



Radiation Protection

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Radiation Glossary D-F

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D

Decay, Radioactive

the decrease in the amount of any radioactive isotope with the passage of time due to the spontaneous emission of radiation from the atomic nuclei (either alpha or beta particles, often accompanied by gamma radiation), and consequent transformation to a different chemical form.

Why Are Some Atoms Radioactive?
This page explains radioactive atoms.
Decay Chains
This page explains decay chains.

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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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Decay Chain

the series of decays that certain radioisotopes go through before reaching a stable form. For example, the decay chain that begins with Uranium-238 culminates in Lead-206, after forming intermediates such as Uranium-234, Thorium-230, Radium-226, and Radon-222. Also called the "decay series."

Decay Chains
This page explains decay chains.

Decay Products

the isotopes or elements that form and the particles and high-energy electromagnetic radiation emitted by the nuclei of radionuclides during radioactive decay. Also known as "decay chain products," "daughter products," or "progeny" (the isotopes and elements).

Docket

a publicly accessible collection of documents that Federal agencies use in making regulatory decisions

Decommission

the process of removing a nuclear facility from service by reducing residual radioactivity in buildings or at the site to a level that permits the release of the property for unrestricted use or maintenance under protection for reasons of public health and safety. (see also, decontamination)

Decontamination

the reduction or removal of contaminated radioactive material from a structure, object or person. (See also decommission)

Depleted Uranium

uranium containing less 0.7% uranium-235, the amount found natural uranium (See also enriched uranium.)

Uranium

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

Dewatered

to have reduced the water content of recently produced wastes or other materials either mechanically or by evaporation. For example, dewatering reduces the water in tailings to 30% by weight or less.

Dirty Bomb

commonly refers to a device that spreads radioactive material by exploding a conventional (non-nuclear) explosive, such as dynamite. Because they do not involve the sophisticated technology required to create a nuclear explosion, dirty bombs are much simpler to make than a true nuclear bomb.

Dose (radiation)

denotes the quantity of radiation or energy absorbed. Dose may refer to the following:

- absorbed dose, the amount of energy deposited per unit mass
- equivalent dose, the absorbed dose adjusted for the relative biological effect of the type of radiation being measured
- committed dose, a dose that accounts for continuing exposures over long periods of time (such as 30, 50, or 70 years)

Radiation Health Effects

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

Radiation Protection Basics

This page provides three Basic Concepts of Radiation Protection.

Dose Rate

the radiation dose delivered per unit time

Dosimeter

a small portable instrument (such as a film badge, thermoluminescent, or pocket dosimeter) for measuring and recording the total accumulated personal dose of ionizing radiation

--dosimetry, monitoring of individuals to accurately determine their radiation dose equivalent

Ecological Atlas

a series of maps that describe each aspect of an area's ecosystem. For example, one map in the series would describe the biology (plant and wildlife); another would describe the geology; and so forth.

Electron

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

Emergency Removal action

steps taken to remove contaminated materials that pose an imminent threat to local residents (e.g., removal of leaking drums or the excavation of explosive waste).

Emergency Support Functions (ESF)

ESFs detail the missions, policies, structures, and responsibilities of federal agencies for coordinating resource and programmatic support to states, tribes, and other federal agencies or other jurisdictions and entities during Incidents of National Significance. The introduction to the ESF Annexes summarizes the functions of ESF coordinators and primary and support agencies.

Environmental Radiation Ambient Monitoring System (ERAMS)

now known as RadNet, is a nationwide system of air, water, and milk sampling stations that monitor radiation in the environment

RadNet
This page provides information about different RadNet sampling programs.

End Products

the materials that leave the treatment facility or are disposed of onsite after all processing is completed (e.g., ash from incineration, digested liquid or dewatered cake, dried pellets, compost).

Enriched Uranium

uranium in which the proportion of the isotope uranium-235 has been increased(See also depleted uranium.)

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

Entomb

a method of decommissioning a nuclear facility in which radioactive contaminants are encased in long-lived material, such as concrete. The entombment structure is maintained and monitored until the radioactivity decays to a level allowing decommissioning and ultimately, safe unrestricted use of the property.

Epidemiological Studies

studies of the distribution of disease and other health issues as related to age, sex, race, ethnicity, occupation, economic status, or other factors

Radiation Health Effects

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

Exposure(radiation)

a term relating to the amount of ionizing radiation that strikes a living or inanimate material. (This is a general definition. In health physics, exposure is specifically defined as a measure of ionization in air caused by x-ray or gamma radiation only.)

Exposure Pathways

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

Fallout, nuclear

the slow descent of minute particles of radioactive debris in the atmosphere following a nuclear explosion.

Federal Facilities Compliance Act (FFCA or FFCAct)

an amendment to RCRA, which requires DOE and other federal agencies, to follow RCRA regulations, and requires DOE to develop plans for treating the hazardous components of radioactive wastes subject to RCRA requirements.

Field Exercise (FX)

also known as "full scale exercise"; an emergency response training exercise that tests a major portion of the functions in an emergency plan and/or operating procedures. Field exercises incorporate a high degree of realism and an extensive involvement of resources and personnel. (See also table top exercise.)

Exercises

This page provides information on exercises that range from informal "walk through's" to highly complex, realistic simulations of actual emergencies. It also provides examples of the exercises in which EPA's Radiological Emergency Response Team has participated.

Final Status Survey

<http://www.epa.gov/rpdweb00/glossary/termdef.html#d>

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measurements and sampling to describe the radiological conditions of a site, following completion of decontamination activities (if any) in preparation for release.

Fissile Material

although sometimes used as a synonym for fissionable material, this term has acquired a more restricted meaning. Namely, any material fissionable by thermal (slow) neutrons. The three primary fissile materials are uranium-233, uranium-235, and plutonium-239.

Fission (fissioning)

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. Fissioning is also referred to as 'burning.' (See also fusion.)

Fissioning that occurs without any outside cause, such as bombardment with a neutron, is called 'spontaneous fission.'

Fuel Cycle

the series of steps involved in supplying fuel for nuclear power reactors. The fuel cycle can include mining, milling, isotopic enrichment, fabrication of fuel elements, use in a reactor, re-enrichment of the fuel material, re-fabrication into new fuel elements, and waste disposal.

Fuel Rod

a long, slender tube that holds fissionable material (fuel) for nuclear reactor use. Fuel rods are assembled into bundles called fuel elements or fuel assemblies, which are loaded individually into the reactor core.

Fusion

a reaction in which at least one heavier, more stable nucleus is produced from two lighter, less stable nuclei. Reactions of this type are responsible for enormous release of energy, as in the energy of stars, for example. (See also fission.)

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