VAMC RADIATION SAFETY

For Non-Medical Use of Radioactive Materials in Basic Sciences

Refresher Training

Taking The Course and Receiving Credit

Who Should Complete This Course?

You should complete this course if you are a VAMC radiation worker listed on an approved non-human use radioactive materials authorization and need to complete refresher training for continued use privileges. You must take refresher training annually.

Receive Course Credit

- Review the course slides.
- Complete the online exam and mail to EHS – Training, 100 EHS.
- Make a copy for your records.
- If you score less than 80% you will be notified to retake the exam.

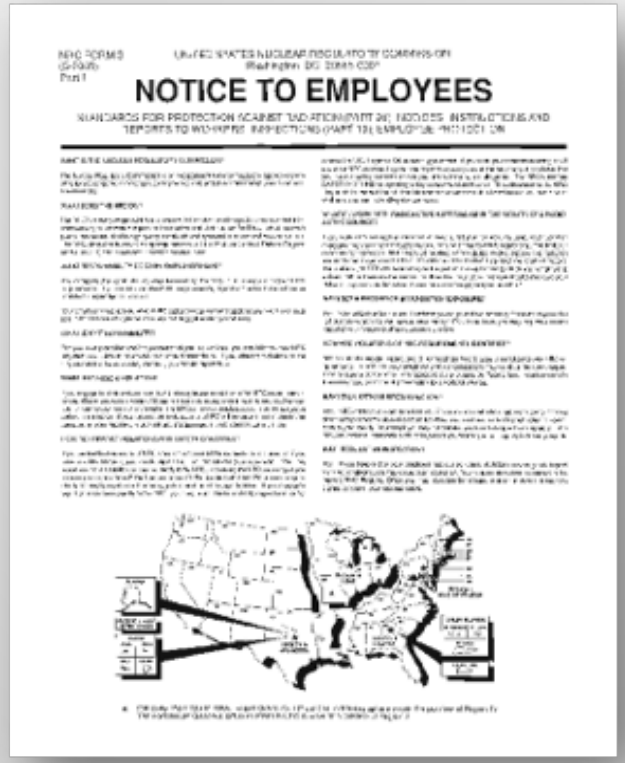
You Have the Right to Report Radiation Safety Concerns and Violations

Report concerns or suspected radiation safety violations to your supervisor. If it is not adequately corrected, notify the VA-RSO Laurie Scholl at 353-5389.

If the violation is still not resolved, you have the right to contact NHPP at 501-257-1571.

NHPP/NRC regulations prohibit academic or job discrimination against individuals who report radiation safety concerns or violations.

Reporting Concerns or Violations Notice to Employees



NOTICE TO EMPLOYEES

If you suspect that a radiation safety violation has occurred, report the violation to your supervisor. If you believe that adequate corrective action has not been taken, notify Laurie Scholl, VAMC - RSO, at 353-5389.

If the violation has not been resolved this way, you have the right to contact the NHPP at 501-257-1571 or NRC at 1-800-695-7403.

NRC regulations prohibit academic or job discrimination against individuals who report radiation safety concerns or violations.

VAMC Radiation Safety Office Role

- Performs routine audits of labs to ensure compliance with VAMC policy, NHPP and Nuclear Regulator Commission (NRC) regulations.
- Receives and ships all RAM for VAMC.
- Posts and deposts all labs on campus.
- Performs pre-maintenance and pre-equipment disposal surveys.
  Contact Laurie Scholl, VA- RSO at 353-5389 to schedule a survey prior to maintenance or equipment disposal.

VA's Master Materials License

The U.S. Nuclear Regulatory Commission (NRC) has delegated authority to the VA's National Health Physics Program (NHPP) to oversee and regulate the use of radioactive materials at all VA facilities nationwide under a Master Materials License agreement.

Under this agreement the VA's NHPP issues and renews permits to use radioactive materials at VA facilities and performs onsite inspections. The NHPP has issued the VAMC a broad-scope radioactive materials permit, that covers all medical and research use of radioactive materials at the VAMC.

Any action that jeopardizes the VA's broad-scope radioactive materials permit, jeopardizes the permission of all individuals to use radioactive materials at the VAMC.

