



**Written submission from
Canadian Light Source Inc.**

**Mémoire de
Centre canadien de rayonnement
synchrotron Inc.**

In the Matter of

À l'égard de

**Application to change the licensing basis for
its Class 1B particle accelerator facility**

**Demande visant à modifier le fondement
d'autorisation de son installation de catégorie
IB dotée d'un accélérateur de particules**

Public Hearing - Hearing in writing based on
written submissions

Audience Publique - Audience fondée sur des
mémoires

October 2021

Octobre 2021



June 14, 2021

Ms. Leah Shuparski-Miller
Senior Project Officer
Accelerators and Class II Facilities Division
Canadian Nuclear Safety Commission
P.O. Box 1046, Station B
OTTAWA, ON K1P 5S9

Dear Ms. Shuparski-Miller,

Re: Electron Source Laboratory Project – Phase I

CLSI is requesting an amendment for the Class 1B Operating Licence PA1OL-02.01/2022 in order to proceed with Phase I of the development of an Electron Source Laboratory (ESL).

The development of the ESL has been initiated by CLSI to improve operational reliability for the synchrotron facility and create a research laboratory for the development and testing of new electron sources. The project will be completed in 3 phases [1].

The first phase of the project requires removal of an area in the CLS facility sub-basement level from the current lock-up area for the CLS linear accelerator. As this change impacts the safety envelope of the Class 1B operating licence, an amendment to the licence is required.

Further development of the ESL is expected to proceed through the Class II licencing process for subsequent phases. Construction and Installation of ESL related facilities and equipment required to support the ESL Project will not proceed until approved by CNSC.

A hazard analysis of phase I of the project has been completed. The risks identified and their mitigations are summarized below.

The risks identified included:

1) Existing Radiation Shielding Inadequate for Occupancy of ESL

Mitigation:

- a) Use an analytical model to assess the radiation dose rate in the occupied areas during normal and accident conditions [3]
- b) Perform radiation measurements to verify radiation dose rate in occupied area
- c) Routine radiation surveys during normal operation

Application for Phase I of Electron Source Laboratory

2) ESL Phase I Development In Sub-basement Not in Compliance with National Building and Fire Codes

Mitigation:

- a) Complete Code Compliance Review to assess impact of ESL shielding installation on egress [4, 5]
- b) Complete third-party review of Code Compliance Review noted in a) [5]
- c) Obtain CNSC approval for changes proposed in Code Compliance Review [7]
- d) Implement recommendations from code compliance review

CLSI is developing the two documents below to reflect the new requirements identified in the Code Compliance Review:

- “Sub-Basement Restricted Transient Materials Zone Procedure” CLSI Tech. Doc. 11.7.54.5
- “Subbasement Occupancy” CLSI Tech. Doc. 8.7.54.4

Once the safety case for Phase I of the Electron Source Laboratory Project is accepted by the CNSC, CLSI will revise the following documents to reflect the planned change:

- “CLSI Safety Report” CLSI Tech. Doc 11.18.40.2
- “Fire Protection Program” CLSI Tech. Doc. 11.12.54.1

We have provided the documentation we believe necessary to show that Phase I of the Electron Source Laboratory can be carried out safely at the CLS Facility. We look forward to your response, and will provide additional information or answer any questions you may have when requested.

Kind Regards,

Grant Cubbon B.Sc., RRPT
Manager – Health, Safety & Environment

cc: Robert Lamb, Executive Director, CLSI

Attachments

- [1] “Electron Source Lab Project Overview P2018-23” CLSI Tech Doc. 39.12.21.1 Rev 0
- [2] “Electron Source Laboratory Hazard and Risk Assessment” CLSI Tech Doc 39.18.53.1 Rev 0
- [3] “Electron Source Laboratory Radiation Shielding Test Plan” CLSI Tech Doc 11.7.53.18 Rev 0
- [4] “Code Compliance Review (PLC-CLS-P1912-001-CA-2)”
- [5] “CLSI Electron Source Laboratory Shielding Drawings (20024)”
- [6] “Third Party Review (4O2003090-701-R0_CLSI_TPR)”
- [7] “E-DOCS-#6535227-v1-EDAD_Staff_Review_of_CLS_Updated_Code_Compliance_Review_for_the_Electron_Source_Lab_Shielding_Installation”