



Radiation Safety



RADIATION PROCEDURES MANUAL

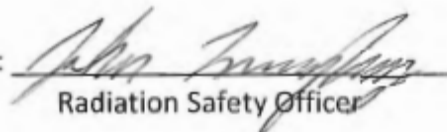
Procedure Cover Sheet

Procedure Title: Radioactive Material Inventory

Procedure Number: RS-16_Rev 2

Effective Date: August 1, 2019

Approved By:


Radiation Safety Officer

Date:

11-30-2019



Procedure #: RS-16_Rev 2
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Approval Date: 11-JUL-2019
Effective Date: 01-AUG-2019

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1. INTRODUCTION

ISU must keep a record of radioactive material and accountable nuclear material inventories showing their receipt, transfer and disposal. This record is to be maintained for as long as the material is possessed and for three years following its transfer or disposal. The EHS Assistant is software which ISU utilizes to keep an inventory of radioactive materials used under its license. This tool has query functions that provide ISU the means to monitor the amount of radioactive materials being used as a function of the limit found in the general ISU license.

2. PURPOSE

This procedure specifies instructions for maintaining a database of radioactive material possessed by ISU, for labeling radioactive material items, and for performing semi-annual physical inventories. It applies to source, special nuclear, and byproduct material as well as to accountable nuclear material tracked in the Nuclear Material Safeguards and Security federal database.

3. SCOPE

This procedure applies to radiation safety personnel who enter data into the EHS Assistant database, authorized users who perform inventories and label materials, the radiation safety officer, the reactor supervisor, and senior reactor operators who perform inventories. This procedure specifies instructions for maintaining the RAM inventory database, labeling radioactive materials, and performing biannual inventories of radioactive material and accountable nuclear material.

4. ROLES AND RESPONSIBILITIES

- Radiation Safety Officer –
 - Maintaining the EHS Assistant database.
 - Performing independent verification of at least one user inventory every six months.
 - Participating in the accountable nuclear material inventory every six months.
 - Maintaining the inventory list for accountable nuclear material.
- Radiation Safety Personnel –
 - Entering data in the EHS Assistant database.
 - Generating inventory reports for authorized users.
 - Uploading inventory reports into radiation safety records on Box.
- Authorized users



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- Labeling radioactive material as specified in 10 CFR 20 Subpart J.
- Providing radiological data to radiation safety personnel for inclusion in the EHS Assistant database.
- Performing physical inventories every six months

Note: Authorized users who have been trained and authorized may perform data entry in the EHS Assistant database.

- Reactor supervisor
 - Performing physical inventory of accountable nuclear material on the reactor and SNM licenses every six months in conjunction with the 10% survey.

5. REQUIRED MATERIAL(S)

Computer with access to EH&S software or webserver

6. PROCEDURE

6.1. Managing Data in the EHS Assistant Database

6.1.1. Logging Into EH&S Assistant

Double click the EHS icon on your desktop to enter HP assistant – OR-
Access the web version at (<http://hpassist.cose.isu.edu/ehsaweb/ehsawebisapi.dll/EXEC>)
Enter a valid USER ID and PASSWORD
Click Login to enter the system

6.1.2. Entering RAM in the EHS Assistant Database

All radioactive material that is not exempt in accordance with 10 CFR 30 Schedule B must be entered in the EHS Assistant database. This includes all source and special nuclear material except uranium ores exempted in 10 CFR 40.13 (a) and (b). It also includes 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 when they are transferred out of the accelerator hall/counting lab or reactor bay. Waste containers will be inventoried when they are full and ready for transfer. New waste items will be entered in the EHS Assistant database when the waste tag is created and stored separately from a container and waste containers will be entered when the container is closed and characterized.

There are two ways to enter radioactive material in the EHS Database.

- For single nuclides enter through the desk top application
- For multiple nuclides enter through the web based application



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6.1.2.1. Desk Top

Once you are logged into the system, select **Inventory** → **Quick Isotope Entry** located on the top menu bar. Input the following information for the source or sample:

- Description of the sample/source
- Lab and Location of source from the pick list
- Vendor for Sealed Sources
- Lot# - unique source ID for the material or Sealed Sources labeled on the item
- Physical form (use sealed for sealed sources).
- Volume with the correct units
- Assay Activity
- Assay Date
- Receipt Date
- Comments – Give brief description to aid in inventory

6.1.2.2. Web Based

Log on to the web base software.

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.



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Note: It is necessary to use the desk top version to change the transaction code from SMP to RAM in order to perform virtual deletion.

6.1.3. Virtual Deletion of RAM

When an item is transferred to a radioactive waste container or waste tag or shipped to another facility, it will be virtually deleted from the EHS Assistant database. The material will no longer be included in the PI RAM inventory but a record will still exist in the EHS Assistant database. Complete the following steps to virtually delete an item in the Desk Top 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.

The item including all applicable nuclides will be marked as deleted and will no longer be in the Authorized User Inventory.

6.2. Labeling Radioactive Material

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 App 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 App B) "Exempt Quantity" or "EQ"
- Caution radioactive material sticker



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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 EHS Assistant number where necessary will allow physical inventory when necessary.

- If greater than exempt quantity (10 CFR 30 App 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 App 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.

6.3. Inventory Verification

Each authorized user performs a complete physical inventory of all materials in the EHS Assistant database every six months. In addition, the RSO will participate in the inventory for at least one authorized user every six months.

Radiation Safety Personnel complete the following steps to generate the inventory report. If the inventory is too large to print as described below, radiation safety personnel will develop a simplified listing.

- Log into the EHS Assistant desk-top version
- Select Inventory
- Select Inventory Reports
- Select Current Inventory by Location, Inventory Number (TBD)
- Select Pick Your Own dates and enter 01/01/1950 to current date
- Select OK
- Choose the applicable PI(s) and double click
- Select OK
- Print the pdf inventory report
- Provide the inventory report as a pdf file to the Authorized User

The authorized user will complete the following steps for the physical inventory.

- Go to the first field location
- For each item in storage, locate the identifier or EHS Assistant number on the list and initial next to the item.



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- 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.
- Scan the final inventory reports and radiation safety personnel will upload them to EHS Dept\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.

6.4. Accountable Nuclear Material Inventory

6.4.1. Broad Scope License

The RSO in conjunction with applicable Authorized Users performs a complete physical inventory of all accountable materials managed under the Broad Scope License every six months. The ISU_Itemized_Nuclear_Material_Inventory spreadsheet will be updated by the RSO each time ANM is added to or removed from the broad scope license. The RSO will complete the following steps to generate the ANM inventory list.

- Go to the EHS Dept\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 place a check mark on 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.



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6.4.2. Reactor and SNM License

The reactor supervisor is responsible for completion and documentation of an itemized inventory every six months in conjunction with the 10% survey for the sub-critical assembly. This inventory will include all accountable materials on the reactor and SNM licenses. The reactor supervisor will assign two people, for whom a Trustworthy and Reliability Assessment has been successfully completed, to document the inventory. The inventory document will be approved and all records maintained by the reactor supervisor. Reactor personnel will complete the following actions.

- Print itemized lists for SNM sub-critical assembly cabinet and SNM storage safe.
- Two people with T&R verify inventory and check each item on the list.
- Two people with T&R sign and date the list.
- Reactor supervisor signs and dates the list.
- Reactor supervisor maintains inventory records.