

Authorization to Use Radioactive Material

Authorized Users

Introduction

A license to possess and use radioactive materials has been issued to USC by the California Department of Health Services. The license is called a “broad license” because it permits the flexibility that is required for patient care and research in a dynamic research University. At the same time, it requires USC to maintain a well-managed and documented program to ensure that radioactive materials are used safely.

Under the terms of this license, the Radiation Safety Committee is delegated the responsibility for authorizing qualified individuals to use radioactive materials.

Permits

This is done through “Permits” issued to faculty. These Permits list the radioactive materials that may be used, the purpose for which they may be used, and the individuals authorized to use them.

User Definitions

Authorized Users

Those faculty members who, because of their training and experience, have been designated by the Radiation Safety Committee as being qualified to supervise the use of radioactive material at USC are referred to as Authorized Users.

Non-Faculty Authorized Users

In some circumstances, individuals who hold a doctorate level degree and are qualified by virtue of training and experience to use radioactive material, but are not members of the USC faculty (e.g., research fellows), may be designated *Non-Faculty Authorized Users*. These individuals may use radioactive material only in conjunction with a Faculty Authorized User who is willing to be accountable for the radioactive material and to ensure that all USC policies are followed.

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Permit Holder

The individual faculty member to whom the Permit is issued is designated as the Permit Holder. In most cases, the Authorized User is the Permit Holder. In cases where two or more Authorized Users are using the same facilities, only one Permit will be issued for the area with one of the Authorized Users designated as the Permit Holder.

Technical Staff

Individuals, other than the Authorized User, who work primarily under one Permit for an extended period of time and routinely use radioactive materials (e.g., graduate students, post doctoral fellows, laboratory technicians) will be designated as "Technical Staff." The Authorized User must notify Radiation Protection before technical staff are permitted to work with radioactive material.

After appropriate training (p. 2-9 through 2-13), Technical Staff are authorized to use any of the radioactive materials authorized under the Permit in quantities consistent with the information presented in the Permit application.

Students

Students (e.g. Rotating students, Edmonson Fellow students, Magnet High School students) may work with radioactive material under the guidance of an Authorized User, as described below. These students will not be considered as "Technical Staff". The Authorized User must notify Radiation Protection before students are permitted to work with radioactive material.



After appropriate training (p. 2-11), these individuals are authorized to use any of the radioactive material authorized under the Permit in accordance with the following limited quantities:

- ❖ Less than 1 mCi per procedure for any of the radioactive materials authorized under the Permit, or
- ❖ In quantities consistent with the information presented in the Permit application, whichever is less. This will ensure that these individuals do not fall under dosimetry or bioassay requirements.

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The Permit Holder is responsible for ensuring that these individuals' radioactive material usage is limited to these quantities.

Minors

Individuals under 18 years of age may be considered as either Technical Staff or students, after appropriate training. However, regulatory constraints require their usage of radioactive material be carefully controlled. As such, these individuals are authorized to use exempt quantities of the radioactive materials authorized under the Permit. (See Appendix C in this manual for the table of exempt quantities).

User Responsibilities

Authorized Users

The Authorized User is directly responsible for all aspects of radiation safety associated with the possession and use of radioactive materials under his/her Permit.

This responsibility includes:

- ❖ Complying with California Radiation Control Regulations.
- ❖ Complying with conditions of the USC Radioactive Materials License.
- ❖ Complying with the conditions of the Permit.
- ❖ Complying with the USC Radiation Safety Manual and policies of the Radiation Safety Committee.
- ❖ Providing instructions on safe and proper radiation practices to all persons working within the facilities of the Permit Holder. These rules must be prominently posted in your laboratory area(s).
- ❖ Providing emergency procedures for laboratory personnel. These procedures must include the names and telephone numbers of key lab personnel, e.g., the lab Safety Officer, to be contacted in case of emergency. These procedures shall be prominently posted in work areas where radioactive materials and radiation-producing machines are used.
- ❖ Maintaining adequate control of the radioactive material to ensure that areas beyond the Permit Holder's control are not adversely affected by its use.

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- ❖ Providing necessary equipment for safe work with radioactive material.
- ❖ Properly labeling all radiation sources and areas.
- ❖ Notifying Radiation Protection of any accident or abnormal incident involving or suspected of involving radioactive material.
- ❖ Informing Radiation Protection of any changes in personnel and any significant changes in lab design or procedures.
- ❖ Informing Radiation Protection in advance of plans to relocate the lab or leave the University.

Technical Staff

The technical staff is responsible for:

- ❖ Being aware of and complying with the requirements outlined in this Manual.
- ❖ Being aware of emergency procedures.
- ❖ Being aware of and complying with the conditions of the Permit.
- ❖ Working with radioactive material only after receiving adequate instructions about radiation safety.
- ❖ Reporting any unsafe practices to the Permit Holder and the Radiation Safety Officer.
- ❖ Notifying Radiation Protection of any accident or incident involving or suspected of involving radioactive material or radiation-producing machines.

