**Information for New**

**Radioactive Material Supervisors**

Version: March 30, 2018

**Introduction:**

The information in this document is to help you, as a new Radioactive Material Supervisor, to understand the basic responsibilities and requirements for use radioactive materials in your labs at Penn State University. More detailed description of those responsibilities and requirements can be found in the Rules and Procedures for Use of Radioactive Material at the Pennsylvania State University, which can be downloaded from the Environmental Health and Safety website: https://ehs.psu.edu/radioactive-materials/radioactive-materials-requirements-guidelines. In addition, the Penn State Environmental Health and Safety Policy (SY01) and Use of Radioactive Materials (SY14) can be found in the University Policy Manual, which can be downloaded at http://guru.psu.edu/policies/index.cfm. In order to fully understand the responsibility and requirements for the safe use of radioactive materials at Penn State, you should carefully read the Rules and Procedures plus related safety policies, and complete the EHS offered initial radioactive material safety training before an Authorization Request for Use of Radioactive Material is submitted to University Isotope Committee (UIC) for review and approval. The authorization request form can be downloaded at <https://ehs.psu.edu/radioactive-materials/forms>. No radioactive material can be ordered or used in your lab until the authorization request is approved.

**Responsibilities**

As an authorized supervisor, you are responsible for the actions of yourself and all other personnel working under your authorization. You have the responsibility to ensure the health and safety of yourself and those who are under your supervision. You must also ensure that required safety equipment, devices and personal protective equipment and apparel are provided, maintained, and are properly used by individuals working in your labs. More responsibilities for an authorized supervisor can be found in Section 3 of the Rules and Procedures and PSU Policy SY01.

**Initial training and annual retraining of radiation workers**.

As an authorized supervisor, you are responsible for assuring that you and all those working under your authorization have received sufficient training necessary to safely handle radioactive materials. The training provided by EHS, including reading materials and quiz via website and hands-on instruction at the Academic Projects Building, is only part of the training that each radiation worker is required to complete. You are also required to train your employees and students in the proper scientific techniques required for the safe use of radioactive materials.

Annual radiation safety refresher training is provided by “newsletters” or presentation format and must be properly distributed and discussed with all staff working with radioactive materials. The refresher training is delivered to each radioactive lab in early spring along with a list of your lab members which must be updated and signed by the authorized supervisor before it is returned to our the radiation protection office. In addition, Laboratory Safety training is required for everyone who supervises or works in an area using flammable, acidic or basic, toxic or reactive chemicals. This course is presented by EHS staff on a regular basis. Information about this course can be found on the EHS web site. Annual refresher training is also required.

If new students or staff join your research lab, you must ask them to take the required safety training or verify that they have completed the training before they start to work with radioactive material. **To add the person to your authorization, simply send an e-mail to the RSO.**

Familiarization training should be provided to persons in your area who don’t work with radioactive material. All laboratory members should get familiar with some basic safety and security requirements for a lab with radioactive material, which can be found at <http://www.ehs.psu.edu/radprot/ancillary.cfm>.

Detailed training requirements for an authorized supervisor and radioactive workers can be found in Section 4 of the Rules and Procedures.

**Ordering Radioactive Material**

To order radioactive material, a purchasing requisition should be prepared by your department accounting office or though E-Buy system. Radioactive Material Check Box must be checked, and the address for the Radiation Protection Office below must be used as the shipping address in the requisition.

Environmental Health and Safety

228 Academic Projects Building

Attn: supervisor’s name

University Park, PA 16802

Once the purchasing requisition is reviewed and approved by EHS and the purchasing department, a purchasing order will be created and sent to the vendor for material purchase. EHS will verify if the requested isotope and amount are approved in your authorization. Keep in mind, no radioactive material shall be ordered by Penn State P-Card. Detailed procedures for the radioactive material purchase can be found at EHS website: <https://ehs.psu.edu/radioactive-materials/radioactive-materials-requirements-guidelines>

**Receiving Radioactive Material**

All packages with radioactive materials must be shipped to the Radiation Protection Office for contamination survey. In the meantime, the received radioactive material will be added to your inventory. After required surveys and paperwork are completed, the package will be delivered to your laboratory. For each radioisotope in the package, you will receive a *Radioactive Materials Inventory Record* sheet that you must use for tracking your daily usage. After the material is used up or disposed of, the inventory record sheet should be mailed to our Office for inventory removal.

