



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire

Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant Canadian Light Source Incorporated

Subject Application to Amend the Class IB Particle
Accelerator Operating Licence

Hearing Date March 30, 2015

RECORD OF PROCEEDINGS

Applicant: Canadian Light Source Incorporated

Address/Location: 44 Innovation Boulevard, Saskatoon, Saskatchewan,
S7N 2V3

Purpose: Application to Amend the Class IB Particle Accelerator
Operating Licence

Application received: October 29, 2014 and March 11, 2015

Date of hearing: March 30, 2015

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

Members present: M. Binder, Chair

Licence: Amended

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1.0 INTRODUCTION

1. Canadian Light Source Incorporated (CLSI) has submitted a request to the Canadian Nuclear Safety Commission¹ (CNSC), under subsection 24(2) of the *Nuclear Safety and Control Act*² (NSCA), for two amendments to the Particle Accelerator Operating Licence for its Class IB synchrotron facility located in Saskatoon, Saskatchewan. The current licence, PA1OL-02.00/2022, expires on May 31, 2022.
2. CLSI is requesting a licence amendment to authorize the processing of nuclear substances at its synchrotron facility. The amendment would add the verb “process” to section IV) c) of the licence and the word “processing” to licence condition 5.3. When CLSI’s current licence was issued in May 2012, the processing of nuclear substances was not conducted at the synchrotron facility. However, CLSI recently constructed a laboratory in this facility for the processing of unsealed nuclear substances and is now seeking to amend its licence to authorize this proposed activity.
3. The second requested licence amendment is to update the address on CLSI’s licence for its synchrotron facility. The synchrotron facility is located on the campus of the University of Saskatchewan. Although the physical location of the facility has not changed, the road infrastructure surrounding the facility was recently modified by the City of Saskatoon, resulting in a change of street name and postal code for the facility.

Issue

4. In considering the application, the Commission was required to decide, pursuant to subsection 24(4) of the NSCA:
 - a) if CLSI is qualified to carry on the activity that the amended licence would authorize; and
 - b) if, in carrying on that activity, CLSI would make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

Panel

5. Pursuant to section 22 of the NSCA, the President of the Commission established a Panel of the Commission to review the application. The Commission, in making its decision, considered information presented for a hearing based on written materials held on March 30, 2015 in Ottawa, Ontario. The Commission considered written submissions

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.

from CLSI (CMD 15-H106.1) and CNSC staff (CMD 15-H106).

2.0 DECISION

6. Based on its consideration of the matter, as described in more detail in the following sections of this *Record of Proceedings*, the Commission concludes that CLSI has met the conditions of subsection 24(4) of the NSCA. Therefore,

the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, amends the Particle Accelerator Operating Licence PA1OL-02.00/2022 issued to Canadian Light Source Incorporated for its Class IB synchrotron facility located in Saskatoon, Saskatchewan. The amended licence, PA1OL-02.01/2022, is valid until May 31, 2022.

7. The Commission includes in the licence the conditions as recommended by CNSC staff in CMD 15-H106.

3.0 ISSUES AND COMMISSION FINDINGS

Authorization to Permit the Processing of Nuclear Substances

8. CNSC staff submitted that, while the construction of a laboratory does not require a licence, the processing of a nuclear substance is an activity for which a licence is required under paragraph 26(b)³ of the NSCA. The requirements related to site description and room design fall under paragraphs 3(1)(d) and 3(1)(l) of the *Nuclear Substances and Radiation Devices Regulations*⁴.
9. The amendment of CLSI's Class IB Particle Accelerator Operating Licence is required since the current licence does not authorize the licensee to process nuclear substances and this amendment can only be authorized by the Commission.
10. CLSI submitted that it had constructed an Industrial Science Laboratory in its synchrotron facility. CLSI proposes to use this room as a 'basic level laboratory.' CNSC staff noted that this is the lowest risk classification for a nuclear substance laboratory under CNSC GD-52, *Design Guide for Nuclear Substance Laboratories and Nuclear Medicine Rooms*⁵ and provided information about the low risk nature of this classification.

