Radiation Safety Institute of Canada
Institut de radioprotection du Canada

Becoming a Radiation Protection Professional

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President, Canadian Radiation Protection Association

December 17, 2025

Good Science in Plain Language®

Land Acknowledgement

Webinar Functionality

Audio and video

- During the presentation, from the presenters only
- Captions: More>Language and speech>Turn on live captions

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

- Jurisdiction
- Why RPP and Safety Officer?
- NORM/Radon
- XSO
- CNSC Licensed Facilities and Activities
- RSO
- Common pathways to RSO
- CRPA & CRPA(R)
  - Delmar McCormack Smyth Scholarship
  - Anthony J. MacKay Student Paper Contest
- Movement break

General Radiation Protection Regulatory Structure in Canada

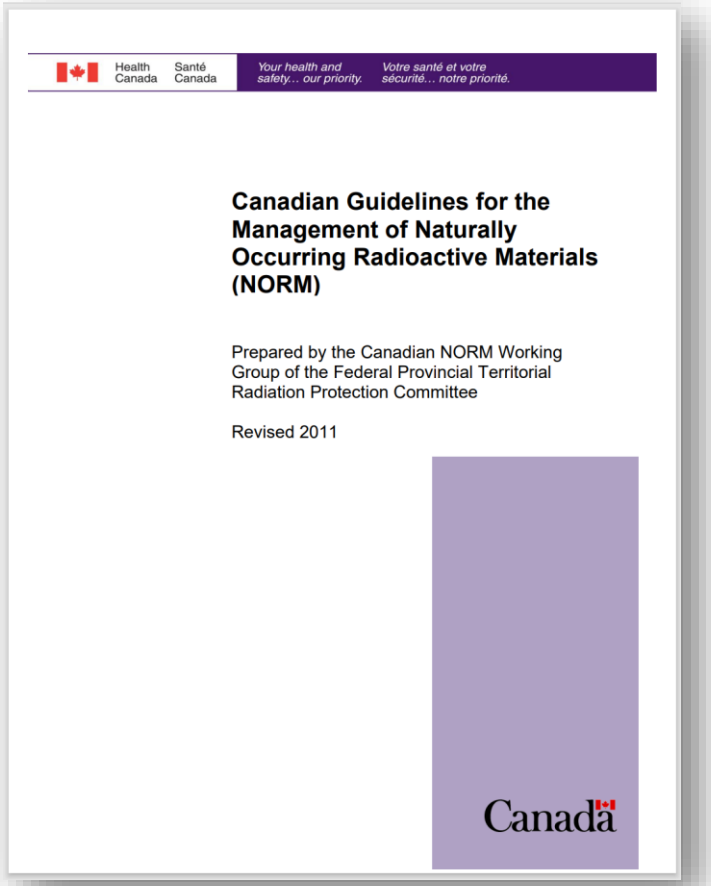
Radiation Source	Details	Jurisdiction	Regulator	Overarching Legislation
Nuclear X-Ray >= 1 MeV	Does not include NORM unless part of the nuclear fuel cycle, import/export	Federal	Canadian Nuclear Safety Commission Transport Canada	Nuclear Safety and Control Act Transportation of Dangerous Goods Act
X-Ray < 1 Mev	Being manufactured, sold, imported, or leased	Federal	Health Canada, Radiation Protection Bureau	Radiation Emitting Devices Act
X-Ray < 1 Mev	Once installed	Provincial, Territorial, or Federal	Province, Territory, or Employment and Social Development Canada	Typical OSHA, but some have standalone legislation
NORM	Handling and disposal, not part of nuclear fuel cycle	Provincial, Territorial, or Federal	Province, Territory, or Employment and Social Development Canada	Typically OSHA EPAs
NORM	Transport, not part of nuclear fuel cycle	Federal	Canadian Nuclear Safety Commission Transport Canada	Packaging and Transport of Nuclear Substances Regulations, 2015 Transportation of Dangerous Goods Act
Radon	For those not licenced with the CNSC	Provincial, Territorial, or Federal	Province, Territory, or Employment and Social Development Canada	Typical OSHA Some building codes

Why Have a RPP and Safety Officer?

