



Technical Safety



RADIATION PROCEDURES MANUAL

Procedure Cover Sheet

Procedure Title: Receipt of Package Containing Radioactive Material

Procedure Number: TSO-10-18-REV 1

Effective Date: April 23, 2011

Approved by: 
Technical Safety Office Director

Date: April 23, 2011



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A. INTRODUCTION

Radioactive material brought under the scope of Idaho State University's (ISU) Nuclear Regulatory Committee (NRC) license is required to be inspected and surveyed upon receipt and placed in an inventory tracking system. Two radioactive material (RAM) inventory systems have been implemented at ISU. The Technical Safety Office maintains a (RAM) inventory using the Environmental Health and Safety (EH&S) program and the responsible user in custody of RAM uses the standardized spread sheet to maintain an inventory of all radionuclides and their corresponding activity concentrations. Authorized users are required to maintain an accurate inventory of radionuclide activity concentrations to insure that radionuclide activity limits in the NRC license are not exceeded.

B. PURPOSE

The purpose of this procedure is to provide guidance on inspection, survey, transportation and inventory of RAM packages received by ISU.

C. REQUIRED MATERIAL(S)

- Appropriate hand held survey meters
- Swipes
- Gloves
- Plastic bag to contain swipes
- Pen
- Whole body dosimeter
- RPR 13A form
- Authorized vehicle for transport of RAM on public roads
- Liquid Scintillation Counter (LSC) for swipe analysis

D. PROCEDURE

Technical Safety Office (TSO) personnel are required to inspect and survey all packages containing radioactive material (RAM) within three hours of package arrival. If package arrival occurs at the end of the work day than the three hour time frame starts at the beginning of the next work day. Mean while RAM packages must remain locked in a secure location to prevent unnecessary exposure to personnel.

The following steps are performed by the TSO employee once notification of package arrival has been received:

Preparation

- 1 Wear whole body dosimeter.
- 2 Perform operation and response checks on survey meters.
- 3 Prepare RPR 13A form and accompanying swipe material.
- 4 Obtain authorized vehicle if transporting RAM on public roads. **Never use a personal vehicle to transport RAM.**
- 5 Contact the responsible user and ensure that preparations are made to receive custody of the package.

Inspect and Survey Package

- 1 Inspect integrity of package and notify RSO if package is crushed, wet or opened.
 - 1.1 Be sure to wear gloves and personal dosimetry when ever handling the RAM packages.
 - 1.2 If significant damage has occurred make notifications and perform surveys on package and surrounding areas to ensure that there was no spread of contamination.
 - 1.3 Bag package to contain any loose surface contamination still present.
 - 1.4 Perform whole body frisk as a precautionary measure.
- 2 If the integrity of the package passes inspection then continue with routine surveys.
 - 2.1 As directed by the RPR 13A form, perform a loose surface contamination survey by swiping a comprehensive surface of the packaging.
 - 2.2 Direct frisk each swipe and verify that the limits for loose surface contamination listed on RPR 13A are not exceeded.

- 2.3 Bag the swipes for analysis with a LSC to verify that there is no contamination above the action level and critical Level (Lc).
- 2.4 The TSO employs a removable contamination swipe-sample action level of 70 dpm/100cm² unidentified beta or gamma emissions or 7 dpm/100cm² alpha emissions. However, any radioactive contamination detected which demonstrates a quantity of radioactive material present that is greater than Lc, (Lc is equal to 2.33 times the uncertainty in background) will be brought to the attention of the RSO. The operational goal in accordance with good practice and ALARA is to not tolerate detectable removable contamination at any ISU facility.
- 2.4.1 If values greater than Lc are identified after a recount of the sample, then the RSO based upon experience and judgment, will determine if further remediation is appropriate.
- 2.4.2 If the results of analysis for a swipe show activity above 70 dpm/100cm² unidentified beta or gamma emissions or 7 dpm/100cm² alpha emissions and a reanalysis of the removable contamination sample does not demonstrate that the activity is below the action level, then a series of decontaminations of the area must be performed until the contamination surveys show activities less than 70 dpm./100cm² unidentified beta or gamma emissions or 7 dpm/100cm² alpha emissions. This action level ensures that all sources of removable contamination, even low levels of contamination, are investigated and decontaminated.
- 2.4.3 The value of 70 dpm./100cm² unidentified beta or gamma emissions or 7 dpm/100cm² alpha emissions represents those levels of radioactivity that can be reliably detected with readily available bench top laboratory analyses devices such as liquid scintillation counters or gas flow proportional counters during an analysis of 2 to 10 minutes. It is consistent with a level that is about twice the Lc value for most of the devices in current use at ISU – a value near the minimum detectable activity (MDA) for most analysis methods.
- 2.5 Perform dose rate surveys on contact with the packaging and at one meter from the surface of the packaging.
- 2.5.1 Verify that packaging labels are in agreement with the measured dose rates and the corresponding label requirements. If a discrepancy is identified notify the RSO immediately.
- 2.5.2 Document the dose rates on the RPR 13A.
- 2.5.3 If a package contains limited quantities of radioactive material and is exempt from labeling requirements set by the Department Of Transportation then the only requirements are:

