

	Radiation Safety Procedure for Safety and Security of Irradiators	Revision: 1.1 Date: Mar 2016 Page: 1 of 5
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1. Introduction

1.1. Purpose

The purpose of this document is to describe the security procedures surrounding the medical and research irradiators licensed through McMaster University. These measures are in place to protect these sources from unauthorized access, use or tampering. The sources within these devices are considered category 2 sealed sources by REGDOC-2.12.3, published by the Canadian Nuclear Safety Commission [1]. The procedures described here have been designed to meet the requirements of this regulatory document.

The irradiators licensed through McMaster University are located on Hamilton Health Sciences (HHS) Property. Physical security for these devices is provided by HHS security services.

2. Responsibilities

2.1. Radiation Safety Officer

The Senior Health Physicist at McMaster University serves as the Radiation Safety Officer (RSO), and is ultimately responsible for each irradiator listed on the McMaster license. Specific responsibilities include, but are not limited to the following:

- Reviewing the irradiator site security plan annually with the security services supervisor.
- Training security services personnel in radiation protection emergency procedures and response protocols.
- Annually assessing the need for continuing training of all groups listed in this procedure.
- Performing a semi-annual review of compliance with this procedure for each irradiator licensed through the facility.

2.2. Security Services Supervisor

The HHS Security Services Supervisor is responsible for overseeing the physical security of all irradiators.

- The security supervisor shall participate in the annual review of the site security plan.

2.3. Radiation Safety Personnel

Radiation Safety Personnel is used as a general term for personnel supervised by the Senior Health Physicist. This includes all members of the McMaster University Health Physics department.

Responsibilities include:

- Providing radiation protection and security awareness training to authorized users.
- Maintaining records of all training.
- Performing and documenting leak testing for each irradiator.
- Maintain an inventory of all irradiators licensed through the facility.

2.4. Security Services Personnel

HHS security services personnel are responsible for:

- Monitoring the security of the irradiators.
- Responding to any incidents involving the irradiators.
- Performing testing of security alarms and cameras.

- Following all procedures and protocols detailed in the site security plan.

2.5. Permit Holder

The permit holder is responsible for the actions and trustworthiness of all personnel working with the irradiator. The permit holder must maintain the following documents, and provide them to the RSO or designate on request:

- A current list of all authorized users.
- Records of authorized user registration and trustworthiness verification.
- Key control records.
- Authorization records for visitors and contractors.

The permit holder must also maintain written procedures for:

- Key/access control.
- Registering of authorized users.
- Repair or replacement of keys and locking devices.

2.6. Lab Manager

The lab manager is responsible for acting as a role model for safety and implementing radiation safety procedures in the area housing the irradiator. The lab manager is appointed by the permit holder, or the permit holder may act as the lab manager. Specific responsibilities include:

- Ensuring that work under their direction is conducted in a safe manner that complies with procedural requirements.
- Immediately terminating unsafe work and ensuring that unsafe acts and conditions are reported to management and Radiation Safety Personnel.
- Registering authorized users.
- Ensuring that all authorized users have received hands-on training on the operation of the irradiator.
- Confirming that authorized users have completed required radiation protection and security awareness training.
- Controlling access to irradiator keys. This includes the operating key, and the key to the irradiator enclosure (if applicable).
- Contacting facility services and submitting a high priority work order if ventilation issues or other circumstances prevent the door to the irradiator room from automatically closing and latching.
- Authorizing visitors and contractors for escorted access to the irradiator.

2.7. Authorized Users

An authorized user is a staff member who is authorized to operate the irradiator and has been granted access to the final security enclosure (room or cage) in which the irradiator is housed. All authorized users are responsible for:

- Working in a safe manner.
- Following all procedures, posted instructions and established practices designed to achieve safety when operating an irradiator.
- Seeking assistance from supervision or Radiation Safety Personnel when unsure how to complete a task.
- Immediately alerting supervision and Radiation Safety Personnel to any unsafe condition or act.
- Wearing visible photo identification (McMaster or Hamilton Health Sciences) at all times while in the vicinity of the irradiator.

- Not propping the door open or otherwise defeating security systems.
- Ensuring that the door fully closes and latches after every entry and exit. Immediately reporting any issues to the lab supervisor.
- Not allowing anyone access to the room other than an authorized user or authorized contractor/visitor.

3. Site Security Plan

A site security plan specific to the irradiators is maintained by the RSO in conjunction with the security services supervisor. This includes the physical protection measures for the irradiators and an assessment identifying any potential threats and risks, revealing possible vulnerabilities at the site.

4. Training and Qualifications

All personnel shall receive training that addresses safety and security concerns specific to the irradiators.

