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Mr. M. A . Leblanc  
Commission Secretary  
Canadian Nuclear Safety Commission  
P.O. Box 1046, Station B  
Ottawa, Ontario  
Canada  
K1P 5S9

**Subject: Application for the Renewal of SRB Technologies (Canada) Inc.  
Nuclear Substance Processing Facility Operating Licence  
NSPFOL-13.00/2022**

Dear Mr. Leblanc,

Enclosed, please find SRB Technologies (Canada) Inc.'s application for the renewal of Nuclear Substance Processing Facility Operating Licence NSPFOL-13.00/2022 for a period of fifteen (15) years. SRBT's current operating licence expires on June 30, 2022.

This application includes thirty-eight (38) appendices. The application and all appendices are being submitted to your attention in electronic format, as requested by CNSC staff in correspondence dated April 13, 2021 [1].

SRB Technologies (Canada) Inc. believes that this application, including appendices, is complete, and that it contains sufficient information to demonstrate that it meets the requirements of the Nuclear Safety and Control Act, and regulations made pursuant to the Act.

Best Regards,

A handwritten signature in blue ink, consisting of a large, stylized 'S' followed by a series of loops and a long horizontal stroke extending to the right.

Stephane Levesque  
President  
SRB Technologies (Canada) Inc.

cc: L. Levert, CNSC  
A. McAllister, CNSC  
L. Posada, CNSC

M. Demers, SRBT  
R. Fitzpatrick, SRBT  
J. Hollingworth, SRBT  
K. Levesque, SRBT  
J. MacDonald, SRBT  
T. Sennett, SRBT

**Reference:**

- [1] Letter from A. McAllister (CNSC) to S. Levesque (SRBT), *Application for the Renewal of SRB Technologies (Canada) Inc. Nuclear Substance Processing Facility Operating Licence NSPFOL-13.00/2022*, dated April 13, 2021 (e-Doc 6514495).



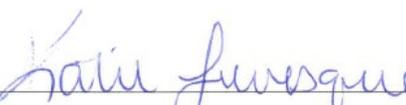
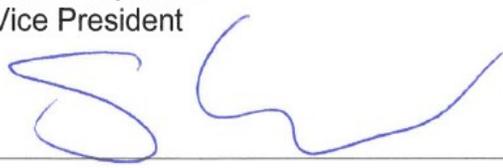
**Application for Renewal of Class IB Nuclear  
Substance Processing Facility Operating  
Licence - 2022**

June 2021

# Application for Renewal of Class IB Nuclear Substance Processing Facility Operating Licence - 2022

SRB Technologies (Canada) Inc.

June 2021

Developed by:	 _____	<u>JUNE 30/2021</u> _____
	Jamie MacDonald Manager - Health Physics and Regulatory Affairs	Date
Reviewed by:	 _____	<u>June 30/21</u> _____
	Tanya Sennett Compliance Manager	Date
Reviewed by:	 _____	<u>June 30, 2021</u> _____
	Katie Levesque Executive Assistant	Date
Reviewed by:	 _____	<u>June 30/21</u> _____
	Ross Fitzpatrick Vice President	Date
Approved by:	 _____	<u>JUNE 30/21</u> _____
	Stephane Levesque President	Date

**Statement of Application for Licence to Operate a Class IB Nuclear Facility**

*“As the officer in charge, and part owner of SRB Technologies (Canada) Inc., I, Mr. Stephane Levesque, President, hereby make application to the Canadian Nuclear Safety Commission for the renewal of nuclear substance processing facility operating licence NSPFOL-13.00/2022, as a Class IB nuclear facility, for a period of fifteen (15) years.”*

Name: Stephane Levesque

Title: President

Company: SRB Technologies (Canada) Inc.

Signature:



Date:

*JUNE 30/21*

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## **Acronyms and Abbreviations**

ACR	Annual Compliance Report
ALARA	As Low as Reasonably Achievable
APFN	Algonquins of Pikwakanagan First Nation
CLC	Canada Labour Code
CNSC	Canadian Nuclear Safety Commission
CSA	Canadian Standards Association
DRL	Derived Release Limits
EffMP	Effluent Monitoring Program
EMP	Environmental Monitoring Program
EMS	Environmental Management System
EP	Emergency Plan
EPP	Environmental Protection Plan
ERA	Environmental Risk Assessment
ERO	Emergency Response Organization
ESDC	Employment and Social Development Canada
FG	Financial Guarantee
FHA	Fire Hazard Assessment
FPP	Fire Protection Program
FSP	Fire Safety Plan
GMP	Groundwater Monitoring Program
GWPP	Groundwater Protection Program
HP	Health Physics
HP&RA	Health Physics and Regulatory Affairs
IAEA	International Atomic Energy Agency
LCH	Licence Conditions Handbook
MSP	Management System Process
NCR	Non-conformance Report

## **Acronyms and Abbreviations (continued)**

NEW	Nuclear Energy Worker
NFPA	National Fire Protection Association
NNIECR	Nuclear Non-proliferation Import and Export Control Regulations
NSCA	Nuclear Safety and Control Act
NSPFOL	Nuclear Substance Processing Facility Operating Licence
NSRDR	Nuclear Substances and Radiation Devices Regulations
OFI	Opportunity for Improvement
OLC	Operating Limit and Condition
PDP	Preliminary Decommissioning Plan
PFD	Pembroke Fire Department
PIP	Public Information Program
PTNSR	Packaging and Transport of Nuclear Substances Regulations
REGDOC	Regulatory Document
ROR	Regulatory Oversight Report
RP	Radiation Protection
RSP	Radiation Safety Program
SAR	Safety Analysis Report
SAT	Systematic Approach to Training
SCA	Safety and Control Area
SRBT	SRB Technologies (Canada) Inc.
SSC	Structure, System and Component
WMP	Waste Management Program

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## 1. INTRODUCTION AND EXPLANATORY NOTES

On June 30, 2022, Nuclear Substance Processing Facility Operating Licence (NSPFOL) number NSPFOL-13.00/2022, issued to SRB Technologies (Canada) Inc. (SRBT), is set to expire.

On April 13, 2021, SRBT received correspondence [1] from the Director – Nuclear Processing Facilities Division of the Canadian Nuclear Safety Commission (CNSC), informing SRBT of the requirements and expectations regarding the information that should be included with an application for renewal of this licence.

**This document, including all referenced appendices, hereby forms the application for renewal of the NSPFOL for SRBT.**

This application has been developed in close consideration of the guidance contained in the aforementioned letter, and is intended to fully meet the legal requirements for this purpose, as prescribed by the *Nuclear Safety and Control Act* (NSCA), and regulations pursuant to the NSCA.

A reference matrix {1} has been included with the application, in order to demonstrate how each specific regulatory requirement and expectation has been met with respect to the application for licence renewal.

This application is submitted in seven main parts:

Part 1 contains the introduction and explanatory notes that explain the application and the high-level rationale for the requested term.

Part 2 contains general information supporting the application which is administrative or legal in nature, and does not necessarily fall under the scope of a particular Safety and Control Area (SCA).

Part 3 captures information that falls within the CNSC regulatory framework functional area of 'Management', including:

- Management System
- Human Performance Management
- Operating Performance

Part 4 captures information that falls within the functional area of 'Facility and Equipment', including:

- Safety Analysis
- Physical Design
- Fitness for Service

Part 5 captures information that falls within the functional area of 'Core Control Processes', including:

- Radiation Protection
- Conventional Health and Safety
- Environmental Protection
- Emergency Management and Fire Protection
- Waste Management
- Security
- Safeguards and Non-proliferation
- Packaging and Transport

Part 6 includes any other information deemed necessary to support the application and to demonstrate that SRBT is qualified to carry on the activities that the licence would authorize, and that SRBT will make adequate provisions 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.

Part 7 includes all references and appendices to the application, as noted in the previous parts of the application.

Throughout the duration of the current operating licence, SRBT facility operations have been extremely safe and successful.

Over the term of the licence, for the past seven years, several major projects have been implemented to improve and modernize elements of the SRBT Management System, bringing it into full compliance with the requirements of CSA Standard N286-12, *Management system requirements for nuclear facilities*.

The key management system principles outlined in this standard have been integrated with all SRBT safety-related processes and programs, and comprehensive management review exercises ensures continued high levels of compliance, performance and improvement.

Our training program has been revamped and revised to align with CNSC Regulatory Document (REGDOC)-2.2.2, *Personnel Training*, and a systematic approach to training has been adopted in our nuclear facility operations and safety-related processes.

SRBT's Environmental Management System has been brought into full alignment with the relevant CSA standards, including our Environmental, Effluent and Groundwater Monitoring Programs. Annual independent third-party comparison exercises within EMS monitoring programs consistently demonstrate high precision and accuracy of measurements, and excellent program performance.

In 2020, SRBT completed the first full Environmental Risk Assessment (ERA) in accordance with CSA Standard N288.6-12, *Environmental risk assessments for Class I nuclear facilities and uranium mines and mills*. The report has been published on our website, and the recommendations stemming from the assessment have been incorporated into our EMS going into the next five-year cycle of the process.

Our Safety Analysis Report (SAR) has been maintained and updated to reflect facility changes through the current licence term. The SAR underwent a significant revision in 2017, and was accepted by CNSC staff in 2018. The facility has been operated in full compliance with the Operating Limits and Conditions contained within the SAR throughout the current licence term.

The facility has been continuously maintained in line with our Maintenance Program, ensuring that all safety-related equipment is kept in a high state of fitness for service at all times.

Workers and the public are well-protected and safe. SRBT has worked tirelessly to achieve a very low frequency of significant workplace incidents and injuries, and very low effective doses to both nuclear energy workers and the public. There have been no exceedances of regulatory limits or action levels for effective dose throughout the current licence term of seven years.

SRBT has maintained a comprehensive Fire Protection Program, with several layers of defence-in-depth that provides excellent assurance of protection and control of this hazard. In addition, our Emergency Plan has been maintained, and both fire drills and emergency exercises conducted to ensure operational readiness at all time.

Waste continues to be managed in accordance with licence requirements, including applicable CSA standards in the N292-series. Through the application of a continuous principle of waste minimization, and the implementation of effective and conservative processes for characterizing and categorizing waste materials, SRBT ensures that the burden on the environment and on future generations of Canadians is minimized.

Thousands of shipments containing radioactive material have been shipped and received during the current licence period, in compliance with regulatory requirements pertaining to packaging, transport, and import/export controls, with very few reportable incidents, all of which were of low risk-significance, and addressed to the satisfaction of CNSC staff. As well, facility security has been continuously maintained, with no security-related incidents or issues throughout the licence term.

The Preliminary Decommissioning Plan (PDP) was updated in November 2019, including a revised estimate of the cost of decommissioning. In turn, the value of the Financial Guarantee was increased to a level equal to this cost estimate in 2020, with the funds held in escrow for the sole purpose of financing the decommissioning of the facility. The Commission accepted the revised guarantee in late 2020.

The SRBT Financial Guarantee is a cash fund held in escrow, and does not rely on any letters of credit, bonds, insurance or other expressed commitments. Interest accrued on the funds deposited remain held in escrow over time; as a result, as of the end of March 2021, the FG is funded to \$738,571.67, or 101.54% of the required guarantee of \$727,327.00.

Our compliance performance has continued to be exemplary, with few compliance actions being put to SRBT as a result of CNSC compliance inspection activities. Those compliance actions that have been issued have generally been low in risk significance, and addressed quickly and effectively to the satisfaction of the CNSC.

#### Requested Licence Term

**SRBT respectfully requests that the Canadian Nuclear Safety Commission renew operating licence NSPFOL-13.00 for a period of fifteen (15) years, spanning from July 1, 2022 to June 30, 2037.**

#### Justification of Requested Licence Term

There are numerous technical and administrative justifications for a licence term of fifteen years.

The **stable and unchanging nature of our nuclear substance processing operations** itself warrants consideration of a long-term licence.

SRBT manufactures tritium-powered self-luminous safety lights and devices, and has done so using fundamentally static methods for decades. Incremental improvements have been made over time, and will continue to be made in order to reduce our impact on persons and the environment, but the general process of what we do will not differ in the next fifteen years.

Our facility does not include components that need to undergo refurbishment for long-term performance, such as with nuclear reactor facilities. SRBT does not perform unique nuclear research or complex, nuclear-related operations. The physical licenced activities conducted under the current licence have not changed significantly through the term of the licence, and no significant changes are foreseen in the period requested.

Our **comprehensive and mature management system** provides an excellent level of safety assurance. SRBT was one of the first Class I nuclear facilities to achieve alignment and compliance with the requirements of CSA Standard N286-12, and we have continued to improve the management system over time, in line with our organizational philosophy. We have continuously revised elements of our management system with each new or revised regulatory document that is incorporated as part of our licensing basis over time.

The **quality and comprehensiveness of the safety analyses** that support our licenced activities have remained high while being continually improved with each iteration. The latest versions of the facility Safety Analysis Report, the Fire Hazard Assessment, and the more recently-completed Environmental Risk Assessment have been deemed to meet CNSC staff expectations, and demonstrated that the risks are acceptable.

The set of risk assessments conducted demonstrate that the expected impact upon persons and the environment, during both routine / normal operations and emergency situations, is very low, especially among Class I nuclear facilities.

Emergency and accident scenarios have been modelled, showing that **even in the most limiting emergency scenario, the anticipated effective dose imparted to any person is expected to be well below regulatory limits for routine operations** (i.e. less than 1 mSv for persons who are not nuclear energy workers, and less than 50 mSv for nuclear energy workers – refer to Appendix A of the Safety Analysis Report for more information).

**CNSC staff have continually rated our performance as satisfactory or fully satisfactory** across all Safety and Control Areas throughout the current licence term.

SRBT has ensured that representatives attend all annual meetings of the Commission where CNSC staff have presented Regulatory Oversight Reports on our facility, and have readily been available to answer questions at each meeting – a practice that will continue into the next licence term. Frequent meetings where SRBT's performance is discussed openly, in a public setting, provide additional rationale for why a longer licence term is justifiable.

Our **regulatory compliance history** for the last decade and beyond has been excellent. CNSC inspection activities continue to occur frequently, with the number and significance of compliance actions being issued trending lower and remaining so over time. SRBT prides itself on ensuring a high level of regulatory compliance in all Safety and Control Areas.

As well, over the current licence term SRBT has been able to achieve and maintain a **very low rate of reportable events**. For those events that have occurred, the nuclear safety-related risk to persons and the environment has ranged from very low to virtually non-existent.

We implement a comprehensive **Environmental Management System** that includes several key protection and monitoring programs that comply and align with the CSA N288-suite of standards. Both Environmental and Groundwater Monitoring Program data has consistently demonstrated that the impact of our operations on the environment has remained exceedingly low over time.

With respect to groundwater protection in particular, **tritium concentrations in monitoring wells across the entire array of sampling wells have continuously been decreasing for several years**, as the operational changes that were implemented in the mid- to late-2000s take full effect. Of the 29 monitoring wells routinely sampled, only a single well located in an access-restricted fenced area very near the stacks exhibits a tritium concentration in excess of the Ontario Drinking Water Guideline value of 7,000 Bq/L. Tritium concentrations in wells used for some drinking water exhibit concentrations that are less than 14% of the Guideline value.

**SRBT openly and promptly shares a wide variety of information with the public** by way of our website, including environmental and groundwater monitoring data, reportable events, inspection reports, annual compliance reports, and more. We have meaningfully engaged with local stakeholders and Indigenous groups as part of our Public Information Program, and will continue to improve these processes as we move into the future.

Our business provides an important service to end users of tritium self-luminous safety signs, where we will take in expired or otherwise disused signs for safe processing. A long-term licence provides consumer assurance that there will continue to be a safe and effective option for ensuring best disposal practices for these items in the future.

As well, a fifteen-year licence term would provide several key benefits to our organization, and would substantially help SRBT to continue to grow and maintain the current business in a sustainable fashion, and ensure a continued high level of focus on operating the facility safely and compliantly.

A fifteen-year licence term allows resources that would otherwise need to be allocated toward licence renewal-related cost recovery fees to be diverted into facility improvements, effective safety management, and the exploration and research of ways to minimize SRBT's impact on the environment.

The licence renewal process is a very important, but resource-intensive activity. The issuance of a fifteen-year licence would represent the longest-term licence in our history, and our team has worked very hard every day to position SRBT where this is a feasible possibility.

Our workforce is very experienced, with very little turnover over time. Having an operating licence in place for a long-term period is also an important factor in **attracting and retaining key qualified staff**.

The stability offered by a fifteen-year licence would also further ensure SRBT's ability to **secure long term contracts with customers and suppliers**. Experience has demonstrated that customers and suppliers are not willing to sign contracts beyond a licence term.

Experience has also shown that it is easier to **secure financing** from financial and banking institutions with longer-term operating licences in place, as this provides for a signal of assurance that the business is stable and secure.

A fifteen-year licence term would also instill additional confidence with stakeholders that SRBT's operation is recognized by the Commission as presenting little risk to the community.

CNSC staff, the Commission and all stakeholders can be assured that the current vision for the operation of the facility over a fifteen-year licence term would not deviate in strategy from the operations that have occurred during the current licence period.

To conclude, based upon our performance, our continued commitment to operating the facility safely, and improving our operations continuously, SRBT believes that a licence term of fifteen years would be reasonable, beneficial, appropriate and justified.

**IMPORTANT NOTE:**

Numbers in [square brackets] are intended to guide the reader to a referenced document.

Numbers in {braces} are intended to guide the reader to a document included as an appendix to this application.

Complete lists of these documents are found in **Part 7** of this application document.

## 2. GENERAL INFORMATION IN SUPPORT OF APPLICATION

### a. Applicant Name and Business Address

SRBT has operated at the same address since inception in 1990:

SRB Technologies (Canada) Inc. (SRBT)  
320-140 Boundary Road  
Pembroke, Ontario, Canada  
K8A 6W5

*(unchanged since licence renewal in 2015)*

### b. Activity to be Licenced

The activity to be licenced is requested to be identical to the activity of that described in section IV of the current licence NSPFOL-13.00/2022; specifically:

- (a) operate a Class IB Facility, comprising of a tritium processing facility, at the location referred to in Section II of this licence (hereinafter “the facility”) for the purposes of manufacturing radiation devices;*
- (b) produce, possess, transfer, service and use, radiation devices arising from the activities described in (a);*
- (c) possess, transfer, use, process, manage, store and dispose of nuclear substances that are required for, associated with, or arise from the activities described in (a);*
- (d) the possession of tritium up to a limit of 6,000 terabecquerels of tritium in any form;*
- (e) possess, and use prescribed information that is required for, associated with, or arise from the activities described in (a).*

*(unchanged since licence renewal in 2015)*

### c. Nuclear Substances to be Encompassed by the Licence

The following nuclear substances are to be encompassed by the renewed licence, with maximum quantities and form listed where applicable:

- Tritium (Hydrogen-3), elemental form, with a total, including sealed and unsealed sources, not exceeding 6,000 TBq;

- Depleted uranium in metallic form, for use in tritium traps during the course of tritium processing, with a total including sealed and unsealed sources not exceeding 10 kg.
- Commercially manufactured radiation sources (Eu-152) contained within instrumentation, activity content typically less than exemption quantities, which are used for the purposes of liquid scintillation counting.
- The storage, use, packaging and transport of CNSC-certified Type B(U) tritium transport containers, which each typically contain approximately 320 grams of depleted uranium in metallic form.

(unchanged since licence renewal in 2015)

**d. Persons with Authority to Act for SRBT in Dealings with Commission**

- The President, Stephane Levesque, and the Vice President, Ross Fitzpatrick, both have the authority to act for SRB Technologies (Canada) Inc. in dealings with the Canadian Nuclear Safety Commission and each have 27 years of work experience at SRBT in various capacities.
- The President of SRB Technologies (Canada) Inc., Stephane Levesque, is responsible for the management and control of the licensed activity, the nuclear substances, nuclear facility, prescribed equipment and prescribed information encompassed by the licence.
- In accordance with SRBT's *Organizational Structure and Responsibilities* management system document, the Vice President of SRB Technologies (Canada) Inc., Ross Fitzpatrick assumes full duties of the President in their absence.
- The persons with authority to act for SRBT in dealings with the Commission has remained consistent throughout the current licence term.

(unchanged since licence renewal in 2015)

**e. Evidence of Authority from Owner of the Site**

As SRBT leases the building and area within which the nuclear substance processing facility is located, a letter of authority from the owner of the site has been provided as part of the licence application, in order to fulfill this requirement. This letter is included as Appendix {2}, as evidence that the owner of the site continues to be knowledgeable of the nature of our operations, and authorizes SRBT to conduct activities licenced by the Commission.

(unchanged since licence renewal in 2015)

**f. Statement of Changes in the Information Previously Submitted**

There have been numerous changes to information previously submitted over the course of the current licence term, all of which have been controlled and accepted by the Commission and/or CNSC staff. Significant changes pertinent to the renewal of the licence are outlined within individual sections of the application.

**g. Standards, Codes and Regulatory Documents - General**

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as compliance verification criteria in the next revision of the SRBT Licence Conditions Handbook (LCH):

- CNSC REGDOC-3.3.1, *Financial Guarantees for Decommissioning of Licenced Activities*.
  - Published in January 2021, superseding G-206 (see below);
  - SRBT's Financial Guarantee (FG) was last revised and accepted [2] by the Commission in December 2020;
  - SRBT intends to comply with REGDOC-3.3.1 when our Preliminary Decommissioning Plan (PDP) is next revised, by **November 29, 2024**, followed by the submission, and Commission acceptance of a revised FG encompassing the cost estimate associated with the PDP at that time.
- CNSC REGDOC-3.2.1, *Public Information and Disclosure*.
  - SRBT intends to revise its Public Information Program (PIP) and associated Public Disclosure Protocol, by **March 31, 2022**. This revision will incorporate any required changes to comply with REGDOC-3.2.1.

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as recommendations and guidance in the next revision of the SRBT LCH:

- CNSC Guide G-206, *Financial Guarantees for the Decommissioning of Licenced Activities*.
- CNSC REGDOC-3.5.3, *Regulatory Fundamentals*
  - will supersede CNSC INFO-0795, *Licensing Basis Objective and Definition*
- CNSC REGDOC-3.6, *Glossary of CNSC Terminology*

### 3. FUNCTIONAL AREA: MANAGEMENT

#### a. SCA – Management System

##### Governing Management System Document

The management system aspects of SRBT's operations, both with respect to safety and product quality, are described in the SRBT *Quality Manual* {3}.

All other management system documents are subordinate to the Quality Manual, and must conform to its requirements.

The Quality Manual is designed in a way that fully aligns and complies with the requirements of CSA Standard N286-12, *Management system requirements for Class I nuclear facilities and uranium mines and mills*.

All N286-12 management system principles are discussed in this manual, along with high-level descriptions of the processes that have been implemented to ensure that these principles are consistently incorporated into our operations and the maintenance of nuclear safety.

The manual includes SRBT's Quality Policy statement, which codifies the key vision and mission statements for the entire organization, outlines key safety goals, and ensure that our values are well understood and internalized within all levels of the organization.

