Radiation Safety Institute of Canada
Institut de radioprotection du Canada

Common Errors to Avoid in Your X-Ray Plan Application to the Ontario MLITSD

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Webinar Functionality

Audio and video

- During the presentation, from the presenters only
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Use the Chat feature to talk to discuss with everyone

Use Q&A feature to ask questions for Q&A portion

Posted on webinar page

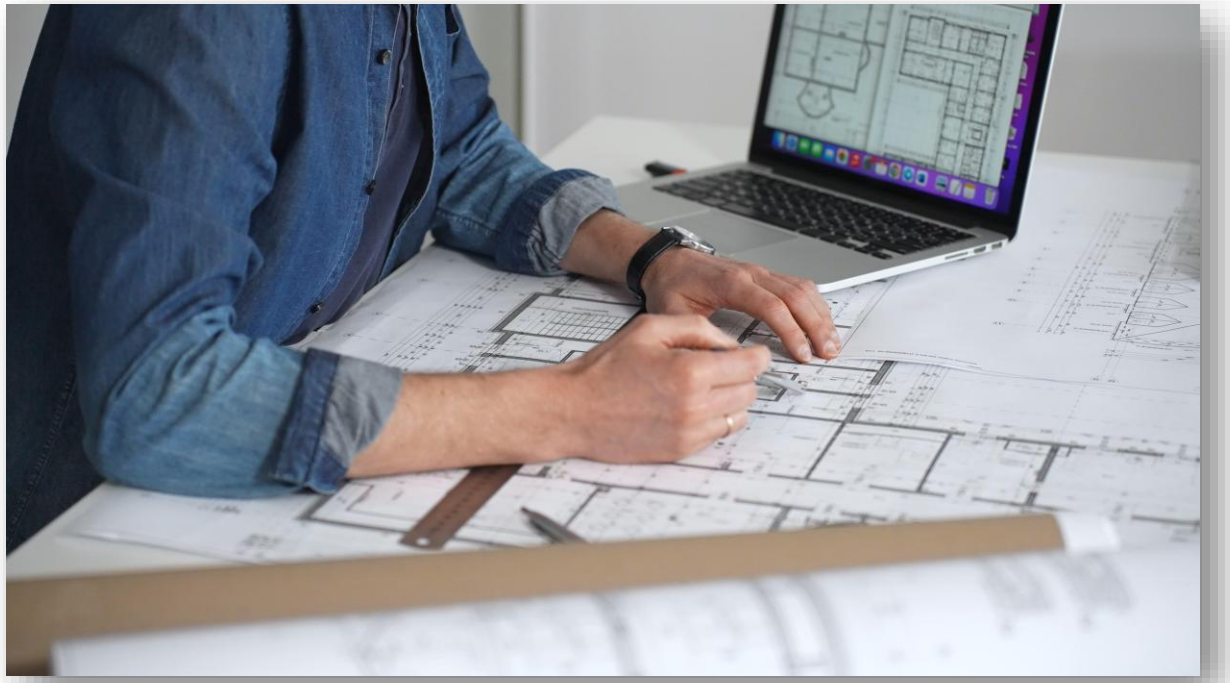
- Video, answers to questions, copy of the slides

Follow up email will be sent

- Topics covered, time of attendance

In This Session

- Ontario X-ray Regulation
- Reg 861 X-ray Plan Submission
- Common Errors
- Q&A
- Additional Resources
- Movement Break
  - Beginner Tai Chi



