Radiation Glossary A-C

a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | r | s | t | u | v | w | xyz

A

Acute Exposure

a single exposure that results in biological harm or death; usually characterized by a brief exposure lasting no more than 7 days, as compared to longer, continuing exposure over a period of time

Chronic Exposure
This link provides the definition of chronic exposure.
Radiation Health Effects
This page describes the effects of both long-term and acute exposure to radiation.

Agreement State

a state that has signed an agreement with the Nuclear Regulatory Commission allowing the state to regulate the use of by-product radioactive material within the state

NRC Agreement States
NRC's description of its program.
Organization of Agreement States EXIT Disclaimer
Organization through which Radiation control program directors and staff from the 34 agreement states work with each other and with the NRC on regulatory issues associated with their agreements.

Alpha Particle

a positively charged particle made up of two neutrons and two protons emitted by certain radioactive nuclei. Alpha particles can be stopped by thin layers of light materials, such as a sheet of paper, and pose no direct or external radiation threat; however, they can pose a serious health threat if ingested or inhaled.

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

Glossary
Acronyms
A-Z Subject Index
Site Map

Alpha Particles
This fact sheet describes the basic properties, uses and the health effects. It also discusses radiation protection related to it.

Ambient Air

the air that surrounds us

Americium

a silvery metal; it is a man-made element whose isotopes americium-237 through -246 are all radioactive. Americium-241 is formed spontaneously by the beta decay of plutonium-241. Trace quantities of americium are widely used in smoke detectors, and as neutron sources in neutron moisture gauges.

Americium
This fact sheet describes the basic properties and uses, and the hazards associated with this radionuclide. It also discusses radiation protection related to it.
Smoke Alarms
This page focuses mainly on the ionization chamber technology.

Advanced Notice of Proposed Rulemaking (ANPRM)

an official notice by a government agency that it is preparing regulations on a specific topic. An ANPRM frequently describes the approach the agency is taking in general terms, and may invite public comment.

Applicable or Relevant and Appropriate Requirement (ARAR)

Under the Comprehensive Environmental Responsibility, Cleanup and Liability Act (Superfund), cleanups must follow two kinds of requirements:

applicable requirements meaning those that directly apply to the situation
relevant or appropriate requirements meaning those that apply to contaminants that are present at the site or apply to a contaminated medium, such as water, at the site

For example, the standards for cleaning up uranium and thorium processing facility sites are frequently considered "relevant and appropriate" for radiologically contaminated sites that did not conduct such processing. ARARs can be federal, state, or local requirements.

Area

a general term referring to any portion of a site, up to and including the entire site.

Area of Elevated Activity

an area over which residual radioactivity exceeds a specified value DCGL(sub-EMC).

Atomic Mass number

the number of protons and neutrons in the nucleus of a nuclide. (The atomic mass number is not the same as the chemical atomic weight, which is the average of all the naturally occurring isotopes of an element weighted according to their relative abundances.)

B

Atomic Mass Unit (AMU)

AMU is equal to the mass of one-twelfth of a carbon-12 atom.

Weighing Atoms: Atomic Mass Units
This page explains the atomic mass units.

Atoms for Peace

President Eisenhower's 1954 initiative to allow the peaceful uses of atomic energy to be available to other nations.

Authorities

the Presidential and legislative powers transferred to federal agencies through laws, Executive Orders, and Presidential Decision Directives

Beneficiation

a set of processes used to reduce the particle size of mined ore to allow the desired mineral to be separated from wastes and either used or further processed

Biological Effects of Ionizing Radiation (BEIR) Reports

reports of the National Research Council's committee on the Biological Effects of Ionizing Radiation

Becquerel (Bq)

a unit used to measure radioactivity. One Becquerel is the amount of a radioactive material that will undergo one transformation in one second.

Often radioactivity is expressed in larger units like: thousands (Kq), or millions (MBq) of becquerels.

As a result of having one Becquerel being equal to one transformation per second, there are 3.7 x 10^{10} (37 billion) Bq in one curie.

Curie
This page explains the unit curies.

Beta Particle

an electron or positron emitted by certain radioactive nuclei. Beta particles can be stopped by aluminum. They can pose a serious direct or external radiation threat and can be lethal depending on the amount received.They also pose a serious internal radiation threat if inhaled or ingested.

Beta Particles
This fact sheet describes the basic properties, uses and the health effects. It also discusses radiation protection related to it.

C

Binding Energy(cosmic glue)

the amount of energy required to break up a nucleus into its constituent parts, or conversely, the energy released upon formation of the nucleus

By-Product Material

radioactive materials left over from the production or use of special nuclear material

the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content

Regulatory definition : "(1) Any radioactive material (except special nuclear material) yielded in, or made radioactive by, exposure incident to the process of producing or utilizing special nuclear material, and (2) The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "by-product material" within this definition (10 CFR 20.1003)."