Adherence to the Quality Manual and a faithfulness to the components of the Quality Policy are obligations of all employees and management at SRBT. As well, the concept of continually improving the management system at all levels, by all workers, is actively encouraged in the Quality Manual.

SRBT's Executive Committee is responsible for ensuring the design of the Quality Manual meets requirements, that it is continually improved, and that all facility operations are conducted in accordance with its requirements.

##### Organization and Organizational Structure

Insofar as it may bear on SRBT's compliance with the Nuclear Safety and Control Act (NSCA) and the regulations made under the NSCA, the organization, organizational structure, reporting lines and responsibilities for all members of SRBT's workforce are fully described in full in the administrative descriptive document *Organizational Structure and Responsibilities* {4}.

Internal allocations of functions, responsibilities and authorities are fully described in this document, which is directly subordinate to the SRBT Quality Manual {3}.

SRBT management are responsible and accountable for compliance with the NSCA, associated regulations, and the requirements of any CNSC licence at all times, with the ultimate accountability being held by the President.

### Organizational Changes in the Current Licence Term

There have been a small number of significant changes in the organization since the last renewal of SRBT's NSPFOL.

At the top management level, no change has taken place. Senior management continues to consist of the President and Vice President, who hold the ultimate accountability for the maintenance of nuclear safety at the site, as well as the control of the organization and its structure.

At the lower production levels, no change has taken place. At this level, the organization is divided into five production departments, with assigned supervisors in each department who are responsible for the control of day-to-day work activities, and the maintenance of a safe and compliant work environment.

At the organizational management and assistant level, several changes have been implemented since 2015:

- The position of 'Graphics Design Specialist' was added to the organization, taking on several of the responsibilities held previously by the Engineering Assistant position.
- The position of 'Engineering Assistant' was removed from the organization, and their responsibilities were redistributed over time to the Project Engineer and Graphics Design Specialist positions.
- The position of 'Fire Protection Specialist' was added to the organization.
- The position of 'Information Technology (IT) Specialist' was added to the organization.
- The position of 'Import and Export Manager' was re-defined to a new position titled 'Logistics Manager'.
- The position of 'Import and Export Specialist' was removed from the organization, with these duties and responsibilities either being rolled in to

those of the Logistics Manager, or to qualified Production Technicians working in the Shipping and Receiving department.

- The position of 'Inventory Control Assistant' was added to the organization, reporting to the Production Control Manager.
- The position of 'Health and Safety Specialist' was re-defined as 'Manager – Safety and Security', as an improved description of the associated responsibilities and authorities of this position.
- The position of 'Human Protection Coordinator' has been removed from the organization, with those safety-related responsibilities having been re-allocated to other positions in the organization.
- An expansion of the Health Physics sub-organization (i.e. the Health Physics Team) took place, with the creation of three new positions in the organization, all reporting through the Manager – Health Physics and Regulatory Affairs (HP&RA):
  - A new position of Assistant Manager – Health Physics (HP), reporting directly to the Manager – HP&RA;
  - A new position of Radiation Protection Technician, reporting to the Assistant Manager – HP; and
  - A new position of Environmental Protection Technician, reporting to the Assistant Manager – HP.

These individuals took over all responsibilities previously held by the Human Protection Coordinator.

In all cases, the organizational changes described above were managed in accordance with SRBT's change control processes.

All safety-related responsibilities and authorities were distributed and transferred accordingly, to ensure the maintenance of a high level of safety within the framework of both our licence and our management system.

Each noted organizational change has had a positive impact on maintaining compliance and safety, and helped to ensure that our operations and our processes are continually reviewed and improved over time.

### Monitoring and Improvements by Committees

To ensure a collaborative and cross-disciplinary approach is taken in monitoring our safety programs and directing improvements and change, SRBT implements a variety of Committees.

Committees can be comprised of members of the organization at all levels, including management, program or process owners, subject-matter experts, and workers who support each given area. Frequent meetings are held to discuss data collected, evident trends, programmatic goals and targets, and any new information, events or significant developments, as well as any other pertinent information that could help drive improvement or key decisions.

As described in the governing administrative descriptive document *Committee Process and Descriptions* {5}, the implementation of the committee model ensures that:

- Purpose is created and communicated,
- Planning is conducted, and plans are acted upon,
- Issues that are relevant to the purpose and strategic direction of the business, or that could affect the ability to achieve results, are determined, monitored and reviewed,
- Relevant requirements are identified and met,
- Resources are provided to support the management system,
- Risks to objectives are identified and controlled,
- Opportunities for improvement are identified,
- Objectives, measures and targets are established and monitored,
- Performance is monitored, and
- Collaboration occurs for complex, safety-significant or technical decisions that could affect the business in a significant way.

The Committee model at SRBT has been implemented and maintained throughout the current licence term, and has proven to be highly effective at supporting good program monitoring, and promoting safety and high compliance performance.

## Documented Management System Structure

In accordance with our Quality Manual, as well as in line with the principles described in CSA N286-12 where the business and organization shall be defined, SRBT maintains an interrelated 'structure' of management system documents that fully encompass all safety and production-related activities conducted at the facility.

All management system documents (or high-level sets of documents) are represented within a chart contained within administrative descriptive document titled *Document and Process Structure* {6}.

The relationship of SRBT's safety programs, procedures, and licence-supporting technical analyses are fully described in this document, which is directly subordinate to the SRBT Quality Manual {3}. The document also describes the specific responsibilities associated with the establishment, maintenance and alteration of the structure of the management system document set.

The interrelated nature of our management system document set ensures that each aspect of our operations is clearly managed by assigned individual program or process owners. Where changes and improvements are warranted, the responsible individual in the organization can clearly be traced, aiding in ensuring accountability for the maintenance of, and compliance with the overall management system.

The general hierarchy of the documented management system is illustrated in section 4 of *Document and Process Structure*. As a general description, at the top tiers are:

- the Quality Manual {3} which represents the overall governing document in the system;
- Management System Processes (MSP), consisting of processes aimed at addressing all of the high-level principles defined in the N286-12 standard, and which apply to all programs, processes and procedures globally in the system;
- Descriptive Documents, both administrative and technical:
  - Administrative Descriptive Documents are intended to act as controlled descriptions of key elements of the organization and licenced activities, and include:

- Organizational Structure and Responsibilities {4},
  - Committee Process and Descriptions {5}, and
  - Document and Process Structure {6}.
- Technical Descriptive Documents, which are intended to capture:
    - Licensing-basis safety analyses (e.g. Safety Analysis Report; Environmental Risk Assessment; Conditional Clearance Levels, etc.),
    - Limiting criteria on operations or parameters associated with our operations (e.g. Licence Limits, Action Levels, and Administrative Limits; EMS Objectives and Targets, etc.), and
    - Future- or event-specific plans of actions (e.g. Preliminary Decommissioning Plan, Fire Safety Plan, etc.).

Throughout the term of the current licence, SRBT has updated safety programs and processes in the spirit of continuous improvement, and in response to developments in regulatory requirements and events.

In all cases, the programs and processes that are associated with our licensing basis have been submitted to CNSC staff for review and acceptance, in order to ensure that the CNSC remains informed of the changes within our documented management system, as well as to provide assurance that the facility remains within the licensing basis at all times.

These changes were implemented in compliance with the condition 1.2 of our NSPFOL, as well as in line with the described compliance verification criteria in SRBT's LCH.

As well, since the licence was last renewed, several key safety analyses have been reviewed and updated in line with modern requirements and best practices. New analyses were also performed in line with regulatory expectations, and in support of continuing to improve the understanding of the impact of our operations on persons and the environment.

More information on the development of these safety analyses is included in the sections of this application dealing with the Safety and Control Areas (SCA) of Safety Analysis, Environmental Protection, Fire Protection and Waste Management.

The number of changes in the documents comprising our management system since 2015 are numerous; rather than listing these changes in their entirety here, some notable key changes and improvements are described that support our application.

- Starting in 2014, SRBT embarked on a comprehensive gap analysis project, focused on assessing the gaps between CSA Standard N286-12, *Management system requirements for nuclear facilities*, and what was at that time called our Quality Assurance Program.

In September 2014, the gap analysis report was submitted to CNSC staff, along with an action plan to address all significant gaps over the following three years. CNSC staff accepted [3] this action plan in November 2014, and SRBT provided scheduled updates on our progress in implementing the plan over time.

Over the course of the implementation of the action plan, several management system documents were revised, new hierarchical relationships between the document set were established, and new processes and procedures developed in order to ensure all gaps were addressed effectively, and in a controlled fashion.

A final status update was provided on December 1, 2016, where it was noted that all improvement actions had been completed, bringing our management system into compliance with the requirements of N286-12.

CNSC staff conducted a compliance inspection focused on the SCA – Management System in March 2017. One action notice and two recommendations were issued, both of which were addressed to the satisfaction of CNSC staff by August 2017.

The three-year project to align our management system with the requirements of N286-12 was highly successful, and has helped SRBT to improve our operations and safety performance throughout the term of our licence.

- Starting in 2015, SRBT embarked on a comprehensive gap analysis project, focused on assessing the gaps between several CSA Standards associated with the SCA of Environmental Protection.

The CSA Standards against which our Environmental Management System (EMS) was assessed included:

- REGDOC-2.9.1, *Environmental protection policies, programs and procedures*;
- N288.4, *Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills*;
- N288.5, *Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills*;
- N288.6, *Environmental risk assessments at Class I nuclear facilities and uranium mines and mills*;
- N288.7, *Groundwater protection programs at Class I nuclear facilities and uranium mines and mills*.

In January 2016, the gap analysis report was submitted to CNSC staff, followed by a revised version of the analysis and an associated action plan in May 2016, based on CNSC staff feedback on the original analysis.

The action plan was designed to address all significant gaps over the course of the following four years. As each action was completed, SRBT submitted revised program documents associated with our EMS to CNSC staff for review and acceptance.

As can be seen in SRBT's *Document and Process Structure* management system document {6}, the EMS, its associated protection and monitoring programs, the key technical analyses, and descriptive documents were incorporated as subordinate components of our overall management system.

This embedded structure in our overall management system hierarchy ensures that the principles and requirements of CSA Standard N286-12 are consistently applied to every aspect of our EMS.

As part of the action plan, the Environmental Monitoring Program (EMP) was revamped, in order to ensure a complete and fulsome description of all activities conducted by SRBT as part of this program in line with the associated standard N288.4.

As well, Effluent Monitoring Program (EffMP) and Groundwater Monitoring Program (GMP) documents were established in order to ensure program alignment with N288.5 and N288.7 respectively, and to separate these aspects of the EMS away from the EMP and Radiation Safety Program.

All three monitoring programs included a new set of procedure level documents that clearly describe all activities in detail, whether conducted in-house or by an independent qualified third-party laboratory.

The last two years of the action plan were primarily focused on the completion of the first comprehensive Environmental Risk Assessment (ERA) of our operations, in compliance with CSA Standard N288.6. The first iteration of the ERA was completed in 2020, and a report detailing all aspects of the ERA was published by SRBT in December 2020, after having been submitted to CNSC staff.

A revision to the ERA was published after CNSC staff provided comments in early 2021, and the recommendations contained within the report were then actioned in an effort to further improve the understanding of the risks posed by the operation of the SRBT facility over the next five-year cycle of the ERA maintenance process.

- The SRBT Fire Protection Program (FPP) was revised in July 2015 to bring it into full alignment with the requirements of CSA Standard N393-13, *Fire protection for facilities that process, handle or store nuclear substances*.

The program revision was implemented after the conclusion of a gap analysis between the previous iteration of the FPP and the CSA Standard, over the course of approximately one year.

Since being revised to comply with N393-13, the program has been continuously improved, and has been subjected to numerous internal and external audits over time. The implementation of this program has contributed to the high level of fire safety assurance in the facility, and the overall good compliance performance in the associated SCA.

Complementing this programmatic improvement are the revised Fire Hazards Assessment and Fire Safety Plan documents, all of which have again been continuously reviewed and approved throughout the term of the current licence.

- The SRBT Radiation Safety Program underwent a major revision in 2017, in order to remove non-radiation protection related aspect of our operations from this program (e.g. several Management System / EMS / Conventional Health and Safety / Packaging and Transport of Nuclear Substances requirements / other non-RP aspects previously described within the RSP).

The major revision included an expansion and improved description of all radiation-protection related processes, including the application of the 'as low as reasonably achievable (ALARA) principle, contamination control,

bioassay and dosimetry, health physics instrumentation, hazard monitoring and controls, and the use of protective equipment and clothing.

The procedure set subordinate to this program also evolved over the licence term, with the addition of five new procedures to date, and the continuous improvement of existing procedures over time in response to internal audits, regulatory inspections, and changes to regulatory requirements.

As well, a subordinate Dosimetry Service Program document has been established under the Radiation Safety Program, in order to capture the specific requirements and controls associated with that activity, which SRBT performs in accordance with a separate CNSC-issued Dosimetry Services Licence.

- Other key safety-related programs and technical analyses which are part of our licensing basis for the current NSPFOL were also continuously improved and revised as required, based on inputs such as events, management review, internal audits, regulatory inspections and other developments over time.

Revised programs and analyses that were submitted and accepted by CNSC staff during this licence term not already discussed include:

- Derived Release Limits [4]
- Emergency Plan [5]
- Health and Safety Policy [6]
- Licence Limits, Action Levels and Administrative Limits [7]
- Maintenance Program [8]
- Preliminary Decommissioning Plan [9]
- Public Information Program [10]
- Regulatory Reporting Program [11]
- Safety Analysis Report [12]
- Training Program Manual [13]
- Waste Management Program (including associated Conditional Clearance Levels Technical Report) [14]

In summary, the documented SRBT management system has been well maintained and continuously improved over the course of the current licence term.

## Safety Culture Promotion and Support

Management system process MSP-013, *Safety Culture Monitoring Process* {7} describes the measures by which SRBT promotes and supports a healthy safety culture at the facility.

This process was originally put in place as part of the action plan associated with bringing the SRBT management system into compliance with the requirements of CSA Standard N286-12.

The Safety Culture Committee is responsible for the monitoring and review of this process, as well as the implementation of its requirements.

At all levels, a positive safety culture is promoted by the implementation of our management system, and the active involvement of Committees in managing our safety programs.

In addition, all staff are frequently trained and encouraged to identify safety-related or quality-related issues as part of their engagement with our management system.

During annual all-staff training exercises, as well as when new workers are hired, they are informed that all staff are expected to raise issues when they are identified as a condition of their employment. It is emphasized that all employees can raise non-conformance reports and opportunities for improvements through our MSPs, and participate in the actions that are taken to address issues or incorporate improvements.

The Quality Policy defined in our *Quality Manual* {3} specifically identifies a strong safety culture as one of the overarching goals of the organization:

1. *To promote a strong safety culture throughout the organization by having all employees continuously assess and analyze any impact the operations may have on the public and the environment.*

By actively promoting and encouraging all of our employees to participate in these processes, the goal of pursuing and maintaining a positive safety culture at the facility is continuously supported at all times.

### Standards, Codes and Regulatory Documents – Management System

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as compliance verification criteria in the next revision of the SRBT LCH:

- CSA N286-12, *Management system requirements for nuclear facilities*.
- CNSC REGDOC-2.1.2, *Safety Culture*.

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as recommendations and guidance in the next revision of the SRBT LCH:

- CNSC REGDOC-2.1.1, *Management System*
- CSA N286.0.1, *Commentary on N286-12, Management system requirements for nuclear facilities*.

### Performance Assessment – Management System

Over the course of the current licence term, SRBT considers its performance in the SCA of Management System to meet our internal expectations, and to be very good in general, with a stable trend over time and projected into the future.

This assessment is based on the following key points:

- SRBT conducted a comprehensive overhaul of our management system, bringing into compliance with CSA N286-12 in a controlled manner over the course of several years.
- SRBT has continued to maintain management system documents throughout the course of the current licence term, and has sought out and implemented improvements at every step.
- A comprehensive management review process has continued to be effectively performed annually, resulting in proactive maintenance of our overall system, and integration of key organizational positions into decision-making and risk-management processes.
- A robust process of internal audit, and the active management of non-conformances, opportunities for improvement, and associated action plans drives high performance.
- CNSC staff has consistently rated SRBT's performance in this area as 'Satisfactory' each year as part of their Annual Compliance and Performance Report.

## **b. SCA – Human Performance Management**

### Training and Qualification Management

In order to ensure that an excellent level of human performance is achieved in all operational areas that impact safe operations, SRBT implements a documented program that fully describes the processes implemented with respect to training and human performance management.

This program is titled the *SRBT Training Program Manual* {8}; the manual and its processes have been implemented since 2014 when SRBT undertook to align our training processes with the newly published CNSC REGDOC-2.2.2, *Personnel Training*.

The Manager – Health Physics and Regulatory Affairs (HP&RA) is responsible for ensuring the design of SRBT's training program meets requirements, and that the program is implemented in accordance with the manual.

Over the course of the licence term, the manual has been revised on four separate occasions in response to action items and recommendations stemming from CNSC inspections, as well as from internal audits and management review exercises. In each case, the manual has been submitted to CNSC staff for review and acceptance prior to implementation, in accordance with condition 1.2 of the current NSPFOL.

The manual is designed to describe and govern how training is managed and applied during the course of facility operations. As described within the scope of the manual, it defines:

- When and how a systematic approach to training (SAT) is applied and implemented,
- How each of the five key phases of the systematic approach are conducted,
- How key decisions relating to training are made,
- Who is responsible for managing the Training Program,
- Who is responsible for managing training within each organizational unit,
- Who can authorize training activities to be created, managed and conducted,
- The categorization process for new processes or equipment,
- How the overall Training Program is evaluated and renewed,
- How problems relating to the Training Program are identified and resolved,

- How key training-related records are created and maintained,
- How changes to aspects of the Training Program are controlled, and
- The renewal of the cycle of the SAT.

The manual defines the processes used to determine who requires training, what tasks require training, individual qualifications, how training is delivered, and how often training is renewed.

Qualification management is a key process within the manual. For individual workers, their qualification requirements are described within their job description, as listed in management system document *Organizational Structure and Responsibilities* {4}.

If a worker's responsibilities intersect with activities that have been classified as 'Category 2' in the training program, then a Systematic Approach to Training (SAT) is applied for their qualification process, in line with the requirements and guidance contained in REGDOC-2.2.2.

For safety-related tasks that have been graded to be difficult, important and/or low frequency, timeframes for when requalification is mandated have been established, and processes for maintaining continuous qualification have been put in place.

The implementation and improvement of a training program that complies with the requirements of REGDOC-2.2.2 during the course of the current licence term has been very successful in ensuring safe and compliant operations of the facility, and excellent human performance in the execution of safety-related activities.

The training program is reviewed annually to establish the results achieved in implementing the program for recruiting, training and qualifying workers. Overall, to date the results have been consistently satisfactory, and combined with improvements over time, have significantly enhanced human performance in key safety areas.

Refer to the *SRBT Training Program Manual* {8} for a complete and fulsome description of the processes implemented for training and qualifying workers at SRBT.

### Fitness for Duty

The SRBT facility is not a 'high-security site', as defined in the *Nuclear Security Regulations*; as such, the specific requirements of the 'Fitness for Duty' set of REGDOCs in the 2.2.4-series are not applicable to our current licenced activities.

Notwithstanding, SRBT mandates that all workers only attend to their duties on site when fit to do so, with respect to impairment, fatigue or illness, in line with the requirements of prevention of workplace hazards contained within the Canada Labour Code. These requirements are fully described in SRBT Health and Safety Procedures HAS-003, *Safe Workplace Procedure*, and HAS-004, *Impaired Personnel Procedure*.

As well, all workers are encouraged to identify instances where they suspect a fellow worker or contractor is exhibiting disruptive and abnormal behaviour that suggests they are unfit to perform their work in a safe manner.

### Results Achieved in Recruiting, Training and Qualifying Workers

Throughout the course of the current licence term, SRBT has been very successful in recruiting and retaining a workforce that contributes to all aspects of operational safety of the facility.

Our workforce is very experienced, with very little turnover over time. As of the end of 2020, the average experience of the SRBT workforce of 38 staff members stood at just under 12.5 years. For those organizational managers who are responsible for the maintenance and execution of nuclear safety-related programs, the average experience stood at 18.1 years with production supervisors averaging just over 21 years of experience with SRBT.

The implementation of a SAT has ensured that workers in key safety-related positions are well-trained and qualified to carry on work activities in a way that ensures safety at all times. This is borne out by the fact that the frequency of significant human performance-related safety events has been very low over the course of the current licence.

The training program continues to be routinely analyzed and assessed over time, in the spirit of continuous improvement. By maintaining this program and diligently implementing its processes, the results achieved with respect to the safe operation and maintenance of the nuclear facility are, and are expected to remain, excellent.

## Standards, Codes and Regulatory Documents – Human Performance Management

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as compliance verification criteria in the next revision of the SRBT Licence Conditions Handbook (LCH):

- CNSC REGDOC-2.2.2, *Personnel Training*

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as recommendations and guidance in the next revision of the SRBT LCH:

- CNSC REGDOC-2.2.5, *Minimum Staff Complement*

## Performance Assessment – Human Performance Management

Over the course of the current licence term, SRBT considers its performance in the SCA of Human Performance Management to meet our internal expectations, and to be very good in general, with a stable trend over time and projected into the future.

This assessment is based on the following key points:

- SRBT first implemented a Training Program that complied with REGDOC-2.2.2 just prior to the licence renewal in 2015; since that time the program has been revised several times in order to drive improvements.
- SRBT has experienced very few safety-significant events that had a root cause in human performance throughout the current licence term.
- Trainee performance has been excellent, with few instances of remedial training being required over time.
- Feedback on training is routinely solicited as part of the program; the vast majority of feedback from trainees is that they have found the applied training to provide them with information that was understandable, that helped them to have a better understanding of the subject matter, and can be applied to their job at SRBT.
- CNSC inspections in this area have identified the effective implementation of programmatic requirements and good operating practices.
- CNSC staff has consistently rated SRBT's performance in this area as 'Satisfactory' each year as part of their Annual Compliance and Performance Report.

**c. SCA – Operating Performance**

Operating the Nuclear Facility

As described previously in the section pertaining to Management System, all nuclear-substance related operations of the SRBT nuclear substance processing facility are controlled by programs and procedures that are subordinate to the overall Quality Manual {3}.

A depiction of the relationships and overall structure of the documented programs and procedures can be found in administrative descriptive document titled *Document and Process Structure* {6}.

With respect to key safety-related programs and associated procedures, descriptions and references can be found in the specific sections of this application covering each of the SCAs throughout the application.

With respect to processing of tritium, the departmental procedure set associated with the 'Rig Room' area of the facility fully captures the requirements associated with this activity. These procedures, along with the higher-level management system framework in which they are based, represent the measures, policies, methods and procedures for operating the nuclear facility and processing the nuclear substance.

The operational procedures directly associated with the processing of tritium, including the measures to control releases of nuclear substances to the environment, are included with this application as {9}.

