



# Record of Decision

DEC 23-H3

In the Matter of

Applicant Royal Military College of Canada

Subject Application to Renew the Non-Power Reactor  
Operating Licence for the SLOWPOKE-2  
Reactor at the Royal Military College of Canada

Date of  
Decision June 19, 2023

**RECORD OF DECISION – DEC 23-H3**

Applicant: Royal Military College of Canada

Address/Location: P.O. Box 17000, Station Forces, Kingston, Ontario K7K 7B4

Purpose: Application to Renew the Non-Power Reactor Operating Licence for the SLOWPOKE-2 Reactor at the Royal Military College of Canada

Application received: February 23, 2022

Hearing: Public Hearing in Writing

Panel of the Commission: R. Velshi, Chair  
M. Lacroix

**Licence: Renewed**

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## 1.0 INTRODUCTION

1. The Royal Military College of Canada (RMC) has applied to the Canadian Nuclear Safety Commission<sup>1</sup> (CNSC or the Commission), under subsection 24(2) of the [Nuclear Safety and Control Act](#)<sup>2</sup> (NSCA), for a 20-year renewal of the Non-Power Reactor Operating Licence for RMC's Safe Low-Power Kritical Experiment ([SLOWPOKE-2](#)) reactor. RMC's current licence, NPROL-20.00/2023, is valid until June 30, 2023, and authorizes RMC to operate the SLOWPOKE-2 reactor and associated facilities. The SLOWPOKE-2 facility is located at the Sawyer Science and Engineering Building of RMC in Kingston, Ontario, and on the traditional lands of the Haudenosaunee, Anishinaabe and Huron-Wendat peoples.
2. RMC's SLOWPOKE-2 reactor is a small research reactor used for neutron activation analysis, neutron radiography, neutron tomography and nuclear and radiation protection training. RMC's SLOWPOKE-2 reactor has been in operation since 1985. The reactor operated with its original low enriched uranium<sup>3</sup> (LEU) fuel core until 2021, when RMC refuelled and successfully restarted the reactor. The new fuel is expected to extend the life of the reactor for another 35 years. The RMC property and the reactor belong to the Crown and are administered by Department of National Defence (DND) in the name of the Commandant of RMC.
3. With this licence renewal application, RMC is also requesting a change to its operating limits and conditions (OLCs) to increase the maximum allowable excess reactivity<sup>4</sup> of the reactor from 4.0 milli-k (mk)<sup>5</sup> to 4.3 mk.

### Issues

4. The Commission is required to determine whether and what requirements the [Impact Assessment Act](#)<sup>6</sup> (IAA) imposes in relation to the activities sought to be authorized in RMC's application to renew the licence for its SLOWPOKE-2 reactor. Satisfying any such requirements can be a prerequisite to licensing.

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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.

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

<sup>3</sup> Low enriched uranium is defined as enriched uranium containing less than 20 percent by weight of isotope uranium-235, uranium-233, or combined uranium-233 and uranium-235.

<sup>4</sup> Reactor core excess reactivity is the amount of excess reactivity needed to maintain a reactor just critical ( $k_{eff} = 1$ ) as the fuel burns up. Excess reactivity is required so that the reactor can operate for a period of time before it must be refuelled or other reactivity changes are made.

<sup>5</sup> mk, or milli-k, is a unit used to measure reactivity  $\rho$ , defined as follows:  $\rho = ((k-1)/k) * 10^3$ , where  $k = (\text{neutrons produced in one generation}) / (\text{neutrons produced in the previous generation})$ .

<sup>6</sup> S.C. 2019, c. 28, s. 1.

5. Pursuant to paragraphs 24(4)(a) and (b) of the NSCA, in considering whether to renew the licence, the Commission must be satisfied that:
  - a) RMC is qualified to carry on the activity that the licence would authorize; and
  - b) in carrying on that activity, RMC 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.
  
6. As an agent of the Crown, the Commission recognizes its role in fulfilling the Crown's constitutional obligations, along with advancing reconciliation with Canada's Indigenous peoples. The Commission's responsibilities include the duty to consult and, where appropriate, accommodate Indigenous interests where the Crown contemplates conduct which may adversely impact potential or established Aboriginal<sup>7</sup> or treaty rights<sup>8</sup>. As such, the Commission must determine what engagement and consultation steps and accommodation measures are called for respecting Indigenous interests.

#### Panel

7. On June 6, 2022, the Commission published a [Notice of Public Hearing and Participant Funding](#) for this matter. On January 25, 2023, RMC submitted a [revised application](#) which updated its requested licence length from 10 to 20 years. The Commission subsequently published a [revised notice](#) on January 31, 2023, to specify that RMC was requesting a 20-year licence.
  
8. Due to the Public Service Alliance of Canada's strike position in April 2023, the Commission chose to change the hearing format and conduct the public hearing as a public hearing in writing. The Commission published an [additional revised notice](#) on April 17, 2023 to notify the public of the change in hearing format.
  
9. Pursuant to section 22 of the NSCA, the President of the Commission established a Panel of the Commission over which she would preside, including Commission Member Dr. M. Lacroix, to decide on the application. The Commission, in conducting a public hearing based on written materials, considered written submissions from RMC ([CMD 23-H3.1](#) and [CMD-23.H3.1A](#)) and CNSC staff ([CMD 23-H3](#), [CMD 23-H3.A](#), [CMD 23-H3.B](#)). The Commission also considered written submissions from 2 intervenors (see Appendix A for a list of interventions).

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<sup>7</sup> "Aboriginal" is the term used in this document when referring to the Crown's duty to consult as that is the term used in s. 35 of the Constitution Act, 1982. In all other cases, "Indigenous" is the preferred terminology and used accordingly.

<sup>8</sup> *Haida Nation v. British Columbia (Minister of Forests)*, 2004 SCC 73; *Taku River Tlingit First Nation v. British Columbia (Project Assessment Director)*, 2004 SCC 74.

10. In making its decision, the Commission sent questions to CNSC staff and RMC through [CMD 23-H3Q](#). The Commission sought information from CNSC staff regarding the requested change to the OLCs, reactor shutdown systems, aging of the reactor facility, and specific concerns raised in the intervention by D. Winfield. The Commission sought information from RMC regarding student training, emergency preparedness, and decommissioning. The Commission is satisfied with the completeness of the responses provided by CNSC staff ([CMD 23-H3.C](#)) and RMC ([CMD 23-H3.1B](#)).

#### Participant Funding Program

11. Pursuant to paragraph 21(1)(b.1) of the NSCA, the Commission has established a [Participant Funding Program \(PFP\)](#) to facilitate the participation of Indigenous Nations and communities, members of the public and stakeholders in Commission proceedings. In [June 2022](#), up to \$15,000 in funding was made available through the CNSC's PFP to review RMC's licence renewal application and associated documents, and to provide the Commission with value-added information through topic-specific interventions. A Funding Review Committee, independent of the CNSC, reviewed the funding application received and [made recommendations on the allocation of funds](#). Based on the recommendations from the Committee, the CNSC awarded up to \$900 to 1 applicant, D. Winfield.
12. Following the participant funding application deadline, the Curve Lake First Nation expressed an interest in RMC's licence renewal application and requested funding to support its participation in the process. CNSC staff offered Curve Lake First Nation funding to meet with CNSC staff and discuss the licence renewal, as well as to support the Curve Lake First Nation's participation in the hearing process. A total of [up to \\$9,944](#) was made available to Curve Lake First Nation.

## **2.0 DECISION**

13. Based on its consideration of the matter, as described in more detail in the following sections of this *Record of Decision*, the Commission concludes the following:
  - the [Impact Assessment Act](#) (IAA) does not impose any obligation upon the Commission in this matter;
  - the contemplated licence renewal does not present any novel adverse impact on any potential or established Aboriginal claim or right;
  - the Commission's responsibility to uphold the honour of the Crown and its constitutional obligations with regard to engagement and consultation respecting Indigenous interests has been satisfied;
  - RMC remains qualified to carry on the activity that the licence will authorize; and

- RMC, in carrying on these activities, 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 Non-Power Reactor Operating Licence issued to the Royal Military College of Canada for its SLOWPOKE-2 reactor located in Kingston, Ontario. The renewed licence, NPROL-20.00/2043, is valid from July 1, 2023 to June 30, 2043, unless suspended, amended, revoked or replaced.

14. The Commission includes in the licence the standardized licence conditions as recommended by CNSC staff in Part 2 of CMD 23-H3, with the removal of “transfer” from licenced activity (iii), as proposed in CMD 23-H3.B. Licensed activity (iii) will read as follows:
  - (iii) possess and use prescribed equipment and information that are required for, associated with or arise from the activities described in (i).

The Commission accepts the increased maximum allowable reactivity of the reactor from 4.0 mk to 4.3 mk in RMC’s OLCs. The Commission also agrees with CNSC staff’s recommendation that the OLCs be removed from Appendix A of the licence and rather be included in the Licence Conditions Handbook (LCH) under the operating performance safety and control area.
15. The Commission delegates its authority for the purposes of licence condition 3.2, to the following CNSC staff:
  - Director, Nuclear Processing Facilities Division;
  - Director General, Directorate of Nuclear Cycle and Facilities Regulation;
  - and
  - Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch.
16. With this decision, the Commission directs CNSC staff to report on the performance of RMC and its SLOWPOKE-2 reactor, as part of the periodic *Regulatory Oversight Reports* (RORs) applicable to research/non-power reactors. CNSC staff shall present the periodic reports at public proceedings of the Commission, where members of the public will be able to participate. The Commission directs CNSC staff to inform the Commission, as part of the ROR, of any changes made to the LCH. CNSC staff may bring any matter to the Commission’s attention, as required.

17. The Commission directs that, at the midpoint of the 20-year licence period and no later than December 2033, RMC shall provide to the Commission a comprehensive midterm update on the conduct of its licensed activities and compliance with requirements. This midterm presentation will take place in a public Commission proceeding and will include public participation. The Commission will plan to offer participant funding for this proceeding.

### **3.0 APPLICABILITY OF THE *IMPACT ASSESSMENT ACT***

18. In coming to its decision, the Commission was first required to determine whether any requirement under the IAA applied to the licence renewal application and whether an impact assessment was required.
19. Pursuant to the IAA and the [\*Physical Activities Regulations\*](#)<sup>9</sup> made under it, impact assessments are to be conducted in respect of projects identified as having the greatest potential for adverse environmental effects in areas of federal jurisdiction. A licence renewal is not an activity listed in the *Physical Activities Regulations* that requires an impact assessment, or that meet the definition of a project on federal lands.
20. The Commission is satisfied that there is no requirement under the IAA for an impact assessment to be completed for this application for licence renewal. The Commission is also satisfied that there are no other applicable requirements of the IAA to be addressed in this matter.<sup>10</sup>

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

21. In making its licensing decision, the Commission considered specific relevant issues and submissions relating to RMC's qualification to carry on the licensed activities. 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.
22. The Commission's decision focuses on the issues relevant for this application, specifically:
  - Assessment of the licence application
  - RMC's performance in relevant [safety and control areas](#) (SCAs)
  - Indigenous engagement and consultation

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<sup>9</sup> SOR/2019-285.

<sup>10</sup> The IAA can impose other requirements on federal authorities in respect of authorizing projects that are not designated as requiring an impact assessment, including projects that are to be carried out on federal lands, or projects outside of Canada. This licence renewal does not engage any such applicable IAA requirements.



- Other matters of regulatory importance
- Licence length and conditions, including the delegation of authority and the proposed increase to the maximum excess reactivity OLC

#### 4.1 Assessment of Licence Application

23. RMC submitted a licence renewal [application](#) for its SLOWPOKE-2 reactor on February 23, 2022. RMC subsequently submitted a [revised application](#) on January 25, 2023, amending the requested licence length from 10 years to 20 years. In its consideration of this matter, the Commission assessed the application submitted by RMC, as required by the NSCA, the [General Nuclear Safety and Control Regulations](#)<sup>11</sup> (GNSCR), and the [Class I Nuclear Facilities Regulations](#),<sup>12</sup> and other applicable regulations made under the NSCA, including the [Radiation Protection Regulations](#),<sup>13</sup> the [Nuclear Security Regulations](#),<sup>14</sup> and the [Packaging and Transport of Nuclear Substances Regulations, 2015](#).<sup>15</sup>
24. Section 5 of the GNSCR provides:

An application for the renewal of a licence shall contain

- (a) the information required to be contained in an application for that licence by the applicable regulations made under the Act; and
- (b) a statement identifying the changes in the information that was previously submitted.

Section 7 of the GNSCR also provides that:

An application for a licence or for the renewal, suspension in whole or in part, amendment, revocation or replacement of a licence may incorporate by reference any information that is included in a valid, expired or revoked licence.

25. In its application, RMC provided information to satisfy the requirements set out in each applicable clause of the NSCA and applicable regulations. In Appendix A of its application, RMC mapped each clause to the relevant section of its application.