Radiation Safety Committee (RSC)

The Radiation Safety Committee (RSC) is established by the Medical Center Director as the administrative body for the oversight of the safe use of radiation sources within the institution. The Committee is responsible for reviewing and authorizing all proposed uses of radioactive material and setting radiation safety policy for the VAMC.

Research involving the use of radioactive materials in or on human beings must be approved by the University of Iowa's IRB, as well as VAMC's RSC, and R & D Committees. Contact the VA-RSO Laurie Scholl at 353-5389 for assistance.

NRC Radiation Safety Program

Control of risks and their consequences is the purpose of regulation, policy, procedures and rules directed by:

- The Nuclear Regulatory Commission (NRC).
- VA Headquarters National Health Physics Program (NHPP).
- The Medical Center Director and Radiation Safety Officer.

Regulations, policies, rules and procedures constitute the Radiation Safety Program for this medical center.

Radiation Safety Officer (RSO)

The Radiation Safety Officer (RSO) is designated by the Medical Center Director and/or Chief of Staff to coordinate and manage the Medical Center's radioactive materials permit and all aspects of the radiation safety program under the procedures and policies approved by the Radiation Safety Committee (RSC). The RSO has the authority to terminate any use of licensed radioactive materials determined to be a threat to human health and safety or VAMC property.

The VAMC's RSO is **Laurie Scholl**. She can be reached at 353-5389

Three Strikes Policy

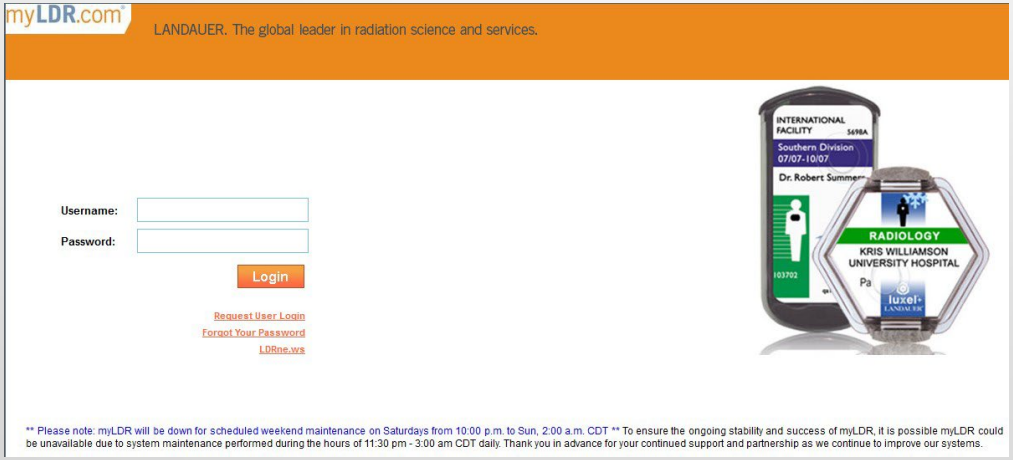
Three identical RAM violations found in your lab within 12 months results in termination of your PI's RAM authorization which means that everyone included on that authorization loses permission to work with RAM. Your PI must request reinstatement from the VAMC's Radiation Protection Executive Committee.

Examples of Non-Compliance

- Eating/drinking/smoking/storing food in RAM areas.
- Inventory and survey records that do not reflect actual radioactive materials on hand and/or in use.
- Failure to secure RAM and/or rad waste from unauthorized use or removal.
- Improper radioactive waste storage.

