



Radiation Protection

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Radiation Glossary N-P

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N

National Priorities List (NPL)

EPA's official list of sites that present sufficient threat to human health or the environment to be eligible for cleanup under the Superfund program. Sites make the NPL if they score above 28.5 on the Hazard Ranking System, which evaluates levels of contamination and the potential for exposure to humans and ecosystems.

Naturally Occurring Radioactive Materials (NORM)

Radioactive materials that are found in nature. Until recently, technologically enhanced naturally occurring radioactive materials (TENORM) was referred to simply as NORM. The words "technologically enhanced" were added to distinguish clearly between radionuclides as they occur naturally and radionuclides that human activity has concentrated or exposed to the environment.

Naturally Occurring Radioactive Materials or Accelerator-Produced Radioactive Materials (NARM)

Radioactive materials not covered under the AEA that are naturally occurring or produced by an accelerator. Accelerators are used in sub-atomic particle physics research. These materials have been traditionally regulated by States. A subset of NARM is NORM. NARM waste with more than 2 nCi/g of ²²⁶Ra or equivalent is commonly referred to as discrete NARM waste; below this threshold, the waste is referred to as diffuse NARM waste. NARM waste is not covered under the AEA, not a form of LLW, and is not regulated by NRC.

Neutrino

An unreactive particle that accompanies a beta particle. It has no charge and virtually no mass.

O

P

Reference Information

People and Discoveries
Commonly Encountered
Radionuclides

Americium-241
Cesium-137
Cobalt-60
Iodine-129 &-131
Plutonium
Radium
Radon
Strontium-90
Technetium-99
Tritium
Thorium
Uranium

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Radioactive Decay (Minor Modes)
This link provides information on Neutron Radiation, Positron Decay, Electron Capture and Isomeric Transition.

Neutron

a small particle possessing no electrical charge typically found within an atom's nucleus. A neutron has about the same mass as a proton.

What is an Atom?
This page describes and explains atoms.

Neutron Poison

in reactor physics, a material other than fissionable material, in the vicinity of the reactor core that will absorb neutrons. The addition of poisons, such as control rods or boron, into the reactor is said to be an addition of negative reactivity.

Neutron Radiation

Neutron radiation is energy released from an atom in the form of neutral particles called neutrons. Neutrons are part of the basic building blocks of atoms. They have no charge and are about the same mass as a proton. Due to ion-producing collisions with matter and absorption/decay processes, neutrons are a type of ionizing radiation.

Non-Ionizing Radiation

Radiation that has lower energy levels and longer wavelengths than ionizing radiation. It is not strong enough to affect the structure of atoms it contacts, but is strong enough to heat tissue and can cause harmful biological effects. Examples include radio waves, microwaves, visible light, and infrared from a heat lamp.

Ionizing and Non-Ionizing Radiation
This page explains ionizing and non-ionizing radiation.

Non-Stochastic Effect

Effects that can be related directly to the dose received. The effect is more severe with a higher dose, i.e., the burn gets worse as dose increases. It typically has a threshold, below which the effect will not occur. A skin burn from radiation is a non-stochastic effect. (See also stochastic effects.)

Radiation Health Effects
This page describes the effects of both long-term and acute exposure to radiation.

Not In My Backyard (NIMBY)

Usually used to describe members of the public who are not opposed to an activity in principle (e.g., nuclear power or waste disposal), but do not want it located near their community.

Nuclear Energy

The heat energy produced by the process of nuclear reaction (fission or fusion) within a nuclear reactor or by radioactive decay.

Nuclear Fuel Cycle

The series of steps involved in supplying fuel for nuclear power reactors. It can include mining, milling, isotopic enrichment, fabrication of fuel elements, use in reactors, chemical reprocessing to recover the fissionable material remaining in the spent fuel, re enrichment of the fuel material refabrication into new fuel elements and waste disposal.

Nuclear Power Plant

An electrical generating facility using a nuclear reactor as its power (heat) source. The coolant that removes heat from the reactor core is normally used to boil water. The steam produced by the boiling water drives turbines that rotate electrical generators.

Nuclear Regulatory Commission

NRC is an independent regulatory agency created out of the Atomic Energy Commission in 1975 to regulate the civilian uses of nuclear material. It has five Commissioners, who are nominated by the President and confirmed by the Senate; the President designates one of the Commissioners as Chairman. The NRC is responsible for ensuring that a civilian nuclear activities are carried out with adequate protection of the public health and safety, the environment, and national security: operation of nuclear power and fuel cycle plants nuclear medicine industrial use of radioactive materials use of radioactive materials in research regulation of all AEA materials. Except in a few cases, NRC does not regulate the Department of Energy's radioactive materials. NRC does not regulate NARM. You can learn more about NRC at <http://www.nrc.gov>.