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<sup>11</sup> SOR/2000-202.

<sup>12</sup> SOR/2000-204.

<sup>13</sup> SOR/2000-203.

<sup>14</sup> SOR/2000-209.

<sup>15</sup> SOR/2015-145.

26. In section 1.4 of CMD 23-H3, CNSC staff submitted that it assessed RMC's application and determined that it complied with all requirements for a Class IA licence application. In Appendix B.1 of CMD 23-H3, CNSC staff reported that its assessment of RMC's licence application included a completeness check, a sufficiency check, and a technical assessment against regulatory requirements.
27. The Commission concludes that RMC's licence renewal application is complete and complies with the regulatory requirements respecting an application for licence renewal. The Commission notes that RMC's application is comprehensive and that CNSC staff's assessment confirms that RMC's application complies with the regulatory requirements respecting an application for licence renewal set in the NSCA and applicable regulations.

#### **4.2 RMC's Performance at the SLOWPOKE-2 Facility**

28. The Commission examined CNSC staff's assessment of RMC's performance with respect to the CNSC's SCA framework for the purpose of evaluating RMC's licence renewal application. CNSC staff submitted information on RMC's performance in all 14 SCAs. CNSC staff reported that RMC had implemented and maintained programs as required by its licence, and that RMC's performance in all SCAs had remained "satisfactory" during the current licence period. CNSC staff based its conclusions on oversight activities which included compliance inspections, document reviews, and technical assessments.
29. The intervention by D. Winfield ([CMD 23-H3.2](#)) questioned the relevance of the SCA framework being applied unilaterally over all classes of licences, and ratings, in the context of annual compliance reports and the RORs. The Commission asked CNSC staff to respond to the intervenor's question. In CMD 23-H3.C, CNSC staff responded that the application of the SCA framework promotes the effective communication of important aspects of operations of nuclear facilities, and that the annual compliance report and ROR processes allow for the application of a graded approach such that regulatory focus is kept on important issues for each licensee. CNSC staff noted that it will consider the intervenor's comments as part of its continuous improvement efforts. The Commission is satisfied with the information provided by CNSC staff on this matter.

##### *4.2.1 Management System*

30. The management system SCA covers the framework that establishes the processes and programs required to ensure that RMC achieves its safety objectives, continuously monitors its performance against these objectives, and fosters a healthy safety culture.

31. Paragraph 3(d) of the *Class I Nuclear Facilities Regulations* states that an application for a licence to operate a Class I nuclear facility shall contain “the proposed management system for the activity to be licensed, including measures to promote and support safety culture.” Section 3 of the GNSCR contains requirements that form the basis of a management system.
32. CNSC regulatory document<sup>16</sup> [REGDOC-2.1.1, Management System](#)<sup>17</sup>, addresses the development and implementation of sound management practices and controls, while [REGDOC-2.1.2, Safety Culture](#)<sup>18</sup> sets out requirements and guidance for fostering a healthy safety culture and conducting safety culture assessments. CSA N286-12, *Management System Requirements for Nuclear Facilities*<sup>19</sup> provides an overall management framework and direction to develop and implement sound management practices and controls for the licensing basis.
33. In section 2.1 of its application, RMC reported that it has implemented a management system for its SLOWPOKE-2 facility in accordance with REGDOC-2.1.1, REGDOC-2.1.2, and CSA N286-12. RMC described its management system, including its:
- management system documentation;
  - organizational structure;
  - safety culture;
  - change management and quality assurance processes;
  - document management system; and
  - incorporation of operating experience from other SLOWPOKE operators.
34. In section 3.1 of CMD 23-H3, CNSC staff confirmed that RMC has implemented a management system which satisfies all regulatory requirements, including those set out REGDOC-2.1.2 and CSA N286-12. CNSC staff noted that REGDOC-2.1.1 was published in 2019 and included it as compliance verification criteria in the proposed LCH for the renewed licence. CNSC staff submitted that it conducted 7 inspections related to the management system SCA over the current licence period. These inspections resulted in 3 notices of non-compliance, in the areas of annual program reviews, document updates, and procedure version control and access. CNSC reported that all non-compliances were of low safety significance and that RMC implemented appropriate corrective actions in response to each non-compliance.<sup>20</sup>

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<sup>16</sup> CNSC [regulatory documents](#) are typically referred to as REGDOCs

<sup>17</sup> REGDOC-2.1.1, *Management System*, CNSC, May 2019.

<sup>18</sup> REGDOC-2.1.2, *Safety Culture*, CNSC, April 2018.

<sup>19</sup> N286-12, *Management System Requirements for Nuclear Facilities*, CSA Group, 2012 (R2022).

<sup>20</sup> A non-compliance is a regulatory requirement that has not been met. When a non-compliance is identified, CNSC staff assess the significance of the non-compliance, and determine the appropriate enforcement action, based on the CNSC's graduated approach to enforcement.

35. The Commission concludes that RMC has acceptable programs in place to ensure that the RMC SLOWPOKE-2 facility achieves its safety objectives and fosters a healthy safety culture. The Commission comes to this conclusion on the following basis:

- The Commission agrees with CNSC staff's assessment that RMC has implemented and maintained a management system that meets regulatory requirements, including REGDOC-2.1.2, and CSA N286-12;
- The Commission is satisfied that the evidence presented by RMC demonstrates that it has appropriate organization and management structures in place to carry on the licensed activities;
- The Commission finds that the evidence presented by RMC demonstrates that RMC has an acceptable safety culture and a process in place to monitor safety culture in accordance with REGDOC-2.1.2; and
- The Commission is satisfied that RMC has implemented adequate corrective actions in response to inspection findings over the current licence term.

#### 4.2.2 *Human Performance Management*

36. The human performance management SCA encompasses activities that ensure that RMC 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.

37. Paragraph 12(1)(a) of the GNSCR requires the licensee to ensure that there are sufficient qualified workers to carry on the licensed activity safely and in accordance with the NSCA, its regulations and the licence, whereas paragraph 12(1)(b) indicates that the licensee must train workers to carry on the licensed activity in accordance with the Act, its regulations and the licence.

38. Paragraph 3(d.1) of the *Class I Nuclear Facilities Regulations* provides that the licence application must include information about the proposed human performance program for the activity to be licensed, including the measures to ensure workers' fitness for duty, whereas paragraphs 6(m) and 6(n) indicate that an application for a licence to operate a Class I nuclear facility must include information on the proposed responsibilities, qualification requirements, training program, and measures for the requalification of workers, as well as on the results obtained through the application of the program for the recruitment, training and qualification of workers related to the operation and maintenance of the nuclear facility.

39. [REGDOC-2.2.2, \*Personnel Training, Version 2\*](#)<sup>21</sup> sets out requirements and guidance for the analysis, design, development, implementation, evaluation, documentation and management of training at nuclear facilities within Canada, including the essential principles and elements of an effective training system.

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<sup>21</sup> REGDOC-2.2.2, *Performance Training, Version 2*, CNSC, December 2016.

40. In section 2.2 of its application, RMC submitted information on its human performance program including details on its training and fitness for duty programs. RMC reported that its human performance program meets the requirements outlined in REGDOC-2.2.2.
41. Regarding training, RMC reported that it has implemented a systematic approach to training (SAT) based training program to ensure that workers, including reactor operators, engineers, and technicians, are qualified to safely carry out their job duties. RMC reported that it maintains a documented training record for each worker and that it ensures that an appropriate number of trained and certified staff are working at its SLOWPOKE-2 Facility. RMC noted that the reactor engineers and reactor technicians for its SLOWPOKE-2 facility are employees of Canadian Nuclear Laboratories (CNL) and are trained at Chalk River Laboratories. Under this arrangement, CNL provides RMC and the CNSC with written confirmation of each worker's training credentials, and the CNSC can then certify qualified candidates.
42. Regarding fitness for duty, RMC submitted that DND has implemented a fitness for duty program that is commensurate with risk. The program includes a policy on alcohol and drug use, access to assistance for employees with emotional stress or substance abuse issues, and referral to medical assessment when appropriate.
43. In section 3.2 of CMD 23-H3, CNSC staff submitted that RMC has maintained a SAT-based training program that satisfies regulatory requirements, including the requirements set out in REGDOC-2.2.2. CNSC staff noted that, throughout the current licence term, RMC has maintained a sufficient number of certified workers, ensured continued worker competence through ongoing training, and updated and improved its training program. CNSC staff noted that it also assessed RMC's fitness for duty program and identified no issues.
44. CNSC staff reported that it conducted 8 inspections related to personnel training during the current licence term, one of which was directly focused on personnel training. CNSC staff identified 5 non-compliances during the inspections, all of which were of low safety significance. CNSC staff reported that RMC implemented satisfactory corrective actions in response to the inspection findings.
45. The Commission asked RMC to provide more information on safety training for RMC students who conduct work at the SLOWPOKE-2 facility. In CMD 23-H3.1B, RMC submitted that all RMC students must complete general safety and workplace hazardous materials information system (WHMIS) training courses. RMC noted that students who conduct laboratory work at the SLOWPOKE-2 facility are given a radiation safety awareness brief and are under the constant supervision of a reactor operator. RMC added that students who conduct individual laboratory work are also

required to complete an ionizing radiation safety awareness course and associated knowledge test.

46. The Commission concludes that RMC has an appropriate human performance management program in place for the conduct of licensed activities. The Commission is satisfied that workers at RMC's SLOWPOKE-2 facility are appropriately trained and qualified in accordance with CNSC requirements. The Commission comes to this conclusion on the following basis:

- The Commission agrees with CNSC staff's assessment that RMC has a SAT-based training program in place that meets regulatory requirements, including REGDOC-2.2.2;
- The Commission is satisfied that the evidence shows that RMC has a fitness for duty program in place to ensure that workers are fit to safely conduct their job duties;
- The Commission agrees with CNSC staff's assessment that RMC has maintained an appropriate number of certified staff throughout the current licence term;
- The Commission is satisfied that RMC provides students with adequate safety training prior to performing work at the SLOWPOKE-2 facility; and
- The Commission is satisfied that RMC has addressed all inspection findings related to the human performance management SCA.

#### 4.2.3 *Operating Performance*

47. The operating performance SCA includes an overall review of the conduct of the licensed activities and the activities that enable effective performance, as well as improvement plans and significant future activities, at RMC's SLOWPOKE-2 facility.

48. Paragraph 6(d) of the *Class I Nuclear Facilities Regulations* provides that an application for a license to operate a Class I nuclear facility must include information on the proposed measures, policies, methods and procedures for operating and maintaining the nuclear facility. [REGDOC-3.1.2, Reporting Requirements, Volume I: Non-Power Reactor Class I Facilities and Uranium Mines and Mills, Version 1.1](#)<sup>22</sup> sets out requirements and guidance for reports and notifications that licensees of Class I nuclear facilities must submit to the CNSC.

49. In section 2.3 of its application, RMC provided information on the processes it has implemented to ensure that its SLOWPOKE-2 facility is operated safely and in compliance with its licence conditions. RMC submitted information on its operating

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<sup>22</sup> REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Facilities and Uranium Mines and Mills*, Version 1.1, CNSC, July 2022.

and maintenance procedure documents, routine monitoring and maintenance activities, and issue-tracking database. Regarding reporting requirements, RMC noted that it submits all reports, including its annual compliance report, to the CNSC in accordance with REGDOC-3.1.2.

50. In section 3.3 of CMD 23-H3, CNSC staff reported that RMC operated its SLOWPOKE-2 facility in accordance with regulatory requirements over the current licence period. CNSC staff submitted that RMC maintains appropriate operating procedures and program documents to ensure the safe operation of the SLOWPOKE-2 facility, and that RMC has satisfied regulatory reporting requirements per REGDOC-3.1.2. CNSC staff noted that no reportable events occurred at RMC's SLOWPOKE-2 facility over the current licence term.
51. In section 3.3 of CMD 23-H3, CNSC staff reported that, during the current licence term, it conducted 7 inspections related to the operating performance SCA and issued one notification of non-compliance related to design requirements around facility renovations. CNSC staff noted that the non-compliance was of low safety significance and that RMC implemented appropriate corrective actions in a timely manner.
52. In its application, RMC provided information on the 2021 project to refuel the SLOWPOKE-2 reactor. In section 3.3 of CMD 23-H3, CNSC staff provided the Commission with specific information on RMC's project to refuel the SLOWPOKE-2 reactor in 2021. CNSC staff reported that the project involved the removal of the fuel core, installation of the new core, as well as subsequent reactivity adjustments. These operations were performed by personnel certified by the CNSC, including the reactor engineer, technician and operator, in addition to a team of physicists, engineers, technicians, health physicists and other support staff. CNSC staff confirmed that the refuelled reactor was successfully returned to service in September 2021 and noted that the new fuel is expected to extend the life of the reactor for another 35 years. CNSC staff reported that it conducted an inspection during the refuelling outage and identified no non-compliances.
53. In section 3.3 of CMD 23-H3, CNSC staff explained that RMC has a set of OLCs that define the conditions that must be met to prevent situations that might lead to accidents, or to mitigate the consequences of accidents, should they occur. CNSC staff noted that OLCs are typically included in licensee documents, however, for RMC, they are also listed in Appendix A of the current licence. CNSC staff reported that RMC has not exceeded or contravened any of the OLCs during the current licence period.

