

Radiation Safety Committee

AUTHORIZATION TO PROCURE AND USE RADIONUCLIDES FOR NON-HUMAN USE

Radiation Safety Procedure 2.1

Rev. 4

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Effective:

_____ Date

Reviewer's Signature:

_____ Date

RSO's Signature:

_____ Date

RSC Chairperson's Signature:

_____ Date

1. Overview

This procedure is intended for use by all Carnegie Mellon University (CM) faculty, staff, and students who need to purchase, use or store radioactive material. It explains how to complete an application to procure and use radioactive materials at CM, have it evaluated by the Radiation Safety Officer (RSO), and obtain authorization to procure and use radioactive materials by the Radiation Safety Committee (RSC).

Carnegie Mellon's RSC has developed this application procedure to conform to the conditions of the university's license to possess and use radioactive material. The Nuclear Regulatory Commission (NRC) and the Pennsylvania Department of Environmental Protection (DEP) have granted these licenses. As a condition of these licenses, the RSO must evaluate and approve your use of radioactive materials at CM according to an NRC or DEP approved set of safety guidelines. The application must provide the RSO with the information needed to evaluate your radionuclide use and recommend approval for use authorization by the RSC.

Note: This authorization procedure and accompanying forms apply only to radioactive materials; they do not apply to devices that generate radiation, such as x-ray machines or electron microscopes. These devices are covered by RS3.1 and RS3.2 procedures.

2. Precautions

None.

3. Preparation

An individual may not order, deliver, or transfer radioactive material (RAM) to CM without an **RS2.1 form 1, Request for Authorization to Procure and Use Radionuclides for Non-Human Use**, approved by the RSO and the RSC.

Note: Prior to completing your application, review the RS2.1 form 1 and contact the RSO if you need assistance in completing the application. The RSO may be reached at (412) 268-3221.

4. Instructions

4.1 Completing the Application for Authorization to Procure and Use Radioactive Material

The Principal Investigator (PI) on a project must complete RS2.1 form 1 and submit it to the RSO for evaluation. The application will be circulated to the RSC upon which the committee may or may not grant approval of the application. The application must provide all pertinent information of the operations or experiments to be carried out with radioactive material. Qualification of authorized users, radiological safety procedures, proposed methods of disposal for radioactive material wastes, and facilities and equipment available to ensure safe operations should be included on the application.

Instructions for completing RS2.1 form 1:

- (1) Enter applicant information: PI's name, department, and college.
- (2) Enter the contact information for the PI, phone numbers and email address.
- (3) Indicate the type of application. Select all that apply. A new application is one that has never been granted approval by the RSC. A research application involves a project that is entirely independent of a university offered course. A classroom application is a project that is performed to complete the requirements of a university offered course. A renewal is an application that has been approved by the RSC and has an authorization # assigned to it.
- (4) Enter the project title. The title should be a general description of the proposed research and one that encompasses the overall purpose of the research project.

- (5) Enter the type of radionuclides that will be used in the project. Refer to the superscripts of each column and their corresponding definitions listed below the table to assist in the completion of the table.
- (6) Enter the work and storage areas for the project. A work location is the area of primary use and where the material will be used for the duration of the project. Storage areas are facilities used for storage of radioactive material. Indicate whether the area is a work or storage location in the facilities column.
- (7) List all persons and their email addresses, who are permitted to receive and use radioactive material under the authorization.
- (8) Briefly describe the proposed use(s) of the radioactive material.
- (9) Describe the experimental procedures that involve radioactive materials. Please refer to RS2.1 form 1, section 9 for additional instructions for the completion of this section.
- (10) The RS Office will complete the equipment section that describes the type of instrumentation that must be used to detect radiation and radioactive contamination.
- (11) Enter the waste type, volume (gallon/month), and activity (mCi/month) that will be generated for the authorization. Complete sections 12.1-12.4. These sections are self-explanatory.

Note: Authorized users are not permitted to generate mixed waste (radioactive waste mixed with chemically hazardous materials such as heavy metals and solvents) without exclusive written permission of the RSO and RSC.

- (12) Complete sections 13-15. These sections contain pertinent, miscellaneous information relevant to the authorization.
- (13) The RSO recommends for the PI to complete the optional section. This section is merely informational and describes the project in broad general terms.
- (14) Complete section 17. The application must be signed and dated by the applicant for its completion.
- (15) The RSO may establish certain restrictions to safeguard users, equipment and/or facilities. If so, the RSO completes this section and signs the application indicating recommendation for approval. The application is then forwarded to the RSC for review.
- (16) Upon approval, the authorization will be signed by the RSO, the RSC departmental representative, and the RSC chairperson.

4.2 Completing the Training Summary for First Time Applicants

The **RS2.1 form 2, Training Summary**, enables the RSO and RSC to evaluate if first time applicants satisfy educational, training, and experience requirements to become a radiation laboratory supervisor (Principal Investigator). This form must be completed and submitted along with RS2.1 form 1 for all first time applicants.

There are three individual tables that require miscellaneous information to be entered. Each field is self-explanatory. Please refer all questions to the RSO.

