



Re: Radiation Safety Institute of Canada Credentials Documentation Package in Support of the Application Submission for the Employer Training Grant/ Radiation Safety Officer (RSO) course.

Please find attached for your review the Institute's documentation package in support of the Training Grant Application under the **Canada Job Grant Program** administered by your Province.

About the Institute

The Radiation Safety Institute of Canada was incorporated in 1980 under the laws of Canada as a not-for-profit corporation. It is the organization's mission to promote radiation safety in the workplace, home, and environment. Over the past four decades, the Institute has earned recognition as a leading radiation and X-Ray safety training provider in Canada. The exceptional quality of our courses is what sets us apart and attracts regulators, workers and employers alike to participate in our educational programs.

Course Information

Radiation Safety Officer course is a legal requirement for working with nuclear sources. It is designed to provide certification for radiation safety personnel for companies and institutions using radioactive materials under Canadian Nuclear Safety Commission (CNSC) regulation and those planning to acquire a CNSC licence. The course develops new technical safety skills and allows course participants to take charge of the CNSC licence, their own safety and that of their co-workers.

Our 35-hour certificate course is recognized by the federal regulatory agency (CNSC) and is delivered by a qualified, senior radiation scientist in a classroom over a weeklong period. Please see attached documentation for the detailed training schedule. Upon successful completion of the course and all exams, graduates will receive an official certificate authorized by the Institute's Chief Scientist. All records of participation and exam results are kept on file by the Institute.

Fall-winter 2018 semester registration fee and course schedule are as follows:

- Toronto September 17-21, 2018 \$2,199.00 (CAD)
- Toronto November 26-30, 2018 \$2,199.00 (CAD)

Please note that all prices, schedules and outlines are posted in the training section of the RSIC website at www.Radiationsafety.ca. For ease of reference please see screen shots attached.

Trainer Qualifications

The Institute is highly selective about its educational staff. All our educators have a minimum of a master's degree in Health Physics and a minimum of 10 years of teaching experience. We apply the latest adult education teaching techniques and standards to our courses. The trainers' bios are attached.

Contact Information for the Provincial Grant Administrators

If you have any questions about the Institute's eligibility as training provider, please contact our Executive Director, Natalia Mozayani: Tel: 416 650 9090 ext 28 or nmozayani@radiationsafety.ca

Radiation Safety Officer Course - Detailed Outline

The Radiation Safety Institute of Canada offers a 5-day **Radiation Safety Officer Course**. Each day is divided into sessions which consist of a 50 minute presentation followed by a 10 minute refreshment break. Participants are encouraged to ask questions and participate in discussions during the presentations. Instructors are also available to answer questions and discuss material during the break times.

The following is an outline of the sessions covered in the course.

Scientific and Technical Sessions:

Introduction to Matter and Radiation

- Atoms
- Elements
- Isotopes
- Nuclear radiation
- Radioactivity
- Ionizing radiation

Nature of Radiation and Radioactivity

- Alpha radiation
- Beta radiation
- Gamma radiation
- X-rays
- Activity
- Half-life

Radiation Interactions and Neutron Radiation

- Direct Ionization
- Indirect Ionization
 - Photoelectric Effect
 - Compton Effect
 - Pair Production
- Neutron Radiation
 - Ionization by neutrons
 - Fission
 - Elastic and Inelastic Scattering
 - Activation

Radiation Quantities and Units

- Energy
- Exposure
- Absorbed Dose

- Equivalent Dose
- Effective Dose

Biological and Health Effects of Exposure to Radiation, Part I

- Radiation effects on tissues
- Direct and Indirect damage
- Cellular biology
- Hereditary effects
- Somatic effects

Biological and Health Effects of Exposure to Radiation, Part II

- Deterministic effects (Acute Exposure and Radiation Effects on Organs)
- Sources of radiation exposure
- Occupational exposures
- Medical exposures
- Effects on the foetus

Radiation Instrumentation: Gas-Filled Detectors

- Detecting radiation
- Gas-filled detectors
 - Ionization chambers
 - Proportional counters
 - Geiger-Müller counters

Radiation Instrumentation: Other Detectors and Instrument Selection

- Scintillation detectors
- Neutron detectors
- Instrument selection

Radiation Instrumentation: Dosimeters

- Thermoluminescent dosimeters
- Optically stimulated luminescent dosimeters
- Film badges
- Pocket dosimeters
- Electronic dosimeters
- Regulatory requirements

Regulations and Regulatory Requirements Sessions:

