations.
95. Based on the information presented on the record for this hearing, the Commission is satisfied that this licence amendment will not result in changes to SRC's operations that would cause adverse impacts to any potential or established Indigenous and/or treaty rights.

#### 4.7 Decommissioning Plans and Financial Guarantee

96. The Commission requires SRC to have a detailed decommissioning plan for the decommissioning of the SRC SLOWPOKE-2 facility and a long-term management plan for waste produced from the project. In order to ensure that adequate resources are available for safe and secure decommissioning of the SRCSF, 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.
97. As part of the licence amendment application, SRC submitted a Detailed Decommissioning Plan (DDP) which describes the decommissioning process for the SRCSF and the measures in place to ensure that the public and the environment are protected during the decommissioning project. CNSC staff reported that the DDP was assessed against the requirements of CNSC Regulatory Guide G-219, *Decommissioning Planning for Licensed Activities* and CSA N294-09: *Decommissioning of Facilities Containing Nuclear Substances*<sup>28</sup> and CNSC staff found it to be acceptable.
98. CNSC staff submitted that SRC's activities that are authorized under the operating licence included defueling the reactor, maintenance of the reactor, and transport of spent fuel and radioactive waste. CNSC staff further submitted that the defueling of the SLOWPOKE-2 reactor had been subject to a CNSC inspection in which inspectors from the International Atomic Energy Agency (IAEA) participated and found no regulatory non-compliances.
99. The Commission asked for clarification in regard to the financial guarantee that SRC has in place for the decommissioning of the SRCSF. CNSC staff submitted that SRC has in place a financial guarantee in the amount of \$5,760,000, which will be used towards decommissioning and that the SRC's Board of Directors had approved expenditures in the amount of up to \$7,500,000. An SRC representative responded that the current financial guarantee in place was in the form of a trust fund for the amount of \$7,500,000 approved by the SRC Board of Directors and accepted by the CNSC.

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<sup>28</sup> N294-09 (R2014), *Decommissioning of facilities containing nuclear substances*, CSA Group, reaffirmed in 2014.

The SRC representative added that the decommissioning work would be funded out of SRC's operating budget of \$ 5,760,000 and that the trust fund in place would be released to the SRC upon successful decommissioning and final approval from the Commission.

100. Based on the record, the Commission concludes that the detailed decommissioning plan and related financial guarantee for the SRCSF are acceptable for the purpose of the current application for licence amendment.

## **5.0 CONCLUSION**

101. The Commission has considered the amendment application submitted by the SRC. Based on its consideration of the information submitted, the Commission is satisfied that the application meets the requirements of the NSCA, the GNSCR and other applicable regulations made under the NSCA.
102. The Commission has also considered the information and submissions of the applicant, CNSC staff and all participants as set out in the material available for reference on the record, as well as the oral presentations made by the participants at the hearing.
103. The Commission is satisfied that SRC meets the test set out in subsection 24(4) of the *Nuclear Safety and Control Act*. That is, the Commission is of the opinion that SRC is qualified to carry on the decommissioning activity that the amended licence will authorize and that it 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.
104. Therefore, the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, amends the Non-Power Reactor Operating Licence issued to the Saskatchewan Research Council for its facility located in Saskatoon, Saskatchewan. The amended licence, NPROL-19.01/2023, is valid until June 30, 2023.
105. The Commission amends Part IV a) of SRC's licence as recommended by CNSC staff in CMD 19-H100, to authorize it to decommission the SRCSF.
106. The Commission would like to note that this decision does not authorize abandonment. Should SRC apply for a licence to abandon, this will be the subject of a different proceeding.
107. The Commission anticipates that, following its decision in this matter, CNSC staff will update SRC's Licence Conditions Handbook (LCH) to include references to the Detailed Decommission Plan (DDP) and other documents as presented during this hearing.

108. The Commission considers the environmental protection review that was conducted by CNSC staff to be acceptable and thorough. The Commission is satisfied that an EA under CEAA 2012 was not required for the SRCSF licence amendment application and notes that the NSCA provides a strong regulatory framework for environmental protection.
109. The Commission anticipates that, following its decision in this matter, CNSC staff will update SRC's Licence Conditions Handbook (LCH) to include references to the Detailed Decommission Plan (DDP) and other documents as presented during this hearing. A draft amended LCH was not included in the hearing materials following usual practice; CNSC will update it following this decision.

 Dec 6, 2019

Rumina Velshi  
President,  
Canadian Nuclear Safety Commission

Date

## Appendix A – Intervenors

Intervenors – Oral Presentations	Document Number
Concerned Citizens of Renfrew County and Area, represented by O. Hendrickson	CMD 19-H100.5 CMD 19-H100.5A
National Council of Women of Canada, represented by G. Janes	CMD 19-H100.2
Nortwatch, represented by B. Lloyd	CMD 19-H100.6 CMD 19-H100.6A
Nuclear Waste Watch and Inter-Church Uranium Committee Educational Cooperative, represented by J. Karban	CMD 19-H100.8 CMD 19-H100.8A

  

Intervenors – Written Interventions	Document Number
Elaine Hughes	CMD 19-H100.3
Linda Murphy	CMD 19-H100.4
North American Young Generation in Nuclear	CMD 19-H100.7