



**DREXEL UNIVERSITY  
COLLEGE OF MEDICINE**

**Office of Regulatory Research Compliance**

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April 16, 2012

U.S. Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, PA 19406

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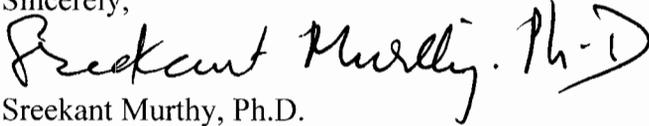
re: License No. 37-04594-11 **03015139**  
Renewal Application

Dear Sir or Madam:

Because the scope of the license has changed dramatically since its renewal almost 10 years ago, it is appropriate to submit a renewal application in its entirety. The attached document follows NRC Form 313 and NUREG 1556 Volume 7.

This license permits the use of Drexel University Atmospheric Pressure Ionization Mass Spectrometers (APIMS) containing nickel-63 as a plated foil when in locations under NRC jurisdiction. When the APIMSs are at Drexel University, they are regulated by the Commonwealth of Pennsylvania under license number PA-0132.

If you have any questions, please feel free to contact our Radiation Safety Officer, Kent Lambert (215-255-7860, kent.lambert@drexel.edu). If I can be of assistance, do not hesitate to contact me.

Sincerely,  
  
Sreekant Murthy, Ph.D.  
Vice Provost for Regulatory Research Compliance

**577409**  
NMS3/RGN1 MATERIALS-002

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www.research.drexel.edu • www.drexelmed.edu

**In the tradition of Woman's Medical College of Pennsylvania and Hahnemann Medical College®**  
Philadelphia Health & Education Corporation d/b/a Drexel University College of Medicine is a separate not-for-profit subsidiary of Drexel University.  
Drexel University is not involved in patient care.

**1. This is an application for:**

Renewal of license 37-04594-11

**2. Name and address of applicant:**

Drexel University  
1601 Cherry Street, Suite 10444  
Philadelphia, PA 19102

**3. Address where licensed material will be used or stored**

Licensed material may be used or transported on-board vessels at temporary job sites at sea in international waters, and in national waters, bays, and coastal waters and at temporary job sites on or over land located anywhere in the United States where the U.S. Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material.

When under the jurisdiction of the Commonwealth of Pennsylvania:

Drexel University campus, 32nd and Chestnut Streets, Philadelphia, Pennsylvania.

**4. Name of person to be contacted about this application**

For technical issues contact:

Kent Lambert  
1601 Cherry Street, Suite 10444  
Philadelphia, PA 19102

voice: 215-255-7860  
fax: 215-255-7874  
e-mail: kent.lambert@drexel.edu

For administrative issues contact:

Sreekant Murthy, Ph.D.  
Vice Provost for Regulatory Research Compliance  
1601 Cherry Street, Suite 10444  
Philadelphia, PA 19102

