Chapter 2
Radiation Safety Organization and Responsibilities

2.1 Historical Perspective

The University of Illinois at Chicago (UIC) has a long history of using sources of ionizing radiation for clinical and research purposes. Medical x-ray units were in use at the University in 1911 or earlier by the Department of Materia Medica and Therapeutics. Radioactive material was being used in research by the College of Medicine as early as 1949. The use of radiation sources at UIC blossomed during the following years, resulting in the wide spectrum of clinical and research uses employed today.

In 1983, as a result of the forming of UIC by merging of the University of Illinois Medical Center and the Chicago Circle Campus, the radiation safety programs of these campuses were combined. The current radiation protection program is administered by the Radiation Safety Section (RSS) of the Environmental Health and Safety Office (EHSO).

2.2 UIC Licenses and Registrations

Licensing of byproduct material by the Atomic Energy Commission (now the Nuclear Regulatory Commission or NRC) began as a result of the Atomic Energy Act of 1954. The State of Illinois has required the registration of radiation installations since September 1, 1957 and began licensing naturally occurring and accelerator produced radioactive material in 1974. On June 1, 1987, the State of Illinois and the NRC finalized an agreement in which the authority to license most types of radioactive material was transferred to the Illinois Department of Nuclear Safety (IDNS). As such, Illinois is now regarded as an "agreement state" and licenses previously issued by the NRC are now administered by the IDNS. The IDNS changed its name to the Illinois Emergency Management Agency (IEMA) in 2001.

As required, UIC is registered with IEMA as a radiation installation and has obtained a broad scope license permitting a wide variety of research and medical uses of radioactive material. If further information about registration or licenses is required, you may contact any one of the Radiation Safety Section's health physicists.

2.3 Radiation Safety Committee

A Radiation Safety Committee (RSC) composed of knowledgeable individuals, is mandated by IEMA regulations. Its membership is chosen periodically by the Chancellor or the Chancellor's delegate and the authority delegated to it by the Chancellor has been incorporated by reference into the license issued to the University. The membership of the RSC must include the UIC Radiation Safety Officer (RSO), a representative of administration and other individuals who are representative of the types of uses permitted by the license. The individuals designated as the RSO and the chairperson of the RSC must be approved by the IEMA and are specifically named in the license.
The overall objective of the RSC is to ensure that the use of radiation sources does not compromise the safety of people and the environment. It also advises the University on problems relating to radiological hazards. Unlike many university committees which are advisory in nature, the RSC has the authority to establish radiation safety policies and practices, and to review and approve or disapprove authorizations to procure and use radiation sources.

Relevant expertise is focused in various areas of endeavor via the establishment of three Radiation Control Subcommittees: The Human Use Radioisotope Subcommittee, the Nonhuman Use Radioisotope Subcommittee, and the Radiation Producing Machines Subcommittee.

Some specific functions of the RSC and its subcommittees are to:

- Review and approve or disapprove authorizations for use of radioactive materials and radiation producing machines (details are given in Chapter 3 of this manual);
- Review and approve or disapprove operations of the Radiation Control Subcommittees; and
- Conduct regular meetings to review the status of the radiation safety program.

### 2.4 Radiation Safety Section

The Radiation Safety Officer is responsible for implementing the University's radiation safety program. The RSO and his staff are collectively referred to as the Radiation Safety Section. Specific responsibilities of the RSS include:

- Serve in an administrative capacity to the RSC;
- Review applications for the use of radioactive material from University personnel prior to approval and recommend or establish the radiation protection procedures that should be implemented for the safe and legal use of radiation sources;
- Provide instruction to new applicants regarding the hazardous properties of the radioactive material to be used and review with them the procedures and practices that must be implemented to maintain a safe working environment and to comply with the rules, regulations, license conditions and University policies;
- Periodically review all terms and conditions of the authorization with each project director and ensure that they are being met;
- Ensure that radioactive materials are used by or under the direct supervision of the radiation project director;
- Perform routine radiation monitoring and laboratory inspections and indicate when corrective actions must be taken;
- Immediately halt any activity judged to be a threat to health, safety or environment, or that is a serious violation of the regulations or the conditions of the license;
- Distribute personnel monitoring devices and enforce their use whenever required by the regulations;
- Investigate each known or suspected case of excessive or abnormal exposure to determine the
cause, and take steps to prevent recurrence;

· Calibrate portable radiation survey instruments at required intervals;

· Provide and maintain a system for the safe and legal disposal of radioactive waste;

· Maintain an inventory system for radiation sources possessed by UIC;

· Conduct periodic leak tests of sealed radioactive sources;

· Provide training and instruction to University personnel regarding radiation protection theory, practice and procedures;

· Maintain records to document regulatory compliance including those concerning radiation surveys, leak tests, personnel monitoring, waste disposal, receipt of material, training, RSC meetings and authorizations, etc.; and

· Handle routine matters involving the regulatory agencies including periodic licensing, registration of radiation sources, generating ALARA and other exposure reports, and license inspections.