Methods of monitoring the releases of nuclear substances to the environment are discussed in the section SCA – Environmental Protection.

Compliance with Operating Limits and Conditions

SRBT operates the nuclear facility in compliance with a set of Operating Limits and Conditions (OLCs) that are detailed in the facility Safety Analysis Report (SAR) {10}. A complete list of OLCs are listed in section 10 of the SAR.

Application of these OLCs ensure that SRBT's nuclear processing facility operations remain safe and controlled at all times, with sufficiently conservative safety margins, both with respect to workers, other persons and the environment.

Throughout the current licence term, SRBT has continued to operate the nuclear facility within the bounds of these OLCs at all times. Each year, a summary of

compliance with each individual OLC has been included in SRBT’s Annual Compliance Report (ACR), with no noted non-compliances over the course of the licence term.

This includes limits on the amount of tritium possessed by SRBT at any time, as well as limits on the quantity of tritium released to the environment, in any form, through both the gaseous and liquid effluent pathways.

Table 1 summarizes data associated with quantitative OLCs over the course of the current licence term (six years of data), including minima and maxima:

**TABLE 1: SRBT OPERATING LIMITS AND CONDITIONS (2015-2020)**

OLC	UNITS	LIMIT	MINIMUM	MAXIMUM
Tritium Possession Limit	TBq	6,000	2,117 <i>(May 2020)</i>	5,064 <i>(May 2015)</i>
Tritium Releases to Atmosphere – Tritium Oxide	Bq	6.72E+13	5.29E+12 <i>(2016)</i>	1.19E+13 <i>(2019)</i>
Tritium Releases to Atmosphere – Tritium Oxide + Elemental	Bq	4.48E+14	2.48E+13 <i>(2017)</i>	5.62E+13 <i>(2015)</i>
Tritium Releases to Sewer – Water-soluble Tritium	Bq	2.00E+11	5.18E+9 <i>(2016)</i>	1.37E+10 <i>(2019)</i>

The following statements of compliance with OLCs also apply throughout the course of the current licence term:

- Tritium processing operations (filling and sealing tritium light sources, laser cutting of miniature light sources, and bulk splitting operations) only occurred between the hours of 0700h-1900h.
- Tritium processing did not occur during any measurable periods of precipitation.
- Tritium processing only occurred when the minimum differential pressure for each active ventilation stack was verified as being achieved at the start of the production day.

- The number of filling cycles applied to any tritium trap did not exceed 30 at any time.
- Tritium traps were not filled with more than 111,000 GBq during any filling cycle.
- Bulk tritium containers received from our supplier were not loaded with more than 1,000,000 GBq at any time.
- Bulk tritium containers were not heated and sustained beyond 550 degrees Celsius at any time during tritium processing operations.
- The on-site physical inventory of depleted uranium (virgin, in use and in decommissioned tritium trap bases) did not exceed 10 kg at any time.

The SAR is included with this licence application {10}. Operational procedures controlling nuclear substance inventory controls include RSO-009, *Tritium Inventory Management*, and RSO-029, *Nuclear Substances Inventory Management*. These procedures are also included with this renewal application {11, 12}.

#### Action Level Exceedances

An action level is an indicator of a potential loss of control of part of a program or control measure. Exceeding an action level signals a potential reduction in the effectiveness of the program or control measure, and may indicate a deviation from normal operation.

SRBT implements action levels for radiation protection and environmental protection purposes. These are set to be much lower than licence limits and OLCs, in order to ensure adequate margin for safety in case of an exceedance.

**Since the current NSPFOL went into effect on July 1, 2015, there have been no instances where an action level has been exceeded at the SRBT facility.**

Facility action levels were last reviewed, revised and submitted to CNSC staff for acceptance in 2019. The current action levels are defined in SRBT's administrative technical document *Licence Limits, Action Levels and Administrative Limits*, Revision F.

The action levels defined within this document were proactively developed in line with the requirements and guidance contained in CSA Standard N288.8-17, *Establishing and implementing action levels for releases to the environment from nuclear facilities*.

This document was reviewed and accepted by CNSC staff on August 21, 2019 [7], and is included as an appendix to this licence renewal application {13}.

### Reportable Events

Over the course of the current licence term, SRBT has experienced a small number of events that met the criteria for reporting to CNSC staff.

The requirements for reporting events to the Commission and/or CNSC staff are defined in the NSCA, and the criteria for reporting defined in the regulations made pursuant to the NSCA.

SRBT developed and implemented a new program in March 2016, focused on ensuring reports of events were controlled and consistently met compliance requirements. The in-force revision of the *Regulatory Reporting Program* is included with this licence renewal application {14}.

In January 2018, the Commission published REGDOC-3.1.2, *Reporting Requirements, Volume 1: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*.

This document describes the applicable event reporting requirements for such facilities, and the SRBT *Regulatory Reporting Program* was revised to ensure compliance with this new REGDOC.

Table 2 provides a complete summary of reportable events experienced by the facility, spanning from July 1, 2015 to June 30, 2021:

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**TABLE 2: REPORTABLE EVENTS (2015-2021)**

DATE	EVENT DESCRIPTION	FINAL REPORT ACCEPTANCE DATE
September 25, 2015	During maintenance work on the air compressor, an oil hose became disconnected from a pressurized section of the compressor, ejecting a fine mist of oil into the room, and activating the smoke detector and setting off the facility fire alarm. The Pembroke Fire Department responded to the false alarm within minutes. There was no hazard to workers, the facility or the environment.	November 18, 2015
June 1, 2016	At 1150h, the facility fire alarm sounded, and all personnel evacuated and responded accordingly. It was determined that the smoke had been detected in the compressor room, caused by friction associated with the entanglement of a failed drive belt on the unit. There was no hazard to workers, the facility or the environment. SRBT increased the frequency of drive belt maintenance from annual to semi-annual as a result of this event.	June 15, 2016
November 26, 2016	Information provided to SRBT indicated that a trailer containing four pallets of expired tritium exit signs had been stolen while in transport to our facility in Pembroke. The trailer was stolen while parked in the yard of Sera Global Logistics in Mississauga, Ontario while awaiting further transport. The trailer was reported as being found on December 15, 2016. The carrier and Peel Regional Police inspected the trailer in close consultation with SRBT, where it was determined that the packages had not been tampered with, and remained in good condition for transport. Once the shipment arrived in Pembroke, members of the SRBT Health Physics Team performed a radiological assessment of the trailer and its contents, finding no evidence of any hazard. An inventory check confirmed that there were no missing exit signs.	February 7, 2017
June 6, 2017	A package was returned to SRBT with clear evidence of damage in transport. The package was categorized as UN2910, Excepted Package, Limited Quantity of Material, and was destined for a customer located in Bulgaria when it was refused loading for export by aircraft due to the apparent damage to the outside of the package. The package was assessed upon receipt, and although the physical damage was visually evident, an assessment found no radiological hazard associated with the package (i.e. no evidence of contamination, products contained within were still in excellent condition). There was no hazard to workers, the facility or the environment.	June 20, 2017
November 21, 2017	A contracted freight carrier notified SRBT that they had declared a package containing 26 tritium-powered self-luminous aircraft safety signs lost. The package was intended for a customer in Germany, and was categorized as UN2911, Excepted Package, Articles. On December 6, 2017, the carrier informed SRBT that the package had been located in Munich, and delivery to the customer was completed on December 12, 2017.	January 22, 2018

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**TABLE 2 (continued): REPORTABLE EVENTS (2015-2021)**

DATE	EVENT DESCRIPTION	FINAL REPORT ACCEPTANCE DATE
February 28, 2018	On February 5, 2018, a spent bulk tritium container was transported and delivered to a consignee as a Type 'A' package, but was later determined to have contained a Type 'B' quantity of tritium. The consignee notified SRBT of this finding after conditioning the tritium container in preparation for filling. As a result, SRBT altered internal packaging procedures to categorize all spent bulk tritium containers as UN2916 Type 'B' in the future. There was no hazard to workers, the facility or the environment.	March 16, 2018
January 2, 2019	SRBT reported that a major fire was in progress at a nearby lumber yard, resulting in a loss of power to a significant part of the City of Pembroke, including the SRBT facility. Power was restored the next morning, and there was never any threat to the SRBT facility from the fire at any time. A member of SRBT's organization was on site at all times once alerted of the loss of power. There was no hazard to workers, the facility or the environment.	January 16, 2019
January 16, 2019	SRBT erroneously accepted three tritium-powered aircraft safety signs from a customer in the European Union. The signs had recently been sold and exported by SRBT in accordance with an export licence. The signs were received by the customer, but after inspection the signs were rejected as they were found to not meet the design requirements for their purpose. The customer sent the three signs back without authorization from SRBT, and the shipment was mistakenly accepted upon arrival, without having the required import licence. There was no hazard to workers, the facility or the environment.	January 24, 2019
February 19, 2021	A fire alarm occurred at the facility at approximately 0745h. A malfunction of the compressor generated a small quantity of smoke just prior to the unit automatically shutting down. The Pembroke Fire Department responded to the event within minutes of the alarm, noted no further hazard, and gave the all clear after assessing the facility. The compressor malfunction was likely due to a very brief power fluctuation on the municipal grid just prior to the false alarm. A momentary 'brownout' caused a voltage drop on the motor under load conditions, likely leading to the generation of smoke from overheating as the motor recovered under load, and eventually an automatic safety trip on the compressor. There was no hazard to workers, the facility or the environment.	March 16, 2021

### Compliance Inspection Performance

Since the issuance of the current NSPFOL, CNSC staff have performed ten compliance inspections focused on several SCAs. No significant nuclear safety-related compliance items were identified during any compliance inspection activity, and all action items have been resolved to the satisfaction of CNSC staff.

A summary of the NSPFOL-related inspection activities conducted since issuance of the current licence is provided in Table 3. The number of compliance actions issued, and the number of days between the issuance of the inspection report and the closure of the last associated action item is also highlighted.

**TABLE 3: CNSC COMPLIANCE INSPECTIONS (2015-2020)**

<b>DATE</b>	<b>SCA(s) / FOCUS AREA</b>	<b>IDENTIFIED COMPLIANCE ACTIONS</b>	<b>BUSINESS DAYS TO CLOSURE OF ALL ACTIONS</b>
October 5-6, 2015	Human Performance Management	7	132
October 4-5, 2016	Environmental Protection	1	33
February 16, 2017	Radiation Protection	2	46
March 20, 2017	Management System	1	64
February 8, 2018	Security	0	0
March 13, 2018	Conventional H&S Fitness for Service Packaging and Transport	1	58
February 26-28, 2019	Conventional H&S Environmental Protection Fitness for Service Operating Performance Radiation Protection Waste Management	6	34
August 28-29, 2019	Environmental Protection	0	0
January 27-28, 2020	Human Performance Management	3	35
October 27-28, 2020	Radiation Protection	0	0
<b>Average</b>		<b>2.1</b>	<b>40</b>

**Annual Compliance and Performance Report Ratings**

Throughout the current licence term of seven years, CNSC staff has rated SRBT performance in all applicable SCAs as either ‘Satisfactory’ (SA) or ‘Fully Satisfactory’ (FS).

Table 4 illustrates the annual ratings of SRBT performance since the licence was renewed in 2015.

**TABLE 4: CNSC PERFORMANCE RATINGS FOR SRBT (2015-2019)**

<b>SAFETY AND CONTROL AREA</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Management System	SA	SA	SA	SA	SA
Human Performance Management	SA	SA	SA	SA	SA
Operating Performance	SA	SA	SA	SA	SA
Safety Analysis	SA	SA	SA	SA	SA
Physical Design	SA	SA	SA	SA	SA
Fitness for Service	FS	FS	FS	FS	SA
Radiation Protection	SA	SA	SA	SA	SA
Conventional Health and Safety	FS	FS	FS	FS	SA
Environmental Protection	SA	SA	SA	SA	SA
Emergency Management and Fire Protection	SA	SA	SA	SA	SA
Waste Management	SA	SA	SA	SA	SA
Security	SA	SA	SA	SA	SA
Packaging and Transport	SA	SA	SA	SA	SA

Note that the use of ‘Fully Satisfactory’ as a performance rating was eliminated by CNSC as a policy decision when tabling the 2019 Annual Compliance and Performance Report. As such, CNSC staff has noted that the rating of ‘Satisfactory’ in the areas of Fitness for Service and Conventional Health and Safety are not intended to represent a downgrade in performance for that year.

### Internal Audits

Throughout the course of the current licence term, SRBT has implemented a comprehensive program of internal audits on all aspects of our processing operations and safety programs.

The position of Compliance Manager has been included as part of our overall organization since 2015. This individual's main responsibility is to perform independent internal audits, and formally report directly to SRBT Senior Management. This individual is also tasked with overseeing and managing SRBT's processes for non-conformances and opportunities for improvement.

Over the last six calendar years between 2015-2020, a total of 71 internal audits have been completed by the Compliance Manager, an average of just under 12 audits per year.

These audits have resulted in the issuance of a total of 71 non-conformance reports (NCR) and 170 opportunities for improvement (OFI), all of which have had risk-informed action plans developed to either address the non-conformances and findings, or to implement the improvement.

As part of the NCR and OFI management system processes, actions are reviewed for effectiveness at an appropriate point in time after implementation, in order to ensure that the cause of any problem or issue has been adequately and successfully addressed.

### Management Review

Top Management is responsible to ensure that a comprehensive Management Review exercise is conducted at least annually, in accordance with MSP-008, *Management Review*. This review encompasses all aspects of our operations, with a particular focus on the maintenance of safety at all levels of the organization.

SRBT organizational managers conduct benchmarking exercises in accordance with MSP-009, *Benchmarking*, as well as self-assessments in accordance with MSP-010, *Self-Assessment*, in support of the annual Management Review.

Key inputs to the Management Review include, as a minimum:

- A review of the status of actions from previous Management Reviews;
- A review of the Quality Policy for adequacy;

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- A review of changes in issues that are relevant to the SRBT management system, both internal and external to the organization;
- A review of the performance and effectiveness of all aspects of the SRBT management system;
- A review of the adequacy of resources;
- A review of the effectiveness of actions taken to manage risks and opportunities; and
- A review of the performance of SRBT Committees.

From this important exercise, decisions and actions are made related to opportunities for performance improvement, changes to the management system, and resourcing, in order to drive continuous improvement at the upper-most level of the organization.

Summary of Annual Production / Utilization Data

Table 5 includes data pertaining to the total amount of tritium processed at the SRBT facility in the six calendar years spanning 2015-2020.

As well, the percentage ratio between the amount of tritium released to atmosphere as gaseous effluent vs. the amount of tritium processed is tabulated, as this metric is an excellent indicator of the operating performance of the facility with respect to SRBT's impact on persons and the environment.

**TABLE 5: ANNUAL TRITIUM PROCESSING DATA (2015-2020)**

<b>CALENDAR YEAR</b>	<b>TRITIUM PROCESSED (GBq)</b>	<b>RELEASED TO ATMOSPHERE (GBq)</b>	<b>RATIO (%)</b>
2015	27,989,832	56,237	0.20
2016	28,122,678	28,945	0.10
2017	32,968,695	24,822	0.08
2018	31,251,329	33,180	0.11
2019	30,327,048	31,769	0.10
2020	27,887,498	25,186	0.09
<b>AVERAGE</b>	<b>29,757,847</b>	<b>33,357</b>	<b>0.11</b>

Over the next fifteen years, SRBT expects to see either a stable or increasing trend in the amount of tritium processed each year, depending directly on the amount of sales of our self-luminous safety-related product lines.

With respect to the amount of tritium released to atmosphere, and the ratio between this value and the amount of tritium processed by the facility, SRBT projects either a stable or decreasing trend, as the organization continues to optimize facility operations and minimize the impact on the environment over time, in line with the SRBT Quality Policy.

#### Standards, Codes and Regulatory Documents – Operating Performance

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as compliance verification criteria in the next revision of the SRBT Licence Conditions Handbook (LCH):

- CNSC REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*

#### Performance Assessment – Operating Performance

Over the course of the current licence term, SRBT considers its performance in the SCA of Operating Performance to meet our internal expectations, and to be very good in general, with a stable trend over time and projected into the future.

This assessment is based on the following key points:

- No instances of operations outside of the bounds of the safety case, as defined by the OLCs.
- Consistent, low levels of tritium emissions throughout the course of the current licence term, and no action level exceedances experienced.
- SRBT has experienced very few safety-significant or reportable events throughout the current licence term, and all reported events did not have an impact on safety to persons or the environment.
- CNSC inspection activities have consistently identified few non-compliances, and action items have been addressed rapidly and effectively, in accordance with a risk-based approach where appropriate.
- The independent internal audit process has been effective at continually improving all aspects of the organization and operations throughout the course of the current licence term.

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- CNSC staff has consistently rated SRBT's performance in this area as 'Satisfactory' each year as part of their Annual Compliance and Performance Report.

#### 4. FUNCTIONAL AREA: FACILITY AND EQUIPMENT

##### a. SCA – Safety Analysis

The SRBT facility has been in operation since 1990, with various iterations of a facility safety analysis having been developed and documented since first operations began.

The current governing facility-level analysis focused on the nuclear safety of the facility is the SRBT *Safety Analysis Report (SAR)*. The in-force version of the SAR is Revision 4, dated November 2017, and is included with this application {10} as the primary safety case for the operation of the nuclear processing facility.

The SAR was developed using guidance contained with Safety Guide GS-G-4.1, *Format and Content of the Safety Analysis Report for Nuclear Power Plants*, published by the International Atomic Energy Agency (IAEA) in 2004. As the SRBT facility is not a nuclear power plant, the guidance was applied using a graded approach, with the SAR following the guidance as closely as reasonable.

As well, during the review of Revision 3 of the SAR (which represented a major overhaul in the format of the report), CNSC staff assessed the report against the guidance provided in IAEA Safety Standards Series NS-R-5, *Safety of Nuclear Fuel Cycle Facilities*.

Revision 4 of the SAR incorporated improvements to address CNSC review comments, while also integrating new management system processes and structures into the administrative sections of the analysis.

In the SAR, several limiting scenarios of accident / emergency are postulated, and the associated dose impacts to members of the public are modelled using HOTSPOT, along with CSA-published dose coefficients for certain categories of persons.

The SAR includes a significant amount of descriptive information that supports the licence renewal application, including detailed descriptions of:

- The nuclear facility (section 2), including the location, perimeter, areas, and structures of the nuclear facility, as well as the design and design operating condition of said structures;
- SRBT's approach to safety, and the management of safety in general (section 3), including the operational management philosophy, the methods applied to the monitoring and management of safety-related aspects of

facility operations, and the promotion of a strong, positive and health safety culture

- The characteristics of the site, both with respect to the area under the control of SRBT, and the surrounding area (section 4);
- The general safety-related design aspects of the facility, including but not limited to:
  - an established safety objective for both normal operations and during worst-case credible accidents or emergencies, where the established non-emergency regulatory limits for worker (50 mSv) and public (1 mSv) radiation doses are not expected to be exceeded;
  - general design principles for ensuring nuclear and radiation safety of the facility; and
  - application of the safety principle of defence-in-depth;
- The equipment and systems that are used for carrying out licensed activities, such as nuclear substance processing, and for the assurance of nuclear and radiological safety (section 6), as well as the design and design operating condition of said equipment and systems;
- The complete set of safety analyses for worst-case scenarios / postulated initiating events / hypothetical incident scenarios, including the derivation of the source term released and the associated modelled worst-case doses at several distances away from the facility.

The SAR concludes that even under the most limiting hypothetical worst-case incident, workers and members of the public are not expected to exceed the radiation dose limits prescribed by the *Radiation Protection Regulations*.

#### Program for Maintenance of the Safety Analysis

SRBT implements an internal procedure for the development, maintenance and review of the SAR.

ENG-022, *Safety Analysis Review Process*, ensures that the process for safety analysis is established and controlled, and that a safety analysis is performed and documented through the life of the SRBT facility.

### Other Safety Analyses Relating to the SRBT Facility

The SAR represents the primary overall safety case for the operation of the SRBT nuclear substance processing facility; however, there are several other safety analyses that have been performed with respect to specific aspects of the facility, in line with regulatory requirements and expectations in other SCAs, including:

- Derived Release Limits {15}, (*SCA – Environmental Protection*)
- Environmental Risk Assessment {16} (*SCA – Environmental Protection*)
- Comprehensive Report – Groundwater Studies {17} (*SCA – Environmental Protection*)
- Fire Hazard Assessment {18} (*SCA – Fire Protection and Emergency Management*)
- Conditional Clearance Levels {19} (*SCA – Waste Management*)

These analyses are each described in greater detail in the applicable section of this licence renewal application, and are submitted as part of the application.

### Standards, Codes and Regulatory Documents – Safety Analysis

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as compliance verification criteria in the next revision of the SRBT Licence Conditions Handbook (LCH):

- None

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as recommendations and guidance in the next revision of the SRBT LCH:

- IAEA SSR-4, *Safety of Nuclear Fuel Cycle Facilities*

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included in the next revision of the SRBT LCH, with the applicability and/or implementation requirements yet to be determined:

- CNSC REGDOC-2.4.4, *Safety Analysis for Class IB Facilities (not yet published)*

### Performance Assessment – Safety Analysis

Over the course of the current licence term, SRBT considers its performance in the SCA of Safety Analysis to meet our internal expectations, and to be very good in general, with a stable trend over time and projected into the future.

This assessment is based on the following key points:

- The SRBT SAR was revised in 2017, and meets the intent of applicable guidance documents.
- Other safety analyses such as the Fire Hazards Assessment, Environmental Risk Assessment and Conditional Clearance Levels have been executed to demonstrate facility operational safety, and have been reviewed and accepted by CNSC staff for their intended purposes.
- A Safety Analysis Review Process is incorporated as part of the overall SRBT management system, and the consideration of the impact on SRBT safety analysis is integrated as a component part of our overall change control processes.
- CNSC staff has consistently rated SRBT's performance in this area as 'Satisfactory' each year as part of their Annual Compliance and Performance Report.

## **b. SCA – Physical Design**

### Description of Structures, Systems and Components (SSC) of the Facility

A comprehensive description of the SRBT nuclear substance processing facility is contained in the Safety Analysis Report {10}, including:

- The location, perimeter, areas and structures that comprise the nuclear facility (section 2), as well as the design and design operating condition of said structures;
- The characteristics of the site, both with respect to the area under the control of SRBT, and the surrounding area (section 4); and
- The equipment and systems that are used for carrying out licensed activities, such as nuclear substance processing, and for the assurance of nuclear and radiological safety (section 6), as well as the design and design operating condition of said equipment and systems;

The SAR includes descriptions of all safety-related components and systems, including the active ventilation system, the fire protection systems, radiation detection systems for both worker safety and effluent monitoring, along with a very limited amount of information on the security systems (due to the sensitive nature of this information).

### Design Control Processes

SRBT implements a suite of processes aimed at ensuring the control of physical design aspects of SSC associated with licensed activities.

ENG-003, *Design Control* describes the organizational and process-based requirements associated with design planning, design inputs, design control, design outputs, and changes to designs.

