GLOSSARY

"Absorbed dose" Means the energy imparted by ionizing radiation per unit mass of irradiated material. It is determined as the quotient of dE by dM, where dE is the mean energy imparted by ionizing radiation to matter of mass dM. The SI unit of absorbed dose is joule per kilogram and the special name of the unit of absorbed dose is the gray (Gy). The units of absorbed dose are the gray (Gy) and the rad.

"Activity" Means the rate of disintegration or transformation or decay of radioactive material. The units of activity are the curie (Ci) and the Becquerel (Bq).

"Agreement state" Means any state with which the U.S. Nuclear Regulatory Commission or the U.S. Atomic Energy Commission has entered into an effective agreement under Subsection 274b of the Atomic Energy Act of 1954 as amended (73 Stat. 689).

"Airborne radioactive material" Means any radioactive material dispersed in the air in the form of dusts, fumes, particles, mists, vapors, or gases.

"Alpha particle" A positively charged particle ejected spontaneously from the nuclei of some radioactive elements. It has low penetrating power and a short range (a few centimeters in air). The most energetic alpha particle will generally fail to penetrate the dead layers of cells covering the skin and can be easily stopped by a sheet of paper. Alpha particles are hazardous when an alpha-emitting isotope is inside the body.

"As low as is reasonably achievable" (ALARA) Means making every reasonable effort to maintain exposures to radiation as far below the dose limits in these rules as is practical, consistent with the purpose for which the licensed or registered activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed or registered sources of radiation in the public interest.

"Background radiation" Means radiation from cosmic sources; naturally occurring radioactive materials, including radon (except as a decay product of source or special nuclear material); and global fallout as it exists in the environment from the testing of nuclear explosive devices or from past nuclear accidents such as Chernobyl that contribute to background radiation and are not under the control of the licensee. "Background radiation" does not include sources of radiation from radioactive materials regulated by the agency.

"Beta particle" A charged particle emitted from a nucleus during radioactive decay with a mass equal to 1/1,837 that of a proton. A negatively charged beta particle is identical to an electron. A positively charged beta particle is called a positron. Large amounts of beta radiation may cause skin burns. Beta emitters are harmful if they enter the body and can produce a whole body does. Beta particles may be stopped by thin sheets of metal, plastic, or glass.

"Cask" A heavily shielded container used to store and/or ship radioactive materials. Lead and steel are common materials in casks.

"CFR" means Code of Federal Regulations.

"Contamination" The deposition of unwanted radioactive material on the surfaces of structures, areas, objects, or people. It may also be airborne, external, or internal (inside components or people).

"Curie" Means a unit of quantity of radioactivity. One curie (Ci) is that quantity of radioactive material which decays at the rate of 3.7E+10 transformations per second (tps).

"Decommission" Safely removing a facility from service and reducing residual radioactivity to a level that permits the release of the property for unrestricted and under certain conditions, restricted use.

"Decontamination" The reduction or removal of contaminated radioactive material from a structure, area, object, or person. Decontamination may be accomplished by (1) treating the surface to remove or decrease the contamination, (2) letting the material stand so that the radioactivity is decreased as a result of natural radioactive decay, or (3) covering the contamination to shield the radiation emitted.

"Dose" is a generic term that means absorbed dose, dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, total organ dose equivalent, or total effective dose equivalent. For purposes of these rules, "radiation dose" is an equivalent term.

"Gamma radiation" High-energy, short wave length, electromagnetic radiation emitted from the nucleus. Gamma radiation frequently accompanies alpha and beta emissions. Gamma rays are very penetrating and are best stopped or shielded by dense materials, such as lead. Gamma rays are similar to x-rays.

"Gauging Devices" Devices used to measure, monitor, and control the thickness of sheet metal, textiles, paper napkins, newspaper, plastics, photographic film, and other products as they are manufactured. Non-portable gauging devices are designed for measurement or control of material density, flow, level, thickness, or weight. The gauges contain sealed sources that radiate through the substance being measured to a readout or controlling device. Portable gauging devices, such as moisture density gauges, are used at field locations. These gauges contain a gamma-emitting sealed source, usually cesium-137, or a sealed neutron source, usually americium-241 or beryllium.

"Gray (Gy)" Means the SI unit of absorbed dose. One gray is equal to an absorbed dose of 1 joule per kilogram (1 Gy=100 rad).

