



Directorate of Nuclear Cycle and Facilities Regulation

File No. 4.02.02
e-Doc 5896684

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May 9, 2019

Mr. Stephane Levesque
President
SRB Technologies (Canada) Inc.
320-140 Boundary Road
Pembroke, ON K8A 6W5

Subject: Inspection Report No. SRBT-2019-01
February 26, 2019 – February 28, 2019

Dear Mr. Levesque,

Please find enclosed Canadian Nuclear Safety Commission's (CNSC) final inspection report SRBT-2019-01 for the Compliance Inspection carried out on February 26-28, 2019 at SRB Technologies (Canada) Inc.'s (SRBT) Tritium Processing Facility in Pembroke, ON.

As a result of this inspection, six (6) compliance actions were issued:

- **SRBT-2019-01-A1:** SRBT shall ensure that all eyewash stations are free of obstructions and accessible for immediate use by employees.
- **SRBT-2019-01-A2:** SRBT shall ensure that fire-fighting equipment is free of obstructions and readily accessible.
- **SRBT-2019-01-A3:** SRBT shall consistently post warning signs at access points where hazardous substances are stored in the work place warning workers of the presence of any hazardous substances.
- **SRBT-2019-01-A4:** SRBT shall ensure that records are complete according to SRBT's Quality Manual.
- **SRBT-2019-01-A5:** SRBT shall label waste containers containing radioactive nuclear substances in accordance with the *Radiation Protection Regulations*.

- **SRBT-2019-01-A6:** SRBT shall clearly mark each type of waste receptacle in accordance with SRBT's Waste Management Program.

In addition, two (2) recommendations were made:

- **SRBT-2019-01-R1:** SRBT should consider identifying the underlying cause of near miss events and take corrective actions to prevent recurrence, as appropriate.
- **SRBT-2019-02-R2:** SRBT should ensure that internal audits are completed as planned.

SRBT is requested to submit in writing its corrective action for each compliance action within 60 days from the date of this letter.

If you have any questions, or concerns, please do not hesitate to contact me.

Sincerely,



Rinat Rashapov
Project Officer
Canadian Nuclear Safety Commission
Nuclear Processing Facilities Division

Enclosure: CNSC Compliance Inspection Report, SRBT-2019-01 (e-Doc 5806274)

c.c.: R. Fitzpatrick, J. MacDonald (SRBT)
J. Thelen, R. Van Hoof, C. Ducros (CNSC)



CNSC COMPLIANCE INSPECTION REPORT

Inspection Number: SRBT-2019-01

Inspection Title: General Type II Compliance Inspection

Prepared by: Rinat Rashapov, Lead Inspector
Nuclear Processing Facilities Division
Directorate of Nuclear Cycle and Facilities Regulation

Report Date: May 6, 2019



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**CANADIAN NUCLEAR SAFETY COMMISSION
COMPLIANCE INSPECTION**

Inspection Identification No.: SRBT-2019-01

Licensee: SRB Technologies (Canada) Inc.
Licence No.: NSPFOL-13.00/2022
Facility / Site Inspected: SRBT's Tritium Processing Facility
Inspection Dates: February 26, 2019 – February 28, 2019
Report Issuance Date: May 6, 2019

Prepared by:



Rinat Rashapov
Project Officer, NPF

Approved by:



Caroline Ducros
Director, NPF

Safety and Control Areas:

Operating Performance
Fitness for Service
Radiation Protection
Conventional Health and Safety
Environmental Protection
Waste Management

Inspector Accompanied by:

Licensee Staff:

Stephane Levesque, President
Ross Fitzpatrick, Vice President
Jamie MacDonald, Health Physics and Regulatory
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CNSC Staff:

John Thelen, Inspector, Senior Project Officer, NPF
Rebekah Van Hoof, Project Officer, NPF

EXECUTIVE SUMMARY

Pursuant to paragraph 30(1)(a) of the *Nuclear Safety and Control Act* (NSCA) Canadian Nuclear Safety Commission (CNSC) staff conducted a General Type II Compliance Inspection at the SRB Technologies (Canada) Inc. (SRBT) Tritium Processing Facility from February 26, 2019 to February 28, 2019. This inspection was conducted as part of NPDF's compliance verification plan for SRBT's licensed facility.

The scope of the general inspection focused on elements of the following safety and control areas:

- (a) Operating Performance,
- (b) Fitness for Service,
- (c) Radiation Protection,
- (d) Conventional Health and Safety,
- (e) Environmental Protection; and
- (f) Waste Management.

CNSC inspectors' preliminary inspection facts and findings were discussed with licensee staff. A Preliminary Inspection Facts and Findings Report was tabled during the closing meeting held on February 28, 2019.

Following the analysis of all inspection facts and findings, CNSC staff found areas of non-compliance, and therefore six (6) compliance actions have been raised for SRBT to address. In addition, two (2) recommendations were made. The identified enforcement actions do not pose an immediate or unreasonable risk to the health and safety of persons, but improvements are required to address the identified issues.

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1. INTRODUCTION

A General Type II Compliance Inspection at the SRBT Tritium Processing Facility was conducted from February 26, 2019 to February 28, 2019.

The licensee was assessed against provisions of the *Nuclear Safety and Control Act* (NSCA) and its associated regulations, the conditions of the licence NSPFOL-13.00/2022 [1] and the Licence Conditions Handbook (LCH) for SRBT's facility [2], as well as applicable facility-specific and programmatic governing documentation.

Criteria for this inspection were derived directly from the set of documents described in the notification letter and compiled into a compliance matrix, which had been provided to licensee staff prior to the inspection [3]. Observations, interviews, samples and review of records were undertaken to assess compliance with regulatory expectations.

This report documents the findings and conclusions of the inspection, along with any compliance actions and recommendations arising from these findings. The results of this inspection activity will form part of CNSC staff's evaluation of the licensee's performance.

2. PURPOSE AND SCOPE

This inspection was conducted as part of the NPF's compliance verification plan for SRBT's facility. The purpose of the inspection is to verify SRBT's adherence with the NSCA, its associated Regulations, the operating licence NSPFOL-13.00/2022 and its associated LCH, as well as the SRBT's programs and procedures, as necessary.

The scope of the general inspection focused on elements of the following safety and control areas (SCAs):

- (a) Operating Performance;
- (b) Fitness for Service;
- (c) Radiation Protection;
- (d) Conventional Health and Safety;
- (e) Environmental Protection; and
- (f) Waste Management.

3. DESCRIPTION OF INSPECTION METHODS

The NSCA, CNSC regulations, NSPFOL-13.00/2022 licence conditions, and governing documents were reviewed as part of the preparation for the inspection. Various items were selected for verification and compiled into the compliance matrix included in Appendix D. The inspection also included field observations and information provided by licensee staff.

The following methods of assessment were used during the inspection:

A. Documentation and record review

- Records were verified to be maintained as required by many of the outlined criteria, and selected documents were reviewed to ensure their accuracy and completeness.

B. Visual assessment and verification

- A physical inspection of the facility with licensee staff was conducted. Observations based on identified compliance criteria were made for verification purposes.

C. Interviews and discussions with licensee staff

- Interviews and discussions with various licensee staff were conducted during the inspection. Questions were posed based on compliance criteria and responses documented for verification purposes.

D. Sampling

- Samples of potential tritium contamination were collected during the inspection. Analysis of these samples is based on current regulatory expectations and compliance criteria.

Selected documentation and records were reviewed during the field verification component of the inspection. These were reviewed in order to determine whether the various records associated with the areas of the inspection are in compliance with associated regulatory and programmatic requirements.

As per the CNSC process, at the conclusion of the field verification portion of the inspection, a Preliminary Inspection Facts and Findings Report [4] was provided to SRBT representatives. This report outlined observations made by the inspection team at an overall level, based on a preliminary review of the criteria set identified in the compliance matrix and observations made.

Based on criteria identified in the compliance matrix, regulatory requirements and compliance expectations were determined to be met or not met, and reported as inspection findings. CNSC staff may identify compliance actions and recommendations in relation to an inspection finding. Appendix A outlines definitions of compliance action.

4. INSPECTION RESULTS

The following findings and subsequent compliance actions and recommendations are the result of CNSC staff's inspection at SRBT's Tritium Processing Facility. This section of the report has been structured to show the link from the initial inspection finding to the resulting compliance action and/or recommendation as shown below:

- Compliance verification criteria used to identify the deficiency;
- A description of the observed deficiency;
- An analysis linking the compliance verification criteria or regulatory requirement to the observed deficiency; and
- Detailed compliance action requiring the licensee to address the deficiency.