54. As part of its licence renewal application, RMC requested an increase to the OLC for maximum allowable excess reactivity of the reactor from 4.0 mk to 4.3 mk. This request is discussed in section 4.2.4 of this *Record of Decision*. In addition, CNSC staff recommended that the OLCs be moved from the licence to the LCH. This recommendation is discussed in section 4.5.2 of this *Record of Decision*.
55. Referencing the intervention by D. Winfield (CMD 23-H3.2), the Commission asked CNSC staff to comment on whether there is a limit for the number of irradiation samples simultaneously allowed within the reactor's inner radiation sites. In CMD 23-H3.C, CNSC staff stated that there are 8 locations for sample irradiation around the core of RMC's SLOWPOKE-2 reactor. CNSC staff explained that, while normal practice is one sample per location, there is no specified limit for the number of samples that are simultaneously allowed in the irradiation sites. CNSC staff noted that the samples that are irradiated on a day-to-day basis constitute a negative reactivity insertion, and therefore loading the system with more samples is impractical. The Commission is satisfied with the additional information provided by CNSC staff.
56. The intervention by D. Winfield (CMD 23-H3.2) submitted that the OLCs should include a limit for the amount of fissile material that may be irradiated. In CMD 23-H3Q, the Commission asked CNSC staff for more information on this issue. In CMD 23-H3.C, CNSC staff submitted that RMC's SLOWPOKE-2 safety analysis limits the amount of fissile material that may be irradiated to a maximum reactivity worth of 100 mg U-235 equivalent, and no more than 10 mg U-235 equivalent per sample. CNSC staff agreed with the intervenor's suggestion and recommended that these limits be added as an OLC in the proposed LCH. This recommendation is also discussed in section 4.5.2 of this *Record of Decision*.
57. The intervention by D. Winfield (CMD 23-H3.2) also questioned the extent to which the CNSC has applied a graded regulatory approach, particularly related to the relative length of annual compliance reports for different risk-level facilities. In CMD 23-H3Q, the Commission asked CNSC staff to respond to the intervenor's observation. In CMD 23-H3.C, CNSC staff reported that the content of annual compliance reports is suggested in REGDOC-3.1.2 and that the graded approach is also discussed in [REGDOC-3.5.3, Regulatory Fundamentals, Version 3](#).<sup>23</sup> CNSC staff explained that REGDOC-3.1.2 specifies that a graded approach, commensurate with risk, may be defined and used when applying the requirements and guidance contained in the regulatory document, and that the format follows the SCA framework. CNSC staff noted that the annual compliance reports for SLOWPOKE-2 reactors have had typically fewer than 30 pages. CNSC staff have found these reports to comply with REGDOC-3.1.2 and to be commensurate with the level of risk and the complexity of the SLOWPOKE-2 facility.

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<sup>23</sup> REGDOC-3.5.3, *Regulatory Fundamentals, Version 3*, CNSC, March 2023.



58. The Commission concludes that RMC has and will continue to have appropriate programs in place at its SLOWPOKE-2 facility to provide for the protection of the health and safety of persons and the environment. The Commission comes to this conclusion on the following basis:
- The Commission agrees with CNSC staff's assessment that RMC operated its SLOWPOKE-2 facility in accordance with regulatory requirements over the current licence period;
  - The Commission agrees with CNSC staff's assessment that RMC's operating programs and procedures meet regulatory requirements;
  - The Commission agrees with CNSC staff's assessment that RMC maintains a program for reporting, in accordance with REGDOC-3.1.2; and
  - The Commission is satisfied that the evidence shows that RMC has implemented adequate corrective actions in response to inspection findings during the current licence term.

#### 4.2.4 Safety Analysis

59. Safety analysis, which supports the overall safety case for the facility, includes a systematic evaluation of the potential hazards associated with the conduct of the licensed activity or the operation of a facility and considers the effectiveness of preventive measures and strategies in reducing the effects of such hazards.
60. Paragraph 6(c) of the *Class I Nuclear Facilities Regulations* provides that an application for a license to operate a Class I nuclear facility must include a final safety analysis report demonstrating that the adequacy of the design of the nuclear facility.
61. [REGDOC-2.4.1, \*Deterministic Safety Analysis\*](#)<sup>24</sup> sets out requirements and guidance for the preparation and presentation of a safety analysis that demonstrates the safety of a nuclear facility. [REGDOC-2.4.3, \*Nuclear Criticality Safety, Version 1.1\*](#)<sup>25</sup> sets out requirements for nuclear criticality safety and provides guidance on how those requirements may be met.
62. In section 2.4 of its application, RMC provided information on its safety analysis program, including the documentation which describes the safety analysis for its SLOWPOKE-2 reactor facility. RMC reported that these documents support the safe operation of its SLOWPOKE-2 reactor and contain technical information that satisfies REGDOC-2.4.1.

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<sup>24</sup> REGDOC 2.4.1, *Deterministic Safety Analysis*, CNSC, May 2014

<sup>25</sup> REGDOC 2.4.3, *Nuclear Criticality Safety, Version 1.1*, CNSC, September 2020

63. In section 3.4 of CMD 23-H3, CNSC staff submitted that RMC’s safety analysis identifies facility hazards, analyzes consequences, and identifies mitigation measures in compliance with regulatory requirements, including REGDOC-2.4.1. CNSC staff reported that it assessed RMC’s safety analysis program over the current licence term through documentation reviews and an inspection during the refueling project which included verification of mitigation measures specified in RMC’s safety analysis. CNSC staff reported that it did not identify any non-compliances during the inspection.
64. CNSC staff further reported that, during the current licence term, RMC updated its safety analysis to reflect additional hazards associated with climate change. On CNSC staff’s request, RMC updated its safety analysis in 2022 and provided analysis which demonstrated that there is no credible scenario where the inherent safety of the reactor could be compromised by high winds, tornadoes, or flooding. CNSC staff reviewed the analysis and found that RMC’s conclusions are adequately supported.
65. In CMD 23-H3Q, the Commission asked CNSC staff for a formal definition of “inherent safety.” In CMD 23-H3.C, CNSC staff described “inherent safety” as it is defined in TECDOC-626, *Safety Related Terms for Advanced Nuclear Power Plants*<sup>26</sup> of the International Atomic Energy Agency (IAEA). In short, per IAEA TECDOC-626, inherent safety refers to the achievement of safety through the elimination or exclusion of inherent hazards through the fundamental conceptual design choices made for the nuclear reactor. An inherent safety characteristic is a fundamental property of a design concept, which assures that a particular potential hazard cannot become a safety concern in any way. CNSC staff noted that, as such, the SLOWPOKE-2 reactor has passive inherent safety characteristics. CNSC staff explained that the terminology of “inherently safe” has been used for the SLOWPOKE-2 reactors in the context that the reactor cannot exceed its operating limits by design, due to the strong negative coefficient of reactivity associated with an increase in temperature. CNSC staff added that the reactor is self-limiting in power, without human intervention or the activation of engineered systems. The Commission is satisfied with this explanation provided by CNSC staff on this matter.
66. Regarding criticality safety<sup>27</sup>, RMC reported that it has a program in place which meets the requirements of REGDOC-2.4.3. RMC noted that CNL conducted a criticality study during the refuelling project to ensure that a criticality event would not occur while refuelling the reactor core. CNSC staff confirmed that RMC’s nuclear criticality safety program meets the requirements of REGDOC-2.4.3 and that the licensee implemented appropriate criticality safety controls during the refuelling project.

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<sup>26</sup> TECDOC-626, *Safety Related Terms for Advanced Nuclear Plants*, IAEA, September 1991

<sup>27</sup> Nuclear criticality is a self-sustaining chain reaction of nuclear fission. Nuclear criticality safety refers to the prevention of – and protection against the consequences of – a criticality accident, such as an accidental production of a self-sustaining or divergent neutron chain reaction.

67. The intervention by D. Winfield (CMD 23-H3.2) expressed the view that CPR-77<sup>28</sup> is outdated and should not be included as a reference in RMC's safety analysis or in the LCH. The document CPR-77, *Description and Safety Analysis for the SLOWPOKE-2 Reactor with LEU Oxide Fuel*, was issued by Atomic Energy of Canada Limited (AECL) in 1985 and is included in RMC's current LCH as a licensee program document that requires notification of change. In CMD 23-H3Q, the Commission asked CNSC staff to address the intervenor's view on this point. In CMD 23-H3.C, CNSC staff agreed that CPR-77 is an outdated document and committed to remove it from RMC's LCH. CNSC staff also noted that it has requested that RMC update its safety analysis prior to June 30, 2024 to reflect the current configuration and incorporate current references.
68. The intervention by D. Winfield (CMD 23-H3.2) also questioned why [RD-367, Design of Small Reactor Facilities](#)<sup>29</sup> is not included in RMC's LCH. In CMD 23-H3Q, the Commission asked CNSC staff to address this question. In CMD 23-H3.C, CNSC staff explained that RD-367 had not been included in RMC's LCH because of the simplicity and low risk of the RMC SLOWPOKE-2 reactor, and because its design has not been altered over its operational life. CNSC staff noted that the RMC LCH makes reference to REGDOC-2.4.1, which goes beyond the scope of RD-367, however, CNSC staff stated that it would add RD-367 to the SLOWPOKE-2 LCHs as guidance<sup>30</sup>, considering the relevance of some of the information and the graded approach that is afforded by the document.

#### Increase to the Maximum Allowable Excess Reactivity of the Reactor

69. As part of its licence renewal application, RMC requested that the Commission approve an increase to the maximum allowable excess reactivity of the reactor from 4.0 mk to 4.3 mk. RMC submitted that increasing the maximum excess reactivity limit would facilitate periodic reactor adjustments and optimize the effective life of the new fuel. In Appendix C of its application, RMC provided a technical assessment which supports the proposed increase and explains that experimental data have shown that the SLOWPOKE-2 reactor would remain safe with reactivity additions of up to 6.5 mk.
70. CNSC staff recommended that the Commission accept the proposed increase to the maximum allowable excess reactivity of the reactor from 4.0 to 4.3 mk. In sections 3.3 and 3.4 of CMD 23-H3, CNSC staff reported that it found RMC's technical assessment to be valid and technically sound. CNSC staff noted that RMC's technical assessment was supported by analytical simulations and data obtained from a similar SLOWPOKE-2 reactor which demonstrated that the proposed increase to the maximum excess reactivity would not affect the safety of the reactor.

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<sup>28</sup> CPR-77, *Description and Safety Analysis for the SLOWPOKE-2 Reactor with LEU Oxide Fuel*, AECL, January 1985.

<sup>29</sup> RD-367, *Design of Small Reactor Facilities*, CNSC, June 2011.

<sup>30</sup> As noted in CNSC staff's response, documents may be referenced in a licensee's LCH as either compliance verification criteria or as guidance.

71. Noting that the safety of the SLOWPOKE-2 reactor has been demonstrated for a positive reactivity insertion of up to 6.5 mk, the Commission asked CNSC staff to describe the adequacy of the safety margin between 4.3 mk and 6.5 mk. In CMD 23-H3.C, CNSC staff reported that the safety margin is adequate as, given the controls in place and physical limitations, there is no credible scenario where reactivity could be inserted to exceed 6.5 mk. CNSC staff noted that the requested increase from 4.0 to 4.3 mk is a small change relative to the current allowable excess reactivity and the demonstrated margin of safety. Further, CNSC staff noted that, from an operational perspective, an installed reactivity of 4.3 mk would decrease below 4.0 mk within a few months of operation due to normal fuel burnup.

#### Conclusions on Safety Analysis

72. The Commission concludes that RMC's safety analysis is adequate for the licensed activities associated with the operation of the SLOWPOKE-2 facility under the proposed license. The Commission comes to this conclusion on the following basis:
- The Commission agrees with CNSC staff's assessment that RMC's safety analysis meets regulatory requirements, including REGDOC-2.4.1;
  - The Commission is satisfied that RMC has updated its safety analysis over the current licence term to consider potential climate change hazards;
  - The Commission agrees with CNSC staff's assessment that RMC has sufficiently demonstrated that it has met the nuclear criticality safety requirements per REGDOC-2.4.3; and
  - The Commission is satisfied that the technical information provided by RMC and CNSC's staff, including experimental data, demonstrates that an increase in the maximum allowable excess reactivity of the reactor from to 4.3 mk will not affect the safety of the reactor.