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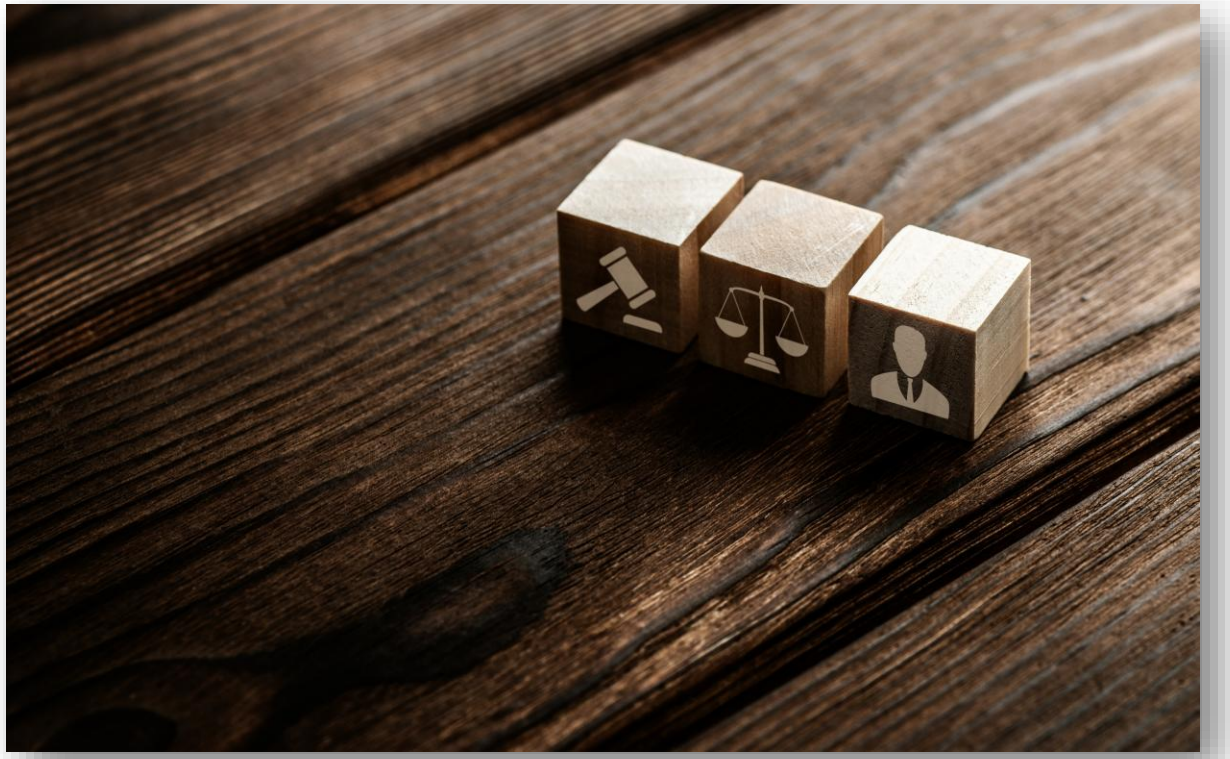
- The material provided in this webinar is not legal or engineering advice.
- The webinar is for general information only and the authors assumes no responsibility or liability in the application of the content herein.
- The content is correct for Ontario, Canada at the time of webinar delivery.
- We will not give specific plan advice.



Who's in Charge?

X-ray sources operating at energies above 1 MeV are within the jurisdiction of the Canadian Nuclear Safety Commission (CNSC).

- Nuclear Safety and Control Act

Other X-ray sources are within the jurisdiction of the Ministry of Labour, Immigration, Training and Skills Development (Ontario).

- Occupational Health and Safety Act - Regulation 861: X-Ray Safety.

For human health care in Ontario, some sections of Regulation 861 do not apply, but those sections are covered in Regulation 543 under the HARP Act.

Regulation 861 Definitions

X-rays

electrically-generated electromagnetic radiation of maximum photon energy not less than 5,000 electron volts.

X-ray machine

an electrically powered device, the principal purpose of which is the production of X-rays

X-ray source

any device, or that portion of any device, that emits X-rays, whether or not the device is an X-ray machine

Reg 861 Section 1

Regulation 861 Application

Applies to every owner, employer, supervisor, and worker at a workplace where:

- An X-ray machine is present or used; or
- An X-ray source that is not an X-ray machine is present or use, if the X-ray source is capable of producing an air kerma rate greater than 1.0 microgray per hour at any accessible point outside its surface.

It does not apply to an X-ray source that is licensable under the Nuclear Safety and Control Act

Certain sections do not apply if the installation, registration or operation of the X-ray machine is subject to the *Healing Arts Radiation Protection Act*.

Reg 861 Sections 2 & 3

Requirement for Registration

An X-ray source shall not be used at a workplace unless the employer who has possession of the X-ray source is registered with a Director.

If an employer who is registered under this section ceases to have possession of an X-ray source, the employer shall forthwith give a notice to a Director advising the Director of that fact.

An application for registration under this section shall be in a form obtained from the Ministry and shall be filed with a Director.

An employer's registration under this section terminates when the employer notifies a Director that the employer no longer has possession of any X-ray sources.

