



Radiation Safety

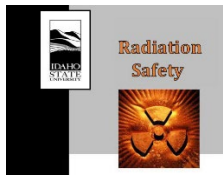


RADIATION PROCEDURES MANUAL **Procedure Cover Sheet**

Procedure Title: Radioactive Material Inventory
Procedure Number: RS-16 Rev.3
Effective Date: 10/31/2022

Approved By: Radiation Safety Committee

Date: 10/06/2022



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Revision History

Revision Number	Author Name	Date	Approved by/date
RS 16.0	Mason Jaussi & John Longley	06/18/09	TSO-08/11/09
RS 16.1	Mason Jaussi & John Longley	05/15/18	RSO-05/15/18
RS 16.2	Mason Jaussi & John Longley	08/01/19	RSO-07/11/19
RS 16.3	Mason Jaussi	08/03/22	RSC-10/06/22

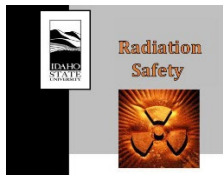
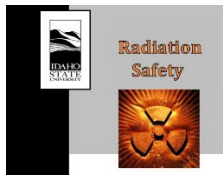


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1. INTRODUCTION

Idaho State University (ISU) must keep a record of licensed radioactive material, special nuclear material and accountable source material inventories showing their receipt, transfer and disposal. Transfer and disposal records are to be maintained for until the applicable license is terminated. ISU utilizes a database software, currently EHS Assistant termed HP Assist, to keep an inventory of radioactive materials possessed under its NRC issued licenses.

2. PURPOSE

This procedure specifies instructions for maintaining the inventory database of licensed radioactive materials, for labeling of radioactive materials, and for performing semi-annual inventories. It applies to non-exempt radioactive sources, special nuclear materials, byproduct materials, and accountable nuclear materials that are also tracked in the Nuclear Material Management and Safeguards System (NMMSS).

3. SCOPE

This procedure applies to all radiation safety personnel, authorized users, and approved designees who maintain the radioactive material database, label radioactive materials, and perform inventories of radioactive materials.

4. ROLES AND RESPONSIBILITIES

Radiation Safety Officer

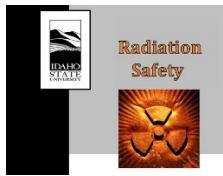
- Maintain the inventory database software (HP Assist)
- Perform independent verification of at least one user inventory every six months
- Participate in the special nuclear material inventory every six months
- Maintain the inventory list for special nuclear material

Radiation Safety Personnel

- Enter inventory data in the database software
- Generate inventory reports for Authorized Users
- Upload inventory reports into radiation safety records on Box

Authorized Users

- Label radioactive material as specified in this procedure
- Provide radiological data to radiation safety personnel for inclusion into the inventory database software



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- Perform physical inventories every six months
- Authorized users who have been trained and authorized may perform data entry into the HP Assist database

Reactor Supervisor

- Perform an inventory of special nuclear materials on the reactor, SNM, and broad scope (Permit 72) licenses every six months in conjunction with the 10% survey of the sub-critical assembly

5. ACRONYMS/DEFINITIONS

ANM:	Accountable Nuclear Material
AU:	Authorized User
EQ:	Exempt Quantity
NMMSS:	Nuclear Materials Management and Safeguards System
NSTS:	National Source Tracking System
NRC:	Nuclear Regulatory Commission
PI:	Principal Investigator
RAM:	Radioactive Material
RSO:	Radiation Safety Officer
SCA:	Sub-critical assembly
SMP:	Sample
SNM:	Special Nuclear Material

6. REQUIRED MATERIAL(S)

- A computer with access to the inventory database software.

