



Canadian Nuclear  
Safety Commission

Commission canadienne  
de sûreté nucléaire

# Record of Proceedings, Including Reasons for Decision

In the Matter of

Licensee Shield Source Inc.

Subject A Licence Amendment Under Section 25 of the  
*Nuclear Safety and Control Act*

Hearing  
Date May 2, 2012

## RECORD OF PROCEEDINGS

Licensee: Shield Source Inc.

Address/Location: 925 Airport Road, RR#5 Municipal Airport,  
Peterborough, Ontario K9J 6X6

Purpose: A licence amendment under Section 25 of the *Nuclear Safety and Control Act*

Application received: April 27, 2012

Date of hearing: May 2, 2012

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

Members present: M. Binder, Chair

Secretary: M. Leblanc  
Recording Secretary: M. Young  
Senior General Counsel: J. Lavoie

**Licence:** Amended on the Commission's own motion

## Table of Contents

<b>Introduction</b> .....	1
<b>Decision</b> .....	2
<b>Issues and Commission Findings</b> .....	2
<i>Licence Limit Exceedance and Suspended Operations</i> .....	2
<i>Protection of the Public, Workers and the Environment</i> .....	3
<i>Proposed Amendment to SSI's Operating Licence</i> .....	4
<b>Application of the <i>Canadian Environmental Assessment Act</i></b> .....	5

## Introduction

1. Shield Source Inc. (SSI) operates a Class IB nuclear substance processing facility located in Peterborough, Ontario. The current nuclear substance processing facility operating licence, NSPFOL-12.00/2012, was issued on August 1, 2009 and expires July 31, 2012. In September 2011, SSI applied to the Canadian Nuclear Safety Commission<sup>1</sup> (CNSC) to have its operating licence renewed.
2. SSI processes tritium gas to produce gaseous tritium light sources (GTLS) and manufactures radiation devices containing GTLS. The facility receives tritium gas that is used to fill glass tubes to produce GTLS. Both the GTLS and the devices are distributed in Canada and internationally. SSI does not reclaim or recycle tritium from expired or old devices; all old or expired GTLS that are received by SSI are transferred to a facility that is authorized to recycle or dispose of them.
3. SSI leases space in a hangar building at the Peterborough Municipal Airport for the facility. The licensed facility occupies approximately 300 square metres (m<sup>2</sup>) of floor space. Approximately 170 m<sup>2</sup> is used in the manufacturing of GTLS, assembly of radiation devices, storage and packaging, and distribution activities. The additional space is used for administration purposes. There are twenty-four persons employed by SSI at this location. The only nearby residence is located across the road, 220 m from the facility.
4. On March 28, 2012, SSI suspended its tritium gas filling operations at the facility to investigate a potential error in the computer software used to calculate the data for total tritium released to air from its stack. On April 11, 2012, this third party investigation revealed that SSI had been under-reporting the effluent values. SSI reported that it exceeded the licence limit for total tritium released to air for both 2010 and 2011.
5. The current effluent release limits are designed so that exceeding them does not result in an immediate impact on the public or the environment. Although SSI exceeded the licence limit for total tritium effluent discharge, the health and safety of the public and the environment have not been compromised.
6. The Commission was to hold a public hearing on May 2, 2012 to consider SSI's application for licence renewal. Due to the exceeded licence limits, the Commission decided to cancel the May 2 hearing and consider a proposal to amend SSI's licence on its own motion, pursuant to section 25 of the *Nuclear Safety and Control Act*<sup>2</sup> (NSCA). The proposed amended licence would expire on December 31, 2012 and includes restrictions on tritium processing activity. Furthermore, SSI would not be able to resume its operations without prior approval from the Commission.

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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.

### Issue

7. Pursuant to subsection 25 of the NSCA, the Commission may, on its own motion, renew, suspend in whole or in part, amend, revoke or replace a licence under the prescribed conditions. The conditions under which it may do so are outlined in subsection 8(2) of the *General Nuclear Safety and Control Regulations*<sup>3</sup>.

### Hearing

8. 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 held on May 2, 2012 in Ottawa, Ontario. During the hearing, the Commission considered written submissions from CNSC staff (CMD 12-H116) and SSI (CMD 12-H116.1).