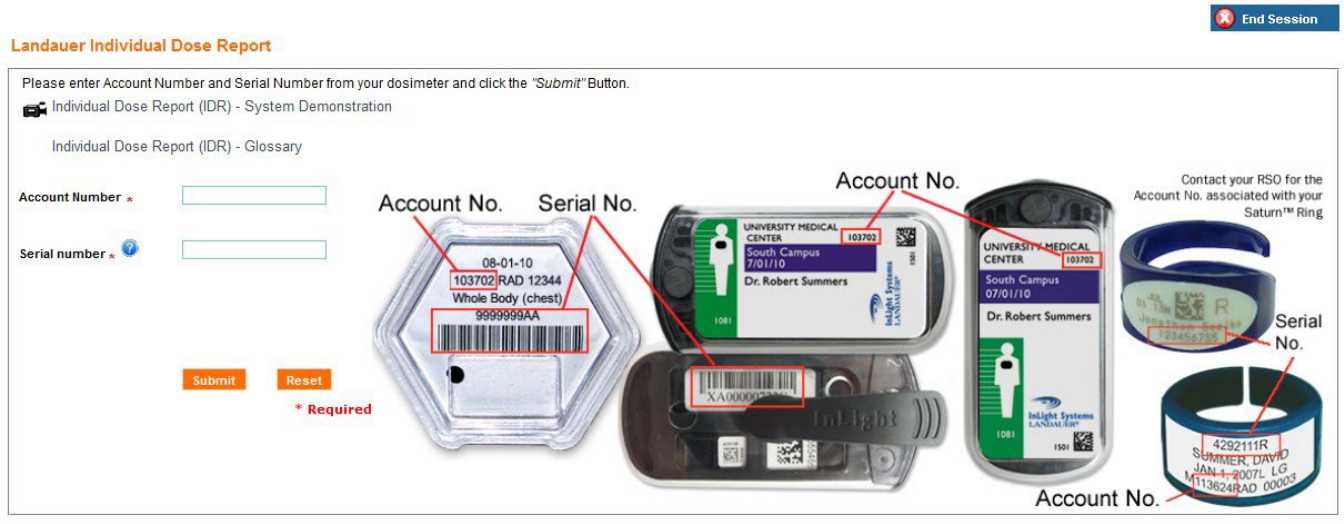
Landauer Individual Dose Reports

- Go to www.myLDR.com
- Your login id is the dosimeter account number + idr as follows:
- UIHC participants **= 88509idr**
- UI research participants = **88510idr**
- VAMC participants = **88511idr**
- Password: **Hawkeyes**



Landauer Individual Dose Reports

Once you have logged in, you will see a screen like the one below. You will then enter the dosimeter account number (just like the login id, but without idr). The serial number is located just above the barcode on the back of the badge.



Landauer Individual Dose Reports

Summary Results

To protect your privacy, no personal information is displayed

History Results

The doses are displayed in **mrem**

Dose Results

Total Records: 4

Doses as of 2014/06/24 13:14 CST

Dose Period	Total DDE	Total LDE	Total SDE	Beta	Total Neutron	Extremity
Q22014	13	13	12			
2014	16	15	14			
2013	22	22	24			
Lifetime	361	416	518	51		M

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Export Result to : Excel Export View Details

Landauer Individual Dose Reports

Detailed Results

History Details

Dosimeter Dose

Total Records: 19
Doses as of 2014/06/24 13:16 CST

Account	Subaccount Name	Subaccount Code	Begin Wear Date	End Wear Date	Dosimeter Type	Dosimeter Location	Total DDE	Total LDE	Total SDE	Beta	Total Neutron	Fast Neutron	Thermal Neutron	Extremity	Frequency	Control Subtracted	Not in Assig Dose
88509	HPO	HPO	2014/07/01	2014/07/31	Pa	Chest									Monthly	☐	☑
88509	HPO	HPO	2014/06/01	2014/06/30	Pa	Chest									Monthly	☐	☑
88509	HPO	HPO	2014/05/01	2014/05/31	Pa	Chest	11	11	10						Monthly	☑	☐
88509	HPO	HPO	2014/04/01	2014/04/30	Pa	Chest	2	2	2						Monthly	☑	☐
88509	HPO	HPO	2014/03/01	2014/03/31	Pa	Chest	1	1	1						Monthly	☑	☐
88509	HPO	HPO	2014/02/01	2014/02/28	Pa	Chest	2	1	1						Monthly	☑	☐
88509	HPO	HPO	2014/01/01	2014/01/31	Pa	Chest	M	M	M						Monthly	☑	☐
88509	HPO	HPO	2013/12/01	2013/12/31	Pa	Chest	M	M	M						Monthly	☑	☐