- Sometimes specifically legislated or expected
- Even if not
  - Ionizing radiation is a carcinogen
  - OHSA legislations requires hazard identification and risk reduction
  - A safety officer for ionizing radiation takes on the implementation and day-to-day administration of a radiation protection program (RPP).

NORM/Radon

https://www.canada.ca/en/health-canada/services/publications/health-risks-safety/canadian-guidelines-management-naturally-occurring-radioactive-materials.html


Health Canada Santé Canada

Your health and safety... our priority. Votre santé et votre sécurité... notre priorité.

Canadian Guidelines for the Management of Naturally Occurring Radioactive Materials (NORM)

Prepared by the Canadian NORM Working Group of the Federal Provincial Territorial Radiation Protection Committee

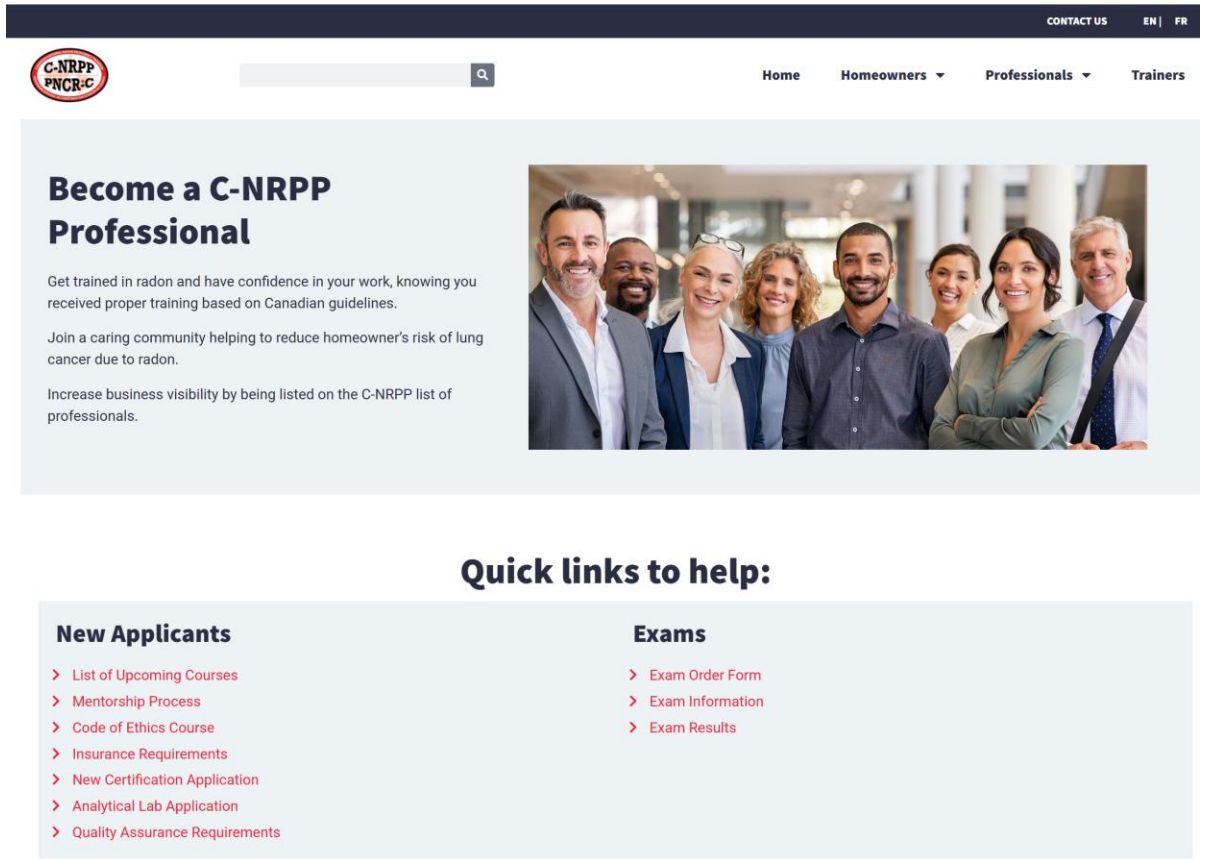
Revised 2011

Canada

Dose estimate to public > 0.3 mSv/a

Radon gas > 200 Bq/m^3

http://c-nrpp.ca/professionals/become-a-certified-professional/



X-Ray Safey Officer (<1MeV)

Province/Territory	Name of Safety Officer in Regulation
Alberta	Safety Codes
British Columbia	Safety Codes
Manitoba	No formal title/role
New Brunswick	Safety Codes
Newfoundland and Labrador	Safety Codes
Northwest Territories	Safety Codes
Nova Scotia	No formal title/role
Nunavut	Safety Codes
Ontario - Human Health Care	Radiation Protection Officer
Ontario - Worker	Competent person
Prince Edward Island	No formal title/role
Quebec	No formal title/role
Saskatchewan	No formal title/role
Yukon	Safety Codes
Federally regulated	Safety Codes

Safety Code	Name of Safety Officer
28 - Veterinary	Responsible user
29 - Baggage	Designee
32 - Analytical	Designee
34 - Industrial	Radiation Safety Officer
30 - Dentistry	Coordinator of the radiation protection program
35 - Large Medical	Responsible user
36 - Mammography	Responsible individual / user

Sample XSO Qualification Requirements

Ontario Human Healthcare

- HARP Act RPO must be a
  - Doctor
  - Dentist
  - Chiropodist
  - Chiropractor

Ontario Other

- OSHA Reg 861 designated person must be “competent because of knowledge, training or experience in the use and operation of X-ray sources and in radiation safety practices.”