This process is very closely tied to MSP-007, *Change Control*, which requires design control considerations to be evaluated for each instance of physical change to SSCs or product specifications.

As well, associated with both ENG-003 and MSP-007 are four processes that are focused on ensuring adequate controls at each life-cycle stage of major physical design changes.

- ENG-027, *Research and Development* describes the requirements associated with planning for potential changes in the physical design of the

SSCs of the facility, such as if new safety-related equipment were to be possibly brought in as an improvement initiative. This procedure ensures that a controlled plan is documented that captures the key considerations of any potential physical change that is not like-for-like.

- ENG-026, *Commissioning Process* describes the requirements associated with the post-installation phase of any safety-related SSC in the facility, including establishing commissioning objectives and requirements, acceptance criteria, any prerequisites for commissioning, any special equipment required, and the data to be collected as part of the commissioning process. A plan is developed in compliance with this procedure, with approval steps integrated into the plan as needed.
- ENG-021, *Turnover Process* describes the requirements associated with the post-commissioning phase of any new or changed safety-related SSC in the facility. A turnover plan to operations must be documented and completed prior to formally commencing operations of the SSC.
- ENG-025, *Decommissioning Process* describes the requirements associated with permanently taking any SSC out of service, including if necessary the physical dismantlement of the SSC in a safe way. A plan must be developed and implemented that includes a comprehensive assessment of the safety aspects and risks of the work involved.

All four of the above noted procedures are included as part of the overall change control process under MSP-007, and must be considered whenever a physical design change of any safety-related SSC is being planned.

#### Standards, Codes and Regulatory Documents – Physical Design

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as compliance verification criteria in the next revision of the SRBT Licence Conditions Handbook (LCH):

- *National Building Code of Canada*
- *National Fire Code of Canada*
- NFPA 801, *Standard for Fire Protection for Facilities Handling Radioactive Materials*
- CSA N393-13, *Fire protection for facilities that process, handle, or store nuclear substances*

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as recommendations and guidance in the next revision of the SRBT LCH:

- CNSC REGDOC-2.5.1, *General Design Considerations: Human Factors*

#### Performance Assessment – Physical Design

Over the course of the current licence term, SRBT considers its performance in the SCA of Physical Design to meet our internal expectations, and to be very good in general, with a stable trend over time and projected into the future.

This assessment is based on the following key points:

- The SSCs that comprise the SRBT nuclear processing facility are well characterized and designed for purpose and safe facility operations. The design basis of all nuclear safety-related equipment is well understood and maintained by the organization effectively.
- MSP-007, *Change Control* has continuously been implemented effectively throughout the course of the current licence term, and all physical design changes and new SSCs have undergone comprehensive review in accordance with this process, as well as the supporting set of ENG-processes where appropriate.
- The consideration of the physical design impact of any change is integrated as a component part of our overall change control processes.
- CNSC staff has consistently rated SRBT's performance in this area as 'Satisfactory' each year as part of their Annual Compliance and Performance Report.

**c. SCA – Fitness for Service**

Maintenance Program

As described in the SAR, the SRBT nuclear substance processing facility consists of a number of structures, systems and components that are designed to process tritium, manufacture gaseous tritium light sources, and ensure safety of workers, members of the public and the environment.

In order to ensure that important SSC are kept fit for service, SRBT implements a comprehensive Maintenance Program {20} which includes a set of subordinate procedures focused on the control and effective execution of all maintenance activities on site. The scope of the program includes all safety-related SSCs, as well as critical equipment which supports the continuity of key business processes.

The Maintenance Program describes how SRBT performs corrective maintenance, preventive maintenance, and SSC monitoring. Requirements for the conduct of work assessment, planning, scheduling and execution of the maintenance activities are defined, as well as for post-maintenance testing and verification.

The SRBT Maintenance Program has been designed in consideration of the guidance contained in CNSC REGDOC-2.6.2, *Maintenance Programs for Nuclear Power Plants*, with many concepts and elements having been incorporated into the program using a graded approach.

Processes are in place for the management of a master equipment list and critical spare parts, which are both typical elements of maintenance programs implemented by Class 1A nuclear facilities that SRBT has integrated into its program as a best practice.

The Vice President is responsible for ensuring the design of the Maintenance Program meets requirements, and that the program is implemented in accordance with associated procedures.

Maintenance Committee

A committee focused solely on the management and execution of maintenance activities at the facility continues to actively oversee and improve all aspects of the program.

The committee is chaired by the Vice President, and meets frequently throughout the year to ensure maintenance-related issues are resolved effectively, and the program is implemented effectively.

As with many other committees, the Maintenance Committee includes staff at all levels of the organization, helping to facilitate a better understanding of any issues at hand, as well as promoting a positive safety culture with respect to maintenance at the facility.

### Management of Maintenance Contractors

Maintenance is performed both in-house by qualified and authorized members of the internal organization, and by qualified contracted third parties where necessary. Where contractors are used for on-site maintenance activities, controls are implemented to ensure their safety with respect to radiological and conventional hazards, as per the Maintenance Program and associated processes.

SRBT does not routinely deploy contract staff for dose-intensive work, as is typical in nuclear power stations. During the current licence term, no contract worker has received a significant dose from exposure to ionizing radiation at the SRBT facility.

Contract workers who may be exposed to a radiological hazard undergo screening bioassay testing, and there have been no instances of a recordable effective dose during the current licence term.

Where warranted, contractors that frequently service SRBT SSCs obtain elevated security clearances, as per the SRBT Security Program. These contractors can then be authorized to work more independently in the facility where appropriate, subject to oversight and control from their assigned contact / project manager.

### Standards, Codes and Regulatory Documents – Fitness for Service

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as compliance verification criteria in the next revision of the SRBT Licence Conditions Handbook (LCH):

- National Fire Code of Canada
- NFPA 801, *Standard for Fire Protection for Facilities Handling Radioactive Materials*
- CSA N393-13, *Fire protection for facilities that process, handle, or store nuclear substances*

### Performance Assessment – Fitness for Service

Over the course of the current licence term, SRBT considers its performance in the SCA of Fitness for Service to meet our internal expectations, and to be very good in general, with a stable trend over time and projected into the future.

This assessment is based on the following key points:

- All safety-related SSCs have functioned well throughout the current licence term, and there have been no significant failures of equipment directly related to the inadequate application of our Maintenance Program.
- SRBT does not have a significant backlog of preventive maintenance activities. These activities have been performed routinely and on-time throughout the duration of the current licence term, with very few instances of deferral.
- The Maintenance Program incorporates aspects of programs used by nuclear power plants, such as keeping a master equipment list and an inventory of critical spare parts.
- Contractors have been leveraged effectively where needed, and the work controls put in place for these members of the public have effectively protected them from all hazards while working in the facility.
- CNSC staff has consistently rated SRBT's performance in this area as 'Satisfactory' or 'Fully Satisfactory' each year as part of their Annual Compliance and Performance Report.

## 5. FUNCTIONAL AREA: CORE CONTROL PROCESSES

### a. SCA – Radiation Protection

#### Radiation Protection Program

All aspects of operational radiation protection are described in, and controlled by SRBT's Radiation Safety Program {21}.

This management system safety program defines the composition of the internal organization responsible for ensuring the program is implemented (the Health Physics Team), how the 'as low as reasonably achievable' (ALARA) principle is applied at the facility, how dose due to ionizing radiation is quantified and controlled, and how radiation hazards such as contamination are monitored, limited and managed.

The Manager – Health Physics and Regulatory Affairs (HP&RA) is responsible for ensuring the design of the Radiation Safety Program meets requirements, and that the program is implemented in accordance with associated procedures. The Health Physics Team acts to ensure all procedures are executed, and effective doses to workers are maintained ALARA.

The implementation of the Radiation Safety Program by SRBT fulfills the requirement of section 4 of the *Radiation Protection Regulations*.

#### Action Levels for Radiation Protection

As part of the Radiation Safety Program, SRBT has defined several radiation protection-related action levels.

Action levels are defined in terms of both effective doses, and the internal concentration of tritium in workers, as a multi-layered control measure. Action levels are subdivided into specific work areas where appropriate, and consideration is made for pregnant nuclear energy workers (NEW).

SRBT action levels are currently described in the management system technical descriptive document *Licence Limits, Action Levels and Administrative Limits* {13}. This document is included as part of the licence renewal package, fulfilling the requirement of subsection 3 (1) (f) of the *General Nuclear Safety and Control Regulations*.

### Radiation Dose Control

Effective doses of ionizing radiation are routinely incurred by workers at SRBT, via intake of tritium oxide. Over the course of the current licence period, the effective doses to SRBT workers have remained very low compared to regulatory limits.

The effective dose to persons is calculated using data obtained by monitoring tritium concentration in persons using bioassay testing (urinalysis). These activities are performed in line with SRBT's Dosimetry Services Licence 11341-3-28.4, issued by CNSC staff, as well as SRBT's *Dosimetry Service Program*.

Table 6 describes key statistical data pertaining to the effective dose incurred by NEWs at SRBT in the past six calendar years, since the current licence term began.

**TABLE 6: EFFECTIVE DOSES TO SRBT NEW (2015-2020)**

CALENDAR YEAR	MAXIMUM EFFECTIVE DOSE (mSv)	AVERAGE EFFECTIVE DOSE (mSv)	COLLECTIVE DOSE (p·mSv)
2015	0.87	0.070	3.22
2016	0.34	0.049	2.21
2017	0.46	0.045	1.96
2018	0.48	0.044	2.06
2019	0.57	0.065	2.95
2020	0.43	0.077	3.30
<b>AVERAGE</b>	0.53	0.058	2.62

It is worthwhile to note that during the current licence term, **no SRBT NEW has incurred an effective dose that exceeded 1 mSv** in any calendar year, which represents the limit for any person who is not a NEW, as defined by the *Radiation Protection Regulations*.

For more information on the programmatic controls in place with respect to radiation dose, see section 5 of the *Radiation Safety Program*.

## Contamination and Hazard Control

In order to limit the spread of radioactive contamination within and from the site of licensed activity, SRBT implements a comprehensive program of contamination assessment as part of the Radiation Safety Program.

Using a defense-in-depth approach, a high degree of contamination control is routinely achieved.

The SRBT facility is divided into three radiological safety zones, based upon the level of radiological hazards associated with the work in each area, and upon the contamination controls in place.

Each individual zone has specific controls in place for the protection of personnel from the hazards associated with radiation. The requirements for the wearing of personal protective equipment and clothing are defined in accordance with the particular zone in which the work is to be performed.

Persons moving from a higher 'active' zone (Zone 2 or 3) into Zone 1 must follow a specific procedure for removing articles of protective clothing, traversing a physical 'barrier' which acts as a buffer zone, and proceeding to thoroughly wash their hands.

In the areas where nuclear substances are processed, controlled and monitored air handling systems provides negative-pressure ventilation, in order to ensure any fugitive tritium gas is removed from the area, minimizing the hazard to workers.

Finally, a comprehensive contamination monitoring program is implemented by the Health Physics Team, in order to characterize the amount of contamination that is present at any given time, and to drive ALARA-focused decontamination efforts where necessary. Items that are removed from 'active' zones are assessed for contamination prior to being released to the 'inactive' areas of the facility.

The contamination monitoring program is fully described in procedure RSO-001, *Facility Contamination Monitoring* {22}.

Due to the nature of the main nuclear substance of concern (tritium gas), the likelihood of a significant personnel contamination event is very low. As well, circumstances where any person, site or equipment is expected to be contaminated to a level requiring specific procedures to be established to accomplish this task are extremely remote.

In accordance with the licence application requirements defined in the *Nuclear Substances and Radiation Devices Regulations* (NSRDR), section 3 (1) (b) (iv), and section 3 (1) (c), any significant, non-routine decontamination efforts with respect to nuclear substances shall be performed in line with SRBT's Radiation Safety Program, and with the direct consultation of the Health Physics Team.

Refer to section 6 of the *Radiation Safety Program* for more information.

#### Radiation Detection Instrumentation

As part of the Radiation Safety Program, SRBT deploys several instruments for the routine detection of radiation and radiological contamination. These instruments include:

- Liquid scintillation counters (two units);
- Stationary tritium-in-air monitors (five units deployed routinely, with spares available);
- Portable tritium-in-air monitors (six units deployed routinely, with spares available);
- Portable alpha/beta- and gamma-detecting instruments (one unit each).

Tritium-in-air monitors are located in strategically selected areas of the facility in order to ensure proper hazard control, and to keep exposures ALARA.

Portable radiation-detecting instruments (otherwise known as radiation survey meters) are only used by trained and qualified workers, and the instruments are calibrated and maintained in accordance with applicable regulatory requirements, under procedure RSO-011, *Instrument Calibration* {23}.

Refer to section 6.4 of the *Radiation Safety Program* for more information.

#### Other Licence Application Considerations Described in the NSRDR

SRBT is applying for a Class IB nuclear substance processing facility operating licence; however, considerations of some of the requirements for licence applications defined in the NSRDR (and not otherwise addressed elsewhere in this application) must be dispositioned in accordance with correspondence with CNSC staff [1].

The following statements are intended to address the specifically listed section of the NSRDR:

- Section 3 (1) (g): the proposed instructions for dealing with accidents, including fires and spills, in which the nuclear substance may be involved:
  - Refer to section titled “SCA – Fire Protection and Emergency Management” in this application.
- Section 3 (1) (h): the proposed inspection program for the equipment and systems that will be used to carry on the activity to be licensed:
  - Refer to section titled “SCA – Fitness for Service” in this application.
- Section 3 (1) (j): the methods, procedures and equipment that will be used to calibrate and verify the calibration of dosimeters referred to in paragraphs (30 (3) (d) and (e):
  - Due to the nature of the nuclear substance processed, the SRBT Radiation Safety Program does not use dosimeters to determine the effective or equivalent doses to workers.
- Section 3 (1) (k): the methods, procedures and equipment that will be used to conduct the leak tests and surveys required by these Regulations:
  - SRBT does not use or own any radiation devices that meet the requirements for leak testing and/or surveys, as defined in the NSRDR.
  - Gaseous tritium light sources do undergo a process of leak assessment as a measure of quality control during manufacturing, in accordance with industry standards and in-house procedures; however, these processes are not implemented for the purposes of the NSRDR.
- Section 3 (1) (l): where the application is in respect of a nuclear substance that is an unsealed source and that is to be used in a room, the proposed design of the room:
  - Tritium gas is processed within sealed, vacuum-based systems under negative ventilation at all times. A description of the areas where tritium is processed in the facility can be found in the SRBT Safety Analysis Report {10}.
- Section 3 (1) (m): if the application is in respect of a nuclear substance that is contained in a radiation device, the brand name and model number of the radiation device, and the quantity of the devices:
  - This application is not in respect to the use of radiation devices, as described in the NSRDR.
  - SRBT manufactures several types of CNSC-certified radiation devices for use both in Canada pursuant to the NSRDR, as well as

internationally, with names and model numbers included on certificates.

- Section 3 (1) (n): where the application is in respect of Category I, II or III nuclear material, as defined in section 1 of the *Nuclear Security Regulations*...:
  - This application is not in respect to any such nuclear materials.
- Section 3 (1) (o): if the applicant will be manufacturing or distributing radiation devices referred to in paragraph 5 (1) (c), or section 6 or 7, or check sources mentioned in section 8.1, the proposed procedure for the disposal of each radiation device or check source or for its return to the manufacturer.
  - Refer to section titled “SCA – Waste Management” in this application.

#### Standards, Codes and Regulatory Documents – Radiation Protection

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as compliance verification criteria in the next revision of the SRBT Licence Conditions Handbook (LCH):

- None

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as recommendations and guidance in the next revision of the SRBT LCH:

- CNSC Guide G-129, *Keeping Radiation Exposures and Doses “As Low As Reasonably Achievable (ALARA)*
- CNSC Guide G-228, *Developing and Using Action Levels*
- CNSC Guide G-91, *Ascertaining and Recording Radiation Doses to Individuals*
- CNSC Standard S-260, *Making Changes to Dose-Related Information Filed with the National Dose Registry*

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included in the next revision of the SRBT LCH, with the applicability and/or implementation requirements yet to be determined:

- CNSC REGDOC-2.7.1, *Radiation Protection (not yet published)*
- CNSC REGDOC-2.7.2, *Dosimetry, Volume I: Ascertaining Occupational Dose (not yet published)*

### Performance Assessment – Radiation Protection

Over the course of the current licence term, SRBT considers its performance in the SCA of Radiation Protection to meet our internal expectations, and to be very good in general, with a stable trend over time and projected into the future.

This assessment is based on the following key points:

- Radiation doses to NEWs have been maintained exceptionally low for a Class I nuclear facility, with no instance of a NEW exceeding even the limit prescribed for persons who are not a NEW of 1 mSv in any calendar year.
- Radiation hazards have consistently been well controlled, with very good performance in both monitoring the hazards, and ensuring that they are reduced or eliminated in line with the ALARA principle.
- The Radiation Safety Program and associated procedures have been continuously improved and maintained over the course of the current licence term.
- CNSC inspection activities have consistently identified few non-compliances in the area of Radiation Protection, and action items have been addressed rapidly and effectively, in accordance with a risk-based approach where appropriate.
- The latest CNSC inspection focused on the area of Radiation Protection at SRBT (in October 2020) did not identify any areas of non-compliance nor put forth any recommendations. The inspection team concluded that they “... found the licensee to be in compliance with the inspection criteria, and therefore no compliance actions or recommendations were raised as part of this inspection”.
- CNSC staff has consistently rated SRBT’s performance in this area as ‘Satisfactory’ each year as part of their Annual Compliance and Performance Report.

**b. SCA – Conventional Health and Safety**

Conventional Health and Safety Management

As a federally-regulated entity, SRBT is subject to the conventional health and safety provisions of the *Canada Labour Code* (CLC), and the *Canada Occupational Health and Safety Regulations*.

In order to ensure a safe and compliant workplace is maintained at all times, and during all activities, SRBT implements a conventional health and safety program that includes the following documented management system components:

- *Health and Safety Policy* {24},
- *Hazard Prevention Program* {25}, and
- Health and Safety Procedures (HAS-xxx)

The implementation and maintenance of this program is the responsibility of the Manager – Safety and Security. The *Health and Safety Policy* and *Hazard Prevention Program* represents the top tier of SRBT's worker health and safety policies and procedures, as required by the *Class I Nuclear Facilities Regulations*, section 3 (f).

In accordance with section 135 of the CLC, Part II, SRBT has established a Workplace Health and Safety Committee.

This Committee consists of both management and employee representatives, who work to ensure that all aspects of the program are carried out effectively, and that requirements of the CLC, the regulations pursuant to the CLC, and the conventional health and safety aspects of the NSPFOL are identified, understood and complied with by the organization.

Workplace Injuries and Lost-Time Incidents

Throughout the course of the current licence term, SRBT has effectively maintained a very low rate of workplace injuries and lost-time incidents.

Table 7 describes key statistical data pertaining to these conventional health and safety metrics over the course of the past six calendar years, since the current licence term began.

For the purposes of this table, a workplace injury is defined as an injury which required first aid treatment on-site, at a minimum. Examples of such injuries may include a minor cut which required application of a self-adhesive bandage, a minor

burn to the skin of the hand, or a muscle strain relating to a work activity. A lost-time incident is an injury which resulted in the worker missing scheduled work.

**TABLE 7: MINOR INJURIES AND LOST-TIME INCIDENTS (2015-2020)**

CALENDAR YEAR	WORKPLACE INJURIES	LOST-TIME INCIDENTS
2015*	2*	0
2016*	3*	0
2017	21	3
2018	15	0
2019	22	0
2020	16	0
<b>AVERAGE</b>	13	0.5

\*NOTE: beginning in 2017, the definition for a recordable workplace injury was changed to include any and all incidents requiring basic first aid, no matter how minor. Prior to 2017, workplace injuries were only tracked if they were deemed significant and/or required off-site medical attention.

Standards, Codes and Regulatory Documents – Conventional Health and Safety

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as compliance verification criteria in the next revision of the SRBT Licence Conditions Handbook (LCH):

- None

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as recommendations and guidance in the next revision of the SRBT LCH:

- CNSC REGDOC-2.8.1, *Conventional Health and Safety*

Performance Assessment – Conventional Health and Safety

Over the course of the current licence term, SRBT considers its performance in the SCA of Conventional Health and Safety to meet our internal expectations, and to be very good in general, with a stable trend over time and projected into the future.

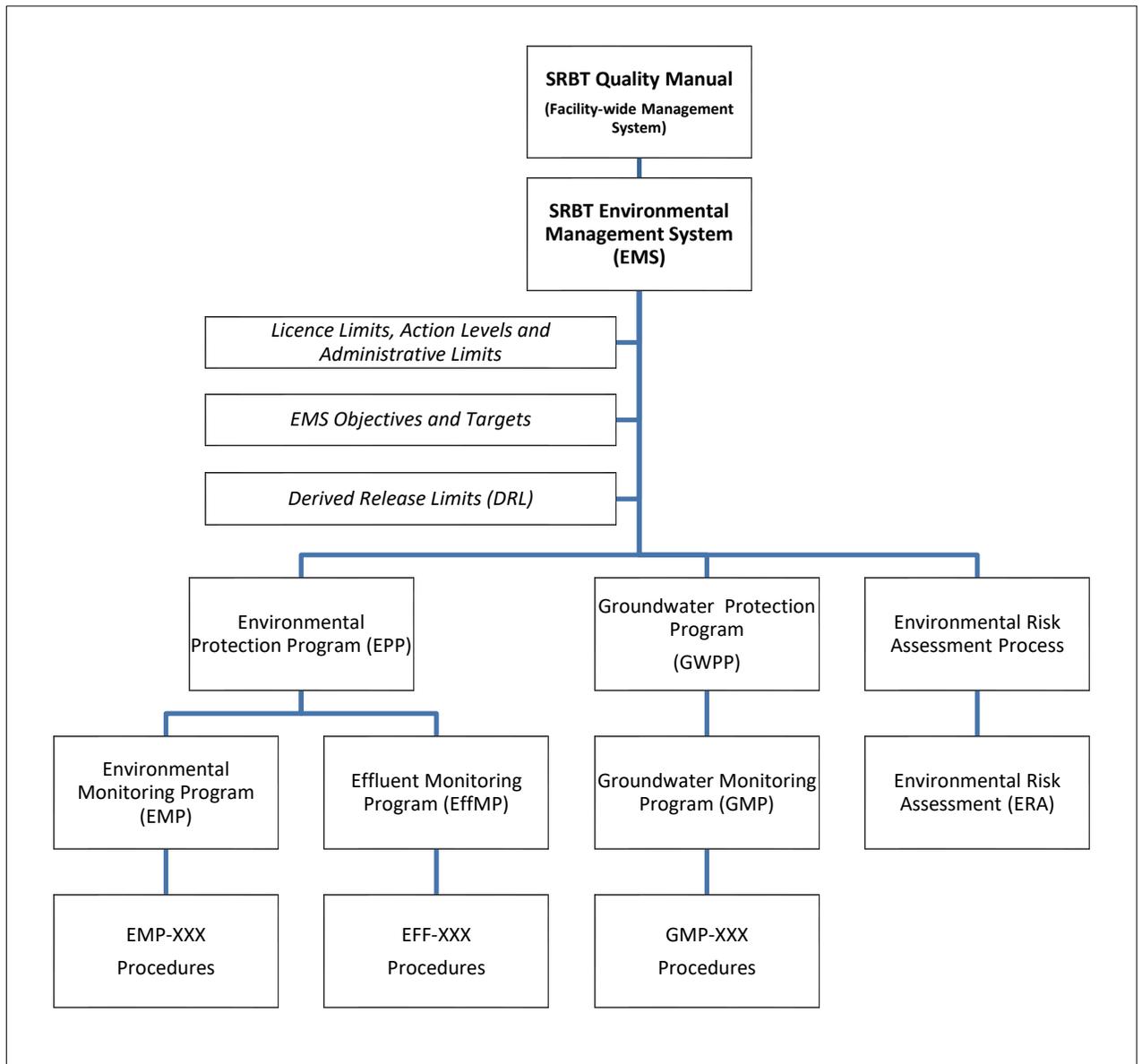
This assessment is based on the following key points:

- The rate of workplace injuries and lost-time incidents has been maintained very low, and there have been no incidents of significant or disabling injury to workers at SRBT throughout the current licence term.
- The Workplace Health and Safety Committee has continued to monitor and improve the program of conventional health and safety assurance, and all reports to the applicable federal regulatory body having jurisdiction (i.e. Employment and Social Development Canada (ESDC)) have been made with no identified issues.
- CNSC inspection activities have consistently identified few non-compliances in the area of Conventional Health and Safety, and action items have been addressed rapidly and effectively, in accordance with a risk-based approach where appropriate.
- Officers with the ESDC conducted an unannounced inspection of the SRBT facility in 2017, and assessed the documentation comprising the required health and safety program, and the conduct of the Workplace Health and Safety Committee. The inspection activity did not identify any findings or concerns, and several positive findings and best practices were noted at the exit meeting.
- CNSC staff has consistently rated SRBT's performance in this area as either 'Fully Satisfactory' or 'Satisfactory' each year as part of their Annual Compliance and Performance Report.

