



Canadian Nuclear  
Safety Commission

Commission canadienne  
de sûreté nucléaire

# Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant SRB Technologies (Canada) Inc.

Subject Application to Renew the Class IB Nuclear  
Substance Processing Facility Operating  
Licence for the Gaseous Tritium Light Source  
Facility in Pembroke, Ontario

Public Hearing  
Dates February 17 and May 19, 2010

**RECORD OF PROCEEDINGS**

Applicant: SRB Technologies (Canada) Inc.

Address/Location: 320-140 Boundary Road, Pembroke, Ontario K8A 6W5

Purpose: Application to renew the Class IB Nuclear Substance Processing Facility Operating Licence for the gaseous tritium light source facility in Pembroke, Ontario

Application received: October 28, 2009

Dates of public hearing: February 17 and May 19, 2010

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

Members present: M. Binder, Chair R. J. Barriault  
 A.R. Graham M. J. McDill  
 C.R. Barnes A. Harvey  
 D.D. Tolgyesi

Secretary: M.A. Leblanc  
 Recording Secretary: M. Young  
 Senior Counsel: L. Thiele

<b>Applicant Represented By</b>			<b>Document Number</b>
<ul style="list-style-type: none"> <li>• S. Levesque, President</li> </ul>			CMD 10-H5.1 CMD 10-H5.1A CMD 10-H5.1B CMD 10-H5.1C
<b>CNSC staff</b>			<b>Document Number</b>
<ul style="list-style-type: none"> <li>• P. Elder</li> <li>• R. Ravishankar</li> <li>• K. Bundy</li> <li>• R. Jammal</li> </ul>	<ul style="list-style-type: none"> <li>• A. Erdman</li> <li>• S. Mihok</li> <li>• B. Thériault</li> </ul>	<ul style="list-style-type: none"> <li>• S. Lei</li> <li>• M. Rinker</li> <li>• R. Lane</li> </ul>	CMD 10-H5 CMD 10-H5.A CMD 10-H5.B CMD 10-H5.C
<b>Intervenors</b>			<b>Document Number</b>
See appendix A			

**Licence: Renewed**

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## Introduction

1. SRB Technologies (Canada) Inc. (SRBT) has applied to the Canadian Nuclear Safety Commission<sup>1</sup> (CNSC) for the renewal of the nuclear substance processing facility operating licence (NSPFOL) for its facility located in Pembroke, Ontario. The current operating licence, NSPFOL-13.00/2010, expires on June 30, 2010. SRBT has applied for the renewal of this licence for a period of five years.
2. SRBT operates a Class IB nuclear facility to produce gaseous tritium light sources (GTLS) and manufacture devices containing GTLS. SRBT's facility is leased space in an industrial building and the closest residence is located 255 metres (m) from the facility. In 2006, information on tritium releases from SRBT and groundwater contamination around the facility led CNSC staff to conclude that the operation of the SRBT facility has resulted in an unreasonable risk to the environment. Subsequently, the Commission issued SRBT a Nuclear Substance Processing Facility Possession Licence that did not allow tritium processing activities<sup>2</sup>. After making a number of improvements to its facility and programs, SRBT applied for an operating licence in December 2007 and was issued a two-year licence following a two-day public hearing on April 3 and June 12, 2008<sup>3</sup>.
3. SRBT has requested that its licence be renewed with the same licence conditions as its current licence. SRBT also requested that the exemption regarding the payment of cost recovery adjustments, which was granted at the time of its current licence, continue to be in effect.

## Issue

4. In considering the application, the Commission was required to decide, pursuant to subsection 24(4) of the *Nuclear Safety and Control Act*<sup>4</sup> (NSCA):
  - a) if SRBT is qualified to carry on the activity that the licence would authorize; and
  - b) if, in carrying on that activity, SRBT 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> Refer to the Record of Proceedings on *Application for the Renewal of Class IB Operating Licence for the Gaseous Tritium Light Source Facility in Pembroke, Ontario*, November 27, 2006.

<sup>3</sup> Refer to the Record of Proceedings on *Application to Resume the Processing and Use of Tritium at the Gaseous Tritium Light Source Facility in Pembroke, Ontario*, June 12, 2008.

<sup>4</sup> Statutes of Canada (S.C.) 1997, chapter (c.) 9.

### Public Hearing

5. The Commission, in making its decision, considered information presented for a public hearing held on February 17, 2010 and May 19, 2010 in Ottawa, Ontario. The public hearing was conducted in accordance with the *Canadian Nuclear Safety Commission Rules of Procedure*<sup>5</sup>. During the public hearing, the Commission considered written submissions and heard oral presentations from CNSC staff (CMD 10-H5, CMD 10-H5.A, CMD 10-H5.B, CMD 10-H5.C) and SRBT (CMD 10-H5.1, CMD 10-H5.1A, CMD 10-H5.1B, CMD 10-H5.1C). The Commission also considered oral and written submissions from 60 intervenors (see Appendix A for a detailed list of interventions).
6. The Concerned Citizens of Renfrew County requested that the Commission consider an intervention (CMD 10-H5.2) for Day 1 of the hearing, on February 17, 2010. The Commission decided to grant this request on an exceptional basis.
7. During Day 2 of the hearing, several intervenors requested that the Commission extend the hearing record for 10 days in order for the intervenors to respond to a supplementary submission from SRBT (CMD 10-H5.1.B) that contained direct correspondence with the intervenors. The Commission granted the request and the intervenors were allowed until June 2, 2010 to respond to SRBT's submission. Four additional submissions were received (CMD 10-H5.2C, CMD 10-H5.5A, CMD 10-H5.6B and CMD 10-H5.7B). SRBT was offered a chance to respond to these submissions and chose not to make any additional submissions. The Commission has considered all of the additional submissions in making its decision.

### **Decision**

8. 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 SRBT is qualified to carry on the activity that the licence will authorize. The Commission is of the opinion that SRBT, 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*, renews the nuclear substance processing facility operating licence issued to SRB Technologies (Canada) Inc.'s for its facility located in Pembroke, Ontario. The renewed licence, NSPFOL-13.00/2015, is valid from July 1, 2010 to June 30, 2015.

9. The Commission includes in the licence the conditions as recommended by CNSC staff

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<sup>5</sup> Statutory Orders and Regulations (S.O.R.)/2000-211.

and set out in the draft licence attached to CMD 10-H5.B. The Commission directs SRBT to continue its practice of not processing tritium during precipitation in order to keep releases ALARA. As such, the Commission includes this directive in the licence conditions handbook as a matter against which CNSC staff will verify SRBT's compliance. The Commission adds in the licence conditions handbook the requirement that any amendments to the licence conditions handbook related to third party monitoring must be approved by Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch.

10. With this decision, the Commission directs SRBT to prepare an annual status report on the safety performance of its facility. The Commission requests that CNSC staff also prepare an annual report on the results of compliance activities carried out during the licence term and on the licensee's performance during that period. The reports should include detailed information on environmental monitoring, groundwater studies, depleted uranium inventory and annual releases. SRBT and CNSC staff shall present their reports at a public proceeding of the Commission, in approximately June of each year. The Commission notes that the public will have an opportunity to provide comments on the 2013 report.
11. The Commission notes that SRBT's submission CMD 10-H5.1C includes target reductions in releases over the course of the proposed licence period that are independent of any production levels. The Commission expects that CNSC staff will verify that SRBT's releases fall within these targets. The Commission also expects that SRBT will benchmark its actual releases against these targets in its annual report to the Commission.
12. The Commission expects that CNSC staff will continue to verify that SRBT performs mass balance analysis and report any concerns on this matter to the Commission.
13. The Commission encourages SRBT to continue its practice of waste minimization and to ensure that it keeps as little waste on site as possible.

### **Issues and Commission Findings**

14. In making its licensing decision, the Commission considered a number of issues relating to SRBT's qualification to carry out the proposed activities and the adequacy of the proposed measures for protecting the environment, the health and safety of persons, national security and international obligations to which Canada has agreed. The Commission considered information regarding SRBT's operating performance between 2005 and 2009, with the previous licence period being from 2008 to 2009.

### **Radiation Protection**

15. SRBT presented information regarding its performance in the area of radiation

protection. The SRBT representative stated that SRBT had implemented a dose reduction strategy in order to reduce doses to workers in accordance with the principle of ALARA (As Low As Reasonably Achievable). CNSC staff stated that SRBT's radiation protection program and implementation meet regulatory requirements and CNSC expectations.

