

LABORATORY LICENSING

1. INTRODUCTION

Most of the use of radioactive materials at the University of Colorado occurs in laboratories. Proper laboratory set up and licensing are essential to maintaining a safe working environment for personnel using radioactive materials and/or radiation. This section will address general laboratory safety requirements for unsealed radioactive materials, sealed radiation sources, x-rays, and lasers. It will also address the responsibilities of the Principal Investigator (PI) and individuals using radioactive materials and/or other radiation sources.

2. LABORATORY LICENSING

The University of Colorado issues Radioactive Materials Licenses (License) to qualified PIs, also known as Authorized Users (AUs) or Licensees. Applications for a new license, license amendment, license renewal, or license termination may be obtained from Health Physics. Sample forms are included in Appendix B. A license must be obtained prior to working with radioactive materials and must be kept current. The Radiation Safety Committee (RSC) has established a renewal frequency goal of three years. A license will be issued with an expiration date reflecting the three year period. Licenses not amended or renewed within the three year period remain valid until an amendment or renewal is issued.

New Licenses

New licenses are approved at quarterly meetings of the Radiation Safety Committee. Applicants should allow at least six (6) weeks should for processing of applications. License requirements include laboratory contact information, radionuclide information and limits, experimental procedures, equipment to be used, waste information, and past training and experience.

Laboratory contact information includes building location, offices, telephone numbers at work and at home, and campus box number. Radionuclide information includes radionuclide(s), amount of activity required for each experiment, and the physical and chemical forms needed. Experimental procedures should describe the experiment, operating procedures to be used for each radionuclide and a statement indicating whether or not biohazardous materials will be used with the radioactive materials. Operating procedures should include information to limit the spread of contamination, frequency of surveys, analysis methods such as liquid scintillation counters, and any special logistics required to complete the experiment.

Equipment item information includes type, make, model, serial number(s), and location. For equipment that requires internal radiation sources and/or calibration sources, information also includes the radionuclide, activity, physical and chemical forms, manufacturer, and assay dates for the sources.

Waste information should be broken into volume, approximate percentage of the total waste, and chemical constituents. All laboratories using unsealed radioactive material must perform contamination surveys, and will, therefore, generate scintillation vial waste upon analyzing the wipe smears. Please refer to the Radiation Survey chapter for more information. Biodegradable scintillation cocktails are strongly recommended whenever possible. Please refer to the Waste chapter for additional information.

The Training, Education, and Experience sections refer primarily to the PI. These sections may be completed for additional laboratory staff if necessary. Dates should be provided as much as possible in these sections. Anyone using radioactive materials in a laboratory also must obtain training specific to the type of radiation used. Training is available by contacting Health Physics. Please refer to the Training chapter for additional information.

A laboratory visit may be scheduled for new licensees upon completion of the application to review equipment, signs, use areas, and waste storage areas. The entire application and results of the laboratory visit are then submitted to the RSC for review and approval. New license applications may not be reviewed or approved by the Committee outside of their meetings, so please plan accordingly when submitting a license application.

License Amendments

Amendments are required for changing radionuclides, experimental procedures, and laboratory locations. When in doubt, contact Health Physics. At least three (3) weeks should be allowed for processing amendment applications. Amendments include verifying and updating laboratory contact information, radionuclide information and limits, experimental procedures, waste information, and past training and experience. See New Licenses section for clarification.

New or different experimental procedures should describe the experiment and operating procedures to be used for each radionuclide. Operating procedures should include information to limit the spread of contamination, frequency of surveys, analysis methods such as liquid scintillation counters, and any special logistics required to complete the experiment.

Waste information should be broken into volume, approximate percentage of the total waste, and chemical constituents for each new radionuclide and/or new procedure. All laboratories using unsealed radioactive material must perform contamination surveys, and will, therefore, generate scintillation vial waste upon analyzing the wipe smears. Please refer to the Radiation Survey chapter for more information. Biodegradable scintillation cocktails are strongly recommended whenever possible. Please refer to the Waste chapter for additional information.

A new type of radiation may require additional training specific to the type of radiation used. Training is available by contacting Health Physics. Please refer to the Training chapter for additional information.

A laboratory visit may be scheduled for amendments involving new or completely different procedures. The entire application and results of the laboratory visit are submitted to the RSC for review and approval.

