

File / dossier : 6.01.07 Date: 2015-05-06 Edocs: 4749370

Supplementary Information

Presentation from SRB Technologies (Canada) Inc.

Renseignements supplémentaires

Présentation de SRB Technologies (Canada) Inc.

In the Matter of

À l'égard de

SRB Technologies (Canada) Inc.

Application to renew the Nuclear Substance Processing Facility Operating Licence for SRB Technologies (Canada) Inc. SRB Technologies (Canada) Inc.

Demande concernant le renouvellement du permis d'exploitation d'une installation de traitement de substances nucléaires pour SRB Technologies (Canada) Inc.

Commission Public Hearing

Audience publique de la Commission

May 14, 2015

Le 14 mai 2015





SRB TECHNOLOGIES (CANADA) INC.

Presentation – May 14, 2015 Licence Renewal Hearing

In Support Of Application To Renew Nuclear Substance Processing Facility Operating Licence For A Period Of 10 Years



INTRODUCTION

1.0 INTRODUCTION

SRB Technologies (Canada) Inc. has been in operation since 1990, and currently:

- Employs 46 people.
- Located in an industrial park on the outskirts of Pembroke.
- Leases 12,000 square feet of a building.
- Closest residence is approximately 250 m from the facility.



FIGURE A: AERIAL PHOTOGRAPH OF THE FRONT OF SRBT'S FACILITY

INTRODUCTION (Continued)

- SRBT is licensed by the CNSC to process tritium.
- Process tritium for the manufacturing of gaseous tritium light sources.
- Gaseous tritium light sources are glass capsules coated with luminescent powder and filled with tritium.
- Interaction between the particles emitted by the tritium and the luminescent coating produces light on a continuous basis.



FIGURE B: VARIOUS TYPES OF TRITIUM LIGHT SOURCES PRODUCED BY SRBT

INTRODUCTION (Continued)

- Our products ensure the safety and security of people all over the world.
- Supplier of aircraft signs for many aerospace manufacturers.
- We manufacture many vital products used by Canadian and other NATO peacekeeping troops worldwide.



FIGURE C: PICTURE OF A SOLDIER WITH OUR ILLUMINATED TORCH

INTRODUCTION (Continued)

- Other lighting technologies require wiring, power or batteries.
- Our lighting products do not use electricity thereby reducing energy consumption.



FIGURE D: VARIOUS TYPES OF PRODUCTS PRODUCED BY SRBT

SRBT requests that the Commission renew our operating licence for a period of 10 years.

We are requesting a licence with <u>no</u> new methods or processes, and we will be operating our existing equipment with same trained staff.

We request a licence with:

- The same licence activities.
- The same release limits.
- The same action levels.
- The same possession limit.

Our renewal request is based upon our positive compliance history and safety record:

- Facility was operated safely throughout the current licence.
- Total air emissions maintained < 18% of licence limits.
- Liquid emissions maintained < 7% of licence limits.
- Maximum worker dose < 2 mSv in any year.
- Maximum public dose < 0.007 mSv in any year.
- One single lost time injury in the licence period.

Our renewal request is based upon our stable and experienced workforce:

- 14 of the 15 staff employed in 2010 continue to work in the same positions.
- Despite our growth our workforce averages nearly 9 years of experience at the facility.
- Members of the Health Physics team possess a combined 107 person-years working at SRBT (over 15 years on average per member).
- President and Vice-President, who now own the company, have a combined 42 years of experience managing and operating the facility.

Our renewal request is based upon our safety-related programs and processes:

- Programs and processes continue to undergo continuous review, improvement and revision.
- Several new CNSC Regulatory Documents and CSA Standards are being integrated into our management systems.
- Continuous improvement remains a key priority.

Our renewal request is based upon the success of our emissionreduction initiatives:

- Tritium production has increased over licence term but releases to atmosphere have risen at less than half the rate of production.
- Therefore the ratio of tritium released versus processed continues to be driven down.

