Performance-Based Inspection Field Guide

Non-radioactive material worker

1. Have you completed the on-line Radiation Safety Course?
   If yes, get the individual's name.# to verify attendance
   If no, instruct the individual it is required.

Criteria: All individuals working in laboratories posted for the use of radioactive material have completed the On-Line Radiation Safety Course.
Risk Ranking: 2

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2. Can you explain the policy regarding security of radioactive materials? How do you implement this policy?
   RAM is under constant surveillance or secured from unauthorized access or removal.
   RAM is either locked/secured within the lab or the laboratory is locked when unattended.

Criteria: All individuals working in laboratories posted for the use of radioactive materials must be trained to not leave radioactive material unattended and unsecured. The laboratory, or the radioactive material within the laboratory, must be locked when unattended
Risk Ranking: 3

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3. If EHS arrives with a package containing radioactive materials, what do you do with it after you have signed for it?
   The individual is aware of their lab-specific procedures.

Criteria: Non-radioactive material user is aware of laboratory specific procedures for the receipt, storage, and security of packages containing radioactive material.
Risk Ranking: 2

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4. Where do you usually eat and/or drink? Where do you store your food?
   The individual is aware of the regulation that prohibits eating, drinking, smoking, application of cosmetics and that this also includes the storage of food, drink, cosmetics (which includes hand lotion).

Criteria: Non-radioactive material user is aware of the regulation regarding the prohibition of eating, drinking, smoking, or applying cosmetics in laboratories posted for the use of radioactive materials.
Risk Ranking: 3

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5. Do you know where radioactive material is used or stored in the lab? How would you know if a piece of equipment was used with radioactive materials?
   The individual can show you where RAM is used and stored.
   The individual recognizes labeled equipment and is aware this signifies the potential for radioactive contamination.

Criteria: All individuals working in a posted laboratory must be aware of where radioactive material is stored, used, and that associated postings and labels indicate the potential for the presence of radioactive contamination.
Risk Ranking: 2

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6. If you were present when a co-worker either spilled radioactive material or contaminated themselves, what would you do? How would you know what to do next?
   The individual knows where the spill response notice is posted.

Criteria: Non-radioactive material user is aware of where the spill/personnel contamination emergency response procedure is posted.
Risk Ranking: 1

Radioactive material worker

7. Do you know what the acronym ALARA stands for?

   As **L**ow **A**s **R**easonably **A**chievable. It is a basic radiation safety philosophy to keep your personal exposure as low as *reasonably* achievable.

8. What are the four basic concepts for implementing an ALARA program? How does your lab implement ALARA?

   Time
   Distance
   Shielding
   Containment – contain yourself (PPE) and contain the radioactive material (use of fume hoods, absorbent plastic-backed bench liners, trays)

Criteria: Radiation worker is able to describe how the laboratory implements their ALARA program including time, distance, shielding, and containment.
Risk Ranking: 3

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9. What meter are you using (if multiple meters present)?

   Is the meter/probe appropriate for radiation type?
   If the laboratory uses multiple radionuclides, have the individual point out which meter for which radionuclide.
   If using a Ludlum 3-98, does the individual know the difference between internal and external probes?

10. Do you know meter's calibration frequency? Do you check the calibration date and the battery?

    What do you do if the meter isn't performing normally, is past the calibration date, or the battery is too low?
    Does the individual know they cannot change the probe attachment without recalibrating the meter?

11. Demonstration of a survey meter survey.

    Background reading is taken at the appropriate scale, is consistent with meter type, taken at each survey, and documented in CPM.
    Is the meter close enough to the surface; appropriate scanning speed
    Appropriate locations are surveyed, including lab coats
    Frequency of the meter surveys are appropriate – after each use and documented weekly on the RS-15 form.

Criteria: Radiation worker is able to demonstrate appropriate survey meter use. All radiation workers must be able to demonstrate which meter and detector is appropriate for the radionuclides in use; perform a battery check; and survey the work area.
Risk Ranking: 4

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12. Demonstration of a smear wipe survey.

    Appropriate surface area and number of smears for the size of work area
    Avoid cross contamination of swear wipes
    Check surveys for consistency in documentation including results in dpm, rewipes for areas >200 dpm/100 $cm^{2.}$
    Survey within 7 days of use.

Criteria: Radiation worker is able to demonstrate appropriate techniques for smear wipe surveys. All radiation workers must be able to demonstrate locations to survey; avoiding cross-contamination of swipes; preparation of smear wipes for counting; interpretation of results; and documentation.
Risk Ranking: 4

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13. Show me the work station where you use radioactive material. What kind of experimental techniques do you perform and what types of waste are you generating? What do you do with the waste? Show me your main waste storage area.