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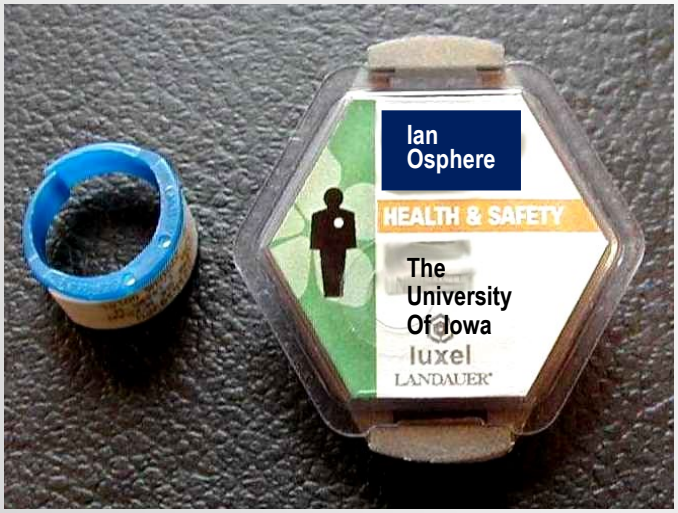
Export Result to : Excel Export

Dosimeters

Dosimeters are not typically required for individuals working with tracer quantities of radioactive materials commonly used in a laboratory setting.



Dosimeters are required if you:

- Are likely to receive >10% of an occupational dose limit.
- Enter a high radiation area.
- Routinely work with >1 mCi quantities of P-32, Fe-59 or Cr-51.
- Routinely work with >5 mCi quantities of I-125.

Dosimeters cannot detect low-energy beta radiation from radionuclides such as C-14, H-3, P-33 and S-35.

Dosimeter Requests and Wear Locations

To obtain a dosimeter or change in service, submit a completed "Dosimeter Request or Change" Form found online or contact the VAMC's Radiation Safety Officer.

- A whole body dosimeter is worn on the to torso in a location where it is likely to receive the highest exposure.
- Ring dosimeters are worn underneath disposable gloves.

Returning your dosimeter

- Towards the end of each month, EHS will send your dosimeter(s) to you or your supervisor in a white envelope with the words “Radiation Dosimeter” on the front.

- Send back to EHS in the provided envelope through campus mail. Be sure to send it early enough so that it will gets to EHS by the 10th of the month following the wear period.

Dosimeter Participants

- Dosimeters are exchanged monthly. Your new dosimeter(s) will be mailed to you or your group's dosimeter coordinator at the beginning of each month.
- **Mail your old dosimeter(s) from the previous month back to the Environmental Health and Safety Office (EHS) by the 10th day of the month following the wear date, in the return envelope provided.**
- If your dosimeter(s) is lost or returned late three times within one year, an administrative fee of $30.00 will be charged to your department.
- Your dosimeter report records are available for your review by contacting your supervisor or calling the VAMC – RSO at ext. 5753.

Fetal Dosimeters

- A fetal dosimeter and fact sheet are provided to pregnant radiation workers upon completion of the VAMC Pregnancy Declaration Form.
- Contact Laurie Scholl VA-RSO at 353-5389 for more information.
- A fetal dosimeter is worn at waist level.
- Regulations state that fetal dose is limited to 500 mrem for the entire gestation period for all women who declare their pregnancy in writing.

Ordering Radioactive Materials (RAM)

Your PI must have prior VAMC Radiation Safety Office authorization for the exact chemical form and activity of the RAM you wish to obtain before you order it.

If you have authorization, contact your vendor and place your order.

Instruct the vendor to place your PI's name on the packing slip.

Delivery of RAM Shipments

The vendor must ship the package to:

VAMC
601 HWY 6
Nuclear Medicine Department
Room 2W40
Iowa City, IA 52246-2503

Lab Receipt/Inventory Records of RAM

- Verify you received the correct RAM, chemical form, and activity.
- Wear PPE to open RAM shipment.
- Immediately include received material into your lab's RAM inventory and record activity in units of millicuries (mCi).
- Assume that the inner surfaces of the package (source vial and packaging material) may be contaminated and handle accordingly until proven otherwise by survey.
- Before discarding the packing material from the shipmen, obliterate all radiation warning labels before discarding as normal trash.

Radioactive Waste Management

Radioactive waste is collected, processed, and disposed of by EHS.

Segregate radioactive waste by half-life (less than or greater than 90 days) and type (solid or liquid.)

Never place lead in any waste container supplied by EHS.

Container lids must be kept closed except when adding waste.

Check For Contamination

Wipe test the entire external surface of the container.