Our renewal request is also based upon public perception:

- Very little concern expressed over the current licence period.
- Public Information Program will ensure that regular public input is facilitated and considered in lieu of hearings.
- Regular meetings with all stakeholders will take place as required.
- Will continue an open flow of information between parties.

2.2 VALUE OF PRODUCTS

- Our products are crucial to ensure the safety and security of people all over the world.
- Without our products some companies would need to redesign their products at considerable cost.
- Would force use of inferior lighting technologies requiring wiring, power or batteries, resulting in a lack of reliability, portability, and in some cases, safety.
- Military, aerospace and commercial organizations choose our products because they are safe, reliable and highly effective.
- The sale of tritium light sources and products represent the sole source of revenue for SRBT.

2.3 VALUE OF TEN YEAR LICENCE TERM

A 10 year licence term would:

- Allow more resources to be focused on research to further reduce emissions.
- Help attract, hire and retain highly qualified staff to support business growth and safety.
- Assist in securing long term contracts with customers and suppliers.
- Support planning of facility improvements and dedication of a fixed part of revenue to emission reduction initiatives.
- Increase access to financing for equipment and training.



SAFETY AND CONTROL AREAS

3.1 MANAGEMENT SYSTEM

Our Management System is comprised of programs, procedures and associated documents that are in place with the purpose of meeting the NSCA, Regulations and conditions of the Licence.

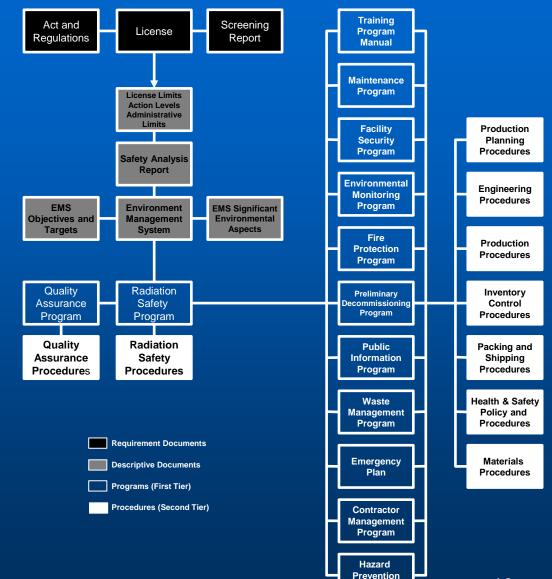


CHART A: SRBT PROGRAMS AND PROCEDURES

Program

3.1.1 MANAGEMENT SYSTEM IMPROVEMENTS

SRBT has analyzed several new or modernized standards and regulatory documents. Safety programs are continually improved to meet or exceed these evolving requirements:

- CSA N292.0-14, N292.3-14, N292.5-11 focused on radioactive waste management practices.
- CSA N393-13, Fire protection for facilities that process, handle or store nuclear substances.
- REGDOC 2.2.2, Personnel Training.
- REGDOC 2.10.1, Nuclear Emergency Preparedness and Response.
- Certain aspects of RD/GD-210, *Maintenance Programs for Nuclear Power Plants* were proactively incorporated into our facility Maintenance Program.
- Our Public Information Program was revamped to ensure that we meet or exceed the requirements of RD/GD-99.3, *Public Information and Disclosure.*
- CSA N286-12, Management system requirements for nuclear facilities.
- CSA N294-09, Decommissioning of Facilities containing Nuclear Substances.

3.1.2 TRANSITION TO CSA N286-12

- SRBT has analyzed its current management system and established an action plan to become compliant with CSA N286-12.
- As an initial step the SRBT Quality Manual which governs and defines our key processes, management responsibilities and accountabilities was revised in September 2014 to reflect organizational improvements and to provide greater clarity.
- SRBT fully expects to meet the requirements of N286-12 by the end of 2016, and continue to keep CNSC staff informed of our progress towards this goal.

