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Ms. J. Campbell
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Canadian Nuclear Safety Commission
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Subject: SRBT Response to CNSC Review of 2014 ACR

Dear Ms. Campbell,

Thank you for your letter [1] detailing CNSC staff review of our 2014 Annual Compliance Report (ACR) [2]. As requested within sixty business days of the date of your letter, SRBT provides the following set of responses to specific comments contained in the review. CNSC comments are repeated below, followed by SRBT's response.

Comment 1 – Page 40, Section 2.3.1.7.2 Public Dose

In the discussion on public dose, the report states “in addition to the bubbler systems, the Radiation Safety Program requires that a real-time emissions monitoring system is also used. The system is in place to monitor tritium emissions from the facility as they take place, in real time. The results are verified regularly by production staff and production supervisors as part of tritium processing procedures.” How frequently is the real time monitoring data reviewed? Why were the elevated levels during the action level exceedance event not noticed until after the weekly bubbler data was received?

Real-time monitoring data is reviewed several times each day as part of production procedures. Technicians are required to observe the real-time emissions concentration during all significant production steps that result in the emission of tritium to the active ventilation systems. Peak concentrations of tritium in the effluent are recorded at the conclusion of each tritium filling cycle. In addition, members of the Health Physics team routinely check the emission trend lines throughout the operating day whenever entering or exiting the Rig Room.

The conclusion that the elevated levels of tritium being released to the active ventilation systems were not noticed until after the weekly bubbler data was received is not accurate. For both related events associated with the exceedance of the action level for tritium released to atmosphere during the period of October 28 – November 4, 2014, SRBT staff were immediately and fully aware that the events had occurred resulting in the release of elevated concentrations of tritium.

SRBT calculates official tritium releases to atmosphere based on the results of our weekly bubbler sampling. This method allows for the quantification and discrimination of both tritium oxide and elemental tritium releases to atmosphere, and is independently verified on an annual basis. Although

estimates can be made by integrating the data from the real-time stack monitoring systems, a conclusive determination of the quantity of tritium oxide and elemental tritium released cannot be made since the system does not discriminate between the two forms.

The real-time stack monitoring system is a useful semi-quantitative measurement of the concentration of total tritium in the effluent stream at any given time, but an integration of the data over time is insufficiently precise to rely upon for reporting purposes. This is sole reason why the initial report was not made until the results of the weekly bubbler samples was completed.

Comment 2 – Page 80, Section 3.1.3.4 Derived Release Limits (DRLs)

A new DRL is expected to be established in late 2015 or early 2016. Since the information in a DRL document is used in dose to the public calculations, it is considered to be an important document by CNSC staff. Therefore CNSC staff need to be kept informed on the status of the implementation of the new DRL document and any impact on the annual dose to the public calculations.

As a clarification, we note that SRBT uses data collected from our comprehensive Environmental Monitoring Program (EMP) and not using a DRL. This method is used in order to directly and conservatively calculate the formally reported annual dose to various public critical group members.

As part of the overall plan for compliance with several N288-series of CSA standards associated with Environmental Protection, SRBT has previously committed [3] to CNSC staff that a revision to the DRLs will be available by June 2016. CNSC staff will be kept informed on the status of this initiative as necessary.

Comment 3 – Page A15, Appendix B Facility Emissions Data for 2014, Figure Emissions Data

In the Emissions Data figure two total tritium emission peaks are visible in 2014. The first is at week 26 and the second is at week 44. The second peak aligns with the reported action level exceedance at the end of October. Does SRBT know what caused the first peak at week 26?

On June 26, 2014, several gaseous tritium light sources failed as they were being heat tested as part of routine manufacturing processes in the Rig Room. The cause of the failure was investigated and traced back to dimensional non-conformances with this specific batch of light sources. Corrective measures were taken to successfully address the problem, and there has been no instance of recurrence since the initial event.

Comment 4 – Page 6, Section 1.3.2 Release Limits to Atmosphere

The placement of this information under ‘Section 1.3 Production or Utilization’ is unusual. To align with reports from other licensees and to allow easier report review this section on air emissions monitoring should be included under ‘Section 2.3.3 Environmental Protection’. In addition, it is not possible to assess the data trends over multiple years without looking in previous annual reports. A trend table showing historical release data (at least 5 years) against the release limits would be helpful.

SRBT has traditionally included this information in the introductory section of the report as it is an important data point in both the calculation of the ratio of tritium releases to tritium processed, and in establishing the safety of our operations, especially to members of the general public.