Veterinary SC

- Responsible User
  - Veterinarian
  - Animal Health Technologist,
  - Registered Radiology Technician

Baggage & Analytical SCs

- Designee
  - Senior Operator
  - Facility H&S Officer
  - Senior Maintenance Worker*

Industrial SC

- Radiation Safety Officer
  - NDT Level 1 or Higher
  - CNSC Approved

Dentistry SC

- Coordinator of the RPP
  - Dentist or Other Qualified Staff

Medical SC

- Responsible User
  - Physician
  - CAMRT/Radiological Technologist member of OTIMROEMPQ

Mammography SC

- Responsible Individual / User

*Listed in Baggage SC Only

CNSC Regulated Facilities & Activities

Class I Nuclear Facility

- IA – Nuclear reactors
- IB – High-energy particle accelerators & facilities that handle, process, or store large quantities of nuclear substances

Uranium Mines & Mills

- Facilities involved in the mining, ore processing, and milling of uranium

Certification of Prescribed Equipment

- Particle accelerators, industrial radiators, and cancer therapy machines

Class II Nuclear Facility

- Facilities that have Class II equipment, typically used in medicine, cancer therapy, and research

Nuclear Substances & Radiation Devices

- All nuclear substances, sealed sources, and radiation devices not included in Class II Prescribed Equipment.

https://www.cnsc-ccsn.gc.ca/eng/acts-and-regulations/regulatory-documents

Class II Facilities

Class II prescribed equipment, parts of building housing the equipment, any additional equipment

- Irradiator >10^{15} Bq
- Requires shielded enclosure & dose rate > 1cGy/min at 1 m
- Radioactive-source teletherapy
- Particle accelerator
  - 1 MeV < energy < 50 MeV if amu < 4
  - 1 MeV < energy < 15 MeV if amu > 4
  - Brachytherapy remote afterloader

RSO requirements in Class II Regulations

- Section 15
- REGDOC-2.2.3 for more information

Must be certified by the CNSC

- Tailored exam
  - Relevant provisions of the NSCA and its ensuing regulations
  - Principles of radiation safety
  - Radiation physics
  - Operational activities and facilities which are to be licensed by the CNSC
  - Radiation protection program of the facility