    Solid waste: waste box and smaller waste containers at the work station are labeled as radioactive; using transparent liners. Liquids, LSV, loose sharps, and lead should not be in solid waste containers. Sharps boxed separately.

    Bulk liquid waste: labeled container (preferably one of our two gallon jugs), no glass (exceptions e.g. phenol – glass container should be in a tray). Do not mix aqueous and organic bulk liquids. Preferably store bulk liquid waste by work station.

    Hot sink: readily soluble or biologically dispersible material only, within monthly limits

    LSV: segregation of de minimus, decay-in-storage, long-lived hot vials. D-I-S and long-lived waste must be labeled.

    Mixed Waste: classified as both radioactive and hazardous material (as defined by EPA)

    Animal Carcasses: Kept frozen until pick up or released from decay-in-storage; double bagged.

    Decay-in-Storage: Allowed for radionuclides with <120-day half-life. Suggestion to segregate by half-life; must remove or deface all radiation symbols/words on items put in solid waste. To be released, waste must not have discernable counts above background with an appropriate meter. EHS Assist tracks 10 half-lives which is a rule of thumb for estimate of length to hold

    All long-lived waste must be removed from lab within 1 year of sealed date. Waste released from decay-in-storage must be disposed in the cold waste stream.

Criteria: Radiation worker is aware of the laboratory specific procedures for handling low-level radioactive waste. All radiation workers must know the types of waste generated in the lab and how the waste is to be disposed. This includes appropriate waste segregation; decay-in-storage; de miminus waste; mixed waste; and hot sink disposals.
Risk Ranking: 3

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14. What signs, postings or notices are required in your lab with regards to radioactive material use? Show me where they are located

    Door sign, hot sink, Spill Response/Emergency Procedures, ODH Notice to Employees, equipment, waste.
    Containers of radioactive material must be labeled and marked with EHS Assist numbers and/or the nuclide present, activity, date, and radiation level.
    What is the gist of the ODH Notice to Employees? (Rights & responsibilities as radiation workers)

Criteria: Radiation worker is aware of proper posting and labeling requirements in a laboratory using radioactive materials. Radiation workers must know that all equipment used with radioactive material has to be labeled with the radiation symbol. Workers must be cognizant of the various postings in the lab including door signs, hot sink signs, spill response, and ODH Notice to Employees which identifies their rights and responsibilities.
Risk Ranking: 3

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15. Have you ever had to deal with a radioactive material spill?
    If so, how was it handled?
    Can you walk me through the lab's response?

16. Can you show me what you would do to clean up a minor spill?
    Response should include: notify; shield; contain; clean up; survey; report

17. What would you do with the materials used to clean up? How would you ensure that the contamination has been completely removed?
    Clean up materials into LLRW; appropriate meter and smear wipe survey

18. Can you tell me how you would respond if you dropped and spilled the contents of a tube containing 200μCi of "P32" onto the floor? How would your response change if you were also contaminated?
    Response should include: clear the area; call for help; shield, contain; secure the room; clean up with RSS. Personnel contamination must be report to emergency cell phone immediately.

Criteria: Radiation worker is able to articulate and/or demonstrate proper procedures to follow if there is a spill of radioactive material or a personnel contamination incident.
Risk Ranking: 5

Do a pre-inspection check to see if the lab personnel wear dosimetry badges. This information should appear in the conditions section of the permit in EHS Assist. This information can also be found on the RS-1. Does the lab use Iodine? If so, do a pre-inspection check of the PI's inventory to see if the PI has placed an order of high enough activity that someone should have done a bioassay. If so, check records to see if bioassays were done.

19. Where do you store your badges?
    Badges must be kept at worked and stored in a low background area.

20. Do you wear your badges outside of the lab or work?
    Badges should only be worn at work; never during a medical or dental procedure involving radiation

21. How do you wear your badge?
    The badge should be worn on the trunk of the body at the point where it is most likely to receive maximum exposure. (Note: Most research labs use quarterly whole body badges. The NRL is the only exception.)
    Ring badges are worn so that the flat part of the ring is worn inside the palm of the hand that handles the most activity. Ring badges are worn under the gloves. (Note: many labs do not use ring badges.)

22. What should you do if you think your badge has been overexposed for some reason?
    Call Radiation Safety immediately.

23. Do you know the options for a pregnant worker occupationally exposed to radiation?
    Pregnant workers have the option to declare their pregnancy in writing. Declared Pregnant Workers (DPW) should wear a fetal badge (depending on the radionuclides involved) in addition to the whole body badge. Information on fetal exposures and fetal badges can be found on our website under "Personnel Monitoring Program."