The data on the 2014 releases of both oxide and elemental tritium is also included in section 2.3.3.13 as well, although not in tabular form.

Future SRBT ACRs will ensure that the data on our releases to atmosphere contrasted against our licence limits is captured in the section dealing with the Environmental Protection Safety and Control Area (SCA). In addition, five-year trends will be included in future annual compliance reports.

Comment 5 – Page 8, Section 1.3.5 Action Levels for Releases to Atmosphere

The placement of this information under 'Section 1.3 Production or Utilization' is unusual. To allow easier report review this section on action level releases to atmosphere should be included under Section 2.3.3 Environmental Protection.

SRBT has traditionally included this information in the introductory section of the report as it highlights the action levels for the reader, and the number of action level exceedances is important in confirming the safety of our operations, especially for the general public.

Future SRBT ACRs will ensure that the data on our releases to atmosphere contrasted against our action levels is captured in the section dealing with the Environmental Protection SCA.

Comment 6 – Page 8, Section 1.3.6 Release Limit to Sewer

The placement of this information under 'Section 1.3 Production or Utilization' is unusual. To allow easier report review this section on releases to the sewer should be included under 'Section 2.3.3 Environmental Protection'. It is not difficult to assess the data trends over multiple years, a trend table showing historical release data (at least 5 years) against the release limits would be helpful.

SRBT has traditionally included this information in the introductory section of the report as it highlights both the licence limits and actual annual tritium released to the sewer, another key parameter in confirming the safety of our operations, especially for the general public.

Future SRBT ACRs will ensure that the data on our releases to sewer contrasted against both our action level and licence limit is captured in the section dealing with the Environmental Protection SCA. In addition, five-year trends will be included in future annual compliance reports.

Comment 7 – Page A14, Appendix B Facility Emission Data for 2014

The weekly monitoring data is combined with percentage of action levels, percentage of 1998 DEL, percentage of weekly release limit, percentage of 2006 DRL. CNSC staff had the following comments after reviewing the table:

- Why does the table not include data for both monitored stacks? That information could be included in the table in columns before the combined weekly release values.
- Why does the table include the percentage of the 1998 SRBT DEL? The 2006 SRBT DRL is the most current document.
- In the percentage 2006 SRBT DRL section, what is meant by percentage DRL? The 2006 DRL document included DRLs for both HTO and HT. Which one is reflected in this table?
- It is not possible to assess the data trends over multiple years without looking in previous annual reports. Why is a multiple year air emission trend table not included?

Bullet 1: It is important to note that data is included for both monitored stacks - the table detailing the emissions data from the facility combines the emissions from both the Rig and Bulk stack systems.

The reason the report is structured in this fashion is that there are no specific compliance requirements that relate to either unique stack system; all facility action levels and licence limits are established as a composite measured value. As such, the breakdown of the total releases into discrete stack systems has not been previously considered in the context of a report focused on demonstrating compliance.

Bullet 2: There is no specific reason why the table continues to define the percentage of the derived emission limits established in 2006, other than continuity of reporting for those who would continue to trend this value over time, such as interested members of the public.

Bullet 3: The reported percentage of the 2006 DRL is a value that combines both tritium oxide and elemental tritium releases to easily estimate a dose to a member of the specific critical group.

The 2006 DRL established the weekly amount of both types of tritium emissions that would theoretically result in a dose of 1 mSv to a member of the public if consistently released over 52 weeks. These values are listed in the bottom two rows of the table.

In the ACR, the reported % DRL value in Appendix B combines two percentages of both HTO and HT together into one value.

The calculation is as follows:

$$\left(\frac{\text{HTO released}}{\text{Weekly HTO Limit}} + \frac{\text{HT released}}{\text{Weekly HT Limit}} \right) \times 100 = \% \text{ DRL}$$

Bullet 4: SRBT will include multiple years of data as part of future annual compliance reports.

Comment 8 – Appendix C Annual Liquid Effluent Data for 2014

It is not possible to assess the data trends over multiple years without looking in previous annual reports. A trend table showing historical release data (at least 5 years) against the release limits would be helpful.

SRBT will include multiple years of data as part of future annual compliance reports.

Comment 9 – Appendix I Passive Air Sampler Results 2014

It is not possible to assess the data trends over multiple years without looking in previous annual reports. A trend table showing historical passive air sampling data (at least 5 years) would be helpful.

SRBT will include multiple years of data as part of future annual compliance reports.

