



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire

Record of Decision

In the Matter of

Applicant University of Alberta

Subject Application to Revoke the Non-Power Reactor
Licence and to Issue a Licence to Abandon for
the University of Alberta SLOWPOKE-2 Reactor
Facility

Date of
Decision May 25, 2018

RECORD OF DECISION

Applicant: University of Alberta

Address/Location: 2-51 South Academic Building,
Edmonton, Alberta, T6C 2G7

Purpose: Application to Revoke the Non-Power Reactor Licence
and to Issue a Licence to Abandon for the University of
Alberta SLOWPOKE-2 Reactor Facility

Application received: October 24, 2017

Date of decision: May 25, 2018

Location: Canadian Nuclear Safety Commission (CNSC)
280 Slater St., Ottawa, Ontario

Panel of Commission: M. Binder, President

Non-Power Reactor Licence: Revoked
Licence to Abandon: Issued

Table of Contents

1.0 INTRODUCTION..... 1
2.0 DECISION..... 2
3.0 ISSUES AND COMMISSION FINDINGS 3
 3.1 Application of Environmental Assessment Act, 2012..... 3
 3.2 Decommissioning and Abandonment of the UASR Facility 4
 3.3 Safeguards and Non-proliferation..... 6
 3.4 Release of the UASR Facility from CNSC Regulatory Control..... 6
4.0 CONCLUSION 8

1.0 INTRODUCTION

1. The University of Alberta (U of A) has applied to the Canadian Nuclear Safety Commission¹ (CNSC), under subsection 24(2) of the *Nuclear Safety and Control Act*² (NSCA), for the revocation of its Non-Power Reactor Licence (NPROL) and for the issuance of a licence to abandon for its SLOWPOKE-2 Reactor (UASR) facility. The UASR facility is located at the U of A Campus in Edmonton, Alberta. The current licence, NPROL-18.01/2023, expires on June 30, 2023.
2. The UASR was a 20-kilowatt thermal research reactor that was in operation from April 1977 until July 2017. This reactor was light-water cooled and moderated, and the reactor core contained slightly less than 1 kilogram of highly enriched uranium (HEU). The UASR was located in the basement of the Dentistry/Pharmacy building on the U of A campus and two other radioisotope laboratories in the immediate vicinity of the UASR comprised the facility.
3. In December 2016, the U of A applied for a licence to decommission the UASR facility. At that time, CNSC staff had recommended to the Commission to amend the UASR NPROL to authorize the decommissioning of the UASR facility. After holding a public hearing in writing, the Commission amended the NPROL for the UASR facility in September 2017 to authorize the requested decommissioning activities.³ All activities associated with the decommissioning of the UASR facility, such as defueling the reactor, removing reactor components and nuclear substances, as well as decontamination, were completed by October 2017. As part of this application, the U of A is proposing an end state objective of unrestricted future use of the UASR facility for non-CNSC regulated activities.

Issue

4. In considering the application, the Commission was required to decide:
 - a) what environmental assessment review process to apply in relation to this application; and
 - b) whether, through the decommissioning of the UASR facility, the U of A made adequate provision for the protection of the environment and the health and safety of persons to allow release of the facility from CNSC regulatory control and has met its requirements to be issued a licence to abandon for the facility.

¹ The *Canadian Nuclear Safety Commission* is referred to as the “CNSC” when referring to the organization and its staff in general, and as the “Commission” when referring to the tribunal component.

² Statutes of Canada (S.C.) 1997, chapter (c.) 9.

³ CNSC Record of Decision – University of Alberta, “Application for the University of Alberta to Authorize the Decommissioning of the SLOWPOKE-2 Reactor Facility”, September 22, 2017.

Hearing

5. Pursuant to section 22 of the NSCA, I established myself to preside a Panel of one Commission Member to hear the application. The Commission, in conducting a public hearing based on written materials, considered written submissions from the U of A (CMD 18-H101.1) and CNSC staff (CMD 18-H101).