The Commission expects CNSC staff to inform the Commission on the status of RMC's safety analysis update in the ROR applicable to research/non-power reactors.

#### *4.2.5 Physical Design*

73. The physical design SCA includes the activities to design systems, structures and components to meet and maintain the design basis of a facility. The design basis is the range of conditions, according to established criteria, that the facility must withstand without exceeding authorized limits for the planned operation of safety systems.
74. Paragraph 3(1)(d) of the GNSCR requires that an application for a licence shall contain a description of any nuclear facility, prescribed equipment or prescribed information to be encompassed by the licence.

75. Paragraphs 3(a) and 3(b) of the *Class I Nuclear Facilities Regulations* indicate that an application for a license for a Class I nuclear facility must include a description of the site of the activity to be licensed, as well as plans showing the location, perimeter, areas, structures and systems of the nuclear facility. Paragraphs 6(a) and 6(b) of the *Class I Nuclear Facilities Regulations* provide that an application for a license to operate a Class I nuclear facility includes a description of the structures, systems and equipment at the nuclear facility, including their design and their design operating conditions.
76. In section 2.5 of its application, RMC provided information on its physical design program including its design governance, site characterization, and facility design. RMC submitted that AECL is the Design Authority for its SLOWPOKE-2 reactor and that AECL has delegated technical work to CNL.<sup>31</sup> RMC clarified that, outside of the reactor container itself, any system addition, design, modification, or procurement is governed by RMC's own change control process. RMC submitted that there were no physical changes to the design of the SLOWPOKE-2 reactor over the current licence term. RMC further noted that the new reactor core meets its design intent and has been operating successfully.
77. In section 3.5 of CMD 23-H3, CNSC staff submitted that RMC has implemented and maintained a physical design program in accordance with regulatory requirements. CNSC staff reported that RMC's safety analysis and reactor manual describes the various systems and components of the SLOWPOKE-2. The documents also outline the design aspects that achieve the safety objectives of the facility design, including the design principles, application of defence-in-depth, and the measures in place to ensure conformance with design criteria. CNSC staff confirmed that RMC has an appropriate change control processes in place to ensure that changes are executed safely and within RMC's licensing basis
78. In CMD 23-H3Q, the Commission asked CNSC staff for additional information on the design of the primary and backup shutdown systems for RMC's SLOWPOKE-2 reactor. In CMD 23-H3.C, CNSC staff explained that the primary shutdown system uses the main cadmium control rod and is part of the control system, whereas the backup – or auxiliary – shutdown system uses cadmium capsules that are manually inserted into the irradiation sites to shut down the reactor. Regarding the primary shutdown system, CNSC staff further explained that the cadmium control rod is partially withdrawn from the core during reactor operation and that, on a loss of electrical power, the control rod drops by the force of gravity and shuts the reactor down. CNSC staff noted that the reactor dynamics are effectively bounded by the design characteristics of the SLOWPOKE-2 reactor, which include negative thermal power coefficient and negative void coefficient to prevent a loss of control of reactor power.

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<sup>31</sup> CNL delivers work on behalf of AECL under a government-owned, contractor-operated model.

79. In CMD 23-H3Q, the Commission also asked CNSC staff for information regarding the testing of the auxiliary shutdown system. In CMD 23-H3.C, CNSC staff explained that each reactor operator is required to execute the auxiliary shutdown procedure at least once a year. CNSC staff noted that it verifies this activity during inspections and through the personnel certification process, and that RMC reports on it in its annual compliance report. The Commission is satisfied with the information provided by CNSC staff on the SLOWPOKE-2 reactor's shutdown systems.
80. The Commission concludes that RMC continues to implement and maintain an effective physical design program at its SLOWPOKE-2 facility, and that the design is adequate for the requested licence period. The Commission comes to this conclusion on the following basis:
- The Commission agrees with CNSC staff's assessment that RMC has a physical design program in place that meets regulatory requirements;
  - The Commission agrees with CNSC staff's assessment that RMC's SLOWPOKE-2 facility meets design requirements;
  - The Commission is satisfied that RMC has an adequate process in place to manage design changes within the licensing basis; and
  - The Commission is satisfied that the physical design of the SLOWPOKE-2 reactor includes primary and auxiliary shutdown systems that meet regulatory requirements.

#### 4.2.6 *Fitness for Service*

81. The fitness for service SCA covers activities that are performed to ensure that systems, structures, and components at RMC's SLOWPOKE-2 facility continue to effectively fulfill their intended purpose.
82. Paragraph 6(d) of the *Class I Nuclear Facilities Regulations* requires that an application to operate a Class I nuclear facility contain the proposed measures, policies, methods and procedures for operating and maintaining the nuclear facility. [REGDOC-2.6.3, \*Aging Management\*](#)<sup>32</sup> sets out guidance and the requirements for managing aging of structures, systems, and components for reactor facilities. Specific aspects of CSA N393-13 *Fire protection for facilities that process, handle, or store nuclear substances*<sup>33</sup> are also applicable to this SCA.
83. In section 2.6 of its application, RMC provided information on its fitness for service program and activities, including routine inspections, preventative maintenance,

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<sup>32</sup> REGDOC-2.6.3, *Aging Management*, CNSC, March 2014.

<sup>33</sup> N393-12, *Fire protection for facilities that process, handle, or store nuclear substances*, CSA Group, 2013 (R2018). This standard provides the minimum fire protection requirements for the design, construction, commissioning, operation, and decommissioning of facilities which process, handle, or store nuclear substances, and other hazardous substances that directly relate to the nuclear substances being regulated.

equipment testing, and aging management practices. RMC submitted that its fitness for service program complies with the maintenance requirements specified in REGDOC-2.6.3. RMC noted that the refuelling project included a detailed visual examination of the inside and outside of the reactor container. RMC reported that no reactor life-limiting degradation was observed, and that the inspection verified that there are no aging issues relevant to the continued safe use of the systems, structures, and components of the reactor facility.

84. In section 3.6 of CMD 23-H3, CNSC staff submitted that RMC has maintained a fitness for service program in accordance with regulatory requirements, including REGDOC 2.6.3. CNSC staff confirmed that RMC has adequate maintenance, testing, calibration, and inspection processes in place to ensure that its SLOWPOKE-2 facility remains fit for service. In the interest of continuous improvement, CNSC staff proposed that CSA N393-13 be included as compliance verification criteria in the LCH for the renewed licence, with an implementation date of January 2024. During the current licensing period, CNSC staff reported that it performed five inspections related to the fitness for service SCA and identified no non-compliances.
85. Regarding the visual examination of the reactor container conducted during the refuelling project, in CMD 23-H3Q, the Commission asked if a visual examination is sufficient to confirm the absence of aging management issues. In CMD 23-H3.C, CNSC staff responded that the visual inspection done during the refueling project complemented RMC's aging management program and provided additional assurance that components which are otherwise difficult to inspect are fit for service. CNSC staff reiterated that aging issues for SLOWPOKE-2 reactors are well understood and effectively managed through RMC's maintenance and aging management programs. The Commission is satisfied with the information provided by CNSC staff.
86. The Commission is satisfied that RMC has appropriate programs in place to ensure that the equipment at the SLOWPOKE-2 facility will remain fit for service throughout the proposed licence period. The Commission comes to this conclusion on the following basis:
  - The Commission agrees with CNSC staff's assessment that RMC has a fitness for service program in place that includes adequate maintenance, testing, calibration, and inspection processes and meets regulatory requirements, including REGDOC-2.6.3; and
  - The Commission is satisfied that the evidence shows that RMC has implemented adequate aging management practices and that there are no aging issues relevant to the continued safe operation of the SLOWPOKE-2 facility.

#### 4.2.7 Radiation Protection

87. The radiation protection SCA covers the implementation of a radiation protection program in accordance with the *Radiation Protection Regulations*. The radiation protection program must ensure that radiation doses to persons and contamination are monitored, controlled, and kept ALARA, with social and economic factors taken into consideration.
88. Section 4 of the *Radiation Protection Regulations* requires licensees to implement a radiation protection program. As part of this program, licensees must keep effective and equivalent doses received by, and committed to, persons as low as reasonably achievable (ALARA), taking into account social and economic factors, and ascertain the quantity and concentration of any nuclear substance released as a result of the licensed activity. Paragraphs 6(e) and 6(h) of the *Class I Nuclear Facilities Regulations* require that an application to operate a Class I nuclear facility contain the proposed procedures for handling, storing, loading and transporting nuclear substances and hazardous substances, as well as the effects on the environment and the health and safety of persons that may result from the operation and decommissioning of the nuclear facility, and the measure that will be taken to prevent or mitigate those effects.
89. [REGDOC-2.7.1, Radiation Protection](#)<sup>34</sup> provides guidance on radiation protection programs, the principles of worker dose control and the principles of radiological hazard control to ensure the protection of workers and the public. [REGDOC-2.7.2, Dosimetry, Volume I: Ascertaining Occupational Dose](#)<sup>35</sup> sets out guidance for ascertaining occupational dose and provides guidance for making changes to dose-related information filed with Health Canada's National Dose Registry.
90. RMC submitted that its radiation protection program complies with the requirements of the *Radiation Protection Regulations*. In section 2.7 of its application, RMC provided information on its radiation protection program including its radiation protection documentation, required radiation safety training, dosimetry practices, posting of radiation warning signage, application of the ALARA principle, and worker dose control.
91. In section 3.7 of CMD 23-H3, CNSC staff reported that RMC has implemented and maintained an effective radiation protection program as required by the *Radiation Protection Regulations*. CNSC staff assessed RMC's radiation protection program documentation, including the radiation safety manual, and found that it adequately describes the procedures, individual responsibilities, and training requirements pertaining to radiation safety at the SLOWPOKE-2 facility. During the current licence term, CNSC staff conducted 7 compliance inspections related to the radiation protection SCA. CNSC staff reported identifying one non-compliance related to radiation signage and fume hood maintenance. CNSC staff noted that the non-

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<sup>34</sup> REGDOC-2.7.1, *Radiation Protection*, CNSC, July 2021.

<sup>35</sup> REGDOC-2.7.2, *Dosimetry, Volume I: Ascertaining Occupational Dose*, CNSC, July 2021.



compliance was of low safety significance and that RMC implemented satisfactory corrective actions in a timely manner.

92. CNSC staff reported that doses to nuclear energy workers (NEWs) at RMC's SLOWPOKE-2 facility remained well below regulatory dose limits over the current licence period.<sup>36</sup> CNSC staff submitted that the maximum effective dose received by an RMC NEW during the current licence period was 0.42 millisieverts per year (mSv/y), and the maximum effective dose received by a NEW over any of the five-year dosimetry periods during the current licence term was 0.69 mSv. CNSC staff added that no worker received a dose in excess of the RMC's action level<sup>37</sup> of 0.25 mSv per quarter. CNSC staff found that RMC effectively applied the ALARA principle to keep doses to workers ALARA over the current licence period. CNSC staff noted that REGDOC-2.7.1 and REGDOC-2.7.2 were published in 2021 and, in the interest of continuous improvement, it included both new REGDOCs as guidance in the proposed LCH.
93. CNSC staff also submitted that doses to workers during the 2021 refuelling campaign were kept below regulatory dose limits. CNSC staff noted that there was no recordable dose to RMC workers, and that the maximum effective dose received by a CNL NEW during the refuelling project was 0.65 mSv.
94. The Commission concludes that RMC has implemented and maintained an adequate radiation protection program to protect the health and safety of persons and the environment from radiation hazards associated with the SLOWPOKE-2 facility. The Commission comes to this conclusion on the following basis:
- The Commission agrees with CNSC staff's assessment that RMC has implemented a radiation protection program that meets the requirements of the *Radiation Protection Regulations*;
  - The Commission is satisfied that doses to workers at the SLOWPOKE-2 facility were kept below regulatory limits during the current licence term; and
  - The Commission is satisfied that RMC has implemented satisfactory corrective actions in response to inspection findings over the current licence term.

#### 4.2.8 *Conventional Health and Safety*

95. The conventional health and safety SCA covers the management of workplace safety hazards to minimize risk to the health and safety of workers posed by conventional

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<sup>36</sup> The regulatory dose limits for nuclear energy workers are 50 mSv in any one year and 100 mSv in a five-year dosimetry period. There have been three, five-year dosimetry periods during the current licence term: from 2010 to 2015, 2016 to 2020, and 2021 to 2025. The regulatory dose limit for members of the public is 1 mSv in one calendar year.

<sup>37</sup> Action levels are designed to alert licensees before regulatory dose limits are reached. By definition, if an action is reached, a loss of control of some part of the associated radiation protection program may have occurred, and specific action is required, as defined in the *Radiation Protection Regulations*.

(non-radiological) hazards in the workplace. This program includes compliance with applicable labour codes.

