



Radiation Safety – Standard Operating Procedure

Title: Security Measures for Sealed Nuclear Sources

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Purpose

Access to radioactive materials is to be controlled from the time of acquisition until disposal. This SOP outlines security requirements for controlling unauthorized access to sealed sources as required by Canadian Nuclear Safety Commission *REGDOC-2.12.3, Security of Nuclear Substances: Sealed Sources*.

Scope

The permit holder shall implement and maintain security measures commensurate with the nuclear substance and/or radiation device in possession, and legislative requirements. This SOP shall apply to the use and storage of Category 4 and 5 sealed sources, and radiation devices (i.e. liquid scintillation counters).

Responsibility

It is the responsibility of the Radioisotope Permit Holders, Radioisotope Lab Supervisors and Authorized Workers to secure nuclear substances in their possession and ensure that radioactive materials are used and stored in a manner to prevent unauthorized access or removal.

Definitions

Category 4 source: sources that are very unlikely to permanently injure anyone. However, this amount of unshielded radioactive material, if not safely managed or securely protected, could possibly – although it is unlikely – temporarily injure someone who handled it or was otherwise in contact with it, or who was close to it for a period of many weeks.

Category 5 source: sources that could not permanently injure someone.

Radiation Device: a device that contains more than the exemption quantity of a nuclear substance and that enables the nuclear substance to be used for its radiation properties; a device that contains a radium luminous compound.

Sealed Source: A radioactive nuclear substance in a sealed capsule or in a cover to which the substance is bonded, where the capsule or cover is strong enough to prevent contact with or the dispersion of the substance under the conditions for which the capsule or cover is designed.



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Storage The holding of radioactive sources in an area that provides for their containment with the intention of retrieval.

Training

- a) Radiation Safety Training (Part 1 – Theory and Part 2 – Practical) provided by Safety Services. Note: at the discretion of the Radiation Safety Officer, Part 2 training may not be required for workers who only use Category 5 sealed sources.
- b) Lab specific radiation safety training provided by the Radioisotope Permit Holder and/or Radioisotope Lab Supervisor is required prior to working with radioactive materials.
- c) Radiation Safety Awareness training will be provided to Facilities staff (Caretakers, Utilities, etc.) by Safety Services.

Safety

The Radioisotope Permit Holder shall conduct a hazard assessment that identifies hazards and mitigating controls for the use and storage of sealed sources. A copy of the hazard assessment shall be available to Authorized Workers.

A copy of the following shall be available to Authorized Workers:

- UofL Radiation Safety and Procedures Manual
- Radiation Safety Data Sheets
- Manufacturer's safety information
- Any other relevant safety information

Material and Equipment

- Lockable enclosures
- Shielding (if required)
- Record keeping systems (see Records section below)

Procedure

The security of sealed sources shall be maintained by implementation of the following:

1. Access Control and Authorization:

- Access to sealed sources is to be controlled from the time of acquisition until transfer or disposal.

a) Physical Security (locked storage)

- When not in use or not under the direct supervision and control of an authorized worker, sealed sources shall be secured in a locked room, area, enclosure (e.g. storage freezer).
- A method of key control shall be implemented by the Radioisotope Permit Holder.

b) Authorization

- Only trained Authorized Workers are permitted access to sealed sources.



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- Sealed sources must be secured in such a manner that an individual with authorized access to the area (Caretaking, Maintenance, Materials Management staff) but who is not authorized to use or possess the materials cannot gain access or control of the materials.

2. Training:

- Radioisotope Permit Holders shall ensure that all Authorized Workers are trained and competent in application of required security measures.
- Authorized non-users that access the laboratory shall receive radiation safety awareness training.
- Records of training/review must be maintained.

3. Inventory Management:

- Inventory management of nuclear substances and radiation devices (e.g. maintenance and verification inventory records and sign-out log books) must be maintained by the Radioisotope Permit Holder.
- Individual sealed sources must be identified with a unique inventory number.
- Regular inventory verification checks must be conducted by the Radioisotope Permit Holder and at the request of the RSO.
- A log book entry must be made each time a sealed source is removed from and returned to storage. The entry must include the date, the Authorized Worker's name, the identity of the source, the location the source will be used and the date the source was returned to storage.

4. Incident Reporting:

- The Permit Holder or his/her designate must immediately report any actual or suspected loss or theft of a nuclear substance or radiation device to the RSO and an investigation must begin.

Review Period

- This SOP must be reviewed every three years by the Radiation Safety Committee and the Radiation Safety Officer.
- This SOP must be immediately revised if errors are identified or if procedures change.

Records

The Permit Holder must maintain the following records:

- Inventory records documenting purchases, transfers and disposals
- A log book to record the use of sealed sources
- Training records
- Key control records

References

CNSC Regulatory Document 2-12-3, Security of Nuclear Substances – Sealed Sources:

http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/REGDOC-2-12-3-Security-of-Nuclear-Substances-Sealed-Sources.pdf

University of Lethbridge Radiation Safety and Procedures Manual: http://www.uleth.ca/risk-and-safety-services/sites/risk-and-safety-services/files/UofL%20Radiation%20Safety%20and%20Procedures%20Manual_02.10.2017.pdf