*Protection of Workers from Radiation*

16. The SRBT representative stated that, during the period between 2005 and 2009, the maximum annual dose to an SRBT staff member was 3.61 millisieverts per year (mSv/y) in 2005. The regulatory limits for a Nuclear Energy Worker are 50 mSv/y and 100 mSv/5 years. The SRBT representative further noted that in 2009, the maximum annual dose to a staff member had been reduced to 1.45 mSv/y. In addition, the SRBT representative stated that the collective occupational dose for its 18 staff members in 2009 was 4.52 mSv, or an average of 0.25 mSv/person.
17. The SRBT representative stated that, in 2006, SRBT personnel developed an Occupational Dose Target in order to reduce the collective occupational dose to workers. The SRBT representative stated that SRBT met its target for 2009 and further stated that SRBT expects to remain at or below the 2009 average collective dose for 2010, despite an increase in production and processing of tritium. The SRBT representative explained that improvements in work practices implemented by its Health Physics team are expected to result in lower doses to staff.
18. CNSC staff stated having conducted compliance inspections at the SRBT facility and has no concerns regarding the radiation protection program.

*Protection of the Public from Radiation*

19. CNSC staff explained that the dose to the public is calculated using the data collected from environmental monitoring and based on a hypothetical member of the public (called the critical receptor) who would receive the maximum exposure. The regulatory limit for a member of the public is 1 mSv/y.
20. The SRBT representative stated that during the 2005 – 2009 period, the maximum annual dose of 0.0337 mSv to a member of the public occurred in 2005. The SRBT representative further stated that in 2009, the maximum annual dose to a member of the public had been reduced to 0.00569 mSv, or 0.57% of the regulatory limit.
21. CNSC staff stated that SRBT has proposed to use the same release limits as those in SRBT's current licence. CNSC staff stated that SRBT's current release limits are more

restrictive than those based on the Derived Release Limit<sup>6</sup> and will result in an annual dose to the public that is well below the regulatory limit of 1 mSv/y.

22. In its intervention, the International Institute of Concern for Public Health (IICPH) asked for information on how release limits are established. CNSC staff noted that detailed explanations of the calculation method (using conservative assumptions) were provided during the Commission SRBT public hearing in 2006. The Commission notes that SRBT proposed lower release limits during the 2008 Commission hearing, which CNSC staff and the Commission accepted.
23. Intervenors expressed concerns regarding the radiation risks of GTLS devices. The Commission sought further information in this regard. The SRBT representative responded that the dose from one broken new sign is less than 1 mSv. CNSC staff responded that its tritium studies project<sup>7</sup> found no adverse health effects related to exposure to this level of tritium.
24. Several intervenors expressed concerns regarding the health effects of tritium and radiation. These intervenors were of the opinion that the facility should not be releasing any radiation into the environment. The Commission asked CNSC staff to comment on the matter. CNSC staff responded that the basis of the CNSC's scientific information comes from the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR). CNSC staff further responded that they have conducted a comprehensive study of the health effects, dosimetry and radiation protection of tritium for workers and the public. CNSC staff stated that the studies concluded that, to date, there is no evidence of raised risk of any disease associated with tritium based on past and current exposure levels from nuclear facilities. CNSC staff stated that adverse health effects due to tritium exposure, based on past and current exposure levels to the public and workers in Canada, are highly unlikely.
25. The IICPH, in its intervention, expressed concerns regarding organically bound tritium (OBT). The Commission asked for further information on the subject. CNSC staff responded that OBT is tritium that has bonded to other substances and there are two forms. CNSC staff explained that the exchangeable form of OBT is tritium bound to carbon and has a biological half-life in adults of around 40 days. CNSC staff further explained that non-exchangeable OBT is tritium bound to oxygen or sulphurs and has a biological half-life of about 10 days. CNSC staff noted that there are also some small, longer-lived components of OBT that can stay in the body for up to 500 days. CNSC staff stated that the dose from both forms of OBT, which is twice the dose of tritiated water, is taken into consideration when the dose to the public is calculated. CNSC staff stated that OBT is taken into account in dose calculations, but it represents a small fraction (around 2%) of the total calculated dose to the public which is mostly from the ingestion of tritiated water (83%). CNSC staff noted that the releases from the facility do not contain OBT but OBT is formed in the environment.

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<sup>6</sup> The Derived Release Limit is a calculated limit that would result in a maximum dose of 1 mSv/y to the critical receptor.

<sup>7</sup> [http://www.nuclearsafety.gc.ca/eng/readingroom/factsheets/tritium\\_studies.cfm](http://www.nuclearsafety.gc.ca/eng/readingroom/factsheets/tritium_studies.cfm)



*Conclusion on Radiation Protection*

26. Based on the information presented, the Commission is of the opinion that, given the mitigation measures and safety programs that are in place to control hazards, SRBT will provide adequate protection to the health and safety of persons, the environment and national security. The Commission accepts CNSC staff's opinion that the tritium releases resulting from the operation of the facility do not pose a health and safety risk to the public.

**Operating Performance**

27. The SRBT representative provided information regarding its operating performance. The SRBT representative stated that, based on operational experience, SRBT has implemented several improvements to its programs and procedures in order to reduce the effects of its facility on the environment and the public. The SRBT representative provided details regarding these improvements, including not operating the reclamation unit and ceasing processing tritium during the occurrence of any type of precipitation.
28. CNSC staff stated that SRBT made continuous improvement regarding its operating performance during the licence period, including the implementation of non-conformance reporting and root cause investigation. CNSC staff stated that SRBT has effective procedures and programs in place, and SRBT is carrying out its licensed activities in accordance with its programs and procedures. In addition, CNSC staff stated that they inspected SRBT's facility four times during the licence period and observed improvements regarding safety culture.
29. CNSC staff stated that SRBT's effluent releases and radiation doses are well within the licence limits and that SRBT's operational controls are acceptable. CNSC staff noted that SRBT reported one event during the licence period when a weekly action level for tritium released from the facility was exceeded. CNSC staff stated that they were satisfied with the corrective actions taken by SRBT in response to this event.
30. On the subject of operating during precipitation events, the Commission asked whether SRBT will continue its practice of not processing tritium during precipitation. The SRBT representative stated that SRBT will continue this practice and will be using weather monitoring equipment to ensure that this is the case. The SRBT representative noted that SRBT can stop processing for hours at a time or days at a time, depending on the weather. CNSC staff noted that this practice forms part of the licensing basis for the facility as it is included in SRBT's licence renewal application and is controlled within the licence conditions handbook.
31. The Commission directs SRBT to continue its practice of not processing tritium during precipitation in order to keep releases ALARA. As such, the Commission includes this

direction in the licence conditions handbook, so that CNSC staff will monitor the licensee's compliance with this practice.

#### *Use of Depleted Uranium*

32. Several intervenors expressed concerns regarding the use of depleted uranium at the facility. The Commission requested further information on the matter. The SRBT representative responded that SRBT currently has a depleted uranium inventory of 6.6 kilograms (kg) onsite. The SRBT representative stated that SRBT safely stores and handles the depleted uranium, and disposes of the waste related to its use in a licensed waste facility. CNSC staff stated that SRBT is licensed to possess the nuclear substances that are associated with the licensed activities, including the small amount of depleted uranium. CNSC staff noted that SRBT is required to account for depleted uranium being onsite in its safety programs.
33. The Commission asked CNSC staff to comment on the health effects of depleted uranium. CNSC staff stated that a 2006 UNSCEAR report summarized the international understanding of the health effects from exposure to depleted uranium, and concluded that there is no epidemiological evidence for an association between depleted uranium and cancer.
34. The Commission notes that SRBT's operating licence requires that SRBT ensure the safety of persons and the environment. Therefore, SRBT is required to ensure that depleted uranium is safely stored, handled and disposed of, and SRBT is required to account for its inventory of depleted uranium. The Commission expects that SRBT will include information regarding its inventory of depleted uranium in its annual report to the Commission, including the total amount on site, the amount in tritium traps and the amount disposed.

#### *Reclamation Unit*

35. The Commission sought further information regarding the reclamation unit. The SRBT representative responded that the unit had been used to recover tritium from used devices in order to build new devices. The SRBT representative noted that SRBT currently does not operate the reclamation unit. The SRBT representative further noted that SRBT sends used GTLS to a licensed facility in South Africa for reclamation. CNSC staff commented that they visited the facility in South Africa and that CNSC staff have no concerns regarding SRBT's practice.
36. The SRBT representative noted that SRBT currently recycles certain used, intact GLTS in order to build new devices if the used GTLS are determined to still have a useful life. The SRBT representative explained that this practice does not involve the use of the reclamation unit and the tritium is not removed from the used GTLS during this process. CNSC staff stated that they have no concerns regarding this practice.