96. The NSCA provides that the Commission must ensure that the applicant takes the necessary measures to safeguard the health of persons. Paragraph 3(f) of the *Class I Nuclear Facilities Regulations* provides that the license application for a Class I nuclear facility must include a description of the proposed worker health and safety policies and procedures. [REGDOC-2.8.1, \*Conventional Health and Safety\*](#)<sup>38</sup> sets out information regarding conventional health and safety and the implementation and maintenance of a conventional health and safety program. In addition, RMC's activities must comply with the [Canada Labour Code](#)<sup>39</sup>, and the associated [Canada Occupational Health and Safety Regulations](#).<sup>40</sup>
97. In section 2.8 of its application, RMC provided information regarding the implementation of its conventional safety program including information on its multiple health and safety sub-committees, routine health and safety inspections, and mandatory WHMIS training. RMC reported that its conventional health and safety program complies with REGDOC-2.8.1 and with Part II of the *Canada Labour Code* and the associated *Canada Occupational Health and Safety Regulations*. RMC submitted that no lost-time injuries occurred during the current licence term, and that it has never experienced a lost-time injury at its SLOWPOKE-2 facility due to a workplace health hazard or safety occurrence.
98. In section 3.8 of CMD 23-H3, CNSC staff confirmed that RMC has maintained a conventional health and safety program that meets regulatory requirements of Part II of the *Canada Labour Code*, and the *Canada Occupational Health and Safety Regulations*. CNSC staff reported that RMC also satisfied the requirements of REGDOC-2.8.1, which CNSC staff have included as compliance verification criteria in the proposed LCH. CNSC staff conducted seven inspections related to this SCA over the current licence period. CNSC staff did not identify any non-compliances but made two recommendations for improvement of safety inspections and housekeeping. RMC promptly acted upon CNSC staff's recommendations.
99. The Commission concludes that RMC has made, and will continue to make, adequate provision for the protection of the health and safety of persons with respect to conventional hazards arising from the operation of the SLOWPOKE-2 facility for the proposed licence period. The Commission comes to its conclusion on the following basis:
- The Commission agrees with CNSC staff's assessment that RMC's conventional health and safety program meets regulatory requirements,

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<sup>38</sup> REGDOC-2.8.1, *Conventional Health and Safety*, CNSC, July 2019.

<sup>39</sup> R.S.C., 1985, c. L-2.

<sup>40</sup> SOR/86-304.

including REGDOC-2.8.1, Part II of the *Canada Labour Code*, and the *Canada Occupational Health and Safety Regulations*;

- The Commission is satisfied that RMC adequately addressed CNSC staff recommendations over the current licence term; and
- The Commission notes that RMC has not experienced any lost-time injuries at the SLOWPOKE-2 facility due to a workplace health hazard or safety occurrence.

#### 4.2.9 Environmental Protection

100. Environmental protection programs 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 emission control, environmental monitoring, and estimated doses to the public.
101. In accordance with the NSCA, licensees are required to ensure that there are adequate provisions for the protection of the environment. Paragraphs 12(1)(c) and (f) of the GNSCR require each licensee to take all reasonable precautions to protect the environment and the health and safety of persons, and to control the release of radioactive nuclear substances and hazardous substances within the site of the licensed activity and into the environment. The *Radiation Protection Regulations* prescribe dose limits for the public, which, pursuant to subsection 1(3), are 1 mSv per calendar year.
102. [REGDOC-2.9.1, Environmental Protection: Environmental Principles, Assessments and Protection Measures, Version 1.2](#),<sup>41</sup> describes the CNSC's principles of environmental protection, the scope of an environmental review and the roles and responsibilities associated with an environmental review, as well as the CNSC's requirements and guidance for developing environmental protection measures, including an environmental risk assessment (ERA) where required. CSA N288.6, *Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills*,<sup>42</sup> provides requirements for the performance and maintenance of an ERA at nuclear facilities.
103. In section 2.9 of its application, RMC provided information on its environmental protection program, including its environmental management system, effluent and emissions controls, and public dose impacts. RMC submitted that its environmental protection program complies with REGDOC-2.9.1, and with all federal, provincial, and municipal environmental regulations. RMC further submitted that its SLOWPOKE-2

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<sup>41</sup> REGDOC-2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures*, Version 1.2, CNSC, September 2020.

<sup>42</sup> N288.6-12, *Environmental risk assessments at Class I nuclear facilities and uranium mines and mills*, CSA Group, 2012

reactor has not had any adverse effects on the surrounding environment since its commissioning in 1985.

104. In section 3.9 of CMD 23-H3, CNSC staff reported that RMC has an environmental protection program in place that protects the environment and human health in accordance with regulatory requirements. During the current licence period, CNSC staff performed 6 compliance inspections related to the environmental protection SCA, and did not identify any non-compliances. CNSC staff noted that RMC promptly addressed the lone recommendation, which related to periodic sampling and analysis of reactor water.
105. Regarding emissions and effluent control, CNSC staff submitted that airborne emissions from RMC's SLOWPOKE-2 facility remained negligible throughout the licence term. CNSC staff reported that RMC releases small quantities of radioactive noble gases, primarily Xe-133 and Ar-4,1 as a result of weekly purges of reactor head space and irradiation activities. CNSC staff explained that all gaseous emissions pass through high efficiency particulate air (HEPA) filters to remove any particulates, and that RMC monitors the amount of radioactive noble gases by sampling the emissions prior to release. CNSC staff added that RMC does not release any radioactive liquid effluent or hazardous substances from its SLOWPOKE-2 facility.
106. CNSC staff reported that RMC submitted an ERA to the CNSC in 2022, in support of its licence renewal application. CNSC staff explained that the purpose of the ERA was to assess the potential risks to human health and the environment associated with the operation of RMC's SLOWPOKE-2 facility, and to determine any appropriate protective measures. CNSC staff reported that RMC completed its ERA in accordance with REGDOC-2.9.1 and CSA N288.6-12. CNSC staff confirmed that the ERA demonstrated that people and the environment around the SLOWPOKE-2 facility are protected. CNSC staff also noted that, though REGDOC-2.9.1 and CSA N288.6-12 are not referenced in RMC's current LCH, they have been added as compliance verification criteria in the proposed LCH.
107. CNSC staff reported that RMC performed a conservative public dose assessment as part of its ERA. The assessment determined that the maximum estimated public dose would be 0.0625 mSv/year. This is equivalent to approximately 6% of the regulatory dose limit of 1 mSv/year<sup>43</sup>. CNSC staff also reported that RMC's ERA found dose rates to non-human ecological receptors to be much lower than conservative benchmarks. CNSC staff noted that RMC is not required to implement an environment monitoring program as the estimated dose to public and non-human ecological receptors are well below the regulatory public dose limit.

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<sup>43</sup> The regulatory dose limit for members of the public is 1 mSv in one calendar year.

108. The Commission concludes that RMC has and will continue to provide adequate protection to the health and safety of persons and the environment throughout the proposed licence period. The Commission is satisfied that the measures implemented at the SLOWPOKE-2 facility are adequate for the purposes of environmental protection under the NSCA. The Commission comes to this conclusion on the following basis:
- The Commission is satisfied that RMC has maintained an environmental protection program that meets regulatory requirements, including REGDOC-2.9.1;
  - The Commission is satisfied that releases to the environment from the SLOWPOKE-2 facility during the current licence period were well below regulatory limits;
  - The Commission is satisfied that RMC has completed an ERA that meets the requirements of REGDOC-2.9.1 and CSA N288.6-12;
  - The Commission is satisfied that the dose to the public during the current licence period was well below the regulatory limit; and
  - The Commission is satisfied that RMC has addressed CNSC staff's recommendation from its environmental protection SCA inspections.

#### *4.2.10 Emergency Management and Fire Protection*

109. The emergency management and fire protection SCA covers the measures for preparedness and response capabilities implemented by RMC in the event of emergencies and non-routine conditions at its SLOWPOKE-2 facility. These measures include nuclear emergency management, conventional emergency response, and fire protection and response.
110. Subsection 24(4) of the NSCA provides that the applicant, in carrying out the proposed licenced activity, will take 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.
111. Paragraph 12(1)(c) of the GNSCR states that the licensee shall "take all reasonable precautions to protect the environment, preserve the health and safety of persons and maintain the security", while paragraph 12(1)(f) states that the licensee shall "take all reasonable precautions to control the release of radioactive nuclear substances or hazardous substances within the site of the licensed activity and into the environment of the licensed activity".
112. Paragraph 6(k) of the *Class I Nuclear Facilities Regulations* requires that a licence application include information on the licensee's proposed measures to prevent or mitigate the effects of accidental releases of nuclear substances and hazardous

substances on the environment, the health and safety of persons and the maintenance of national security.

113. [REGDOC-2.10.1, Nuclear Emergency Preparedness and Response, Version 2](#)<sup>44</sup> sets out the CNSC's requirements and guidance for emergency preparedness, and applies to licensees and license applicants for Class I nuclear facilities, uranium mines and uranium mills, including RMC.
114. In section 2.10 of its application, RMC provided information on its emergency management procedures and noted that it has an on-site emergency plan which details the responsibilities, authorities, and arrangements for coordinating site activities and external response organizations throughout an emergency. RMC submitted that its emergency management program complies with the requirements of REGDOC 2.10.1.
115. Regarding fire protection, RMC submitted that it has implemented a fire protection program to reduce both the probability of occurrence and the consequences of fire at the SLOWPOKE-2 facility. RMC explained that its fire protection program describes the implementation and control of fire safety activities, which are conducted by various departments within RMC and by the CFB Kingston Base Fire Prevention Chief. RMC reported that its fire protection program was designed in accordance with the [National Building Code of Canada 2020](#)<sup>45</sup> (NBCC 2020), the [National Fire Code of Canada 2015](#)<sup>46</sup> (NFCC 2015), and the [NFPA 801 Annex B Standards for Fire Protection for Facilities Handling Radioactive Materials](#)<sup>47</sup> (NFPA 801 Annex B).
116. In section 3.10 of CMD 23-H3, CNSC staff reported that RMC's emergency management and fire protection programs meet regulatory requirements, including those set out in REGDOC-2.10.1, NBCC 2020, NFCC 2015 and NFPA 801 Annex B. CNSC staff submitted that, during the current licence period, it performed 7 compliance inspections related to the emergency management and fire protection SCA and issued one notice of non-compliance. CNSC staff noted that the non-compliance was of low safety significance and that RMC implemented satisfactory corrective actions in response.
117. In section 2.10 of its application, RMC provided information on two emergency training exercises it executed during the licence period – one in 2019 and one in 2021. RMC explained that the 2019 exercise was a comprehensive discussion-based – or tabletop<sup>48</sup> – exercise for security response to all non-routine conditions at the SLOWPOKE-2 facility. RMC conducted this exercise in response to recommendations

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<sup>44</sup> REGDOC 2.10.1, *Nuclear Emergency Preparedness and Response, Version 2*, CNSC, February 2016

<sup>45</sup> *National Building Code of Canada 2020*, National Research Council Canada, 2020

<sup>46</sup> *National Fire Code of Canada 2015*, National Research Council Canada, 2015.

<sup>47</sup> *NFPA 801 Annex B Standards for Fire Protection for Facilities Handling Radioactive Materials*, National Fire Protection Association, 2020.

<sup>48</sup> REGDOC-2.10.1 notes that “tabletop emergency exercises, such as those for notification and communications, may be sufficient to stimulate discussion of various issues regarding a hypothetical emergency.”

made by the CNSC following a 2019 security inspection. In 2021, RMC conducted another multi-jurisdictional emergency services training exercise. The exercises included coordination with multiple emergency response organizations including the CFB Kingston Military Police and the City of Kingston Fire Department. CNSC staff reported in section 3.10 of CMD 23-H3, that it reviewed the results of these exercises and was satisfied with the outcomes.

118. In CMD 23-H3Q, the Commission asked RMC for clarification regarding who maintains the ultimate authority for emergency response at RMC. In CMD 23-H3.1B, RMC stated that the Commandant of RMC has ultimate authority of personnel at RMC and that the CFB Kingston Base Commander has ultimate authority regarding emergency response for the Canadian Armed Forces at CFB Kingston. RMC explained that the CFB Kingston Base G3 coordinates on and off-site emergency response while reporting to the CFB Kingston Base Commander and the RMC Director of Operations and Plans. In the case of a nuclear emergency, the RMC SLOWPOKE-2 Director and Radiation Safety Officer reports on the readiness of the SLOWPOKE-2 reactor and the radiological hazards to the RMC Director of Operations and Plans, while recommending protective measures to maintain radiation exposure ALARA. The Commission is satisfied with the additional information provided by RMC on this matter.
119. The Commission concludes that RMC's nuclear and conventional emergency management program and the fire protection measures are adequate to protect the health and safety of persons and the environment. The Commission comes to this conclusion on the following basis:
- The Commission agrees with CNSC staff's assessment that RMC's emergency management and fire protection programs meet regulatory requirements, including REGDOC-2.10.1, NBCC 2020, NFCC 2015 and NFPA 801 Annex B;
  - The Commission is satisfied that RMC has implemented adequate corrective actions in response to inspection findings over the current licence term; and
  - The Commission notes that RMC has successfully executed multi-jurisdictional emergency services training exercises.