³ Paragraph 26(b) of the *Nuclear Safety and Control Act* states: "Subject to the regulations, no person shall, except in accordance with a licence, mine, produce, refine, convert, enrich, process, reprocess, package, transport, manage, store or dispose of a nuclear substance."

⁴ SOR/2000-207.

⁵ CNSC Regulatory Guidance Document GD-52, "Design Guide for Nuclear Substance Laboratories and Nuclear Medicine Rooms", 2010.

11. In its amendment application, CLSI submitted a complete nuclear substance laboratory design assessment form for a basic level laboratory, based on the approach provided in GD-52. CNSC staff submitted that it had also conducted an inspection at CLSI in May 2014 when the construction of the laboratory was nearly completed. During the inspection, CNSC staff assessed the laboratory against the design submitted by CLSI and concluded that, at that time, CLSI satisfied the design requirements detailed in GD-52. CNSC staff further noted that it has reviewed the final laboratory design and information submitted by CLSI in its licence amendment request and concluded that CLSI has satisfied all of the design guidelines provided in GD-52.
12. CNSC staff submitted that CLSI operates the Medical Isotope Project (MIP), a Class II electron accelerator facility, under a separate CNSC Class II Nuclear Facility Licence at the same location as the synchrotron accelerator facility. Using 95% enriched molybdenum-100 (^{100}Mo) targets, CLSI produces radioactive molybdenum-99 (^{99}Mo), the parent isotope of technetium-99m. After the ^{99}Mo has been extracted by an external laboratory, the proposed nuclear substance processing laboratory will allow CLSI to safely recover non-radioactive ^{100}Mo from the used targets and recycle it into new targets for the MIP. Since trace amounts of radioactive ^{99}Mo may still be present in the used targets, recycling them constitutes the processing of nuclear substances.
13. CLSI submitted that the laboratory would also be used to prepare radioactive samples for experiments carried out in the synchrotron beamline. These samples would typically be tailing pond samples from mines, containing uranium in the form of slurry. CNSC staff noted that the laboratory would process no more than 16 kBq of natural uranium at any time.
14. As part of its licence amendment application, CLSI submitted to CNSC staff a complete set of nuclear substance processing and contamination control procedures for the laboratory and proposed activities. CNSC staff reviewed this supporting documentation and concluded that it meets the requirements of subparagraph 4(a)(iii) of the *Radiation Protection Regulations*⁶.
15. CNSC staff reviewed the application and concluded that the proposed nuclear substance processing laboratory is a low risk activity and does not include any additional or unusual hazards.

Modification of CLSI Address

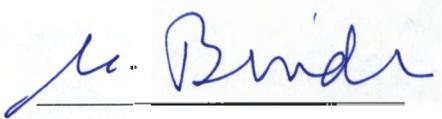
16. CLSI submitted that the City of Saskatoon recently modified road infrastructure on the campus of the University of Saskatchewan. Although the physical location of the CLSI facility did not change, its street address changed from 101 Perimeter Road, Saskatoon, Saskatchewan, S7N 0X4 to 44 Innovation Boulevard, Saskatoon, Saskatchewan, S7N 2V3. CLSI requested an update to the address on its licence.

⁶ SOR/2000-203.

17. CNSC staff submitted that it had reviewed the address change request and concluded that the request is purely administrative in nature.

4.0 CONCLUSION

18. The Commission has considered the information and submissions from CLSI and CNSC staff and is satisfied that the requested amendments will not adversely impact the safety of CLSI's Class IB synchrotron facility operations.
19. The Commission is satisfied that CLSI is qualified to carry out the proposed activities and would make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.



Michael Binder
President,
Canadian Nuclear Safety Commission

MAR 30 2015

Date