37. Several intervenors expressed concerns regarding the potential return-to-service of the reclamation unit. The Commission sought further information in this regard. The SRBT representative responded that SRBT plans to assess the reclamation unit over the next licence period to decide whether to decommission it or to modify it in order to return it to service. The SRBT representative noted that SRBT must apply for a licence amendment if it decides to return the unit to service. CNSC staff responded that, based on the past releases from the reclamation unit, the use of the reclamation unit is currently not permitted in SRBT's licence as it is outside of the licensing basis for the facility. CNSC staff explained that SRBT would have to submit a valid safety case for the use of the unit to CNSC staff before the Commission would consider an application for a licence amendment.
38. Intervenors also noted that the SRBT Radiation Safety Program document includes the use of the reclamation unit. The Commission asked if SRBT would address this matter in order to provide further clarity and assurance to the public. SRBT responded that, although the Radiation Safety Program document states that the unit is not in service, SRBT will be revising the document to remove the reclamation unit from the program. CNSC staff noted that they would follow up on this matter.

#### *Conclusion on Operating Performance*

39. Based on the above information, the Commission is of the opinion that, given the mitigation measures and safety programs that are in place or will be in place to control hazards, SRBT will provide adequate protection to the health and safety of persons, the environment and national security.
40. The Commission directs SRBT to continue its practice of not processing tritium during precipitation in order to keep releases ALARA. As such, the Commission includes this direction in the licence conditions handbook.
41. The Commission expects that SRBT will include information regarding its inventory of depleted uranium in its annual report to the Commission, including the total amount on site, the amount in tritium traps and the amount disposed.

#### **Environmental Protection**

42. The SRBT representative presented information regarding its performance in the area of environmental protection. The SRBT representative stated that SRBT monitors releases from the facility and conducts environmental monitoring in order to determine the effects of its facility on the environment. The SRBT representative noted that SRBT implemented several emission reduction initiatives that have had significant results.

43. CNSC staff recognized that SRBT has made significant improvement in reducing its emissions. CNSC staff stated that the results from SRBT's environmental monitoring programs are acceptable, and that CNSC staff is satisfied with SRBT's environmental protection program and its implementation. CNSC staff stated that if SRBT's environmental protection program is followed, SRBT will make adequate provision for the protection of the environment and that activities at SRBT will not result in an increased risk to the environment or to the health and safety of persons.

### *Effluent Monitoring*

#### Air Emissions

44. The SRBT representative provided information regarding the air emissions from its facility, which are measured in the form of tritium oxide (HTO) and total tritium. SRBT representative stated that its emissions have been significantly reduced since 2005, noting that its weekly releases in 2009 were 97% less than those in 2005, dropping from 23,546 gigabecquerels per week (GBq/week) to 664 GBq/week. In addition, The SRBT representative noted that the ratio of tritium released to tritium processed has been reduced from 5.28% in 2005 to 0.75%, which represents a decrease of 85%.
45. The SRBT representative attributed the reduction to emissions to mitigation initiatives taken by SRBT, as well as an overall reduction in the amount of tritium processed at the facility. The SRBT representative noted that SRBT has reached an agreement with one of its competitors to perform some specific processing activities, which has reduced the tritium processed at the SRBT facility. In addition, The SRBT representative stated that its decision not to include the operation of the reclamation unit in its current licence has also reduced the overall tritium processed and associated emissions at the facility. The SRBT representative stated that emissions have continued to decrease despite an increase in production and tritium processed in 2009.
46. CNSC staff stated that SRBT's 2009 total tritium releases were 9% of the licence limit, and 14% of the 2006 releases, which were the releases in SRBT's last full year of processing. CNSC staff stated that they are satisfied with SRBT's progress in the area of emission reduction. CNSC staff noted that SRBT's releases are currently below the DRL and action levels (action levels, if reached, signify a potential loss of control). CNSC staff noted that the licence limits for SRBT's releases will remain the same in the proposed licence.
47. The Commission, noting that SRBT has made significant progress in reducing its emissions, expressed concerns that SRBT's releases may increase if its production increases. The SRBT representative responded that, despite planned increases in production, he expects that the emissions will continue to decrease. CNSC staff noted that the licence limits are stricter than they were before 2008.

48. The Commission notes that SRBT's submission CMD 10-H5.1C includes target reductions in releases over the course the proposed licence period that are independent of any production levels. The Commission expects that CNSC staff will verify that SRBT's releases do not exceed these targets. The Commission also expects that SRBT will benchmark its actual releases against these targets in its annual report to the Commission.

#### Liquid Effluent

49. CNSC staff stated that SRBT's licence includes a liquid effluent limit of 200 GBq/year that is based on International Atomic Energy Agency (IAEA) guidance. CNSC staff stated that SRBT's annual release limit is well below the IAEA guidance of 1000 GBq/y, which is considered a safe level. CNSC staff stated that they are satisfied that SRBT, whose releases were 31% of the licence limit in 2009, is continuing to monitor liquid releases and is complying with the limit in its licence.
50. The SRBT representative stated that its releases to the sewer have tritium concentrations less than the *Canadian Drinking Water Guideline* of 7,000 Bq/L. The SRBT representative also stated that SRBT has implemented a maximum daily liquid release limit of 0.3 GBq.
51. An intervenor expressed concerns regarding the tritium concentration being released to the municipal sewage system. The intervenor requested that an engineering assessment and monitoring be conducted, specifically regarding the Townline Pumping Station. The intervenor also expressed concerns regarding tritium exposure to the municipal workers in that station. The Commission sought further information in this regard. The SRBT representative responded that SRBT personnel have taken samples from the Townline Pumping Station in the past and found that the maximum tritium concentration was 282 Bq/L, with an average of 164 Bq/L. The SRBT representative further stated that SRBT personnel regularly monitor the effluent from the Pembroke pollution control plant and the maximum concentration was 172 Bq/L, with an average of 68 Bq/L. The SRBT representative stated that a conservative dose estimate for a worker who has worked in the Townline Pumping Station for 2000 hours with an average tritium concentration of 300 Bq/L is 0.00043 mSv/y. The SRBT representative noted that if the concentration is on the order of the *Canadian Drinking Water Guideline* of 7,000 Bq/L, the estimated dose would be 0.01 mSv/y. The SRBT representative noted that these values are well below the public dose limit of 1 mSv/y.
52. CNSC staff stated that, in 2007, they conducted a theoretical "worst case scenario" mathematical analysis of the Pembroke sewer system and did not identify any concerns for the health and safety of workers. The intervenor requested that the predicted results be confirmed with further monitoring, employee testing and an engineering assessment of the sewer system.
53. The SRBT representative stated that he would be willing to arrange sampling at the

Townline Pumping Station if the City of Pembroke requests it. The City of Pembroke, in its intervention, stated that a positive working relationship exists between the City and SRBT.

*Environmental Monitoring*

54. The SRBT representative provided information regarding its environmental monitoring program. The SRBT representative noted that SRBT uses a qualified third-party contractor to collect and analyze samples taken from a variety of locations.
55. The SRBT representative presented the results of its environmental monitoring program. The SRBT representative stated that the average tritium concentrations in wells used by local businesses and residents for drinking water have decreased from a maximum of 2,063 Bq/L in 2006 to a maximum of 1,476 Bq/L in 2009. SRBT noted that if an individual was to use the water from a well with a concentration of 1,500 Bq/L as a sole source of drinking water for an entire year, the dose from consuming that water would be approximately 0.025 mSv/y, or 2.5% of the regulatory limit of 1 mSv/y for a member of the public. The SRBT representative further noted that the *Canadian Drinking Water Guideline* for tritium is 7,000 Bq/L, and the levels in Pembroke's municipal water are approximately 6 to 8 Bq/L.
56. The SRBT representative stated that tritium concentrations in locally grown produce have significantly decreased since 2005 to levels well below the *Canadian Drinking Water Guideline*, and the samples of milk taken from a local dairy farm averaged 13 Bq/L in 2009. The SRBT representative further stated that the results of its precipitation monitors and roof downspouts have all been well below 7,000 Bq/L.
57. The SRBT representative stated that SRBT also takes monthly samples from two locations in the Muskrat River, which is located 420 m from the facility and is the receiving water for the groundwater beneath SRBT's facility. The SRBT representative stated that the monthly samples averaged 6 Bq/L in 2009.
58. CNSC staff stated that the results from SRBT's environmental monitoring program are acceptable. CNSC staff noted that the air monitoring results to date have been within the range predicted by atmospheric dispersion monitoring. CNSC staff stated that precipitation and roof water monitoring confirm that the licence release limits are appropriate for areas near the stacks where tritium washout is inherently difficult to model with precision. CNSC staff stated that they are satisfied with SRBT's performance in this area.
59. The Commission inquired about the number of residential wells currently used as a source of drinking water. The SRBT representative responded that SRBT routinely monitors 10 residential wells, and most of those residences also have access to municipal water. SBRT noted that the residential well that has the highest tritium concentration of all of the residential wells, 238 Bq/L, is the sole source of drinking

water for that residence.