#### *4.2.11 Waste Management*

120. Waste management covers waste-related programs that form part of a facility's operations up to the point where the waste is removed from the licensed site for storage, treatment, or disposal at another licensed location, and includes waste minimization, segregation, characterization, and storage programs.
121. Paragraph 3(1)(j) of the GNSCR provides that the licence application must include the name, quantity, form, origin and volume of any radioactive waste or hazardous waste that may result from the activity to be licensed, including wastes that may be stored, managed, processed, or disposed of at the site of the activity to be licensed, and the

proposed method for managing and disposing of that waste. Paragraph 3(k) of the *Class I Nuclear Facilities Regulations* also requires that the application contain the proposed plan for the decommissioning of the nuclear facility or of the site.

122. [REGDOC-2.11.1, \*Waste Management, Volume I: Management of Radioactive Waste\*](#)<sup>49</sup> sets out requirements and guidance for managing radioactive waste. [REGDOC-2.11.2, \*Decommissioning\*](#)<sup>50</sup> sets out requirements and guidance regarding the planning and preparation for as well as the execution and completion of decommissioning.
123. In section 2.11 of its application, RMC provided information on its waste management program including information on its waste characterization, minimization, and handling practices. RMC reported that its waste management program complies with the requirements of REGDOC-2.11.1, *Waste Management, Volume I*.
124. RMC reported that its SLOWPOKE-2 facility generates approximately 0.25 m<sup>3</sup> of neutron-activated waste per year, noting that over 80% of its generated radioactive waste decays to background levels within several months and can be safely disposed of as non-radioactive waste. RMC clarified that waste containing radioisotopes with longer half-lives is stored securely on-site in shielded containers until a suitable volume justifies off-site dispositioning to a licensed waste management facility. RMC submitted that the only high-level radioactive waste generated at the facility was from the original LEU fuel core, which was transported to CNL's Chalk River Laboratories for examination and storage immediately after it was removed from the reactor.
125. In section 3.11 of CMD 23-H3, CNSC staff reported that RMC maintains a waste management program in accordance with REGDOC-2.11.1, *Waste Management, Volume I*, CSA N292.0-19, *General Principles for the Management of Radioactive Waste*<sup>51</sup> and CSA N292.3-14, *Management of Low- and Intermediate-Level Radioactive Waste*.<sup>52</sup> CNSC staff reported that it conducted six compliance inspections related to the waste management SCA during the current licence period. CNSC staff issued 1 notice of non-compliance and 1 recommendation, both of low-safety significance, as a result of these inspections. CNSC staff reported that RMC implemented corrective actions satisfactorily in both cases.
126. Regarding decommissioning, RMC submitted that it revised its Preliminary Decommissioning Plan (PDP) in 2022 in compliance with REGDOC-2.11.2. The PDP describes the radiological and non-radiological hazards associated with decommissioning the SLOWPOKE-2 facility. CNSC staff found RMC's PDP to meet the requirements of REGDOC-2.11.2 and CSA N294-19 *Decommissioning of Facilities*

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<sup>49</sup> REGDOC-2.11.1, *Waste Management, Volume I: Management of Radioactive Waste*, CNSC, January 2021.

<sup>50</sup> REGDOC-2.11.2, *Decommissioning*, CNSC, January 2021.

<sup>51</sup> N292.0-19, *General Principles for the Management of Radioactive Waste*, CSA Group, 2019.

<sup>52</sup> N292.3-14, *Management of Low- and Intermediate-Level Radioactive Waste*, CSA Group, 2014.



*Containing Nuclear Substances*.<sup>53</sup> The PDP and related cost estimate are discussed further in section 4.4.2 of this *Record of Decision*.

127. In CMD 23-H3Q, the Commission asked RMC if it had considered lessons learned from the decommissioning of other SLOWPOKE-2 reactors when preparing the PDP for its SLOWPOKE-2 facility. In CMD 23-H3.1B, RMC stated that it referenced documents from the decommissioning of the [Saskatchewan Research Council](#) (SRC) SLOWPOKE-2 reactor and contacted SRC management during the preparation of its PDP. RMC noted that SRC's experience was particularly helpful when estimating decommissioning costs and timelines.
128. CNSC staff noted that REGDOC-2.11.1, *Waste Management Volume I*, and REGDOC-2.11.2, were published in January 2021 and are not referenced in the current LCH. CNSC staff proposed including these REGDOCs as compliance verification criteria in the LCH for the renewed licence.
129. The Commission is satisfied that RMC has implemented, and continues to maintain, a waste management program to safely manage waste at the RMC SLOWPOKE-2 facility. The Commission comes to this conclusion on the following basis:
  - The Commission agrees with CNSC staff's assessment that RMC has implemented a waste management program that meets regulatory requirements, including CSA N292.0-19, CSA N282.3-14, and REGDOC-2.11.1;
  - The Commission is satisfied that RMC has a PDP in place that meets regulatory requirements, including REGDOC-2.11.2 and N294-19; and
  - The Commission notes that RMC considered lessons learned from the decommissioning of other SLOWPOKE-2 reactors when preparing its PDP.

#### 4.2.12 Security

130. The security SCA covers the implementation of a program to prevent the loss, unauthorized removal and sabotage of nuclear substances, nuclear materials, prescribed equipment, or information. RMC's security program for its SLOWPOKE-2 facility must comply with applicable provisions of the GNSCR and Part 2 of the [Nuclear Security Regulations](#)<sup>54</sup> (NSR).
131. Paragraph 12(1)(c) of the GNSCR requires the licensee to take all reasonable precautions to protect the environment and the health and safety of persons, and to maintain the security of nuclear facilities and of nuclear substances. Paragraphs 12(1)(g) and 12(1)(h) require the licensee to implement measures for alerting the licensee to the illegal use or removal of a nuclear substance, prescribed equipment or prescribed information, or the illegal use of a nuclear facility, and measures for

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<sup>53</sup> N294-19, *Decommissioning of Facilities Containing Nuclear Substances*, CSA Group, 2019.

<sup>54</sup> SOR/2000-209.

alerting it to acts or attempts of sabotage, anywhere at the site of the licensed activity. Section 12(1)(j) requires the licensee to instruct workers on the physical security program at the site of the licensed activity and on their obligations under that program.

132. In addition, sections 21 to 23 of the GNSCR provide obligations for all licensees on the identification, storage, handling, and transfer requirements of information designated as “prescribed information”. [REGDOC-2.12.3, Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material, Version 2.1](#)<sup>55</sup> provides regulatory expectations and guidance for licensees regarding the CNSC’s expectations under the GNSCR for security.
133. In section 2.12 of its application, RMC reported that it maintains a security program that complies with REGDOC-2.12.3 to control access to the SLOWPOKE-2 reactor, nuclear substances, and prescribed information. RMC provided information on its security program, including its site security plan and worker security clearance requirements. RMC noted that its SLOWPOKE-2 facility benefits from enhanced security due to its location at RMC, a unit of Canadian Forces Base (CFB) Kingston.
134. Regarding cyber security, RMC submitted that the digital operating system for the SLOWPOKE-2 reactor is not connected to the internet and is therefore protected from unauthorized remote operation. RMC noted that the rest of RMC’s computer network was targeted by a ransomware<sup>56</sup> attack in June 2020. RMC added that, to limit the possibility of similar attacks in the future, Shared Services Canada has restricted the use of RMC computers that are connected to the internet.
135. In section 3.12 of CMD 23-H3, CNSC staff reported that RMC has maintained a security program that meets regulatory requirements under the GNSCR and Part 2 of the NSR. CNSC staff noted that RMC has implemented appropriate security systems and devices for the SLOWPOKE-2 facility, a satisfactory security clearance process, and a security awareness program for all RMC staff. CNSC staff further noted that RMC has established a response protocol with the Military Police and the Kingston Police to ensure timely off-site armed response, should a security-related incident occur. CNSC staff added REGDOC-2.12.3 as compliance verification criteria in the proposed LCH for the renewed licence.
136. During the licence period, CNSC staff reported that it performed 6 inspections related to the security SCA. In addition, CNSC staff performed 2 security-focused inspections in 2013 and 2019. CNSC staff reported that all inspection findings were of low safety significance and that RMC has implemented satisfactory corrective actions for all findings.

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<sup>55</sup> REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material*, Version 2.1, CNSC, September 2020.

<sup>56</sup> The Canadian Centre for Cyber Security notes that ransomware is a “type of malware that denies a user's access to a system or data until a sum of money is paid.”

137. The Commission is satisfied that RMC has adequate programs and measures in place to provide for the physical security of the SLOWPOKE-2 facility during the proposed licence period. The Commission is further satisfied that RMC's performance with respect to the security SCA has been acceptable and meets regulatory requirements. The Commission comes to this conclusion on the following basis:

- The Commission agrees with CNSC staff's assessment that RMC has implemented a security program that meets regulatory requirements, including those set out in the GNSCR and Part 2 of the NSR;
- The Commission is satisfied that the SLOWPOKE-2 reactor is protected from cyber security threats; and
- The Commission is satisfied that RMC has adequately addressed all inspection findings related to the security SCA over the current licence term.

#### 4.2.13 Safeguards and Non-Proliferation

138. 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\*](#)<sup>57</sup> (NPT). Pursuant to the NPT, Canada has entered into a [\*Comprehensive Safeguards Agreement\*](#)<sup>58</sup> and an [\*Additional Protocol\*](#)<sup>59</sup> (safeguards agreements) with the IAEA. The objective of these safeguards 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 activity in this country.

139. [\*REGDOC-2.13.1, Safeguards and Nuclear Materials Accountancy\*](#)<sup>60</sup> sets out requirements and guidance for safeguards programs for applicants and licensees who possess nuclear material, operate a uranium and/or thorium mine, carry out specified types of nuclear fuel-cycle related research and development work, and/or carry out specified types of nuclear-related manufacturing activities.

140. In section 2.13 of its application, RMC submitted that it has a safeguards and non-proliferation program in place which complies with REGDOC-2.13.1. RMC provided information on its safeguards and non-proliferation activities, including annual physical inventory taking and physical inventory verification performed by IAEA inspectors. RMC reported that, following a physical inventory verification in November 2019, IAEA inspectors found that "all declared nuclear material has been accounted for and that there were no indications of the undeclared presence, production or processing of nuclear material."

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<sup>57</sup> INFCIRC/140.

<sup>58</sup> INFCIRC/164.

<sup>59</sup> INFCIRC/164/Add.1.

<sup>60</sup> REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy*, CNSC, February 2018.

141. In section 3.13 of CMD 23-H3, CNSC staff submitted that that RMC has implemented a safeguards program that meets the requirements of REGDOC-2.13.1 and conforms with the measures required by the CNSC to meet Canada's international safeguards obligations, as well as other measures arising from the NPT. CNSC staff reported that the IAEA performed 5 inspections and 1 complementary access during the current licence term. CNSC staff also performed 4 physical inventory-taking evaluations to ensure that RMC complied with regulatory requirements. CNSC staff reported that RMC provided the required access and assistance for all IAEA inspections and CNSC evaluations, and that the results of all IAEA inspections were satisfactory with no issues identified.
142. The Commission concludes that RMC has implemented and is maintaining a satisfactory safeguards program that provides for, and will continue to provide for, the implementation of measures that are necessary for maintaining national security, and for implementing international agreements to which Canada has agreed. The Commission comes to this conclusion on the following basis:
- The Commission agrees with CNSC staff's assessment that RMC's safeguards and non-proliferation program meets regulatory requirements, including those set out in REGDOC-2.13.1; and
  - The Commission is satisfied that RMC has provided the IAEA with the necessary access and assistance to perform the activities during the current licence term, and that the IAEA had no findings as a result of its inspections.

#### *4.2.14 Packaging and Transport*

143. The packaging and transport SCA covers the safe packaging and transport of nuclear substances and radiation devices to and from the licensed facility. RMC must adhere to the [Packaging and Transport of Nuclear Substances Regulations, 2015](#)<sup>61</sup> (PTNSR, 2015) and Transport Canada's [Transportation of Dangerous Goods Regulations](#)<sup>62</sup> (TDGR) for all shipments. These regulations apply to the packaging and transport of nuclear substances at RMC, including the design, production, use, inspection, maintenance and repair of packages, and the preparation, consigning, handling, loading, carriage and unloading of packages.
144. In section 2.14 of its application, RMC provided information on its packaging and transportation program, including relevant procedures and required training. RMC reported that its packaging and transportation processes comply with applicable Transport Canada regulations.
145. In section 3.14 of CMD 23-H3, CNSC staff confirmed that RMC has a packaging and transport program in place to ensure that all shipments to and from its SLOWPOKE-2 facility comply with the PTNSR, 2015 and the TDGR. CNSC staff noted that, during

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<sup>61</sup> SOR/2015-145.