Count the wipe in an LSC or gamma counter to check for contamination.

A result >22 dpm/cm^2 means you need to decontaminate the container, re-wipe, and count.

A result <22 dpm/cm^2 indicates no contamination and you can ✓ the “yes” box on the waste tag.

To Arrange for a Waste Pick Up

EHS's waste pickup request is available online. Notify EHS at least one day in advance.

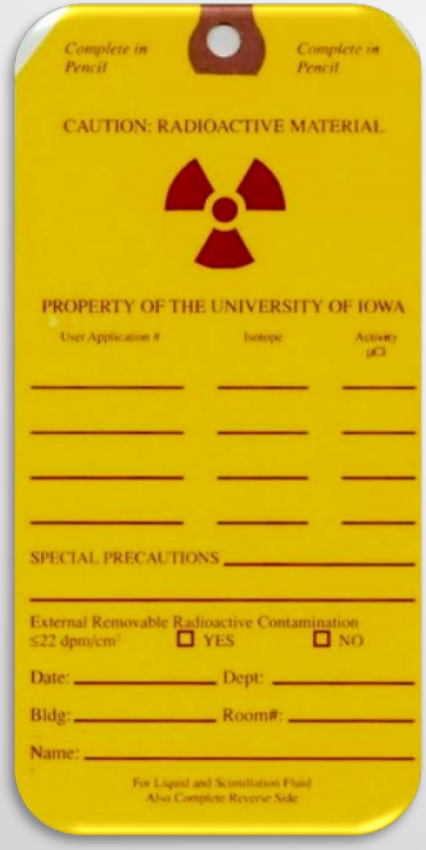
The online request can be found at: https://ehs.research.uiowa.edu/wasteenvironmental/radioactive-waste

Radioactive Waste Management

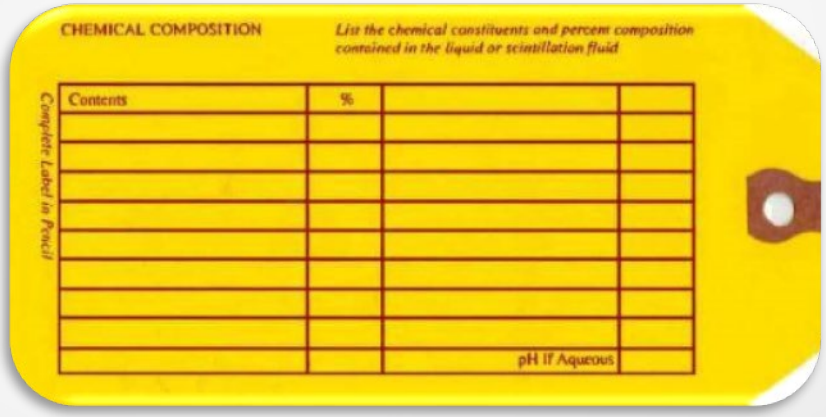
- Store all liquid waste containers within a secondary container – this is mandatory.
- Use labels provided to indicate what is placed in waste containers as soon as you add waste. This prevents unlabeled and unknown waste from accumulating in your lab.
- Avoid overfilling solid or liquid waste containers.
- Never mix organic solvent wastes with water or other aqueous wastes.
- Radioactive waste containing biological, pathogenic, or infectious material must be disinfected with biocide prior to depositing into radioactive waste containers.