Reg 861 Section 5 (1),(2),(4),(5)

Regulation 861 Plan Requirements

An X-ray source shall not be installed or used in a permanent location and an X-ray source that is designed for portable or mobile use shall not be installed or used regularly in one location unless an application for review, together with plan location drawings, of the installation have been reviewed by and are acceptable to an inspector. The drawings must:

- bear the name of the applicant and the address of the location;
- be on a legible scale that is not less than 1:100 and that is suitable for microfilming;
- indicate the direction north;

Reg 861 Section 6

Regulation 861 Plan Requirements

An X-ray source shall not be installed or used in a permanent location and an X-ray source that is designed for portable or mobile use shall not be installed or used regularly in one location unless an application for review, together with plan location drawings, of the installation have been reviewed by and are acceptable to an inspector. The drawings must:

- show the proposed location of the X-ray source and, where applicable, the range of its motion;
- show the proposed location of the X-ray control panel, if the location of the control panel is different from that of the X-ray source;
- indicate the use of rooms or areas that are adjacent, both horizontally and vertically, to the proposed location;

Reg 861 Section 6

Regulation 861 Plan Requirements

An X-ray source shall not be installed or used in a permanent location and an X-ray source that is designed for portable or mobile use shall not be installed or used regularly in one location unless an application for review, together with plan location drawings, of the installation have been reviewed by and are acceptable to an inspector. The drawings must:

- indicate the type and thickness of the shielding installed or to be installed on the boundaries of the proposed location; and
- indicate the type and location of the safety devices such as warning lights, interlocks and cut-off switches.

Reg 861 Section 6

Portable and Mobile

Where an employer comes into possession of an X-ray source that is designed for portable or mobile use and that is so used, written notice needs to be given to the Ministry. It must include:

- the name and address of the employer;
- the employer's registration number, if any, under section 5;
- the location where the X-ray source will normally be stored;
- the purpose for which the X-ray source will be used;
- the make, model and serial number of the X-ray source; and
- the maximum operating voltage and current of the X-ray source.

Reg 861 Section 7

Filling out Form ON00057E

Ontario

Ministry of Labour, Immigration, Training and Skills Development

Application for Registration and Installation of an X-ray Source

Registration number:
(Ministry use only)

Instructions

Complete and submit this form to apply for registration and review of a permanent X-ray location with the Radiation Protection Services.

Use the Save Form, Submit by Email and Print Form buttons at the bottom of the form.

If you need assistance contact us at 1-888-999-3921 (toll free), 416-235-5922, or by email RadiationProtection@ontario.ca.

According to subsection 5 (1) of Reg. 861 for X-ray Safety under the *Occupational Health and Safety Act*, "An X-ray source shall not be used at a workplace unless the employer who has possession of the X-ray source is registered with the Director". Complete and submit this form to apply for registration.

According to subsection 6 (1), "An X-ray source shall not be installed or used in a permanent location and an X-ray source that is designed for portable or mobile use shall not be installed or used regularly in one location unless an application for review, together with plan location drawings, of the installation have been reviewed by and are acceptable to an inspector." Complete and submit this form and attach floor plans and other documents to apply for an installation review.

According to subsection 7 (1), "Where an employer comes into possession of an X-ray source that is designed for portable or mobile use and that is so used, notice thereof shall be given to a Director". Complete and submit this form to provide notice.

Fields marked with an asterisk (*) are mandatory. **Failure to complete mandatory fields may result in the return of your application unreviewed.**

Section 1: Applicant information

Employer information

Employer legal name *

Business number

Employer operating name

Employer business address

Unit Number | Street Number * | Street Name * | Street Type

Street Direction | City/Town * | Province ON | Postal Code * | Telephone Number *

Employer contact information

Last Name * | First Name * | Telephone Number *

Position/Title | Email Address *

Nature of the employer's business (Select one category only) *

- Industrial and/or commercial
- Security
- Education and training
- Other
- Veterinarian
- Medical (exposure of non-living)
- Maintenance and repair
- Research and development
- Gauge
- Rental service

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Applicant notes to reviewer (optional)

Section 2: X-ray source

Nature of the application (check all that apply) *

- Opening new facility
- Replacement of old sources
- Relocation of sources
- Conversion from analog to digital
- Additional sources
- Acquisition of an existing facility
- Change of shielding provisions, structure or any safety devices
- Other

Is this application made in compliance with a MLITSD inspector's direction? * Yes No

Guidance

Complete the sections below for each X-ray source to be reviewed. Attach files for floor plans and any shielding calculations.

X-ray source number 1

The following refers to X-ray source number 1 of 1 X-ray sources located in the room designated as *

Operation of X-ray source

Operation is expected to commence on (yyyy/mm/dd) *

X-ray source type

Portable: An X-ray source designed for portable or mobile use and that is so used.