### **Decision**

9. Based on its consideration of the matter, as described in more detail in the following sections of this *Record of Proceedings*,

the Commission, pursuant to section 25 of the *Nuclear Safety and Control Act*, amends the nuclear substance processing facility operating licence, NSPFOL-12.00/2012, issued to Shield Source Inc. for its facility located in Peterborough, Ontario. The amended licence, NSPFOL-12.01/2012, is valid until December 31, 2012.

10. The Commission includes in the licence the conditions as recommended by CNSC staff in CMD 12-H116.

### **Issues and Commission Findings**

#### *Licence Limit Exceedance and Suspended Operations*

11. CNSC staff stated that, in the summer of 2011, it requested that SSI conduct independent effluent monitoring to confirm the accuracy of its monitoring results. SSI had a qualified third party conduct monitoring from December 2011 to January 2012.
12. CNSC staff stated that the preliminary results, which were provided to SSI on March 27, 2012, indicated a potential error in the computer software used to calculate data for total tritium releases. SSI immediately informed CNSC staff of the issue and voluntarily suspended its tritium gas filling operations.

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<sup>3</sup> Statutory Orders and Regulations (SOR)/2000-202.

13. CNSC staff stated that SSI submitted an interim report on April 11, 2012, which confirmed that SSI had under-reported the tritium effluent discharges from the stack. CNSC staff noted that SSI reported that it had exceeded its licence limit of 500 terabecquerels per year (TBq/y) for total tritium released to atmosphere for 2010 and 2011, with 1338 and 1261 TBq/y, respectively. CNSC staff further noted that the third party review also confirmed that SSI had been correctly measuring and reporting tritium oxide emissions.
14. CNSC staff stated that exceeding the licence limit was a serious breach of the licence. CNSC staff noted that it reviewed the interim report from SSI and concluded that more information would be needed in order to understand the technical and organization factors that led to the under-reporting of tritium discharges. As such, CNSC staff required SSI to conduct a more thorough investigation and proposed that SSI's tritium gas filling operations should remain suspended until all appropriate investigations are completed.

*Protection of the Public, Workers and the Environment*

15. CNSC staff stated that SSI's current effluent release limits were designed so that exceeding them would not result in an immediate impact on the public or the environment. CNSC staff noted that the health and safety of the public and the environment were not compromised even though SSI exceeded the licence limit for total tritium effluent discharge, as the releases were still well below regulatory limits.
16. CNSC staff explained that SSI has environmental monitoring and dosimetry programs in order to determine the potential doses to the public, workers and the environment. CNSC staff noted that these programs are independent of the tritium effluent emission data and, as such, the recent errors in the reported tritium effluent did not result in any changes to the previously reported doses to workers and the public. CNSC staff further stated that SSI's environmental monitoring data is analysed by a qualified third party and has also been verified by CNSC staff and the independent CNSC Tritium Studies Project. CNSC staff further noted that SSI's worker doses are monitored through independent bioassays.
17. CNSC staff reported that that doses to the public were well below the regulatory limit of 1 millisievert per year (mSv/yr) in 2010 and 2011, with values of 0.014 and 0.0099 mSv/y, respectively. CNSC staff further reported that doses to workers were well below the regulatory limit of 50 mSv/y for 2010 and 2011, with maximum effective doses of 1.99 and 1.75 mSv/y, respectively.
18. Based on the above information, the Commission is satisfied that the health and safety of the public and the environment have not been compromised by the licence limit exceedances. The Commission is satisfied that the doses to workers and the public as a result of SSI's operations remain well below regulatory limits.