2.0 DECISION

6. Based on its consideration of the matter, as described in more detail in the following sections of this *Record of Decision*, the Commission concludes that the U of A satisfies the conditions of subsection 24(4) of the NSCA. Therefore,

The Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, issues the Licence to Abandon a Non-Power SLOWPOKE-2 Reactor Facility, NPRAL-18.00/2018, to the University of Alberta for its SLOWPOKE-2 Reactor Facility, located in Edmonton, Alberta. The licence to abandon, NPRAL-18.00/2018, is effective May 25, 2018 and expires May 25, 2018.

The Commission, pursuant to subsection 24(4) of the *Nuclear Safety and Control Act*, concurrently revokes the Non-Power Reactor Licence, NPROL-18.01/2023, issued to the University of Alberta for its SLOWPOKE-2 Reactor Facility in Edmonton, Alberta.

7. With this decision, the Commission authorizes the release of the UASR facility from CNSC regulatory control through the issuance of the licence to abandon.
8. The Commission is satisfied that an EA under CEAA 2012 is not required in regard to the University of Alberta's licensing request. Furthermore, the Commission is of the opinion that, throughout the decommissioning of the UASR facility, the U of A made adequate provision for the protection of the environment and the health of persons and that that future environmental protection measures will not be required following the abandonment of the UASR facility. The Commission is satisfied that no additional EA was required for this application for the release of the UASR facility from CNSC regulatory control.
9. The Commission notes that, pursuant to subsection 14(4) of the *Class I Nuclear Facilities Regulations*,⁴ the U of A is required to retain records referred to in paragraphs 14(2)(a) to (d) and 14(3)(a) to (d) of the *Class I Nuclear Facilities Regulations* for 10 years after the expiry date of the licence to abandon by the Commission through this decision.

⁴ SOR/2000-204.

3.0 ISSUES AND COMMISSION FINDINGS

10. In making its licensing decision, the Commission considered a number of issues and factors relating to the U of A's request to release the UASR Facility from CNSC regulatory control. The Commission also considered the adequacy of the measures that the U of A had implemented in decommissioning the UASR facility for the protection of the environment and the health and safety of persons, and the proposed measures for the U of A's maintenance of the national security and international obligations to which Canada has agreed.
11. In its consideration of this matter, the Commission examined the completeness of the application and the adequacy of the information submitted by the U of A, as required by the NSCA, the *General Nuclear Safety and Control Regulations*⁵ (GNSCR), the *Class I Nuclear Facilities Regulations* and other applicable regulations made under the NSCA.
12. The Commission notes that, pursuant to section 7 of the GNSCR, since the U of A has applied for the revocation of its NPROL the licence application may incorporate by reference any information that is included in the U of A's current NPROL.
13. Details on the Commission's consideration of information submitted by the U of A in support of its application and of CNSC staff assessments in relation to this matter are provided in the following sections of the *Record of Decision*.

3.1 Application of *Environmental Assessment Act, 2012*

14. In coming to its decision, the Commission was first required to determine whether an Environmental Assessment (EA) under the *Canadian Environmental Assessment Act, 2012*⁶ (CEAA 2012), was required.
15. The application submitted by the U of A is for a licence to abandon and the revocation of its NPROL for the UASR facility. The Commission recognizes that the abandonment of a decommissioned non-power reactor facility is not considered as a designated project⁷ under CEAA 2012.
16. Based on the information examined by the Commission in this matter, the Commission is satisfied that the abandonment of a decommissioned nuclear reactor, as considered during this application, does not trigger an environmental assessment under CEAA 2012, and therefore an EA under CEAA 2012 was not required in this matter.
17. The Commission notes the EA that was conducted under the NSCA in 2017 for the licence amendment authorizing the decommissioning of the UASR facility. The Commission is satisfied that the U of A made adequate provision for the protection of the

⁵ SOR/2000-202.

⁶ Statutes of Canada (S.C.) 2012, chapter (c.) 19.

⁷ "Projects" as defined in section 66 of CEAA 2012.

environment and the health of persons and that future environmental protection measures will not be required following the abandonment of the UASR facility.