The order in which findings are presented in the report does not indicate a ranking of their safety significance.

The findings documented in this report were arrived at by assessing the facts and observations, gathered by CNSC staff during the inspection activities, with the related compliance criteria and regulatory requirements, as detailed in the compliance matrix. Where improvements are necessary, compliance actions and recommendations have been issued as detailed in this section of the inspection report.

Compliance criteria that was met during the inspection is also listed in the compliance matrix. Follow-up activities were also performed on actions issued in previous inspections, the results of which are listed at the end of the compliance matrix.

4.1 SCA: Conventional Health and Safety

4.1.1 Finding 1: Eye Wash Stations

Criteria

- Subsection 16.5 (3) of the *Canada Occupational Health and Safety Regulations* (SOR/86-304), which states:

Every first aid station shall be

- (a) located at or near the workplace;*
- (b) clearly identified by a conspicuous sign; and*
- (c) accessible during all working hours.*

- Subsection 16.8 (1) of the *Canada Occupational Health and Safety Regulations* (SOR/86-304), which states:

Subject to subsection (2), if a hazard for skin or eye injury from a hazardous substance exists in the workplace, the employer shall ensure that shower facilities to wash the skin and eye wash facilities to irrigate the eyes are provided for immediate use by employees.

Facts

CNSC staff observed equipment related to conventional health and safety (e.g. eye wash stations, first aid kits, fire safety equipment and PPE stations). In the tritium laboratory area, the eye wash station was obstructed by several items as shown in **Photo 1**.

Analysis/Finding



Photo 1: Obstructed eye wash station in the tritium laboratory area



Photo 2: Eye wash station in the tritium laboratory area cleared of obstructions

In the tritium laboratory area in Zone 3, CNSC staff observed an eye wash station that was obstructed by several items (liquid effluent barrels and liquid containers) as shown in Photo 1. It is evident that this eye wash station is not readily accessible for immediate use by employees, which does not confirm with subsection 16.8 (1) of the *Occupational Health and Safety Regulations*.

Compliance Action

SRBT-2019-01-A1: SRBT shall ensure that all eye wash stations are free of obstructions and accessible for immediate use by employees.

Follow-Up

Shortly after the inspection, SRBT responded to CNSC staff observations identified in the Preliminary Facts and Findings Report and provided visual evidence to confirm that several of

the preliminary findings had been addressed [5]. In particular, SRBT addressed this compliance action by clearing the obstructions surrounding the eye wash station as shown in Photo 2. Additionally, SRBT staff committed to install a permanent eye wash station in the area that is easily accessible at all times. CNSC staff is satisfied with SRBT's response regarding this finding. As a result, this compliance action is considered **closed**.

4.1.2 Finding 2: Fire Blanket

Criteria

- Paragraph 14.50 (3) (d) of the *Canada Occupational Health and Safety Regulations* (SOR/86-304), which states:

All materials, goods or things shall be stored in a manner so that

(d) the ready access to or the operation of fire fighting equipment is not obstructed;

Fact

CNSC staff observed equipment related to conventional health and safety (e.g. eye wash stations, first aid kits, fire safety equipment and PPE stations). In the Coating room in Zone 1, the fire blanket affixed to the wall was obstructed and not readily accessible, as illustrated in **Photo 3**.

Analysis/Finding

In the Coating room in Zone 1, CNSC staff observed that a paper towel dispenser and lab coats obstructed the fire blanket, making it difficult for employees to easily access the fire blanket in the case of an emergency. This does not conform with paragraph 14.50 (3) (d) of the *Canada Occupational Health and Safety Regulations*, which requires that fire fighting equipment be readily accessible.



Photo 3: Obstructed fire blanket in the Coating room

Photo 4: Fire blanket moved to an accessible location after inspection

Compliance Action

SRBT-2019-01-A2: SRBT shall ensure that fire fighting equipment is free of obstructions and readily accessible.

Follow-Up

Shortly after the inspection, SRBT responded to CNSC staff observations identified in the Preliminary Facts and Findings Report and provided visual evidence to confirm that several of the preliminary findings had been addressed [5]. SRBT addressed this compliance action by relocating the fire blanket to a location that is free of obstructions, as shown in Photo 4. CNSC staff is satisfied with SRBT's response regarding this finding. As a result, this compliance action is considered **closed**.

4.1.3 Finding 3: Cabinet with Hazardous Substances

Criteria

- Section 10.13 of the *Canada Occupational Health and Safety Regulations* (SOR/86-304), which states:

Where hazardous substance is stored, handled, or used in the work place, warnings shall be given in appropriate places at access points warning every person granted access to the work place of the presence of the hazardous substance and of any precautions to be taken to prevent or reduce any hazard of injury to health.

Fact

CNSC staff observed a metal cabinet with no hazard warning signage located in the Stores area in Zone 1 that contained chemicals affixed with WHMIS pictograms (e.g., acute toxicity) as shown in Photo 5.

Analysis/Finding

CNSC staff observed a cabinet in the stores area that contained hazardous substances (e.g. phosphorescent powder) that did not have a label on the exterior of the cabinet warning employees of the hazardous substances within as illustrated in Photo 5. This is not consistent with section 10.13 of the *Occupational Health and Safety Regulations*, which require that warnings shall be given in appropriate places at access points warning every person, granted access to the work place of the presence of the hazardous substance and of any precautions to be taken to prevent or reduce any hazard of injury to health. Furthermore, this is inconsistent with current practices as CNSC staff observed warning labels on chemical storage cabinets in the facility.



Photo 5: Cabinet with no warning of hazardous substances



Photo 6: Cabinet with a warning sign posted after inspection

Compliance Action

SRBT-2019-01-A3: SRBT shall consistently post warning signs at access points where hazardous substances are stored in the work place warning workers of the presence of any hazardous substances.

Follow-Up

Shortly after the inspection, SRBT responded to CNSC staff observations identified in the Preliminary Facts and Findings Report and provided visual evidence to confirm that several of the preliminary findings had been addressed [5]. After the inspection, SRBT posted a warning sign on the exterior of the cabinet in the Stores Area that stores hazardous substances as shown in Photo 6. CNSC staff is satisfied with SRBT's response regarding this finding. As a result, this compliance action is considered **closed**.

4.1.4 Finding 4: Injury and Near Miss Records

Criteria

- Section 5.0 of SRBT's Health and Safety Policy [6], which states:

All incidents and/or injuries are to be reported to the Safety Manager however they can also be reported to any of the Work Place Health and Safety Committee representatives.

The incident and/or injury is kept on record and stored in the Health & Safety folder on the SRBT computer server by the Safety Manager.

- Section 4.7.4 of SRBT's Quality Manual [7], which states:

Management system processes are designed to ensure that important records are generated where required or appropriate for business purposes. These records must be easily readable and retrievable, and must be preserved and retained over time where prescribed.

SRBT implements a master records list in order to ensure that each department or organization identifies and completes the required records, and that they are traceable to the work that was performed or the requirements that the record fulfills. Specific information on how records are managed can be found in MSP-003, Control of Records.

- Section 4.7.4 of CSA N286-12, *Management system requirements for nuclear facilities* [8], which states:

Records shall be

- (a) readable;*
- (b) complete;*
- (c) identifiable;*
- (d) traceable to the related items and work;*
- (e) retrievable;*
- (f) reserved; and*
- (g) retained as specified.*

Facts

Injury records were not complete (e.g., missing signature, incomplete form fields). CNSC staff reviewed records associated with minor injuries and near misses during the 2018 calendar year. Specifically, CNSC staff reviewed two incidences that involved burns. The February 26, 2018 injury form was missing the injured worker's signature. The field "arrangements made" related to the worker (e.g., returned to work, follow up) was marked as not applicable (N/A) while the June 5, 2018 injury form was blank for the "arrangements made" section.

Analysis/Finding

CNSC staff reviewed two injury forms in which both had missing field entries. As a result, these injury forms were incomplete which is inconsistent with section 4.7.4 of SRBT's Quality Manual and section 4.7.4 of CSA N286-12, requiring that records are complete.