60. The Commission, noting the data provided by CNSC staff in its presentation, asked why the tritium concentrations in some residential wells increased between November 2007 and April 2010, when other wells saw significant decreases. CNSC staff responded that this was likely due to the vertical movement of the tritium in the soil around the well. CNSC staff noted that the tritium in residential wells is a result of air emissions from SRBT, as opposed to groundwater contamination, which does not travel in the direction of residential wells. CNSC staff explained that the emissions from past years may take several years to reach the well water. CNSC staff noted that the concentration levels vary over time due to many conditions, including precipitation and the characteristics of the well. CNSC staff stated that SRBT's current lower releases will result in lower concentrations in residential wells over time, and the wells will continue to be monitored to ensure that this is the case.
61. Many intervenors expressed the view that SRBT should continue to utilize a qualified third party to perform environmental monitoring and analysis, and that this should be a clear condition of SRBT's licence. The Commission sought confirmation that this practice would continue to be the case. CNSC staff responded that the specification for third-party monitoring is part of the licence conditions handbook for the facility. CNSC staff noted that, although they expect SRBT to develop the ability to perform its own environmental monitoring in the future, CNSC staff will continue to ensure that the monitoring is performed by a qualified third party. The SRBT representative responded that third-party monitoring provides reassurance to the public that the monitoring is being done correctly.
62. The Commission accepts CNSC staff's proposed approach for including the issue of third party monitoring in the licence conditions handbook. The Commission adds in the licence conditions handbook the requirement that any amendments to the licence conditions handbook related to third party monitoring must be approved by Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch.

#### *Groundwater Monitoring*

63. The SRBT representative presented information regarding its groundwater monitoring. SRBT stated that SRBT has produced a groundwater studies report, which contains monitoring data from 55 wells, including 38 wells within 150 m of the facility. The SRBT representative noted that SRBT continues to perform ongoing monitoring of 50 of those wells, including the wells that are used by neighbouring businesses and residences. The SRBT representative added that all wells to be used for drinking water near the facility have been identified.
64. The SRBT representative stated that the highest tritium concentration of approximately 50,000 Bq/L is in a monitoring well located in the stack area of the SRBT facility

where air emissions are released. The SRBT representative explained that analysis has shown that it would require 40 years for the water from the highest-concentration well to reach the location of the closest well used for drinking water, which is a non-residential well located at a business, and in that time, the tritium concentration would decay to 10% of its initial value, which would be below the current *Canadian Drinking Water Guideline* of 7,000 Bq/L.

65. CNSC staff provided detailed information regarding groundwater. CNSC staff explained that, in the past, tritium releases from SRBT's facility had found their way to the groundwater in the immediate vicinity of the facility, primarily using rainfall as the migration pathway. CNSC staff explained that this resulted in groundwater contamination, which was a significant concern to CNSC staff and the Commission at previous licensing hearings for SRBT. CNSC staff noted that SRBT was required to implement multiple operational controls in order to minimize tritium releases to the groundwater. CNSC staff further noted that the groundwater contamination near the SRBT facility will continue to be a legacy issue.
66. CNSC staff stated that, based on SRBT's groundwater monitoring data, the groundwater is in a recovery mode, with most of SRBT's monitoring wells showing continually decreasing tritium concentrations. However, CNSC staff noted that the well at the base of the stack has shown an increasing trend since 2008, due to the vertical movement of the tritium in soil from SRBT's past operating practices. CNSC staff further noted that the groundwater plume extends to approximately 500 m around the facility.
67. CNSC staff provided analysis regarding the contamination in the groundwater, based on SRBT's monitoring data. CNSC staff stated that they have developed a model to predict the tritium concentrations in the groundwater over time. CNSC staff noted that, based on SRBT's current operating limit, the model predicts that the groundwater will reach a steady state at or below 31,000 Bq/L. CNSC staff noted that this is a conservative model and the actual values are likely to be less than this. CNSC staff further stated that they will continue to closely monitor the situation.
68. CNSC staff also stated that, based on the modelling, the tritium released at SRBT's facility will take approximately 30 years to reach the Muskrat River, and by then the tritium will have decayed by approximately 80%. CNSC staff further stated that none of the residential drinking water wells are in the path of the groundwater plume, and therefore none will be affected.
69. CNSC staff stated that SRBT's current release limits protect the groundwater and the environment. CNSC staff stated that there are currently no concerns regarding the impact of SRBT's facility on the environment. CNSC staff stated that the previous releases from the facility do not pose a risk to workers or the public.
70. The Commission expressed concerns regarding the groundwater contamination and requested further information regarding the groundwater analysis. CNSC staff stated



that the tritium concentrations are highest around the stack because facility emissions from the stack have been deposited in the ground around the stack. CNSC staff explained that the tritium is moving vertically through the ground before it reaches the groundwater, which is why the higher emissions from previous years of operation are resulting in the current levels. CNSC staff noted that the levels around the stack will decrease because emissions have been reduced, and this will be verified with ongoing monitoring. The SRBT representative stated that, based on its groundwater studies, the full results of the current operation are expected to be evident within six or seven years.

71. The Commission inquired about the effects of increased production on groundwater. CNSC staff responded that the production is limited by the licence limit for emission levels, and that the groundwater modelling is conservative since the emission level values used in the groundwater model are higher than the licence limit.

#### *Drinking Water Standards*

72. The Commission sought further information regarding the Ontario Drinking Water Advisory Council's recommendation to the Ontario Minister of the Environment that the standard for drinking water in Ontario be revised from Health Canada's *Canadian Drinking Water Guideline* of 7,000 Bq/L to 20 Bq/L. CNSC staff stated that they will monitor the situation to see how the Minister of the Environment of Ontario responds to those recommendations. CNSC staff added that they will consult with officials from the Ontario Ministry of the Environment to determine, if the government adopts this standard, how it would be applied, and to identify potential implications for CNSC licensees. CNSC staff stated that they expect that, should the new standard be adopted, there would likely be a five-year phase-in period.
73. The SRBT representative stated that SRBT has held discussions with the Ontario Ministry of the Environment regarding this issue. The SRBT representative explained that, based on the current trends and licence limits, he expects that the tritium concentrations in local residential wells will decrease below the proposed drinking water standard of 20 Bq/L. The SRBT representative added that, should the new standard be adopted, he will look into contingency plans, including alternate water supplies for residents who consume well water.
74. CNSC staff provided information regarding the drinking water standards in other jurisdictions and affirmed that the current *Canadian Drinking Water Guideline* of 7,000 Bq/L is safe. CNSC staff explained that the dose received by a person who drinks solely from a source with a tritium concentration of 7,000 Bq/L for a full year would be 0.1 mSv, or 10% of the regulatory limit of 1 mSv/y for a member of the public.

#### *Conclusion on Environmental Protection*

75. Based on the information provided, the Commission accepts CNSC staff's opinion that,

given the mitigation measures and safety programs that are in place or will be in place to control hazards, SRBT will provide adequate protection to the health and safety of persons, the environment and national security.

### **Waste Management**

76. CNSC staff stated that waste management includes waste minimization, segregation and storage. CNSC staff stated that SRBT manages tritium-contaminated waste in a manner that meets CNSC expectations. CNSC staff explained that SRBT actively manages its waste by means of waste minimization and segregation.
77. The SRBT representative stated that SRBT has stored waste, including shoe covers and lab jackets, in drums on site before disposal. The SRBT representative explained that this waste is disposed by a contracted waste handler and placed in a conventional waste landfill. The SRBT representative further stated that SRBT does not dispose of any GTLSs or radiation devices in landfills. The SRBT representative stated that GTLSs are packaged and sent for disposal in licensed facilities.
78. The Commission sought further information regarding the drums that have been disposed in landfill. The SRBT representative responded that the drums had an average tritium concentration of less than 0.01 MBq/g, which is less than one percent of the regulatory limit of 1 MBq/g for allowance for disposal to landfill. The SRBT representative noted that although SRBT has disposed of 20 drums per year in the past few years, he expects to reduce this to two to four drums per year in future years, due to the waste minimization practices implemented at the facility.
79. CNSC staff stated that there is no risk to health, safety or the environment through SRBT's practice and SRBT meets the requirements of the *Nuclear Substances and Radiation Devices Regulations*<sup>8</sup>. CNSC staff stated that they are satisfied that SRBT is managing its waste in compliance with the CNSC regulations.
80. CNSC staff further stated that SRBT also collects and disposes of hazardous wastes, such as chemicals, in accordance with the requirements of the Ontario Ministry of the Environment. CNSC staff stated that they have observed during inspections that SRBT keeps itemized records of all radioactive waste generated at the facility. CNSC staff stated that they have no concerns regarding SRBT's inventory control.
81. The Commission asked the SRBT representative if SRBT's clients are obligated to return the used GTLS devices. The SRBT representative responded that its clients have no obligation, but SRBT does have a recall procedure in place in order to encourage clients to return the devices.
82. Several intervenors expressed concerns regarding the volume and type of waste stored and disposed by SRBT. The Commission requested clarification from SRBT on this

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<sup>8</sup> S.O.R./2000-207.

matter. The SRBT representative responded that SRBT follows all regulations and does not dispose of any GTLSs or devices in landfills. The SRBT representative stated that these devices are packaged and sent for disposal in licensed facilities. SRBT noted that only waste that meets the requirements of the *Nuclear Substances and Radiation Devices Regulations*, including shoe covers, lab coats and conventional waste, are sent for disposal in landfill, according to the Regulations.