*Proposed Amendment to SSI's Operating Licence*

19. SSI's current operating licence authorizes SSI to possess, transfer, use, process, manage and store tritium. In light of the recent developments, SSI voluntarily suspended the processing of tritium.
20. CNSC staff expressed that if SSI were to process tritium at this time, the licence limit could once again be exceeded. CNSC staff noted that, of the various activities carried out by SSI, the tritium gas filling operation was the operation that resulted in the licence limit exceedances. As such, CNSC staff stated that SSI meets the requirements of section 24(4) of the NSCA only when it is not processing tritium.
21. CNSC staff proposed that SSI should not be allowed to process tritium until the causes for the exceedances are understood and corrected. CNSC staff expressed the view that this could be achieved within a period of six months. CNSC staff outlined its expectations for the investigations, stating that SSI must do the following:
  - a) complete a root cause analysis by a qualified third party that includes the technical and organizational factors behind the errors;
  - b) submit a comprehensive corrective action plan to address the findings of the root cause analysis;
  - c) implement the corrective actions to demonstrate the facility can operate within the licence limits; and
  - d) revise all affected previous annual and environmental reports to reflect corrected data, and submit to CNSC for review and make available to general public.
22. Section 25 of the NSCA allows the Commission to amend a licence on its own motion. The conditions under which it may do so, as outlined in subsection 8(2) of the *General Nuclear Safety and Control Regulations*<sup>4</sup>, include paragraph 8(2)(c), where "the licensee has failed to comply with the Act, the regulations made under the Act or the licence." In this case, SSI has failed to comply with its licence because it exceeded the licence limit for tritium releases to the atmosphere.
23. CNSC staff recommended that the Commission amend SSI's licence on its own motion in order to prevent SSI from processing tritium. CNSC staff proposed the following amendment to licence condition 2.1:
  - a) The licensee shall not process tritium gas for the purpose of producing gaseous tritium light sources without the prior approval of the Commission.
24. CNSC staff proposed that the amendment of SSI's operating licence should take effect immediately and remain in place until such a time as the Commission would have the required updated and accurate information from the licensee on which to consider an application for an operating licence after a public hearing pursuant to subsection 40(5) of the NSCA.

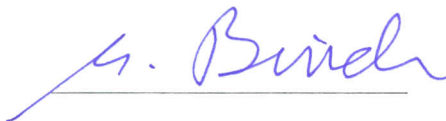
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<sup>4</sup> Statutory Orders and Regulations (SOR)/2000-202.

25. CNSC staff stated that it would not be in a position to present recommendations on SSI's application for renewal of its operating licence until CNSC staff could review SSI's root cause analysis report and corrective action plan, noting that these investigations were ongoing. CNSC staff expressed that it should be in a position to present its revised recommendations to the Commission by October 2012. As such, CNSC staff proposed that the amended licence be effective until December 31, 2012.
26. SSI agreed with the proposal from CNSC staff to extend the licence to December 31, 2012 and prohibit the processing of tritium gas for the purpose of producing gaseous tritium light sources without the prior approval of the Commission.
27. The Commission concurs with CNSC staff's proposed licence amendment. The Commission accepts the view of CNSC staff that SSI meets the requirements of section 24(4) of the NSCA only when it is not processing tritium. The Commission notes that it would consider an application for an operating licence in the context of a public hearing once SSI has completed its investigations to the satisfaction of CNSC staff.
28. Based on the above information, the Commission, pursuant to section 25 of the NSCA, amends the nuclear substance processing facility operating licence, NSPFOL-12.00/2012, issued to Shield Source Inc. for its facility located in Peterborough, Ontario. The amended licence, NSPFOL-12.01/2012, is valid until December 31, 2012.

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

29. Before making a licensing decision, the Commission must be satisfied that all applicable requirements of the *Canadian Environmental Assessment Act*<sup>5</sup> (CEAA) have been fulfilled.
30. CNSC staff reported that it had completed an Environmental Assessment (EA) determination. With respect to the new licence condition, CNSC staff explained that the amended licence would not enable the licensee to carry out any project, for the purposes of paragraph 5(1)(d) of the CEAA. With respect to the change to the licence term, CNSC staff explained that a licence renewal is not a trigger under the *Law List Regulations*<sup>6</sup> made under the CEAA, and therefore does not give rise to the need for an environmental assessment. CNSC staff stated that there was no requirement for an EA pursuant to subsection 5(1) of the CEAA.
31. Based on the above information, the Commission is satisfied that all applicable requirements of the CEAA have been fulfilled.



Michael Binder  
President,  
Canadian Nuclear Safety Commission

MAY 02 2012

Date

<sup>5</sup> S.C. 1992, c. 37.

<sup>6</sup> SOR/94-636