Compliance Action

SRBT-2019-01-A4: SRBT shall ensure that records are completed according to SRBT's Quality Manual.
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4.1.5 Finding 5: Underlying Cause of Near Miss Event

Criteria

- Section Incident Reporting of SRBT’s Health and Safety Policy [6], which states:
The incident and/or injury is kept on record and stored in the Health & Safety folder on the SRBT computer server by the Safety Manager.

- Section 4 of SRBT’s Corrective Actions Procedure (MSP-012) [9], which states:
When non-conformances are identified they are corrected recorded and reported. The corrective action process is initiated to correct the problem and determine the cause of the non-conformance in order to prevent recurrence. The root cause needs to be determined to ensure appropriate corrective action is taken. The effectiveness of corrective action taken is reviewed by the individual who raised the Non-Conformance Report (NCR).

- Section 4.9 of CSA N286-12, *Management system requirements for nuclear facilities* [8], which states:
When problems arise, they shall be
 - (a) immediately controlled, if required;*
 - (b) documented;*
 - (c) evaluated for significance and for underlying cause if deemed by management to be systemic or having impact on meeting business objectives; and*
 - (d) accepted.*
Actions employed to resolve problems shall be reviewed for effectiveness.

Fact

One identified corrective action in response to a near miss event may not appropriately prevent recurrence of the problem.

Analysis/Finding

CNSC staff reviewed a near miss event at SRBT that was reported on February 5, 2018. On January 10, 2018, an equipment failure in the Coating room in Zone 1 resulted in large electrical sparks, representing an electrical hazard to SRBT employees working in the area. SRBT staff stated that the malfunctioning equipment had been locked out and repaired prior to its return to service. The “action taken” section of the near miss form did not specify if this piece of equipment would undergo maintenance or inspection to monitor and remedy a potential recurrence of this issue.

According to the near miss form, SRBT’s corrective action for the near miss event included repairing the equipment. In this instance, SRBT staff fixed the equipment but did not identify the underlying root cause of the equipment failure. As a result, while the issue was immediately controlled and its apparent cause addressed, the identified corrective action may not appropriately prevent recurrence of the equipment failure.

Recommendation

SRBT-2019-01-R1: SRBT should consider identifying the underlying cause of near miss events and take corrective actions to prevent recurrence, as appropriate.

4.2 SCA: Radiation Protection

4.2.6 Finding 6: Labelling of Waste Containers

Criteria

- Subsection 20 (1) of the *Radiation Protection Regulations* (SOR/2000-203), which states:
No person shall possess a container or device that contains a radioactive nuclear substance unless the container or device is labelled with
 - (a) *the radiation warning symbol set out in Schedule 3 and the words “RAYONNEMENT — DANGER — RADIATION”; and*
 - (b) *the name, quantity, date of measurement and form of the nuclear substance in the container or device.*

Fact

There were several instances of inconsistent radiation warning labelling of waste containers in Zone 3.

Analysis/Findings

In the tritium laboratory area in Zone 3, CNSC staff observed three 220 L barrels with inconsistent radiation warning labels as shown in Photo 7. SRBT staff stated that these barrels contained liquid effluent waste for Zone 3 that was potentially contaminated with tritium. Two liquid effluent barrels (Barrel A and C) were labelled with a yellow sign with a black radiation trefoil and the wording “DANGER – RADIATION – RAYONNEMENT” while a third liquid effluent barrel (Barrel B) was labelled with a yellow sign which was marked with a black radiation trefoil and the wording “ATTENTION – POTENTIALLY CONTAMINATED WATER”.

In the waste storage room adjacent to the rig room in Zone 3, CNSC staff also observed a waste drum without a radiation warning label as shown in Photo 9. SRBT staff stated that this drum contains low-level waste (LLW) for the facility (e.g., used gloves, paper towel) and was estimated to contain a total of 10 Gigabecquerels (GBq) of tritium.



Photo 7: Liquid effluent barrels in the tritium laboratory



Photo 8: Liquid effluent collection drums in Zone 3 with new labels posted after inspection

The liquid effluent collection drums in the tritium laboratory area and the LLW drum in the waste storage area in Zone 3 were adequately labelled in accordance with subsection 20 (1) of the *Radiation Protection Regulations*.



Photo 9: LLW drum in Zone 3 waste storage area



Photo 10: New label on LLW drum in waste storage area posted after inspection

Compliance Action

SRBT-2019-01-A5: SRBT shall label waste containers containing radioactive nuclear substances in accordance with subsection 20 (1) of the *Radiation Protection Regulations*.

Follow-Up

Shortly after the inspection, SRBT responded to CNSC staff observations identified in the Preliminary Facts and Findings Report and provided visual evidence to confirm that several of

the preliminary findings had been addressed [5]. In particular, SRBT staff affixed new radiation warning labels on the liquid effluent collection drums throughout the facility and the LLW drum in the waste storage area, as shown in Photo 8 and Photo 10. CNSC staff is satisfied with SRBT's response regarding this finding. As a result, this compliance action is considered **closed**.

4.3 SCA: Waste Management

4.3.7 Finding 7: Marking of Waste Receptacles

Criteria

- Section 4.4 of SRBT's Waste Management Program [10], which states:

In Zone 3, dedicated waste receptacles are designated either for the purpose of collecting LLW (low level waste) or VLLW (very low level waste) that are generated as part of daily work. Each type of receptacle is clearly marked, and workers are trained to ensure that the correct types of materials are placed in each type of container.

Facts

In the tritium laboratory area in Zone 3, CNSC staff observed liquid effluent barrels without labels identifying the type of waste in the container as shown in Photo 7. According to SRBT staff, these barrels collect liquid effluent waste for Zone 3 that is potentially contaminated with tritium.

In the waste storage area, CNSC staff observed a waste drum without a label identifying the type of waste in the container as shown in Photo 9. According to SRBT staff, this waste drum contains LLW for the facility.

Analysis/Finding

The absence of waste identification labels on the liquid effluent collection barrels in the tritium laboratory area and on the LLW drum in the waste storage area does not align with section 4.4 of SRBT's Waste Management Program, which states that each type of receptacle in Zone 3 must be clearly marked. Incorrect or missing identification markings may result in workers placing incorrect waste types in containers not meant for a particular waste type.

Compliance Action

SRBT-2019-01-A6: SRBT shall clearly mark each type of waste receptacle in accordance with SRBT's Waste Management Program.

Follow-Up

Shortly after the inspection, SRBT responded to CNSC staff observations identified in the Preliminary Facts and Findings Report and provided visual evidence to confirm that several of the preliminary findings had been addressed [5]. In particular, SRBT addressed this compliance action by marking all liquid collection effluent barrels throughout the facility with "LIQUID EFFLUENT COLLECTION DRUM" as shown in Photo 8. Furthermore, SRBT marked the LLW waste drum in the waste storage area with "LOW LEVEL WASTE DRUM" as shown in

Photo 10. CNSC staff is satisfied with SRBT's response regarding this finding. As a result, this compliance action is considered **closed**.

4.4 SCA: Management System

4.4.8 Finding 8: Audits

Criteria

- Section 4.3 of SRBT's Audits Procedure (QAS-007) [11], which states:

An audit schedule will be developed to encompass all licensed activities and processes. The audit schedule should be fully detailed to ensure that all aspects of licensed activities and processes are included and assessed.

The audit schedule is to be developed with audit frequencies spanning over 1 to 3 years and will take into consideration the importance of the processes concerned, changes affecting the organization and the results of previous audits.

- Paragraph 12 (1) (a) of the *General Nuclear Safety and Control Regulations* (SOR/2000-202), which states:

Every licensee shall

(a) Ensure the presence of a sufficient number of qualified workers to carry on the licensed activity safely and in accordance with the Act, the regulations made under the Act and the licence.

Fact

CNSC staff reviewed SRBT's audit schedule for the 2018 calendar year and noted that seven out of the fourteen audits that were planned were not conducted (e.g. Health and Safety, Radiation Protection and Maintenance inspections).

Analysis/Finding

Fourteen audits were planned for the 2018 calendar year; however, it was identified that seven audits were not conducted as planned (e.g., Health and Safety, Radiation Protection, Maintenance). This was due to the Compliance Manager responsible for the audits training a new employee on packaging and shipping responsibilities after the worker who previously held this position passed away unexpectedly in July 2018. SRBT raised a non-conformance report (NCR) in response and developed corrective actions. One of SRBT's corrective actions was to train at least one individual as back-ups for the position. In addition, the missed audits for the 2018 calendar year are captured in future planned internal audits at SRBT.