<sup>62</sup> SOR/2001-286.

the refuelling project, RMC implemented an appropriate transportation plan to safely transport the spent fuel core to CNL. CNSC staff reported that it completed 4 inspections related to the packaging and transport SCA over the current licence term and identified no non-compliances, including during the refuelling project.

146. The Commission concludes that RMC has an adequate program in place to meet regulatory requirements regarding packaging and transport. The Commission comes to this conclusion on the following basis:
- The Commission agrees with CNSC staff's assessment that RMC has implemented a packaging and transport program that meets regulatory requirements, including the PTNSR, 2015 and the TDGR; and
  - The Commission is satisfied that the evidence shows that RMC safely packaged and transported radioactive materials during the current licence term, including during the refuelling project.

#### *4.2.15 Conclusions RMC's Performance at the SLOWPOKE-2 Facility*

147. Based on the review and the analysis of all of the information provided and discussed above, the Commission is satisfied and concludes that RMC is qualified to carry on the licensed activities under the proposed renewed licence. The Commission finds that RMC has adequate programs in place with respect to the 14 SCAs to ensure that the health and safety of workers, the public and the environment will be protected over the proposed 20-year licence term. The Commission further concludes that RMC has measures in place to provide for the maintenance of national security and to implement international obligations to which Canada has agreed.

### **4.3 Indigenous Engagement and Consultation**

148. The Commission considered the information provided by CNSC staff and RMC regarding Indigenous consultation and engagement activities in respect of this licence renewal application. Indigenous consultation refers to the common law duty to consult with Indigenous Nations and communities pursuant to section 35 of the [\*Constitution Act, 1982\*](#).<sup>63</sup>
149. The common law duty to consult with Indigenous Nations and communities is engaged 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 Nations and communities. The CNSC ensures that its licensing decisions under the NSCA uphold the honour of the Crown and

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<sup>63</sup> Schedule B to the *Canada Act 1982* (UK), 1982, c 11.

consider potential impacts to claimed or established Aboriginal and/or treaty rights pursuant to section 35 of the *Constitution Act, 1982*.

150. The duty to consult is engaged wherever the Crown has “knowledge, real or constructive, of the potential existence of an Aboriginal right or title and contemplates conduct that might adversely affect it.”<sup>64</sup> Licensing decisions of the Commission, where Indigenous interests may be adversely impacted, can engage the duty to consult, and the Commission must be satisfied that it has met the duty prior to making the relevant licensing decision.

#### Indigenous Engagement by CNSC Staff

151. In section 4.1 of CMD 23-H3, CNSC staff provided the Commission with information about its engagement activities with the Indigenous Nations and communities that were identified as having a potential interest in the RMC licence renewal. CNSC staff identified the following communities due to the proximity of their communities, treaty areas, and/or traditional territories and homelands to the RMC SLOWPOKE-2 facility, or due to previously expressed interest in being kept informed:
- Mohawks of the Bay of Quinte
  - Métis Nation of Ontario
152. After CNSC staff had notified the identified Indigenous Nations and communities of RMC’s application, Curve Lake First Nation indicated its interest in the proposed licence renewal. Based on this information, CNSC staff added Curve Lake First Nation to the identified Indigenous Nations and communities and discussed RMC’s licence renewal application with them during meetings in October and December 2022.
153. CNSC staff submitted that it advised the identified Indigenous Nations and communities of the availability of participant funding and encouraged them to participate in the regulatory review process so they could advise the Commission directly of any concerns they have in relation to this licence renewal application. CNSC staff noted that it had not been made aware of any specific concerns from Indigenous Nations and communities regarding RMC’s application.
154. CNSC staff submitted that the licence renewal application is not expected to cause any new adverse impacts to potential or established Indigenous and/or Treaty rights. CNSC staff noted its commitment to ongoing engagement and collaboration with interested Indigenous Nations and communities and reported that it will continue to provide opportunities for meaningful long-term engagement over the proposed licensing term.

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<sup>64</sup> *Haida Nation v. British Columbia (Minister of Forests)*, 2004 SCC 73 at para 35.

### Indigenous Engagement by RMC

155. In section 3.2 of its application, RMC provided information regarding its Indigenous engagement initiatives, including information on the DND and Canadian Armed Forces Indigenous affairs program, RMC's Indigenous knowledge and learning working group, and RMC's action plan on institutional equity, diversity, and inclusion. RMC reported that it follows the guidance of [REGDOC-3.2.2, \*Indigenous Engagement\*](#)<sup>65</sup> and, in CMD 23-H3.1A, RMC noted its commitment to open communication with, and the inclusion of, Indigenous peoples in matters of mutual interest.
156. RMC provided information on its Indigenous Leadership Opportunity Year (ILOY) which provides indigenous youth from across the country the opportunity to receive military, academic, and cultural education at RMC. RMC noted that ILOY students visit RMC's SLOWPOKE-2 reactor as part of their learning on nuclear and radiation safety. RMC reported that successful ILOY students may choose to apply to continue their education at RMC under the Regular Officer Training Program or apply to become a Non-Commissioned Member of the Canadian Armed Forces.
157. In section 4.1 of CMD 23-H3, CNSC staff noted that the CFB Kingston Base Commander sent letters to the following Indigenous Nations and communities, informing them of RMC's licence renewal request:
- Algonquins of Pikwakanagan First Nation
  - The Chippewas of Rama First Nation
  - Mississaugas of Scugog Island First Nation
  - Mohawks of the Bay of Quinte
  - Métis Nation of Ontario
  - Algonquins of Ontario
  - Huron Wendat First Nation
  - Alderville First Nation
  - Hiawatha First Nation
  - Chippewas of Georgina Island First Nation
  - Curve Lake First Nation
  - Beausoleil First Nation

CNSC staff also noted that RMC updated its public website with information on its application.

### Submissions by Indigenous Nations and Communities

158. The Commission received a written intervention from Curve Lake First Nation ([CMD 23-H3.3](#)), a PFP recipient. In its written submission, Curve Lake First Nation expressed that it had not contemplated the reactor at RMC until it received a letter from CFB

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<sup>65</sup> REGDOC-3.2.2, *Indigenous Engagement*, Version 1.2, CNSC, February 2022.

Kingston informing it of RMC's licence renewal application. Curve Lake First Nation submitted that it had not yet had the opportunity to build an understanding with RMC regarding engagement expectations and meaningful relationship-building and noted that RMC's CMD 23-H3.1 lacked information on past and planned engagement efforts. Concerning future relationship-building with RMC, Curve Lake First Nation noted its appreciation that RMC had invited Curve Lake First Nation to visit its SLOWPOKE-2 facility and reported that it planned to prioritize this visit.

159. Regarding the proposed 20-year licence term, Curve Lake First Nation expressed concern that a 20-year licence would limit future opportunities for engagement and communication. The proposed licence length is discussed further in section 4.5.1 of this *Record of Decision*.

#### *4.3.1 Conclusion on Indigenous Consultation and Engagement*

160. The Commission concludes that its responsibility to uphold the honour of the Crown and its constitutional obligations with regard to engagement and the duty to consult respecting Indigenous interests has been satisfied. The renewal of RMC's Non-Power Reactor Operating Licence for the RMC SLOWPOKE-2 facility does not include any new licensed activities that could cause new impacts on the environment or changes in the ongoing licensed activities at the RMC site, and therefore, will not cause any new adverse impacts to any potential or established Indigenous and/or treaty rights.<sup>66</sup>
161. The Commission acknowledges CNSC staff's efforts in this regard on behalf of the Commission, including efforts to ensure that Indigenous Nations and communities were properly informed of the licence renewal application and that participant funding was made available to assist Indigenous Nations and communities in participating in the hearing process. The Commission is satisfied with CNSC staff's efforts to engage with Indigenous Nations and communities who may have interest in the RMC's SLOWPOKE-2 facility. The efforts made by CNSC staff in this regard are key to the important work of the Commission toward reconciliation and relationship-building with Canada's Indigenous Nations and communities. The Commission expects CNSC staff to continue to build meaningful long-term relationships with Indigenous Nations and communities as part of the CNSC's reconciliation efforts.
162. The Commission also recognizes RMC's commitment to continue communication with and inclusion of Indigenous peoples in matters of mutual interest. The Commission further recognizes that RMC has acknowledged Curve Lake First Nation's expressed interest in RMC's SLOWPOKE-2 reactor and expects RMC to continue to make its best efforts to build its relationship with Curve Lake First Nation.

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<sup>66</sup> *Rio Tinto Alcan v. Carrier Sekani Tribal Council*, 2010 SCC 43, at paras 45 and 49.



## 4.4 Other Matters of Regulatory Importance

### 4.4.1 Public Engagement

163. A public information and disclosure program (PIDP) is a regulatory requirement for licence applicants and licensed operators of Class I nuclear facilities. In section 3.1 of CMD 23-H3.1, RMC submitted that its PIDP<sup>67</sup> meets the requirements of [REGDOC-3.2.1, Public Information and Disclosure](#).<sup>68</sup> RMC explained that its PIDP was designed to build and sustain the trust of local communities by effectively communicating information related to the health, safety, and security of individuals living near the RMC SLOWPOKE-2 facility. RMC added that its PIDP also provides educational information related to the SLOWPOKE-2 reactor and radiation safety.
164. RMC highlighted its commitment to disclose information in a transparent, consistent, and timely manner. RMC reported that it shares information about the routine operations of its SLOWPOKE-2 facility, as well as planned and unplanned events, via its [website](#), local and social media, and in scientific publications. RMC noted that it also participates in an annual public science festival.
165. In section 4.3 of CMD 23-H3, CNSC staff confirmed that RMC updated its PIDP in January 2022 to meet the specifications of REGDOC-3.2.1. CNSC staff reported that RMC had demonstrated acceptable public communication activities related to its SLOWPOKE-2 facility. CNSC staff recommended that RMC could further improve its PIDP by demonstrating mechanisms for audiences to provide feedback, as well as providing a summary of public or media inquiries and examples of communication products.
166. The Commission concludes that RMC will continue to communicate to the public information about the health, safety and security of persons and the environment and other issues related to its facility. The Commission comes to this conclusion on the following basis:
- The Commission is satisfied that RMC met its public disclosure and reporting obligations throughout the current licence term; and
  - The Commission agrees with CNSC staff's assessment that RMC's PIDP meets the requirements of REGDOC-3.2.1.

### 4.4.2 Decommissioning Plans and Financial Guarantee

167. The NSCA and associated Regulations require licensees to make adequate provision for the safe decommissioning of their facilities and long-term management of waste produced during the facilities' lifespan. In order to ensure that adequate resources are

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<sup>67</sup> RMC's PIDP is available on the RMC [website](#).

<sup>68</sup> REGDOC-3.2.1, *Public Information and Disclosure*, CNSC, May 2018.

available for the safe and secure future decommissioning of the RMC SLOWPOKE-2 facility, the Commission requires that an adequate financial guarantee for the realization of planned activities be implemented and maintained in a form acceptable to the Commission throughout the licence period.

168. In section 3.4 of its application, RMC reported that it revised the preliminary decommissioning plan (PDP) for its SLOWPOKE-2 facility in 2022. RMC reported that costs associated with the future decommissioning of the facility were calculated in accordance with [REGDOC-3.3.1, \*Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities\*](#).<sup>69</sup>
169. In section 5.2 of CMD 23-H3, CNSC staff specified that RMC proposed a revised financial guarantee in the amount of \$16.5 million dollars and in the form of a letter of commitment from the Deputy Minister of the Department of National Defence (DND).<sup>70</sup> CNSC staff confirmed that RMC's revised financial guarantee is sufficient to fund RMC's decommissioning obligations and that an expressed commitment from DND, a Canadian government entity, is a valid instrument per REGDOC-3.3.1.
170. The Commission is satisfied that the revised preliminary decommissioning plan and related financial guarantee for decommissioning RMC's SLOWPOKE-2 facility are acceptable for the purpose of this licence renewal. The Commission accepts the new financial guarantee amount of \$16.5 million in the instrument of an expressed commitment from DND.

#### 4.4.3 Cost Recovery

171. Paragraph 24(2)(c) of the NSCA requires that a licence application be accompanied by the prescribed fee, as set out by the [Canadian Nuclear Safety Commission Cost Recovery Fees Regulations](#)<sup>71</sup> (CRFR), and based on the activities to be licensed.
172. In section 5.1 of CMD 23-H3, CNSC staff reported that RMC, as an academic institution, is exempt under section 2 of the CRFR:

These Regulations do not apply to

- a) a secondary school or a specified educational institution as defined in subsection 2(1) of the Canada Student Loans Act;
- b) a not-for-profit organization that carries out research and is wholly owned by an institution referred to in paragraph (a);

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<sup>69</sup> REGDOC-3.3.1, *Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities*, CNSC, January 2021.