Completing the Radioactive Waste Tag

Front of tag



Back of tag

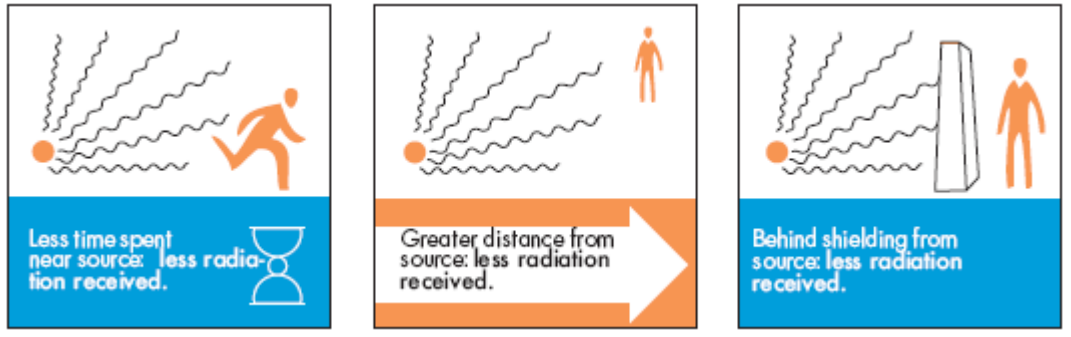


- Complete the tag in pencil.
- Complete all information required.
- Perform a contamination survey of the waste container and record results on the waste tag.
- If waste is liquid, indicate chemical composition on back of the tag.
- Affix tag securely to waste container.

Examples of Good Practice - PPE

- Personal protective equipment is known as PPE.
- Wear the correct PPE for work with RAM and other hazardous materials.
- PPE includes gloves and lab coat (at a minimum).
- Do not wear open-toed shoes when working with any type of hazardous material or equipment.
- Never wear PPE outside the lab!

Time, Distance, and Shielding



The less **TIME** spent near radioactive material, the less dose received.

The more **DISTANCE** between you and radioactive material, the less exposure received. Doubling the distance from radioactive material reduces exposure by ~ a factor of 4. Use tongs or other remote-handling tools to reduce exposure to fingers and hands.

For **SHIELDING** β emitters use Plexiglass. Lead is best for X- or gamma radiation, but each X- or gamma ray emitter has a specific thickness of shielding required to reduce exposure – one size doesn't shield all. Contact the VAMC Radiation Safety Officer to determine the proper thickness and types of shielding material to use.

Contamination Surveys - Meters

Prime areas to survey include waste storage areas, source vial storage areas, frequently used areas and equipment, and the floor near work and storage areas.

- **Suggested Allowable Exposure Rates at 30 cm**
- Occupied Areas - <2 m rad/hour
- Storage Areas = <5m rad/hour

Contamination Surveys - Wipes

They are used to determine if removable contamination is present from any type of radioactive material when counted in a liquid scintillation counter.

They are the best method for detecting contamination from low-energy beta emitters (C-14, S-35, and P-33) and the only way to detect H-3 contamination.

Decontamination Action Level

All radionuclides $\geq$ 200 dpm/100 cm^2

Remember to Document Your Surveys!

- Surveys must be done at a frequency to ensure that exposure to RAM is kept ALARA (as low as reasonably achievable).
- Keep your survey records in a form that the VAMC - RSO and VA's National Health Physics Program (NHPP) can audit.
- Call Radiation Safety Officer @ 353-5389 for blank survey record forms.

If a survey isn't recorded, you cannot prove it was done – Joe Regulator

User Responsibilities

- Keep RAM use authorization current.
- Complete radiation safety training.
- Maintain up-to-date inventory records.
- Perform and document RAM surveys after each use of Radioactive Material to control contamination and keep exposure ALARA.
- Follow required radiation safety and radioactive waste handling and disposal policies.

Contamination Control and Security

- Wear PPE when working with RAM.
- Monitor hands, shoes, and PPE frequently.
- Use bench paper and spill trays.
- Use warning labels on RAM items and areas.
- Use a fume hood when working with volatile materials or materials that produce aerosols.
- Secure RAM from unauthorized removal.
- Immediately report missing RAM to the VAMC Radiation Safety Officer at 353-5389.

Spills

- Uninjured, contaminated individuals remain in the area until decontaminated (if safe). Move all others to another area.
- Handle spills according to your lab's spill response plan.
- Evacuate area of volatile spills.
- Contact 335-8501 immediately when spills occur! Contact the VAMC Police at ext. 6600 during other than normal business hours of 8:00am – 5:00pm.

Personal Contamination

Notify Laurie Scholl, VAMC - RSO 353-5389 **immediately** of any case of personal contamination.

Uninjured persons should remove contaminated clothing and wash or use emergency shower or eyewash as needed. **Do not delay.**

If an injured person is contaminated, do not delay medical attention.

The Environmental Health and Safety Office can also provide assistance - call 335-8501.

Congratulations!

You have completed the VAMC Radiation Safety Refresher Course.

To receive credit for this online training course, you must complete the exam and receive a score of 80% or greater.

Click here to take exam.