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Absence of Authorized User

If the Authorized User is to be absent from the University for an interval of time:

Greater Than Four Weeks
Suspend the use of radioactive material and ensure its safe storage for the duration of the absence OR Submit to Radiation Protection the name of a qualified individual who will assume responsibility for the safe use of radioactive material (this individual must be approved as an Authorized User by the Radiation Safety Committee and must submit a signed statement of intent to Radiation Protection.
Less Than Four Weeks
Ensure that the use of radioactive material will be under the supervision of a qualified Technical Staff member (see <i>Training Requirements</i> , p. 2-9) OR Comply with the rules for absence greater than four weeks.

Authorized Users leaving USC for visiting professorship at another institution and desiring to have radioactive materials transferred there should refer to *Transfer of Radioactive Materials*.

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Resignation of Authorized Users

Use these steps

Step	Procedure
1	Notify Radiation Protection at least two weeks in advance of the departure.
2	Complete and return to Radiation Protection all Radioactive Material Usage and Disposal Records for any radioactive materials you have used or disposed.
3	Contact Radiation Protection to perform a closeout survey. This ensures that all equipment and facilities used with radioactive materials are free of radioactive contamination. Note: This includes equipment being taken to a new location and equipment remaining at USC.
4	Return to Radiation Protection all <i>Radiation Safety Manuals</i> issued to the Authorized User.
5	Return any personal dosimetry devices issued to the Authorized User
6	Ensure proper disposition of all radioactive material: If radioactive materials are not to be used again, discard the material in appropriate disposal containers following routine disposal procedures. Arrange for pickup by the Safety Office. If radioactive materials are going to another USC Authorized User, transfer them to the other Permit (see <i>Transfer of Radionuclides</i>). If radioactive materials are going to the User's new location, make arrangements with Radiation Protection to have the materials properly shipped to the new location.
7	Have a post-operational bioassay performed by Radiation Protection if you have participated in the bioassay program.

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Permit to Use Radioactive Material

Applications for Permits

Any qualified faculty member who wishes to become authorized to use radioactive materials must submit an application to the Radiation Safety Committee describing:

- ❖ Training and experience
- ❖ Facilities
- ❖ Radiation producing, measuring and detection equipment
- ❖ Types of work planned including radionuclides and amounts to be used
- ❖ Special safety devices
- ❖ Procedures for control of radioactive material and radiation exposures
- ❖ Emergency procedures
- ❖ Waste disposal methods

Procedures

To obtain a Permit to use radioactive materials:

Step	Procedure
1	Complete an Application.
2	Have your facility inspected by Radiation Protection.
3	The completed Application and staff recommendation will be presented to the Radiation Safety Committee for Approval at the next regularly scheduled meeting.
4	If the Application is approved by the RSC, a Permit will be issued.

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The Permit will list the Permit Holder, the Authorized User(s), the radionuclides, the physical and/or chemical forms and the amounts authorized for use and any special conditions imposed by the Radiation Safety Committee. Permits are valid for three years.

Applications for permits and a guide for completing them are available from Radiation Protection. Call to have a copy sent to you. The Radiation Protection staff will assist all applicants in completing the forms.

Amendments of Permits

Requests for relatively minor changes in a Permit may be submitted to Radiation Protection using the On-Line Computer System. The Radiation Safety Officer can approve minor changes. If the requests involve new procedures, new radioactive materials, or a significant change in hazard level, supportive information will be requested. Major changes in a Permit will require approval of the Radiation Safety Committee. Please see Appendix C, *Exempt Quantities*, for more information.

Renewal of Permits

Radioactive Material Use Permits are valid for three years and expire on the last day of the month indicated on the Permit. Sixty days prior to that date, Radiation Protection meets with the Permit Holder to discuss the Permit renewal. All information will be carefully reviewed to ensure that it accurately describes current conditions and is sufficient to meet current criteria. Applications for renewal of Permits must be submitted by the close of the business day on the last day of the month prior to the expiration month.

If the Permit is not to be renewed, the Permit Holder must send a message to Radiation Protection stating their intent to let the Permit expire.

Permit Holders who do not submit a request for renewal or respond to a request for additional information within the time limits specified will be asked to deliver their radioactive material to Radiation Protection for disposal.

Inspection of Permits

Radiation Protection conducts semiannual inspections for Permit compliance in all areas authorized for storage and use of radioactive material.

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Results of these inspections are sent via e-mail within five (5) working days. Corrective items will be verified within thirty (30) days of the inspection. Actions that are required to bring a Permit back into compliance are to be completed within two (2) weeks of receipt of the notice of noncompliance.

