Term
Acute Exposure Definition: Exposure to a large dose of radiation, generally over a short period of time. Large acute doses can result from accidental or emergency exposures or from specific medical procedures.
Acute Radiation Sickness (Syndrome) Definition: Symptoms that can be seen when the body receives a very large dose of ionizing radiation. The earliest symptoms are nausea, fatigue, vomiting, and diarrhea. Hair loss, hemorrhaging, swollen or inflamed mouth and throat, and general loss of energy may follow.
Agreement State Definition: A state that has signed an agreement with the Nuclear Regulatory Commission (NRC) allowing them to regulate the use of some radioactive material within the state.
Alpha Particle Definition: A positively charged particle made up of two neutrons and two protons emitted by certain radioactive nuclei. Alpha particles cannot penetrate most matter. A piece of paper or the dead outer layers of skin is sufficient to stop alpha particles. Radioactive material that emits alpha particles (alpha emitters) can be very harmful when inhaled, swallowed, or absorbed into the blood stream. Acronym: α
Ambient Air

Term
Definition: The outdoor air which we breathe.
Atom Definition: Extremely small particles of which we, and everything around us, are made. Atoms consist of a nucleus, containing protons and neutrons, surrounded by electrons.
Background Radiation Definition: The radiation present in the natural environment; includes cosmic, terrestrial, radon and internal radiation.
Beta Particle Definition: An electron or positron emitted by certain radioactive nuclei. Beta particles can be stopped by a layer or two of clothing or by a few millimeters of a substance such as aluminum. They are capable of penetrating the skin and causing radiation damage, such as skin burns. As with alpha emitters, beta emitters are most hazardous when they are inhaled or ingested. Acronym: β
Chronic Exposure Definition: Continuous or intermittent exposure to low doses of radiation over a long period of time. There is often a delay between the exposure and any potential health effect.
Computed Tomography (CT) Definition: A medical imaging procedure that uses x-rays to show cross-sectional images of the body. Also called computerized axial tomography (CAT) scanning.

Term
Contamination Definition: Contamination occurs when a person makes direct contact with, ingests or inhales radioactive materials. Contamination may occur when radioactive materials are released into the environment as the result of an accident, an event in nature or an act of terrorism.
Daughter Products Definition: Radioactive atoms decay in an attempt to become more stable. The element that remains after the radioactive decay is called the daughter product or decay product.
Decay Definition: The process in which an unstable (radioactive) nucleus emits radiation and changes to a more stable isotope or element. A number of different particles can be emitted by decay. The most typical are alpha or beta particles, often accompanied by gamma radiation.
Decay Chain Definition: The series of decays or steps that certain unstable (radioactive) atoms go through before reaching a stable form. For example, the decay chain that begins with uranium–238 culminates in lead–206, after forming uranium–234, thorium–230, Radium–226 and Radon–222.
Decay Products Definition: Radioactive atoms decay in an attempt to become more stable. The element that remains after the radioactive decay is

Term
called the daughter product or decay product.
Dirty Bomb Definition: An explosive device that uses conventional material (ex. dynamite) and radioactive material. It is designed to spread radioactive material when it is detonated. See Radiological Dispersal Device (RDD).
DNA (deoxyribonucleic acid) Definition: The "blueprints" that carry our genetic information. DNA ensures that a perfect copy of the original cell is created when our body repairs or replaces cells.
Dose Definition: The quantity of energy absorbed by a person exposed to radiation.
Dosimeter Definition: A small portable instrument (e.g., a film badge, thermoluminescent or pocket dosimeter) for measuring and recording the total accumulated personal dose of ionizing radiation.
Dosimetry Definition: The monitoring of individuals to accurately determine their radiation dose equivalent.
Drilling Mud