CNSC staff note that SRBT has identified this finding through a non-conformance report and is tracking corrective actions.

Recommendation

SRBT-2019-01-R2: SRBT should ensure that internal audits are completed as planned.

5. SUMMARY OF COMPLIANCE ACTIONS AND RECOMMENDATIONS ISSUED

The following six (6) compliance actions are a result of the analysis presented in Section 4 of this report:

- **SRBT-2019-01-A1:** SRBT shall ensure that all eye wash stations are free of obstructions and accessible for immediate use by employees.
- **SRBT-2019-01-A2:** SRBT shall ensure that fire fighting equipment is free of obstructions and readily accessible.
- **SRBT-2019-01-A3:** SRBT shall consistently post warning signs at access points where hazardous substances are stored in the work place warning workers of the presence of any hazardous substances.
- **SRBT-2019-01-A4:** SRBT shall ensure that records are complete according to SRBT's Quality Manual.
- **SRBT-2019-01-A5:** SRBT shall label waste containers containing radioactive nuclear substances in accordance with the *Radiation Protection Regulations*.
- **SRBT-2019-01-A6:** SRBT shall clearly mark each type of waste receptacle in accordance with SRBT's Waste Management Program.

The following two (2) recommendations are a result of the analysis presented in Section 4 of this report:

- **SRBT-2019-01-R1:** SRBT should consider identifying the underlying cause of near miss events and take corrective actions to prevent recurrence, as appropriate.
- **SRBT-2019-02-R2:** SRBT should ensure that internal audits are completed as planned.

6. CONCLUDING STATEMENTS

CNSC staff performed a General Type II Compliance Inspection at SRBT's facility in order to verify compliance with the NSCA, its associated Regulations, the conditions of the licence and the LCH.

During the inspection, several areas were identified which as good operating practices, and effective implementation of programmatic requirements. CNSC staff also identified several areas where the implementation of programmatic requirements was not sufficient to meet regulatory expectations, as identified in Section 4 of this report.

Following the analysis of all inspection facts and findings, CNSC staff found areas of non-compliance, and therefore six (6) compliance actions and two (2) recommendations have been raised.

SRBT is requested to submit its corrective action(s) for each compliance action 60 days from the time this report was issued. The response must include corrective measures and proposed completion dates, including the date by which the corrective measure will be documented (if required), implemented, and verified for adequacy and effectiveness. SRBT is also requested to acknowledge the recommendations.

CNSC staff extend their appreciation to SRBT staff for their assistance in conducting this inspection.

7. REFERENCES

- [1] SRB Technologies (Canada) Inc. Nuclear Substance Processing Facility Operating Licence, NSPFOL-13.00/2022, valid from July 1, 2015 to June 30, 2022 (e-Doc [4624670](#)).
- [2] Licence Conditions Handbook, SRB Technologies (Canada) Inc. Nuclear Substance Processing Facility Operating Licence, NSPFOL-13.00/2022, Revision 2, January 6, 2017 (e-Doc [5127037](#)).
- [3] E-mail from J. Thelen (CNSC) to S. Levesque (SRBT), subject: *Notice of CNSC Type II Compliance Inspection of SRBT on February 26-28, 2019*, January 30, 2019 (e-Doc [5775946](#)).
- [4] CNSC, Preliminary Inspection Facts and Findings Report, February 28, 2019 (e-Doc [5829531](#)).
- [5] Email from J. MacDonald (SRBT) to R. Rashapov (CNSC), subject: *Immediate Actions Taken in Response to Preliminary Findings*, February 28, 2019 (e-Doc [5815056](#)).
- [6] SRB Technologies (Canada) Inc., Health and Safety Policy, Revision A, January 16, 2017 (e-Doc [5146721](#)).
- [7] SRB Technologies (Canada) Inc., Quality Manual, Revision K, January 29, 2017 (e-Doc [5445182](#)).
- [8] CSA Group, N286-12, *Management system requirements for nuclear facilities*, Mississauga, Ontario, Canada, June 2012.
- [9] SRB Technologies (Canada) Inc., Corrective Actions Procedure, MSP-012, Revision B, May 17, 2017 (e-Doc [5399547](#)).
- [10] SRB Technologies (Canada) Inc., Waste Management Program, Revision H, October 1, 2018 (e-Doc [5650157](#)).
- [11] SRB Technologies (Canada) Inc., Audits Procedure, QAS-007, Revision I, April 8, 2016 (e-Doc [5462223](#)).

APPENDIX A: DEFINITIONS

Compliance Action Categories:

Directive

A written request that the licensee or a person subject to enforcement action take action to correct:

- a non-compliance with the NSCA, the applicable regulations, licence conditions, codes, standards, or
- a general or sustained failure to adhere to approved documents, policies, procedures, instructions, programs, or processes that the licensee has established to meet licensing requirements.

Action Notice

A written request that the licensee or a person subject to enforcement action take action to correct a non-compliance that is not a direct contravention of the NSCA, the applicable regulations, licence conditions, codes or standards, but that can compromise safety, security, or the environment and that may lead to a direct non-compliance if not corrected.

Such non-compliances include:

- a failure to satisfy one of the compliance criteria if the criteria are not directly referenced in the applicable regulations or licence conditions.
- a significant but non-systemic failure to comply with the licensee's own policies, procedures, or instructions that have been established to meet licensing requirements (including programs and internal processes submitted in support of a licence application)

Recommendations:

Recommendation

A written suggestion to effect an improvement based on good industry practice.

A recommendation is not:

- an indication of non-compliance with regulatory requirements,
- subject to enforcement action,
- to be issued as a means of suggesting improvements to the licensee's programs outside the mandate of the CNSC.

Recommendations are not required to be implemented.

APPENDIX B : ACRONYMS AND ABBREVIATIONS

ALARA	As Low As Reasonable Achievable
CNSC	Canadian Nuclear Safety Commission
CSA	Canadian Standards Association
GBq	Gigabecquerel
HTO	Tritium Oxide
LCH	Licence Conditions Handbook
LLW	Low-Level Waste
N/A	Not Applicable
NPFD	Nuclear Processing Facilities Division
NSCA	<i>Nuclear Safety and Control Act</i>
OFI	Opportunity for Improvement
OPEX	Operating Experience
PPE	Personal Protective Equipment
RP	Radiation Protection
SCA	Safety and Control Area
SRBT	SRB Technologies (Canada) Inc.
VLLW	Very Low-Level Waste

APPENDIX C: ATTENDANCE RECORDS



Canadian Nuclear Safety Commission
 Commission canadienne de sûreté nucléaire

Inspection Opening Meeting Attendance Record
 Directorate of Nuclear Cycle and Facilities Regulation
 Ref. Procedure *How to Conduct DNCFR Inspections*

Not Protected

Instructions:

Complete the top section of this form prior to the Meeting. Have all Meeting participants sign this form as a record of participation.

[Click here to refresh document selection fields.](#)

5769285

e-Doc
 Number

Licensee: SRB Technologies (Canada) Inc.
 Licence Number: NSPFOL-13.00/2022
 Facility, Site, or Location: SRB Technologies Tritium Processing Facility
 Inspection Number: SRBT-2019-01

Lead Inspector: Rinat Rashapov, NPF
 Meeting Type: Opening

Inspection Date(s): **February 26, 2019 to February 28, 2019**

Name (print)	Organization, Role or Job Title	Signature
Rinat Rashapov	CNSC, Lead Inspector	<i>R. Rashapov</i>
John Thelen	CNSC, Inspection Team Member	<i>John Thelen</i>
Rebekah Van Hoof	CNSC, Inspection Team Member	<i>R van Hoof</i>
JAMIE MACDONALD	SRBT - MGR HP + REG AFFAIRS	<i>Jamie Macdonald</i>
STÉPHANE LEVESQUE	SRBT - PRESIDENT	<i>Stéphane Levesque</i>
ROSS FITZPATRICK	SRBT - VICE PRESIDENT	<i>Ross Fitzpatrick</i>



Canadian Nuclear Safety Commission
 Commission canadienne de sûreté nucléaire

Inspection Closing Meeting Attendance Record

Not Protected

Directorate of Nuclear Cycle and Facilities Regulation

Ref. Procedure *How to Conduct DNCFR Inspections*

Instructions:

Complete the top section of this form prior to the Meeting. Have all Meeting participants sign this form as a record of participation.