24. What are the single use limits for radioiodine that require a thyroid bioassay? Where can this information be found?
    Any one time use of
    5 mCi or greater of I-131 or I-124
    6 mCi or greater of I-125
    27 mCi or greater of I-123
    This information can be found on our website under "Personnel Monitoring Program."
    The information for Thyroid Bioassays can also be found on the "RS-25 – Internal Isotope Request Form"

25. If required, when and where do you need to go for a bioassay?
    Nuclear Medicine, 203 Doan Hall, 24 –72 hours after the use of iodine.

Criteria: Radiation worker is aware of the laboratory specific personnel monitoring requirements. All radiation workers must know if they are required to participate in a personnel monitoring program. These may include whole body and/or ring dosimeters, thyroid bioassays, and urine bioassays. Radiation workers must also know the correct place on the body to wear dosimeters and how to store the dosimeters. Radiation workers required to have thyroid bioassays must be aware that the bioassay should occur 24-72 hrs post-use.
Risk Ranking: 3

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26. What are your site-specific procedures for ordering radioactive material?
    All orders must be approved by Radiation Safety prior to the order being placed by OSURF or Purchasing. Free gifts from vendors, reshipments, or material shipped from collaborators must be approved and shipped to RSS.

Criteria: Radiation worker is able to explain the laboratory's site-specific procedures for ordering radioactive materials. Radiation workers must know that the Radiation Safety Section of EHS approves all orders of radioactive materials before Purchasing or OSURF will place the order with the vendor.
Risk Ranking: 1

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27. If a representative from EHS shows up with a package containing radioactive material, what are your procedures?
    Proper training (on-line radiation safety course) to sign for any packages containing radioactive material.
    Upon receipt of package you must perform a smear wipe of the outside and the contents of the package before usage to determine if there was any leakage. Monitor all packages known to contain radioactive material for radioactive contamination and radiation levels if there is evidence of degradation of package integrity, such as packages that are crushed, wet, or damaged.

28. Where do you store radioactive materials and how do you know it is secure?
    Upon Receipt of radioactive material, it is to be taken to the hot lab if package is received in non-posted lab space. Materials are then brought to designated area for storage within the posted lab.
    Radioactive materials and waste must be secured from unauthorized access or removal. Each laboratory must assure security of radioactive materials of laboratory doors or storage freezers/refrigerators depending on use and accessibility of the area.
    Never leave a posted laboratory unlocked and unattended where radioactive materials are in use or stored.

Criteria: Radiation worker is aware of laboratory specific procedures for the receipt, storage, and security of packages containing radioactive material. In addition, users must know that all shipping material must be smear wiped, free of contamination, and that all radiation symbols or the word "radioactive" must be removed or defaced prior to disposal into the normal waste stream.
Risk Ranking: 3

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29. How does the lab manage entering the required radioactive material transactions in EHS Assist? How this does this information get communicated to the person responsible for entering the data?

30. What is the frequency at which personnel enter transactions into the EHS Assist database?
    Transactions must be entered within 7 days of use

Criteria: Radiation worker is entering data into EHS Assist at the appropriate frequency and is accurately entering disposal information. Radiation workers must be able to navigate EHS Assist or communicate disposal information to the data entry person.
Risk Ranking: 2

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31. Do you have an approved IACUC protocol to use radioactive material in animals?
    This is more of a cross check but also part of approval procedures

32. Where do you complete your radioactive material animal work?
    Is the individual aware urine and feces may be hot depending on the radionuclide and procedures.
    Room and cages must be posted. On cages yellow acetates with radioactive stickers on the acetates as well as the isotope used, the start date, and date after 10 half lives

33. Who completes animal husbandry duties?
    ULAR
    Approved Users –do they know how to dispose of bedding properly?

34. How is the radioactive waste handled?
    Radioactive needles in labeled sharps container with waste inventory number; animal carcasses in freezer with waste inventory number, dry solid waste collected in labeled container with waste inventory number.

Criteria: Radiation workers are following the proper URSC-approved procedures for handling animals used with radioactive materials
Risk Ranking: 3

35. What is Safety Culture and what are the traits of a positive nuclear safety culture?
    Safety culture encompasses the core values and behaviors resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment.
    Traits include:
    - Leaders demonstrate a commitment to safety in their decisions and behaviors
    - Promptly and fully identify, evaluate, and correct safety issues commensurate with significance
    - Take personal responsibility for safety
    - Plan, implement, and control work activities so that safety is maintained.
    - Seek out opportunities to learn and implement ways to ensure safety
    - Encourage raising safety concerns without fear of retaliation, intimidation, harassment, or discrimination
    - Maintain a focus on safety
    - Permeate trust and respect through the organization
    - Avoid complacency and continually challenge exiting conditions to identify discrepancies that might result in inappropriate action

Risk Ranking: No points assessed