3.2 ORGANIZATIONAL STRUCTURE

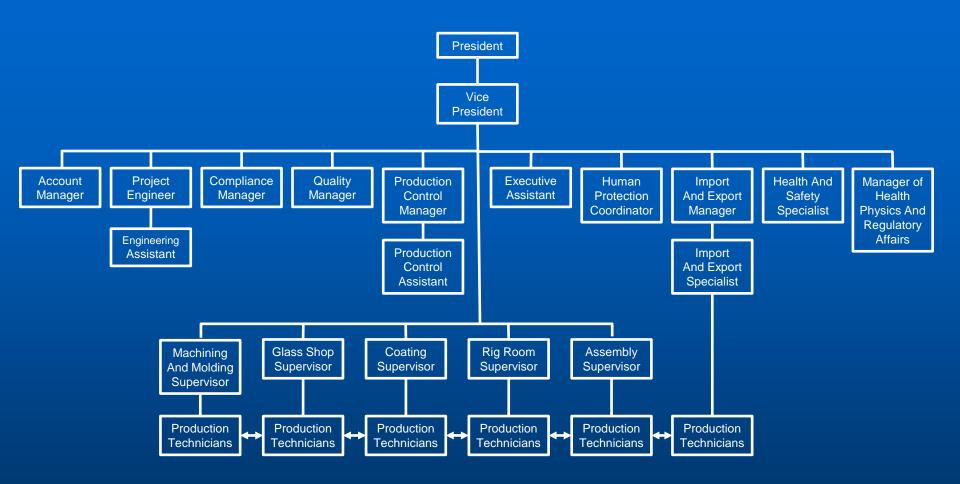


CHART B: SRBT ORGANIZATION

3.2.1 ORGANIZATIONAL CHANGES

Over the term of the current licence, a number of organizational improvements have been made:

- 2012 Import and Export Specialist added.
- 2013 Health and Safety Specialist added
- 2013 Project Engineer added.
- 2013 Production Control Assistant added.
- 2014 Compliance Manager position created.
- 2014 Manager of Health Physics and Regulatory Affairs added.
- 2014 Full time consultant retained.
- 2015 Design Engineer recently added.

3.2.3 COMMITTEE MEETINGS

Organization includes <u>committees</u> which deal with specific areas affecting safety, and are instrumental in the development and refinement of programs and procedures:

- Health Physics Committee.
- Workplace Health and Safety Committee.
- Fire Protection Committee.
- Mitigation Committee.
- Public Information Committee.
- Waste Management Committee.
- Executive Committee.
- Production Committee.
- Training Committee.

3.3 PERFORMANCE ASSESSMENTS, IMPROVEMENTS AND MANAGEMENT REVIEWS

3.3.1 CNSC Compliance Verification

Throughout the term of our current licence, CNSC staff conducted several compliance inspections, facility visits and promotional visits.

As of the end of April 2015, SRBT has zero open action items.

TYPE OF FINDING	2010	2011	2012	2013	2014
Directive	0	0	0	0	0
Action Notice	1	3	3	1	1
Recommendation	2	2	2	1	1

TABLE A: CNSC COMPLIANCE ACTION ITEMS

3.3 PERFORMANCE ASSESSMENTS, IMPROVEMENTS AND MANAGEMENT REVIEWS

Additional Independent Oversight:

- Annual ISO 9001 Audits by our Registrar.
- Frequent Internal Audits.
- Three Ontario Power Generation (OPG) audits.
- Annual Pembroke Fire Department Inspections.
- Annual Fire Protection Consultant Inspections.
- Quarterly Underwriters Laboratories (UL) audits.
- Numerous customer audits.

3.4 HUMAN PERFORMANCE MANAGEMENT

SRBT has always effectively trained our employees in all key aspects of our licenced activities and operations.

REGDOC 2.2.2, Personnel Training published in August 2014.

