



Module 1

Radiation Safety at LSU

LSU Radiation Safety Program

The LSU radiation safety program will be conducted in such a manner so that exposure to faculty, staff, students, the public, and the environment will be maintained as low as reasonably achievable and that no radiation exposure will be received without societal benefit. This will be accomplished without impeding legitimate research, or realistic teaching objectives.

Responsibility of All Individual Users, Technicians, Students, and Operating Personnel

Each person who handles radioactive materials or source of radiation must realize that the ultimate success of a radiation safety program lies in responsible actions by individuals in their daily work.

- Limit university personnel, students, and visitors with undue radiation exposure,
- Full compliance to Federal and State regulations,
- Full compliance to University regulations and policies.

Topics Covered In This Module:

- Radiation Safety Office (RSO) Personnel,
- Becoming a Radiation User,
- Ordering and Receiving of Radioactive Materials,
- Laboratory Audits,
- Laboratory Surveys,
- Annual Radiation User Fees.



Radiation Safety Personnel

Campus Radiation Safety Committee:

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Radiation Safety Office



Director and Radiation Safety Officer
Dr. Wei-Hsung Wang, CHP, CSP, CLSO



Operation Manager and Associate Radiation Safety
Officer, Amin M. Hamideh, M.S., CLSO



Radiation Safety Coordinator
Nicholas Desselles, M.S., CLSO



Administrative Coordinator
Melissa Esnault



CAMD Radiation Safety Officer
Ji Young Wiley, M.S.



Becoming a Radiation User

Steps to Take to Become Radiation Users:

- Review the online training modules found at [Training | Radiation Safety Office \(lsu.edu\)](#),
- Take Radiation Safety Exam at the Radiation Safety Office (by appointment only),
- Fill out the Radiation Worker Application and submit it to the RSO.

Training is Required for All Users of:

- Open Isotope,
- Radiation Producing Equipment,
- Sealed Sources,
- Animal Experimentation.

For All Radiation Users

- Core Material – Required for ALL Radiation Users
 - Module 1. Radiation Safety at LSU,
 - Module 2. Fundamentals of Basic Radiation,
 - Module 3. Biological Effects of Ionizing Radiation,
 - Module 4. Regulations and Standards,
 - Module 5. Exposure Control and Personnel Monitoring.

For Open Isotope Users:

- Core Material,
- Open Isotope:
 - Module 6. Radioactive Waste Handling, Storage and Disposal,
 - Module 7. General Rules of Radioactive Material.

For Radiation Producing Machines Users

- Core Material,
- Radiation Producing Machines (i.e., X-ray equipment):
 - Module 8. General Rules for Radiation Producing Machines.

For Sealed Sources Users

- Complete Core Material,
- Sealed Sources:
 - Module 9. General Uses for Field Use of Sealed Sources.

For Animal Experimentation

- Complete Core Material,
- Open Isotope (Modules 6-7),
- Animal Experimentation:
 - Module 10. General Rules – Animal Experimentation.

Becoming Authorized Users

Individuals who wish to use sources of radiation in research, development, teaching, clinical, or demonstration projects must obtain prior approval from the Radiation Safety Office:

- Radiation User Application must be submitted for approval,
- Once approved, an Approval Letter will be issued outlining:
 - Lists of approved isotopes and/or radiation producing equipment,
 - Lists of maximum activity of each isotope that can be ordered,
 - Lists of maximum activity of each Isotope that may be in the Laboratory,
 - Lists of approved laboratory locations.

Ordering and Receiving of Radioactive Materials

Ordering Radioactive Material

- Only persons who are approved users can order radioactive material,
- All orders must include the PI's name and must be shipped to the Radiation Safety Office at:

Radiation Safety Office

112 Nuclear Science Building

Louisiana State University

Baton Rouge, LA 70803-5820

- All improperly addressed packages will be rejected and returned to sender.

Receiving of Radioactive Material

- Once the package is received at the RSO:
 - The RSO will assign a unique log number to track radioactive material from receipt to disposal (cradle to grave),
 - The RSO will also perform a check for contamination on the package.
- Once the RSO has checked-in the package:
 - The approved radiation PI is notified,
 - Then the PI or his/her approved personnel can pickup the shipment and sign for it at the Radiation Safety Office:
 - NOTE: Radiation symbols and labels must be completely defaced before disposal of used packaging



Laboratory Audit

Laboratory Audits

All locations where radioactive material is used or stored is audited by RSO staff every 6 months to verify the following:

- Current Inventory/disbursement Logs,
- Record of In-laboratory surveys,
- Proper calibration and operations of survey meters,
- Proper posting of warning and emergency signs,
- Up-to-date In-Laboratory Training.

In-Laboratory Training (see the Radiation Safety Manual)

Every person who frequents a laboratory where radioactive material is stored or handled must have ANNUAL training covering at least the following:

- No eating and drinking (excludes laboratories only using radiation producing machines),
- Security of sources of radiation,
- Proper disposal of sources of radiation,
- Laboratory emergencies involving radioactive materials.

Common Violations

- Eating and drinking in open/sealed source laboratories,
- Leaving radiation producing equipment and/or radioactive material unsecured,
- Failure to follow proper waste procedures,
- Failure to conduct and record in-laboratory surveys,
- Failure to maintain source inventory/disbursement logs,
- Failure to wear appropriate dosimeters (radiation badges) if required.

Consequences for Violation

- Initial Violation:
 - Principal Investigator will be placed on probation for one year (or longer) in accordance with PS-99.
- Violations while on Probation:
 - Principal Investigator will lose privileges to use radioactive material and/or sources of radiation.



Laboratory Survey

Routine Survey

- The Radiation Safety Office surveys each laboratory where open-source radioactive material is used or stored every 3 months.
- A notice is sent when acceptable activity level ($100 \text{ pCi}/100 \text{ cm}^2$) is exceeded.

In-Laboratory Survey

- In-laboratory surveys must be conducted every time 0.5 mCi of a radioactive material is handled by a radiation worker in the laboratory,
- The results of In-laboratory surveys must be kept and documented in the laboratories copy of the Radiation Safety Manual.



Annual User Fee

Fee Schedule

User Class	Description	Fee
1-A	Approved to use radiotracers and received less than 2 shipments in the prior fiscal year	\$400
1B	Approved to use radiotracers and received between 3 and 5 shipments in the prior fiscal year	\$600
1C	Approved to use radiotracers and received 6 or more shipments in the prior fiscal year	\$800
2	Approved to use Irradiator	\$400
3	Approved to use Sealed Source (\$100 for leak test is performed per additional sealed source or device)	\$400
4	Approved to use radiation producing equipment	\$ 400 per unit
	* \$100 extra per user of Pennington Biomedical Research Center	

What is provided with the Annual User Fee?

- Contamination and/or other radiological surveys,
- Radiation Badges (up to 5), if applicable,
- Waste pick up and storage of short-lived radioactive waste,
- Assure compliance with Federal, State, and University regulations.

What is NOT Covered Under the Annual Radiation User Fee?

- Registration fee charged by the State on X-Ray machines,
- Disposal of long-lived radioactive waste,
- Removal and disposal of sealed sources in gas-chromatographs (GC's),
- Removal of radioactive standards from liquid scintillation counters (LSC's),
- Miscellaneous fees which would be discussed at the time of approval of the Radiation Use Application.



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