Class II nuclear facilities and prescribed equipment
REGDOC-2.2.3, Personnel Certification: Radiation Safety Officers
Class II Nuclear Facilities and Prescribed Equipment Regulations

Nuclear Substance and Radiation Devices

All licensable nuclear substances and sealed sources, as well as radiation devices not included in Class II prescribed equipment

- e.g. portable & fixed gauges, industrial radiography, nuclear medicine, laboratory research & teaching, calibration & check sources, servicing of radiation devices
- About 60 different use types

RSO designation part of licence application

REGDOC 1.6.1 v2

- Person responsible for the management and control of the licenced activity and the nuclear substances and radiation devices
- Must have sufficient knowledge, experience, and resources to effectively manage the RPP
- Necessary competence varies according the assigned responsibilities and complexity of the program
- Competency may be gained through combination of formal training and practical experience relevant to that use type

Licensing: Nuclear substances and radiation devices
REGDOC-1.6.1, Licence Application Guide: Nuclear Substances and Radiation Devices, Version 2
Nuclear Substances and Radiation Devices Regulations

Medical Physics

Medical applications of physics

Clinical

- Radiotheraphy
  - Treatment planning
  - Machine design, testing, calibration, troubleshooting
- Diagnostic imaging
  - Machine purchase, installation, testing, QC, operation

Radiation Safety

- Medical isotope facilities

Teaching

Research and Development

- Design and construction of radiotheraphy equipment
- Use of heat and lasers in cancer treatment
- Theory of radiation absorption and dose calculation radiobiology
- Improved imaging of bodily structure and function
  - e.g. PET, MRI, ultrasound, X-ray and radionuclide imaging, biomagnetic mapping

What is Medical Physics?

Medical Physicists

https://comp-ocpm.ca/

https://ccpm.ca/

Health Physics

Branch of physics

- Science of radiation protection
- Protect people and the environment
- Interdisciplinary
- May or may not be certified professional

Can perform complex technical analysis

- Assess radiation exposures
- Evaluate shielding and control measures
- Design monitoring programs
- Support incident response

Workplaces with health physicists

- Higher risk
- Greater complexity
- Increased regulatory expectations

Examples

- Nuclear power plants
- Uranium mines and mills
- Nuclear waste management facilities
- Legacy cleanup
- Nuclear research
- Universities

Consulting

- Supporting smaller/less complex programs

Medical physicists may take on some or all of these functions

Nuclear Medicine

- Uses radioactive sources for diagnosis or treatment
- Radiopharmaceuticals combined with imaging can determine function, not just structure
  - e.g. cardiac imaging, bone scans, thyroid studies, cancer detection
- Therapeutic uses higher activities of targeted radiation
  - e.g. cancer, benign tumour, thyroid disorder treatment
- CAMRT
- REGDOC 1.6.1 v2 Appendix C
  - “RSOs that handle packages containing open-source radioisotopes should understand methods and technology to control, use, handle, store and transfer the nuclear substances, and to monitor and control radioactive contamination, radiation fields and radiation exposures.”

Canadian Association of Medical Radiation Technologists
REGDOC-1.6.1, Licence Application Guide: Nuclear Substances and Radiation Devices, Version 2

Nuclear Engineering

- Design, development, operation, and safe management of nuclear systems
- Many applications
  - Nuclear reactor design
  - Radiation safety and protection
  - Radioisotope applications
    - Medical imaging, radiation therapy, industrial sterilization, density gauges
  - Nuclear fuel cycle
  - Fusion energy research

What is Nuclear Engineering? | UNENE

Industrial Radiography

- Use powerful X-rays or gamma rays to inspect internal structures of materials and components
  - e.g. welds, pipelines, castings
- Nuclear exposure devices require CNSC licence and must be certified
- CNSC certifies EDOs; implemented by NRCan

Image courtesy Source Production & Equipment Company [SPEC]. Used with permission.

