

# 1. Executive Summary

The purpose of this Report is to provide guidance for the safe use of ionizing- and nonionizing-radiation sources in educational institutions, including both teaching and research activities. Brief explanations of the terms radiation, ionizing radiation, and nonionizing radiation are given in the Glossary.

To take advantage of the benefits of using radiation sources in these activities, it is necessary to provide radiation safety controls commensurate with the potential hazard. Since the sources of radiation used in many educational institutions usually produce only low radiation levels, the potential hazard to faculty, staff and students is usually correspondingly low when simple basic precautions are followed.

This Report is intended primarily for those institutions that do not need a full-time radiation safety professional because the uses and radiation levels of the sources are limited. In these instances, an individual with limited expertise in radiation safety (*e.g.*, a professor, teacher, researcher, or general safety staff member) could assume the responsibility for implementing the radiation safety program. Usually, this individual is called the radiation safety officer (RSO). This individual may have other safety responsibilities in addition to radiation safety. Full-time RSOs may also find this Report helpful.

To assist administrators in determining whether a radiation safety program is necessary, and to assist the RSO in assuming the responsibility for the radiation safety program, this Report provides information on the following topics:

- types of ionizing radiation including alpha and beta particles, neutrons, and gamma and x rays;
- potential health effects of exposure to ionizing radiation, and the applicable radiation dose limits;
- potential hazards and the safety controls for nonionizing radiation [*e.g.*, radiofrequency, microwave, ultraviolet (UV), infrared and visible];
- an administrative structure appropriate for effectively controlling radiation sources at an educational institution;

- academic disciplines (*e.g.*, biology, physics, geology, general science, or chemistry) where radiation sources could potentially be used or found and what types of radiation sources might be used or found in each discipline;
- regulatory requirements that apply to various types and radiation levels of sources;
- sources that are exempt from licensing requirements;
- sources that are authorized by a general license issued by a regulatory agency;
- sources that require a specific license from the U.S. Nuclear Regulatory Commission (NRC) or a state;
- components of a radiation safety program, including radiation-source inventory control, safety procedures, routine monitoring of the workplace, radiation-safety training, audits, contamination control, waste management, record keeping, emergency-response procedures, and security; and
- technicalities and legal commitments of licensing and of establishing and managing a radiation safety program.