[Click here to refresh document selection fields.](#)

5769288

e-Doc
 Number

Licensee: SRB Technologies (Canada) Inc.
 Licence Number: NSPFOL-13.00/2022
 Facility, Site, or Location: SRB Technologies Tritium Processing Facility
 Inspection Number: SRBT-2019-01

Lead Inspector: Rinat Rashapov, NPFDR
 Meeting Type: Closing

Inspection Date(s): **February 26, 2019 to February 28, 2019**

Name (print)	Organization, Role or Job Title	Signature
Rinat Rashapov	CNSC, Lead Inspector	<i>[Signature]</i>
John Thelen	CNSC, Inspection Team Member	<i>[Signature]</i>
Rebekah Van Hoof	CNSC, Inspection Team Member	<i>[Signature]</i> R van Hoof
JAMIE MACDONALD	SRBT - MANAGER HP+RA.	<i>[Signature]</i>
STEPHANIE WAREWICK	SRBT - PRESIDENT	<i>[Signature]</i>
ROSS FITZPATRICK	SRBT - VICE PRESIDENT	<i>[Signature]</i>

APPENDIX D: COMPLIANCE MATRIX

e-Doc Number & Security Classification: **SRBT-2019-01 | Not Protected | Non-Classifié**
Licensee: SRB Technologies (Canada) Inc.
Licence Number: NSPFOL-13.00/2022
Facility / Program / Site: SRB Technologies Tritium Processing Facility

Inspection Number: SRBT-2019-01
Title of Inspection: General Type II Compliance Inspection

Inspection Team: Rinat Rashapov, NPF (Lead Inspector)
John Thelen, NPF (Participant)
Rebekah Van Hoof, NPF (Inspector-In-Training)

Inspection Safety and Control Area(s) and/or Other Matters of Regulatory Interest

- | | | |
|---|--|---|
| <input type="checkbox"/> Management System | <input checked="" type="checkbox"/> Environmental Protection | <input checked="" type="checkbox"/> Waste Management |
| <input checked="" type="checkbox"/> Fitness for Service | <input checked="" type="checkbox"/> Radiation Protection | <input type="checkbox"/> Security |
| <input checked="" type="checkbox"/> Operating Performance | <input checked="" type="checkbox"/> Conventional Health and Safety | <input type="checkbox"/> Safeguards and Non-Proliferation |
| <input type="checkbox"/> Safety Analysis | <input type="checkbox"/> Human Performance Management | <input type="checkbox"/> Packaging and Transport |
| <input type="checkbox"/> Physical Design | <input type="checkbox"/> Emergency Management & Fire Protection | <input type="checkbox"/> Other, specify below |

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
Safety and Control Area: Environmental Protection			
<p>#1</p> <p><u>Source:</u> Regulation</p> <p><u>Details:</u> <i>Class I Nuclear Facilities Regulations, Section 14 (1)</i></p> <p>Every licensee shall keep a record of the results of the effluent and environmental monitoring programs referred to in the licence.</p>	<p>Document Review:</p> <p>Records pertaining to the nature and amount of radiation, nuclear substance and hazardous substances.</p> <p>Records pertaining to the results of effluent (airborne and liquid emissions) and environmental monitoring programs.</p> <ul style="list-style-type: none"> - Review weekly stack monitoring record - Review liquid effluent monitoring record - Review sample analysis and reporting records of airborne and liquid effluent 	<p>Document Review:</p> <p>Environmental monitoring and sampling locations were observed during the facility walkdowns.</p> <p>Gaseous and liquid effluent records were reviewed and CNSC staff confirmed that emissions remained below licence limits. There were no administrative levels or action levels exceeded during the 2018 calendar year.</p> <p>As recorded in an Environmental Monitoring Program (EMP) self-assessment, there were a total of 8 recorded sample failures in 2018. The failures were recorded along with reasonable rationale why the sample was not taken. Overall, there was a 98.8 percent sample acquisition achieved.</p>	<p>Met</p>
<p>#2</p> <p><u>Source:</u> Regulation</p> <p><u>Details:</u> <i>General Nuclear Safety and Control Regulations, Section 12(1)(b)(c) and (f)</i></p> <p>Every licensee shall</p> <p>(b) train the workers to carry on the licensed activity in accordance</p>	<p>Field Check:</p> <ul style="list-style-type: none"> - Observe whether monitoring equipment for airborne and liquid emissions are functioning properly. <p>Document Review:</p> <ul style="list-style-type: none"> - Review records of workers training for 2018 	<p>Observations:</p> <p>Monitoring equipment for airborne and liquid emissions were observed functioning properly during the facility walkdown.</p> <p>Document Review:</p> <p>CNSC staff reviewed SRBT's 2018 Annual Training Session conducted on December 11, 2018 and which included Radiation</p>	<p>Met</p>

<p>with the Act, the regulations made under the Act and the licence</p> <p>(c) take all reasonable precautions to protect the environment and the health and safety of persons and to maintain the security of nuclear facilities and of nuclear substances</p> <p>(f) take all reasonable precautions to control the release of radioactive nuclear substances or hazardous substances within the site of the licensed activity and into the environment as a result of the licensed activity</p>	<ul style="list-style-type: none"> - Review records of the Systematic Approach to Training (SAT) based training (SAT-HP-02 and SAT-HP-03) for workers who perform activities in support of the effluent monitoring program - Review calibration records of the equipment used for the effluent monitoring program and compare it against manufacturer of equipment 	<p>Safety Training, Management System Info Session, Security Program Info Session including Security Awareness training, Fire Protection Program Info Session, Portable Tritium Monitoring Refresher, and WHMIS Training. The attendance sheet record for the training was verified to be complete.</p> <p>Reviewed calibration records for selected safety significant equipment including effluent monitoring equipment and confirmed that equipment was calibrated according to manufacturer's and SRBT's procedural requirements. CNSC staff reviewed calibration certificate and verified against the calibration records.</p>	
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Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
Safety and Control Area: Radiation Protection			
<p>#1</p> <p>Source: Regulation</p> <p><i>Radiation Protection Regulations</i> (RPR): 4(a), 5, 7, 10, 11</p>	<p>Document Review:</p> <ul style="list-style-type: none"> - Observe the current listing of NEWs (including contractors). - Observe evidence of the provision of information to NEWs, including contractors. - Follow up on any recent pregnant NEWs and/or nursing NEWs (i.e., since January 1, 2018) and the process followed (including accommodations provided to ensure doses are kept ALARA), along with records associated. 	<p>Document Review:</p> <p>The training documentation for NEWs was reviewed and met program requirements.</p> <p>CNSC staff reviewed SRBT's 2018 Annual Training Session conducted on December 11, 2018 and which included Radiation Safety Training, Management System Info Session, Security Program Info Session including Security Awareness training, Fire Protection Program Info Session, Portable Tritium Monitoring Refresher, and WHMIS Training. The attendance sheet record for the training was complete.</p>	<p>Met</p>
<p>#2</p> <p>Source: Regulation</p> <p>Details:</p> <p>RPR 4(a)</p> <p><i>General Nuclear Safety and Control Regulations</i> (GNSCR): 12(1)(c)(d)(e) 17(a)(b)(d)(e)</p>	<p>Field Check:</p> <ul style="list-style-type: none"> - Observe all persons on site wearing appropriate/required personal protective equipment (PPE). - Observe persons as they move through zone transitions throughout the facility. - Observe all persons following safe practices in line with ALARA/RP principles. <p>Document Review:</p>	<p>Observations:</p> <p>SRBT workers were observed wearing suitable PPE to minimize contamination (e.g., booties, gloves, disposable lab coats).</p> <p>Document Review:</p> <p>A radiation protection audit was planned for the 2018 calendar year but was not conducted. This was due to the Compliance Manager responsible for the audit training a new employee on packaging and shipping responsibilities after the worker who</p>	<p>Met</p>