Cabinet: The X-ray source, the object or portion of the object being exposed, and the detection device is enclosed in a shielded cabinet that meets specifications in Regulation 861, section 17.

Cabinet (walk-in): The X-ray source, the object or portion of the object being exposed, and the detection device is enclosed in a shielded cabinet designed to permit entry of workers and meets specifications in Regulation 861, section 17.

Fixed: An X-ray source used in a permanent location or an X-ray source that is designed for portable or mobile use is used regularly in one location.

Select the appropriate category based on the descriptions above. *

Portable Cabinet Cabinet (walk-in) Fixed

X-ray source specifications

Make, model, serial number: if the make, model and serial number are unknown at the time of the application, enter "unknown". Ensure that once the X-ray source is installed, the make, model and serial number are forwarded to the Ministry.

Manufacturer * | Model name and number *

Serial number * | Identified on floor plan as

Maximum rated tube voltage (kVp) * | Maximum rated current (mA) * | Anticipated maximum workload (mA-min/week) *

Location of X-ray source

Enter the name of the workplace and address of the location of the X-ray source. For mobile or portable X-ray sources, record the location where the machine is or will be stored off-hours.

Name of workplace (where the X-ray source will be located) *

Same as business address

Unit Number	Street Number *	Street Name *	Street Type

Street Direction	Rural Route	City/Town *	Province	Postal Code *
			ON	

Location Description (if no street address) *

Responsible person

As required by section 8 of the Regulation for X-ray Safety, an employer shall designate a person, for each X-ray source, who is competent because of knowledge, training or experience in the use and operation of X-ray sources and in radiation safety practices, to exercise direction of the safe use and operation of the X-ray source.

Last Name *	First Name *

Position/Title *	Email Address *

Relevant radiation safety qualifications * (For the exception of DVM/RVT, attach a copy of training certification.)

Floor plans and drawings

An attached PDF (or hard copy if applying by mail) version of a plan location drawing should*

- Be legible
- Use a scale of at least 1:100
- Have a maximum size of 356 mm by 216 mm (8 ½ " x 11")
- Indicate the name of the employer and the address of the workplace at which the X-ray source is to be installed or used
- Indicate the direction north
- Show the proposed location of the X-ray source and the range of its motion if applicable
- Show the proposed location of the control panel and exposure switch
- Indicate the use of the rooms and areas that are adjacent, both horizontally and vertically, to the proposed X-ray source location
- Indicate the type of thickness of the shielding proposed on all the boundaries of the X-ray source location including any doors and windows
- Show the type and location of any safety devices such as warning lights and interlocks

Attach floor plans and drawings. If applicable also attach shielding calculations.

Note: Total attachments must not exceed more than 15 MB in size.
In order to view files you've attached, select View > Show/Hide > Navigation Panes > Attachments

File Attachments Add File | Delete File | Delete All

File Name	Description *	Size (MB)	Delete
	Total Size	0	

Occupancy and use of surrounding areas

Default occupancy factors will be applied unless alternate occupancy factors are provided.

Default Occupancy Factor	Description
Full (1)	X-ray control space, publicly accessible space, shops, corridors large enough to hold desks, living quarters, occupied space in adjoining areas, offices, laboratories, X-ray exposure switch location
1/2	Treatment areas, exam rooms, common work areas
1/5	Corridors too narrow for desks, patient rooms, employee lounges, staff rest rooms, stairways
1/20	Public restrooms, storage areas, outdoor areas with seating, unattended waiting rooms, attics
1/40	Outdoors, parking lots, crawl spaces

Alternate occupancy factors (optional)

Add another X-ray source (+)

The application covers a total of 1 X-ray sources in rooms. Related floor plans are attached.