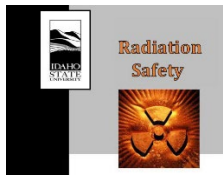
7. REQUIRED TRAINING(S)

- ISU Radiation Safety Training
- Training on how to use the inventory database software

8. PROCEDURE

8.1. Entering RAM in the Inventory Database (HP Assist)

All radioactive materials that are not exempt in accordance with 10 CFR 30 Schedule B must be entered in the inventory database (HP Assist). This includes all source and special nuclear material, except uranium ores exempted under 10 CFR 40.13 (a) and



(b), and all alpha-emitting byproduct material not specifically listed as exempt in Schedule B. Activated materials from accelerators or the reactor will be assessed for radioactivity and inventoried as necessary. Waste containers will be inventoried when they are full and ready for transfer. New waste items will be entered into the database when the waste tag is created, and container information will be included if the waste item is placed in a waste container. Waste containers will be entered when the container is closed and characterized in accordance with RS-09, Procedure for Radioactive Waste Management.

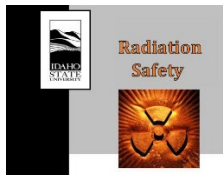
8.1.1. Data Entry Through the Web-Based Application

The web-based application is accessed through the following URL:
<http://hpassist.cose.isu.edu/ehsaweb/ehsawebisapi.dll/EXEC>

- Log on to the web-based application.
- Choose the applicable PI
- Select Inventory/Samples Select Add Inventory/Samples
- Select Receipt or Requisition
- Select Sample or Non-Sample
- Select Permit number from drop down list
- Select Lab/Location
- Select Storage Location
- Enter unique identifier or serial number as lot number
- Enter a description to assist with inventory for description
- Enter Physical Form (Use sealed for sealed sources)
- Enter Volume and Unit
- Enter Assay Date
- Select Add RAM Detail
 - Select Isotope
 - Enter Activity
 - Press Save in the RAM Detail box
 - Repeat as necessary for other radionuclides
 - Press Save at the bottom of the page to save the inventory item.

8.1.2. Virtual Deletion of RAM

When an item is shipped to another facility, it will be virtually deleted from the HP Assist software. The material will no longer be included in the PI RAM



inventory, but a record will still exist in the inventory database.

Complete the following steps to virtually delete an item in the Desktop version.

- Select Waste
- Select Removal of Isotope from PI's Inventory
- Select applicable authorized user
- Double click on the applicable EHS Assistant number
- Select add disposal
- Select Used By from the pick list
- Select Totally Disposed
- Enter a description in the comments that allows traceability (e.g. Waste tag number, waste container number, or shipment number and destination).
- Select save

NOTE: The RSO or designee can also implement update and insert queries to virtually delete records from the web-based version.

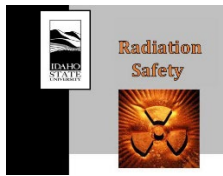
8.2. Labeling Radioactive Materials

All samples and sources that contain radionuclide activities greater than or equal to the values specified in 10 CFR 20, Appendix C are required to be labeled with the following information.

- Isotope(s)
- Sample/Source Activity
- Activity date
- If greater than exempt quantity (10 CFR 30 Schedule B) the HP Assist Number or Lot Number (Sealed source serial number or sample number)
- If less than or equal to exempt quantity (10 CFR 30 Schedule B) "Exempt Quantity" or "EQ"
- Caution radioactive material sticker

Materials that are less than 10 CFR 20 Appendix C thresholds must be labeled with the following information. The trefoil symbol will ensure that the radioactive material will be properly disposed as radioactive waste and the unique identifiers or HP Assist number where necessary will allow physical inventory when applicable:

- If greater than exempt quantity (10 CFR 30 Schedule B) the HP Assist number or Lot number (Sealed source serial number or sample number)



- If less than or equal to exempt quantity (10 CFR 30 Schedule B) “Exempt Quantity” or “EQ”
- Caution radioactive material sticker

NOTE: If the sample or source is too small to hold a label with this information, place it in a secondary bag and label the bag. Do not place labels over any original manufacturer markings, as this is valuable information.

