



Radiation Safety

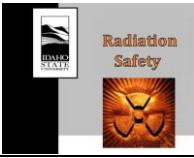


RADIATION PROCEDURES MANUAL **Procedure Cover Sheet**

Procedure Title: Radiation Safety General Procedure
Procedure Number: RS-26 Rev.0
Effective Date: 08/01/2021

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Revision History

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Table of Contents

1. INTRODUCTION	4
2. PURPOSE	4
3. SCOPE	4
4. ROLES AND RESPONSIBILITIES	4
5. REQUIRED MATERIAL(S)	4
6. REQUIRED TRAINING(S)	4
7. PROCEDURE	4
7.1. Confirmatory Surveys	4
7.1.1. Required Materials	5
7.1.2. Handling Steps	5
7.2. User Surveys	5
7.2.1. Required Materials	5
7.2.2. Handling Steps	5
7.3. Sewer Discharge	6
7.3.1. Required Materials	6
7.3.2. Handling Steps	6
7.4. General Waste Handling	7
7.4.1. Required Materials	7
7.4.2. Handling Steps	7
7.5. Radioactive Waste Removal	8
7.5.1. Required Materials	8
7.5.2. Handling Steps	8
7.6. Radioactive Waste Drum Closure	9
7.6.1. Required Materials	9
7.6.2. Handling Steps	9
8. LIST OF FORMS	10
9. REFERENCES	10
10. CHANGE HISTORY	10
11. APPENDICES	10



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1. INTRODUCTION

The Radiation Safety Department personnel periodically handle dispersible radioactive materials or work in laboratories where such materials are handled as a part of routine operations.

2. PURPOSE

This procedure specifies the general safety measures that must be taken by Radiation Safety Department personnel performing operations involving dispersible radioactive materials or working in associated laboratories.

3. SCOPE

This procedure applies to all Radiation Safety Department personnel who perform operations handling radioactive materials or working in dispersible radioactive material laboratories.

4. ROLES AND RESPONSIBILITIES

All Radiation Safety Department personnel have the responsibility to read, understand, and follow this procedure.

The Radiation Safety Officer has the responsibility to oversee the radiation safety program and maintain this procedure.

5. REQUIRED MATERIAL(S)

Specified for each task.

6. REQUIRED TRAINING(S)

Initial Radiation Safety Training

7. PROCEDURE

7.1. Confirmatory Surveys

The Radiation Safety Department performs confirmatory surveys in Authorized User laboratory spaces at the frequency specified in the user permits. The following



instructions specify the minimum safety measures to be implemented during survey operations. Additional requirements may be imposed in User facilities.

7.1.1. Required Materials

- Lab Coat (required for dispersible radiative material use areas)
- Gloves
- Whole-Body Dosimeter

7.1.2. Handling Steps

7.1.2.1. Gather required materials and don PPE.

7.1.2.2. Perform survey as specified in procedure RS-03, Radiological Surveys.

7.1.2.3. Practice ALARA by minimizing time in areas with elevated dose rates.

7.1.2.4. Frisk gloves, sleeves, and front of lab coat. If gloves are contaminated dispose in radioactive waste. Otherwise dispose in ordinary trash. Ask user for guidance in labs using H-3.

7.1.2.5. If applicable, store lab coats in the Radiation Safety Department laboratories or the user facilities.

7.2. User Surveys

The Radiation Safety Department periodically performs user surveys on behalf of the Authorized User. The following instructions specify the minimum safety measures to be implemented during survey operations. Additional requirements may be imposed in User facilities.

7.2.1. Required Materials

- Lab Coat (required for dispersible radiative material use areas)
- Gloves
- Whole-Body Dosimeter

7.2.2. Handling Steps

7.2.2.1. Gather required materials and don PPE.

7.2.2.2. Perform survey as specified in procedure RS-03, Radiological Surveys.



- 7.2.2.3. Practice ALARA by minimizing time in areas with elevated dose rates.
- 7.2.2.4. Frisk gloves, sleeves, and front of lab coat. If gloves are contaminated dispose in radioactive waste. Otherwise dispose in ordinary trash. Ask user for guidance in labs using H-3.
- 7.2.2.5. Store lab coats in the Radiation Safety Department laboratories or the user facilities.

7.3. Sewer Discharge

The disposal of radioactive materials through the sanitary sewer is performed in accordance with the ISU Radiation Safety Manual, section 17.4 and RS-09, section 6.2.3. The approved waste normally will be disposed in the Physical Sciences Laboratory 102 in the fume hood sink drain.

7.3.1. Required Materials

- Safety Glasses
- Double Set of Gloves (inner pair taped to lab coat)
- Lab Coat
- Whole-Body Dosimeter

7.3.2. Handling Steps

- 7.3.2.1. Gather required materials and don PPE.
- 7.3.2.2. Stage the container(s) to be disposed inside the fume hood.
- 7.3.2.3. Slowly dump the sample(s) down the drain, taking care to minimize any splashing.
- 7.3.2.4. Use the faucet to rinse the sink.
- 7.3.2.5. Dispose of empty container(s) in the nearest radioactive waste bin and update WAL.
- 7.3.2.6. Doff outer pair of gloves into radioactive waste bin and don a new outer pair.
- 7.3.2.7. Perform a survey of the fume hood interior paying attention to the sink drain, faucet valves, fume hood ledge and sash.