**c. SCA – Environmental Protection**

As a major sub-component of the overall facility management system, SRBT implements a comprehensive Environmental Management System (EMS) that encompasses all aspects of the protection of the environment from the impact of routine facility operations.

The EMS is comprised of several levels of management system documents and technical assessments, all of which are based upon CSA standards in the N288-series. The governing document in the system is titled *Environmental Management System*, and is included in this application {26}. The documented structure of the complete SRBT EMS is pictographically represented below:



The Manager – HP&RA is responsible for ensuring that the design of the Environmental Management System, and all subordinate components, meet regulatory requirements, and that the system and programs are implemented accurately. Qualified members of the Health Physics Team act to ensure all procedural activities are executed.

The implementation of the EMS and its associated protection and monitoring programs ensures that SRBT is continuously making adequate provision for the protection of the environment and the health and safety of persons.

### Environmental Risk Assessment

In December 2020, SRBT completed and submitted the first Environmental Risk Assessment (ERA), in line with the requirements and guidance of CSA N288.6-12, *Environmental risk assessments at Class I nuclear facilities and uranium mines and mills*.

After receiving and addressing comments from CNSC staff, the ERA was formally accepted [15] in April 2021, and has been published on SRBT's website for public access. The ERA forms a component part of this licence renewal application {16}.

The ERA systematically identifies stressors and contaminants of potential concern that may be introduced in significant amounts through the routine operation of the facility. The associated risks to both humans and ecological components are derived for significant contaminants and stressors. The risks are assessed against established benchmark values to determine significance, and various recommendations and conclusions are put forth to effectively manage these risks, and improve upon the understanding of the environmental aspects of the facility.

The ERA and its conclusions and recommendations form a key input to the design of the EMS monitoring and protection programs, as part of a continuous cycle of improvement and refinement.

The April 2021 ERA concluded that the SRBT facility has operated, and continues to operate, in a fashion that is fully protective of human and ecological receptors in the surrounding area. The conservatively-derived risks are acceptably low, and are projected to remain acceptably low with continued routine operations.

Various recommendations were put forth aimed at improving the understanding of the environmental impact of the facility in the area, by reducing or eliminating uncertainty in the assessment. SRBT is implementing these recommendations beginning in 2021 as part of continuous improvement of the EMS.

### Derived Release Limits

The sole significant radionuclide released into the environment during routine facility operations is tritium, in the form of both tritium oxide and elemental / molecular tritium gas.

Gaseous tritium oxide and elemental tritium are released via the active ventilation systems that service the processing areas of the facility. These systems are monitored, and the amount of tritium released in both forms is quantified weekly, and reported to CNSC staff annually.

The amount of tritium that, if released in any given calendar year, could result in an effective dose exceeding the regulatory limit of 1 mSv for any person who is not a NEW (i.e. a member of the public) is derived using standard methods, and compiled in a report titled *Derived Release Limits for the SRB Pembroke Facility – 2016 Update*.

The current version of the report describing the Derived Release Limits (DRL) was accepted by CNSC staff [4] in January 2017, and is included as part of this licence application {15}.

It is important to note that the limits applied to SRBT atmospheric tritium releases are NOT directly linked to the calculated DRLs. The licenced limits for atmospheric tritium releases have been set to be orders of magnitude lower than the DRLs, in line with the goal of protection of the environment - most specifically groundwater.

As of the date of submission of this application, SRBT has conducted a review of this version of the DRL report. It is noted that there are no major inaccuracies that impact the derived limits or the conclusions of the report, and that there have been no major facility changes that would invalidate these limits or conclusions.

The applicable CSA standard for calculating DRLs is N288.1-14, *Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities*. This standard has not been updated or revised since the release of the current SRBT DRL document.

Nonetheless, SRBT has initiated a formal revision for this important analysis document, in order to ensure it is fully accurate and up to date prior to any renewal of the facility operating licence.

SRBT intends on submitting a revised DRL report to CNSC staff before the end of 2021, with the intent that the revised DRL be accepted as part of the overall basis of any renewed operating licence.

Limits on Releases of Tritium to Atmosphere

Releases of tritium to the atmosphere via gaseous effluent pathways are limited to the amounts described in the operating licence and its associated LCH. These limits are set in Appendix E of the LCH, as follows:

**TABLE 8: LICENCE LIMITS FOR TRITIUM RELEASES TO ATMOSPHERE**

NUCLEAR SUBSTANCE AND FORM	LIMITS (Bq/year)
Tritium as Tritium Oxide	6.72E+13
Total Tritium as Tritium Oxide and Tritium Gas	4.48E+14

SRBT proposes **no change** to these limits for any renewed operating licence.

When routine monitoring and quantification processes have been completed, gaseous releases are also compared to weekly action levels in order to determine if there is any potential loss of programmatic control.

These action levels are defined in SRBT document *Licence Limits, Action Levels and Administrative Limits* {13}, which is included with this application, as well as tabulated below:

**TABLE 9: ACTION LEVELS FOR TRITIUM RELEASES TO ATMOSPHERE**

NUCLEAR SUBSTANCE AND FORM	ACTION LEVEL (GBq/week)
Tritium as Tritium Oxide	840
Total Tritium as Tritium Oxide and Tritium Gas	7,753

Action levels are reviewed and, if necessary, revised every five years, in accordance with CSA standard N288.8-17, *Establishing and implementing action levels for releases to the environment from nuclear facilities*. The current action levels were last revised in August 2019.

During the current licence term, SRBT did not experience any action level exceedances for releases of tritium to atmosphere.

### Limits on Releases of Tritium to Sewer

Releases of tritium to the municipal sewer via liquid effluent pathways are limited to the amounts described in the operating licence and its associated LCH. This limit is set in Appendix E of the LCH, as follows:

**TABLE 10: LICENCE LIMIT FOR TRITIUM RELEASES TO SEWER**

NUCLEAR SUBSTANCE AND FORM	LIMITS (Bq/year)
Tritium – Water-Soluble	2.00E+11

SRBT proposes **no change** to this limit for any renewed operating licence.

The technical basis of this limit is that it is set to be one-fifth (20%) of the recommended limit in Table IV of IAEA-TECDOC-1000, *Clearance of materials resulting from the use of radionuclides in medicine, industry and research*, a value that is designed to limit the dose to a hypothetical worker at the sewage treatment plant to 2 µSv or less.

When routine monitoring and quantification processes have been completed, liquid releases to sewer are also compared to daily action levels in order to determine if there is any potential loss of programmatic control.

This action level is defined in SRBT document *Licence Limits, Action Levels and Administrative Limits* {13}, which is included with this application, as well as tabulated below:

**TABLE 11: ACTION LEVEL FOR TRITIUM RELEASES TO SEWER**

NUCLEAR SUBSTANCE AND FORM	ACTION LEVEL (GBq/day)
Tritium – Water-Soluble	0.15

Action levels are reviewed and, if necessary, revised every five years, in accordance with CSA standard N288.8-17, *Establishing and implementing action levels for releases to the environment from nuclear facilities*. The current action level was last revised in August 2019.

During the current licence term, SRBT did not experience any action level exceedances for releases of tritium to sewer.

## EMS Protection and Monitoring Programs

SRBT implements a series of protection and monitoring programs as component parts of the EMS, all of which are aimed at ensuring the protection of all environmental components around the facility, and the management and minimization of any associated risks.

The *Environmental Protection Program* (EPP) {27} ensures the protection of the environment by establishing the framework upon which releases of tritium are controlled, minimized, monitored at the source, and monitored in the environment.

Subordinate to the EPP are two monitoring programs that ensure quality data is gathered routinely on releases of tritium from the facility, in order to demonstrate compliance and support risk management activities.

The *Effluent Monitoring Program* (EffMP) {28} describes how releases are monitored at the point of release, and establishes a series of programmatic objectives. The program is designed in compliance with the requirements of CSA standard N288.5-11, *Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills*.

EffMP objectives include (but are not limited to) the demonstration of compliance with release limits; adherence to internal objectives and targets; the confirmation of the adequacy of controls on releases; and providing indication of unusual or unforeseen conditions that might require corrective actions.

The *Environmental Monitoring Program* (EMP) {29} describes how the behaviour of tritium is monitored in the surrounding environment, and establishes a series of programmatic objectives. The program is designed in compliance with the requirements of CSA standard N288.4-10, *Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills*.

EMP objectives include (but are not limited to) the assessment of the level of risk on human health and safety, and the potential biological effects in the environment; the demonstration of compliance with regulatory limits on effective doses to persons who are not NEWs; to check on the effectiveness of controls independently of effluent monitoring; and to verify predictions made by the ERA.

The *Groundwater Protection Program* (GWPP) {30} ensures the protection of the quality of groundwater resources near the facility, by establishing the framework for minimizing the interaction of tritium with aquifers, and ensuring the groundwater conditions are continuously monitored and assessed over time.

Subordinate to the GWPP is the *Groundwater Monitoring Program (GMP)* {31}, which describes the processes by which groundwater resources are monitored for tritium concentration, and establishes a series of programmatic objectives. Both programs are designed in compliance with the requirements of CSA standard N288.7-15, *Groundwater protection programs at Class I nuclear facilities and uranium mines and mills*.

GMP objectives include (but are not limited to) supporting the goals of the GWPP; demonstrating compliance with regulatory requirements; providing data to verify predictions made in environmental assessments / ERA / groundwater studies; and providing an indication of unusual or unforeseen conditions that might require corrective action or additional monitoring.

All of the above programs are implemented by qualified members of the Health Physics Team, as directed by the organization manager responsible for the EMS, the Manager – HP&RA. The implementation of the detailed procedures subordinate to the EffMP, EMP and GMP ensures that the objectives of the programs, and the ultimate protection of the environment, are assured during routine facility operations.

Data generated by these monitoring programs is subject to review and assessment at several points. Environmental data is independently verified by another member of the Health Physics Team upon compilation, prior to any report being finalized. The data is reviewed for quality, accuracy, and for any adverse or noteworthy trends before being accepted in-house. In the case of gaseous effluent monitoring, the report is assessed by multiple members of the organization each week, including the Health Physics Team, department supervisors who oversee tritium processing, and Top Management.

In addition, annual independent third-party comparison exercises within EMS monitoring programs consistently demonstrate high precision and accuracy of measurements, and excellent program performance.

The Mitigation Committee meets frequently to review effluent and environmental data, contrast the data against in-house objectives and targets, and consider any operational aspects that could be changed or improved in order to achieve organizational goals of minimizing the effect of operations on the environment.

Finally, a comprehensive report is furnished to CNSC staff as part of the Annual Compliance Reporting cycle, where the requirements described in applicable CSA N288-series standards are met each year, and an assessment of the effective dose to members of the public is completed.

Environmental Performance Metrics during Current Licence Term

Each year as part of the Annual Compliance Report, SRBT compiles an extensive set of data that demonstrates the level of environmental protection performance achieved.

For the purposes of this licence application, SRBT’s achievement in several key areas are summarized in order to provide a clear picture of the level of risk presented by the routine operation of the facility, for consideration as part of the licence renewal process.

The key environmental metrics for the 2015-2020 time period include:

- Annual releases to atmosphere (including % of limit),
- Ratio of atmospheric tritium releases and amount of tritium processed in a calendar year,
- Annual releases to sewer (including % of limit), and
- Annual dose to the public (calculated using both % DRL and EMP data)

Each key metric relating to atmospheric releases of tritium is individually summarized in Table 12.

**TABLE 12: KEY ENVIRONMENTAL METRICS – ATMOSPHERIC RELEASE DATA (2015-2020)**

<b>YEAR</b>	<b>TRITIUM OXIDE RELEASED TO ATMOSPHERE (GBq)</b>	<b>% of LIMIT</b>	<b>TOTAL TRITUM RELEASED TO ATMOSPHERE (GBq)</b>	<b>% of LIMIT</b>	<b>RELEASED TO PROCESSING RATIO (%)</b>
2015	11,554	17.2%	56,237	12.6%	0.20%
2016	6,293	9.4%	28,945	6.5%	0.10%
2017	7,198	10.7%	24,822	5.5%	0.08%
2018	10,741	16.0%	33,180	7.4%	0.11%
2019	11,858	17.6%	31,769	7.1%	0.10%
2020	9,755	14.5%	25,186	5.6%	0.09%
<b>AVG.</b>	<b>9,567</b>	<b>14.2%</b>	<b>33,357</b>	<b>7.5%</b>	<b>0.11%</b>

Data on liquid effluent / releases to sewer is summarized in Table 13.

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**TABLE 13: KEY ENVIRONMENTAL METRICS – SEWER RELEASE DATA (2015-2020)**

YEAR	TRITIUM – WATER SOLUBLE RELEASED TO SEWER (GBq)	% of LIMIT
2015	6.50	3.3%
2016	5.18	2.6%
2017	6.85	3.4%
2018	10.02	5.0%
2019	13.67	6.9%
2020	5.56	2.8%
<b>AVG.</b>	<b>7.96</b>	<b>4.0%</b>

Data on the conservatively-calculated effective dose to persons who are not NEWs (i.e. members of the public) is summarized in Table 14. Note that doses calculated using the DRL do not incorporate any groundwater consumption, while the EMP-calculated value does include this input as a conservative measure.

**TABLE 14: KEY ENVIRONMENTAL METRICS – PUBLIC DOSE (2015-2020)**

YEAR	MAXIMUM EFFECTIVE DOSE (mSv): PERCENTAGE OF DRL	% of LIMIT	MAXIMUM EFFECTIVE DOSE (mSv): CALCULATED VIA EMP	% of LIMIT
2015*	0.0024	0.2%	0.0068	0.7%
2016	0.0008	0.1%	0.0046	0.5%
2017	0.0009	0.1%	0.0034	0.3%
2018	0.0013	0.1%	0.0038	0.4%
2019	0.0014	0.1%	0.0022	0.2%
2020	0.0012	0.1%	0.0024	0.2%
<b>AVG.</b>	<b>0.0013</b>	<b>0.1%</b>	<b>0.0039</b>	<b>0.4%</b>

\*2015 DRL dose calculated using previous version of DRL (2006)

In all cases, the environmental data shows that over the current licence period, SRBT operated in a fashion that was continuously protective of the environment, as well as the health and safety of persons.

Groundwater Status

Over the course of the current seven-year licence term, the concentration of tritium in groundwater monitoring wells has continuously declined. The average annual tritium concentration in the twenty-nine monitoring wells routinely sampled by SRBT is provided in Table 15 for calendar years 2015 and 2020.

**TABLE 15: ANNUAL TRITIUM CONCENTRATION IN SRBT WELLS (2015 vs. 2020)**

<b>WELL ID</b>	<b>ANNUAL AVERAGE – 2015 (Bq/L)</b>	<b>ANNUAL AVERAGE – 2020 (Bq/L)</b>	<b>% CHANGE</b>
MW06-1	4,338	762	-82%
MW06-2	1,965	877	-55%
MW06-3	1,218	244	-80%
MW06-8	906	579	-36%
MW06-9	2,731	1,527	-44%
MW06-10	51,635	29,513	-43%
MW07-11	1,521	924	-39%
MW07-12	463	422	-9%
MW07-13	13,237	4,406	-67%
MW07-15	1,680	1,262	-25%
MW07-16	2,188	1,003	-54%
MW07-17	780	272	-65%
MW07-18	5,491	1,494	-73%
MW07-19	3,222	1,198	-63%
MW07-20	775	326	-58%
MW07-21	1,121	393	-65%
MW07-22	1,171	783	-33%
MW07-23	2,206	1,252	-43%
MW07-24	2,314	1,644	-29%
MW07-26	1,941	514	-74%
MW07-27	4,869	1,994	-59%
MW07-28	1,446	705	-51%
MW07-29	3,950	1,485	-62%
MW07-31	756	182	-76%
MW07-32	128	59	-54%
MW07-34	3,312	1,297	-61%
MW07-35	3,945	1,898	-52%
MW07-36	2,892	1,468	-49%
MW07-37	1,009	763	-24%

### Future Expectations

Going forth into the next licence period, SRBT anticipates that the routine, controlled releases of both nuclear and hazardous substances from the facility will remain relatively stable or decrease over time, in line with the historical rates of releases summarized here and in our Annual Compliance Reports, as well as in line with the assessments performed on the environmental aspects of facility operations (in particular, the ERA).

The locations of points of release, and the physical, chemical and radiological characteristics of those released substances (as described in the SAR / EMS / ERA), will remain unchanged.

The EMS and associated programs and analyses / assessments will continue to be actively managed and improved over time. Both the DRL and ERA will be reviewed and renewed on at least a five-year cycle, and used to help drive improvements and reduce uncertainties in the impact of facility operation on the environment.

### Standards, Codes and Regulatory Documents – Environmental Protection

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as compliance verification criteria in the next revision of the SRBT Licence Conditions Handbook (LCH):

- CNSC REGDOC-2.9.1, *Environmental Principles, Assessments and Protection Measures, (Version 1.1, 2017)*
  - Will supersede CNSC REGDOC-2.9.1, *Environmental Protection Policies, Programs and Procedures (2013)*
  - SRBT intends to review the EMS for compliance with CNSC REGDOC-2.9.1, *Environmental Principles, Assessments and Protection Measures, (Version 1.1, 2017)* by **December 31, 2021**.
  - If required, management system documents and processes will be revised to incorporate any required changes by **March 31, 2022**.
- CSA N288.1-14, *Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities (2014, reaffirmed 2019)*
- CSA N288.4-10, *Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills (2010, reaffirmed 2015)*
- CSA N288.5-10, *Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills (2011, reaffirmed 2016)*

- CSA N288.6-12, *Environmental risk assessments at Class I nuclear facilities and uranium mines and mills (2012, reaffirmed 2017)*
- CSA N288.7-15, *Groundwater protection programs at Class I nuclear facilities and uranium mines and mills (2015)*
- CSA N288.8-17, *Establishing and implementing action levels for releases to the environment from nuclear facilities (2017)*

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included in the next revision of the SRBT LCH, with the applicability and/or implementation requirements yet to be determined:

- CNSC REGDOC-2.9.2, *Environmental Protection: Controlling Releases to the Environment (not yet published)*

#### Performance Assessment – Environmental Protection

Over the course of the current licence term, SRBT considers its performance in the SCA of Environmental Protection to meet our internal expectations, and to be very good in general, with a stable trend over time and projected into the future.

This assessment is based on the following key points:

- Effective doses to persons who are not NEWs have been maintained exceptionally low for a Class I nuclear facility, with no instance of exceeding 1% of the limit of 1 mSv in any given calendar year throughout the current licence term.
- Tritium releases to the environment through both gaseous and liquid effluent streams have been consistently low in relation to authorized limits, with no instance of releases exceeding 20% of the applicable limit during the current licence term.
- Environmental and groundwater monitoring data has continued to be generated consistently, in line with the applicable programs, and the data generated has been of high quality, and demonstrated that concentrations of tritium in the environment remain well below benchmark values.
- The risk to human health and ecological receptors has been formally assessed through the implementation of an Environmental Risk Assessment, in compliance with the requirements and guidance of the applicable CSA standard. No significant risks were identified in the ERA, and SRBT has integrated the recommendations into the EMS and associated monitoring programs.

- The EMS has been fully designed and implemented to meet the requirements and expectations of the suite of applicable N288-series standards. Between 2015 – 2020, SRBT completed a major multi-year project in several controlled stages, in order to address gaps between the EMS and these standards. This project has been very successful, and has resulted in a complete and maturing system of managing the environmental aspects of facility operations.
- The EMS, its programs and associated procedures have been continuously improved and maintained over the course of the current licence term.
- CNSC inspection activities have consistently identified very few non-compliances in the area of Environmental Protection, and any action items have been addressed rapidly and effectively, in accordance with a risk-based approach where appropriate.
- Environmental Protection was included in the scope of three inspections by the CNSC during the current licence term. Only a single action item was raised as a result of these three inspections, with the last two inspections identifying zero action items in this area.
- The latest CNSC inspection (conducted in August 2019) concluded that *“several areas were identified during the inspection, which had been noted as implementations of good operating practices, and effective implementation of programmatic requirements. The inspection team found the licensee to be in compliance with the inspection criteria.”*
- CNSC staff has consistently rated SRBT’s performance in this area as ‘Satisfactory’ each year as part of their Annual Compliance and Performance Report.

**d. SCA – Emergency Management and Fire Protection**

The SRBT Safety Analysis Report and Fire Hazard Assessment documents describe the potential emergency scenarios that have been analyzed for the facility. The probability of occurrence of an emergency involving licenced activities and nuclear substances at the SRBT facility, and its potential consequences, are very low.

This is achieved through the diligent application of strategy of defence-in-depth, using safe process design, implementation and maintenance of safety-related structures, systems and components, and implementation of management system programs and emergency planning.