Term
Definition: When tapping natural resources, soil and bits of rock mix with water used to lubricate drills to form drilling mud. When rocks contain radioactive minerals such as radium, the mud is radioactive.
Electromagnetic Spectrum Definition: Energy that travels in the form of waves or high-speed particles. The electromagnetic spectrum extends from low to high frequencies of energy including radio waves, microwaves, infrared light, visible light, ultraviolet light, x-rays and gamma rays. The electromagnetic spectrum is divided into two major categories: ionizing radiation and non-ionizing radiation.
Electron Definition: Particles that orbit the nucleus as a cloud. They are negatively charged and balance the positive electrical charge of the protons in the nucleus. Interactions with electrons in the outer orbits affect an atom’s chemical properties.
Evaporating Ponds or Pits Definition: Drilling and waste materials produced when tapping natural resources are stored in evaporating ponds or pits. These ponds allow the water to evaporate to reduce the volume. The water may be reused in the drilling process.
Exposure Definition: The amount of radiation that reaches a person or object. Exposure occurs when a person is near a radiation source. Receiving an x-ray is an example of exposure. Though the radiation penetrates the body, it does not remain on the skin or in the body.
Exposure Pathways

Term
Definition: The way in which people are exposed to radiation or other contaminants. The three basic pathways are inhalation (contaminants are taken into the lungs), ingestion (contaminants are swallowed) and direct (external) exposure (contaminants cause damage from outside the body).
Fallout Definition: The slow descent of minute particles of radioactive debris in the atmosphere following a nuclear explosion.
Fission Definition: The splitting of a nucleus into at least two other nuclei and the release of a relatively large amount of energy. Two or three neutrons are usually released during this type of transformation.
Fluoroscopy Definition: Fluoroscopy is a medical technique used by doctors to take real-time moving images of internal structures in the body by placing a patient between a fluorescent screen and an x-ray source.
Fusion Definition: The union of atomic nuclei to form heavier nuclei resulting in the release of enormous quantities of energy.
Gamma Rays Definition: High-energy electromagnetic radiation emitted by certain radioactive elements. These rays have high energy and a short wavelength and are very penetrating. Several feet of concrete or a few inches of lead may be required to stop gamma rays. While gamma rays can easily pass completely through the human body, a fraction of the energy will always be absorbed by tissue.

Term
Geiger Counter Definition: A radiation detection and measuring instrument. It consists of a gas-filled tube containing electrodes, between which there is an electrical voltage, but no current flowing. When ionizing radiation passes through the tube, a short, intense pulse of current passes from the negative electrode to the positive electrode and is measured or counted. The number of pulses per second measures the intensity of the radiation field. It is the most commonly used portable radiation detection instrument.
Half-Life Definition: The amount of time it takes for half of the radioactive atoms in a sample to decay into a more stable form. Every radioactive atom has a different half-life. Half-lives vary from billionths of a second to billions of years.
Hazardous Waste Definition: Waste products that can pose a substantial or potential hazard to human health or the environment when improperly managed. Hazardous waste is regulated at the federal level under the Resource Conservation and Recovery Act (RCRA). A waste may be hazardous if it has at least one of four characteristics: ignitable, corrosive, reactive, or toxicity.
Health Physics Definition: A scientific field that focuses on radiation protection of humans and the environment. Health physics uses physics, biology, chemistry, statistics and electronic instrumentation to help protect individuals from any damaging effects of radiation.
Heap Leaching Definition: The process of sprinkling chemicals on above ground piles of crushed uranium ore-bearing rock in a lined pit and

Term
collecting uranium through underground drains. Either acid or alkaline solutions may be used to remove uranium from the host ore rock.
High-Level Radioactive Waste Definition: Radioactive material resulting from spent nuclear fuel reprocessing. Radioactive materials can be designated as high-level waste if they require permanent isolation. This determination is made by the U.S. Nuclear Regulatory Commission (NRC) based criteria established in U.S. law.
In-Situ Leaching Definition: The process (presently the most common method used in the U.S.) involves drilling wells deep underground and using chemicals (typically are alkaline and include sodium bicarbonate and oxygen mixed with water) to dissolve the uranium before it is pumped to the surface as a liquid through wells.
Ingestion Definition: Eating or drinking radioactive material.
Inhalation Definition: Breathing in radioactive material.
Interventional Fluoroscopy Definition: The use of ionizing radiation to guide small instruments such as catheters through blood vessels or other pathways in the body.