- New Training Committee established to manage transition to a SAT-based program.
- We have undertaken a comprehensive analysis of all processes to determine activities to be trained systematically.
- SRBT developed a Training Program Manual which was accepted by CNSC staff in March 2015.
- Inaugural cycle of the SAT program scheduled for completion by 2016.



3.4 HUMAN PERFORMANCE MANAGEMENT

Key Training Activities:

- Radiation Protection Training.
- Yearly Fire Extinguisher Training.
- Fire Responder Training.
- Transportation of Dangerous Goods Training.
- Health Physics Training.
- Fire Protection Committee Member Training.
- Health and Safety Training.

3.5 OPERATING PERFORMANCE

3.5.1 Conduct of Licenced Activity

SRBT has continued to safely operate our Class 1B Nuclear Facility throughout the current licence period.

We have added key expertise in critical safety areas, and our programs and processes continue to evolve to meet or exceed regulatory requirements.



FIGURE F: END-SEALING LIGHT SOURCES

3.5 OPERATING PERFORMANCE

3.5.2 Reporting and Trending

- Quarterly reports to CNSC on Environmental Monitoring Program.
- Monthly reports to CNSC staff on Groundwater Monitoring.
- Annual reporting on dosimetry licence.
- Reporting requirements on Import and Export licences.
- Annual compliance reports submitted each year to CNSC staff.
 - Annual Report on the Performance of Canadian Uranium Fuel Cycle and Processing Facilities.
 - SRBT will continue to be in attendance and available to answer questions.
 - Annual Report will be published on SRBT website for all members of the public to obtain.

3.7 PHYSICAL DESIGN

The overall design basis of key structures, systems and components relating to the facility and our licenced activities, and relating to safety, has not changed.

Some component modifications have improved safety and reliability, and reduced the environmental impact of our operations.



FIGURE G: STACK MONITORING SYSTEM

Design modifications to key safety-related equipment have been implemented in a controlled fashion, including risk assessment, commissioning and testing plans, and consideration of training.

3.8 FITNESS FOR SERVICE

Structures, systems and components are maintained 'fit for service'. During the current licence term, there were no significant equipment failures that presented a safety issue.

- Ventilation systems were maintained fully operational.
- Stack flow performance independently verified annually against design requirements.
- Liquid Scintillation Counters were maintained annually and two new units were purchased, installed and commissioned.
- New portable tritium monitors were added.
- Increased the number of stationary area tritium monitors.
- Weather station was maintained as required.

3.8 FITNESS FOR SERVICE

SRBT took several actions as a result of the 'Lessons Learned' at Shield Source Inc.:

- SRBT has elected to <u>increase</u> frequency of stack monitoring verification from every two years to every year.
- Invested in upgrading and modernizing equipment associated with stack monitoring by purchasing and installing:
 - New "Bubblers".
 - New tritium monitors for real-time emissions monitoring.
 - New "digital" data recorder to complement the existing analog "paper" chart recorder for real-time emissions data.

3.9 RADIATION PROTECTION

3.9.1 Annual Worker Dose

DOSE	2010 _{mSv}	2011 mSv	2012 mSv			
Maximum	0.88	1.15	0.80	1.93	1.29	
Average	0.11	0.25	0.11	0.21	0.10	50