8.3. Inventory Verification

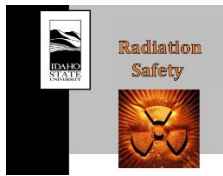
8.3.1. Broad Scope and Production Licenses

8.3.1.1. Each authorized user performs a complete physical inventory of all non-exempt radioactive materials, including SNM, semi-annually, specifically in March and September. The RSO will participate in the inventory for at least one authorized user every six months.

8.3.1.2. Radiation Safety personnel will generate the inventory reports for the RSO to provide to the Authorized Users. Inventory reports are generated through the Reports menu of HP Assist or through querying the inventory database using MySQL. Inventory queries are found in the spreadsheets assigned to each AU program on Box: Radiation Safety Program > Inventory > Semi-Annual Inventory Documentation.

8.3.1.3. The AU will complete the following steps for the inventory:

- Go to the first field location
- For each item in storage, locate the identifier or the HP Assist number on the list and initial next to the item.
- Note any conflicting information on the inventory report.
- Items marked as Exempt Quantity or EQ do not need to be inventoried and will not appear on the report.
- If there are materials present in storage but not on the list, note the identifier, radionuclides, activities, dates, and description so that radiation safety personnel can update the database. Transfer this information to the RSO for inclusion in the database and update of the inventory.
- If there are materials on the list but not present in the storage area, report the discrepancy to the RSO for further investigation.
- Repeat these steps for each storage location.
- After completion of the inventory and reconciliation of all discrepancies, sign, print name and date on the first page of the inventory reports.



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- Scan the final inventory reports and radiation safety personnel will upload them to Radiation Safety Program\Records\Material Inventories (460)

NOTE: A container with multiple items may be inventoried as a single item if the container is sealed with a tamper indicating device(s) and detailed inventory signed by two people is on record.

8.3.2. Special Nuclear Material Inventories

8.3.2.1. Inventory verifications are performed for all SNM (reactor, SNM, and broad-scope licenses) semi-annually in March and September. The March inventory verification is performed in accordance with RS-28, SNM Physical Inventory. The March inventory includes 100% inventory of the SCA plates and counts as one of the semi-annual 10% surveys of the SCA.

8.3.2.2. The RSO in conjunction with applicable Authorized Users performs an inventory of all special nuclear materials managed under the Broad Scope License in September each year. The September inventory will include a 10% survey of the SCA fuel plates. The ISU_Itemized_Nuclear_Material_Inventory spreadsheet will be updated by the RSO each time SNM is added to or removed from the Broad Scope license. The RSO will complete the following steps to generate the SNM inventory list.

- Access the Radiation Safety Program\NMMSS\Itemized Inventory folder and open the ISU_Itemized_Nuclear_Material_Inventory.xlsx workbook and Current_Inventory_Prog tab
- Print the Current Inventory Prog list

The RSO will go to each authorized user to perform the inventory. The RSO and authorized user will complete the following actions:

- For each item the authorized user and RSO will verify the item is present and then initial the list.
- After the list for the authorized user is complete both the authorized user and RSO will print, sign, and date in the adjacent space below the user's list.

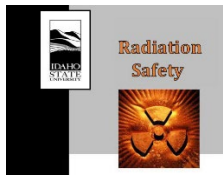
9. LIST OF FORMS

None.

10. REFERENCES

10 CFR 20, Standards for Protection Against Radiation

10 CFR 30, Rules of General Applicability to Domestic Licensing of Byproduct Material



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10 CFR 40, Domestic Licensing of Source Material

11. CHANGE HISTORY

Revision 1 – Revision included an elaboration on solutions to problems encountered when entering RAM inventory into the database.

Revision 2 – Complete revision of the procedure formatting, identifier, and structure. The scope of the procedure was changed to include the required inventory frequencies and instructions.

Revision 3 – Updated the format to meet the requirements set in RS-27. Update to the process for entering, removing, and retrieving data from the inventory database. Update to the inventory requirements to align with the requirements of RS-28.

12. APPENDICES

None.