Term
Ion Definition: An atom that has too many or too few electrons, causing it to have an electrical charge, and therefore, be chemically active.
Ionizing Radiation Definition: Energy given off as either particles or rays from the unstable nucleus of an atom. The most energetic form of radiation, capable of removing electrons from atoms and damaging living cells and the DNA of those cells. Ionizing radiation includes x-rays, gamma rays and alpha and beta particles.
Irradiation Definition: The process of exposing an object to radiation. This usually occurs with postal mail screening or food irradiation (for sterilization or food preservation).
Isotope Definition: A form of an element that has the same atomic number (same number of protons), but a different atomic mass due to the presence of a different number of neutrons.
Low-level Radioactive Waste Definition: Radioactively contaminated industrial or research waste that is not spent nuclear fuel, high-level radioactive waste, transuranic radioactive waste or uranium mill tailings. Low-level radioactive waste could include items such as paper, rags, plastic bags, or water-treatment residues.

Term
Man-made Radiation Definition: Radiation that is produced for medical, manufacturing and consumer purposes.
Meson Definition: A subatomic particle that holds nucleons together in the atomic nucleus.
Millirem Definition: The U.S. unit of measurement for radiation dose absorbed by the body. Doses are most commonly reported as millirem (mrem), which is one thousandth of a rem (1,000 mrem = 1 rem). See rem. Acronym: mrem
Monitoring Definition: The use of sampling and detection equipment to determine the levels of radiation or other toxic materials in land, air or water.
Naturally Occurring Radioactive Materials Definition: Radioactive materials that are found in nature. Acronym: NORM
Neutron

Term
Definition: A small particle, with no electrical charge, typically found within an atom's nucleus. A neutron has about the same mass as a proton.
Non-Ionizing Radiation Definition: Radiation that has lower energy levels and longer wavelengths than ionizing radiation. It has enough energy to move atoms, but not enough to alter them chemically. It can be strong enough to heat tissue and cause harmful biological effects. Examples include radio waves, microwaves, visible light and infrared from a heat lamp.
Nuclear Energy Definition: The heat energy produced by the process of nuclear reaction (fission or fusion) within a nuclear reactor or by radioactive decay.
Nuclear Fuel Cycle Definition: The series of steps involved in supplying fuel for nuclear power reactors. It can include mining, milling, use in reactors, chemical reprocessing, re-enrichment of the fuel material or waste disposal.
Nuclear Medicine Definition: Radioactive elements or tracers that are given intravenously or orally. A gamma camera detects gamma rays emitted by the tracer. These data are fed into a computer where they are used to produce images and other information about the body’s organ system.
Nuclear Power Plant

Term
Definition: An electrical generating facility using a nuclear reactor as its power source.
Nucleus Definition: The central part of an atom that contains protons and neutrons. The nucleus is the heaviest part of the atom.
Open-pit Uranium Mining Definition: The mining process that involves stripping away or excavating the topsoil and rock that lie above the uranium ore.
Orphan Radioactive Source Definition: Found or abandoned radioactive sources are described as "orphan" when their identifying marks have been removed or damaged.
Overburden Definition: Soil and rocks that have been moved out of the way to get to the ore are called "overburden." In areas where there are high concentrations of radionuclides in the rock, overburden may contain relatively high levels of radioactivity.
Photon Definition: A "packet" of electromagnetic energy. Photons have no mass and travel at the speed of light. Gamma rays and x-rays are photons.
Pipe Scale

Term
Definition: Minerals that build up inside pipes used to pump water in and out of the well and in storage tanks is called "pipe scale." The formation of pipe scale concentrates the minerals, including the radionuclides. The level of radioactivity depends on the radionuclide content of the soil and rock in the area.
Produced Water Definition: The water brought to the surface during oil and gas drilling is called "produced water." It often contains dissolved radioactive minerals such as radium from the surrounding rocks.
Protective Action Guide Definition: A protective action guide suggests precautions that state and local authorities may take to protect people from receiving an amount of radiation which might be dangerous to their health. Acronym: PAG
Proton Definition: A small particle typically found within an atom's nucleus that possesses a positive electrical charge. The number of protons is unique for each chemical element.
Radiation Definition: Radiation is energy that travels in the form of waves and makes up the electromagnetic spectrum. The electromagnetic spectrum is divided into two major categories: ionizing and non-ionizing radiation.
Radiation Protection