TABLE B: ANNUAL WORKER DOSE METRICS

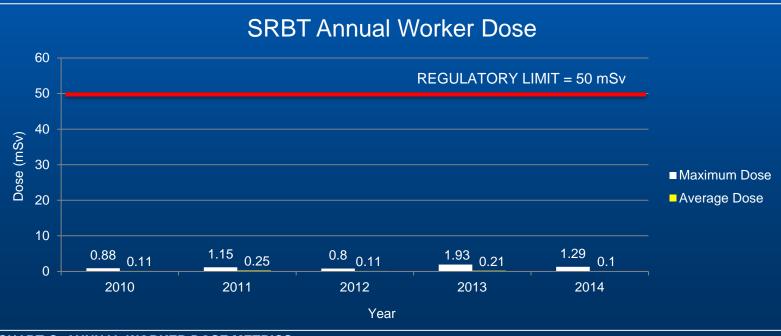


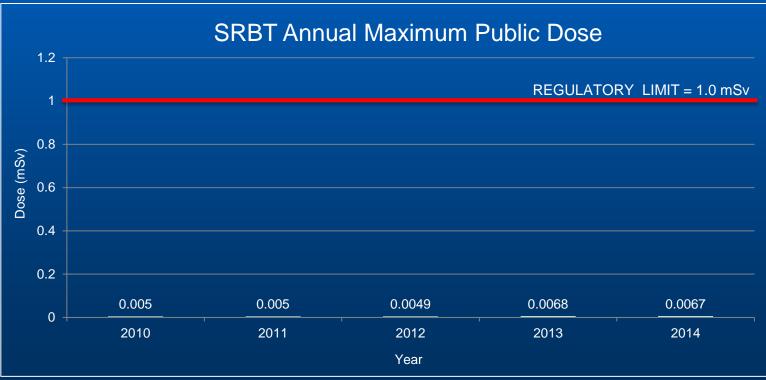
CHART C: ANNUAL WORKER DOSE METRICS

3.9 RADIATION PROTECTION

3.9.2 Annual Maximum Public Dose

DOSE	2010 mSv	2011 mSv	2012 mSv		2014 mSv	
Maximum	0.0050	0.0050	0.0049	0.0068	0.0067	1.0000

TABLE C: ANNUAL MAXIMUM PUBLIC DOSE



3.10 CONVENTIONAL HEALTH AND SAFETY

Lost Time Incidents 2010 – 2014:

	2010	2011	2012	2013	2014
Lost Time Incidents	0	1	0	0	0

TABLE D: LOST TIME INCIDENTS

One lost time incident over licence period in work area where no radiological activities take place. SRBT continues to implement improvements to ensure safety.

Over 30% of our employees are trained in Emergency First Aid, CPR Level 'C' and trained for the use of Automatic Electronic Defibrillators (AED's).



FIGURE H: AED STATION AT SRBT

3.11 ENVIRONMENTAL PROTECTION

• Annual emission of HTO + HT maintained < 18% of licence limit:

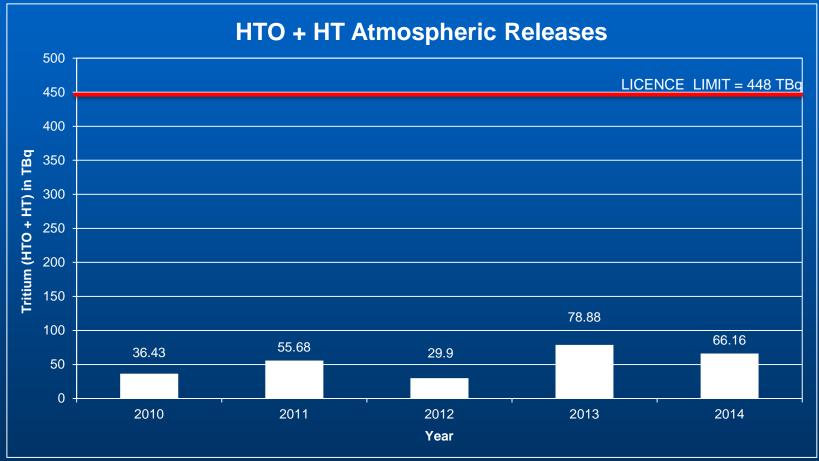


CHART E: TOTAL ATMOSPHERIC RELEASES

• Annual emission of HTO maintained < 27% of licence limit:

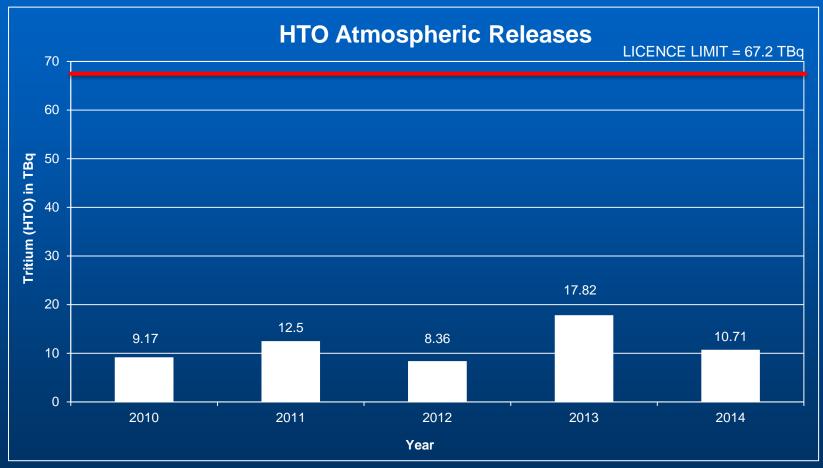


CHART F: TRITIUM OXIDE ATMOSPHERIC RELEASES

Ratio Tritium Released to Processed 2010 – 2014:

	2010	2011	2012	2013	2014
Tritium Released (HTO + HT; TBq)	36.43	55.68	29.90	78.88	66.16
Tritium Processed (TBq)	6,643.73	7,342.45	10,224.59	30,544.80	28,714.12
Released : Processed (%)	0.55	0.76	0.29	0.26	0.23
Change from Year Previous (%)	-31	+38	-62	-10	-12

TABLE E: RELEASED TO PROCESSED RATIO

Ratio Tritium Released to Processed 2010 – 2014:

	2010	2011	2012	2013	2014
Released : Processed (%)	0.55	0.76	0.29	0.26	0.23

TABLE F: RELEASED TO PROCESSED RATIO

SRBT has been successful in reducing this ratio over the last several years, from 1.70% in 2008 down to 0.23% in 2014.

For the first 16 weeks of 2015, this ratio stands at 0.15%.

This ratio is an excellent indicator of the overall effectiveness of our emission-reducing initiatives.

3.11.2 Liquid Effluent 2010 - 2014

	2010 _{ТВq}	2011 твq	2012 _{ТВq}	2013 _{ТВq}	2014 _{ТВq}	
Tritium – Water Soluble (TBq)	0.007	0.008	0.012	0.009	0.013	0.200

TABLE G: ANNUAL LIQUID EFFLUENT

Throughout the term of the existing licence, liquid emissions were maintained at less than 7% of our annual licence limit.

3.11.3.2 Groundwater Monitoring

- Program in place since 2006. Includes sampling by a third party of several monitoring wells and residential wells.
- Highest average residential well in 2014 was measured at 217 Bq/L and continues to trend downward. This concentration is well below the Ontario Drinking Water Guideline value of 7,000 Bq/L.
- Of the 34 monitoring wells, at end of 2014 only 2 wells exceeded the Ontario Drinking Water Guideline value. Both wells are located on the SRBT site within 50 m of the stack.
- Concentrations are expected to gradually decrease with decay and hydrogeological processes.

3.11.3 ENVIRONMENTAL MONITORING

An independent third party also collects and analyzes samples as dictated by SRBT's Environmental Monitoring Program:

- 40 air monitoring stations located within 2 km of the facility.
- 8 precipitation monitors.
- Produce sampling from local gardens and local market.
- Local milk.
- Local wine.
- Muskrat River.

Data is used to calculate the maximum dose to a member of the public as a result of the emissions from SRBT.

3.12.1 Fire Protection

- Fire Protection Committee meets at least every quarter.
- Program revised three times during licence term.
- Gap analysis CSA N393-13, Fire protection for facilities that process, handle, or store nuclear substances.
- Action plan accepted by CNSC staff and continues to be executed in close consultation with third party experts.
- Quarterly maintenance of facility sprinkler system.
- Monthly fire protection equipment inspections.
- At least 5 fire drills were conducted every year.