Emergency Management and Planning

In the event of an emergency at the nuclear substance processing facility, SRBT has documented, maintained and practiced the execution of a comprehensive Emergency Plan {32}.

The Emergency Plan (EP) describes all phases of emergency management at SRBT, including planning and preparation for emergencies, how the organization will respond in the event of an emergency situation developing, and the methods and strategies to be implemented for the recovery phase after the emergency is resolved.

The EP includes four main components: planning basis, emergency response plan and procedures, preparedness, and program management. The design of the plan is intended to comply with CNSC REGDOC-2.10.1, *Nuclear Emergency Preparedness and Response*, with the President having the overall responsibility for the oversight and management of the EP for the SRBT facility.

The declaration of an emergency at the facility triggers the activation of an Emergency Response Organization (ERO), which includes a number of key technical and administrative members of the SRBT organization. Upon activation, these individuals take on specific responsibilities aimed at managing the emergency through coordination and communication with stakeholders and emergency responders, with the aim of resolving it effectively while minimizing its impact on persons and the environment, and ensuring that the recovery phase is implemented.

Unlike most other Class I nuclear facilities, SRBT does not maintain a dedicated on-site emergency response organization, as the potential impacts of an

emergency are relatively lower than those that could manifest with worst-case scenarios at nuclear power stations.

In order to ensure prepared, continuous emergency response capacity, SRBT maintains a collaborative relationship with the City of Pembroke and most specifically the Pembroke Fire Department (PFD), which includes training components for responders, and independent oversight of safety-related SSCs aimed at reducing or eliminating hazards which could result in an emergency situation developing.

As required by our EP, a full-scale emergency exercise is planned to be executed in the Fall of 2021. Originally, this exercise was planned to be conducted in 2020, five years after the last iteration of this activity; however, in consultation with both CNSC staff and community emergency responders, the exercise was deferred as a safety measure, in consideration of the ongoing COVID-19 global pandemic.

Recent developments suggest that if trends on community vaccination and infection rate continue, a significant reduction in risk to SRBT workers, observers and responders should be realized, allowing safe execution of an effective in-person emergency exercise at that time.

### Fire Protection

Several of the emergency scenarios that could develop at the facility are based upon the occurrence of a significant fire which impacts nuclear substances on site. As such, SRBT implements a set of management system programs, procedures and plans which ensure effective control of fire as a potential hazard.

The SRBT Fire Protection Program (FPP) {33} is designed to fully meet the requirements of CSA standard N393-13, *Fire protection for facilities that process, handle, or store nuclear substances*. This program is routinely reviewed by several organizations independent of SRBT, including the Pembroke Fire Department and a qualified third-party contractor in fire protection of nuclear facilities, in order to ensure compliance with requirements, and a high level of defence-in-depth.

The FPP covers both the procedures in place, as well as the physical SSCs that are designed to reduce the likelihood and impact of fires. The program is designed to help in preventing fires from starting, detecting fires early, controlling and extinguishing fires that occur, and providing a level of fire protection for SSCs so that any damage will not prevent essential facility functions from being performed.

The Vice President is responsible for the overall management of the FPP, including (but not limited to) ensuring relevant regulatory requirements, codes and standards are met, that meetings of the Fire Protection Committee are coordinated, and that drills and exercises for fire protection are conducted as required.

Assisting the Vice President in meeting these responsibilities is a dedicated Fire Protection Specialist, who ensures that day-to-day aspects of the program management are implemented and executed consistently.

Supporting the FPP are two technical descriptive documents which establish and quantify the fire hazard at the facility, and define the expected response by all workers at the facility.

The SRBT Fire Hazard Assessment (FHA) {18} is compiled and documented by an independent and qualified third-party (PLC Fire Safety Solutions), with the objectives of identifying the fire hazards at the facility, evaluating the impact of fires involving these hazards on the safety objectives at the facility, and assessing the adequacy of the fire protection measures in place to mitigate these hazards. The current FHA was updated in 2020.

The FHA forms a key input into the continuing improvement of the FPP and associated procedure set, as well as the physical fire safety provisions installed and maintained at the facility.

The SRBT Fire Safety Plan (FSP) is a requirement of the National Fire Code of Canada, as well as the FPP, and covers the pre-incident plan, emergency and evacuation procedures, the fire safety systems and equipment on site, and fire drills and staff training provisions put in place.

All SRBT staff are responsible to be knowledgeable of the FSP and their associated responsibilities, and copies of the plan are available throughout all areas of the facility. The plan is reviewed and approved by the PFD, who provide training to staff and conduct facility fire safety inspections on an annual basis in line with the requirements in the plan.

Fire drills are conducted in excess of required frequencies, to ensure a high level of organizational preparedness. Since the current operating licence was renewed, a total of 33 planned fire drills have taken place (compared to a requirement of one per year). At the conclusion of each drill, participants have the chance to provide feedback and suggest measures for how personnel response to a fire could be improved.

### Standards, Codes and Regulatory Documents – Emergency Management and Fire Protection

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as compliance verification criteria in the next revision of the SRBT Licence Conditions Handbook (LCH):

- CNSC REGDOC-2.10.1, *Nuclear emergency preparedness and response*
- CSA N393-13, *Fire protection for facilities that process, handle, or store nuclear substances*

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included in the next revision of the SRBT LCH, with the applicability and/or implementation requirements yet to be determined:

- CNSC REGDOC-2.10.2, *Fire Protection (not yet published)*

### Performance Assessment – Emergency Management and Fire Protection

Over the course of the current licence term, SRBT considers its performance in the SCA of Emergency Management and Fire Protection to meet our internal expectations, and to be very good in general, with a stable trend over time and projected into the future.

This assessment is based on the following key points:

- No occurrence of emergency or fire at the facility throughout the current licence term.
- Associated safety programs have continued to be improved in line with new regulatory requirements and guidance, including the 2015 versions of the National Building Code and National Fire Code, as well as CSA standard N393-13.
- The FPP, FHA and FSP have all been reviewed and revised as required, in close consultation with stakeholders such as the PFD, and independently qualified third-parties in fire safety of nuclear facilities.
- CNSC inspection activities have consistently identified few non-compliances in the area of Emergency Management and Fire Protection, and action items have been addressed rapidly and effectively, in accordance with a risk-based approach where appropriate.

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- Yearly third-party inspections by both the Pembroke Fire Department and qualified third-party contractors, focused on fire protection measures implemented at the facility, have consistently found very few items of concern or non-conformance.
- Fire drills have been conducted at the required frequencies, with few issues identified and excellent organization response observed each time.
- All actions have been addressed since the last full-scale emergency exercise, and an exercise is planned to be conducted in advance of licence renewal.
- CNSC staff has consistently rated SRBT's performance in this area as 'Satisfactory' each year as part of their Annual Compliance and Performance Report.

**e. SCA – Waste Management**

Waste Management Program

The routine processing of tritium for the purposes of manufacturing gaseous tritium light sources and devices results in the generation of small quantities of tritium-contaminated waste materials.

In order to effectively and safely manage these materials, SRBT implements a *Waste Management Program* (WMP) {34} as a key safety program in the overall management system.

The program includes a comprehensive set of subordinate procedures, all of which are aimed at ensuring that waste is minimized, appropriately classified and segregated, characterized for hazards, stored and processed safely, and cleared or disposed of in accordance with all requirements.

A detailed waste management policy is included in the WMP, which includes several principles that are followed when managing these materials.

The WMP is designed in consideration of several standards, regulatory guides and requirements, including CSA N292.0-14, *General principles for the management of radioactive waste and irradiated fuel*, CSA N292.3-14, *Management of low- and intermediate-level radioactive waste*, and CSA N292.5-11, *Guideline for the exemption or clearance from regulatory control of materials that contain, or potentially contain, nuclear substances*.

The Manager – Health Physics and Regulatory Affairs is responsible for the overall management of the WMP, and ensuring the design, implementation and accuracy of the program meets relevant regulatory requirements. This includes all aspects of the management of both radioactive wastes, and of any conventionally hazardous waste materials at the facility.

As well, the Manager – Health Physics and Regulatory Affairs chairs the Waste Management Committee, which works to ensure that all types of waste from the facility is managed in line with policies, and efforts are put forth to minimize the amount of waste generated, and optimize waste management practices.

Tritium-contaminated waste materials are characterized by qualified members of the Health Physics Team, and routinely directed through the most appropriate waste stream. Waste materials that are characterized as being contaminated to levels that exceed conditional clearance levels are disposed of through licenced radioactive waste management service providers.

### Procedure for the Return of Tritium Safety Signs to Manufacturer

As per section 3 (1) (o) of the *Nuclear Substances and Radiation Devices Regulations*, an applicant that will be manufacturing or distributing radiation devices referred to in section 7 of the same regulation, the proposed procedure for the disposal of each radiation device, or for its return to the manufacturer, must be provided with an application for a licence.

As SRBT manufactures CNSC-certified radiation devices in the form of tritium-powered self-luminous safety signs, the facility offers end-users a service for the return of expired or otherwise disused devices for disposal.

In Canada, subject to certain prescribed conditions, tritium safety signs of a certified design are exempt from requiring a person to have a licence to possess, transfer, use or abandon the signs.

Detailed instructions are furnished to all customers of SRBT-sold products of this nature describing how to safely and compliantly return the sign to the manufacturer for disposal.

Two sets of instructions are provided to end-users of our products, depending on if the customer is domestic or international. Copies of the current version of these instruction sheets are included with this application for completeness {35}.

As part of this service, SRBT safely dismantles devices that contain tritium light sources, so that the light sources may either be safely re-used, or disposed of through a licensed radioactive waste service provider as a low-level waste material.

By dismantling the device and removing the light sources, the mass and volume of low-level radioactive waste generated is minimized.

SRBT details the number of expired tritium safety signs and devices processed, as well as the amount of low-level waste generated and safely disposed of as part of this process, each year as part of our Annual Compliance Report.

Over the course of the current licence term (calendar years 2015-2020), SRBT has processed over 150,000 tritium safety signs from various manufacturers in this way, ensuring a closed-loop life cycle for the tritium light sources used in our products.

## Decommissioning

SRBT has developed and maintained a Preliminary Decommissioning Plan (PDP) {36} which describes the planned, high-level strategies that will be implemented should the decision be made to decommission the nuclear substance processing facility.

The goal of the PDP is to establish feasible decommissioning envelopes that can be accomplished with low risk to the health and safety of decommissioning personnel, the public, and the environment. As well, the PDP helps to establish the anticipated cost of executing decommissioning of the facility, with adequate conservative margins to account for any uncertainties.

The SRBT PDP underwent a significant revision in 2019. The revised and updated plan was submitted to CNSC staff on November 29, 2019, and CNSC staff accepted the revised PDP [9] on February 3, 2020, with a revised cost estimate.

As the cost estimate rose with the revision of the PDP, an update to the required Financial Guarantee associated with the PDP was necessary. Specific details on the Commission-accepted [2] Financial Guarantee can be found under 'Other Information' in section 6 (a) of this application.

## Standards, Codes and Regulatory Documents – Waste Management

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as compliance verification criteria in the next revision of the SRBT Licence Conditions Handbook (LCH):

- CSA N292.0-19, *General principles for the management of radioactive waste and irradiated fuel.*
- CSA N292.3-19, *Management of low- and intermediate-level radioactive waste.*
- CSA N294:19, *Decommissioning of facilities containing nuclear substances.*
- CNSC REGDOC-2.11, *Framework for Radioactive Waste Management and Decommissioning in Canada.*
- CNSC REGDOC-2.11.1, *Waste Management, Volume I: Management of Radioactive Waste.*
- CNSC REGDOC-2.11.2, *Decommissioning*

CNSC Policy P-290 and Guide G-129 are to be superseded by REGDOC 2.11 and 2.11.2, respectively.

For the aforementioned standards and REGDOCs:

- SRBT intends to revise the WMP and bring it into compliance with the relevant CSA standards and REGDOCs by **December 31, 2021**.
- SRBT intends to revise the PDP to align with the relevant CSA standard and REGDOCs at the end of the current five-year cycle, when the next review and revision is due (by **November 29, 2024**), OR if a significant facility modification triggers a review and revision of the PDP earlier before five years elapses.

### Performance Assessment – Waste Management

Over the course of the current licence term, SRBT considers its performance in the SCA of Waste Management to meet our internal expectations, and to be very good in general, with a stable trend over time and projected into the future.

This assessment is based on the following key points:

- No waste management-related safety issues or significant events have occurred during the term of the current licence.
- The WMP was reviewed and revised several times throughout the current licence term, and was continuously improved with each change.
- The application of conditional clearance levels was initiated in 2015, resulting in the implementation of a safe, reasonable waste management strategy for very mildly-contaminated materials from low-level waste streams.
- The SRBT FG was recently updated and fully-funded to the new cost estimate of \$727,327, and was accepted by the Commission in December of 2020 [2].
- The PDP was reviewed and comprehensively revised for both content and format in 2019, considering several facility changes that were implemented during the current licence term, including the addition of a facility extension, and the safe removal of obsolete equipment and equipment that had reached the end of its serviceable life.

- Specifically, three contaminated systems in the tritium processing area (Zone 3) were safely dismantled and removed in 2019-20, in accordance with detailed and controlled work plans, with all contaminated components exceeding clearance levels being disposed of as low-level radioactive waste:
  - Ventilated wooden cabinets (fume hoods) were replaced with modern stainless-steel units in the Rig Room;
  - A laser-cutting system (last used in the mid-2000s) was removed from the Laser Room;
  - The reclaim rig (last operated in January 2007) was thoroughly and safely decontaminated, dismantled and removed from the Tritium Laboratory. The equipment had been shut down, rendered inoperable, and kept in an inoperable, de-energized state for over 12 years.
- CNSC inspection activities have consistently identified few non-compliances in the area of Waste Management, and action items have been addressed rapidly and effectively, in accordance with a risk-based approach where appropriate.
- CNSC staff has consistently rated SRBT's performance in this area as 'Satisfactory' each year as part of their Annual Compliance and Performance Report.

**f. SCA – Security**

Facility Security Program

As a licensee that is listed in Schedule 2 of the *Nuclear Security Regulations*, SRBT must comply with the requirements of Part 2 of those regulations. The provisions of Part 1 of those regulations do not apply, as SRBT is not licensed in respect to Category I, II or III nuclear material, and the facility is not a nuclear power plant.

In order to ensure compliance with Part 2 of the *Nuclear Security Regulations*, SRBT implements and maintains a Facility Security Program.

This program document has not been included as part of this licence application as it contains sensitive information. CNSC staff reviews and accepts revised versions of this program as required as part of SRBT's current licensing basis.

The in-force version of the SRBT Facility Security Program document represents the proposed measures to:

- ensure compliance with the *Nuclear Security Regulations*, as per section 3 (1) (e) of the *General Nuclear Safety and Control Regulations*, and section 41 of the *Nuclear Security Regulations*,
- prevent acts of sabotage or attempted sabotage at the nuclear facility, including measures to alert the licensee of such acts, as per section 6 (l) of the *Class I Nuclear Facilities Regulations*.

Standards, Codes and Regulatory Documents – Security

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as compliance verification criteria in the next revision of the SRBT Licence Conditions Handbook (LCH):

- None

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as recommendations and guidance in the next revision of the SRBT LCH:

- CNSC REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material, Version 2.1*

### Performance Assessment – Security

Over the course of the current licence term, SRBT considers its performance in the SCA of Security to meet our internal expectations, and to be very good in general, with a stable trend over time and projected into the future.

This assessment is based on the following key point:

- CNSC staff has consistently rated SRBT's performance in this area as 'Satisfactory' each year as part of their Annual Compliance and Performance Report.

**g. SCA – Safeguards and Non-proliferation**

Depleted Uranium

SRBT possess and uses a very limited quantity of depleted uranium as a processing storage media for molecular tritium gas.

The maximum amount of depleted uranium possessed by SRBT is defined in the SAR as an Operating Limit and Condition.

This limit is set at 10 kg, an amount which corresponds to the general exemption quantity of this type of material, as defined in section 5 (1) (f) of the *Nuclear Substances and Radiation Devices Regulations*.

As well, an exemption is on file with International Atomic Energy Agency (IAEA) and the International Safeguards Division of the CNSC for the material possessed. Exemption tracking identifier EU\01\CN-2\D\ZZ00211 was granted on December 27, 2018, and SRBT ensures that the associated guidelines are followed with respect to this exemption.

SRBT is continuously prepared to ensure that all necessary measures are taken to facilitate Canada's compliance with applicable international nuclear safeguards agreements. Any IAEA inspector, or person acting on the behalf of the IAEA shall be provided with such reasonable services and assistance as are required to enable the IAEA to carry out its duties and functions pursuant to safeguards agreements.

Import and Export of Tritium

Exported and imported products containing tritium gas are controlled under the *Nuclear Non-proliferation Import and Export Control Regulations* (NNIECR), as tritium is a controlled substance that is listed in the schedule of the NNIECR.

As such, each time SRBT intends to export or import products containing tritium, an application for a licence is made to CNSC staff in compliance with those requirements.

### Standards, Codes and Regulatory Documents – Safeguards and Non-proliferation

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as compliance verification criteria in the next revision of the SRBT Licence Conditions Handbook (LCH):

- Not applicable

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as recommendations and guidance in the next revision of the SRBT LCH:

- Not applicable

### Performance Assessment – Safeguards and Non-proliferation

CNSC staff does not evaluate SRBT's performance in this safety and control area as part of routine regulatory oversight. During the current licence term, a reported SCA rating of 'N/A' has been listed in each Regulatory Oversight Report presented to the Commission.

Notwithstanding, over the course of the current licence term, SRBT considers its performance in the SCA of Safeguards and Non-proliferation to meet our internal expectations, with a stable trend over time and projected into the future.

## **h. SCA – Packaging and Transport**

### Packing and Shipping Procedures

As a manufacturer of self-luminous safety devices which contain tritium gas, and are sold to customers both domestically in Canada and internationally, SRBT implements a comprehensive suite of procedures that ensure compliance with the *Packaging and Transport of Nuclear Substances Regulations, 2015* (PTNSR).

Organizationally, the responsibility for ensuring the safe and compliant shipping of packages containing radioactive materials is held by the Logistics Manager, who is supported by several trained and qualified production technicians in the conduct of all shipping, and import and export activities.

These individuals are trained and certified in the packaging and handling of Class 7 dangerous goods, and undergo refresher training every two years by an independent, qualified service provider to ensure that they are qualified to perform these activities safely and in compliance with all regulatory requirements.

Shipping activities are governed by a specific set of controlled procedures, and the Logistics Manager is responsible for ensuring that procedures are maintained and implemented at all times.

General requirements for shipping, including aspects of packaging and transport, are described within procedure SHP-001, *Packing & Shipping – General Requirements* {37}, and is included with this application as the proposed measures to ensure compliance with the PTNSR.

Several other detailed procedures in the SHP-series are in place to control other aspects of these activities. SRBT does not transport nuclear substances; however, several companies are used to provide shipping services for incoming and outgoing products containing tritium. Instructions to third-party shipping service providers are provided at the time of shipment, depending on the nature and classification of the shipment and the goods.

### Standards, Codes and Regulatory Documents – Packaging and Transport

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as compliance verification criteria in the next revision of the SRBT Licence Conditions Handbook (LCH):

- None

The following standards, codes and regulatory documents have been noted by CNSC staff [1] to be anticipated to be included as recommendations and guidance in the next revision of the SRBT LCH:

- CNSC REGDOC-2.14.1, *Information Incorporated by Reference in Canada's Packaging and Transport of Nuclear Substances Regulations, 2015*

### Performance Assessment – Packaging and Transport

Over the course of the current licence term, SRBT considers its performance in the SCA of Packaging and Transport to meet our internal expectations, and to be very good in general, with a stable trend over time and projected into the future.

This assessment is based on the following key points:

- No major safety issues or significant events have occurred with respect to SRBT's packaging and transport of tritium, and products containing tritium during the term of the current licence.
- For a total of 8,878 shipments of radioactive materials, only five 'dangerous occurrences', as defined in the PTNSR, were experienced during the current licence term.
- In four of the five cases of such an event, the cause of these occurrences was not primarily attributed to SRBT, but was caused instead by outside agencies (carriers, customers). None of these events resulted in significant safety risk to persons or the environment, and were all reported to CNSC as required. See Table 2 of this application for specific details on these events.
- Staff assigned to the Shipping Department have remained certified to handle and ship Class 7 goods, through biannual training from an independent, qualified service provider, ensuring that workers are kept abreast of changes in requirements throughout the term of the current licence.

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- The procedures that control shipping and receiving activities have been maintained by the Logistics Manager, and frequently updated to ensure accuracy.
- CNSC inspection activities have consistently identified few non-compliances in the area of Packaging and Transport, and action items have been addressed rapidly and effectively, in accordance with a risk-based approach where appropriate.
- CNSC staff has consistently rated SRBT's performance in this area as 'Satisfactory' each year as part of their Annual Compliance and Performance Report.

## 6. OTHER INFORMATION IN SUPPORT OF APPLICATION

### a. Financial Guarantee

As described previously, SRBT maintains a Preliminary Decommissioning Plan (PDP) that describes the planned, high-level strategies that will be implemented should the decision be made to decommission the nuclear substance processing facility.

The PDP establishes the anticipated cost of executing decommissioning of the facility, with adequate conservative margins to account for any uncertainties. This cost estimate is backed by a Financial Guarantee (FG) that is allocated solely for the purposes of facility decommissioning in the future.

A revised and updated PDP was submitted to CNSC staff on November 29, 2019, who accepted the revised PDP on February 3, 2020 [9]. The PDP including a revised cost estimate of \$727,327.00, a value which represented an increase from the 2014 estimate of \$652,488.00, thus necessitating an update to the FG.

On February 4, 2020, SRBT submitted the revised financial documentation, as well as a proposal to fully fund the FG to \$727,327.00 by the end of April 2020. On April 24, 2020, SRBT provided evidence to CNSC staff that the FG was fully funded to the updated value, in advance of consideration by the Commission during a hearing focused on the acceptability of the FG.

On September 8, 2020, the CNSC announced that a hearing in writing would be conducted to consider our revised PDP and updated FG. Intervenors were requested to file any submissions before October 9, 2020. One intervention was received from the public on this matter.

The Record of Decision on the matter was issued by the Commission on December 8, 2020, noting that the Commission accepted [2] SRBT's revised financial guarantee amount of \$727,327.00.

The SRBT Financial Guarantee is a cash fund held in escrow, and does not rely on any letters of credit, bonds, insurance or other expressed commitments. Interest accrued on the funds deposited remain held in escrow over time; as a result, as of the end of March 2021, the FG is funded to \$738,571.67, or 101.54% of the required guarantee of \$727,327.00.

The accepted FG on file with the Commission represents the proposed financial guarantee relating to the activity to be licensed, as required by the *General Nuclear Safety and Control Regulations*, section 3 (1) (l).

**b. Public Information Program**

SRBT maintains a Public Information Program (PIP) {38} which is designed to meet the requirements of CNSC RD/GD-99.3, *Public Information and Disclosure*.