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
	<ul style="list-style-type: none"> - Observe records of in-house RP inspections and/or self-assessments conducted at the facility for the 2018 calendar year. Note any areas of concern and determine if corrective actions were implemented and effective. 	<p>previously held this position passed away unexpectedly in July 2018.</p> <p>Consequently, staff reviewed the radiation protection and dosimetry service audit that was performed on November 29, 2017. The report was complete and resulted in 1 NCR and 1 Opportunity for Improvement (OFI).</p>	
<p>#3</p> <p>Source: Regulation Details: RPR 4(a)</p>	<p>Field Check:</p> <ul style="list-style-type: none"> - Perform contamination monitoring (e.g., use of swipes). - Observe RP staff performing contamination monitoring if included in routines. <p>Document Review:</p> <ul style="list-style-type: none"> - Review records of routine contamination monitoring of areas. - Review records for recent exceedances of contamination monitoring “trigger” levels and follow up results/actions. - Review list of personal contamination incidents and events, for the 2018 calendar year, if any. 	<p>Observations:</p> <p>CNSC staff took 12 surface contamination samples for tritium throughout Zones 1, 2 and 3 of the facility. The swipes were counted by the CNSC lab using the liquid scintillation analyzer for tritium activity. The activity results of all collected samples were below the administrative surface contamination limits established for each zone (see appendix E).</p> <p>SRBT RP staff were observed performing contamination checks (swipes) in Zone 2 area according to SRBT’s procedure.</p> <p>Document Review:</p> <p>Routine contamination records for all three zones (Facility Contamination Monitoring Analysis & Report) were reviewed. Any limit exceedances (Zone 1 and Zone 2: 4.0 Bq/cm²/100cm², Zone 3: 40 Bq/cm²/100cm²) were reported, decontaminated and</p>	<p>Met</p>

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
		<p>monitored following routine contamination monitoring.</p> <p>There were no personal contamination incidents and events for the 2018 calendar year and the 2019 year to date.</p> <p>These activities confirmed that contamination is being controlled in an effective manner.</p>	
<p>#4</p> <p>Source: Regulation</p> <p>Details:</p> <p>RPR 4,(b)</p> <p>GNSCR 12(1)(d)</p> <p>NSRDR 20</p>	<p>Field Check:</p> <ul style="list-style-type: none"> - Observe radiation monitoring equipment and instrumentation in the field. Verify instrumentation has been calibrated and/or efficiency-checked within the last 12 months. - Observe appropriate placement and use of radiation monitoring equipment and instrumentation. <p>Document Review:</p> <ul style="list-style-type: none"> - Review equipment inventory list with location and status available. - Cross-reference select radiation monitoring equipment and instruments observed in the field with calibration certificates. 	<p>Observations:</p> <p>Radiation monitoring equipment and instrumentation (e.g. stationary and portable tritium-in-air monitors) were observed in the facility. CNSC staff took photos of the calibration stickers on the radiation equipment and verified that the equipment was calibrated within the last 12 months.</p> <p>Radiation equipment was observed being properly used by staff and appropriately placed throughout the facility. For example, a worker was observed using a portable TAM in the fume hood in the tritium laboratory as they handled used tritium light sources.</p> <p>Document Review:</p> <p>Staff reviewed radiation equipment inventory list with location and status available. This inventory list was cross-referenced with the</p>	<p>Met</p>

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
		calibration sticker photos and confirmed to match the location and status on the list.	
<p>#5 Source: Regulation Details: RPR 4(a), 20, 21, 22, 23</p>	<p>Field Check:</p> <ul style="list-style-type: none"> - Observe radiation warning signs posted as required by Regulation and the licensee's RP program requirements. - Observe containers and devices containing nuclear substances are labeled as required by Regulations. - Confirm that radiological hazard postings are reviewed at a set frequency to ensure they are up to date. 	<p>Observations:</p> <p>CNSC staff observed radiation warning signs posted throughout the facility in accordance with RP program requirements.</p> <p>In the tritium laboratory, CNSC staff observed liquid effluent collection barrels with inconsistent radiation warning labels.</p> <p>In the waste storage area, CNSC staff observed a drum containing low level waste without a radiation warning label.</p> <p>These findings have resulted in a compliance action as further described in Section 4 of the Inspection Report.</p>	<p>Not Met</p>
<p>#6 Source: Regulation Details: RPR 4(a) GNSCR 12(1)(c), 17(b) Source: LCH Details: Radiation Safety Program</p>	<p>Field Check:</p> <ul style="list-style-type: none"> - Observe compliance with the licensee's RP program requirements and rules for personal hygiene, smoking, eating and drinking in zoned areas. - Observe correct practices followed by workers/contractors in zoned areas and in eating areas. 	<p>Observations:</p> <p>CNSC staff observed workers following the rules for personal hygiene, smoking, eating and drinking in zoned areas.</p>	<p>Met</p>

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
	<ul style="list-style-type: none"> - Question workers/contractors on the correct practices for eating, drinking and smoking in the workplace. <p>Document Review:</p> <ul style="list-style-type: none"> - Confirm that expectations for personal hygiene and smoking, eating and drinking restrictions (including chewing of gum) are documented. 		
<p>Source: ACTION NOTICE SRBT-2017-01-A01 (SRBT shall ensure that doses are calculated in accordance with RSO-004 - Bioassay Procedure, Section 8.2)</p>	<p>Document Review: While ACTION NOTICE SRBT-2017-01-A01 (SRBT shall ensure that doses are calculated in accordance with RSO-004 - Bioassay Procedure, Section 8.2) was closed on June 20, 2017 (see closure letter, e-Doc 5278877 and related closed RIB Action # 9805), CNSC staff will conduct follow-up to ensure that the actions taken by SRBT are being implemented effectively.</p>	<p>Document Review: Bioassay records of workers confirmed that doses are kept ALARA. SRBT staff described the revised process for bioassay dose calculations according to their new procedure.</p>	<p>Met</p>

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
Safety and Control Area: Waste Management			
<p>#1</p> <p>Source: Other Waste Management Program</p>	<p>Field Check:</p> <ul style="list-style-type: none"> - Review inventory of radioactive waste <p>Document Review:</p> <ul style="list-style-type: none"> - Review current inventory records of radioactive waste, and other associated records tied to SRBT's Waste Management Program 	<p>Observations:</p> <p>CNSC staff observed radioactive waste inventory in the field (liquid effluent tracking table).</p> <p>Document Review:</p> <p>Recordkeeping of the current inventory of radioactive waste, and other associated records tied to SRBT's Waste Management Program were reviewed and found to be complete.</p> <p>Staff also reviewed electronic records of the monthly shipment of wastes offsite to CRL (tritium wastes) and less frequent shipments to Energy Solutions (scintillation fluid wastes).</p> <p>Records associated with the shipment of radiological wastes for the 2018 calendar year were reviewed and found to be completed and thorough.</p>	<p>Met</p>
<p>#2</p> <p>Source: Other Waste Management Program</p>	<p>Field Check:</p> <ul style="list-style-type: none"> - Verify that the generation of radioactive waste is minimized. 	<p>Observations:</p> <p>Staff observed expired signs being dismantled to minimize hazardous and radioactive waste.</p>	<p>Met</p>

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
Section 2.0 states: The generation of radioactive and hazardous wastes are minimized to the extent practicable by: reducing, reusing and recycling of waste products; characterization and segregation of wastes; volume reduction and minimization; and, staff training.		Waste sorting and segregations was observed.	
#3 Source: Other Waste Management Program	Field Check: - Verify that all radioactive waste is appropriately contained and that radioactive waste containers are appropriately labelled.	Observations: Waste containers and storage locations for radioactive and non-radioactive wastes were verified and implementation of waste sorting and segregation was observed. Several drums/barrels in Zone 3 were found without labels identifying the type of waste within as shown in the following photos.	Not Met

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
			

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
		 <p>This finding has resulted in a compliance action as further described in Section 4 of the Inspection Report.</p>	
<p>#4</p> <p>Source: Other <i>Waste Management Program</i> Section 3.0 states: <i>In order to ensure that waste of all types is managed in line with documented policies, programs and procedures, and to ensure that responsibilities are executed by all parties, SRBT has in place a Waste Management Committee.</i></p>	<p>Document Review:</p> <ul style="list-style-type: none"> - Verify that the Waste Management Committee has met and conducted activities in accordance with the requirements specified in the Waste Management Program document. 	<p>Document Review:</p> <p>Records were reviewed for a January 15, 2018 meeting. The last meeting was held on June 26, 2017. Meeting frequency is at the discretion of the committee. Although the second 2018 meeting was slated for April, SRBT has not held another meeting since. This was discussed with SRBT staff and it is understood that the committee intends to meet more frequently to meet requirements of this program.</p> <p>The meeting records indicate that the committee is discussing to improve ways to manage low level waste (LLW), clearance</p>	<p>Met</p>