**Annual Inventory**

Once a year, at the same time as the annual refresher training, you are required to verify the amount of radioactive materials you have by physically comparing your inventory to our records that is emailed to you. Promptly returning the completed *Radioactive Materials Inventory Record* sheets to our office will ease the annual inventory audit process.

**Storing Radioactive Material**

Radioactive material, including waste, must be stored and secured to prevent from unauthorized removal. It can be either secured by locking the lab when no one is in the lab, or locked in the storage location inside the lab, including refrigerator, freezer, cabinet, or others. Radioactive material not in storage must be controlled and under constant surveillance. The specific methods used to prevent unauthorized removal is up to the laboratory.

**Using Radioactive Material**

Use of the radioactive material must follow the protocols that has been approved by the University Isotope Committee. Proper PPEs should be available and worn to ensure materials are used safely. Always conduct s**urvey** of your work area before each use, during your work, and after each use to ensure no loose contamination is left behind, or fixed contamination is contained.

**Labeling of Radioactive Material**

Unattended containers holding more than 1 μCi of radioactive material must be labeled with the radiation trefoil, “CAUTION, RADIOACTIVE MATERIAL”, the radionuclide present, the date, the activity, and the name of the person responsible for the material.

**Accidents and Spills**

If you see a small spill occur, clean it up. If it is a large spill, or you find a large contaminated area, call EHS for assistance. Read the Emergency Response Procedures in Section 10 of the Rules and Procedures. There is no penalty imposed by the UIC on laboratory groups who detect a spill of radioactive material and promptly notify EHS.

**Personal Dosimetry**

Personal dosimeters will be issued to radioactive material users based on their potential radiation exposures. Users for radioactive materials except for C-14, H-3 and S-35 might receive dosimeters for a short period of time to monitor their exposures, which will be used as an evaluation for dosimeter needs in the future.

**Waste is a terrible thing to mind**

Storage — Secure

EHS supplies containers — Cans, boxes, jugs, tubs for vials

Waste will be collected from your lab **only** after you request a pickup. www.ehs.psu.edu

Documentation on containers — If contents not documented, no pickup. (See solid, liquid and LSC labels)

Minimize generation — But not to the point of reducing safety

Segregate by radionuclide — H-3 and C-14 can be mingled.

Nasty mixed waste — Properly document contents of mixed waste (pesticides).

Segregate nasty chemical contents — Flammable

No lead pigs in rad waste containers — Hazardous material

No un-contained sharps in waste — See PSU Safety Policy SY29 ‑ Infectious Waste Disposal

Autoclave/bleach your biological waste. — See PSU Safety Policy SY29 ‑ Infectious Waste Disposal

**No radioactive material in normal trash!** More details about waste handling and disposal can be found in Section 11 of the Rules and Procedures.

**Shipping radioactive material**

NRC regulations for the shipping of radioactive material across town or across the country are very specific and detailed. Fines for improperly packaged or documented shipments are levied against the person shipping the material, not against the institution.

If you need to transfer some radioactive material to another Supervisor at University Park, first call EHS so the material can be transferred from your inventory to the receiver’s inventory. If it is less than 50 uCi, you can then WALK the material to the new location. Ensure that your name, address, and phone number are included in the package and that the material is labeled "Radioactive Material." If you need to ship radioactive material to another researcher at a different university, contact our office well in advance so that the necessary approvals can be obtained. More information can be found on our web site and in Section 13 of the Rules and Procedures.

**Food in radioactive material laboratories**

The storage or consumption of food or drinks is not permitted in areas in which radioactive material is authorized. See UIC policy for Food and Drinks in laboratories in Section 6 of the Rules and Procedures.

**Releasing equipment for repair or unrestricted release**

If you have equipment (refrigerator, centrifuge, etc.) in which radioactive was used or stored it must be surveyed by EHS prior to it being taken out of the lab. This equipment would need surveyed prior to being sent to salvage, moved to a non-rad lab, or being sent for repair. After you contact us, someone will come to your lab and survey the equipment, after the survey is completed the item will be tagged with a “green tag” indicating it is free of radioactive contamination and may be removed from the lab.