83. Intervenors expressed concerns that SRBT disposes of crushed glass containing tritium in landfills. The Commission asked if this is the case. The SRBT representative responded that SRBT does not place any crushed glass in waste sent to landfill. The SRBT representative stated that crushed glass waste containing tritium is sent to a licensed facility, in accordance with the Regulations. CNSC staff confirmed that this is the case.
84. The Concerned Citizens of Renfrew County, in its intervention, proposed that SRBT should provide information regarding the concentration of waste (in Bq/g) and total mass of waste (in g) in its annual reporting. The Commission is of the opinion that this is a reasonable request. Therefore, the Commission directs SRBT to include this information in its annual report to the Commission.
85. Intervenors expressed concerns regarding the effects of tritium in landfills, citing an example where an Ontario Ministry of the Environment sample taken from the Alice & Fraser Landfill Site near Pembroke contained a tritium concentration of 1,000 Bq/L. The Commission sought further information in this regard. The SRBT representative responded that the Ontario Ministry of the Environment study was conducted in 2007, analyzed samples from six locations within the landfill, found a range of 9.5 Bq/L to 1000 Bq/L, and concluded that no further studies were needed. CNSC staff noted that the documentation from the Ontario Ministry of the Environment included a letter indicating that it had no concerns regarding the findings. CNSC staff further stated that studies in the United States and United Kingdom have found levels ranging up to 4,000 Bq/L in landfills.
86. Intervenors expressed concerns that the *Nuclear Substances and Radiation Devices Regulations* had been modified to facilitate the disposal of contaminated waste and removed the requirement for a “recall procedure.” The Commission asked CNSC staff to comment on this matter. CNSC staff responded that the Regulations were amended so that any manufacturer of radiation devices needs to have a procedure in place for their return. CNSC staff explained that the regulations were broadened from GTLS device manufacturers to all radioactive device manufacturers, and although the specific term “recall procedure” was removed from the regulations, the regulatory expectations remain the same. CNSC staff further explained that, although the GTLS devices do not pose a health concern if they are sent to a landfill, manufacturers are required to dispose of the devices in a licensed facility. CNSC staff noted that SRBT has continued to meet requirements in this regard.
87. In addition, CNSC staff explained that the regulatory limits for waste disposal in the

amended Regulations are consistent with conservative models and are aligned with levels established by the International Atomic Energy Agency. CNSC staff stated that the limits are that the average radioactivity concentration has to remain below 1 MBq per gram of waste or that the total activity in the waste is less than 1 GBq. CNSC staff noted that the total waste must also be less than 1,000 kilograms per year, per facility. CNSC staff stated that SRBT has continued to meet requirements in this regard.

88. An intervenor expressed concerns that SRBT does not perform a mass balance analysis of its tritium input and output. The Commission asked if this is the case. The SRBT representative responded that SRBT does perform a mass balance analysis. The Commission expects that CNSC staff will continue to verify that SRBT performs this analysis. The Commission also expects that CNSC staff will report any concerns on this matter to the Commission.
89. Based on the above information, the Commission is satisfied that SRBT has made and will continue to make adequate provisions in the area of waste management at the facility. The Commission encourages SRBT to continue its practice of waste minimization and to ensure that SRBT keeps as little waste on site as possible.
90. In addition, the Commission directs SRBT to include information regarding the concentration of waste (in Bq/g) and total mass of waste (in g) in its annual report to the Commission.

### **Safety Analysis**

91. CNSC staff stated that they have reviewed the safety analysis for SRBT and finds it acceptable. CNSC staff explained that the safety analysis for the facility is relatively simple, low-risk, and has been stable over the licence period.
92. CNSC staff stated that they have evaluated SRBT's hypothetical, worst-case incident scenarios, including possible radiation doses from accidents, and the highest public dose remains below the regulatory limit of 1 mSv/y. CNSC staff further stated that the highest dose estimated for all scenarios was 12.41 mSv to a member of SRBT's staff, which is below the regulatory limit of 50 mSv/y.
93. In addition, SRBT has submitted a Fire Hazard Analysis (FHA) for the facility, in accordance with the National Fire Protection Association standard *NFPA 801*<sup>9</sup>.
94. On the basis of the information presented, the Commission concludes that the safety analysis of the facility is adequate for the operation period included in the proposed licence.

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<sup>9</sup> NFPA 801: Standard for Fire Protection for Facilities Handling Radioactive Materials, 2008 Edition

## **Management System**

95. The SRBT representative presented information regarding its management system and quality assurance program. The SRBT representative outlined the roles and responsibilities of its employees within the organizational structure and noted that SRBT made minor organizational changes during the licence period. The SRBT representative also noted that there are formal committees within its organizational structure. The SRBT representative further stated that SRBT has made improvements as a result of internal audits and ISO 9001 Registrar audits. The SRBT representative noted that SRBT benchmarks its operations with other CNSC licensees in order to determine where further improvements can be made to its programs and procedures. In addition, the SRBT representative stated that SRBT's organizational managers conduct routine self-assessments. The SRBT representative noted the improvements made as a result of the activities regarding SRBT's management system, including improved work practices, training and equipment modifications.
96. CNSC staff stated that SRBT's quality assurance program meets requirements, and recognized that SRBT made significant improvements to its management system during the licence period. CNSC staff noted that they have observed during inspections that SRBT has implemented an annual program review to measure the effectiveness of its safety programs. CNSC staff stated that they are satisfied with the improvements that SRBT has made in this area. CNSC staff further stated that SRBT will be required to maintain its Quality Manual as part of the proposed licence.
97. The Commission sought further information regarding SRBT's organizational structure. The SRBT representative provided information regarding the responsibilities of its employees and the management structure. The SRBT representative stated that there is sufficient staffing level but may be adding new positions in the future. The SRBT representative noted that he does not expect any employees to retire in the next five years.
98. The Commission inquired about SRBT's audits, both internal and ISO 9001. The SRBT representative responded that its internal auditor is the most experienced SRBT employee and provides detailed findings regarding SRBT's facility and processes. SBRT noted that the ISO 9001 Registrar audits are an overview of segments of the operation.
99. Based on its consideration of the presented information, the Commission concludes that SRBT has appropriate organization and management structures in place and that the operating performance at the facility provides a positive indication of SRBT's ability to adequately carry out the activities under the proposed licence.

## **Human Performance Management**

100. SRBT provided information regarding human performance management and its

training programs. The SRBT representative stated that SRBT provides internal training to its staff and that several members of its staff have taken a variety of external courses regarding occupational health and safety and the *Canada Labour Code, Part II*<sup>10</sup>.

101. CNSC staff stated that SRBT meets requirements in the area of human performance management. CNSC staff stated that SRBT has developed and implemented a training plan, and continued to improve its work processes through self-assessment. CNSC staff stated that they are satisfied that SRBT is continuing to train its staff so that they have the necessary knowledge and skills to safely carry out their duties and that the environment and persons are protected. CNSC staff stated that SRBT's employees are qualified to perform their work.
102. The Commission sought further information regarding SRBT's training. The SRBT representative responded that SRBT provides technical training to its employees, who are also encouraged to undertake external training courses. SRBT noted that the ISO 9001 Registrar and other auditors have not had any concerns regarding the qualifications of its staff to train other employees.
103. Several intervenors expressed concerns that SRBT's employees may not be qualified to perform the work at the facility. The Commission sought further information in this regard. CNSC staff stated that, during inspections, they have interviewed some SRBT employees regarding their qualifications and knowledge for performing their duties, and that they had no concerns regarding the qualifications of these employees. CNSC staff noted that they will be conducting a future inspection to focus on this issue.
104. Based on the above information, the Commission concludes that SRBT has in place the necessary training programs to assure continued adequate human performance management at the facility.

