



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 by Canadian Light Source  
Incorporated to Amend its Particle Accelerator  
Operating Licence

Public Hearing Date June 8, 2011

## RECORD OF PROCEEDINGS

Applicant: Canadian Light Source Incorporated

Address/Location: 101 Perimeter Road, Saskatoon, Saskatchewan, S7N 0X4

Purpose: Application by Canadian Light Source Incorporated to Amend its Particle Accelerator Operating Licence

Application received: March 10, 2011

Date of public hearing: June 8, 2011

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

Members present: M. Binder, President                      R. J. Barriault  
D.D. Tolgyesi    A. Harvey  
M. J. McDill

Secretary: M.A. Leblanc

Recording Secretary: D. Major

General Counsel: L. Thiele

<b>Applicant Represented By</b>	<b>Document Number</b>
Dr. J. Hormes, Executive Director Dr. M. deJong, Director of Accelerators Dr. M. Benmerrouche, Manager, Health, Safety & Environment	CMD 11-H5.1 CMD 11-H5.1A CMD 11-H5.1B
<b>CNSC staff</b>	<b>Document Number</b>
A. Régimbald K. Murthy Dr. J. Plante	CMD 11-H5

**Licence:** Amended

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## Introduction

1. Canadian Light Source Incorporated (CLSI) has applied to the Canadian Nuclear Safety Commission<sup>1</sup> (CNSC) for amendments to the Canadian Light Source (CLS) Particle Accelerator Operating Licence located in Saskatoon, Saskatchewan. The current licence, PA1OL-02.03/2012, expires on May 31, 2012.
2. In order to perform activities related to the proposed medical isotope project, CLSI has requested an authorization to amend the CLSI Safety Report to reflect modifications to the occupancy and the access control to the area identified under PA1OL-02.03/2012 as Experimental Area 2 (EA2). This area is classified as a radiation area with access restrictions when the existing 250MeV (Class IB) linear accelerator is operating. A request for a revision to the “CLSI Quality Assurance Manual” referred to in CLSI’s class IB licence for its synchrotron facility has also been submitted by CLSI and is being considered in this licence amendment application hearing.
3. CLSI has been selected by Natural Resources Canada to participate in the Non-reactor based Isotope Supply Contribution Program (NISP) to produce molybdenum-99. As part of the NISP, CLSI proposes to install a 35MeV linear accelerator to produce the isotope on the existing CLSI Class IB site. The proposed medical isotope project (which is not part of this licence amendment request), would include the construction and operation of a linear accelerator and associated hot cells to process the medical isotopes, would be classified and licensed as a Class II nuclear facility. Applications with respect to Class II nuclear facilities are considered for authorization by a Designated Officer, separately from the Class IB nuclear facilities.
4. The CLS facility presently consists of a 2.9GeV electron synchrotron accelerator, housing the booster, the storage rings and most of the beamlines.

## Issue

5. In considering the application, the Commission was required to decide, pursuant to subsection 24(4) of the *Nuclear Safety and Control Act*<sup>2</sup>:
  - 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.

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

<sup>2</sup> Statutes of Canada (S.C.) 1997, chapter (c.) 9.

### Public Hearing

6. The Commission, in making its decision, considered information presented for a public hearing held on June 8, 2011 in Ottawa, Ontario. The public hearing was conducted in accordance with the *Canadian Nuclear Safety Commission Rules of Procedure*<sup>3</sup>. During the public hearing, the Commission considered written submissions and heard oral presentations from CNSC staff (CMD 11-H5) and CLSI (CMD 11-H5.1). No interventions were submitted to the Secretariat regarding this licence amendment.

### **Decision**

7. 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 is qualified to carry on the activity that the amended licence will authorize. The Commission is of the opinion that CLSI, in carrying on that activity, will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed. Therefore,

the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, amends the Particle Accelerator Operating Licence PA1OL-02.03/2012 issued to Canadian Light Source Incorporated for its synchrotron facility located in Saskatoon, Saskatchewan. The amended licence, PA1OL-02.04/2012, is valid until May 31, 2012.

### **Issues and Commission Findings**

8. In making its licensing decision, the Commission considered a number of issues relating to the proposed licence amendment requests and the adequacy of CLSI's proposed measures for protecting the environment, the health and safety of persons, national security and international obligations to which Canada has agreed.