Exposure device operators
Learn About Becoming Certified in NDT - Natural Resources Canada

Radiation Surveyor/Technician

- Measures, monitors, and documents radiation levels
- Using instruments to survey areas and devices
- Could be a standalone position or a duty of another role
- Usually supportive of Health Physics or Radiation Protection department
  - Possibly an RSO for non-complex licence

Image courtesy of NUVIATech Instruments. Used with permission.

Industrial Hygiene & OHS Professionals

- Professional fields within Environmental, Health, and Safety programs
  - Canadian Registered Safety Professional
  - CBOH Registered Occupational Hygienist
  - Certified Safety Professional
  - Certified Industrial Hygienist
- Industrial Hygiene
  - Identifying, assessing, and controlling workplace hazards that can cause injury or illness
    - Chemical, biological, physical, ergonomic
    - Airborne contaminants, noise, vibration, heat, and other hazardous substances

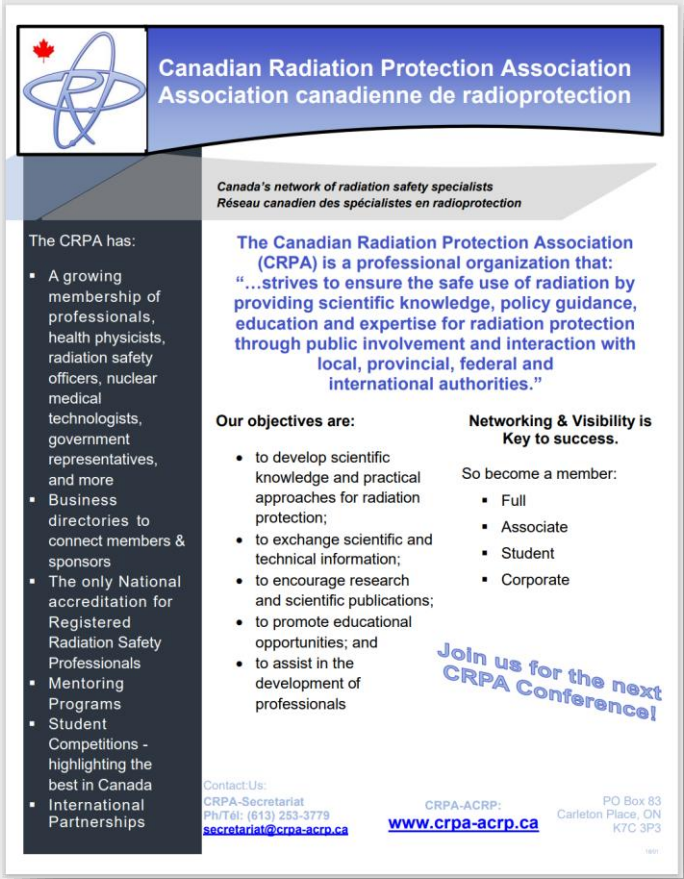
Canadian Registration Board of Occupational Hygienists
Board of Canadian Registered Safety Professionals
Board for Global EHS Credentialing
Board of Certified Safety Professionals

Another Pathway to Radiation Protection Roles

- Selected for management, communication, and leadership skills
- Common pathway for low-risk NORM, X-ray, and nuclear applications
- Some radiation uses require explicit professional training or certification

Canadian Radiation Protection Association

- National, non-profit professional organization
- Supports development and implementation of radiation safety programs in Canada
  - Education, information exchange, professional collaboration
  - Annual conference, professional development, webinars, and publication of CRPA Bulletin
  - Associate Society of IRPA



CRPA-ACRP – Canadian Radiation Protection Association
IRPA - International Radiation Protection Association

Membership

Full member

- Graduate from an accredited university or have recognized equivalent scientific, technological, or professional qualifications or in exceptional cases, have equivalent training;
- Engaged in some form of RP activities for minimum 1 year; and are
- Regularly engaged in one or more appropriate aspects of radiation protection at time of application.