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
		level waste (CLW) and recyclable plastic wastes.	
<p>#5</p> <p>Source: Other <i>Waste Management Program</i> Section 5.0 states: <i>All records relating to the Waste Management Program shall be maintained in accordance with Section 14 of the CNSC document Class I Nuclear Facilities Regulations. Waste Management records shall be managed and maintained in accordance with the associated requirements of the Quality Manual.</i></p>	<p>Document Review:</p> <ul style="list-style-type: none"> - Verify that Waste Management Program records are maintained in accordance with the requirements specified in the Waste Management Program document. 	<p>Document Review:</p> <p>Verified annual liquid effluent assessment records and annual liquid effluent tracking table for the 2018 calendar year and confirmed that annual licence limit was not exceeded. CNSC staff confirmed that records were maintained in accordance with the Waste Management Program.</p>	<p>Met</p>

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
Safety and Control Area: Conventional Health and Safety			
<p>#1</p> <p>Source: LCH</p> <p>SRBT Hazard Prevention Program</p>	<p>Field Check:</p> <ul style="list-style-type: none"> - Verify housekeeping practices in the field - Verify by observation that workers are working safely and using the proper PPE and trained to do so. - Conduct a walkdown of locations where licensed activities do or can occur (utilize the floorplan supplied by the licensee to assist with this check). <p>Document Review:</p> <ul style="list-style-type: none"> - Verify that health and safety related training has been provided for required workers - Verify records related to health and safety awareness 	<p>Observations:</p> <p>Housekeeping practices were observed; facility housekeeping was very well maintained.</p> <p>Workers were observed wearing the appropriate PPE suitable for their job duties.</p> <p>Numerous health and safety awareness communication tools (e.g., signs, safety bulletin boards, posters) were observed throughout the facility.</p> <p>Equipment related to safety was observed operational in the field (e.g. eye wash stations, first aid kits, fire safety equipment, PPE stations).</p> <p>However, there were two noted discrepancies observed. In the Tritium Laboratory, the eye wash station was obstructed by several items as shown in the following photo.</p> <p>In the Coating Room, the fire blanket was visually obscured as shown in the following photo.</p>	<p>Not Met</p>

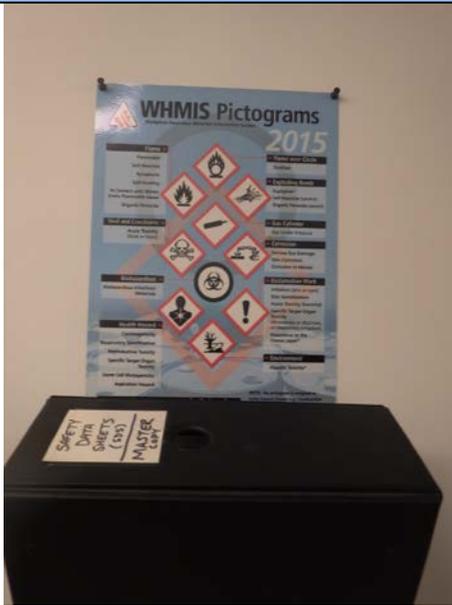
Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
		 <p>These observations have resulted in a compliance action as further described in Section 4 of the Inspection Report.</p> <p>Document Review:</p> <p>Records associated with H&S training (also included WHMIS, Radiation Safety, and Fire</p>	

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
		<p>Safety) were reviewed and were found to be complete.</p> <p>Records of the completion of WHMIS training was reviewed for SRBT staff. Records of H&S training for 6 workers hired in the past two years were also reviewed and found to be complete.</p> <p>Training records included annual training on health safety related requirements for the site. SRBT staff (students included) partake in this annual event. This training also covers other SCAs other than H&S.</p>	

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
<p>#2</p> <p>Source: LCH</p> <p>SRBT Hazard Prevention Program</p> <p>Details: Section 3.0</p>	<p>Document Review:</p> <ul style="list-style-type: none"> - Verify records related to Workplace Health and Safety Committee (internal audits, self-assessments, meeting minutes, workplace inspections) - Note actions arising from Health and Safety Committee meetings/inspections and progress to closure 	<p>Document Review:</p> <p>Records associated with the Workplace Health and Safety committee were reviewed and were complete. Reviewed raised actions were addressed and closed to completion.</p> <p>Specifically, all 2018 records were provided and their content reviewed. This included 9 sets of Workplace Health and Safety Committee meeting minutes for 2018: March 6, April 5, April 12, May 2, June 7, July 4, September 27, October 22, and December 20.</p> <p>These minutes were thorough and indicated how near misses, improvements to safety and training were being implemented. It also included the committee's review of a gaps analysis on Conventional Health and Safety.</p> <p>It also included a Health and Safety Hazard Report form dated April 6, 2018 which resulted in hearing protection being a requirement in the assembly room when ultrasonic welding is underway.</p> <p>Also noted was an April 5, 2018 meeting discussion about the importance of labeling chemicals and using proper gloves when handling chemicals. Staff were reminded to be vigilant and not repeat any non-conformances to this requirement.</p>	<p>Met</p>

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
		<p>H&S inspections were confirmed to be occurring monthly. As documented in the April 5, 2018 meeting minutes, the need to keep first aid kits maintained was noted.</p> <p>Fourteen audits were planned for the 2018 calendar year; however, it was identified that seven audits were not conducted as planned (e.g., Health and Safety, Radiation Protection, Maintenance). This was due to the Compliance Manager responsible for the audits training a new employee on packaging and shipping responsibilities after the worker who previously held this position passed away unexpectedly in July 2018. SRBT raised a non-conformance report (NCR) in response and developed corrective actions. One of SRBT's corrective action is to train several individuals as back-ups for the position. In addition, the missed audits for the 2018 calendar year are captured in future planned internal audits at SRBT.</p> <p>As this was already self-identified by SRBT and corrective actions are being implemented, this finding has resulted in a recommendation as described in Section 4 of the Inspection Report.</p> <p>A radiation protection audit was planned for the 2018 calendar year but was not conducted due to the circumstances stated above.</p> <p>Staff reviewed the Health and Safety inspection performed on November 6, 2017.</p>	

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
		The inspection was a full gap analysis of SRBT's H&S practices against the <i>Canada Labour Code</i> . The report was well-written, thorough and complete.	
#3 Source: LCH SRBT Hazard Prevention Program	<p>Field Check:</p> <ul style="list-style-type: none"> - Visual observations and record reviews of labels and safety data sheets to confirm status of compliance with WHMIS 2015. <p>Document Review:</p> <ul style="list-style-type: none"> - Verify that WHMIS training aligns with 2015 requirements and verify status of training for all workers. 	<p>Observations:</p> Staff observed updated WHMIS pictogram posters and location of safety data sheets in the facility as shown below.	Met

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
		 <p>Staff observed updated WHMIS labels on hazardous substances throughout the facility.</p> <p>Document Review: Workplace Health and Safety Committee meeting minutes noted that staff were trained on how to access SDSs electronically.</p>	
<p>#4 Source: SRBT Hazard Prevention Program</p>	<p>Discussions with workers during walkdown:</p> <ul style="list-style-type: none"> - Individual(s) who are required to work in an area which necessitates the use of respiratory protective equipment. 	<p>Observations:</p> <p>Respirators observed in storage. SRBT staff stated that there are no ongoing activities at the facility that require the use of respirators.</p>	<p>Met</p>

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
	<p>Document Review:</p> <ul style="list-style-type: none"> - Quantitative fit test records for respiratory protective equipment - Activities do or can occur (utilize the floorplan supplied by the licensee to assist with this check). 	<p>Document Review:</p> <p>Not checked as these respirators are no longer used for operational activities.</p>	
<p>#5</p> <p>Source:</p> <p>SRBT Hazard Prevention Program</p>	<p>Field Check:</p> <ul style="list-style-type: none"> - Verify location(s) for chemical storage and ensure that chemicals are safely stored according to procedure. <p>Document Review:</p> <ul style="list-style-type: none"> - Review records associated with inventory of hazardous substances in the workplace. 	<p>Observations:</p> <p>Chemicals used in the facility were observed as appropriately labelled and stored in chemical storage cabinets.</p> <p>However, a metal cabinet with no hazard warning signage located in the Stores area contained chemicals with WHMIS pictograms (e.g., acute toxicity) as shown in the following photo:</p> 	<p>Not Met</p>