2.5 Department Heads

It is important that department heads fully support the radiation safety program. They should be familiar with the appropriate aspects of the program as outlined in this manual, implement the program in their department or section, and require their subordinates to comply with the program and the regulations.

Department heads must sign each application requesting use of radiation sources to signify their approval of the proposed project(s).

2.6 Radiation Project Directors and Supervisory Personnel

Radiation project directors are responsible for implementing the radiation safety program for their project. Project directors and individuals who supervise the use of radiation sources should be very familiar with this manual, applicable aspects of the radiation safety program, and conditions stated in the project authorization documents. They must also:

· Provide complete information to the RSS when applying for the use of radiation sources and provide full cooperation with any RSS health physicist reviewing the project;

· Ensure that a copy of this manual and the project authorization documents are readily available to project personnel at all times;

· Require all project personnel to be familiar with the manual and project authorization documents, and to adhere to the conditions of authorization;

· Permit the use of only those radiation sources that are listed in the authorization documents;

· Permit work with radiation sources only by those individuals who are listed in the authorization documents;
· Permit the use of radiation sources only in the locations listed in the authorization documents;

· Notify the RSS when personnel should be added to or removed from the authorization and when the project should be terminated or temporarily inactivated;

· Notify the RSS when work with radiation sources is being discontinued in a room listed in the authorization documents;

· Notify the RSS before permitting physical plant personnel to work in areas where radiation exposure or radioactive material contamination is likely;

· Ensure that each monthly Radionuclide Inventory Report is properly completed and returned to the RSS by the tenth of the month so that license conditions are met and sewage disposal calculations can be completed as required by IEMA regulations;

· Ensure that project personnel who are provided with film badges or dosimeter rings exchange them with their film badge representative on the first working day of each month;

· Notify the RSS prior to an extended leave or sabbatical and appoint a qualified individual to be responsible for the project during the period of absence;

· Provide instruction to project personnel regarding the hazards associated with exposure to the authorized radiation sources and the precautions and procedures that must be used to minimize exposure;

· Require all project personnel to attend the UIC Radiation Safety Lectures;

· Instruct project personnel in the proper use of radiation detection instruments and radiation survey techniques;

· Promptly report radiation hazards and violations of IEMA rules and regulations to the RSS including;
  · Known or suspected overexposures (See Chapter 11);
  · Conditions that could lead to overexposures;
  · Radiation levels in public areas in excess of the limits (see Chapter 11);
  · Wounds contaminated with radioactive material;
  · Inhalation or ingestion of radioactive materials;
  · Spills of Type II quantities of radioactive material (see Chapter 18); and
  · Spills of radioactive material in any public area.

· Ensure that radiation surveys are conducted at meaningful times by personnel using radioactive material under the authorization;

· Maintain all necessary records including authorization documents, solid waste disposal logs, sewage disposal logs, required surveys, radionuclide inventories, etc.;

· Require all project personnel to adhere to their responsibilities as outlined below; and

· Submit significant changes in protocol to the RSS for review and approval (see Chapters 3 and 8).
2.7 Project Personnel

Project personnel must:

- Know and adhere to the conditions of the authorization and the procedures and practices outlined in this manual;

- Receive, possess, or use only those sources and quantities authorized in the project authorization documents;

- Acquire, transfer, and dispose of authorized radiation sources in accordance with the procedures in this manual;

- Use authorized radiation sources only in rooms listed in the authorization documents;

- Keep exposure to radiation sources as low as is reasonably achievable;

- Wear personnel monitors when required by the RSS (film badges and/or TLD rings) and strictly follow the monthly film badge exchange schedule;

- Immediately report any of the following to the RSS and project director:
  - Any known or suspected overexposure (see Chapter 11);
  - Conditions that could lead to an overexposure;
  - Radiation levels in public areas in excess of the limits (see Chapter 11);
  - Wounds contaminated with radioactive material;
  - Inhalation or ingestion of radioactive material;
  - Spills of Type II quantities of radioactive material (see Chapter 18); and
  - Spills of radioactive material in any public area.

- Perform radiation surveys at meaningful times (see Chapter 14, Section 14.3) and report significant results to the project director;

- Know and adhere to the General Rules for Radioisotope Labs when working with unsealed radioactive materials;

- Monitor hands and clothing for radioactive material contamination during and after the use of unsealed radioactive material;

- Clean up radioactive material contamination promptly;

- Record each radioactive material disposal at the time it is made on the log forms provided for this purpose; and

- Properly label, store, and secure all radioactive material.