### *Safety Report*

9. CLSI representatives requested revisions to the Safety Report in order to release Experimental Areas 2 (EA2) from the current 250 MeV Linac Access Control Interlock System (ACIS) and to allow occupancy of the area while the 250MeV linear accelerator is operating. CLSI representatives stated that modifications to the linear accelerator ACIS and installation of additional shielding are required. CLSI

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<sup>3</sup> Statutory Orders and Regulations (SOR)/2000-211.

representatives described the required modifications and explained the shielding requirements, as determined by their calculations, as well as the strategy for installation of the shielding.

10. CNSC staff reviewed the proposed revised shielding analysis for EA2 and the revised drawings of the control access zone of the 250MeV linear accelerator, which are part of the proposed revised CLSI Safety Report. The project description for the medical isotope project was also reviewed by CNSC staff. CNSC staff performed independent shielding analysis for the worst case scenario and for normal operation. CNSC staff confirmed that the results from the independent shielding analysis agree with CLSI's data. CNSC staff indicated that CLSI will perform radiation measurements to validate its calculations and will submit the measurements for CNSC staff review prior to being allowed occupancy in EA2 while the 250MeV linear accelerator is operating.
11. The Commission enquired about the validation of the adequacy of installed shielding. CNSC staff explained that a simulation is used to establish the shielding design, and that measurements are taken in the field, using proper precautions to avoid unnecessary exposures, to assess the adequacy of installed shielding.
12. CNSC staff also reviewed CLSI's proposed changes to access to area EA2 and found that the proposed modifications to area EA2 occupancy and access control would have no adverse impact on the safety of workers, the public or the environment.
13. Based on the information provided, the Commission is of the opinion that the application for the amendment of CLSI's operating licence to include the revised version of the CLSI's Safety Report meets CNSC regulatory requirements.

#### *Quality Assurance Manual*

14. In a separate request, CLSI applied for a revision of the CLSI Quality Assurance Manual. CLSI explained that several deficiencies of the Quality Assurance (QA) program were identified following an event that occurred in October 2009. In CNSC staff's review of the QA program, weaknesses in documentation and implementation of some core processes were identified. CLSI's investigation concurred with CNSC staff's review. CLSI stated that they revised their core quality management processes and procedures covered by the QA Manual.
15. The Commission asked several questions about the 2009 event (an unusual steering of the electron beam). The CLSI representative provided technical details on this incident. CNSC staff commented that the workers in the area received radiation doses well below regulatory limits, most of them being undetectable.
16. CNSC staff stated that they thoroughly reviewed the second revision of the QA manual and that it met CNSC staff's expectations. CNSC also stated that the implementation of the revised CLSI Quality Assurance Manual, Revision 7, will be verified prior to

CLSI's licence renewal in 2012.

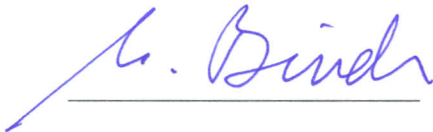
17. Based on the above information, the Commission concludes that the document entitled "CLSI Quality Assurance Manual, Revision 7" meets CNSC regulatory requirements and is sufficient to assure continued adequate performance at the facility.

**Application of the *Canadian Environmental Assessment Act***

18. Before making a licensing decision, the Commission must be satisfied that all applicable requirements of the *Canadian Environmental Assessment Act*<sup>4</sup> (CEAA) have been fulfilled.
19. The Commission examined the proposed licence amendments and determined that they do not constitute a project. Therefore, an environmental assessment is not required pursuant to subsection 5(1) of the CEAA.

**Conclusion**

20. The Commission has considered the information and submissions of CLSI and CNSC staff as presented in the material available for reference on the record.
21. The Commission is satisfied that the applicant meets the requirements of subsection 24(4) of the *Nuclear Safety and Control Act*. That is, the Commission is of the opinion that CLSI is qualified to carry on the activity that the amended licence will authorize and that it will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed, with the licence amended as requested.
22. The Commission therefore amends, pursuant to section 24 of the *Nuclear Safety and Control Act*, the Particle Accelerator Operating Licence issued to Canadian Light Source Incorporated for its synchrotron facility, located in Saskatoon, Saskatchewan. The amended licence, PA1OL-02.04/2012, remains valid until May 31, 2012.



JUL 28 2011

Michael Binder  
President,  
Canadian Nuclear Safety Commission

Date

<sup>4</sup> S.C. 1992, c. 37.