

Source Inventory and Control

Nuclear Secured / Radiation Safety

NS-RS-PR-206, 0

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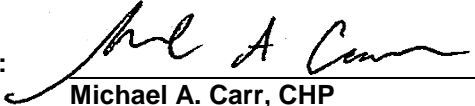
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History and Approvals


History

Revision	Intent Y/N	Purpose description
0	Y	For Issue (Rebrand CS-RS-PR-009)

Approvals

Preparer:  8/5/2019

 Michael A. Carr, CHP
 Radiation Safety Officer Date

Approver:  8/14/2019

 Dutch Conrad
 Senior Vice President Field Services Date

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1. Purpose and Scope

1.1. Purpose

The purpose of this procedure is to provide the minimum requirements for handling, storing, inventory and leak testing of check and/or sealed radioactive sources.

1.2. Scope

This procedure applies to all Nuclear Secured (NS) personnel and subcontractors where the NS Radiation Protection Plan (RPP) has been implemented for the control of radioactive materials including sources. This procedure does not address the specific security measures and increased controls for high activity sources nor sources installed in gauges.

2. References

- 2.1. 10CFR20, *Standards for Protection Against Radiation*
- 2.2. 10CFR30, *General Rules Applicable to Domestic Licensing of Byproduct material*
- 2.3. AE-SH-PR-002, *Incident Reporting and Notification*
- 2.4. NS-RS-PG-001, *Radiation Protection Program*
- 2.5. NS-RS-PR-102, *Project Records Management*
- 2.6. NS-RS-PR-200, *Emergency Response*
- 2.7. NS-RS-PR-202, *Radiological Postings*
- 2.8. NS-RS-PR-207, *Radioactive Materials Control*
- 2.9. NS-RS-PR-300, *Performance of Radiological Surveys*

3. General

3.1. Definitions

- 3.1.1. *Check Source* – A radioactive source, not necessarily traceable to NIST, which is used to confirm the continuing satisfactory operation of an instrument.
- 3.1.2. *Exempt Quantities* - By-product material in individual quantities, each of which does not exceed the applicable quantity set forth in 10CFR30.71, Schedule B.

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- 3.1.3. *Licensed Radioactive Material (or Licensed Material) (LRM)* - Source material, special nuclear material, or by-product material received, possessed, used, transferred or disposed of under a general or specific license issued by the Nuclear Regulatory Commission or an Agreement State.
- 3.1.4. *Sealed Source* - Any by-product material that is encased in a capsule designed to prevent leakage or escape of the by-product material.

3.2. Responsibilities

Depending on personnel qualifications and the size of the project, project personnel may be assigned multiple roles and/or responsibilities.

3.2.1. NS Radiation Safety Officer

The NS Radiation Safety Officer (RSO) maintains and oversees the implementation of the NS RPP. The RSO shall ensure that radiation safety, radioactive materials management, and radiological operations procedures and programs are kept up to date such that they comply with current regulations and incorporate current and relevant industry practices and regulatory guidance.

3.2.2. Project Manager

The Project Manager (PM) is responsible for ensuring that the proper program procedures and programs are implemented on the project site as required by customer agreements and contracts. The PM is responsible for ensuring that these programs and procedures are properly incorporated into project specific plans and procedures. The PM is responsible for ensuring that the NS RPP and client programs and procedures, as applicable, are available for use by project personnel.

3.2.3. Project Health Physicist

The Project Health Physicist (PHP) is responsible for assisting the RSO in providing health physics support to the PM and Radiation Protection Supervisor (RPS). This includes technical support to ensure procedural and regulatory compliance and to ensure that the project-specific Data Quality Objectives (DQOs) are met.

3.2.4. Radiation Protection Supervisor

The Radiation Protection Supervisor (RPS) is responsible for implementing the ANS RPP at the project location. The RPS manages and oversees the project personnel in regards to radiation safety and reports directly to both the PM and the RSO.

3.2.5. Health Physics Personnel

Health physics personnel are responsible for proper control and handling of radioactive sources including inventory, storage and leak testing.

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3.3. Precautions and Limitations

- 3.3.1. Exempt quantity sources are not subject to the inventory and leak testing requirements; however, they should be included for tracking purposes and positive control.
- 3.3.2. When leak testing sources, the active source surface should not be directly smeared to prevent any potential source damage.
- 3.3.3. When leak testing high activity sources, the source should be indirectly smeared.
- 3.3.4. Specific controls for high activity sources such as interlock and alarm requirements are not addressed in this procedure.
- 3.3.5. Sealed sources in long term storage are not required to be leak tested; however, the source shall be leak tested upon removal from storage if the last leak test was more than 6 months prior.