4.1. Radiation Protection Training

- 4.1.1. All authorized users shall receive radiation protection training that prepares them to perform their duties safely in routine and upset conditions.
- 4.1.2. Authorized visitors or authorized contractors/maintenance workers are exempt from radiation protection training requirements provided they are escorted at all times while the irradiator is in use and provided that they do not operate the irradiator.
- 4.1.3. The radiation protection training programs shall be documented.

4.2. Security Awareness Training for Authorized Users

- 4.2.1. All authorized users shall receive Security Awareness Training detailing the security policies, protocols and practices surrounding the irradiator.
- 4.2.2. The security awareness training programs shall be documented and reviewed annually.
- 4.2.3. Security awareness training for authorized users may be incorporated into the radiation protection training program.

4.3. Security Awareness Training for Radiation Safety Personnel

- 4.3.1. All Radiation Safety Personnel shall receive Security Awareness Training detailing the security policies, protocols and practices surrounding the irradiator.
- 4.3.2. The security awareness training programs shall be documented and reviewed annually.

4.4. Training for Security Services

- 4.4.1. All security personnel shall receive training in radiation protection emergency procedures and response protocols.
- 4.4.2. The security services training programs shall be documented.

4.5. Continuing Training

- 4.5.1. The need for continuing training for all personnel shall be assessed annually by the RSO.

5. Trustworthiness and Reliability

Before being granted authorized user status, the lab manager or the applicant's immediate supervisor must verify their trustworthiness and reliability:

5.1.1. Obtain and review a recent copy of a criminal records check issued in the past year.

5.1.2. Verify the applicant's photo identification.

5.1.3. Verify the applicant's employment history for the past 5 years.

Detailed instructions on completing this check are provided in Attachment B: Registration of Authorized Users.

5.2. Records Maintenance

5.2.1. The permit holder/area manager shall maintain a completed Irradiator Access Registration form for each authorized user granted access to the irradiator.

5.2.2. Records shall be maintained for a period of up to one year after the expiry of the license, in accordance with subsection 28(1) of the General Nuclear Safety and Control Regulations.

6. Key and Access Control

6.1. Access

6.1.1. Only authorized users as defined in this document shall access the irradiator. Visitors, maintenance staff and contractors who do not possess a trustworthiness and reliability verification shall be escorted at all times while in the vicinity of the irradiator. Line of sight must be maintained with the escorted individual at all times.

6.2. Expiry

6.2.1. The applicant shall be granted access for a period of up to 5 years.

6.2.2. Upon expiry, the user's file shall be reviewed and their access revoked. Trustworthiness and reliability verification shall be re-established before access is restored (see section 5).

6.3. Keys

6.3.1. Operating keys and/or keys to the irradiator enclosure shall be stored in a secure location, accessible only to authorized users.

6.3.2. Users shall sign out keys by recording their name, employee ID and the time of exit/entry.

6.4. Documentation

6.4.1. Records of all trustworthiness checks listed in section 5 shall be maintained.

6.4.2. A list of all active users shall be maintained, including the date access was granted, and the date of expiry.

6.4.3. Documentation of all key control procedures shall be maintained, including measures for repairing or replacing a compromised key or locking device.

7. Surveillance and Alarms

7.1. Hardware

7.1.1. The irradiator enclosure shall be equipped with an intrusion detection system that alarms immediately and is linked to the central HHS security control centre.

7.1.2. CCTV cameras shall provide 24 hour surveillance of the irradiator unit. Sufficient illumination shall be provided at all times to ensure that the unit is visible to monitoring personnel.

7.1.3. The CCTV camera and monitoring station shall be equipped with a 'blow through' functionality such that an alarm triggers a priority display of the room.

7.2. Testing

7.2.1. All security alarms and CCTV cameras shall be tested every 6 months at a minimum.

7.2.2. Testing shall be documented.

7.3. Documentation

Security services shall maintain specific, written procedures for:

- 7.3.1. Alarm response.
- 7.3.2. Apprehension and detainment of unarmed suspects.
- 7.3.3. Reporting of suspicious individuals to law enforcement.
- 7.3.4. Alarm testing and maintenance.
- 7.3.5. Operation of security equipment.

8. Information Security

8.1.1. All information referred to in this document (listed below) and any other information regarding the locations of, and security measures surrounding the irradiators shall be considered prescribed information, labelled accordingly, and protected as such.

- 8.1.1.1. Site security plan
- 8.1.1.2. Security training material
- 8.1.1.3. Key control procedures
- 8.1.1.4. Alarm testing records

8.1.2. Prescribed information shall be secure when left unattended and stored in a manner that prevents removal or theft

8.1.3. Prescribed information shall only be shared with individuals on a “need to know” basis

8.1.4. All prescribed information must be communicated following the procedure outlined in Attachment A: Protection of Prescribed Information

9. Service and Repairs

9.1.1. Service and repair of irradiators shall only be performed by a qualified technician dispatched by the manufacturer or retailer of the irradiator.

