Radiation Safety Institute of Canada
Institut de radioprotection du Canada

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Re: Radiation Safety Institute of Canada Credentials Documentation Package in Support of the Application Submission for the Employer Training Grant/ X-Ray Safety Officer (XSO) 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 decades, the Institute 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
X-Ray Safety Officer course is essential for working with X-Ray emitting devices, it develops new technical safety skills and allows course participants to take charge of their own safety and that of their co-workers. The course takes **3 days** and **21 hours** to complete. Please see attached documentation for the detailed training schedule. This is a certificate course. At the end of day 3 participants who have passed the exam will receive a formal individualized certificate signed by the Institute's Manager of Training. Record of their participation and the exam result shall be kept on file by the Institute.

The remaining 2021 registration fee and course schedule are as follows:

- July 5-7, 2021 Eastern Time $1,540.00 (CAD)
- October 19-21, 2021 Eastern Time $1,540.00 (CAD)

Please note that all prices, schedules, and course 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 and no less than 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 regarding RSIC eligibility as training provider, please do no hesitate to contact our Administrator Maria Costa: Tel: 416 650 9090 ext. 21 or mcosta@radiationsafety.ca.

Attachments: Course Outline
Course Brochure
Course Page print screen
Trainers' bios

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Session/Lecture 3: CAMRT CE Credit Submission
X-Ray Safety Officer (XSO)

The Radiation Safety Institute of Canada offers a 3-day **X-Ray 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

Understanding Radiation
- Activity
- Half-life
- Alpha
- Beta
- Gamma
- X-rays
- Photon interactions

Radiation Quantities and Units
- Energy
- Exposure
- Absorbed Dose
- Equivalent Dose
- Effective Dose

Fundamentals of Electricity
- Current flow
- Voltage
- Resistance
- Power
- Other circuit components
- Direct (DC) vs. alternating current (AC)

X-Rays: Radiation Made by Machine
- What are X-rays?
- How are X-rays produced?
- X-ray spectra

- Description of an X-ray machine
- Types of X-ray machines

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

X-Ray Systems
- Overview
- X-ray tube construction
- Extra-focal radiation
- Timing control
- Power and loading ratings

Radiation Instrumentation
- Detecting radiation
- Gas-filled detectors
- Scintillation detectors
- Instrument selection

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

Regulations and Regulatory Requirements Sessions:

Radiation Emitting Devices Act and Regulations

Provincial X-Ray Safety Regulations
- Jurisdiction
- Enforcement
- X-ray worker
- Registration
- Employer's obligations
- Radiation dose limits
- Shielding
- Overexposure

Radiation Protection Sessions:

Scattering and Attenuation of X-Rays
- Scattered radiation
- Build-Up radiation
- Attenuation of X-rays
- Half-value layer

Radiation Protection: Principles and Practices
- ALARA
- Radiation exposure
- Radiation protection principles
- Shielding issues
- WUT product
- Collimation

X-Ray Imaging and Safety Survey
- Issues and definitions
- Exposure and image quality
- Jurisdiction
- Inspection and compliance

X-Ray Safety Officer (XSO) Online Course

IMPORTANT: **All our courses are delivered online with 100% live instruction**

About the Course

if you are responsible under provincial and federal regulations for the safety of employees exposed to X-rays in the workplace, the Radiation Safety Institute of Canada offers a three-day **X-ray Safety Officer (XSO)** course.

17.75

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.*

Watch this 1-minute video on our upcoming X-ray Safety Officer Course in Vancouver

Download 2021 XSO Brochure

Your Legal Obligations

Across Canada, many employers and employees responsible for workplace safety are not fully aware of regulations governing the use of X-ray equipment in the workplace. Yet, every province and territory has such regulations. These regulations have the force of law. For example, in most provinces, regulations require that an employer designate and provide the name of a qualified person to oversee the safe use of X-ray equipment. Federal regulations also apply. When you complete the requirements

of the three-day X-ray Safety Officer (XSO) course and receive your XSO Certificate, you will be more knowledgeable about your employer's legal obligations and more confident about your ability to meet them.

How you learn hide details

Online: The sessions held online are designed to recreate the in-class experience as much as possible. The course is delivered live through an online meeting platform, led by our experienced instructors. Participants are encouraged to ask questions and instructors are available to offer assistance. Breaks are offered throughout the day, including one hour for lunch. Please note that the timing of the course is set for the time-zone of the course location. For example, if the course location is specified as Toronto, the course will begin at 9:00 am Eastern time and the lunch break will be around noon Eastern time. All course materials will be provided electronically and certificates will be emailed to participants within a week after the end of the course.

Classroom: You learn in a friendly classroom setting over a period of three 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.

Subjects Covered hide details

- Structure of matter
- Understanding radiation
- X-rays: radiation made by machine
- Radiation quantities and units
- Biological and health effects of exposure to X-rays
- X-ray systems, X-ray imaging and safety survey
- Scattering and attenuation of X-rays
- Radiation detection, instrumentation and dosimetry
- Radiation protection principles and practices
- Hands-on exercises in the practical application of radiation protection principles
- What the law requires: Key federal, provincial and territorial regulations on x-ray safety

Course Location show details

XSO not for you?

If you find that XSO 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

Details	Price	Qty
July 5-7, 2021 *Online* 9am EDT start time	$1,540.00 (CAD)*	0
October 19-21, 2021 *Online* 9am EDT start time	$1,540.00 (CAD)*	0

* price before applicable taxes

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Biographical Note

Tara Hargreaves, BSc, MSc
Staff Scientist and Coordinator – Training Program

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 new 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

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. Hel 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 of such professional organization 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 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

Lynn MacDonald, BSc, BEd, MSc, OCT
Scientist

Lynn MacDonald is a scientist at the Radiation Safety Institute of Canada. In this role, she educates workers in ionizing radiation safety including the related science and legislation. She works as a part of the scientific team to design, edit, and prepare materials for educational and consulting services, review relevant materials to include on the company website, and answer enquiries received through the Institute's free information service. She is the lead in the Institute's project to convert current in-person radiation awareness courses to SCORM-compliant e-Learning courses.

Mrs. MacDonald comes to the Institute with an extensive teaching background. She had a successful teaching career in the public school system in Prince Edward Island, with 12 years of experience as a high school teacher including positions as department head and vice principal. Before this, she worked in adult education and web design. In 2009, she returned to graduate school at the University of Toronto to obtain her MSc in physics.

Her scientific training included work in condensed matter physics and biophysics. Her experimental physics research projects were in the areas of scanning tunneling microscopy (STM) of liquid cultures, non-linear pattern formation, and cellular biology in micro-fluidic systems. She is highly computer literate and has learned to program in many computer languages.

A believer in life-long learning, Mrs. MacDonald can relate well to training clients and their needs. Her strong scientific background and experience teaching to various learners allows her to translate technical subject matter into information usable to the trainee when they return to their workplace. Her skills as a professional teacher have been positively received by our course participants.