### **Physical Design**

105. CNSC staff stated that they are satisfied that the physical design of SRBT's facility meets requirements. CNSC staff explained that, during the licence period, SRBT made an improvement regarding the equipment used to fill tubes with tritium and this improvement resulted in a reduction in emissions. The SRBT representative committed to investigate whether further design improvements can be made over the proposed licence period in order to further reduce emissions.
106. Based on its consideration of the presented information, the Commission concludes that SRBT's facility is designed to ensure the health and safety of persons and the protection of the environment.

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<sup>10</sup> Revised Statutes of Canada (R.S.C.) 1985, c. L-2

### **Fitness for Service**

107. CNSC staff stated that SRBT maintains the facility in order to ensure that the systems, components and structures remain effective over time, and that the equipment required to operate the facility safely is available to perform as designed. CNSC staff stated that the maintenance program includes appropriate testing and inspection to ensure availability, reliability and effectiveness of safety systems and components.
108. CNSC staff stated that SRBT has developed a maintenance program for its equipment, including the ventilation system and a weather station that was constructed during the licence period. CNSC staff further stated that they have confirmed during inspections that maintenance is continuing as required. CNSC staff noted that SRBT had no major system failures in 2008.
109. Based on the information presented, the Commission is satisfied with SRBT's programs for the inspection and life-cycle management of key safety systems. Based on the above information, the Commission concludes that the equipment as installed at the facility is fit for service.

### **Conventional Health and Safety**

110. The SRBT representative presented information regarding its conventional health and safety program. The SRBT representative stated that SRBT has an occupational health and safety committee, and that its new occupational health and safety documents are in compliance with the *Canada Labour Code, Part II* and the *Canada Occupational Health and Safety Regulations*<sup>11</sup>. The SRBT representative further stated that SRBT has developed and implemented a hazard prevention program, which includes hazard identification and assessment, methodology, preventative measures, preventative maintenance, employee education, and program evaluation. The SRBT representative stated that there were no lost-time or minor incidents at the facility during the licence period.
111. CNSC staff stated that they are satisfied with SRBT's conventional health and safety program and its implementation. CNSC staff noted that they have observed that SRBT has been trained on workplace instructions and the *Canada Labour Code, Part II*.
112. The SRBT representative also presented information regarding noise levels at its facility. The SRBT representative noted that a noise survey resulted in the recommendation that protection be worn during certain activities.
113. The Commission sought further information regarding SRBT's noise survey. The SRBT representative provided information regarding the noise level measurements in various aspects of the operation, including the milling machine, and noted that hearing protection is being used as recommended by the consultant who conducted the survey.

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<sup>11</sup>S.O.R./86-304.

The SRBT representative noted that noise levels exceeding 87 A-weighted decibels (dBA) are posted and appropriate training has been provided to SRBT's staff.

114. The Commission asked whether CNSC staff assesses SRBT's occupational health and safety committee meeting minutes to ensure that there are no ongoing issues. CNSC staff responded that they do not on a regular basis, but they have looked at meeting minutes during some inspections and have not noted any concerns.
115. The Commission inquired about SRBT's employee safety culture. CNSC staff responded that, during an inspection, they surveyed SRBT's employees and received a positive response in this regard. The SRBT representative responded that SRBT has encouraged the facility's employees to discuss ways to improve the facility and work processes.
116. Based on the information provided, the Commission accepts CNSC staff's opinion that, given the mitigation measures and safety programs that are in place or will be in place to control hazards, SRBT will provide adequate protection to the health and safety of persons, the environment and national security.

### **Emergency Management and Response**

117. CNSC staff stated that the Emergency Management and Response plan document that SRBT revised during the licence period currently meets requirements. CNSC staff noted that SRBT's plan relies on the Pembroke Fire Department to handle emergency response. CNSC staff stated that this response is reasonable, and confirmed that the municipality is prepared to respond to a fire or other emergency involving nuclear substances.

### *Fire Protection*

118. The SRBT representative provided information regarding fire protection. The SRBT representative stated that SRBT conducts training and fire drills, and has a fire protection committee, which has led to an improved fire protection program. The SRBT representative stated that the Pembroke Fire Department has conducted annual inspections of the facility and found no violations of the *Ontario Fire Code*<sup>12</sup>. In addition, the SRBT representative stated that the minor recommendations from third-party inspections conducted in 2008 and 2009 have been addressed.
119. CNSC staff stated that SRBT's fire protection program is acceptable. CNSC staff stated that SRBT meets requirements with regard to the *National Fire Code of Canada*<sup>13</sup> and the National Fire Protection Association standard *NFPA 801*.

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<sup>12</sup> Ontario Regulation 213/07

<sup>13</sup> National Fire Code of Canada 2005.



120. The Commission asked the SRBT representative how often SRBT conducts fire drills. The SRBT representative responded that SRBT conducts fire drills on a quarterly basis.
121. The Commission asked whether the Pembroke Fire Department is prepared to respond to an emergency at the SRBT facility. The SRBT representative responded that SRBT has provided tours and technical training to the Pembroke Fire Department's firefighters, including the volunteer firefighters.
122. The Commission asked if there are any concerns regarding the flammable waste stored onsite. CNSC staff responded that they have conducted a thorough review of SRBT's fire protection plan, which takes into account the hazards onsite, including waste. CNSC staff stated that the results of the analysis showed that the hazards would not result in a significant dose to workers or the public. In addition, CNSC staff stated that the Pembroke Fire Department has been informed of the hazards at the facility.

#### *Conclusion on Emergency Management and Response*

123. Based on the above information, the Commission is of the opinion that, given the mitigation measures and safety programs that are in place to control hazards, SRBT will provide adequate protection to the health and safety of persons, the environment and national security.

#### **Security**

124. With respect to site security issues, the Commission was provided with separate, protected CMDs, which were considered in a closed session.
125. The Commission concludes that SRBT has made adequate provisions for ensuring the physical security of the facility, and is of the opinion that SRBT will continue to make adequate provisions during the proposed licence period.

#### **Non-Proliferation and Safeguards**

126. The CNSC's regulatory mandate includes ensuring conformity with measures required to implement Canada's international obligations under the *Treaty on the Non-Proliferation of Nuclear Weapons*. Pursuant to the Treaty, Canada has entered into a safeguards agreement's Additional Protocol with the International Atomic Energy Agency (IAEA). The objective of these agreements is for the IAEA to provide credible assurance on an annual basis to Canada and to the international community that all declared nuclear material is in peaceful, non-explosive uses and that there are no undeclared nuclear material or activities in this country.
127. CNSC staff stated that, although SRBT is not required to have a safeguards program,

SRBT must be prepared to respond to any requests from the IAEA. CNSC staff noted that the IAEA did not request any information from SRBT during the licence period. CNSC staff explained that SRBT possesses depleted uranium for use in tritium traps, but is exempt from routine safeguards verification from the IAEA. CNSC staff noted that in order to ensure that SRBT can respond to any IAEA request concerning nuclear material in Canada, safeguards licence conditions have been included in SRBT's proposed licence and licence conditions handbook. CNSC staff stated that they are satisfied that SRBT will comply with the licence conditions if it receives any safeguards-related request.

128. Regarding non-proliferation, CNSC staff stated that, as tritium is a controlled nuclear substance, SRBT is required to obtain separate import and export licenses, pursuant to the CNSC's *Nuclear Non-Proliferation Import and Export Control Regulations*<sup>14</sup> (NNIECR). CNSC staff reported that, during the licence period, SRBT continued to comply with the NSCA to seek regulatory authorization for the import and export of its products. CNSC staff noted that SRBT has supplied all information pertinent to the authorization process, pursuant to the requirements of the NNIECR.
129. Based on the above information, the Commission is satisfied that SRBT has made and will continue to make adequate provisions in the areas of safeguards and non-proliferation at the facility that are necessary for maintaining national security and measures necessary for implementing international agreements to which Canada has agreed.

### **Packaging and Transport**

130. CNSC staff stated that, although packaging and transport are not licensed activities for SRBT, SRBT is required to comply with the *Packaging and Transport of Nuclear Substances Regulations*<sup>15</sup> and the *Transportation of Dangerous Goods Regulations*<sup>16</sup>. CNSC staff stated that they have inspected SRBT's performance in this area and found that SRBT packages and transports nuclear substances in accordance with the appropriate regulations to ensure that the nuclear substances are packaged and transported safely.
131. The Commission concludes that SRBT has made adequate provision for ensuring it meets the regulations for packaging and transport, and is of the opinion that SRBT will continue to make adequate provision during the proposed licence period.

### **Decommissioning Plan and Financial Guarantee**

132. The Commission requires that the licensee has operational plans for decommissioning

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<sup>14</sup> S.O.R./2000-210.

<sup>15</sup> S.O.R./2000-208.