Training Requirements

Introduction

Appropriate training for any individuals who work with or in the vicinity of radioactive material or radiation-producing machines is an essential part of any radiation safety program. This includes all individuals, regardless of employment classification (e.g., faculty member, post-doctoral fellow, graduate student, research associate, laboratory technicians). The University has an obligation to its employees and students to provide them with:



- ❖ A safe working environment
- ❖ An awareness of the hazards to which they may be exposed
- ❖ Training in methods to protect themselves against those hazards

This training is required by the California Radiation Control Regulations (CRCR). It must be a joint effort between Radiation Protection and the individuals authorized to use radioactive material or radiation-producing machines.

All individuals who work with or in the vicinity of radioactive material must be knowledgeable about the potential health hazards of ionizing radiation, methods and procedures to minimize exposure to radiation, and their rights and responsibilities under the CRCR and the USC Radiation Protection Program.

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Human Use

Training requirements for physicians who wish to use radioactive material in humans are listed below:



❖ Human use research involving uptake, dilution or excretion studies, but not involving imaging, localization or therapy.

- Training in basic radionuclide handling techniques equivalent to 40 hours. See Appendix B, Group 1 for specific requirements.
- Supervised clinical training and experience under the supervision of a properly trained Authorized User, totaling 20 hours.

NOTE 1: Radiation Protection will provide required training for physicians who do not have 40 hours of documented training.

NOTE 2: Physicians not meeting the training requirement may be given a one year grace period provided a Nuclear Medicine Authorized User be added to the Permit to review practices and procedures. The Permit Holder must fulfill the requirements during the grace period.

NOTE 3: The Laboratory Safety Course counts for 16 hours toward the 40 hour training requirement.

❖ All other clinical uses. See Appendix B, groups 2-7.

- Physicians must be Board Certified in the appropriate specialty for the medical use.
- Appendix B lists medical uses and identifies the accepted specialties for each.

Non-Human Use



Authorized User's must have appropriate training and practical experience in the use of radioactive material. Radiation Protection conducts a training course titled "Introduction to Laboratory Safety" that includes the characteristics of ionizing radiation, radiation dose quantities, principles of radiation protection, radiation biology, radiation detection instruments, radioactive waste management and emergency procedures.

All new Authorized User's must take this course. Faculty members who have documentation of equivalent training at another institution may be exempted from this course provided:

❖ They receive instruction about California Radiation Control Regulation and USC policies and procedures.

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- ❖ They pass the written examination covering USC policies and procedures.

The Authorized User must also have practical experience that includes experience with the types and quantities of radioactive material being requested.

Limited Use

Selected (limited) users (e.g. electron microscopes, analytical x-ray units, sealed source irradiators) may receive approval based on demonstration of knowledge of the radiation hazards and regulations associated with the particular use requested. In general, this applies only to uses where the occupational dose is unlikely to exceed 500 mrem per year (one-tenth the annual limit for occupational exposure). The Radiation Safety Officer may require special instruction for limited use applicants.

Technical Staff

All individuals designated as technical staff must successfully complete "Introduction to Laboratory Safety" at one of the two sessions immediately following commencement of their work with radioactive material. Successful completion of this course is a requisite for working with radioactive materials at this University.

Students

The student will be required to attend a training session conducted by Radiation Protection prior to starting work with radioactive materials.

Training Exemptions

Exemptions will be granted on an individual basis to:

- ❖ Individuals who can document comparable training at another institution.
- ❖ Individuals who have had comparable training but have no documentation, upon passing a written exam encompassing the type of material covered in the USC course.

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All other exemptions will be determined on an individual basis by the Radiation Safety Officer.

All individuals, regardless of prior training and experience, will be required to pass an examination on USC policies and procedures.

Note

Prior to successful completion of the course, or receiving an exemption, individuals may work with radioactive material only under the direct supervision and in the physical presence of another individual who has been appropriately trained.

This policy does not relieve Authorized User's of their responsibility to provide in-service training for personnel working in their laboratory.

Annual In-Service Training

The Authorized Users are required to provide training to all individuals who will be working in the laboratory before the individual begins working in the laboratory and annually thereafter.

Before the individual begins working in the lab, the supervisor must provide instruction in:

- ❖ The procedures to be followed
- ❖ Protective clothing to be used
- ❖ Emergency procedures
- ❖ Proper maintenance of records

This training must be documented and sent to Radiation Protection before the individual begins work.

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Annual in-service training shall include:

- ❖ Changes in the Permit
- ❖ Special radiation safety problems
- ❖ Items of noncompliance found during inspections
- ❖ A review of laboratory safety procedures
- ❖ A review of the proper use of protective equipment (e.g., syringe shields, lead aprons, remote handling devices, etc.)
- ❖ A review of procedures to follow in case of a spill or other accidents involving radioactive material or radiation-producing machines
- ❖ Other topics provided by Radiation Protection



Documentation

All radiation safety-related training or education that employees receive, whether from Radiation Protection or within the laboratory, shall be properly documented and maintained on file for review by Radiation Protection. Radiation Protection will provide guidelines for the design of in-service training programs.

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