



Application to Renew Licence for the SLOWPOKE-2 Facility

Royal Military College

CMD 23-H3.B

CNSC Staff Presentation
Commission Hearing
April 19, 2023





Presentation Outline

RMC SLOWPOKE-2 Licence Renewal: CMD 23-H3.B

- Purpose of Hearing
- Facility and Licence Overview
- Review of Licence Application
- Regulatory Oversight
- Performance Assessment
- Financial Guarantee
- Indigenous and Public Engagement
- Licence Period
- Conclusions and Recommendations



Royal Military College of Canada
Source: RMC



Purpose of Hearing

RMC SLOWPOKE-2 Licence Renewal: CMD 23-H3.B

Royal Military College (RMC) has applied to the Commission to:

- Renew its operating licence for a period of 20 years*
- Increase the maximum allowable excess reactivity

CNSC staff recommend that the Commission:

- **Conclude, pursuant to paragraph 24(4)(a) and (b) of the NSCA, that RMC:**
 - i. Is qualified** to carry on the activities authorized by the licence
 - ii. 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
- **Renew the non-power reactor licence for a period of 20 years**, expiry date being June 30, 2043, and **include a requirement for RMC to do a mid-term update to the Commission**
- **Approve RMC's request for a maximum allowable excess reactivity increase**
- **Accept the financial guarantee** as set out in CMD 23-H3
- **Delegate authority to CNSC staff** as set out in CMD 23-H3

*Amended application received January 25, 2023



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FACILITY AND LICENCE OVERVIEW

RMC SLOWPOKE-2 Licence Renewal: CMD 23-H3.B



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	Current text	Should read
CMD 23-H3 page 35	There was no recordable dose associated with the 2021 refueling project, either with RMC or CNL workers.	There was no recordable dose associated with the 2021 refueling project for RMC workers.
Proposed licence, (Licensed Activities) CMD 23-H3 page 9	possess, transfer and use prescribed equipment and information that are required for, associated with or arise from the activities described in (i)	possess and use prescribed equipment and information that are required for, associated with or arise from the activities described in (i)



Current Licence

6

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The current Class 1A Non-Power Reactor Licence authorizes RMC to:

- **Operate the RMC SLOWPOKE-2 reactor** and associated facilities
- **Produce, possess, transfer, use, package, manage, and store the nuclear substances** that are required for, associated with or arise from the operation of the SLOWPOKE-2 reactor
- **Possess and use prescribed equipment** and information that are required for, associated with or arise from the operation of the SLOWPOKE-2 reactor

The current licence was renewed July 1, 2013,
valid until June 30, 2023 (10 years)

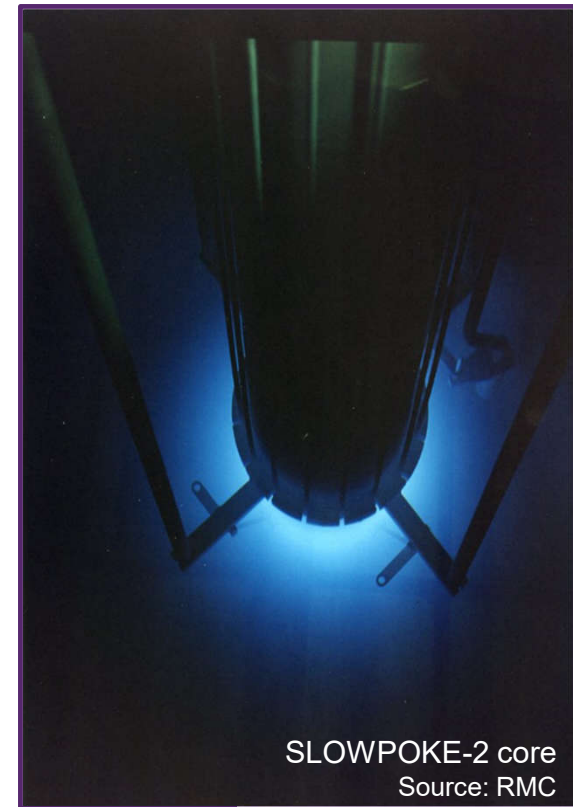


Facility Location

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SLOWPOKE-2 Capacity = 20 kW





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LICENCE RENEWAL APPLICATION

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RMC's Licence Renewal Application