License Renewal

The Radiation Safety Committee (RSC) has established a renewal frequency goal of three years. A license will be issued with an expiration date reflecting the three year period. Licenses not amended or renewed within the three year period remain valid until an amendment or renewal is issued. The Health Physics office will contact licensees whose licenses need review, typically after a license has been active without amendments for more than three years. License requirements are reviewed and updated including laboratory contact information, radionuclide information and limits, experimental procedures, waste information, and past training and experience.

A laboratory visit may be scheduled for renewals upon completion of the paperwork. The entire application and results of the laboratory visit are then submitted to the RSC for review and approval.

Inactive Licenses

Periodically, research using radioactive materials is put on hiatus but a licensee may wish to keep their laboratory license. In this case, the licensee may request to be placed on inactive status. In this situation, all radioactive materials and waste must be removed from the laboratory through the Health Physics office. A final wipe survey will be performed on laboratory surfaces and equipment. After this, the Radiation Safety Committee will review the request and, if approved, the licensee will be released from regular license requirements such as training and surveying.

If a licensee wishes to become active again within three years of going inactive, the Radiation Safety Committee can approve a re-activation. The license will be reviewed by the Committee as though it was an amendment.

After three years on inactive status, an inactive license will be terminated by the Radiation Safety Committee and the licensee will need to submit a new License application to resume work with radioactive materials.

License Termination

Termination is required for laboratories leaving the University of Colorado. If a laboratory is relocating or closing, the PI should contact Health Physics as soon as possible to facilitate proper relocation or disposal of the radioactive materials and closing of the laboratory. EH&S should also be contacted at (303) 492-6025 to facilitate proper relocation or disposal of non-radioactive materials.

Termination may also be used for laboratories that are discontinuing work with radiation and/or radioactive materials. Contact Health Physics to facilitate proper termination and disposal of radioactive materials.

3. RESPONSIBILITIES

PIs are responsible for the radiation safety program in their labs, including the following: overall supervision of work with radioactive materials, ensuring completion of basic and refresher training by all personnel, ensuring proper use and exchange of dosimeters when necessary, ensuring that contamination surveys are performed and properly documented, and ensuring compliance with all regulations and license commitments. Additionally, the PI must designate a Laboratory Contact. If the PI elects to be the Laboratory Contact, then an Alternate Safety Contact must be designated for emergencies. The Laboratory Contact is responsible for coordinating activities such as contamination clean-up (See Mishaps and Emergencies Chapter) and radioactive waste disposal (See Waste Chapter). Correspondence from Health Physics regarding lab practices will be sent to both the PI and the Lab Contact.

4. LABORATORY SIGNS & LABELS

All entrances and doors to laboratories must have signs posted to warn users of hazardous conditions. For example, *Caution Radioactive Materials*, *Caution X-ray Producing Equipment*, *Caution Lasers* (various classes), and *Emergency Notification* signs are necessary for doors and entrances as applicable. Each laboratory should have a Notice to Employees posting. Additionally, all areas in a laboratory where radioactive materials are being used must be labeled clearly with Caution Radioactive Materials signs or stickers. This includes labeling equipment in which radioactive materials are used as well as equipment that contains radioactive sources. Equipment and X-ray machines should be labeled clearly. These signs and stickers may be obtained from laboratory safety supply vendors or are available by contacting Health Physics at (303) 492-6523.

5. LABORATORY AUDITS

Health Physics performs periodic audits of each laboratory using radioactive materials. These audits review training, contamination surveys and other safety issues to ensure compliance with the laboratory's Radioactive Materials License and Federal, State and local regulations. Audits will be unannounced, but laboratories will be given an opportunity to complete a pre-audit checklist which will help reduce the time spent with the auditor in the field. Final audit findings are sent to the Licensee. Items of non-compliance and other concerns identified during the audit require a written response from the licensee which must include planned corrective actions.

6. STATE INSPECTIONS

The University of Colorado is inspected by the State of Colorado to ensure compliance with the Rules and Regulations pertaining to Radiation Control. The inspections may occur at any time, but are usually once every 1-2 years. Most inspections include a review of records, interviews with personnel, and laboratory visits. Items of non-compliance must be corrected and may include enforcement sanctions.