Associate Member

- Engaged in a field or endeavor related to radiation protection; or
- Has a demonstrated interest in supporting or advancing radiation protection.

Reduced rates for full and associate members who are retired from the workforce are available.

Student and Corporate Memberships are also available.

Full and retired full members have voting rights.

https://crpa-acrp.ca/membership/

CRPA(R)

- Highest level of competency recognized by CRPA at the Canadian level
  - Full member
  - Demonstrated academic achievement and experience in radiation sciences field
  - Successfully complete an in-person exam
  - Requires ongoing maintenance

Canadian Radiation Protection Association
Association canadienne de radioprotection

Canada's network of radiation safety specialists
Réseau canadien des spécialistes en radioprotection

The CRPA has:

- A growing membership of professionals, health physicists, radiation safety officers, nuclear medicine technologists, government representatives, and more
- Business directories to connect members & sponsors
- Mentoring programs
- Student competitions highlighting the best in Canada
- International partnerships

Thinking of becoming a **Radiation Safety Professional** in Canada?

The CRPA has the only National designation for **Registered Radiation Safety Professionals**

GET RECOGNIZED!

Get Started! Download a copy of the **CRPA Professional Registration Process Document** today! To become a **Registered Radiation Safety Professional** (**RRSP**), you must first be recognized by the association for your education and training obtained in the fields of radiation protection or health physics. This knowledge and experience should reflect a core group of competencies for varied duties of a Radiation Safety Professional.

The Canadian Radiation Protection Association (CRPA) is a professional organization that: "…strives to ensure the safe use of radiation by providing scientific knowledge, policy guidance, education and expertise for radiation protection through public involvement and interaction with local, provincial, federal and international authorities."

The **CRPA(R)** designation is the highest level of competency recognized by the CRPA at the Canadian level.

Benefits of registration:

- Canadian credential tailored to our radiation safety practice environment
- Validation that a standard competency level has been met
- Career enhancement
- Mandatory maintenance program ensuring continued development

Visit our **Professional Designation** page to learn more about the Recognition and Registration Process and the benefits of being a **Registered Radiation Safety Professional**.

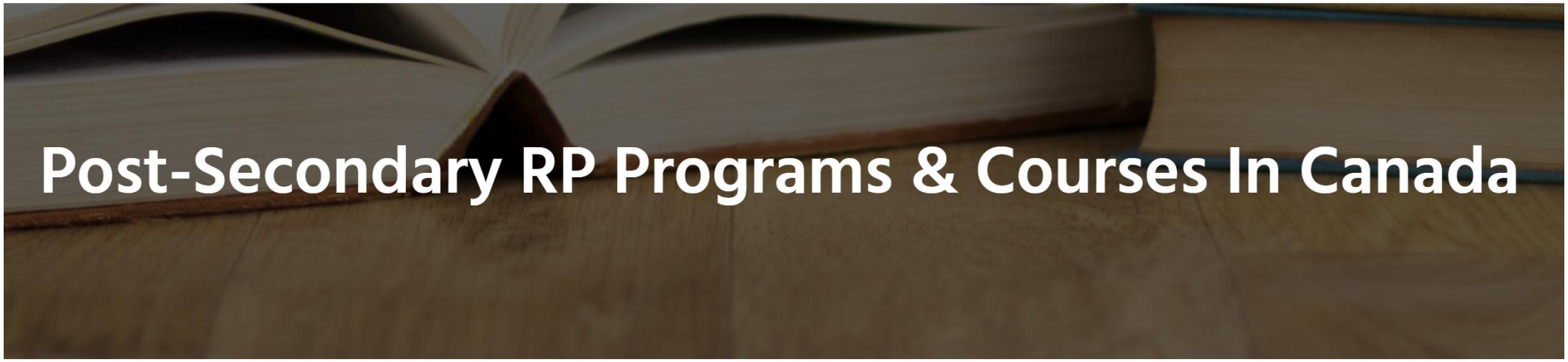
Contact:
CRPA-Secretariat
Ph/Tél: (613) 253-3779
secretariat@crpa-acrp.ca