9

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RMC's licence renewal application requests that the Commission:

- Renew its Class 1A non-power reactor licence for a period of 20 years, effective July 1, 2023 to June 30, 2043
- Approve a maximum allowable excess reactivity* increase from 4.0 to 4.3 mk

* Core excess reactivity = the amount of excess reactivity needed to maintain a reactor just critical ($k_{\text{eff}} = 1$) as the fuel burns up

RMC has been operating safely since 1985



CNCS's Review of the Licence Application

10

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CNCS staff:

- **Verified** that the information submitted in support of the application is complete in satisfying CNCS regulatory requirements, including the *Nuclear Safety and Control Act* (NSCA) and associated Regulations, for all 14 safety and control areas (SCAs)
- **Reviewed** RMC's past performance
- **Assessed** all aspects of RMC's application, including the acceptability of the requested maximum allowable excess reactivity and licence period

RMC's application complies with regulatory requirements



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REGULATORY OVERSIGHT AND PERFORMANCE ASSESSMENT

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Regulatory Oversight Activities

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A dedicated facility assessment and compliance team oversees all licensed activities at the RMC facility, including compliance verification activities such as:

- **Desktop reviews** of annual reports and licensee program updates
- **Inspections:** CNSC staff track and verify completion of corrective actions to address all non-compliances
All inspection findings since 2013 are of low safety significance
- **Reviews of event notifications,** and event follow up reports with corrective actions identified.
One event (Security) reported during the current licencing period in February 2023 – No safety implication to the facility or persons.

Year	Inspections
2013	1
2014	1
2015	1
2016	1
2017	1
2018	0
2019	2
2020	0
2021	1
2022	1

CNSC staff report every 3 years to the Commission on research reactors through Regulatory Oversight Reports



Assessment of Safety and Control Areas

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- CNSC staff assessed all **14 safety and control areas (SCAs)** for RMC’s licence application
- Information submitted in support of the application satisfies CNSC requirements under the NSCA and its Regulations
- Assessment criteria and results are summarized in CMD 23-H3

Safety and Control Areas
Management System
Human Performance Management
Operating Performance
Safety Analysis
Physical Design
Fitness for Service
Radiation Protection
Conventional Health and Safety
Environmental Protection
Emergency Management and Fire Protection
Waste Management
Security
Safeguards and Non-Proliferation
Packaging and Transport

RMC’s programs meet regulatory requirements



SCA – Safety Analysis

14

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CNSC staff's assessment of RMC's safety analysis report:

- RMC's **Safety Analysis Report (SAR)** identifies facility hazards, analyzes consequences, and identifies mitigation measures, as per the regulatory requirements
- The SAR was updated in 2022 to include potential climate change outcomes
- Safety analysis of hazards demonstrates adequate **safety through defence-in-depth**

CNSC assessment of the requested increase to excess reactivity:

- Supporting analyses are valid and technically sound – Demonstrated safety up to 6.5 mk
- **The requested increase to excess reactivity does not impact the safety of the reactor**

RMC's safety analysis meets regulatory requirements



SCA – Radiation Protection

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Maximum Individual Effective Dose (mSv) to RMC workers

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
mSv	0	0.42	0.29	0	0	0	0	0	0.65*	0

RMC workers are designated as nuclear energy workers (NEW)
Regulatory limit = 50 mSv/yr

* Dose received by CNL contractors during refueling

RMC maintains doses low and ALARA



SCA – Environmental Protection

16

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CNSC staff's assessment:

- RMC releases small quantities of radioactive noble gases (Ar-41, Xe-133)
- Environmental Risk Assessment (2022): conservative dose estimate to member of the public and non-human biota – doses well below the public dose limit and conservative benchmarks, respectively
- No releases of hazardous substances
- No liquid effluent
- No environmental monitoring program required
- The environment and human health remain protected from RMC's operations

**RMC's environmental protection program
meets regulatory requirements**



SCA – Waste Management

17

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Waste Management Program:

- RMC has an effective program covering the characterization, segregation, and minimization of radioactive wastes generated on site
- RMC produces very small quantities of radioactive waste
- In August 2021, as part of RMC's refueling project, the reactor core was removed by CNL and transported to CNL's licensed facility at Chalk River for interim storage