voice: 215-255-7857  
fax: 215-255-7874  
e-mail: s.murthy@drexel.edu

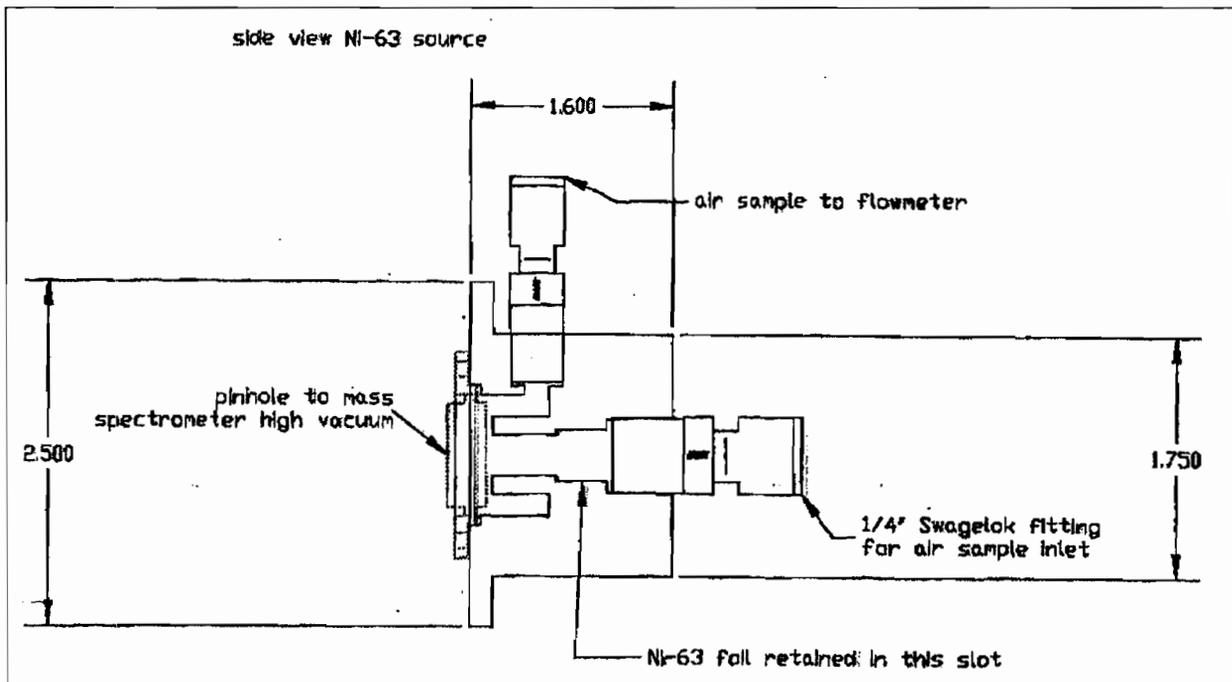
## 5. Radioactive Material

- a. Element and Mass No. Nickel 63
- b. Chemical / Physical form Foils or plated sources
- c. Possession limit 150 millicuries

## 6. Purpose for which licensed material will be used:

Foils are used in the electron capture device of mass spectrograph units which are used to measure atmospheric conditions around the world.

The Drexel University Atmospheric Pressure Ionization Mass Spectrometer (APIMS) consists of a stainless steel vacuum chamber for housing a quadrupole mass filter at high vacuum, a stainless steel chamber at 1-10 torr, and a stainless steel chamber at atmospheric pressure containing nickel-63 on a nickel alloy foil at an activity of 10 – 15 mCi per unit. The Ni-63 chamber is attached to the low pressure chamber by screws. The Ni-63 is retained in its chamber by a Swagelok fitting that connects to the air source to be analyzed. A pinhole aperture in the Ni-63 chamber allows ions formed at atmospheric pressure to be guided by an electrostatic forces into the vacuum region and then into the high vacuum region where mass separation is obtained through the quadrupole mass filter.



The APIMS is used to quickly determine parts per trillion by volume levels of sulfur dioxide and dimethyl sulfide in ambient air. Because of its nearly real time measurements, the APIMS can be installed in aircraft. It has been used to study the marine boundary layer and the interchange between the oceans and the atmosphere above.

## **7. Individuals responsible for radiation safety program**

### Radiation Safety Officer (RSO)

Kent Lambert, M.S., CHP, is the Radiation Safety Officer for Drexel University. He is certified by the American Board of Health Physics in comprehensive health physics (1990) and has over 25 years experience in radiation safety at academic institutions.

### Radiation Safety Committee

Drexel University has a Radiation Safety Committee which oversees the radiation safety program and approves authorized users based on their training and experience.

### Authorized User

To be an authorized user, an applicant must have at least the following education, training and experience:

- A college degree in physical or biological sciences.
- A minimum of 40 hours formal classroom and/or supervised on the job training in:
  - The characteristics of ionizing radiation
  - Radiation dose and quantities
  - Radiation detection instrumentation
  - Biological hazards of exposures to radiation appropriate to the types, quantities and forms of radioactive material to be used.
- An authorized user must have previous experience working with radioactive materials which pose similar radiological protection problems.