3.12.2 Emergency Preparedness

- SRBT has developed, implemented and maintained an Emergency Plan.
- Plan revised twice during licence term, once as a result of the 'Lessons Learned' from the disaster at Fukushima-Daiichi.
- Then performed a gap analysis between our Emergency Plan and REGDOC 2.10.1, *Nuclear Emergency Preparedness and Response* and submitted an action plan which was accepted by CNSC staff.
- Revision of Emergency Plan to REGDOC 2.10.1 expected to be submitted in September 2015.

3.12.2.2 Emergency Exercise

- SRBT conducted a full-scale emergency training exercise on February 9, 2015.
- Conducted in concert with Pembroke Fire Department and the City of Pembroke, and was observed by CNSC staff.
- Simulated emergency situation in Zone 2 where tritium light sources are installed into safety signs and devices.
- Response deemed acceptable, SRBT identified only minor improvement opportunities, but no safety concerns.

3.12.2.2 Emergency Exercise



FIGURE I: EMERGENCY EXERCISE, FEBRUARY 9, 2015

3.13 WASTE MANAGEMENT

- Latest revision of Waste Management Program accepted by CNSC staff on March 3, 2015.
- Expanded procedure set focused on processes outlined in CSA N292-series of standards.
- Between 2010 and 2014, SRBT made 23 low-level waste consignments to licenced waste management facilities.
 - All waste shipments reported as part of Annual Compliance Reports (ACR).
- Waste Management Committee focused on reducing all types of facility waste generation.

3.14 SECURITY

- No security-related events throughout the current licence term.
- SRBT continues to maintain a Security Program in accordance with regulatory requirements and expectations.
- Security enhancements and upgrades to improve nuclear security.
- Maintenance of security systems performed by independent third-party at least every six months.
- All minor issues identified during Physical Security inspections by CNSC staff promptly addressed.

3.15 SAFEGUARDS AND NON-PROLIFERATION

- In addition to tritium processing, SRBT possesses, uses, stores and manages an extremely small quantity of depleted uranium. Currently have 3.3 kg in loose form and less than 6.0 kg in total on site.
- Depleted uranium is used in our containers that store and dispense tritium gas in our processing equipment.

3.16 PACKAGING AND TRANSPORT

3.16.1 Import and Export Activities

- Required to obtain import and export licenses for international shipments.
- All requirements relating to import and export controls continue to be met.



FIGURE J: PACKAGING

3.16 PACKAGING AND TRANSPORT

3.16.2 Shipping Activities

- In 2014, 1,122 shipments were made to 19 countries.
- Approximately 90% of our shipments are destined for customers in Canada or the USA.
- No transport incidents involving our packages have occurred over the term of the licence.
- SRBT continues to comply with all requirements.



OTHER MATTERS OF REGULATORY INTEREST

4.1.1 Direct Interaction with the Public

- 98 plant tours between 2011 and the end of 2014, 28 tours conducted so far in 2015.
- Received only two inquiries from members of the public during the current licence term up until the end of 2014.
- Information pamphlet and licence renewal information sent to various stakeholders including those living within 500 meters of the facility.
- Information pamphlet later sent to 10,000 residences, businesses and establishments in Pembroke and Laurentian Valley.
- Door to door campaign of 369 residences, 76 individuals that were at home expressed very little to no concern.

4.1.2 Public Information Program

- Revised on August 1, 2014 to address comments received from CNSC staff.
- Also revised to reflect requirements of RD/GD-99.3, *Public Information and Disclosure,* published by CNSC in 2012.
- CNSC staff approved Public Information Program Rev. 8 on October 31, 2014, deeming it <u>fully satisfactory</u>.

4.1.3 Public Information Committee

- Committee managed program throughout current licence term.
- Meetings held quarterly to discuss public opinion, media coverage and discuss Public Information Program and Public Disclosure Protocol.
- Former Mayor of Pembroke, who served Pembroke for 18 years including 3 terms as Mayor and 2 terms as Deputy Mayor is now employed by SRBT and is a member of the Committee.
- SRBT has recently invited members of the Concerned Citizens of Renfrew County (CCRC) and of the First Six Years organization to be part of our Public Information Committee.