Preliminary Decommissioning Plan:

- RMC submitted a revised preliminary decommissioning plan (PDP) in 2022
- CNSC staff reviewed the PDP against regulatory requirements and found it to be acceptable

RMC's waste management program meets regulatory requirements



Financial Guarantee

18

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- CNSC have assessed the proposed financial guarantee and confirm that it is adequate to meet the needs according the most up to date PDP
- RMC's financial guarantee instrument is a letter of commitment from the Deputy Minister of National Defense
- The SLOWPOKE-2 facility is owned by the Department of National Defence (DND) and the costs associated with the future decommissioning of this facility (estimated at \$13.6 M in 2022) will be paid by DND
- Should the Commission accept the proposed financial guarantee, the next revision would be expected in 2028

The proposed financial guarantee is valid
and sufficient to fund RMC's decommissioning obligations



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INDIGENOUS AND PUBLIC ENGAGEMENT

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Indigenous Engagement

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The RMC Campus is situated on the traditional homelands and treaty territories of many Indigenous Nations and communities.

CNSC staff engagement activities included:

July 2022	<ul style="list-style-type: none">Letters of notification sent to identified nations via e-mail
Dec 2022	<ul style="list-style-type: none">Curve Lake First Nation was awarded funding through CNSC's Participant Funding Program
Oct – Dec 2022	<ul style="list-style-type: none">Discussions with Curve Lake First Nation
Jan 2023	<ul style="list-style-type: none">Notified Indigenous Nations and communities of amendment to the applicationNotified Indigenous Nations and communities of Webinar on Research Reactor Licence Renewals
Feb 2023	<ul style="list-style-type: none">Webinar on SLOWPOKE Research Reactor Licence Renewals

Indigenous Nations and Communities:

- Mohawks of the Bay of Quinte
- Métis Nation of Ontario
- Curve Lake First Nation



Public Engagement

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Event	Date
Announcement for Notice of Hearing and PFP	June 6, 2022
CNSC Webinars (French and English)	February 1, 2023

Polling showed participants with a good or excellent understanding of the licence renewal increased from 33% to 89%.



Participant Funding and Interventions

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Participant funding recipients

Topics covered in interventions

Curve Lake First Nation

- Indigenous engagement and consultation over longer licence periods

Dr. David Winfield

- Application of a graded approach
- Safety analysis
- Operating limits and conditions
- Documents referenced in LCH



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LICENCE PERIOD

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Proposed Licence Period (1/2)

24

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Background and Assessment Criteria

- Research reactor licences of 20 years or longer are common internationally
- CNSC staff have a risk-informed process with criteria for recommending licence periods to the Commission

CNSC Staff Regulatory Oversight

- Compliance verification is not dependent on licence duration
- Key licensee documents updated periodically
- Process in place to keep compliance with regulatory framework updates

CNSC staff regulatory oversight activities
are not dependent on a licence term



Proposed Licence Period (2/2)

25

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Public Engagement

- CNSC employs a broad range of communication strategies and trust-building initiatives

Indigenous Engagement

- CNSC continues to build strong relationships with Indigenous Nations and communities

Commission Involvement

- Regulatory Oversight Report (every three years)
- Financial guarantee updates (every five years)
- Recommend RMC present mid-term report (at 10 years)

CNSC staff recommend a 20-year licence period



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CONCLUSIONS AND RECOMMENDATIONS

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Conclusions

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Based on the technical assessment of RMC's application and supporting information, CNSC staff conclude that:

- The application complies with the regulatory requirements
- The licensee's performance during the current licence period was satisfactory and met regulatory requirements



Recommendations

28

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CNSC staff recommend that the Commission:

- Conclude, pursuant to paragraph 24(4)(a) and (b) of the *Nuclear Safety and Control Act*, that the licensee:
 - i. is qualified to carry on the activities authorized by the licence
 - ii. 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
- **Renew the operating licence for a period of 20 years**, expiry date being June 30, 2043, and **include a requirement for RMC to provide a mid-term update to the Commission**
- **Approve RMC's request for an increase to its maximum allowable excess reactivity**
- **Accept the financial guarantee** as set out in CMD 23-H3
- **Delegate authority to CNSC staff** as set out in CMD 23-H3



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29

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