Nuclear Safety and Control Act

General Nuclear Safety and Control Regulations

Radiation Protection Regulations

Nuclear Substances and Radiation Device Regulations

Packaging and Transport of Nuclear Substances Regulations

Nuclear Substances and Radiation Device Licensing

- Types of Licences
- Exemptions
- Introduce licensing concept
- Discuss general licensing requirements
- Licence application

Regulatory and Standards Organizations

- Canadian organizations
- International organizations
- US organizations

Organization and Administration of Radiation Safety Programs

- ALARA
- Radiation Safety Organization Structure
- Executive and Senior Management
- Radiation Safety Committee
- Radiation Safety Officer
- Permit Holders/Authorized Users
- Radiation Users/Employees
- Radiation Safety Program

Radiation Protection Sessions:

External Exposure to Radiation

- ALARA principle
- Principles of radiation protection
- Shielding

Internal Exposure to Radiation

- Internal radiation exposure
- Distribution of radionuclides in the body
- Effective half-life
- Toxicity
- Annual limit on intake
- Derived air concentration

Employee Qualifications and Performance

- Worker classifications
- Training requirements

Operating Procedures

- Nuclear material management
- Receipt of packages
- Safety rules
- Waste management and disposal

Contamination Control

- Radioactive contamination
- Surface contamination
 - Loose
 - Fixed
- Measuring contamination
- Regulatory limits
- Decontamination

Controlling Exposure to Radiation

- Leak testing
- Air sampling
- Good work practices
- Personal protective clothing
- Respiratory protection

Emergency Management

- Incidents and Emergencies
- Spills
- Radiation accidents

Transportation of Dangerous Goods

- Training requirements
- Dangerous goods classes
- UN number and shipping name
- Shipping document
- Placards and labels
- Accidental release
- Reporting
- ERAP

Transportation of Radioactive Materials

- Regulations
- Package types
- Package testing
- Package labels
- Transportation documents
- Example

Inspections, Audits and Investigations

- CNSC Inspections/Audits
- Internal Inspections
- Internal Reviews
- Investigations
- Radiation Safety Self-Audit Check List

Nuclear Gauges

- Nuclear gauge types
- Applications
- Radiation safety

Radiation Safety Officer (RSO-1)



Our five-day **Radiation Safety Officer (RSO-1)** training is the premiere course of its kind in Canada and is designed to provide certification for radiation safety personnel for companies and institutions using radioactive materials under Canadian Nuclear Safety Commission (CNSC) regulations.

If you are responsible for workplace radiation safety within your organization, you owe it to your fellow employees to benefit from this highly acclaimed program.

BONUS! Transportation of Dangerous Goods Certificate!

Along with the RSO Certificate now you will be getting a TDG Certificate.

How you learn [^ hide details](#)

You learn in a friendly classroom setting over a period of five days from **our knowledgeable Education Team**. Each day has several learning sessions. Appropriate refreshment breaks are included. Your learning is enhanced by lively discussions and video presentations.

When you complete the course requirements and pass the final exam, you will receive the Radiation Safety Institute of Canada's Radiation Safety Officer (RSO-1) Certificate. You will also be eligible to write the Canadian Radiation Protection Association's professional registration exam.

30.75

Category A credit*

**The Canadian Association of
Medical Radiation Technologists**

*CAMRT Credits are recognized by the ARRT, The ASRT, and all Provincial Associations under the CAMRT umbrella.



Download 2018 RSO Brochure

Subjects Covered [^ hide details](#)

- Structure of matter
- Radiation and radioactivity
- Radiation quantities and units
- Radiation detection, instrumentation and dosimetry
- Biological and health effects of exposure to radiation
- Radiation protection principles and practices, including contamination control
- Hands-on exercises in the practical application of radiation protection principles
- Nuclear gauges and their applications
- Workplace radiation safety program: organization and administration
- Emergency procedures
- Employee training
- Transport of radioactive materials
- Workplace inspections and audits
- Regulatory agencies and standard-setting organizations
- Licensing of nuclear substances and radiation devices
- Key sections of the Nuclear Safety and Control Act and Regulations

Course Location [^ hide details](#)

Toronto: National Education Center Location 165 Avenue Road, Suite 300, ON M5R 3S4

Accommodation The Eaton Chelsea Hotel, 33 Gerrard Street W, is pleased to offer the rate of \$155+tax per night to our course participants. Once your course registration has been confirmed a link to the Eaton Chelsea will be sent to you. Please note, proof of your registration will be required upon hotel check-in.