<sup>16</sup> S.O.R./2001-206.

and long-term management of waste produced during the life-span of the facility. In order to ensure that adequate resources are available for a safe and secure future decommissioning of the facility, the Commission requires that an adequate financial guarantee for realization of the planned activities is put in place and maintained in a form acceptable to the Commission throughout the licence period.

133. CNSC staff stated that SRBT's current financial guarantee, which was valued at \$550, 476 and accepted by the Commission on September 12, 2007<sup>17</sup>, remains valid and in effect. CNSC staff explained that SRBT has a payment plan in place, governed by licence conditions, to fund the escrow account by April 2014. CNSC staff noted that, to date, SRBT has complied with the licence conditions, and CNSC staff recommended that these licence conditions be included in the proposed licence. The detailed schedule that was accepted by the Commission is in the licence conditions handbook. The SRBT representative stated that, as of April 2010, the balance in the escrow account was \$204,056.00, and SRBT remains on schedule to accumulate the full amount by April 2014.
134. CNSC staff noted that the next regular revision to the preliminary decommissioning plan and financial guarantee is expected in 2011, five years after the current plan was approved in 2006.
135. The Commission sought further information regarding the future of SRBT's funding of the financial guarantee. CNSC staff responded that the payment schedule will be revisited at the time of the revision to the preliminary decommissioning plan and financial guarantee. CNSC staff noted that the decision to approve the revised financial guarantee will be made by the Commission.
136. Intervenors, including the Concerned Citizens of Renfrew County, expressed concerns regarding the adequacy of the financial guarantee and the payment schedule. The Commission sought information in this regard. CNSC staff responded that the cost estimate for the financial guarantee includes a factor for contingency, in the event that the cost is higher than anticipated. In addition, CNSC staff stated that the initial amount of the financial guarantee was sufficient to place the facility in a safe shutdown state.
137. Intervenors expressed concerns that the responsibility to decommission the facility may fall to the landowner of SRBT's facility in the event that SRBT fails to adequately fund the financial guarantee. The Commission asked SRBT to comment on this matter. The SRBT representative responded that SRBT has discussed its decommissioning plan with its landlord but has not fully discussed the liability of the landowner in the event that SRBT fails to meet its financial obligations. The Commission encouraged SRBT to ensure that its landlord completely understands the situation.
138. Based on this information, the Commission considers that the preliminary decommissioning plan and related financial guarantee are acceptable for the purpose of

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<sup>17</sup> Refer to the Record of Proceedings on *Financial Guarantee for the Safe State of Closure for the Class IB Facility Located in Pembroke, Ontario*, hearing date September 12, 2007

the current application for licence renewal.

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

139. Before making a licensing decision, the Commission must be satisfied that all applicable requirements of the *Canadian Environmental Assessment Act*<sup>18</sup> (CEAA) have been fulfilled.
140. CNSC staff indicated that the renewal of a licence under subsection 24(2) of the NSCA is not prescribed for the purposes of paragraph 5(1)(d) of the CEAA in the *Law List Regulations*<sup>19</sup>. Since there are no other CEAA triggers for this project that involve the CNSC, CNSC staff stated that an environmental assessment under CEAA is not required.
141. Based upon the above assessment, the Commission is satisfied that an environmental assessment under the CEAA is not required with respect to this licence renewal.

### **Public Information Program**

142. SRBT provided information regarding its public information program. The SRBT representative stated that SRBT has a public information committee committed to improving its public information program. The SRBT representative stated that SRBT regularly updates its Web site with information, including public notifications and presentations, annual compliance reports, environmental monitoring data, and a tritium information page. In addition, The SRBT representative stated that SRBT actively engages with the public, responds to requests for information and offers facility tours.
143. CNSC staff stated that SRBT's public information program meets the criteria for an acceptable public information program as set out in CNSC Regulatory Guide-G-217<sup>20</sup>. CNSC staff noted that SRBT's public information program addresses issues related to health, safety and the environment. CNSC staff recommended that SRBT's proposed licence include a new condition that requires SRBT to implement a public disclosure approach as part of its public information program. CNSC staff explained that a formalized public disclosure approach would include criteria for proactive release of non-routine emissions and events.
144. The Commission asked CNSC staff to explain the basis for its licence condition regarding proactive disclosure. CNSC staff responded that the basis for the licence condition is the fact that other CNSC licensees currently use this approach and there is public interest in the facility. CNSC staff noted that this licence condition will provide a formal approach to what SRBT currently provides as part of its public information program.

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<sup>18</sup> S.C. 1992, c. 37.

<sup>19</sup> S.O.R./94-636.

<sup>20</sup> CNSC Regulatory Guide G-217, Licensee Public Information Programs, January 2004.

145. The IICPH, in its intervention, mentioned that it was difficult to obtain information regarding SRBT's release data. The Commission asked for more information in this regard. The SRBT representative responded that SRBT tries to respond to all requests for information as quickly as possible, but in the particular instance for the intervenor, the request was for older data that takes longer to find.
146. Based on this information, the Commission is satisfied that SRBT's public information program meets regulatory requirements and is effective in keeping the public informed on the facility operations.

### **CNSC Consultation - Aboriginal**

147. CNSC staff stated that the SRBT facility is located within 35 kilometres of the Algonquins of Pikwakanagan and within the Kawartha/Ottawa River Métis region. CNSC staff stated that they sent letters to the two Aboriginal groups to inform them of the public hearing regarding SRBT's application to renew its licence.

### **Cost Recovery Exemption**

148. CNSC staff noted that SRBT is exempted by the Commission, pursuant to section 11 of the *General Nuclear Safety and Control Regulations*<sup>21</sup> (GNSCR), from subsection 24(2) of the NSCA, and Part 2 of the *CNSC Cost Recovery Fees Regulations*<sup>22</sup> (CRFR) to the extent that the requirements apply to the timing of payments of the prescribed fee arrears and adjustments. The Commission issued the temporary exemption as part of SRBT's licence renewal in 2008<sup>23</sup>. At that time, SRBT proposed a payment plan to April 2014 in order to pay the cost recovery fee adjustments, in addition to the payments to the financial guarantee escrow account. CNSC staff reviewed the payment plan and considered it adequate.
149. CNSC staff stated that, since SRBT's licence was renewed in 2008, CNSC staff has reported on SRBT's compliance with fee payments at each Commission Meeting. CNSC staff stated that SRBT has complied with the repayment schedule to date. CNSC staff noted that SRBT requested in the current licence renewal application that the same licence conditions be incorporated in the proposed licence.
150. CNSC staff stated that they have reviewed SRBT's request and considers the current funding schedule to remain adequate, with the exception that the final payment should be increased by \$2,068 so that the total cost adjustments are paid by September 30, 2013. CNSC staff recommended that the Commission grant the requested exemption

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<sup>21</sup> S.O.R./2000-202.

<sup>22</sup> S.O.R./2003-212.

<sup>23</sup> Refer to the Record of Proceedings on *Application to Resume the Processing and Use of Tritium at the Gaseous Tritium Light Source Facility in Pembroke, Ontario*, June 12, 2008.

because the proposed exemption would not pose an unreasonable risk to the environment, the health and safety of persons or to national security, and it would not result in a failure to achieve conformity with measures of control and obligations to which Canada has agreed.

151. The Commission asked if SRBT is up to date on the cost recovery payments. CNSC staff responded that SRBT has continued to meet its obligations regarding the payment plan.
152. Some intervenors expressed the view that the cost recovery for the CNSC represented a financial incentive for the CNSC to issue licences. CNSC staff stated that the CNSC does not profit from cost recovery. The Commission notes that cost recovery is paid by the majority of licensees and is required for the CNSC to conduct its regulatory oversight activities as part of its role as an independent regulator.
153. Before considering the exemption, the Commission must be satisfied that the requirements of section 11 of the GNSCR are met. In this regard, the Commission is of the opinion that the proposed exemption would not pose an unreasonable risk to the environment or the health and safety of persons; would not pose an unreasonable risk to national security; and would not result in a failure to achieve conformity with measures of control and international obligations to which Canada has agreed.
154. The Commission exempts SRBT from subsection 24(2) of the NSCA and Part 2 of the CRFR to the extent to which the requirements apply to the timing of the payments of the prescribed fee arrears. The exemption is conditional upon the payment of the fees as per the proposed schedule and subject to any further decisions by the Commission. The Commission also agrees with the increase in the final payment as proposed by CNSC staff.