# What Everyone in Your Lab Should Know

Every person who works with or around radioactive material should be able to answer the basic questions listed below on the left. Very brief *typical* answers are shown on the right, however your answers must be specific to your laboratory requirements. When EHS inspects your laboratory or if a Department of Environmental Protection inspector were to visit your laboratory, these are the kinds of questions that you should expect to be asked and the typical answer to these questions.

Laboratory supervisors should save this list to help verify the knowledge of people who join your laboratory group.

**For individuals who do NOT work with radioactive material:**

**Typical Questions Typical General Answers**

What do you do if someone comes into the room

whom you have never met? Ask for identification and reason for entry.

Who do you ask for more information about radiation? My supervisor or EHS

Where do you store or eat your lunch? Not in a radioactive material laboratory.

What radioactive material do you handle? None, but I may sign for a package delivered by EHS.

What do you do when you leave the laboratory Lock the door to prevent the theft

and no one else is here? Why? of radioactive material and other things.

**For individuals who work with radioactive material:**

**Typical Questions Typical General Answers**

What do you do if someone comes into the room

whom you have never met? Ask for identification and reason for entry.

What radioisotopes do you work with? P-32, S-35, tritium . . . .

How did your laboratory become authorized? PI sent form to EHS, UIC approved.

Where is a copy of PSU’s radioactive material rules? EHS web site.

What training have you had at PSU? EHS class and technical training by professor. And EHS annual retraining newsletters.

How do you get your radioactive material? Process a standing order. Someone calls the vendor. It is delivered to EHS, they bring it to our lab.

Where are your radioactive material stocks stored? Locked freezer.

What do you do with the empty box? Survey the box, remove the labels, place it in trash.

How much do you use at a time? 25 uCi.

How do you keep track of your inventory? Document use on inventory form. Return form to EHS when the vial is empty. Put vial in rad waste. Plus annual inventory audits.

What do you do if some radioactive material is missing? Ask others in lab, contact PI, and contact EHS within four hours of noticing the material is missing.

What do you do before working with radioactive material? Put on lab coat and gloves, survey the area.

How do you survey your work area? For P-32 or S-35 and C-14: wipe test with paper towels and a GM meter. For I-125: towels and a NaI detector. For tritium use an LSC.

How do you know your GM meter is working? Battery check, measure check source.

What do you do if the meter does not properly

respond to the check source? Use a different meter, call EHS for loaner or repair.

What could cause high meter response? Contaminated probe, bad electrical connection or cable. Or maybe the entire room is contaminated.

What could cause zero meter response? Dead batteries or bad electrical connection.

What do you do after you have completed work? Secure the material, survey all areas and myself.

Survey my shoes and hands.

What do you do if you find a little contamination? Clean it.

How would you decontaminate the lab bench? Water or *Formula 409* and paper towels.

What do you do if you find contamination all Call for help! (See “what to do when spills

over the place? happen on the next page.) Warn others, call EHS, clean it up, tell my supervisor. Lab specific instructions include \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

If you use tritium, how do you survey? Smears and a LSC.

What would you do if you became pregnant? Discuss possible exposure with Radiation Safety Officer

Where is your waste stored? In designated area, secure from removal.

How is your waste collected? Request on web, EHS collects it.

Where do you eat your lunch? Not in my lab, sometimes downtown.

What do you do when you leave the laboratory

and no one else is here? Lock the door. Secure all radioactive material.

If you have a body dosimeter, where do you wear it? Clipped to my clothes at chest height.

If you have a ring dosimeter, how do you wear it? Facing toward the radiation. If I will be holding a vial of material, I wear the ring with the monitor towards my palm. I always wear it on the hand closest to the radiation.

Everyone in your laboratory who works with radioactive material should be able to answer all of these questions without hesitation. In addition, staff who do not work with radioactive material should know not to touch the radioactive material, know how to keep the material secure, and know about the prohibition against eating or drinking in the laboratory. Everyone should know to contact EHS if they have any questions.

Remember, the training provided by EHS in our office or through this newsletter does not prepare you with the techniques for working safely in a laboratory. It is the responsibility of the principal investigator to ensure that the experiments are being performed safely and properly. Ultimately, every person working with radioactive material is responsible to make sure that it is handled safely and properly.