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
		This finding has resulted in a compliance action as further described in Section 4 of the Inspection Report. Document Review: Hazardous chemical inventories were verified (e.g., Hydrofluoric acid).	
#6 Source: SRBT Hazard Prevention Program Details: Section 7.0.	Field Check: <ul style="list-style-type: none"> - Verify preventive measures being achieved in accordance with the priority hierarchy per this program's requirements. 	Observations: CNSC staff observed that preventive measures (elimination, isolation, PPE, and administrative procedures) were in place to eliminate or reduce potential hazard. Newly identified hazards were discussed and actioned upon in SRBT's Health and Safety Committee.	Met
#7 Source: SRBT Hazard Prevention Program Details: Section 8.0 and 10.0.	Document Review: <ul style="list-style-type: none"> - Verify training records and program review records are maintained per this program's requirements. 	Document Review: Records of the completion of WHMIS training was reviewed for all staff. Records of H&S training for 6 workers hired in the past two years were also reviewed and found to be complete. These records included annual training on health safety and WHMIS related requirements for the site. All staff (students included) partake in this annual event.	Met

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
<p>#8 SRBT LCH section 9 SRBT Health and Safety Policies and Procedures</p>	<p>Document Review: Verify records related to key performance indicators for safety</p> <ul style="list-style-type: none"> - Review records of OH&S performance for 2018 - Review records of OH&S objectives and targets for 2018 - Review recent Occupational Injuries, Minor Injuries, Hazardous Occurrence and Near Misses records 	<p>Document Review: Health and Safety Objectives and Targets for 2019 (draft) were provided. Specifically, SRBT provided access to a copy of their draft 2019 Annual Compliance Report (ACR) for review which contained this information.</p> <p>Records associated with minor injuries and near misses were reviewed. There were a few minor inconsistencies observed (e.g., missing signature, incomplete form fields). However, the safety significance of these observations was low. This finding resulted in a compliance action as further described in Section 4 of the Inspection Report.</p> <p>In 2018, there were 15 minor incidences (10 minor cuts, 2 flame burns, 1 cut requiring stitches, 1 ankle injury, 1 strain injury).</p> <p>CNSC staff reviewed two of those incidences that involved burns. The Feb 26 injury form did not have the injured worker's signature. Arrangements made related to the worker (e.g., returned to work, or follow up) was marked as N/A. The June 5 injury form was blank for the arrangements made section.</p> <p>This finding has resulted in a compliance action as further described in Section 4 of the Inspection Report.</p>	<p>Not Met</p>

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
		<p>CNSC staff reviewed the cut requiring stitches that occurred on May 15. Arrangements made included modified work until the stitch was removed.</p> <p>CNSC staff reviewed the records for the ankle injury that occurred on July 15 to ascertain if footwear contributed to the injury. It occurred in the lunch area and based on the records it is unclear if footwear was a contributing factor.</p> <p>CNSC staff reviewed the record for one near miss that was reported on Feb 5. On January 10 equipment failure resulted in large sparks. Locked out and repaired prior to return to service. The action taken section of the form did not specify if this piece of equipment would undergo maintenance or inspection to prevent recurrence of this issue.</p> <p>This finding resulted in a recommendation as further described in Section 4 of the Inspection Report.</p>	

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
Safety and Control Area: Operating Performance			
<p>#1 Source: SRBT LCH section 4 SRBT Tritium Inventory Management</p>	<p>Document Review:</p> <ul style="list-style-type: none"> - Review tritium possession records 	<p>Document Review:</p> <p>CNSC staff reviewed a summary of tritium and depleted uranium inventory for 2018 which outlined the total inventory values at the end of each month. Additionally, CNSC staff reviewed the monthly inventory breakdown for tritium and depleted uranium for January, February, March, May, October and December.</p> <p>In May, there was a discrepancy between the estimated inventory and the actual inventory of tritium outside of SRBT's acceptable discrepancy rate. However, SRBT followed its procedure by creating a non-conformance report which investigated and documented the reason for the discrepancy.</p> <p>The tritium inventory was confirmed to be below the tritium possession limit of 6,000 TBq.</p> <p>The inventory of on-site depleted uranium was verified to be below 10 kg.</p>	<p>Met</p>
<p>#2 Source: SRBT LCH section 4</p>	<p>Document Review:</p> <ul style="list-style-type: none"> - Review records indicating operating hours and when operations have ceased due to precipitation events 	<p>Document Review:</p> <p>A sample of precipitation record logs was correlated with the rig room operations log and</p>	<p>Met</p>

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
		confirmed that no tritium operations were conducted during precipitation events.	

Criteria	Compliance Expectation / Inspection Methods	Comments	Met / Not Met
Safety and Control Area: Fitness for Service			
<p>#1 Source: SRBT LCH section 7 SRBT Maintenance Program</p>	<p>Field Check:</p> <ul style="list-style-type: none"> - Verify equipment maintenance is done and documented in accordance with requirements - Verify equipment labelling is done accordance with requirements <p>Document Review:</p> <ul style="list-style-type: none"> - Verify list of radiation monitoring equipment and instrumentation inventory (with location and status), and associated maintenance records 	<p>Observations:</p> <p>Equipment labeling is done in accordance with SRBT program requirements.</p> <p>Document Review:</p> <p>Equipment related to safety was maintained according to program requirements.</p> <p>CNSC staff reviewed preventative maintenance records for safety-related equipment (e.g., weather station, fume hoods, air handling units, gaseous effluent monitoring system) and confirmed that they were complete. CNSC staff also compared the preventative maintenance schedule for 2018 to the dates the maintenance was completed for the select equipment. The maintenance was completed as per the schedule except for two instances which were minor deviations with no safety significance.</p> <p>Calibration records were being generated and maintained for radiation monitoring equipment according to program requirements. CNSC staff reviewed calibration records for portable and stationary tritium-in-air monitors. Calibration stickers on the equipment were cross-referenced with calibration records and matched accordingly.</p>	<p>Met</p>

Items for Follow-Up

Not Protected | Non-Classifié

Directorate of Nuclear Cycle and Facilities Regulation

Lead Inspector: Rinat Rashapov
Division: NPFDD

#	Item
1	Follow-up on the recent lumber facility fire in Pembroke, ON (Full Report received on Jan 15, 2019; see e-Doc 5763333). Verify whether there are any lessons learned from this event that impact the SRBT facility. - This update was provided by SRBT staff immediately after the Day 3 closing meeting.
2	Follow-up on SRBT's research project on extending the filling cycles of PUTTs and verify analysis supporting the extension. - This update was provided by SRBT staff during the Day 2 document review.
3	Follow-up on the status of SRBT's outreach activities to Indigenous communities. - This update was provided by SRBT staff immediately after the Day 3 closing meeting.

APPENDIX E: SAMPLE RESULTS

Final Report

2019-03-04

Laboratory Services

Canadian Nuclear Safety Commission

Sample Analysis Report for: LR-SA-2019-00007

Submitted By: Rinat Rashapov

Division/Directorate/Site: NPF_DITN

Approved By: Slobodan Jovanovic

Analysis Review and Report by: Nadareh St-Amant

Background and Methodology:

Thirteen swipe samples from the SRBT facility, submitted by CNSC inspectors, were received by the CNSC Laboratory for tritium analysis on February 28, 2019.

The swipes were counted using the liquid scintillation analyzer for tritium activity.

A laboratory blank sample and a check sample were also included in the measurement sequence for quality control.

Result Summary:

The analysis result is listed in the following table. The activity results are reported in unit of Bq/cm² using the swiped area provided by the inspector. The swipe area for the samples were 100 cm² with one exception for sample #3 (swipe area =300 cm²). Note that a pickup collection efficiency of 10% is used in the calculation of activity concentration, and the reported uncertainty represents only the laboratory measurement uncertainty.

Results:

Sample Type: Swipe
 Analysis Tritium (HTO)

Sender Sample Id	Analyte	Result	Uncertainty	Unit
1	HTO	<0.05		Bq/cm ²
2	HTO	<0.05		Bq/cm ²
3	HTO	<0.05		Bq/cm ²
4	HTO	<0.05		Bq/cm ²
5	HTO	<0.05		Bq/cm ²
6	HTO	0.50	0.02	Bq/cm ²
7	HTO	0.10	0.01	Bq/cm ²
8	HTO	0.06	0.01	Bq/cm ²
9	HTO	0.95	0.03	Bq/cm ²
10	HTO	2.30	0.07	Bq/cm ²
11	HTO	1.18	0.04	Bq/cm ²
12	HTO	<0.05		Bq/cm ²
C	HTO	<0.05		Bq/cm ²