- Website was frequently updated throughout the current licence term.
- Complete website redesign recently launched.
 - Public notifications regularly posted.
 - Licence and Licence Conditions Handbook posted.
 - Annual Compliance Reports posted.
 - Monitoring results posted, including passive air samplers, air emissions, produce sampling, and groundwater.
 - Details of main Presentations and meetings posted.
 - Information on tritium and radiation posted.
 - Emergency Preparedness information posted.
 - Community support and involvement initiatives.
- Facebook page developed and linked to website.

номе	OUR COMPANY & VISION	PRODUCTS	DISPOSAL & RECYCLING	TRANSPORT	PUBLIC DISCLOSURE PROTOCOL	PUBLIC NOTIFICATIONS	SEARCH SITE	CONTACT US
		-				⊠No V		
SRB CTTP No Electricity								
	150 900	1	EZ.	\square^2		⊠No I	Maintenan	ce
	- <mark>1</mark> 2							
			100		-			
		CDD	Dart o	f Vour	Commi	mitu		
		ShD,	Parto	Tour	Commu	uncy	f	Join Us On acebook
PAMPHLET & BROCHURE	LICENCE & HANDBOOK	ANNUAL COMPLIANCE REPORTS	OTHER REPORTS & MONITORING RESULTS	PRESENTATIONS & MEETINGS	TRITIUM	PUBLIC SURVEYS	EMERGENCY PREPAREDNESS	COMMUNITY

FIGURE K: www.srbt.com

4.2 COST RECOVERY

- SRBT fully complied with repayment schedule stipulated in our current licence.
- Final payment and total cost adjustments paid on September 25, 2013.
- Regular payments are now made and SRBT is in full compliance with the Cost Recovery Fees Regulations.

4.3 FINANCIAL GUARANTEE

4.3.1 Current Funding

- CNSC-approved Financial Guarantee (FG) on June 26, 2008 based on previous revision of Preliminary Decommissioning Plan (PDP).
- Final installment in April 2014 brought account held in escrow to \$550,476 and building interest.
- 4.3.2 Proposed Funding
 - Hired contractors directly involved with decommissioning of Shield Source Inc.
 - SRBT PDP then revised in late 2014.
 - Required FG now \$652,488, an increase of \$102,012.
 - SRBT proposes 6 equal payments of \$17,002 to fund revised FG, to be made every six months to escrow account beginning in October 2015.

4.4 FUTURE OUTLOOK

- Committed to Product Development in Safety Applications where we are ensuring that our products are developed with a focus on contributing to the safety of people in situations where reliable illumination is needed.
- Committed to Research of Emission Reduction Initiatives where no less than 5% of our annual profit over our new licence term shall be allocated to researching and implementing emission-reduction strategies and technologies.
- Committed to Integration with Scientific and Nuclear Community to advance education, our emission reduction and environmental monitoring initiatives.
- Committed to Reduction of Occupational Doses where we will continue to strive to lower doses to all of our workers below the public dose limit of 1 mSv.

CONCLUSION

- Throughout the term of the current licence, SRBT has operated the igodolFacility safely and in accordance with the provisions of the licence and the Nuclear Safety Control Act (NSCA) and Regulations.
- SRBT has demonstrated its commitment and integrity by the work \bullet described in this submission.
- SRBT has demonstrated that it will continue to make improvements \bullet in the future by the various initiatives, goals and targets described in this submission and based on input and concerns raised by the CNSC, members of the public and our employees.
- We therefore believe that under Section 24(4) of the NSCA, SRBT: ightarrow
 - Is qualified to carry on the activity for which it has applied. igodol
 - Will, in carrying on that activity, make adequate provision for the igodolprotection 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. 59