In this program, processes are described which are designed to inform persons living in the vicinity of the site of the general nature and characteristics of our facility and the operations undertaken.

In addition, information is provided in order to illustrate the anticipated effects on the environment and the health and safety of persons that may arise from licensed activities.

SRBT uses several strategies to communicate with the public and interested stakeholders, such as pamphlet distribution, and a specific section dedicated to this function on our corporate website.

All public information and media are periodically updated and refreshed, and CNSC staff is kept apprised of the progress in this area.

SRBT also maintains Facebook, Instagram, Twitter, LinkedIn, TikTok and Reddit accounts, all of which are updated periodically.

SRBT's Public Disclosure Protocol outlines our goal to be transparent, visible and open with our community, our regulators, and our staff.

SRBT staff, led by Senior Management, are committed to achieving this goal by having suitable mechanisms in place to provide specific information in a timely, clear and concise manner about operations to the target audience.

SRBT is also committed to the continuous review of the effectiveness of these mechanisms and to make modifications to adapt to perceived changes in public perception.

The facility operates within the City of Pembroke. The effects of the operations, although minimal, are by far the greatest on Pembroke and its residents.

For these reasons, the PIP has been developed to reach the population of Pembroke, specifically including:

- The critical group defined as individuals living within 500 meters of the facility;
- Residents with wells or gardens that are being monitored by SRBT;
- Local and adjacent businesses;
- Local media, television, print and radio;
- Local special interest groups;
- Local Aboriginal groups; and
- Local elected officials at the Municipal, Provincial and Federal level

The activities outlined in the PIP demonstrate that SRBT is committed to:

- Maintaining two-way communication channels to address the questions and concerns of people within our target audience in a timely and clear manner;
- Sending a press release to the local media, CNSC staff and local elected officials within one business day after becoming aware of any regulatory limit or licence limit exceedance;
- Posting on our website within five business days after notifying the CNSC of any regulatory limit or licence limit exceedance, action level exceedance, major events, incidents or issues with the operations;
- Posting on our website within five business days after making any licence renewal or amendment application to the CNSC;
- Posting on our website all Annual Compliance Reports and associated amendments and/or addendums within five business days after issuance to CNSC staff;
- Posting on our website before March 31<sup>st</sup> a yearly update of our pamphlet, which is a two-page document which introduces the company to members of the public and provides some information on risks associated with emissions of the facility as well as providing clear contact information for an interested reader to acquire more detailed information;
- Posting on our website before March 31<sup>st</sup> a yearly update of our brochure, which is an eight-page document that provides more detailed information than our pamphlet regarding the company and regarding the risks associated with emissions of the facility as well as providing clear contact information for an interested reader to acquire more detailed information;

- Formally meeting with representatives of local interest groups to discuss licence renewals or amendments;
- Conducting regular tours of our operations for members of the community to increase public knowledge and understanding of our operations;
- Performing presentations pertaining to our operations for members of the community to increase public knowledge and understanding of our operations;
- Reviewing at least on a quarterly basis what is believed the public perception is regarding the operations, and making modifications to Public Information Program as deemed necessary, and;
- Continuing to collaborate with other members of the nuclear industry.

SRBT intends to revise its Public Information Program (PIP) and associated Public Disclosure Protocol, by **March 31, 2022**. This revision will incorporate any required changes needed in order to comply with REGDOC-3.2.1, *Public Information and Disclosure*.

#### Licence Application – Public Distribution

We will post on our website a full copy of our fifteen-year licence application.

All households, apartments, farms and businesses located within a 10 km radius of SRB Technologies (Canada) Inc. will be provided SRBT's yearly pamphlet, which will provide details on SRBT and make mention of our application for a fifteen-year licence, with the website link to where the application can be found.

A physical copy of our licence application will also be provided to:

- Local elected officials at the Municipal, Provincial and Federal level
- Local Aboriginal groups (Algonquin of Ontario, Metis Nation of Ontario, Algonquins of Pikwakanagan First Nation and the Algonquin Anishinabeg Nation)
- Residents with wells or gardens that are being monitored by SRB Technologies (Canada) Inc.
- Local special interest groups (Concerned Citizens of Renfrew County and Area)

As well, a press release discussing our fifteen-year licence application will also be provided to local media, television, print and radio (including TV Cogeco Pembroke, The Daily Observer, The North Renfrew Times and MyFM Radio).

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All information provided will include SRB Technologies (Canada) Inc. contact details, where questions may be directed.

Once COVID-19 restrictions permit, SRBT will also make a presentation to Pembroke City Council at a session of Council, to discuss SRBT's application for a fifteen-year operating licence.

**c. Operational Plans for Next Licensing Period and Beyond**

Plans for Next Licence Period

SRBT is applying for a fifteen-year licence to operate the nuclear substance processing facility.

The operational plans for the next fifteen years are, in essence, 'status-quo', meaning that there are currently no major changes anticipated in the way that the organization will operate the facility, and no planned major nuclear substance processing facility modification projects on the horizon.

SRBT fully expects to continue to strive to sustainably manufacture self-luminous safety devices and tritium light sources for our customers, with the fundamental business goals of increasing market share, and finding new safety-related applications for the products and technologies that are offered by our company.

We expect to continue to assess our operations, and continually find opportunities for improvement in both the safety-related aspects of our operations, and in the quality of our products.

Facility SSCs will continue to be maintained and, where required, renewed and refurbished, in order to ensure that they remain fit to serve their purpose.

We will continue to closely monitor the impacts of the operation of our facility, and ensure that any associated risks to workers, the public and the environment are continuously assessed and minimized.

Plans for Beyond the Next Licence Period

Assuming that this application is successful and a long-term licence is issued by the Commission, current projections suggest that operations will remain the same, in line with the considerations made above.

There is no set future time frame where it is expected that nuclear substance processing at the facility is to cease, or for the decommissioning phase of the facility life cycle to commence.

#### **d. Operational Safety Challenges**

##### Existing Safety Challenges

Throughout the term of the current licence, SRBT has maintained a high degree of operational safety in all aspects of our licenced activities.

We have experienced few significant safety challenges that have required actions to be taken outside of our routine safety management programs and processes with challenges associated with COVID-19 to be the most significant.

Like all other organizations, SRBT is continuing to manage the challenge posed by the global COVID-19 pandemic. To date, the safety provisions enacted at the facility have proven to be highly effective at ensuring a low rate of infection. **No SRBT employee has experienced a confirmed case of COVID-19**, and the rate of vaccination at the facility has been increasing in lock-step with the evolving eligibility criteria issued by the Province of Ontario. As of the date of writing this document over 90% of SRBT's staff received their first dose of a vaccine with over 39% having received both doses.

Otherwise, there are no current, significant operational safety challenges being experienced at the facility.

##### Future Safety Challenges

Looking ahead, and given the anticipated operational plans described in the previous section of this application, there are no significant future safety challenges foreseen that are unlikely to be addressed by the routine implementation of our programs and processes.

The nature of the business is generally quite static; in contrast to other Class I nuclear facilities (such as nuclear reactors), there are typically few safety problems that are dependent on a given amount of operating time elapsing. The concept of major project-based, safety-oriented refurbishment of SSCs does not generally apply to our operations.

##### Opportunities for Improvement to Address Safety Challenges

No specific opportunities for improvement are presented here, given the above information. SRBT continues to monitor all aspects of our operations for opportunities for improvement, through the application of several management system processes such as benchmarking, self-assessment, internal audit and management review.

**e. Status of Action Items and Issues from Commission Hearings and Meetings**

Actions from Commission Hearings

Two Commission Hearings have occurred with respect to SRBT over the last seven years.

The 2015 hearing to consider the previous licence renewal application took place in Pembroke, resulting in the issuance of a seven-year nuclear substance processing facility operating licence.

With the issuance of the licence, SRBT conducted a self-assessment through a desktop review on the action items and issues that were discussed at that hearing, and tracked all commitments and actions to completion. There are no outstanding action items stemming from the 2015 hearing.

In 2020, a Commission Hearing was conducted to consider the revised Financial Guarantee associated with future decommissioning activities. The hearing was conducted as a panel-of-one, by the President of the Commission.

No action items were identified as a result of the 2020 hearing, and the Financial Guarantee was accepted [2]. For further information please see section 6 (a) of this application.

Actions from Commission Meetings

Each year, Commission Meetings are held to discuss performance of major licensees, including nuclear substance processing facilities. These meetings include the presentation of a Regulatory Oversight Report (ROR) by CNSC staff to the Commission.

The ROR describes in detail the performance of each facility in the area of Radiation Protection, Conventional Health and Safety, and Environmental Protection. CNSC staff assigns performance ratings in each SCA, including those not discussed in detail, in order to provide a complete picture of facility performance.

SRBT routinely makes itself available to answer any questions and discuss any relevant topics during these meetings. A review of the transcripts and minutes of the meetings conducted during the current licence term did not reveal that there are action items that remain unaddressed by SRBT.

**f. List of Applicable Regulations, Authorities and Obligations**

Regulations

Note: this list only consists of regulations that apply to SRBT due to the specific nature of our business.

It is not intended to capture regulations which apply to all Canadian businesses or corporations, such as Canada's *Income Tax Regulations*, etc.

The following specific regulations apply to SRBT by virtue of our business activities:

- Regulations pertaining to the protection of the environment, as administered by the Province of Ontario, including regulations relating to the approved emission of gaseous hazardous substances, and the handling and disposal of subject waste materials, in accordance with various regulations made pursuant to the Ontario's *Environmental Protection Act*;
- Regulations pertaining to the manufacture of medical devices, including the *Medical Devices Regulations* made pursuant to Canada's *Food and Drugs Act*.

List of Obligations to Authorities and Other Organizations

Note: this list only consists of authorities that have specific, periodic jurisdictional oversight or engagement with SRBT as a business.

It is not intended to capture authorities to whom all Canadian businesses are subject to, such as law enforcement, financial regulatory bodies, human rights commissions, etc.

SRBT is subject to the authority of the following organizations:

- Ontario Ministry of the Environment, Conservation and Parks
- Ontario Ministry of Labour, Training and Skills Development
- Employment and Social Development Canada
- Health Canada
- The City of Pembroke

List of Permits, Certificates and Licences Issued by Authorities other than CNSC

1. Certificate of Approval (Air) #5310-4NJQE2, issued by the Ontario Ministry of the Environment
2. Certificate of Registration, FM 64093 (Quality Management System - ISO 9001:2015), issued by BSI
3. Medical Device Establishment Licence 12643, issued by Health Canada

## **g. Indigenous Engagement and Associated Considerations**

### Self-assessment – Duty to Consult

As an agent of the Crown, the CNSC has responsibility for fulfilling its legal duty to consult, and where appropriate accommodate Indigenous peoples when its decisions may have an adverse impact on potential or established Indigenous and/or treaty rights.

In order to establish if this licence application has the potential to result in any new adverse impacts on Indigenous or treaty rights, thereby raising the duty to consult, a self-assessment of CNSC REGDOC-3.2.2, *Indigenous Engagement* was performed.

In Section 1.2, 'Scope' of REGDOC-3.2.2, it is stated that:

*The following are examples to which the requirements contained in this document do not apply:*

- ***licence renewals with no proposed changes to existing operations as authorized by the Commission***
- *administrative licence amendments*
- *Class II nuclear facilities in existing hospitals*
- *users of portable nuclear gauges and radiography equipment*

Given that SRBT is applying for the renewal of our nuclear substance processing facility operating licence, and have no proposed changes to existing licensed activities and operations, it is determined that the duty to consult is not raised by the submission of this application.

### Planned Outreach Activities

The SRBT facility is located in Pembroke, Ontario, a city that lies within the unceded and traditional territory of the Algonquins of Ontario.

Over the past several years, SRBT has conducted outreach with local Indigenous communities on multiple occasions, with the goal of introducing these communities to our company, and providing them with any information that may help to foster sustainable and meaningful long-term relationships.

These outreach activities included collaboration with the Algonquins of Pikwakanagan First Nation (APFN), an Indigenous community near Golden Lake, Ontario, during the execution of the SRBT Environmental Risk Assessment (ERA)

project. Continued collaboration with this community is planned going forth, to help improve and maintain the ERA over time.

With respect to licence renewal, SRBT plans to provide a copy of this renewal application document to the APFN, ensure that we answer any questions and provide any further information that the community may need, and continue to engage with this community as various milestone dates are determined during the process, in order to ensure their engagement in the process.

SRBT has also invited members of the APFN for a facility tour and information-sharing meeting at some point in the future, and Top Management has also indicated the intention to attend a tour of the Algonquin Way Culture Centre in Pikwakanagan. Unfortunately, the COVID-19 pandemic has resulted in the deferral of these tours until such time that the associated risks have been adequately lowered.

Logically, these outreach activities are primarily aimed at the nearest Indigenous community; however, other more remote Indigenous communities on both sides of the Ottawa River may also have interest in the renewal of SRBT's operating licence. As such, additional outreach measures will be taken to engage with these communities, supplementing outreach work that has already taken place over the past several years.

## 7. REFERENCES AND APPENDICES

### a. References

- [1] Letter from A. McAllister (CNSC) to S. Levesque (SRBT), *Application for the Renewal of SRB Technologies (Canada) Inc. Nuclear Substance Processing Facility Operating Licence NSPFOL-13.00/2022*, dated April 13, 2021 (CNSC e-Doc 6514495).
- [2] CNSC Record of Decision DEC 20-H105, dated December 8, 2020.
- [3] Email from R. Buhr (CNSC) to S. Levesque (SRBT), *Quality Manual and CSA N286 Gap Analysis*, dated November 6, 2014.
- [4] Letter from R. Buhr (CNSC) to S. Levesque (SRBT), *CNSC Staff Comments on SRBT's Submission of Final 2016 Derived Release Limits for SRBT*, dated January 13, 2017 (CNSC e-Doc 5165192).
- [5] Letter from R. Rashapov (CNSC) to S. Levesque (SRBT), *CNSC Staff Review of SRB Technologies (Canada) Inc.'s Groundwater Protection Program and Groundwater Monitoring Program (sic)*, dated September 22, 2017 (CNSC e-Doc 5341760).
- [6] Letter from L. Posada (CNSC) to S. Levesque (SRBT), *CNSC Staff Review of SRB Technologies (Canada) Inc.'s Revised Health and Safety Policy, Revision C*, dated May 26, 2021 (CNSC e-Doc 6567291)
- [7] Letter from R. Rashapov (CNSC) to S. Levesque (SRBT), *CNSC Staff's Review of SRB Technologies (Canada) Inc.'s Revised Licence Limits, Action Levels and Administrative Limits (Revision F)*, dated August 21, 2019 (CNSC e-Doc 5972701).
- [8] Letter from R. Rashapov (CNSC) to S. Levesque (SRBT), *CNSC Staff's Review of SRB Technologies (Canada) Inc.'s Revised Maintenance Program (Revision 7)*, dated June 5, 2019 (CNSC e-Doc 514020).
- [9] Letter from L. Posada (CNSC) to S. Levesque (SRBT), *CNSC Staff Review of SRB Technologies (Canada) Inc.'s Revised Preliminary Decommissioning Plan - 2019*, dated February 3, 2020 (CNSC e-Doc 6111181).
- [10] Letter from J. Campbell (CNSC) to S. Levesque (SRBT), *SRB Technologies (Canada) Inc. Public Information Program, Revision 9*, dated October 26, 2015 (CNSC e-Doc 4864333).

**References continued...**

- [11] Letter from L. Posada (CNSC) to S. Levesque (SRBT), *CNSC Staff Review of SRB Technologies (Canada) Inc.'s Revised Regulatory Reporting Program*, dated March 27, 2020 (CNSC e-Doc 6260355).
- [12] Letter from R. Rashapov (CNSC) to S. Levesque (SRBT), *CNSC Staff Review of SRB Technologies (Canada) Inc.'s Disposition of Comments on the Safety Analysis Report, Revision 4*, dated January 12, 2018 (CNSC e-Doc 5430845).
- [13] Letter from L. Posada (CNSC) to S. Levesque (SRBT), *CNSC Staff Review of SRBT's Response to Inspection Report SRBT-2020-01*, dated May 15, 2020 (CNSC e-Doc 6296642).
- [14] Letter from R. Rashapov (CNSC) to S. Levesque (SRBT), *CNSC Staff Review of SRB Technologies (Canada) Inc.'s Revised Waste Management Program with Modified Conditional Clearance Levels*, dated October 8, 2018 (CNSC e-Doc 5650161).
- [15] Letter from L. Posada (CNSC) to S. Levesque (SRBT), *CNSC Staff Follow-up Review of SRB Technologies (Canada) Inc.'s Environmental Risk Assessment*, dated April 22, 2021 (CNSC e-Doc 6539968).

**b. Appendices (available upon request)**

- {1} Application Requirements Matrix – SRBT Renewal of NSPFOL-13.00/2022, dated June 30, 2021.
- {2} Letter from M. Harrington (898702 Ontario Inc.) to S. Levesque (SRBT), dated May 4, 2021.
- {3} Quality Manual, Revision L, July 30, 2021.
- {4} Organizational Structure and Responsibilities, Revision D, June 11, 2021.
- {5} Committee Process and Descriptions, Revision E, June 9, 2021.
- {6} Document and Process Structure, Revision D, June 11, 2021.
- {7} MSP-013, Safety Culture Monitoring Process, Revision B, June 28, 2021.
- {8} SRBT Training Program Manual, Revision E, June 11, 2020.
- {9} SRBT Rig Room / Laser Room / Tritium Laboratory Procedure Set.
- {10} Safety Analysis Report, Revision 4, November 2017.
- {11} RSO-009, Tritium Inventory Management, Revision N, August 18, 2020.
- {12} RSO-029, Nuclear Substances Inventory Management, Revision F, January 28, 2021.
- {13} Licence Limits, Action Levels and Administrative Limits, Revision F, August 19, 2019.
- {14} Regulatory Reporting Program, Revision D, June 11, 2020.
- {15} Derived Release Limits for the SRB Pembroke Facility – 2016 Update, dated January 22, 2017.
- {16} Environmental Risk Assessment – SRB Technologies (Canada) Inc., Revision B, April 2021.
- {17} Comprehensive Report – Groundwater Studies at the SRB Technologies Facility, Pembroke, ON, January 2008 (including addendum dated February 6, 2008).
- {18} 2020 Fire Hazard Assessment – SRB Technologies, PLC-SRBT-P1894-FHA-0, December 9, 2020.
- {19} Technical Report SRBT-2018-TR-01, Information in Support of Revised Conditional Clearance Levels for Minimally Contaminated Waste, August 2018

**Appendices continued... (available upon request)**

- {20} Maintenance Program, Revision 7, June 2, 2019.
- {21} Radiation Safety Program, Revision N, July 30, 2021.
- {22} RSO-001, Facility Contamination Monitoring, Revision N, March 20, 2019.
- {23} RSO-011, Instrument Calibration, Revision L, December 16, 2020.
- {24} Health and Safety Policy, Revision C, June 4, 2021.
- {25} Hazard Prevention Program, Revision E, July 30, 2021.
- {26} Environmental Management System, Revision B, July 30, 2021.
- {27} Environmental Protection Program, Revision B, July 30, 2021.
- {28} Effluent Monitoring Program, Revision C, July 30, 2021.
- {29} Environmental Monitoring Program, Revision C, July 30, 2021.
- {30} Groundwater Protection Program, Revision B, July 30, 2021.
- {31} Groundwater Monitoring Program, Revision C, July 30, 2021.
- {32} Emergency Plan, Revision 6, February 27, 2017.
- {33} Fire Protection Program, Revision F, July 30, 2021.
- {34} Waste Management Program, Revision I, July 30, 2021.
- {35} Disposal/Return Procedure for Tritium Signs (for customers within Canada - September 5, 2018) and International Disposal/Return Procedure for Tritium Exit Signs, Devices and Light Sources (for international customers – June 13, 2018).
- {36} SRBT Preliminary Decommissioning Plan, November 29, 2019.
- {37} SHP-001, Packing & Shipping – General Requirements, Revision H, January 28, 2021.
- {38} Public Information Program, Revision 9, September 25, 2015.