- 2.5.3.1 Package has a UN number
 - 2.5.3.2 Package has a radioactive sticker either on the inner item/packaging or on the outside of the packaging.
 - 2.5.3.3 Highest dose rate on contact (o.c.) does not exceed 0.5 mrem/hr.
- 3 Package opening instructions:
 - 3.1.1 Assume that container and packaging materials may be contaminated.
 - 3.1.2 Open in fume hood, if possible. Wear gloves and work over absorbent material.
 - 3.1.3 Use shielding and tongs for energetic beta or gamma emitters.
 - 3.1.4 Monitor thoroughly for contamination, including packaging materials, work area, clothing, hands, etc.
 - 3.1.5 Survey the inner container for removable contamination with swipes and check the swipes for activity. Use LSC for low-energy beta emitters such as H-3, gamma counter for Cr-51, I-125 etc., and portable survey meter for energetic beta emitters such as P-32.
 - 3.1.6 Verify that the material description, nuclide, and activity listed on the certification form from the manufacturer are correct.
 - 3.1.7 Use the Radioactive Material Inventory TSO-09-16-REV0 procedure to log RAM items into the EH&S inventory program-**Applicable to TSO Staff only.**
 - 3.1.8 After all survey samples are analyzed and determined that the package and packaging are free of detectable loose surface contamination then the package may be delivered to the responsible user.
 - 3.1.9 **Use only designated vehicles for RAM transport. Do not use a personal vehicle to transport RAM.**
- 4 The responsible user will log all RAM in the RAM inventory spreadsheet. The responsible user will log the individual radionuclide and activity level into the excel spreadsheet.
 - 4.1 The excel spreadsheet will automatically account for decay correction.
 - 4.2 The excel spreadsheet will be updated when a radionuclide is used and waste is generated. Subtract the estimated amount of radionuclide activity wasted from the total amount of radionuclide activity in the inventory.
 - 4.3 Ensure that all radioactive waste is bagged and tagged properly. The tag will contain the following:
 - 4.3.1 Physical description of the waste.
 - 4.3.2 The radionuclide and activity level of the waste in the bag.
 - 4.3.3 The name of the responsible user who generated the waste and the date of generation.

4.4 Request a RAM pickup by completing an electronic pickup form located on the TSO webpage. <http://www.physics.isu.edu/health-physics/tso/ohome1.html>

Attachment 1 INVENTORY SPREADSHEET EXAMPLE

		Responsible User/ Lab Supervisor								
		Program Number								
		Revision Number								
		Revision Date								
No.	RADIONUCLIDE	Ref. Date	SERIAL # / OTHER ID	PO Number	Vendor	Sample Volume (ml)	Total Ref Activity (µCi)	Description/Comments	Location	Disposed Date
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REFERENCES

10 CFR 20.1906 Procedures for receiving and opening packages.

10 CFR 71.4.

10 CFR 71.87(i).

10 CFR 71.47.

49 CFR 172.403 and 172.436-440.



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REVISION TRACKER

Revision 0	January 10, 2011	Original Procedure
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