9.1.2. Security services shall be alerted before any planned maintenance or repair takes place.

10. List of Attachments

- Attachment A Protection of Prescribed Information
- Attachment B Registration of Authorized Users
- Attachment C Irradiator Access Registration Form
- Attachment D Irradiator Authorized Users List
- Attachment E Irradiator Key Control Form
- Attachment F Irradiator Visitor and Contractor Authorizations

11. References

- [1] Canadian Nuclear Safety Commission, “Security of Nuclear Substances: Sealed Sources,” REGDOC-2.12.3, 2013.

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Protection of Prescribed Information

Introduction

All information related to the facility security plan, locations and inventory of irradiators and testing of alarm systems is considered prescribed information and must be protected according to the requirements of sections 21 to 23 of the General Nuclear Safety and Control Regulations. Measures must be taken to prevent loss or illegal use, and the information may only be shared on a 'need to know' basis.

What to Consider Prescribed Information

- Installation schematics for security systems
- Any document listing the location (room number) of an irradiator
- Any document detailing the security features protecting an irradiator

Communication Options

If prescribed information is to be communicated to an individual at another location, it shall be hand delivered by Radiation Safety Personnel or mailed according to the instructions below. Do not communicate prescribed information through e-mail.

Mailing of Prescribed Information

The document must be placed in two sealed envelopes.

The inner envelope must be clearly marked: "Protected – PRESCRIBED INFORMATION. To be opened only by addressee."

The outer envelope shall contain no identifiers other than the required postal information.

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Registration of Authorized Users

Introduction

All authorized users must complete an Irradiator Access Registration Form and pass a trustworthiness and reliability check before being granted access to the irradiator. This document provides instruction on how to complete the registration process.

Section A: Personal Information

The applicant must complete this section.

Section B: Training

The applicant must attend in class radiation safety training delivered by radiation protection staff and an on the job irradiator orientation session delivered by the lab manager or designate *before* access is granted.

The trainer must confirm that training was completed by signing the applicant's access registration form.

Section C: Trustworthiness Verification

The trustworthiness and reliability of an applicant shall be verified. The lab manager or the applicant's immediate supervisor shall verify the applicant's identity by viewing a piece of government issued photo identification. The applicant must provide one of the following documents.

- 1) A "Police Criminal Record Check" from a police station in their city of residence: the address listed on their driver's license. The applicant must not have resided outside of Canada for a period greater than 1 year during the past 5 years.
- 2) One of the "Alternatives to a Criminal Records Check" listed below.
- 3) For international students or applicants who do not meet the criteria of condition 1 only: a background check obtained through the service Sterling Backcheck, www.backcheck.ca . Instructions on using this service are provided below.

Criminal Records Check. The applicant must provide an original copy of the results to their immediate supervisor or the lab manager. The lab manager or the applicant's immediate supervisor shall review the results of the criminal record check. If the result is *cleared* or *no records found*, the records check is complete, and the corresponding box can be checked on the registration form.

Alternately, the results of the name check can come back *not cleared*; *record may or may not exist*; or *incomplete*. If this is the case, consult with the Radiation Safety Officer (RSO) for the site. Note that this does not necessarily preclude access to the irradiator, but a further investigation will be performed by the RSO including a personal interview with the applicant.

Alternatives to a Criminal Records Check.

- NEXUS card issued by the Canadian Border Services Agency (CBSA)
- Free and Secure Trade (FAST) issued by the CBSA
- Firearm Possession and Acquisition License issued under the *Firearms Act* S.C. 1995, C.39
- Natural Resources Canada Explosive Regulatory Division security screening letter
- Permis Général issued under the *Quebec Explosive Act*, R.S.Q E-22

- A security assessment under the Controlled Goods Program administered by the Controlled Goods Directorate of the Department of Public Works and Government Services Canada

Sterling Backcheck. If the service Sterling Backcheck is used, the RSO or designate will receive the results of the background check directly. The RSO or designate will contact the lab manager and indicate if the applicant is cleared.

Applicants should contact the Health Physics department at hphys@mcmaster.ca with the following information: the applicant's full name and e-mail address, the name of the irradiator they are applying to use, and the name of their immediate supervisor.

Section D: Employment History

The applicant does not need to complete this section if already employed by McMaster University or Hamilton Health Sciences for 5 years or more.

The applicant shall complete this section, ensuring that the employment history covers a period of 5 years with no gaps and that periods of unemployment are identified.

The lab manager, applicant's immediate supervisor or designate shall contact each previous employer or academic institution and confirm that the applicant was employed or enrolled during the period indicated.

Section E: Access Approval

The applicant shall provide the completed form to the lab manager. The lab manager shall confirm that all sections have been completed in full, and specify a date on which the user's access will expire. Access must expire within a period than 5 years from the date it was granted.