Comment 10 – Provide a general overview of any internal and external audits carried out by the licensee during the review period which relate to the licensed activities at the facility.

SRB did not provide information related to their external audits carried out by them. If SRB did not conduct any external audits (for example those conducted to approve a suppliers), it should have stated it to ensure that the information is not missing

As a point of clarification, in the ACR SRBT states the following in section 2.1.1.3, titled “Internal and External Audits” on page 15 of 93:

“In 2014 there were no external audits performed.”

Comment 11 – Summary of projected facility operations and any proposed or foreseen changes to equipment, procedures, production capacity, organization and licensing documents.

SRB provided a summary of proposed or foreseen changes to equipment, procedures, organization and licensing documents but not for any changes to its production capacity.

If there is no changes to its production capacity, SRB should have stated it to ensure that the information is not missing.

Although we appreciate the comment, it is uncertain from where the expectation for reporting on our production capacity arises.

Both the previous and current Licence Conditions Handbooks (LCHs) neglect to mention that the reporting on our production capacity is an expected component of an ACR.

The following objective was found to reside in CNSC regulatory document R-27, *Preparation of an Annual Compliance Report for a Uranium Fuel Fabrication Plant*:

“Summarize the projected plant operations by mentioning any proposed or foreseen changes to equipment, procedures, production capacity, organization and licensing documents.”

REGDOC 3.1.2, *Reporting Requirements for Non-Power Reactor Class I Facilities and Uranium Mines and Mills* has yet to be published in draft; however, we surmise that this expectation may be documented within this REGDOC in the future.

SRBT has reported on the total quantity of tritium processed in each ACR from the past several years; however, we acknowledge that this is not necessarily representative of the concept of ‘capacity’, as the facility design is such that more tritium could have been processed if demanded by the market.

We do note in several sections of the ACR that we expect a 15% increase in processing in 2015 versus the 2014 value of 28,714,118 GBq.

As noted to the Commission during the licensing hearing of May 14, 2015 [4], SRBT estimates that production could theoretically be increased by about 50% without significant facility modification. Based on the 2014 values for tritium processed, this would correspond to an estimated production capacity of approximately 43,071,177 GBq per calendar year.

The capacity of our facility to process tritium is not expected to change in 2015. Based upon this review comment, SRBT will summarize proposed or foreseen changes to production capacity in future annual compliance reports.


To summarize, as a result of CNSC staff review of the 2014 ACR, future annual compliance reports will include:

- Data on releases to atmosphere contrasted against our licence limits in the section dealing with the Environmental Protection Safety and Control Area.
- Data on releases to sewer contrasted against both our action level and licence limit in the section dealing with the Environmental Protection Safety and Control Area.
- Multiple years of data on releases to atmosphere for trending.
- Multiple years of data on releases to sewer for trending.
- Multiple years of data comparing atmospheric tritium releases with derived release limits, for trending.
- Multiple years of data on the results of passive air sampling, for trending, and
- A summary of proposed or foreseen changes to the production capacity of the facility.

SRBT hopes that these responses are sufficient to address the comments provided by CNSC staff on our 2014 ACR.

If you require any additional information or wish to discuss this matter further, please do not hesitate to contact Jamie MacDonald, Ross Fitzpatrick or myself at any time.

Best Regards,

A handwritten signature in black ink, appearing to read 'Stéphane Levesque', with a stylized flourish extending to the right.

Stéphane Levesque
President
SRB Technologies (Canada) Inc.

cc: R. Buhr, CNSC
M. Rinker, CNSC
N. Belleau, SRBT
R. Fitzpatrick, SRBT
M. Foster, SRBT
P. Lavigne, SRBT
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References:

- [1] Letter from J. Campbell (CNSC) to S. Levesque (SRBT), *CNSC Review of SRB Technologies Ltd. 2014 Annual Compliance Report*, dated June 10, 2015. (E-Doc 4773670)
- [2] SRB Technologies (Canada) Inc. 2014 Annual Compliance and Performance Report, Licence Number NSPFOL-13.00/2015, submitted March 31, 2015
- [3] Letter from S. Levesque (SRBT) to M. Rinker (CNSC), *Implementation of Environmental Protection Standards*, dated April 20, 2015.
- [4] Page 78, Transcript of Canadian Nuclear Safety Commission Public Hearing of May 14th, 2015. <http://nuclearsafety.gc.ca/eng/the-commission/pdf/TranscriptSRBTPublicHearing-Pembroke-May142015-e.pdf>