3.2 Decommissioning and Abandonment of the UASR Facility

18. In considering the U of A's application, the Commission assessed the results of decommissioning and environmental monitoring programs of the UASR facility as submitted in the U of A's application pursuant to sections 7 and 8 of the *Class I Nuclear Facilities Regulations*, and sections 3 and 4 of the GNSCR.
19. The Commission assessed the radiation protection practices during the decommissioning of the UASR facility. The U of A indicated in its written materials that UASR facility had been decontaminated and surveyed. The U of A submitted that no further measures or action levels would be required to ensure compliance with the *Radiation Protection Regulations*⁸ for the issuance of a licence to abandon for the UASR facility.
20. CNSC staff confirmed the information provided by the U of A and submitted that, following the decommissioning and decontamination of the UASR facilities, the dose rates and surface contamination were consistent with general background radiation outside of the facility below the maximum values for unrestricted use. CNSC staff provided the Commission with information about an inspection at the UASR facility on October 3, 2017 which verified that the decommissioning activities had been carried out safely and in compliance with the NSCA and its regulations. CNSC staff submitted that the final site clearance survey performed by the licensee, as well as the independent surveys and contamination monitoring performed by CNSC staff during the inspection, showed that the end state radiological conditions in the U of A's decommissioning plan were met.
21. The U of A submitted that the radiological doses received by workers during the decommissioning of the UASR facility were reported in the End-State Report. CNSC staff indicated in its written materials to the Commission that the radiological doses received by workers during the decommissioning work were extremely low, with a cumulative dose for all workers during decommissioning work of 0.26 mSv.
22. The Commission considered the environmental protection practices at the UASR facility during decommissioning activities. The U of A submitted that no cumulative, residual or harmful effects to the environment had occurred as a result of the decommissioning process or were expected from the abandonment of the UASR facility. The U of A further submitted that its environmental protection programs met CNSC regulatory requirements, that it had made adequate provision to protect the health and safety of persons and the environment, and that no additional measures or monitoring would be required following the abandonment of the UASR facility. The U of A also reported to the Commission that the detailed environmental performance data was included in the End-State Report.

⁸SOR/2000-203.

23. The U of A submitted that, during the decommissioning activities, indoor air and water quality were measured continuously. CNSC staff confirmed this information in its written materials and informed the Commission that, throughout the decommissioning process, there was no detectable concentration of airborne contaminants that was above the normal background reading. CNSC staff reported that the water from the reactor pool was treated to reduce the concentration of hazardous substances to below the City of Edmonton wastewater acceptance criteria⁹ before it was discharged into the sanitary sewer system.
24. CNSC staff submitted to the Commission information regarding the transfer of the UASR core from the UASR facility to the US Department of Energy (DOE) Savannah River, Georgia site. CNSC staff reported that the U of A submitted a transportation security plan that was accepted by CNSC staff, as well as a transport licence application, with the transport licence subsequently issued by a CNSC Designated Officer. CNSC staff submitted that the reactor core was loaded into a CNSC-certified transport flask in the presence of CNSC, IAEA and US DOE personnel, sealed by the IAEA for safeguards purposes and that the UASR core was safely shipped to the US DOE facility.
25. The Commission considered the waste management practices at the USAR facility. The U of A submitted that all radioactive and hazardous waste had been disposed of and confirmed that no radioactive waste would be stored at the UASR facility following the Commission's authorization to allow for its unrestricted use. The U of A further submitted that all information regarding the waste that resulted from the decommissioning process was described in the End-State Report.
26. CNSC staff indicated to the Commission in its written materials that it had reviewed the UASR End-State Report with respect to waste management and that the waste from the UASR facility was removed and disposed of appropriately and in accordance with regulatory requirements. CNSC staff further submitted that all radioactive materials from the UASR facility, other than the reactor core, were removed and shipped to the Chalk River Laboratories site in Chalk River Ontario as radioactive waste in Type A containers.
27. The U of A reported to the Commission that a site security plan was submitted to CNSC staff with respect to the decommissioning activities, including the removal of the UASR core. The U of A further submitted that since no prescribed equipment, prescribed information or nuclear substances remained at the UASR site, no specific measures for site security or site access control would be required for the abandonment of the UASR facility.
28. The Commission considered the U of A's Public Information Program. CNSC staff submitted that the U of A had maintained ongoing public consultation and communication activities. The Commission notes that there were no comments from the public with respect to regulatory concern regarding the decommissioning or abandonment of the USAR facility.