- 7.3.2.8. Frisk gloves, sleeves, and front of lab coat. If gloves are contaminated dispose in radioactive waste. Otherwise dispose in ordinary trash. Ask user for guidance in labs using H-3.
- 7.3.2.9. Store lab coats in the Radiation Safety Department laboratories or the user facilities.

7.4. General Waste Handling

The Radiation Safety Department performs radioactive waste handling operations. Operations involving less than 200 ALI may be performed in user laboratories or the waste sheds. Operations involving more than 200 ALI will be performed in the fume hood in laboratory 3:102 or a fume hood in a user laboratory if possible. For jobs involving more than 200 ALI that cannot be done in a fume hood, a specific work plan will be developed to include the appropriate PPE and Engineering Controls, in addition to the general requirements outlined in this procedure. If the handling operation is expected to involve 200 times the ALI for the radionuclide(s) present the technician will be monitored in accordance with RS-11, Internal Dosimetry. At minimum, a lapel air sampler will be worn by the technician.

7.4.1. Required Materials

- Gloves (double gloves with inner pair taped to lab coat required for dispersible radioactive material use areas)
- Lab Coat (required for dispersible radiative material use areas)
- Lapel air sampler (required if dispersible radioactive materials are expected to exceed 200 ALI)
- Whole-Body Dosimeter

7.4.2. Handling Steps

- 7.4.2.1. Gather required materials and don PPE.
- 7.4.2.2. Perform operations in the fume hood the work area or in accordance with specific job plan
- 7.4.2.3. At the conclusion of the job, perform a whole-body frisk and doff PPE.
- 7.4.2.4. Perform a user map survey of the area.



7.5. Radioactive Waste Removal

The steps below describe the process for removing the radioactive waste bags from the white rad trash bins.

7.5.1. Required Materials

- Gloves
- Lab Coat
- Whole-Body Dosimeter
- Vinyl or Duct Tape
- Waste Addition Log (WAL)
- Waste bin liner (clear)

7.5.2. Handing Steps

- 7.5.2.1. Gather required materials and don PPE.
- 7.5.2.2. Remove the lid from the trash bin and pull the liner edge away from the bin.
- 7.5.2.3. Twist the liner and remove it from the bin.
- 7.5.2.4. Using vinyl or duct tape, J-seal the liner and set aside.
- 7.5.2.5. Place a new liner in the bin and replace the bin lid.
- 7.5.2.6. Place a new waste addition log near the bin and remove the log associated with the waste bag.
- 7.5.2.7. Frisk gloves, sleeves, and front of lab coat. If gloves are contaminated dispose in radioactive waste. Otherwise dispose in ordinary trash. Ask user for guidance in labs using H-3.
- 7.5.2.8. Store lab coats in the Radiation Safety Department laboratories or the user facilities
- 7.5.2.9. Obtain the waste tag for the bag of waste from the Authorized User.
- 7.5.2.10. Contact a radiation safety staff member for guidance on moving the waste
- 7.5.2.11. Move the sealed waste bag to a staged drum and place the associated waste addition log with the drums waste addition log. Note the waste tag number on the drum waste addition log.



7.6. Radioactive Waste Drum Closure

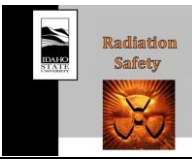
The following steps describe the process for closing and securing full radioactive waste drums.

7.6.1. Required Materials

- Gloves
- Lab Coat
- Whole-Body Dosimeter
- Crescent wrench
- Torque wrench with 15/16" socket
- Rubber mallet
- Vinyl tape
- Marker

7.6.2. Handling Steps

- 7.6.2.1. Gather required materials and don PPE.
- 7.6.2.2. J-tape the drum liner bag closed.
- 7.6.2.3. Place the drum bolt ring around the seal between the lid and the drum with the bolt lugs facing downward.
- 7.6.2.4. Insert the bolt through the unthreaded lug, thread the hex nut onto the bolt, and tighten the bolt into the threaded lug. Close the ring to an initial gap of approx. ½ in. with the hex nut seated against the unthreaded lug.
- 7.6.2.5. Tap around the top of the ring with a rubber mallet to fully seat the ring.
- 7.6.2.6. Torque the bolt to 55 ft-lbs. Note the ring ends must not touch.
- 7.6.2.7. Seat the hex nut against the unthreaded lug with a crescent wrench.
- 7.6.2.8. Label the drum with a piece of vinyl tape using the following format:
FACILITY_YEAR-MONTH-DAY-Drum#. e.g., IAC_2020-09-01-001
- 7.6.2.9. Remove the Waste Addition Log and upload it to the appropriate Box folder.



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- 7.6.2.10. Perform a transportation survey on the drum and place a piece of tape on the lid indicating the highest on contact dose rate. See procedure RS-03, Radiological Surveys.
- 7.6.2.11. Ensure the drum lid has a Caution Radioactive Materials sticker.
- 7.6.2.12. Weigh the drum and place an additional piece of vinyl tape on the lid with the weight. Record the weight on the waste addition log.
- 7.6.2.13. Frisk gloves, sleeves, and front of lab coat. If gloves are contaminated dispose in radioactive waste. Otherwise dispose in ordinary trash. Ask user for guidance in labs using H-3.
- 7.6.2.14. Store lab coats in the Radiation Safety Department laboratories or the user facilities

8. LIST OF FORMS

None.

9. REFERENCES

None.

10. CHANGE HISTORY

None.

11. APPENDICES

None.