Attestation

I am completing this form as the: *

Employer Agent Contractor Other

I confirm that I am the employer or am authorized to complete and submit this form as the agent of the employer. I hereby certify that the information provided is true and correct to the best of my knowledge. *

Last name of person completing this form *	First name of person completing this form *

Position/Title *	Email Address *	Date (yyyy/mm/dd) *

Save Form | Submit by Email | Print Form | Clear Form

Workload = (maximum current) x (time per exposure) x (exposures per week) ÷ (60 seconds per minute)

$$workload = \frac{(i\ max) * \left(\frac{time}{exposure}\right) * \left(\frac{exposure}{week}\right)}{60\ \frac{sec}{min}}$$

Workload Example:

- the maximum voltage and current for separate x-rays would be shown in their technical specification brochures.
- assume stated 1 mA for the maximum current as per the technical brochure
- if it takes 1/10 of a second for one "snapshot", or exposure, each time the equipment is used,
- and you anticipate that you will use it 200 times per week, then:

Workload = (maximum current) x (time per exposure*) x (exposures per week) ÷ (60 seconds per minute)
= (1 mA) x (1/10 second) x (200 exposures per week) ÷ (60 seconds per minute)
= 1/3 (mA)(minute)/week
= 0.33 (mA)(minute)/week
= 0.33 milliampere-minutes per week

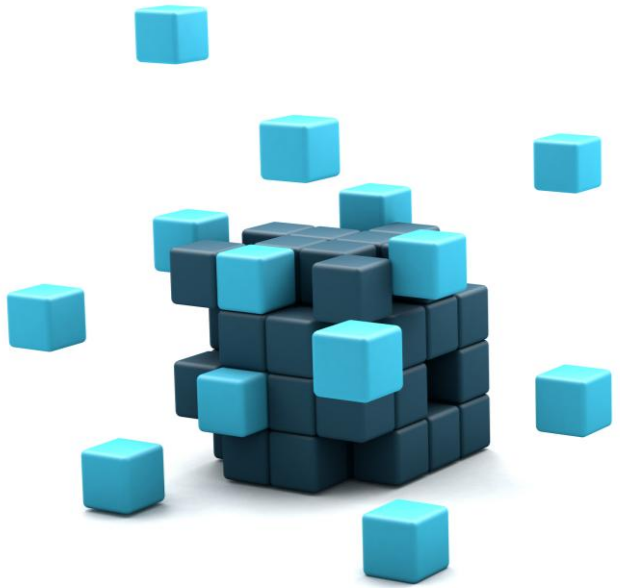
* time per exposure is assumed to be in units of seconds

Tips for the Form ON00057E

- Treat this like a legal document
- Workload calculations and considerations
  - Future plans
- Occupancy Tables: is it applicable to your Adjacent Spaces?
- Explain any additional control procedures, PPE, etc.

Common Errors when filling out the Form

- E-signature unchecked
- Short-form/spelling errors in the Employer/Business/Responsible person names
- First and Last Name not correctly filled in
- Required information not included



Creating Your X-Ray Floor Plan

Minimum Requirements for a floor plan

- Legible Scale Drawing of 1:100 or greater
- Name of Employer and x-ray facility address indicated
- North Direction indicated
- Proposed location of X-Ray source and its range of motion if applicable
- Proposed location of Control Panel and Exposure Switch
- Adjacent Spaces to the x-ray room, both horizontally and vertically, indicated
- All shielding materials and thicknesses for all walls, barriers, doors, windows, ceiling and floor for the x-ray source location
- Indication of all safety devices such as warning lights and interlocks