CRPA-ACRP:
www.crpa-acrp.ca

PO Box 83
Carleton Place, ON
K7C 3P3

[Professional Designation – CRPA-ACRP]

RP Education Programs in Canada

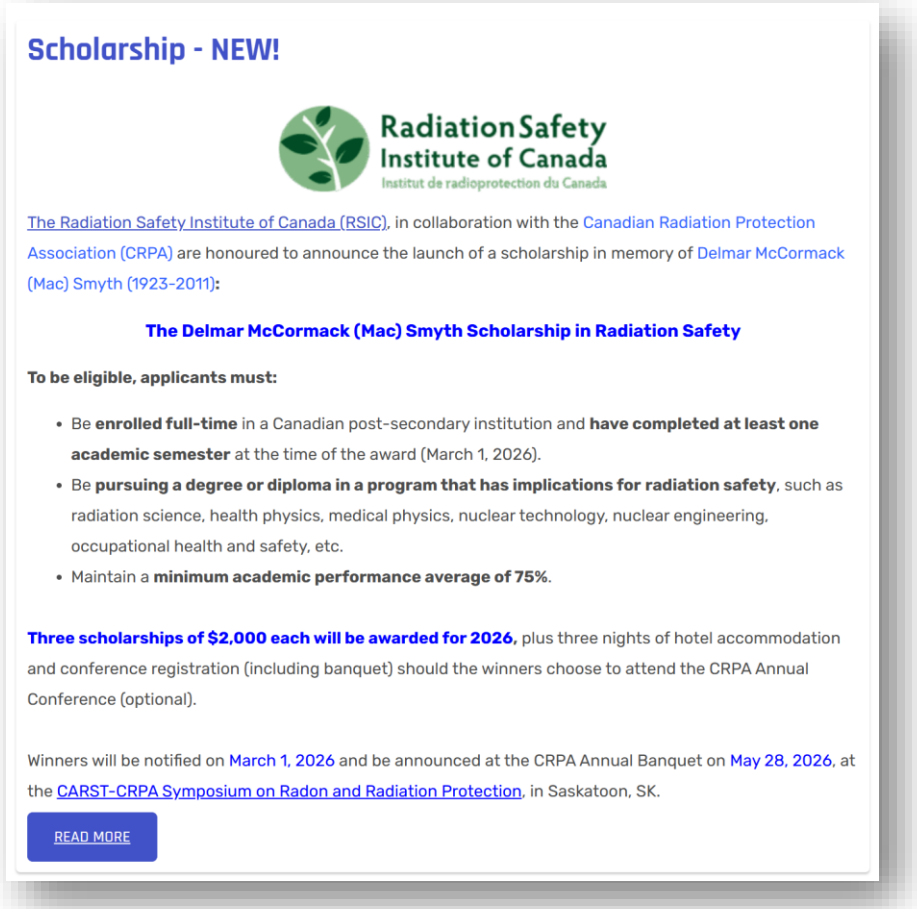


Below is a list of Canadian Universities and Colleges that offer Radiation Protection and/or Health Physics Programs and Courses.

If you do not see a program that you think should be on the list, please contact us to let us know!

https://crpa-acrp.ca/resources/radiation-protection-programs-in-canada/

Scholarship



Scholarship - NEW!

Radiation Safety Institute of Canada
Institut de radioprotection du Canada

The Radiation Safety Institute of Canada (RSIC), in collaboration with the Canadian Radiation Protection Association (CRPA) are honoured to announce the launch of a scholarship in memory of Delmar McCormack (Mac) Smyth (1923-2011):

The Delmar McCormack (Mac) Smyth Scholarship in Radiation Safety

To be eligible, applicants must:

- Be **enrolled full-time** in a Canadian post-secondary institution and **have completed at least one academic semester** at the time of the award (March 1, 2026).
- Be **pursuing a degree or diploma in a program that has implications for radiation safety**, such as radiation science, health physics, medical physics, nuclear technology, nuclear engineering, occupational health and safety, etc.
- Maintain a **minimum academic performance average of 75%**.

