Canadian Nuclear Safety Commission

Commission canadienne de sûreté nucléaire

Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant: TRIUMF Accelerators Inc.

Subject: Application to Amend the Particle Accelerator Operating Licence for its Facility Located in Vancouver, British Columbia to Include Low current Irradiations of Uranium Targets

Hearing Date: November 19, 2009

Canada

RECORD OF PROCEEDINGS

Applicant:	TRIUMF Accelerators Inc.
Address/Location:	4004 Wesbrook Mall, Vancouver, British Columbia, V6T 2A3
Purpose:	Application to amend the Particle Accelerator Operating Licence for its facility located in Vancouver, British Columbia to include low current irradiations of uranium targets
Application received:	June 22, 2009 and August 21, 2009
Date of hearing:	November 19, 2009
Location:	Canadian Nuclear Safety Commission (CNSC) 280 Slater St., Ottawa, Ontario
Members present:	M. Binder, Chair
Secretary:	K. McGee
Recording Secretary:	M. Young

Licence: Amended

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Introduction

1. TRIUMF Accelerators Inc. (TRIUMF) has applied to the Canadian Nuclear Safety Commission[1] (CNSC) for an amendment to its Class IB Particle Accelerator Operating Licence for its TRIUMF particle accelerator facility located in Vancouver, British Columbia. The current licence, PA1OL-01.01/2012, expires on March 31, 2012.

2. In 2008, TRIUMF's operating licence was amended to include a limited, one-time irradiation test using uranium oxide targets at its Isotope Separator and Accelerator (ISAC) facility. TRIUMF has applied to amend its operating licence to perform longer-term irradiations on an ongoing basis at its ISAC facility.

Issue

3. In considering the application, the Commission was required to decide, pursuant to subsection 24(4) of the *Nuclear Safety and Control Act*[2] (NSCA):

   a) if TRIUMF is qualified to carry on the activity that the amended licences would authorize; and

   b) if in carrying on that activity, TRIUMF 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.

Hearing

4. Pursuant to section 22 of the NSCA, the President of the Commission established a panel of the Commission to hear this matter.

5. The Commission, in making its decision, considered information presented for a hearing held on November 19, 2009 in Ottawa, Ontario. During the hearing, the Commission considered written submissions from CNSC staff (CMD 09-H125) and TRIUMF (CMD 09-H125.1).

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 TRIUMF has met the conditions of subsection 24(4) of the NSCA. Therefore,

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[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] S.C. 1997, c. 9.

the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, amends the Particle Accelerator Operating Licence issued to TRIUMF Accelerators Inc. for its TRIUMF particle accelerator facility located in Vancouver, British Columbia. The amended licence, PA1OL-01.02/2012, remains valid until March 31, 2012.

7. The Commission includes in the licence the conditions as recommended by CNSC staff in CMD 09-H125.

Issues and Commission Findings

Qualifications and Protection Measures

8. TRIUMF presented information regarding its request. TRIUMF stated that the one-time test of operation with an actinide[3] (uranium) target was successfully completed in September 2008. TRIUMF explained that the test used a low proton beam current of 1-2 microamperes (μA) for a short duration, 300 μA·hours (μA·h).TRIUMF stated that the test established that the safety envelope for the experiment is conservative. TRIUMF provided a copy of its test results, the *Actinide Target Test Report* and an addendum to its *Actinide Target Safety Analysis Report* in its submission.

9. TRIUMF requested that its operating licence be amended in order to perform longer-term irradiations of 1000 μA·h with a maximum proton beam current of 2 μA. TRIUMF stated that these further experiments will continue to be performed within the defined safety envelope.

10. CNSC staff stated that it reviewed TRIUMF's request, including TRIUMF's addendum to the *Actinide Target Safety Analysis Report*. CNSC staff stated that TRIUMF has adequately covered safety management for the proposed longer-term irradiations and the new tests will present no hazard outside of the defined and acceptable safety envelope. CNSC staff noted that TRIUMF has specified measures and strategies to reduce the effects of the hazards associated with the operation.

11. CNSC staff stated that TRIUMF will implement appropriate dose control and source control measures to ensure that doses are within the framework of TRIUMF's radiation protection program. CNSC staff stated that the measures implemented by TRIUMF, including charcoal filtration, will ensure that the dose to the public in the event of the worst case accident scenario will not exceed 0.0075 millisieverts (mSv), or 0.75% of the regulatory dose limit of 1 mSv/year. The dose to workers will also not exceed the regulatory dose limit of 50 mSv/year.

[3] Group of elements with atomic numbers between 89 and 103 that includes uranium.

12. CNSC staff stated that in order to ensure safe operation, TRIUMF has committed to implementing additional safety measures, such as the use of specialized respiratory equipment, additional detection and sampling methods, monitoring for migration of volatile species and additional procedural changes to alarm responses and access control. CNSC staff further stated that TRIUMF is providing additional training to workers before the next test takes place. CNSC staff stated that the proposed safety measures and additional worker training are adequate for the proposed operation.

13. For compliance verification purposes, CNSC staff proposed that a licence condition requiring TRIUMF to report after it performs irradiation of targets in the ISCA facility to 1000 μA·h be added to Section V of the operating licence.

14. CNSC staff noted that the requested amendment to the operating licence does not have any impact on TRIUMF's security program and does not affect safeguards requirements.

Application of the *Canadian Environmental Assessment Act*

15. Before making a licensing decision, the Commission must be satisfied that all applicable requirements of the *Canadian Environmental Assessment Act*[4] (CEAA) have been fulfilled.

16. CNSC staff reported that it had completed an Environmental Assessment (EA) determination. CNSC staff stated that there was no requirement for an EA pursuant to subsection 5(1) of the CEAA. CNSC staff noted that the EA for this project was completed in April, 1997 and no further EA is required.

17. The Commission is satisfied that all applicable requirements of the CEAA have been fulfilled.

M. Binder

NOV 19 2009

Michael Binder
President,
Canadian Nuclear Safety Commission

Date

[4] S.C. 1992, c. 37.