4.3 Requesting the Use of Radionuclides in Animal Studies

The RS 2.1 form 4, Request for Use of Radionuclides in Animal Studies, provides additional information that is necessary for the RSO and RSC representatives to complete a comprehensive evaluation of the authorization application.

Instructions for completing RS2.1 form 4.

- (1) Enter applicant information: PI's name, department, and college.
- (2) Enter the contact information for the PI, phone numbers and email address.
- (3) Enter the animal information. Refer all questions to the RSO.
- (4) Enter the type of radionuclides that will be administered to the animal. Refer to the superscripts of each column and their corresponding definitions listed below the table to assist in the completion of the table.
- (5) List the locations and facility descriptions where administration and housing will occur.

- (6) The RSO may establish certain conditions and requirements to safeguard users, equipment and/or facilities. If so, the RSO completes this section and signs the application indicating his/her recommendation for approval. The application with all accompanying forms is then forwarded to the RSC for review.

4.4 Application Review by the Radiation Safety Officer and RSC

After receiving the completed application, the RSO will review the application and evaluate proposed operations and experiments, and recommend revisions where appropriate. He/she will determine the facility requirements necessary to ensure a safe work environment. The International Atomic Energy Agency (IAEA) Safety Standard, Safety Series No.1, Safe Handling of Radionuclides, 1973 Edition, and USNRC NUREG 1556, Volume 11 are reference guidelines used to determine the radiation control facilities and equipment needed to conduct the experiments specified in the application.

The RSO, RSC Chair and RSC departmental representative evaluate the request and grant approval provided the following conditions are satisfactory:

- (1) The application and RAM uses described therein are in accordance with CM's RAM license requirements.
- (2) The RSC approves of the RS procedures described in the application.
- (3) Facilities are adequate for the procedures and use described in the application.
- (4) Personnel using material and occupying restricted areas have the necessary training.
- (5) Bioassays performed when requested by the RSO.
- (6) Personnel monitoring devices as directed by the RSO.
- (7) Proper survey frequency and types of survey monitoring instruments are used.
- (8) Protocols used will ensure minimization of personnel exposure and generation of contaminated waste materials.

The RSO forwards any application to the RSC for review and approval that the RSO, RSC chair, and RSC departmental representative cannot resolve. The RSC shall grant approval based on the same criteria discussed above.

The RSC informs the applicant of the approval/rejection of his/her application by a returned copy of the application. The RSO attaches Radiation Safety Guidelines, RS 2.1, form 6, and assigns a radionuclide authorization (RA) number to each approved application, and the applicant receives an authorized user classification. An authorized user is an individual who possesses a current RA and is able to order RAM specified in his/her RA. Individuals may possess multiple RAs.

The RSO will obtain a signed copy of the Statement of Agreement, RS 2.1 form 7, from the prospective authorized user prior to the commencement of the project outlined in the application.

4.5 Receiving Authorization to Use Radionuclides

After receiving authorization to use radionuclides, the PI must ensure that all individuals to whom he/she grants entry to his/her work or support locations have been properly trained. Individuals that merely have access to the areas and do not handle RAM must receive ancillary training every two years. Individuals who plan to handle RAM must receive initial user training and be retrained annually.

In addition, the PI is responsible for training all individuals in laboratory protocol specific to his/her application and informing them about the safety requirements contained in the use authorization prior to the commencement of work involving RAM.

To certify that the individuals have read and understood all of the requirements outlined in the use authorization form, all must sign **RS2.1 form 5 Worker Lab Training Acknowledgement**, before beginning to work in the RAM laboratory. This form along with its corresponding RS2.1 forms must

be placed in a prominent area of the laboratory or maintained in the laboratory RS protocols binder. The RS office provides these binders to the PI.

4.6 Revising the Application for Authorization to Procure and Use Radioactive Materials

Revisions to the application may be submitted to the RSO on **RS2.1 form 3, Request for Amendment to Authorization to Procure and Use Radionuclides for Non-Human Use**. A revision is defined as an alteration in one or more of the following categories: chemical form, physical form, activity per order, work or support locations, waste volumes, or procedure as described in the application. A change in the type of isotope used is not considered a revision and requires the submission of a new RS2.1 form 1.

If the modification to the application does not escalate the safety requirements or hazards, then the RSO may approve the change. Once per year, a summary of all amendments to authorizations is compiled by the RSO and submitted to the RSC chairperson.

All other changes require the approval of the RSC chair and departmental representative.

5. References

- (1) Title 10, Parts 20, Code of Federal Regulations
- (2) NRC license 37-00602-03
- (3) Pennsylvania Department of Environmental Protection license PA-203

6. Attachments

- (1) RS2.1 form 1, Request for Authorization to Procure and Use Radionuclides for Non-Human Use
- (2) RS2.1 form 2, Training Summary
- (3) RS2.1 form 3, Request for Amendment to Authorization to Procure and Use Radionuclides for Non-Human Use
- (4) RS2.1 form 4, Request for Use of Radionuclides in Animal Studies
- (5) RS2.1 form 5, Worker Lab Training Acknowledgement
- (6) RS2.1 form 6, Radiation Safety Guidelines
- (7) RS2.1 form 7, Statement of Agreement