An authorized user would normally hold a faculty appointment at the University.

## **8. Training for individuals working in or frequenting restricted areas**

Individuals working with the APIMS will receive instructions in the following topics:

- Applicable regulations and authorization conditions
- Areas where radioactive material are used or stored
- Potential hazards associated with the radioactive material
- Appropriate radiation safety procedures
- In-house work rules
- Worker's obligation to report unsafe conditions to the Radiation Safety Officer
- Appropriate responses to emergencies or unsafe conditions
- Worker's rights to be informed of occupational radiation exposure and bioassay results
- Locations where notices, regulations, authorizations, and authorization conditions are posted or available

The Radiation Safety Officer or a member of the Radiation Safety staff will provide training. Annual performance-based audits during which workers are asked about key components of the radiation safety program are used to assess knowledge of the radiation safety program. This also acts as refresher training.

## 9. Facilities and Equipment

Drexel University is an educational, research and development institution whose campus is located at and around 32nd and Chestnut Streets, Philadelphia, PA.

The APIMSS' home is Drexel University's Chemistry Department. While at Drexel, the devices are stored and used in a locked laboratory. When used to make environmental measurements, the instruments may be on an aircraft, ship, or in a remote building.

## 10. Radiation Safety Program

Drexel University has a Type A broad-scope license, and the APIMSS, when at Drexel University are subject to the requirements of the broad-scope license and the radiation safety program. This includes oversight by the Radiation Safety Committee.

### Instruments

Drexel University Radiation Safety Office has a variety of radiation detection equipment; however, for detection of nickel-63 the only useful detection system is the Beckman LS 6500 liquid scintillation counter. We reserve the right to upgrade our survey instruments as necessary.

### Material Receipt and Accountability

The nickel-63 sources are not a frequently replaced item and it is highly unlikely that sources will be received under this license. (Receipt at Drexel University would be covered under the agreement state broad scope license.) Nonetheless, the standard procedure at Drexel is for all purchase requisitions to be reviewed, approved, and signed by a member of the Radiation Safety Office prior to the order being placed. Only a University Procurement Buyer may place orders for radioactive materials.

Criteria for approval of purchase and delivery is whether:

- Recipient is an authorized user for particular nuclide to be purchased;
- The possession limits are not exceeded.

All packages are checked by Radiation Safety Office and then delivered to the Authorized User.

The Authorized User is responsible for informing the Radiation Safety Officer whenever the sources will be used off-site. A physical inventory will be conducted at intervals not to exceed 6 months (at the same time that leak tests are conducted), to account for all sealed sources and devices received and possessed under the license.

### Occupational Dose

We have done a prospective evaluation and determined that individuals working with the APIMS are not likely to receive, in one year, a radiation dose in excess of 10% of the allowable limits in 10 CFR Part 20.

#### Safe Use of Radionuclides and Emergency Procedures

Procedures for safe use, including security of materials, and emergencies have been developed.

#### Surveys

Routine ambient radiation level and contamination surveys are not conducted. Leak tests will be conducted at a frequency not to exceed 6 months or at the frequency specified in the respective SSD Registration Certificate, whichever is more frequent. Air inlet and outlets will be wiped where any contamination from a leaking source might accumulate. The device will not be disassembled for leak testing.

### **11. Waste Management**

Nickel-63 foils will be disposed by transfer to a licensed broker for disposal at a licensed disposal facility. Sources may also be returned to the manufacturer or transferred to a person specifically licensed to receive the licensed material.

This is to acknowledge the receipt of your letter/application dated

4/16/12, and to inform you that the initial processing which includes an administrative review has been performed.

Renewal (37-04594-01)  
There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

Please provide to this office within 30 days of your receipt of this card

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A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 577409.  
When calling to inquire about this action, please refer to this control number.  
You may call us on (610) 337-5398, or 337-5260.