REQUIREMENT	RELEVANT APPLICATION PART / SCA	DESCRIPTION OF HOW APPLICATION MEETS REGULATORY REQUIREMENT
<b>General Nuclear Safety and Control Regulations</b>		
3. (1) An application for a licence shall contain the following information: (a) the applicant's name and business address;	General Information	Part 2 (a) includes the applicant's name and business address.
(b) the activity to be licensed and its purpose;	General Information	Part 2 (b) describes the activity to be licensed and its purpose.
(c) the name, maximum quantity and form of any nuclear substance to be encompassed by the licence;	General Information	Part 2 (c) describes the nuclear substances to be encompassed by the licence, including maximum quantities and form.
(d) a description of any nuclear facility, prescribed equipment or prescribed information to be encompassed by the licence;	Safety Analysis Physical Design	Part 4 (a) and (b) include references to comprehensive description of the SSCs that comprise the facility and its equipment to be encompassed by the licence.
(e) the proposed measures to ensure compliance with the Radiation Protection Regulations, the Nuclear Security Regulations and the Packaging and Transport of Nuclear Substances Regulations, 2015;	Radiation Protection Security Packaging and Transport	Part 5 (a) describes the measures proposed to ensure compliance with the Radiation Protection Regulations. Part 5 (f) describes the measures proposed to ensure compliance with the Nuclear Security Regulations. Part 5 (h) describes the measures proposed to ensure compliance with the Packaging and Transport of Nuclear Substances Regulations, 2015.
(f) any proposed action level for the purpose of section 6 of the Radiation Protection Regulations;	Radiation Protection	Part 5 (a) refers to SRBT management system document Licence Limits, Action Levels and Administrative Limits, which describes the proposed action levels for the purpose of section 6 of the Radiation Protection Regulations, and is included as Appendix {13} with this application.
(g) the proposed measures to control access to the site of the activity to be licensed and the nuclear substance, prescribed equipment or prescribed information;	Security	Part 5 (f) describes the measures proposed to ensure compliance with the Nuclear Security Regulations, including controlling access to the site of the activity to be licensed, and the nuclear substances and equipment encompassed by the licence.
(h) the proposed measures to prevent loss or illegal use, possession or removal of the nuclear substance, prescribed equipment or prescribed information;	Security	Part 5 (f) describes the measures proposed to ensure compliance with the Nuclear Security Regulations, including preventing the loss or illegal use, possession or removal of the nuclear substances and equipment encompassed by the licence.
(i) a description and the results of any test, analysis or calculation performed to substantiate the information included in the application;	Safety Analysis Fire Protection Environmental Protection Waste Management	Part 4 (a) notes that the application includes several references to documented analyses, in support of substantiating the information included in this application.  These include: <ul style="list-style-type: none"> <li>• Safety Analysis Report – Appendix {10}</li> <li>• Derived Release Limits – Appendix {15}</li> <li>• Environmental Risk Assessment – Appendix {16}</li> <li>• Comprehensive Report – Groundwater Studies – Appendix {17}</li> <li>• Fire Hazard Assessment – Appendix {18}</li> <li>• Conditional Clearance Levels – Appendix {19}</li> </ul>

## APPLICATION REQUIREMENTS MATRIX – SRBT RENEWAL OF NSPFOL-13.00/2022

June 30, 2021

(j) the name, quantity, form, origin and volume of any radioactive waste or hazardous waste that may result from the activity to be licensed, including waste that may be stored, managed, processed or disposed of at the site of the activity to be licensed, and the proposed method for managing and disposing of that waste;	Waste Management	Part 5 (e) includes information pertaining to the radioactive and hazardous wastes that may result from the activity to be licensed, as described in the SRBT Waste Management Program, which is included as Appendix {34} to this application.
(k) the applicant's organizational management structure insofar as it may bear on the applicant's compliance with the Act and the regulations made under the Act, including the internal allocation of functions, responsibilities and authority;	Management System	Part 3 (a) describes the organizational management structure, insofar as it may bear on compliance with the act. A full description of the organization and its structure is found in SRBT management system document Organizational Structure and Responsibilities, which is included as Appendix {4}.
(l) a description of any proposed financial guarantee relating to the activity to be licensed; and	Other Information	The proposed financial guarantee relating to the activity to be licence is described in Part 6 (a) of the application.
(m) any other information required by the Act or the regulations made under the Act for the activity to be licensed and the nuclear substance, nuclear facility, prescribed equipment or prescribed information to be encompassed by the licence.	Other Information	Part 6 contains all other information requested by CNSC staff as part of this application.
*(1.1) The Commission or a designated officer authorized under paragraph 37(2)(c) of the Act, may require any other information that is necessary to enable the Commission or the designated officer to determine whether the applicant:  (a) is qualified to carry on the activity to be licensed, or	Other Information	Part 6 contains all other information requested by CNSC staff as part of this application.
(b) will, in carrying on that activity, 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.	Other Information	Part 6 contains all other information requested by CNSC staff as part of this application.
(2) Subsection (1) does not apply in respect of an application for a licence to import or export for which the information requirements are prescribed by the Nuclear Non-Proliferation Import and Export Control Regulations, or in respect of an application for a licence to transport while in transit for which the information requirements are prescribed by the Packaging and Transport of Nuclear Substances Regulations, 2015.	N/A	N/A
5. An application for the renewal of a licence shall contain  (a) the information required to be contained in an application for that licence by the applicable regulations made under the Act; and	General Information	SRBT is applying for renewal of a nuclear substance processing facility operating licence, as a Class IB nuclear facility. The licence application requirements of both the Class I Nuclear Facilities Regulations and the Nuclear Substances and Radiation Devices Regulations are both met by this application.
(b) a statement identifying the changes in the information that was previously submitted.	General Information	Part 2 (f) includes this statement.
15. Every applicant for a licence and every licensee shall notify the Commission of  (a) the persons who have authority to act for them in their dealings with the Commission;	General Information	Part 2 (d) includes this information.
(b) the names and position titles of the persons who are responsible for the management and control of the licensed activity and the nuclear substance, nuclear facility, prescribed equipment or prescribed information encompassed by the licence; and	General Information	Part 2 (d) includes this information.
(c) any change in the information referred to in paragraphs (a) and (b), within 15 days after the change occurs.	General Information	No change to this information has taken place in the current licence period.

Class I Nuclear Facilities Regulations		
3. An application for a licence in respect of a Class I nuclear facility, other than a licence to abandon, shall contain the following information in addition to the information required by section 3 of the General Nuclear Safety and Control Regulations:  (a) a description of the site of the activity to be licensed, including the location of any exclusion zone and any structures within that zone;	Safety Analysis	Part 4 (a) refers to the SRBT Safety Analysis Report, which includes comprehensive descriptions of the site of the activity to be licensed, including the location of the exclusion zone and the structures within said zone, as defined in the Class I Nuclear Facilities Regulations. The SAR is included as Appendix {10} to the application.
(b) plans showing the location, perimeter, areas, structures and systems of the nuclear facility;	Safety Analysis	Part 4 (a) refers to the SRBT Safety Analysis Report, which contains these plans and descriptions. The SAR is included as Appendix {10} to the application.
(c) evidence that the applicant is the owner of the site or has authority from the owner of the site to carry on the activity to be licensed;	General Information	Part 2 (e) refers to a letter from the owner of the site, which is included as Appendix {2} to the application. The letter notes that SRBT has the authority to carry on the activity to be licensed.
(d) the proposed management system for the activity to be licensed, including measures to promote and support safety culture;	Management System	Part 3 (a) describes all aspects of the proposed management system to be implemented for the activity to be licensed, including measures to promote and support safety culture. Several referenced management system documents are included as Appendices to the application in support of this information.
(d.1) the proposed human performance program for the activity to be licensed, including measures to ensure workers' fitness for duty.	Human Performance Management	Part 3 (b) describes all aspects of the human performance management program proposed for the activity to be licensed, including measures to ensure workers' fitness for duty. The SRBT Training Program Manual is included as Appendix {8} to the application in support of this information.
(e) the name, form, characteristics and quantity of any hazardous substances that may be on the site while the activity to be licensed is carried on;	General Information Environmental Protection	Part 2 (c) describes the nuclear substances to be encompassed by the licence, including maximum quantities and form.  Part 5 (c) describes the Environmental Risk Assessment for the facility, which includes a comprehensive description of all conventionally hazardous substances that may be on site while the activity is carried on. This assessment is included as Appendix {16} to this licence application.
(f) the proposed worker health and safety policies and procedures;	Conventional Health and Safety	Part 5 (b) describes the proposed worker health and safety policies and procedures. The Health and Safety Policy and Hazard Prevention Program documents are included as Appendices {24} and {25}, respectively, to this licence application.
(g) the proposed environmental protection policies and procedures;	Environmental Protection	Part 5 (c) describes the proposed Environmental Management System for the activities to be licensed, including several subordinate protection programs, which are included as Appendices to this application.
(h) the proposed effluent and environmental monitoring programs;	Environmental Protection	Part 5 (c) describes the proposed Environmental Management System for the activities to be licensed, including several subordinate monitoring programs, which are included as Appendices to this application.
(i) if the application is in respect of a nuclear facility referred to in paragraph 2(b) of the Nuclear Security Regulations, the information required by section 3 of those Regulations;	N/A	The facility to be licensed is not a nuclear power plant.
(j) the proposed program to inform persons living in the vicinity of the site of the general nature and characteristics of the anticipated effects on the environment and the health and safety of persons that may result from the activity to be licensed; and	Other Information	Part 6 (b) describes the Public Information Program, which represents the proposed program in question. This program is included as Appendix {38} to this application.
(k) the proposed plan for the decommissioning of the nuclear facility or of the site.	Waste Management	Part 5 (e) describes the Preliminary Decommission Plan, which represents the proposed plan for decommissioning the facility. The PDP is included as Appendix {36} to this application.

<p>6. An application for a licence to operate a Class I nuclear facility shall contain the following information in addition to the information required by section 3:</p> <p>(a) a description of the structures at the nuclear facility, including their design and their design operating conditions;</p>	Safety Analysis	Part 4 (a) refers to the SRBT Safety Analysis Report, which contains these descriptions and the design operating conditions. The SAR is included as Appendix {10} to the application.
<p>(b) a description of the systems and equipment at the nuclear facility, including their design and their design operating conditions;</p>	Safety Analysis	Part 4 (a) refers to the SRBT Safety Analysis Report, which contains these descriptions and the design operating conditions. The SAR is included as Appendix {10} to the application.
<p>(c) a final safety analysis report demonstrating the adequacy of the design of the nuclear facility;</p>	Safety Analysis	Part 4 (a) refers to the SRBT Safety Analysis Report, which represents this analysis. The SAR is included as Appendix {10} to the application.
<p>(d) the proposed measures, policies, methods and procedures for operating and maintaining the nuclear facility;</p>	Operating Performance Fitness for Service	<p>Part 3 (c) describes the proposed measures, policies, methods and procedures for operating the nuclear substance processing facility. Relevant procedures to the activity to be licenced are included as Appendix {9} to the application.</p> <p>Part 4 (c) refers to the Maintenance Program, which represents the proposed measures, policies, methods and procedures for maintaining the nuclear facility. The Maintenance Program is included as Appendix {20} to the application.</p>
<p>(e) the proposed procedures for handling, storing, loading and transporting nuclear substances and hazardous substances;</p>	Radiation Protection Conventional Health and Safety Waste Management Packaging and Transport	Part 5 (a), (b), (e) and (h) all describe components of the proposed procedures for handling, storing, loading and transporting nuclear and hazardous substances.
<p>(f) the proposed measures to facilitate Canada's compliance with any applicable safeguards agreement;</p>	Safeguards and Non-proliferation	Although the current operating licence does not include specific requirements to this effect, the application describes certain measures that have been made towards the goal of ensuring that SRBT complies with such measures. A description of these measures is included in Part 5 (g) of the application for completeness.
<p>(g) the proposed commissioning program for the systems and equipment that will be used at the nuclear facility;</p>	Physical Design	A description of how systems and equipment are commissioned at the facility is included in Part 4 (b) of the application.
<p>(h) the effects on the environment and the health and safety of persons that may result from the operation and decommissioning of the nuclear facility, and the measures that will be taken to prevent or mitigate those effects;</p>	Environmental Protection	<p>Part 5 (c) describes the proposed Environmental Management System for the activities to be licensed, including several subordinate protection programs, which are included as Appendices to this application. The EMS is designed to prevent or mitigate these effects.</p> <p>This part also refers to the Environmental Risk Assessment, which describes the effects on the environment and the health and safety of persons that may result from the operation of the facility. The ERA is included as Appendix {16} to the application.</p>
<p>(i) the proposed location of points of release, the proposed maximum quantities and concentrations, and the anticipated volume and flow rate of releases of nuclear substances and hazardous substances into the environment, including their physical, chemical and radiological characteristics;</p>	Environmental Protection	Part 5 (c) describes the proposed Environmental Management System for the activities to be licensed, including several subordinate protection and monitoring programs, which are included as Appendices to this application {26-31}. In particular, refer to the Effluent Monitoring Program {28}.
<p>(j) the proposed measures to control releases of nuclear substances and hazardous substances into the environment;</p>	Environmental Protection	Part 5 (c) describes the proposed Environmental Management System for the activities to be licensed, including several subordinate protection and monitoring programs which ensure control over the release of nuclear and hazardous substances, and which are included as Appendices {26-31} to this application.

<p>(k) the proposed measures to prevent or mitigate the effects of accidental releases of nuclear substances and hazardous substances on the environment, the health and safety of persons and the maintenance of national security, including measures to</p> <ul style="list-style-type: none"> <li>(i) assist off-site authorities in planning and preparing to limit the effects of an accidental release,</li> <li>(ii) notify off-site authorities of an accidental release or the imminence of an accidental release,</li> <li>(iii) report information to off-site authorities during and after an accidental release,</li> <li>(iv) assist off-site authorities in dealing with the effects of an accidental release, and</li> <li>(v) test the implementation of the measures to prevent or mitigate the effects of an accidental release;</li> </ul>	<p>Emergency Management and Fire Protection</p>	<p>Part 5 (d) refers to the Emergency Plan and Fire Protection Program management system documents, which represent the proposed measures to prevent or mitigate the effects of accidental releases of such substances on the environment, the health and safety of persons, and the maintenance of national security. These are included as Appendices {32} and {33}, respectively, to this application.</p> <p>SRBT also maintains a Regulatory Reporting Program that describes all required procedures for furnishing required reports to off-site authorities, during routine and emergency operations. This program is included as Appendix {14} to this application.</p>
<p>(l) the proposed measures to prevent acts of sabotage or attempted sabotage at the nuclear facility, including measures to alert the licensee to such acts;</p>	<p>Security</p>	<p>Part 5 (f) describes the measures proposed to ensure compliance with the Nuclear Security Regulations, including preventing acts of sabotage.</p>
<p>(m) the proposed responsibilities of and qualification requirements and training program for workers, including the procedures for the requalification of workers; and</p>	<p>Human Performance Management</p>	<p>Part 3 (b) describes all aspects of the human performance management program proposed for the activity to be licensed, qualification and requalification requirements, and the training program for workers. The SRBT Training Program Manual is included as Appendix {8} to the application in support of this information.</p>
<p>(n) the results that have been achieved in implementing the program for recruiting, training and qualifying workers in respect of the operation and maintenance of the nuclear facility.</p>	<p>Human Performance Management</p>	<p>Part 3 (b) includes a description of the results that have been achieved in implementing the noted program.</p>
<p><b>Nuclear Substances and Radiation Devices Regulations</b></p>		
<p>3. (1) An application for a licence in respect of a nuclear substance or a radiation device, other than a licence to service a radiation device, shall contain the following information in addition to the information required by section 3 of the General Nuclear Safety and Control Regulations:</p> <p>(a) the methods, procedures and equipment that will be used to carry on the activity to be licensed;</p>	<p>Operating Performance</p>	<p>Part 3 (c) describes the proposed measures, policies, methods and procedures for operating the nuclear substance processing facility. Relevant procedures to the activity to be licenced are included as Appendix {9} to the application.</p>
<p>(b) the methods, procedures and equipment that will be used while carrying on the activity to be licensed, or during and following an accident, to</p> <ul style="list-style-type: none"> <li>(i) monitor the release of any radioactive nuclear substance from the site of the activity to be licensed,</li> <li>(ii) detect the presence of and record the radiation dose rate and quantity in becquerels of radioactive nuclear substances at the site of the activity to be licensed,</li> <li>(iii) limit the spread of radioactive contamination within and from the site of the activity to be licensed, and</li> <li>(iv) decontaminate any person, site or equipment contaminated as a result of the activity to be licensed;</li> </ul>	<p>Radiation Protection Environmental Protection Emergency Management and Fire Protection</p>	<p>Part 5 (a) describes the measures proposed to accomplish (ii), (iii) and (iv) in the noted requirement during routine operations. Procedure RSO-001, Facility Contamination Monitoring is included as Appendix {22} to this application.</p> <p>Part 5 (c) describes the measures proposed to accomplish (i) in the noted requirement during routine operations.</p> <p>Part 5 (d) describes the measures proposed to accomplish all aspects of the noted requirement during and following an accident.</p>
<p>(c) a description of the circumstances in which the decontamination referred to in subparagraph (b)(iv) will be carried out;</p>	<p>Radiation Protection</p>	<p>Part 5 (a) describes the circumstances in which such decontamination would be carried out.</p>

(d) the proposed location of the activity to be licensed, including a description of the site;	Safety Analysis	Part 4 (a) refers to the SRBT Safety Analysis Report, which contains this description. The SAR is included as Appendix {10} to the application.
(e) the roles, responsibilities, duties, qualifications and experience of workers;	Management System	Part 3 (a) describes the organizational management structure, insofar as it may bear on compliance with the act. A full description of the organization and its structure is found in SRBT management system document Organizational Structure and Responsibilities, which is included as Appendix {4}.
(f) the proposed training program for workers;	Human Performance Management	Part 3 (b) describes all aspects of the human performance management program proposed for the activity to be licensed, qualification and requalification requirements, and the training program for workers. The SRBT Training Program Manual is included as Appendix {8} to the application in support of this information.
(g) the proposed instructions for dealing with accidents, including fires and spills, in which the nuclear substance may be involved;	Emergency Management and Fire Protection	Part 5 (d) refers to the Emergency Plan and Fire Protection Program management system documents, which represent the proposed measures to prevent or mitigate the effects of accidental releases of such substances on the environment, the health and safety of persons, and the maintenance of national security. These are included as Appendices {32} and {33}, respectively, to this application.
(h) the proposed inspection program for the equipment and systems that will be used to carry on the activity to be licensed;	Fitness for Service	Part 4 (c) refers to the Maintenance Program, which represents the proposed program for maintaining the nuclear facility, including any inspection of equipment and systems. The Maintenance Program is included as Appendix {20} to the application.
(i) the methods, procedures and equipment that will be used to calibrate radiation survey meters in accordance with these Regulations;	Radiation Protection	Part 5 (a) describes the measures proposed to ensure radiation-detecting equipment, including radiation survey meters, are calibrated in accordance with regulatory requirements. Procedure RSO-011, Instrument Calibration is included as Appendix {23} to this application.
(j) the methods, procedures and equipment that will be used to calibrate and verify the calibration of dosimeters referred to in paragraphs 30(3)(d) and (e);	Radiation Protection	Part 5 (a) notes that due to the nature of the nuclear substance processed, the SRBT Radiation Safety Program does not use dosimeters to determine the effective or equivalent doses to workers.
(k) the methods, procedures and equipment that will be used to conduct the leak tests and surveys required by these Regulations;	Radiation Protection	Part 5 (a) notes that SRBT does not use or own any radiation devices that meet the requirements for leak testing and/or surveys, as defined in the NSRDR. Gaseous tritium light sources do undergo a process of leak assessment as a measure of quality control during manufacturing, in accordance with industry standards and in-house procedures; however, these processes are not implemented for the purposes of the NSRDR.
(l) where the application is in respect of a nuclear substance that is an unsealed source and that is to be used in a room, the proposed design of the room;	Radiation Protection	Part 5 (a) notes that tritium gas is processed within sealed, vacuum-based systems under negative ventilation at all times. A description of the areas where tritium is processed in the facility can be found in the SRBT Safety Analysis Report, which is included as Appendix {10} to this application.
(m) if the application is in respect of a nuclear substance that is contained in a radiation device, the brand name and model number of the radiation device, and the quantity of the devices;	Radiation Protection	Part 5 (a) notes that this application is not in respect to the use of radiation devices, as described in the NSRDR. SRBT manufactures several types of CNSC-certified radiation devices for use both in Canada pursuant to the NSRDR, as well as internationally, with names and models included in said certificates.

<p>(n) where the application is in respect of Category I, II or III nuclear material, as defined in section 1 of the Nuclear Security Regulations,</p> <p>(i) the measures that will be taken to prevent nuclear criticality, and</p> <p>(ii) the information required by section 3 or 4 of the Nuclear Security Regulations, as applicable;</p>	N/A	This application is not in respect to any such materials.
<p>(o) if the applicant will be manufacturing or distributing radiation devices referred to in paragraph 5(1)(c) or section 6 or 7, or check sources mentioned in section 8.1, the proposed procedure for the disposal of each radiation device or check source or for its return to the manufacturer.</p>	Waste Management	Part 5 (e) describes the proposed procedure for the return of self-luminous tritium-powered devices, for safe disposal processing. Copies of the instruction sheets provided to domestic and international end-users is included as Appendix {35} of this application.
<b>Nuclear Security Regulations</b>		
<p>41. An application for a licence in respect of a nuclear facility shall contain, in addition to the information required by sections 3 to 8 of the Class I Nuclear Facilities Regulations, a description of the physical protection measures to be taken to ensure compliance with sections 42 to 48.</p>	Security	Part 5 (f) describes the measures proposed to ensure compliance with the Nuclear Security Regulations, including sections 42 to 48.
<b>Other Information Pursuant to subsection 3 (1.1) of the General Nuclear Safety and Control Regulations</b>		
<p>1) Summary of programs and supporting documentation needed to support the licence application organized under each SCA, including other matters of regulatory interest. The programs and supporting documentation should be sufficiently detailed to describe the safety and control measures that will be implemented at SRBT for each SCA.</p>	All	Each individual section of the application summarizes the programs and supporting documentation, organized under each SCA, including other matters of regulatory interest, in sufficient detail to describe the measures that will be implemented.
<p>2) Description of SRBT's approach to safety, including reference to corporate and facility specific documents which enunciate the safety policies and standards to which SRBT must adhere.</p>	Management System	<p>Part 3 (a) includes a description of the overarching safety approaches, and references the Quality Manual, which represents the top-most tier management system document governing all aspects of the licenced activities at SRBT. The Quality Manual includes the corporate safety policies and standards, and is included as Appendix {3} to this application.</p> <p>All of the individual program documents submitted with this application describe sub-components of this approach to safety management.</p>
<p>3) Documents describing the organizational structure, roles and responsibilities of organizational units and management, including documents governing the day-to-day operation and conduct of the organization.</p>	Management System	Part 3 (a) refers to SRBT management system document Organizational Structure and Responsibilities, which is included as Appendix {4}, including the positions responsible for the control of day-to-day operations at the facility.
<p>4) Information on SRBT's performance for each SCA during the current licence period, relative to SRBT's expectations, including any trends.</p>	All	Each SCA includes a summary of SRBT's performance relative to expectations, including any trends, at the end of the section.
<p>5) Assessment of existing and future safety challenges, along with a safety improvement plan to address these challenges during the next licence period.</p>	Other Information	Part 6 (d) describes this information.
<p>6) Describe opportunities for improvements and any safety improvement plans to address identified safety challenges.</p>	Other Information	Part 6 (d) describes this information.
<p>7) A description of the proposed operating plan for the next licensing period.</p>	Other Information	Part 6 (c) describes this information.
<p>8) Information on significant activities envisaged beyond the end of the next licensing period, if any.</p>	Other Information	Part 6 (c) describes this information.

## APPLICATION REQUIREMENTS MATRIX – SRBT RENEWAL OF NSPFOL-13.00/2022

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9) Provide a list of federal, provincial, municipal or other regulations, other than the regulations pursuant to the NSCA, which SRBT must abide by.	Other Information	Part 6 (f) describes this information.
10) Provide a description of any obligations for municipal, provincial or other federal authorities and any obligations for public and/or private organizations.	Other Information	Part 6 (f) describes this information.
11) Provide a self-assessment to determine if the licence applications could have any new adverse impacts on Indigenous or treaty rights and therefore raise the duty to consult and trigger the requirements of REGDOC-3.2.2, Indigenous Engagement. REGDOC-3.2.2 also outlines what to consider when conducting this activity.	Other Information	Part 6 (g) describes this information.
12) Provide a description of outreach activities to engage Indigenous groups and members of the public with respect to licence renewal (following requirements under REGDOC 3.2.1).	Other Information	Part 6 (g) describes this information.
13) Provide a list of any permits, certificates and licences issued by authorities other than the CNSC.	Other Information	Part 6 (f) describes this information.
14) Provide updated Derived Release Limits and Operating Release Limit reports for the facility.	Environmental Protection	Part 5 (c) describes the current Derived Release Limits for the facility, which are included as Appendix {15} to this application. It is also noted that an updated DRL document will be submitted by the end of 2021.
15) Provide SRBT's plans and schedule, including dates, with respect to complying with each of the standards, codes and CNSC regulatory documents required for implementation as per Attachment B (unless recommended to be included under recommendations and guidance), including transition measures as appropriate.	All	Where applicable, the noted standards, codes and CNSC regulatory documents have been identified in the relevant section of the application, along with a schedule for complying with each new requirement set.
16) Summary of the current status of all open action items, as well as issues and requests that were discussed during the last SRBT Commission hearings or meetings, including a plan and date for resolution.	Other Information	Part 6 (e) describes this information.
17) A description of any planned major facility modification projects during the proposed licence period, including the schedule for these projects and, if known, the hazards	Other Information	Part 6 (c) describes this information.