Three scholarships of $2,000 each will be awarded for 2026, plus three nights of hotel accommodation and conference registration (including banquet) should the winners choose to attend the CRPA Annual Conference (optional).

Winners will be notified on March 1, 2026 and be announced at the CRPA Annual Banquet on May 28, 2026, at the CARST-CRPA Symposium on Radon and Radiation Protection, in Saskatoon, SK.

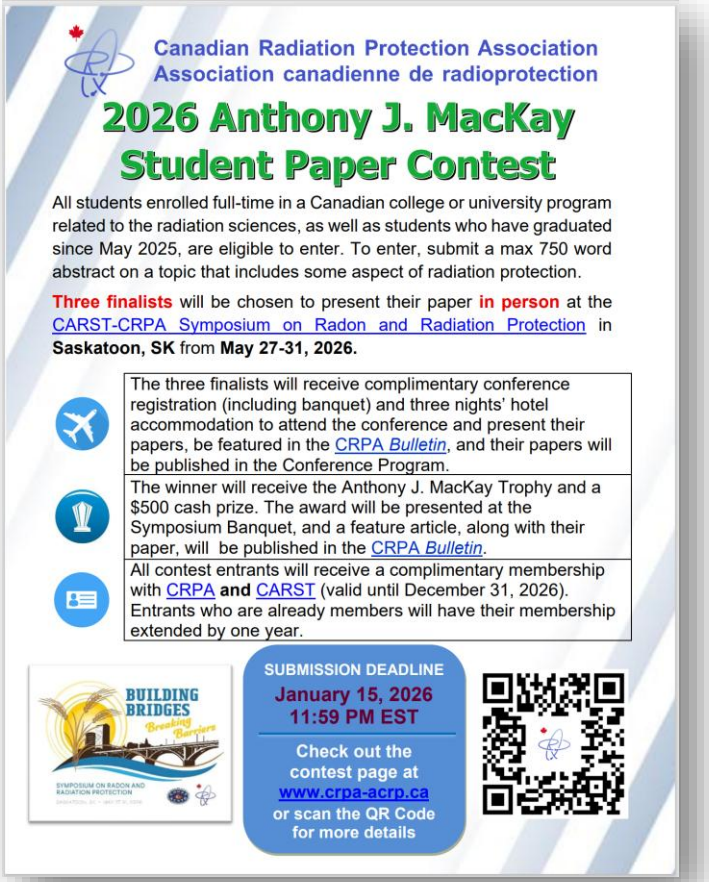
READ MORE

Delmar McCormack Smyth Scholarship – CRPA-ACRP

- RSIC Scholarship in memory of Delmar McCormick Smyth
  - Founding RSIC Chair
- Administered by the CRPA
  - Must be enrolled in Canadian post-secondary in related field
  - Minimum 75%
  - 500 – 750-word essay
- For 2026
  - Deadline January 31, 2026
  - 3 scholarships of $2000 each
  - Hotel accommodation and CRPA conference registration
- Additional details on CRPA website

Anthony J. MacKay Student Paper Contest

- Enrolled full-time in Canadian college or university program or graduated since May 2025
- Deadline to submit abstract January 15, 2026
- Finalists present full paper at joint CRPA/CARST Conference in Saskatoon
- Abstract submission gives membership to CRPA and CARST
- Finalists receives conference registration and accommodation; paper published in CRPA Bulletin and conference program
- Winner receives trophy and $500 CAD
- Additional details on CRPA website



Anthony J. MacKay Student Paper Contest – CRPA-ACRP

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

"Good science in plain language"®

Thank you for listening!

www.radiationsafety.ca

1-800-263-5803

info@radiationsafety.ca

Wellness Break

Ji Hong Tai Chi & Qi Gong, Richmond Hill, ON