Nuclear Tracers

Radioisotopes that give doctors the ability to "look" inside the body and observe soft tissues and organs, in a manner similar to the way X-rays provide images of bones. A radioactive tracer is chemically attached to a compound that will concentrate naturally in an organ or tissue so that a picture can be taken.

Nucleon

a proton or a neutron; a constituent of the nucleus

Nucleus

the central part of an atom that contains protons and neutrons. The nucleus is the heaviest part of the atom.

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Nuclide

a general term applicable to all atomic forms of an element. Nuclides are characterized by the number of protons and neutrons in the nucleus, as well as by the amount of energy contained within the atom.

What is an Atom?
This page describes and explains atoms.
Nuclides and Isotopes
This page describes the distinctions between nuclides and isotopes

Order of Magnitude

a multiple of ten. For example, "two numbers differ by one order of magnitude" means one is about ten times larger than the other. If they differ by two orders of magnitude, one is about 100 times larger than the other.

Overburden

soil and rock that is covering a deposit of ore, such as uranium. Overburden is removed during mining operations and generally stored in piles near the mine. It usually contains at least trace amounts of the ore plus radioactive decay products.

Oxide

a compound formed by the reaction of oxygen with another element. For example, rust-- ferrous oxide--is iron that has combined with oxygen.

Pathways

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).

Exposure Pathways
This page describes the different routes by which radiation can enter the body.

Palladium

a steel-white metal, does not tarnish in air, and is the least dense and lowest melting of the platinum group metals. When annealed, it is soft and ductile. Cold working increases its strength and hardness. It is used in some watch springs.

At room temperatures the metal has the unusual property of absorbing up to 900 times its own volume of hydrogen. Hydrogen readily diffuses through heated palladium and this provides a means of purifying the gas.

Phased Disposal

a method of tailings management and disposal that uses lined impoundments, which are filled and then immediately dried and covered to meet all applicable federal standards.

Phosphor

a substance that emits light when excited by radiation

picocurie

one one-trillionth (1/1,000,000,000,000) of a curie.

Photon

a discrete "packet" of pure electromagnetic energy. Photons have no mass and travel at the speed of light. The term "photon" was developed to describe energy when it acts like a particle (causing interactions at the molecular or atomic level), rather than a wave. Gamma and X-rays are photons.

Gamma Rays

A description of the properties, uses and health effects of gamma and x-rays.

Curies

This page describes and explains the origin of the unit, curie.

Pitchblende

a brown to black mineral that has a distinctive luster. It consists mainly of urananite (UO₂), but also contains radium. It is the main source of uranium ore.

Plume

Material spreading from a particular source and traveling through environmental media, such as air or ground water. For example, a plume could describe the dispersal of particles, gases, vapors and aerosols in the atmosphere, or the movement of contamination through an aquifer (dilution, mixing, adsorption onto soil, etc.).

Plutonium

a heavy, man-made, radioactive metallic element. The most important isotope is Pu-239, which has a half-life of more than 20,000 years; it can be used in reactor fuel and is the primary isotope in weapons. One kilogram is equivalent to about 22 million kilowatt-hours of heat energy. The complete detonation of a kilogram of plutonium produces an explosion equal to about 20,000 tons of chemical explosive. Plutonium is a bone-seeking radiation hazard, and can be lethal depending on the dose and exposure time.

Plutonium

This fact sheet describes the basic properties and uses, and the hazards associated with this radionuclide. It also discusses radiation protection related to it.

Polonium

a radioactive chemical element and a product of radium decay. Polonium is found in uranium ores.

Positron

a particle equal in mass to the electron but having a positive electronic charge.

Radioactive Decay (Minor Modes)

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<http://www.epa.gov/rpdweb00/glossary/termnop.html#n>

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Power

(1- β)

the probability of rejecting the null hypothesis when it is false. The power is equal to one minus the Type II decision error rate, i.e. (1- β).

Power Reactor

a reactor designed to produce heat for electric generation, as distinguished from reactors used for research, for producing radiation or fissionable materials or for reactor component testing.

Protective Action Guide

A protective action guide tells state and local authorities at what projected dose they should take action to protect people from exposure to unplanned releases of radioactive material into the environment.

Protective Action Guides (PAGs)

This page provides information on when and how PAGs are used during a radiation emergency, available training and how to obtain a copy.

Proton

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.

What is an Atom?

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