Term
Definition: Basic radiation protection concepts can be applied separately or in combination to help limit people's exposure to increased radiation levels, including time: limiting time near the radiation source, distance: increasing the distance from a radiation source, and shielding: placing material or a barrier between a person and a radiation source.
Radioactive Atom Definition: An atom with an unstable nucleus that emits ionizing radiation (alpha particles, beta particles or gamma rays) as it decays and attempts to become stable.
Radioactive Materials Definition: Materials that emit ionizing radiation (alpha particles, beta particles and gamma rays).
Radioactivity Definition: The property of some atoms that causes them to spontaneously give off energy as particles or ray. Radioactive atoms emit ionizing radiation when they decay and transform into a new element.
Radiological Dispersion Device Definition: An explosive device that uses conventional material (ex. dynamite) and radioactive material. It is designed to spread radioactive material when it is detonated. See Dirty Bomb. Acronym: RDD
Radiology Definition: Radiography is the use of x-ray machines by doctors and dentists to view the human body.

Term
Radioluminescence Definition: The emission of light from objects containing radioactive material, such as radium.
Radionuclide Definition: An unstable form of a nuclide.
Radium Definition: A naturally occurring radioactive (unstable) element that forms when uranium or thorium decay. Elevated levels of radium can contaminate water supplies. Radium also poses a risk when it decays to form radon, a radioactive gas.
Radon Definition: A naturally occurring (colorless and odorless) radioactive gas found in soils, rock and water throughout the United States. Radon causes lung cancer and is a threat to health because it tends to collect in homes, sometimes in very high concentrations. As a result, radon is the largest source of exposure to naturally occurring radiation.
Risk Definition: The probability of injury, disease, or death under specific circumstances.
Roentgen Equivalent Man Definition: The U.S. unit of measurement for radiation dose absorbed by the body. Doses are most commonly reported as millirem

Term
(mrem), which is one thousandth of a rem (1,000 mrem = 1 rem). See millirem. Acronym: rem
Sealed Source Definition: Small, sealed containers of radioactive materials used as references in research and industrial processes. The sources are usually enclosed in a housing that prevents the escape of the radiation. Often referred to as radioactive sources or sealed sources.
Shelter-in-place Definition: Selecting a small, interior room, with no or few windows, and taking refuge there. This is one of many possible directions members of the public may receive from state, federal or local authorities in the case of an emergency.
Spent Nuclear Fuel Definition: Nuclear reactor fuel that has been exhausted and can no longer effectively sustain a chain reaction.
Strong Nuclear Force Definition: A powerful force between nucleons; proton-to-proton, neutron-to-neutron, and proton-neutron. It extends only a very short distance, about the diameter of a proton or neutron.
Tailings Definition: Tailings are waste from processing ore to extract a desired mineral. The waste may contain radioactive elements that release high levels of radiation into the environment.

Term
Technologically Enhanced Naturally Occurring Radioactive Material Definition: Technologically enhanced naturally occurring radioactive materials (TENORM) are radionuclides that have been concentrated or enhanced as the result of human activity. Acronym: TENORM
Terrestrial Radiation Definition: Radiation that is emitted by naturally occurring radioactive materials in the earth.
Transuranic Waste Definition: Waste materials containing elements with atomic numbers higher than uranium (92).
Trefoil Definition: The official radiation warming symbol; a magenta or black trefoil on a yellow background. It must be displayed where certain quantities of radioactive materials are present or where certain doses of radiation could be received.
Tritium Definition: Tritium is a radioactive isotope of the element hydrogen (chemical symbol H).
Underground Uranium Mining Definition: The mining process that involves extracting rock through a tunnel or opening in the side of a hill or mountain, or digging a

Term
shaft from the surface into the underlying ore zone.
Uranium Definition: A radioactive (unstable) element generally found in the environment. As uranium decays, it releases radiation and forms other elements (like radium and radon) until it becomes a stable element.
Uranium milling Definition: The process that removes uranium from the ore. The ore is crushed and ground up, treated with chemical solutions to dissolve the uranium, and separated from the solution. The final product is commonly called, "yellowcake."
X-Rays Definition: X-rays and gamma rays differ in origin, but have essentially the same properties. All x-rays are less energetic than the most energetic gamma rays. Most diagnostic medical x-rays are stopped by a few millimeters of lead.