

FEB 05 1985

Docket No. 030-22261  
Control No. 18345

The American University  
ATTN: Barbara J. A. Gordon  
Executive Administrator  
Radiation Protection Committee  
303 Hamilton Building  
4400 Massachusetts Avenue, N.W.  
Washington, DC 20016

30-646

Dear Dr. Gordon:

This is in reference to your application dated October 29, 1984 for the issuance of a byproduct material license. Since License Number 08-08371-02 expired October 31, 1984, and your application was not received in this office until November 7, 1984, your application will be processed as a new license request. In order for us to continue our review of your application, please expedite the submission of the following additional information:

1. Specify the particular nuclides which will be used by each individual named in item 6 of your application.
2. A list of the manufacturer, model number, and quantity for all sealed sources. Specifically, this information was not provided for the thorium-228 and barium-133 sealed sources.
3. Describe special precautions to be used while handling sealed sources.
4. Describe your method for determining the radiation dose to the extremities of personnel handling sealed sources.
5. Describe the areas where sealed sources will be stored, including (a) placement and thickness of shielding, and (b) proximity of the storage area to unrestricted areas.
6. Describe the training which will be provided to laboratory personnel or students who are involved in or associated with the use of radioactive materials. The description should include the form of training (e.g., formal course work, lectures), the duration of training, the subject matter included, and the means of determining the proficiency of each person handling radioactive materials. The training program should be of sufficient scope to ensure that all personnel using radioactive materials receive proper instruction in accordance with 19.12 of 10 CFR Part 19 and are knowledgeable in those radiation safety procedures and techniques pertinent to their respective duties.

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7. Submit a copy of general instructions to be followed by laboratory personnel or students while working with radioactive materials. These instructions should:
  - a. Outline control procedures for obtaining permission to use radioactive materials at the institution. Give limitations on the quantity to be handled per student or allowed per experiment.
  - b. Explain what laboratory apparel to wear and what safety equipment to use (e.g., use of laboratory coats, gloves, and remote pipetting devices).
  - c. Prescribe limitations and conditions on handling liquid or loose (unencapsulated or dispersible) radioactive materials and what laboratory equipment to use in working with them. For example, explain when materials and operations should be confined to radio-chemical fume hoods or glove boxes and explain what shielding or remote handling equipment is to be used when hard beta-or-gamma-emitting materials are handled.
  - d. Instruct the user about movement of materials between rooms, halls, or in corridors, if applicable.
  - e. Explain requirements for storage of materials and labeling of containers and how areas will be identified where radioactive materials are used. Explain where and how contaminated articles and glassware are to be handled and stored.
  - f. Specify personnel monitoring devices to be used, where to obtain them, and instructions given on their proper usage.
8. Specify the window thickness in  $\text{mg/cm}^2$  and type of use for each radiation detection instrument. The type of use would normally be monitoring, surveying, assaying or measuring.
9. The name, address and license number of the firm contracted to perform calibration of radiation detection equipment should be specified along with frequency of calibration. The applicant should contact the firm that will perform the calibrations to determine if information concerning calibration procedures has been filed with the Commission. If this information concerning calibration procedures has not been filed, it should be obtained and submitted.
10. Describe your routine area survey program, including the type and frequency of surveys, the areas to be surveyed, the instrumentation or technique to be used and the levels of contamination that you consider to be acceptable, and provisions for preserving records of such surveys. For an institution using the types and quantities of materials listed on your present license, it is recommended that a brief contamination survey be conducted at the end of each experiment, and a comprehensive survey performed once monthly.

11. Submit a description of the duties and responsibilities of your radiation protection officer, Dr. Romeo Segnan, under your license. The typical duties of a radiation protection officer would be:
  - a. To ensure that the use of radioactive material is by or under the direct supervision of individuals specifically listed on your license.
  - b. To ensure that all users (where appropriate) wear personnel monitoring equipment when using radioactive materials.
  - c. To ensure that radioactive materials are properly secured against unauthorized removal at all times when not in use.
  - d. To perform routine inspections of all laboratories using or storing radioactive materials.
  - e. To ensure that the terms and conditions of your license are met, and that all required records are maintained.
12. Submit a copy of the emergency procedures to be followed in case of spills or other types of accidents involving radioactive materials. It is recommended that such procedures contain:
  - a. Instructions to be followed during minor spills.
  - b. Instructions to be followed during major spills.
  - c. Your radiation protection officer's name, his office telephone number, and a telephone number to be used during off-duty hours.
13. Submit a complete, comprehensive description of your procedures for disposal of radioactive wastes. You should include procedures for collecting wastes at individual investigators' laboratories and final disposal procedures and any special instructions given to housekeeping personnel.
14. Cobalt-57, produced in a cyclotron, and radium-226, a naturally occurring isotope are not byproduct materials as defined in Section 30.4(d) of Title 10, Code of Federal Regulations, Part 30, and are not subject to licensing by the NRC. Therefore, you may procure and use them without reference in your byproduct material license.

You should contact District of Columbia regulatory authorities to determine the licensing or registration requirements for use of these radionuclides.
15. If radioactive materials are to be used in animals, please submit:
  - a. A description of the animals' housing facilities.
  - b. A copy of instructions provided to animal caretakers for handling of animals, animal waste carcasses, and cleaning and decontamination of animal cages.

16. Describe your bioassay program for individuals using millicurie quantities of tritium. You should include the type of bioassays (thyroid count, urine count, whole body count, etc.), the criteria and frequency for performing bioassays, and the type of action taken when positive results are obtained. For your assistance, we are enclosing a tritium bioassay guide that contain criteria for performing bioassays that we find acceptable.
17. Describe your procedures for complying with Section 20.1(c), Section 20.103, and Section 20.106 of 10 CFR Part 20, for procedures such as tritium labeling experiments that may release volatile or gaseous radioactive materials to restricted and unrestricted areas. You should include a description of the type of surveys (e.g., environmental or breathing zone), frequency of surveys, and the individuals who will perform the surveys (e.g., radiation safety officer or investigator), equipment to be used, and the procedures for evaluating the results.
18. In support of your request for 75 millicuries of phosphorus-32, you should develop and submit special safety instructions to be provided to individuals using millicurie quantities of P-32. We recommend that your procedures include, but not be limited to, the following:
  - a. The use of low density shielding (e.g., plexiglass) in order to keep Bremsstrahlung radiation at a minimum.
  - b. A mandatory radiation survey and wipe test procedures after each use.
  - c. The use of finger extremity monitors for procedures that involve 1 millicuries or more.
  - d. The use of dry run prior to the performance of unfamiliar procedures in order to preclude unexpected complications. In addition, it is recommended that the radiation protection officer be present during new procedures.
  - e. The use of eye protection for procedures that involve 10 millicuries or more.

We will continue our review of your application upon receipt of this information. Please reply in duplicate and refer to Mail Control #18345.

Sincerely,

Original Signed By:  
John D. Kinneman

John D. Kinneman, Chief  
Nuclear Materials Safety  
Section A  
Division of Radiation Safety  
and Safeguards

Enclosures:

1. Regulatory Guide 10.2
2. 10 CFR Parts 19 and 20
3. Tritium Bioassay Guide

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