"Half-life" The time in which one half of the atoms of a particular radioactive substance disintegrate into another nuclear form. Measured half-lives vary from millionths of a second to billions of years. Also call physical or radiological half-life.

"High-level radioactive waste" or "HLW" Means (1) irradiated reactor fuel; (2) liquid wastes resulting from the operation of the first cycle solvent extraction system, or equivalent, and the concentrated wastes from subsequent extraction cycles, or equivalent, in a facility for reprocessing irradiated reactor fuel; and (3) solids into which such liquid wastes have been converted.

"Industrial radiography" Means an examination of the structure of materials by nondestructive methods, utilizing ionizing radiation to make radiographic images.

"Irradiation" Means the exposure of a living being or matter to ionizing radiation.

"Isotope" Any two or more forms of an element having identical or very closely related chemical properties and the same atomic number but different atomic weights or mass numbers.

"License" Means a license issued by the agency in accordance with the rules adopted by the agency.
"Licensed (or registered) material" Means radioactive material received, possessed, used, transferred or disposed of under a general or specific license (or registration) issued by the agency.

"Licensee" Means any person who is licensed by the agency in accordance with these rules and the Act.
"mA" Means milliampere.

"Radiation" Means alpha particles, beta particles, gamma rays, X-rays, neutrons, high-speed electrons, high-speed protons, and other particles capable of producing ions. For purposes of these rules, ionizing radiation is an equivalent term. Radiation, as used in these rules, does not include non-ionizing radiation, such as radiowaves or microwaves, visible, infrared, or ultraviolet light.

"Radiation detector" Means a device which, in the presence of radiation, by either direct or indirect means, provides a signal or other indication suitable for use in measuring one or more quantities of incident radiation.

"Radiation machine" Means any device capable of producing radiation except those devices with radioactive material as the only source of radiation.

"Radiation source" Usually a sealed source of radiation used in teletheraphy and industrial radiography, as a power source for batteries, or in various types of industrial gauges. Machines, such as accelerators and radioisotope generators, and natural radionuclides may be considered sources.

"Radiation safety officer (RSO)" Means an individual named by the licensee or registrant who has a knowledge of, responsibility for, and authority to enforce appropriate radiation protection rules, standards, and practices on behalf of the licensee or registrant and who meets the requirements of 45.1(10)"d."

"Radioactive contamination" Deposition of radioactive material in any place where it may harm persons or equipment.

"Radioactive decay" Large unstable atoms can become more stable by emitting radiation. This process is called radioactive decay. This radiation can be emitted in the form of a positively charged alpha particle, a negatively charge beta particle, or gamma rays or X-rays.

"Radioactive material" Means any solid, liquid, or gas which emits radiation spontaneously.

"Radioactive waste" Radioactive materials at the end of a useful life cycle or in a product that is no longer useful and should be properly disposed.

"Radioactivity" The spontaneous emission of radiation, generally alpha or beta particles, often accompanied by gamma rays, from the nucleus of an unstable isotope. Also, the rate at which radioactive material emits radiation. Measured in units of Becquerel's or disintegrations per second.

"Radiography" The making of a shadow image on photographic film by the action of ionizing radiation.

"Radiographer trainer (instructor)" means any individual who instructs and supervises radiographer's assistants during on-the-job training and who meets the requirements of 45.1(10) "c."

"Radiographer's assistant" means any individual who has successfully completed the training, testing, and documentation requirements of 45.1(10)"a" and who uses sources of radiation and related handling tools or radiation survey instruments under the direct supervision of a radiographer trainer.

"Radionuclide" Means a radioactive element or a radioactive isotope.

"REM" means the special unit of any of the quantities expressed as dose equivalent. The dose equivalent in rem is equal to the absorbed dose in rad multiplied by the quality factor (1 rem = 0.01 sievert).

"Residual radioactivity" means radioactivity in structures, materials, soils, groundwater, and other media at a site resulting from activities under the licensee's control. This includes radioactivity from all licensed and unlicensed sources used by the licensee, but excludes background radiation. It also includes radioactive materials remaining at the site as a result of routine or accidental releases of radioactive material at the site and previous burials at the site, even if those burials were made in accordance with the provisions of 641—Chapter 40 or any previous state or federal licenses, rules or regulations.

"Sealed source" means radioactive material that is encased in a capsule designed to prevent leakage or escape of the radioactive material.