### **Licence Length and Conditions**

155. In its application, SRBT requested that the licence be granted for a period of five years. SRBT also requested that the licence be renewed with the same licence conditions as its current licence. SRBT also requested that the exemption regarding the payment of cost recovery adjustments continue to be in effect.
156. CNSC staff stated that they reviewed SRBT's application and determined that it meets the criteria for a five-year licence, according to the criteria set out in CMD 02-M12<sup>24</sup>. Based on its assessment, CNSC staff recommended that the licence be granted for a period of five years.
157. Several intervenors, including the Concerned Citizens for Renfrew County and Prevent Cancer Now, recommended that the Commission refuse SRBT's application to renew

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<sup>24</sup> CMD 02-M12, New Staff Approach to Recommending Licence Periods, Commission Meeting, March 1, 2002, <http://nuclearsafety.gc.ca/eng/pdfs/02-M12-e.pdf>

its licence.

158. In addition to the licence length, CNSC staff proposed that the licence be issued with a licence conditions handbook (LCH). CNSC staff explained that the purpose of the LCH, which is currently being used by several other CNSC licensees, is to establish and consolidate into one document the compliance framework related to the operating licence. CNSC staff noted that the LCH would specify expectations with regards to the compliance framework related to SRBT's licence.
159. CNSC staff further stated that the LCH is a controlled document and changes to this document can be approved only by the following CNSC staff positions:
  - Director, Processing and Research Facilities Division;
  - Director General, Directorate of Nuclear Cycle Facilities Regulations; and
  - Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch.
160. CNSC staff also provided a recommendation regarding the delegation of authority under the licence, consistent with current practice, with the restriction that the licensing basis shall be maintained. CNSC staff noted that any proposed changes to the facility that would affect the licensing basis would be subject to the Commission's hearing process. CNSC staff further noted that the acceptance of the cost arrears payment schedule and the funding of the decommissioning escrow account remain with the Commission.
161. CNSC staff further proposed that SRBT provide an annual report to the Commission in order to provide the Commission with up-to-date information regarding environmental monitoring results, as well as provide an update on its financial obligations.
162. Based on the above information and considerations, the Commission is satisfied that a 5-year licence with annual reporting and a mid-term report is appropriate. The Commission accepts the licence conditions as recommended by CNSC staff. The Commission also accepts CNSC staff's recommendation regarding the delegation of authority, and notes that they can bring any matter to the Commission as applicable. The Commission directs that any amendments to the licence conditions handbook related to third party monitoring must be approved by Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch.

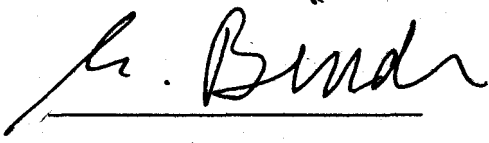
## **Conclusion**

163. The Commission has considered the information and submissions of CNSC staff, SRBT and all participants as set out in the material available for reference on the record.
164. The Commission concludes that an environmental assessment of the proposed continued operation of the facility pursuant to the *Canadian Environmental Assessment*

*Act* is not required.

165. 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 the applicant is qualified to carry on the activity that the proposed licence will authorize and that the applicant 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.
166. Therefore, the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, renews the nuclear substance processing facility operating licence issued to SRB Technologies (Canada) Inc. for its facility located in Pembroke, Ontario. The renewed licence, NSPFOL-13.00/2015, is valid from July 1, 2010 to June 30, 2015.
167. The Commission includes in the licence the conditions as recommended by CNSC staff and set out in the draft licence attached to CMD 10-H5.B. The Commission directs SRBT to continue its practice of not processing tritium during precipitation in order to keep releases ALARA. As such, the Commission includes this direction in the licence conditions handbook. The Commission also adds in the licence conditions handbook the requirement that any amendments to the licence conditions handbook related to third party monitoring must be approved by Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch.
168. With this decision, the Commission directs SRBT to prepare an annual status report on the safety performance of its facility. The Commission requests that CNSC staff also prepare an annual report on the results of compliance activities carried out during the licence term and on the licensee's performance during that period. The reports should include detailed information on environmental monitoring, groundwater studies, depleted uranium inventory, waste concentration and total mass, and annual releases. SRBT and CNSC staff shall present their reports at a public proceeding of the Commission, in approximately June of each year. The Commission notes that the public will have an opportunity to provide comments on the 2013 mid-term report.
169. The Commission notes that SRBT's submission CMD 10-H5.1C includes target reductions in releases over the course of the proposed licence period that are independent of any production levels. The Commission expects that CNSC staff will verify that SRBT's releases do not exceed these targets. The Commission also expects that SRBT will benchmark its actual releases against these targets in its annual report to the Commission.
170. The Commission expects that CNSC staff will continue to verify that SRBT performs mass balance analysis and report any concerns on this matter to the Commission.
171. The Commission encourages SRBT to continue its practice of waste minimization and to ensure that it keeps as little waste on site as possible.





JUN 30 2010

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Michael Binder  
President,  
Canadian Nuclear Safety Commission

Date

## Appendix A – Intervenors

Intervenors	Document Number
Concerned Citizens of Renfrew County, represented by J. Castrilli and K. O’Grady	CMD 10-H5.2 CMD 10-H5.2A CMD 10-H5.2B CMD 10-H5.2C
Linda Harvey	CMD 10-H5.3 CMD 10-H5.3A
Trevor J. Schwan	CMD 10-H5.4 CMD 10-H5.4A
Janet McNeill	CMD 10-H5.5 CMD 10-H5.5A
International Institute of Concern for Public Health (IICPH), represented by A. Tilman and G. Albright	CMD 10-H5.6 CMD 10-H5.6A CMD 10-H5.6B
The First Six Years, represented by K. O’Grady	CMD 10-H5.7 CMD 10-H5.7A CMD 10-H5.7B
Valence Young	CMD 10-H5.8 CMD 10-H5.8A
Venetia Crawford	CMD 10-H5.9
Beatrice Biederman	CMD 10-H5.10
Linda Reiche	CMD 10-H5.11
Marc Letellier	CMD 10-H5.12
Lynne Epps	CMD 10-H5.13
John Yakabuski, M.P.P., Renfrew-Nipissing-Pembroke	CMD 10-H5.14
Mayor Ed. Jacyno, City of Pembroke	CMD 10-H5.15
Council of Canadians	CMD 10-H5.16
KoolTemp-Valley Refrigeration Ltd.	CMD 10-H5.17
Kathrin Winkler	CMD 10-H5.18
Terry Lapierre, Chief Administrative Officer, City of Pembroke	CMD 10-H5.19
Lorraine Luckovitch	CMD 10-H5.20
Betelight B.V.	CMD 10-H5.21
Renfrew County United Way	CMD 10-H5.22
Colleen Sauriol, Manager, Planning & Building, City of Pembroke	CMD 10-H5.23
Virginia Monteleone	CMD 10-H5.24
Seiler Instrument & Manufacturing Company Inc.	CMD 10-H5.25
Signtex Inc. Lighting	CMD 10-H5.26
Gary Amyotte	CMD 10-H5.27
Bev Bergin	CMD 10-H5.28
Kris and Robin Bouchard	CMD 10-H5.29
Cusinda Bryden	CMD 10-H5.30
Tony Contant	CMD 10-H5.31

Robert and Beth Cotnam	CMD 10-H5.32
Rachel Fleury	CMD 10-H5.33
Genny Gravelle	CMD 10-H5.34
Darlene Lafrance	CMD 10-H5.35
Justine Lafrance	CMD 10-H5.36
John and Marcail Macgillivray	CMD 10-H5.37
Kathleen and Lloyd Moss	CMD 10-H5.38
Stephen Blok	CMD 10-H5.39
Kathleen Hoffman	CMD 10-H5.40
Josef Allen	CMD 10-H5.41
Anthony Corriveau	CMD 10-H5.42
Andre R. Pellerin and family	CMD 10-H5.43
Prevent Cancer Now, represented by M. MacKenzie	CMD 10-H5.44 CMD 10-H5.44A
Cheryl Gallant, MP, Renfrew-Nipissing-Pembroke	CMD 10-H5.45
Canadian Association of Physicians for the Environment	CMD 10-H5.46
Larry TerMarsch	CMD 10-H5.47
Patricia Seawright	CMD 10-H5.48
898702 Ontario Inc.	CMD 10-H5.49
Pembroke Fire Department	CMD 10-H5.50
Steel Fire Equipment Ltd.	CMD 10-H5.51
Wild Sales Company, Inc.	CMD 10-H5.52
Occupational and Environmental Working Group, Toronto Cancer Prevention Coalition	CMD 10-H5.53
Rhonda Regimbal	CMD 10-H5.54
Stephanie Snook	CMD 10-H5.55
Tamara White	CMD 10-H5.56
Wayne and Doreen Peever	CMD 10-H5.57
Dave Sloan	CMD 10-H5.58
Scott and Toby Waddell	CMD 10-H5.59
France and Claude Tessier	CMD 10-H5.60
Pia Schroeder-Smith	CMD 10-H5.61