⁹ *Schedule B – Restricted Wastes Applicable to Sanitary and Combined Sewers*, City of Edmonton Bylaw 16200 – Schedule B, City of Edmonton, 2013.

29. The Commission notes that all decommissioning activities at the UASR facility were completed by October 2017 and that, since no decommissioning activities remain at the facility, a financial guarantee will no longer be required.

3.3 Safeguards and Non-proliferation

30. Canada has entered into a safeguards agreement with the IAEA pursuant to its obligations under the *Treaty on the Non-Proliferation of Nuclear Weapons*¹⁰ (NPT). The objective of the Canada/IAEA Safeguards Agreement INFCIRC/164¹¹ and INFCIRC/164/Add.1¹² is for the IAEA to provide assurance on an annual basis to Canada and to the international community that all declared nuclear materials are in peaceful, non-explosive uses and that there is no indication of undeclared nuclear materials or activities.
31. The Commission examined the compliance of the UASR decommissioning and abandonment work pursuant to the Canada/IAEA Safeguards Agreements. The Commission notes that the CNSC would be the governmental authority responsible for implementing those IAEA safeguards agreements. CNSC staff further noted that Article 5.a.(iii) of INFCIRC/164/Add.1 requires Canada to provide the IAEA with complementary access to the UASR facility within 24 hours.
32. The Commission noted that the U of A may also provide CNSC and IAEA inspectors access to the location on a voluntary basis. The Commission expects the IAEA to be provided with complementary access to the UASR facility under Canada's *Additional Protocol* to its IAEA safeguards agreements pursuant to the NPT, if requested.

3.4 Release of the UASR Facility from CNSC Regulatory Control

33. The Commission noted that a licensee is required to prepare an End-State Report documenting the physical, chemical and radiological condition of a facility at the end of decommissioning. The Commission assessed the End-State Report that was submitted by the U of A for this licence application. The U of A provided detailed information regarding the End-State Report, which covered factors such as the completion of decommissioning activities, radiation protection, environmental protection, waste management and lessons learned from the decommissioning process.
34. The Commission recognizes that the release of the decommissioned UASR facility from

¹⁰ *Treaty on the Non-Proliferation of Nuclear Weapons* (1968), IAEA, INFCIRC/140, 729 UNTS 169, entered into force 5 March 1970 (NPT).

¹¹ *Agreement Between the Government of Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons* (1972), IAEA, INFCIRC/164, entered into force 21 February 1972.

¹² *Protocol Additional to the Agreement Between Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons* (1998), IAEA, INFCIRC/164/Add.1, entered into force 8 September 2000.