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Toronto, ON
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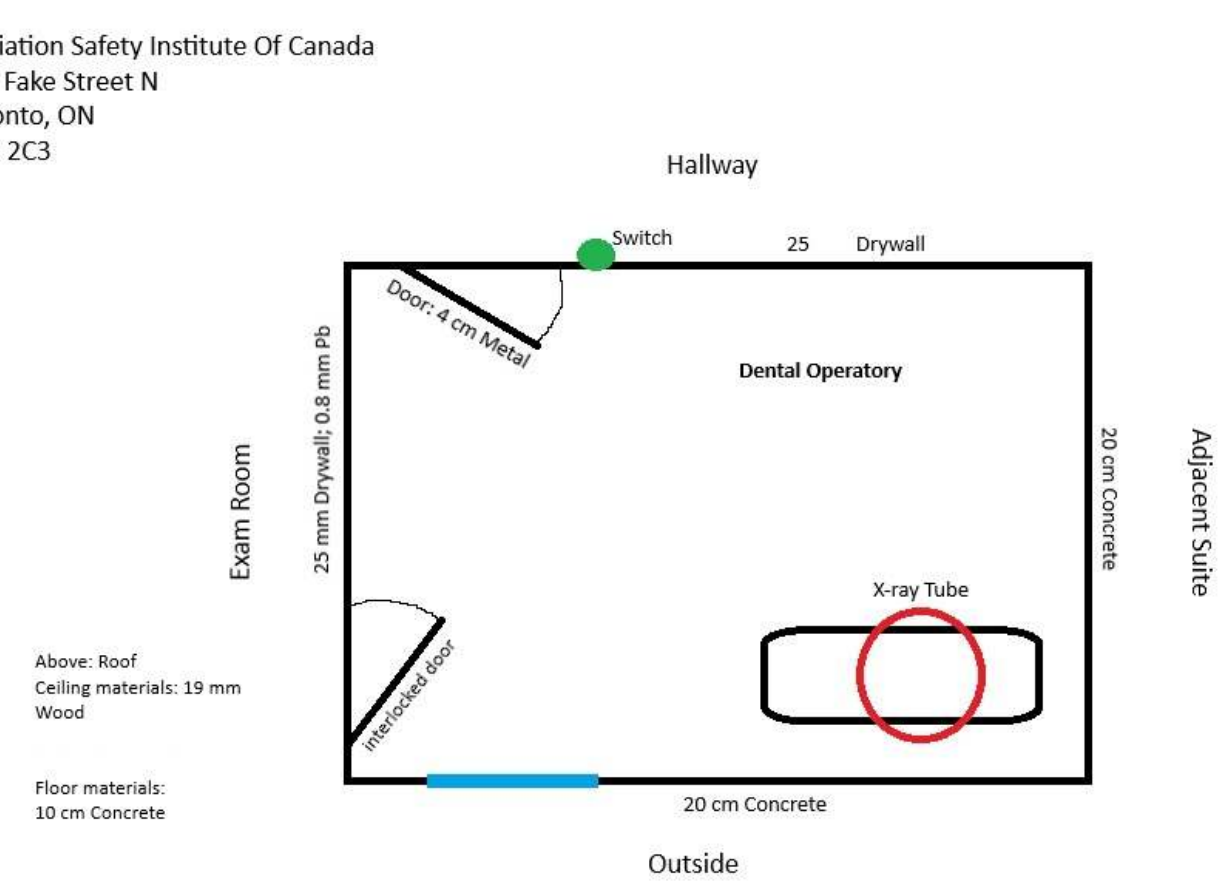

Above: Roof
Ceiling materials: 19 mm Wood

Floor materials:
10 cm Concrete

North

Scale 1:100

June 30, 2026

Can you spot the errors?

Common Errors for X-Ray Floor Plans

- Adjacent Spaces missing or vague
- Street Address/Employer Name not matching with Form
- Above and Below information missing
- Shielding materials not explicit, especially doors, ceiling and floor of x-ray source location
- Safety devices and/or control procedures not clearly indicated

Final Tips for Submitting an X-Ray Application

- Review your work!
- Provide as much necessary detail as possible to the floor plan and Form
- Plan ahead! The application process takes time even with a perfect application, so do not expect a 24-hour turnaround.
- In the case of revisions, respond to all requests from the ministry to the best of your ability

Questions?

- As time permits, we will address questions posted in the Q&A
- Questions we do not get to
  - Answers will be posted to our website and a link to resources emailed out

Resources

Government of Ontario:

- Registering X-ray sources in the workplace: https://www.ontario.ca/page/registering-x-ray-sources-workplace
- Guidance for completing the X-ray registration and application form: https://www.ontario.ca/page/guidance-completing-x-ray-registration-and-application-form
- Application for Registration and Installation of an X-ray Source: https://forms.mgcs.gov.on.ca/dataset/on00057

Resources

Radiation Safety Institute of Canada:

- X-ray application support: Ontario Regulation 861 https://radiationsafety.ca/resources/x-ray-application-support-ontario-regulation-861/
  - Guidance document
  - Training course video
  - Free eLearning course
- Free X-ray safety templates for Regulation 861 (outside human healthcare), https://radiationsafety.ca/resources/861xraysafetytemplates/

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Thank you for listening!

www.radiationsafety.ca

1-800-263-5803

info@radiationsafety.ca

Health & Safety Breakfast

- Annual Health & Safety Breakfast Event will be this September
- In partnership with Workplace Safety and Prevention Services® (WSPS) of Ontario
- Survey webinar registrants for topics of interest

Wellness Break

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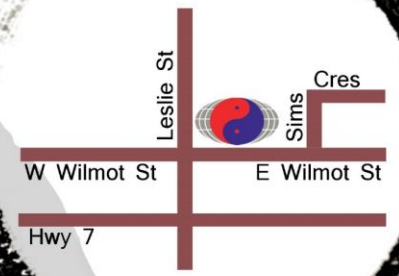

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