Records Maintenance

The permit holder or designate shall store the completed access registration form for each user in a secure location. A copy of the completed form shall be provided to the Radiation Safety Officer for the site.

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Date _____

New ☐Revision ☐**Section A: Personal Information. Completed by applicant**

Surname _____ Given Name _____

E-mail _____ Telephone _____

Room # _____ Extension # _____

Home Address _____ Student or Employee ID _____

 Staff ☐ Undergraduate ☐ Graduate ☐ Other (specify) ☐ _____

Name of irradiator for which access is requested: _____

Section B: Training Received. Completed by trainer

Radiation Safety - Gamma Cell User Date _____ Trainer's Signature _____

Irradiator Orientation Date _____ Trainer's Signature _____

Other (If applicable, please specify)

_____ Date _____ Trainer's Signature _____

Section C: Trustworthiness verification. Completed by applicant's immediate supervisor

Criminal Record Check	Cleared <input type="checkbox"/>	Photo ID Verified <input type="checkbox"/>	Employment History Confirmed <input type="checkbox"/>
	Cleared by RSO <input type="checkbox"/>		

Supervisor's Declaration

As manager or supervisor of this individual I have viewed all required documentation and confirmed the applicant's employment history as required by the Radiation Safety Procedure for the Safety and Security of Irradiators. I certify that this individual meets the trustworthiness and reliability requirements, or have received written confirmation of trustworthiness and reliability from the Radiation Safety Officer for the site.

Signed: _____ Date: _____



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Section D: Employment History. Completed by applicant

This section is not required if the applicant has been employed by McMaster University or Hamilton Health Sciences for more than 5 years.

New Hire ☐ OR Employed at the institution since: _____

Employment history must cover a period of 5 years with no gaps. If unemployed, please indicate as such.

Name of employer/academic institution	From	Y	Y	Y	Y	M	M	To	Y	Y	Y	Y	M	M	Confirmed (initials)
Job-site or school address (street number, name, city, province/state and country)															
Job title/description or field of study															
Supervisor or department administrator's name in full								Supervisor/department administrator's telephone number/e-mail							

Name of employer/academic institution	From	Y	Y	Y	Y	M	M	To	Y	Y	Y	Y	M	M	Confirmed (initials)
Job-site or school address (street number, name, city, province/state and country)															
Job title/description or field of study															
Supervisor or department administrator's name in full								Supervisor/department administrator's telephone number/e-mail							

Name of employer/academic institution	From	Y	Y	Y	Y	M	M	To	Y	Y	Y	Y	M	M	Confirmed (initials)
Job-site or school address (street number, name, city, province/state and country)															
Job title/description or field of study															
Supervisor or department administrator's name in full								Supervisor/department administrator's telephone number/e-mail							

Name of employer/academic institution	From	Y	Y	Y	Y	M	M	To	Y	Y	Y	Y	M	M	Confirmed (initials)
Job-site or school address (street number, name, city, province/state and country)															
Job title/description or field of study															
Supervisor or department administrator's name in full								Supervisor/department administrator's telephone number/e-mail							



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Section E: Access Approval. Completed by Lab Manager

Access Expiry Date: _____ Access shall expire \leq 5 years from today

Lab Manager's Declaration

As lab manager for this irradiator, I certify that I have reviewed this form for completeness. I will maintain the original, and have provided a copy to the Radiation Safety Officer for the site, as required by the Radiation Safety Procedure for the Safety and Security of Irradiators.

Signed: _____ Date: _____

Section F: Applicant's Declaration. Completed by Applicant

By my signature below, I confirm that the information I have provided on this form is correct and complete to the best of my knowledge and belief. I also provide my consent to permit McMaster to verify the information I have provided in Section D by contacting the employers and individuals identified in Section D.

I further acknowledge that I am aware of and accept the responsibilities associated with the access privileges that I have been granted and I agree to abide by all applicable rules and procedures. I understand that non-compliance on my part may lead to suspension or termination of my access privileges without warning.

Signed: _____ Date: _____

FIPPA STATEMENT

I acknowledge that certain information I have provided on this form is my personal information. This is being collected under the authority of the *McMaster University Act*, 1976, the *Nuclear Safety and Control Act*, and pursuant to section 39(2) of the *Freedom of Information and Protection of Privacy Act* of Ontario (RSO 1990). This information is collected and will be used and disclosed solely for the purpose of facilitating and authorizing my access to nuclear substances (sealed sources or prescribed information) and for no other purpose. Questions regarding the collection, use or disclosure of this information should be directed to the Senior Health Physicist, Health Physics Department, Nuclear Research Building at McMaster University.

Irradiator Name:	
Date:	

Radiation Safety Officer:	
Security Services Supervisor:	
Permit Holder:	
Lab Supervisor:	

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Irradiator Name:	
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Irradiator Name:	
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