The hotel is located 2 km from the Institute and a daily complimentary shuttle service will be provided to and from the hotel, departing at 8:30am and returning by 5:00pm.

Saskatoon: National Laboratories Location Innovation Place Research Park, 102 – 110 Research Drive, SK S7N 3R3

Accommodation For recommended hotels please contact Jolene Miner (306) 975 0566 ext 221

Vancouver: Sutton Place Hotel 845 Burrard Street, Vancouver, BC, V6Z 2K

Accommodation For recommended hotels please contact Maria Cost (416) 650 9090 ext. 21

Train your colleagues yourself!

To help RSO-1 graduates train workers at their company or institution, we offer an efficient, ready-to-go training tool on CD, *"Basics of Radiation Safety"*. We have a special price for RSO-1 graduates of \$299.00 (plus HST). Learn more about the **Employee Learning Module**.

RSO-1 not for you?

If you find that RSO course is not what you need, please take a moment to look at **other radiation safety courses we offer**.

Contact Information

Tara Hargreaves

Staff Scientist and Manager of Training

Tel: (416) 650 9090 ext. 23 | Fax (416) 650 9920 | Email: thargreaves@radiationsafety.ca

Cancellations | The following administrative fees will apply to course registration refunds:

- 20% of course fee if cancelled 14 days prior to the scheduled date
- 50% of course fee if cancelled less than 14 days prior to the scheduled date
- No refunds will be issued if cancelled on the day of the course

	Price	Qty
Toronto February 26-March 2, 2018	\$2,199.00 (CAD)	Expired
Vancouver April 9-13, 2018	\$2,199.00 (CAD)	Expired
Toronto April 23-27, 2018	\$2,199.00 (CAD)	Sold Out
Saskatoon May 14-18, 2018	\$2,199.00 (CAD)	Expired
Toronto June 11-15, 2018	\$2,199.00 (CAD)	Expired
Toronto September 17-21, 2018	\$2,199.00 (CAD)	0 ▼
Toronto November 26-30, 2018	\$2,199.00 (CAD)	0 ▼

Add to Cart

Biographical Note

Curtis Caldwell, PhD Medical Physics, Medical Biophysics Chief Scientist

Dr. Caldwell has over 25 years of experience as a Medical Physicist and Radiation Safety Consultant. Before joining the Institute, he held positions as a hospital-based Radiation Physicist and Corporate RSO, as well as being a Class II RSO for a commercial cyclotron facility.

Dr Caldwell earned his M.Sc. in Medical Physics at McGill University in Montreal (1984) and his PhD in Medical Biophysics at the University of Toronto (1990). He is an active member in good standing of the Canadian College of Physicists in Medicine, Nuclear Medicine Physics and an Adjunct Professor in the Department. of Medical Imaging, College of Medicine, University of Saskatchewan.

Through a consulting firm, he has previously provided radiation safety services to numerous Nuclear Medicine and X-ray facilities across Canada, as well as to industrial users of large x-ray and/or radioactive sources. He has held academic appointments in the Departments of Medical Biophysics and Medical Imaging, University of Toronto, as well as the Department of Physics, Ryerson University. Dr. Caldwell has been active in academic research, having more than 100 peer-reviewed publications.

Dr Caldwell is a highly experienced and effective educator. When the schedule allows, he is taking part in the delivery of the Institute's flagship Radiation Safety and X-Ray Safety Officer courses. He leverages decades of academic and hands-on field experience to actively contributed to the course curriculum development. His ability to present complex radiation safety issues in plain language is unparalleled.

As Chief Scientist, Dr. Caldwell is responsible for providing direction to the Institute's scientific staff, including Radiation Protection Services, National Laboratory Operations, and National Education Programs.

Biographical Note

Brian Bjorndal, BSc, MSc
Manager of National Laboratories

Brian Bjorndal brings over 20 years of experience in radiation safety and occupational health and safety in industry, academia and research. Before joining the Institute, he held positions as Director, Workplace Safety and Environmental Protection with the University of Saskatchewan, and Manager Safety and Radiation with AREVA Resources. He managed the Institute's National Laboratories during its formative years and was instrumental in the development and licensing of the Institute's Personal Alpha Dosimetry service with the Canadian Nuclear Safety Commission.

Brian Holds a Master of Science degree in Nuclear Physics. He is a member of such professional organizations as: the Canadian Association of Physicists (CAP), Canadian Society of Safety Engineers (CSSE), Canadian Radiation Protection Association (CRPA), Health Physics Society (HPS) and the Saskatchewan Environmental Industry and Managers Association (SEIMA).