<sup>70</sup> The letter of financial guarantee is included in Appendix D, *Non-Power Operating Licence Renewal Application*, RMC, February 23, 2022.

<sup>71</sup> SOR/2003-212.

The Commission is satisfied that RMC is exempt under the CRFR and is not required to pay any cost recovery fees.

#### 4.4.4 Nuclear Liability Insurance

173. In section 5.4 of CMD 23-H3, CNSC staff reported that the RMC SLOWPOKE-2 facility is identified as a nuclear installation in Schedule 2 of the [Nuclear Liability Compensation Regulations](#)<sup>72</sup> and that RMC is required to maintain valid insurance for the liability amount defined in those regulations, in accordance with the [Nuclear Liability and Compensation Act](#)<sup>73</sup> (NLCA). While this statutory requirement is not administered by the CNSC but by Natural Resources Canada, the nuclear regulator maintains awareness of NLCA compliance, where its licensees are designated nuclear installations.
174. CNSC staff submitted that the Government of Canada, owner of the RMC SLOWPOKE-2 facility, underwrites its own risks and does not purchase insurance in the commercial insurance market. Any liability issues are processed by the staff within the Office of the Judge Advocate General. CNSC staff confirmed that RMC has satisfied the requirements under the NLCA for its SLOWPOKE-2 facility.
175. The Commission concludes that RMC continues to satisfy the requirements for the maintenance of nuclear liability insurance under the NLCA.

### 4.5 Licence Length and Conditions

176. The Commission considered RMC's revised application to renew its licence for a period of 20 years. RMC's current licence, NPROL-20.00/2023, expires on June 30, 2023.

#### 4.5.1 Licence Length

177. RMC applied for the renewal of its licence for a 20-year term. In its revised application, RMC submitted that it is qualified to continue to safely carry out the licensed activities for the proposed 20-year licence term because:
- RMC's SLOWPOKE-2 facility is low-risk and has an excellent safety and performance record;
  - RMC has continued to receive a "satisfactory" performance rating for each of the 14 SCAs;

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<sup>72</sup> SOR/2016-88.

<sup>73</sup> S.C. 2015, c. 4, s. 120.

- Visual inspections during the 2021 refuelling showed no degradation to reactor infrastructure and safety related components, and RMC expects these conditions to be maintained for another 20 years due to its consistent operational practices; and
- RMC will continue to keep up with the evolving regulatory environment, including the implementation of regulatory documents and standards throughout the proposed licence term.

RMC also indicated that a longer licence term will provide an increased level of regulatory certainty and allow RMC to conduct long-term planning.

178. CNSC staff recommended the renewal of RMC's licence for a period of 20 years, until June 30, 2043, submitting that the CNSC's regulatory approach is effective and can provide appropriate regulatory oversight for RMC for any licence period. CNSC staff reported that it reviewed RMC's 20-year licence term request against the criteria from CMD 02-M12, *New Staff Approach to Recommending Licence Periods*<sup>74</sup> and found that a 20-year licence period is reasonable based on those criteria. In Table 2 of CMD 23-H3.A, CNSC staff reported that RMC meets the criteria because:

- RMC's operations of its SLOWPOKE-2 facility have been stable and consistent;
- The hazards associated with the licensed activity are well characterized and their impacts well predicted, and they are within the scope considered in the environmental safety case;
- RMC has in place a management system to provide assurance that its safety-related activities are effective and maintained, and to manage changes within the licensing basis;
- Effective compliance programs are in place on the part of both the RMC and the CNSC; and
- RMC has shown a consistent and good history of operating experience and compliance in carrying on the licensed activity.

179. CNSC staff reported that it also reviewed other considerations before recommending a 20-year licence period, including:

- International approaches to research reactor licensing;
- The CNSC's regulatory oversight framework;
- The capacity for ongoing communication and engagement during the licence term; and
- Commission engagement opportunities.

CNSC staff noted that the health and safety of the public and the risk to the environment would not be impacted by a longer licence term and that there would not be any increased risk to national security.

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<sup>74</sup> CMD 02-M12, *New Staff Approach to Recommending Licence Periods*, CNSC, March 2002. CMD 02-M12 provides a risk-informed process that has been used by CNSC staff to support recommendations regarding licence periods to the Commission in past.

180. CNSC staff recommended that, should the Commission renew the licence for a 20-year period, RMC provide a comprehensive performance update to the Commission at the midpoint of the licence period. CNSC staff noted that this update would also provide an opportunity for the public and Indigenous Nations and communities to provide their views on the RMC SLOWPOKE-2 facility directly to the Commission.
181. In its intervention, Curve Lake First Nation (CMD 23-H3.3) expressed concern that a 20-year licence would limit future opportunities for engagement and communication. In CMD 23-H3.A, CNSC staff explained that engagement will continue throughout the proposed licence term through ongoing engagement and communication activities such as the *Regulatory Oversight Reports*. In addition, CNSC staff noted that the mid-term performance update would enable Indigenous Nations and communities and the public to engage directly with the Commission at a frequency that aligns with the previous 10-year licence terms for the RMC facility.

#### 4.5.2 Licence Conditions

182. In Part 2 of CMD 23-H3, CNSC staff provided a proposed draft licence with a format that incorporates the CNSC's standardized licence conditions applicable to RMC's Non-Power Reactor Operating Licence. In CMD 23-H3.B, CNSC staff noted an error in the licensed activities listed in the proposed draft licence. CNSC staff reported that licensed activity (iii) should not include the word "transfer"; this change would align the licensed activities with those authorized under RMC's current licence.

#### Inclusion of the OLCs in the Licence Conditions Handbook

183. In section 3.3 of CMD 23-H3, CNSC staff explained that OLCs are typically included in licensee documents, however, for RMC, the OLCs from RMC's reactor manual are listed in Appendix A of the current licence. To be consistent with other licences and standard practices, CNSC staff proposed that the OLCs be removed from the licence and included in the LCH instead, under the operating performance SCA. CNSC staff included a draft of the proposed LCH in Part Two of CMD 23-H3.
184. The Commission asked CNSC staff to provide additional information regarding the recommendation to move the OLCs from RMC's licence to the LCH. In CMD 23-H3.C, CNSC staff explained that, at the time of RMC's last licence renewal in 2013, it was still common for relevant limits such as OLCs to be referenced directly in a licence. Since then, the CNSC has continued to modernize its licensing practices by adopting an approach that uses a set of standardized licence conditions and provides further detail in the LCH, including relevant limits. CNSC staff emphasized that moving the OLCs to the LCH does not downgrade their importance nor change the status of the OLCs as regulatory limits, as they are part of the licensing basis.

185. The Commission accepts the following changes to the OLCs:
- The inclusion of an OLC to limit the amount of fissile material to be irradiated to a maximum reactivity worth of 100 mg U-235 equivalent, and to no more than 10 mg U-235 equivalent per sample, as described in section 4.2.3; and
  - An increase to the OLC for maximum allowable excess reactivity of the reactor from 4.0 mk to 4.3 mk, as described in section 4.2.4.
186. Regarding potential future changes to the OLCs, CNSC staff further noted in CMD 23-H3.C that it thoroughly assesses any proposed changes to the OLCs and only permits a change if it is determined to be within the licensing basis.<sup>75</sup> CNSC staff assess whether a proposed change is within the licensing basis based on changes or impact on the overall safety at the RMC SLOWPOKE-2 facility. If a change were determined to be outside the licensing basis, CNSC staff would direct the licensee to seek approval from the Commission. The Commission is satisfied with CNSC staff's response on this matter.

#### *4.5.3 Delegation of Authority*

187. In order to provide adequate regulatory oversight of changes that do not require a licence amendment nor Commission approval, CNSC staff recommended that the Commission delegate authority for certain approval or consent, as contemplated in licence conditions that contain the phrase "a person authorized by the Commission." In section 5.5 of CMD 23-H3, CNSC staff recommended that the Commission delegate authority for licence condition 3.2 to the following CNSC staff:
- Director, Nuclear Processing Facilities Division
  - Director General, Directorate of Nuclear Cycle and Facilities Regulation
  - Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch
188. The Commission delegates its authority for the purposes of licence condition 3.2, to the above CNSC staff as recommended. The Commission notes that the delegation of authority of the identified licence condition is for the purpose of the administration of that licence condition. The Commission is satisfied that this approach is reasonable.

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<sup>75</sup> The licensing basis sets the boundary conditions for acceptable performance at a regulated facility or activity, and thus establishes the basis for the CNSC's compliance program with respect of that regulated facility or activity.

#### 4.5.4 Conclusion on Licence Length and Conditions

189. The Commission concludes that a 20-year licence term, with a comprehensive performance update to the Commission at the midpoint of the licence period, with public participation, is appropriate. The Commission's decision is based on the following:
- The Commission agrees with CNSC staff's assessment of RMC's application against the criteria set out in Table 2 of CMD 23-H3.A;
  - The Commission is satisfied that RMC has successfully characterized and mitigated hazards associated with the operation of its SLOWPOKE-2 facility to ensure the protection of the health and safety of persons and the environment;
  - The Commission notes that the design of the SLOWPOKE-2 reactor is inherently safe and that it is a low-risk facility;
  - The Commission is satisfied that RMC has an effective management system in place that meets the requirements of CSA N286-12;
  - The Commission is satisfied that both RMC and the CNSC have effective compliance programs in place to ensure that facility operations remain in compliance with the licensing basis; and
  - The Commission is satisfied that RMC has a good history of operating experience, noting that CNSC staff have rated RMC as "satisfactory" in all 14 SCAs, RMC has maintained worker dose and public dose well below regulatory requirements, and RMC has not reported any lost-time injuries.
190. The Commission notes that CNSC staff's, as well as the Commission's, oversight of licensed activities is independent of the length of a licence and is based on a robust regulatory framework. The licence / LCH structure is well-crafted to contemplate continuous improvement within the licensing basis over time. The Commission is satisfied that, under this structure, RMC's programs will continue to be adequately maintained over the 20-year licence period. The Commission also notes that, as per subsection 43(3) of the NSCA, it may at any time, on its own initiative, redetermine any decision or order made by it. As such, the Commission is satisfied that the longer licence term does not in any way affect or impair the robust regulatory oversight that the NSCA both enables and mandates.
191. The Commission is of the opinion that providing opportunities to hear from communities, for intervenors to voice their views and for the Commission to hear them is very important to nurture and maintain a dialogue with members of the public and Indigenous Nations and communities. It is the Commission's view that a public proceeding at the midpoint of the 20-year licence can provide such an opportunity. This public proceeding should occur no later than December 2033 and will allow the opportunity for participation to members of the public and Indigenous Nations and communities. The Commission notes that the periodic RORs will also provide the opportunity for ongoing public participation throughout the licence term.

192. The Commission accepts the standardized licence conditions as recommended by CNSC staff, with the removal of “transfer” from licenced activity (iii), as identified in CMD 23-H3.B. Licensed activity (iii) will read as follows:

(iii) possess and use prescribed equipment and information that are required for, associated with or arise from the activities described in (i).

The Commission also accepts CNSC staff’s recommendation regarding the delegation of authority for the purpose of licence condition 3.2.

193. Regarding RMC’s OLCs, the Commission accepts the increased maximum allowable reactivity from 4.0 mk to 4.3 mk. The Commission also agrees with CNSC staff’s recommendation that the OLCs be moved from Appendix A of the licence to be included in the LCH under the operating performance SCAs. The Commission notes that CNSC staff can bring any matter to the Commission as required.

## **5.0 CONCLUSION**

194. The Commission has considered RMC’s licence renewal application for its Non-Power Reactor Operating Licence for the SLOWPOKE-2 facility. The Commission has considered the information and submissions of RMC, CNSC staff, and all participants, as set out in the material available for reference on the record.
195. Based on its consideration of the evidence on the record of this hearing, the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, renews the Non-Power Reactor Operating Licence issued to the Royal Military College of Canada for its SLOWPOKE-2 reactor facility located in Kingston, Ontario. The renewed licence, NPROL-20.00/2043, is valid from July 1, 2023 until June 30, 2043. The Commission directs that, at the midpoint of the 20-year licence period, RMC shall present to the Commission a comprehensive midterm update on the conduct of its licensed activities and compliance with requirements, as part of a public Commission proceeding that allows for interventions.

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Rumina Velshi  
President,  
Canadian Nuclear Safety Commission

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Date



**Appendix A – Intervenors**

<b>Intervenors – Written submissions</b>	<b>Document Number</b>
David Winfield	CMD 23-H3.2
Curve Lake First Nation	CMD 23-H3.3