Carcinogen

a cancer-causing substance

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

Cerium

an iron-gray, lustrous metal. It is malleable, and oxidizes very readily at room temperature, especially in moist air. The pure metal may ignite when scratched with a knife. Cerium-141, -143, and -144 are radioisotopes of cerium. They emit beta particles during radioactive decay.

Cesium

a metal that may be stable (non radioactive) or unstable (radioactive). The most common radioactive form of cesium is cesium-137. Another fairly common radioisotope is cesium-134. Cesium-137 is much more significant as an environmental contaminant than cesium-134. It is also very useful in industry for its strong radioactivity.

Chain Reaction

a reaction that initiates its own repetition. In a fission chain reaction, a fissionable nucleus absorbs a neutron and fissions (splits) spontaneously, releasing additional neutrons. These, in turn, can be absorbed by other fissionable nuclei, releasing still more neutrons. A fission chain reaction is self-sustaining when the number of neutrons released in a given time equals or exceeds the number of neutrons lost by absorption in non-fissionable material or by escape from the system.

Characterize

to describe the characteristics of something, such as a waste or a waste site.For example, characterizing a waste from mining or processing a naturally occurring radioactive material typically includes finding the following types of information:

chemical and radionuclide content
level of radiation
physical description (is it liquid or solid; in big chunks or a fine powder, etc.)
amount

pH (is it an acid or a base

Chronic Exposure

exposure to a substance over a long period of time, possibly resulting in adverse health effects.

Exposure Pathways
This page describes the different routes by which radiation can enter the body.
Radiation Health Effects
This page describes the effects of both long-term and acute exposure to radiation.

Class I Survey

a type of final status survey that applies to areas with the highest potential for contamination, and meet the following criteria: (1) impacted; (2) potential for delivering a dose above the release criterion; (3) potential for small areas of elevated activity; and (4) insufficient evidence to support classification as Class 2 or Class 3

Class 2 Survey

a type of final status survey survey that applies to areas that meet the following criteria: (1) impacted; (2) low potential for delivering a dose above the release criterion; and (3) little or no potential for small areas of elevated activity.

Class 3 Survey

a type of final status survey that applies to areas meeting the following criteria: (1) impacted; (2) little or no potential of delivering a dose above the release criterion; and (3) little or no potential for small areas of elevated activity.

Cobalt

a gray, hard, magnetic, ductile, and somewhat malleable metal, cobalt is relatively rare and generally obtained as a byproduct of other metals, such as copper. Its most common radioactive isotope is cobalt-60, which emits beta particles during radioactive decay.

Cobalt-60
This fact sheet describes the basic properties and uses, and the hazards associated with this radionuclide. It also discusses radiation protection related to it.

Compact

a group of two or more states formed to dispose of low-level radioactive waste on a regional basis. The Low-Level Radioactive Waste Policy Act of 1980 encouraged states to form compacts to ensure continuing low-level waste disposal capacity. As of December 2000, forty-four states have formed ten compacts. No compact has successfully sited and constructed a disposal facility.

Conference of Radiation Control Program Directors (CRCPD)

an organization whose members represent state radiation protection programs

CRCPD EXIT Disclaimer
This Web site describes the activities of the organization, provides access to their reports, and contains contact information for the radiation control program directors in each state.

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).

Continuity of Operations

planning to ensure that the essential functions of an organization, such as an agency or the federal government, can continue during a wide range of potential emergencies.

Responding to Radiological Emergencies
This Web site describes the role of EPA's Radiological Emergency Response Team during a radiological emergency.

Cooling Tower

a heat exchanger designed to aid in the cooling of water that was used to cool exhaust steam exiting the turbines of a power plant. Cooling towers transfer exhaust heat into the air instead of into a body of water.

Coordinating Agency

the agency responsible for the radiological facility or activity involved in the incident. Coordinating agencies have primary responsibilities for federal activities related to the nuclear/radiological aspects of the incident.

Cooperating Agency

agencies that provide support to the Coordinating Agency during the federal response to a radiological emergency.

Criticality

a term used to describe the state of a fission reaction when the number of neutrons released by fission is exactly balanced by the neutrons being absorbed and escaping. For example, reactor is said to be "critical" when it achieves a self-sustaining nuclear chain reaction, as it does when the reactor is operating.

Cumulative Dose

the total dose resulting from repeated exposures of ionizing radiation to an occupationally exposed worker to the same portion of the body, or to the whole body, over a period of time.

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

Curie http://www.epa.gov/rpdweb00/glossary/index.html#a

Last updated on Thursday, March 24, 2011

a measure of radioactivity based on the observed decay rate of approximately one gram of radium. The Curie was named in honor of Pierre and Marie Curie, pioneers in the study of radiation.
One curie of radioactive material will have 37 billion atomic transformations (disintegrations) in one second.

Curie
This page explains the unit curies.
Figures in History: Pierre and Marie Curie EXIT Disclaimer
This page provides information on the work and life of the Curies.

Understanding Radiation in Your Life, Your World

Programs · Topics · References