Brian was instrumental in the development of the Institute's first radiation and x-ray safety training courses in the 1990s. Upon returning to the Institute in 2017, Brian continued to teach and contribute to the course curriculum improvement. He enjoys sharing his practical radiation safety experience with the Institute's students and is passionate about the quality of the training programs offered.

Brian supports the extensive consulting services provided by the organization in a wide range of radiation protection and health and safety areas. These include research, environmental assessments, radiological modelling, dosimetry, programs audit/review and development, field monitoring and assessment, emergency preparedness and response, information systems development in health physics, equipment testing, and licensing.

As Manager and Scientist for the National Laboratories, a federally licensed facility with the Canadian Nuclear Safety Commission, Brian Bjorndal provides leadership and oversight of the National Laboratories staff and operations in the field of radiation safety.

Biographical Note

Tara Hargreaves, BSc, MSc Staff Scientist and Manager of Training

Scientist, training developer, and highly effective course instructor with 10 year of teaching experience. Tara Hargreaves is also knowledgeable in the practical application of radiation protection principles in a variety of industrial and institutional settings.

Ms. Hargreaves has participated in developing and updating various radiation safety training courses for the Institute. She was a key member in the development of the Institute's X-Ray Safety Officer (XSO) course. She was also instrumental in having the Institute's RSO-1 course approved by the Canadian Radiation Protection Association (CRPA) as satisfying eligibility requirements for their professional registration exam.

As an instructor for the Institute's courses, including the week-long Radiation Safety Officer Course, that include Transportation of Dangerous Goods (TDG) certification and the two-day X-Ray Safety Officer Course, Ms. Hargreaves has received high praise from course participants. Her clear speaking style, various illustrative examples, as well as her humorous approach, are among the qualities that course participants greatly appreciate. Ms. Hargreaves has travelled across the country to deliver the Institute's radiation safety courses.

In addition to teaching, Ms. Hargreaves is also experienced in conducting EMF surveys. She was a member of the Institute team that conducted a major EMF survey at the Bruce Nuclear Power Station. On behalf of the Institute, she has also conducted a number of EMF surveys for various Institute clients, from small businesses to large organisations.

Ms. Hargreaves also responds to general inquiry calls at the Institute's head office in Toronto. She provides information to radiation professionals as well as members of the public on a wide range of topics from regulatory obligations to health concerns from radiation exposure.

Ms. Hargreaves holds an Honours BSc in physics and mathematics, and an MSc in physics. She is a member of the Canadian Radiation Protection Association, the Health Physics Society, and has been certified as a Radiation Safety Officer (RSO) by the Institute. She has also completed a course on Quality Control Testing from the Michener Institute.

Biographical Note

Laura Boksman, BSc, MSc
Senior Consulting Scientist

Laura Boksman has over 15 years experience in the nuclear industry in radiation protection as a Health Physicist. She started working in Health Physics at Cameco Corporation, helping with an Environmental Assessment for processing of McArthur River ore (20%) at the Rabbit Lake mill (used to 2% ore). Following this, Laura worked as an Operational Health Physicist at Atomic Energy of Canada's Chalk River Laboratories (CRL), ensuring that work was done safely in various environments including radioisotope laboratories, plutonium fuel fabrication facilities, waste management areas, effluent monitoring, and others. While at the CRL, Laura was a leader of the Radiological Assessment Team, which was on call to deal with any transportation accidents involving radioactive material that occurred in the CRL response area. Laura also provided radiation protection training of the staff on the team, and in other areas of site. In 2011 Laura transferred to the AECL office in Port Hope, to be the Radiation Protection Program Manager for the Port Hope Area Initiative project. There she was involved in staff training, and ensuring that radiation protection program was fully implemented to protect the workers, the public, and the environment as the project proceeded.

Ms. Boksman has a Bachelor of Science Degree in Physics (Medical/Health Option) from McMaster University and a Masters Degree in Medical Biophysics from the University of Western Ontario.

Laura is an experienced instructor, having taught many radiation safety courses and emergency preparedness courses at AECL. Her track record of success includes roles in operational health physics, laboratory management, sampling and analysis, emergency management, training, dosimetry and nuclear waste management and decommissioning.

As the Senior Consulting Scientist of the Radiation Safety Institute of Canada, she is engaged in training and education. Under the leadership of Dr. Curtis Caldwell, RSIC Chief Scientist, Laura provides advice and consulting services on a wide range of radiation protection subjects to the Institute's corporate clients, the government and members of public.