- CNSC regulatory control would be achieved through the revocation of the U of A's current NPROL. The U of A submitted that all decommissioning activities for the UASR facility had been completed, with the reactor core, radioactive and hazardous wastes removed from the facility. The U of A further submitted that the entire UASR facility had been cleaned and surveyed to ensure that no radiological contaminants remained in the facility, with the End-State Report documenting the final state of the facility following decontamination.
35. CNSC staff submitted to the Commission that its review of the UASR facility End-State Report confirmed the completion of the decommissioning and decontamination activities associated with the UASR. CNSC staff further submitted that the report met all of the specifications of G-219, *Decommissioning Planning for Licensed Activities*.¹³ and that the structure and content were consistent with Annex D of CSA N294, *Decommissioning of facilities containing nuclear substances*.¹⁴ CNSC staff confirmed that all radiological conditions at the facility were commensurate with background dose rate levels. CNSC staff recommended in its written materials to the Commission that the U of A's NPROL be revoked, as there were no nuclear substances or residual radiological risks that would require a CNSC licence, and that the U of A be authorized the unrestricted use of the UASR facility by the issuance of a licence to abandon.
 36. The Commission notes that, during the current licence period, the U of A was not subject to cost recovery fees in accordance with subsection 2(a) of the *Cost Recovery Fees Regulations*.¹⁵
 37. The U of A submitted to the Commission that no expenses were anticipated with respect to the abandonment of the UASR facility and therefore no financial guarantee would be required for the issuance of a licence to abandon.
 38. The Commission noted that the UASR facility was subject to the *Nuclear Liability and Compensation Act*.¹⁶ (NLCA) and was designated as a "nuclear installation" under the *Nuclear Liability and Compensation Regulations*.¹⁷ (NLCR), therefore it required nuclear liability insurance during its operation. The Commission notes that, pursuant to the amended NLCR,¹⁸ the UASR facility will be revoked as a designated nuclear installation under the NLCR, effective as of the date of the issuance of the licence to abandon.
 39. The Commission notes that the U of A must retain all required records and documentation for a period of at least ten years, pursuant to the *Class I Nuclear Facilities Regulations*.

¹³ CNSC Regulatory Guide G-219, *Decommissioning Planning for Licensed Activities*, 2000.

¹⁴ N294-09, *Decommissioning of facilities containing nuclear substances*, CSA Group, 2009; Update 1, 2014.

¹⁵ SOR/2003-212.

¹⁶ S.C. 2015, c. 4, s. 120.

¹⁷ SOR/2016-88.


¹⁸ SOR/2017-285, s. 2.

40. Based on the information assessed by the Commission, the Commission is satisfied that all decommissioning and decontamination activities related to the UASR facility are complete. Further, the Commission concludes that the U of A End-State Report for the UASR facility is acceptable.

4.0 CONCLUSIONS

41. The Commission has considered the application for a licence to abandon for the UASR facility submitted by the University of Alberta. Based on its consideration of the information submitted, the Commission is satisfied that the application submitted by the University of Alberta meets the requirements of the NSCA, the GNSCR, *the Class I Nuclear Facilities Regulations* and other applicable regulations made under the NSCA.
42. The Commission has also considered the information in the submissions from the U of A and CNSC staff as set out in the material available for reference on the record for this hearing.
43. The Commission is satisfied that this licence application does not propose any activities that would require an EA under CEAA 2012, and therefore an EA pursuant to CEAA 2012 was not required in this matter.
44. Based on the information provided on the record for this hearing, the Commission is satisfied that the University of Alberta meets the test set out in subsection 24(4) of the *Nuclear Safety and Control Act*. That is, the Commission is satisfied that the UASR facility has been decommissioned in accordance with regulatory requirements and meets the conditions required for release from CNSC regulatory control. The Commission is also satisfied with the completeness and adequacy of the End-State Report provided by the U of A for its UASR facility.
45. Therefore, pursuant to section 24 of the *Nuclear Safety and Control Act*, the Commission issues the Licence to Abandon a Non-Power SLOWPOKE-2 Reactor Facility, NPRAL-18.00/2018, to the University of Alberta for its UASR facility in Edmonton, Alberta. The NRPAL is effective May 25, 2018 and expires May 25, 2018.
46. The Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, concurrently revokes the Non-Power Reactor Licence, NPROL-18.01/2023, issued to the University of Alberta for its SLOWPOKE-2 Reactor Facility in Edmonton, Alberta. With this decision, the Commission authorizes the release of the UASR facility site from CNSC regulatory control by the issuance of the licence to abandon.

47. The Commission expects the U of A to grant complementary access to the IAEA, if requested.
48. The U of A must retain all required records and documentation for a period of at least ten years, pursuant to the *Class I Nuclear Facilities Regulations*.



Michael Binder
President
Canadian Nuclear Safety Commission

MAY 25 2018

Date