4. Pre-Requisites / Requirements

- 4.1. Radioactive sources shall be shipped in accordance with DOT (49CFR) and IATA regulations as applicable.
- 4.2. Leak tests shall be capable of detecting 0.005 microcuries (μCi) or 185 Becquerel (Bq) of radioactivity.
- 4.3. Leak test records for sealed sources shall be maintained for a minimum of 3 years.
- 4.4. Inventory records for sealed sources shall be maintained for a minimum of 3 years.

5. Procedure

5.1. Source Receipt

- 5.1.1. Upon receipt of a source, perform a receipt survey of the package and verify that it was shipped properly in accordance with DOT (49CFR) and IATA regulations.
- 5.1.2. Verify the source against the source shipping records.
- 5.1.3. Obtain a copy of the source certificate if a copy was not provided as part of the shipping records.
- 5.1.4. Enter the source information into the source inventory, Attachment 7.1 or equivalent.

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5.1.5. If a current leak test is not provided as part of the shipping records (i.e., leak test in the last 6 months), perform a leak test in accordance with Section 5.6.

5.2. Source Inventory

5.2.1. The RPS or designee shall compile an inventory of all sources (sealed sources and check sources). The inventory shall include but not be limited to the following:

- ID number,
- isotope(s),
- activity,
- last leak test,
- storage location

5.2.2. The RPS or designee shall update the source inventory as sources are received or shipped off-site.

5.2.3. Source certificates, if available, shall be maintained with the inventory records.

5.2.4. The RPS or designee shall physically verify the presence, location and condition of each source on the list at least every six months.

5.2.5. If required, perform a leak test of any sources in accordance with Section 5.6.

5.3. Missing/Lost Source

5.3.1. If a source is determined to be missing or lost, immediately notify the RPS.

5.3.2. If the source is a licensed source, immediately notify the RSO.

5.3.3. Perform a search for the source.

5.3.4. Initiate an incident report in accordance with AE-SH-PR-002, *Incident Reporting and Notification*.

5.3.5. The RSO shall make the necessary notification in accordance with NS-RS-PR-200, *Emergency Response* as necessary.

5.4. Damaged Source

5.4.1. If a source is physically damaged, immediately notify the RPS and remove the source from use;

5.4.2. Perform a leak test regardless of its activity in accordance with Section 5.6.

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- 5.4.3. If the source is determined to be leaking, secure the source to prevent the potential spread of contamination and immediately notify the RSO.
- 5.4.4. Perform surveys of the immediate area in accordance with NS-RS-PR-300, *Performance of Radiological Surveys* to ensure no spread of contamination. If contamination is identified, health physics shall control the area as necessary.
- 5.4.5. The RSO shall make the necessary notification in accordance with NS-RS-PR-200, *Emergency Response* as necessary.

5.5. Source Handling and Control

- 5.5.1. Sources shall be labeled, and the storage area posted in accordance with NS-RS-PR-202, *Radiological Postings*.
- 5.5.2. The room used for source storage is exempted from posting as “Caution, Radioactive Material” if the only radioactive material present is a sealed source and the radiation level at 30 cm from the surface of the source container does not exceed 5.0 mrem per hour.
- 5.5.3. When not in use, sources shall be secured when left unattended.
- 5.5.4. Sources should only be removed from storage when needed and replaced immediately after use unless under the direct control of health physics personnel.
- 5.5.5. Installed sources (e.g., gauging devices, irradiators, well logging, etc) shall not be removed or exposed as part of this procedure.

5.6. Leak Testing

- 5.6.1. Leak test intervals are specified by the applicable NRC or Agreement State license, or as specified by the source registration / certification; however, it shall not exceed 6 months.
- 5.6.2. Leak tests shall be performed by health physics personnel.
- 5.6.3. Smear the most accessible area where contamination would likely accumulate if the source were leaking (e.g., inside the source holder or container). Do not smear the sources active surface.
- 5.6.4. Document the leak test in accordance with NS-RS-PR-300, *Performance of Radiological Surveys*.
- 5.6.5. If a source is determined to be damaged and/or leaking, follow the requirements in Section 5.4.

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6. Records

- 6.1. Source Inventory
- 6.2. Leak Test Records / Surveys

7. Attachments and Forms

- 7.1. Source Inventory

