
GLOSSARY

This report contains many terms referring to various units of radioactivity and dose as well as different types of radionuclides. Listed below are many of the terms frequently used in the text.

Actinide Elements: A group of rare earth elements starting with thorium, Th (atomic number 90) and continuing through lawrencium, Lw (atomic number 103). Uranium, U (atomic number 92), and plutonium, Pu (atomic number 94) are members of this group.

Activation Products: Products formed by the incorporation of slow neutrons into the nuclei of atoms, which therefore increase by one mass number. Neutron activation is a means of artificially producing radioisotopes for industrial, scientific, and medical purposes. Examples are ^{60}Co (cobalt) and ^{59}Fe (iron).

Alpha Particle: A positively charged particle emitted from the nucleus of an atom that consists of two protons and two neutrons. The alpha particle is identical to the helium nucleus.

Becquerel (Bq): Unit of radioactivity. It is equal to one nuclear disintegration per second, ($3.7 \times 10^{10} \text{ Bq} = 1 \text{ Ci}$).

Benthic (benthos): Biota living on or closely associated with the bottom of a body of water.

Beta Particle: A particle (negative electron) emitted from the nucleus of an atom. Its emission from the nucleus is accompanied by another particle, the neutrino, which has no electrical charge and a vanishingly small mass.

BIORAD: An ecological model.

Collective Dose Equivalent (S): A quantity that relates the total exposure of a group of individuals to a particular source of radiation exposure. It can be defined as $S = \sum_i H_i N(H)_i$, where $N(H)_i$ is the number of individuals in population subgroup i , receiving an average dose equivalent of H_i . The collective dose equivalent is a quantity that can be used in cost-benefit analyses for the purpose of justification and optimization; its unit is the man-Sv.

CRITR: An ecological model.

Curie (Ci): An older unit of radioactivity. It is defined as that quantity of any radionuclide undergoing 3.7×10^{10} disintegrations per second. The choice of this figure is the result of an original definition based on the activity of a sample of ^{226}Ra .

Dyne: In the *cgs* (centimeter, gram, second) system, unit force is the force that will accelerate a 1-gram mass at 1 cm/s^2 , called the *dyne*.

Effective Dose Equivalent (H_E): A sum derived by $H_E = \sum_T W_T H_T$, where W_T is a weighting factor and H_T is the dose equivalent in tissue T. The summation is carried out over the same period for all tissues. The effective dose equivalent acts as an indicator of the death risk from somatic effects, and of hereditary effects in the first two generations, which are assumed to result from any radiation, whether uniform or nonuniform, from both internal and external sources. It is not a complete indicator of health effects, and does not include hereditary effects in subsequent generations.

Erg: A unit of work in the *cgs* (centimeter, gram, second) system; 1 erg = 1 dyne-centimeter.

EXTREM III: An ecological model.

Fission: The splitting of an atom. The fission process usually is accompanied by the emission of neutrons and much more rarely by the emission of *alpha* particles and possibly other light fragments.

Fission Products: Radionuclides arising from fission, both the primary fission fragments and the radionuclides resulting from their decay. Examples are ^{137}Cs (cesium) and ^{90}Sr (strontium).

Furfurol (F): Epoxy resin used to fill and seal reactor compartments.

Gamma Ray: Electromagnetic radiation emitted from the nucleus when an atom is in transition from a higher to a lower energy state.

Gray (Gy): The unit of absorbed dose equal to 1 Joule per kilogram, (1 Gy = 100 rad).

Half-Life: The time required for any given amount of radionuclide to decay to one-half of its original amount. The half-life of a radionuclide is a unique and reproducible characteristic of that radionuclide.

Inherent Radiosensitivity Factors: Factors that are controlled by the genetic makeup of an organism and that determine basic developmental processes and pathways and biological-repair processes.

Joule (J): A unit of work in the *mks* (meter, kilogram, second) system. 1 J = 10^7 ergs = 0.7376 ft-lb.

Nekton: Biota swimming on or near the surface of a body of water.

Pelagic (pelagos): Biota living in or near surface waters distant from land.

Phytoplankton: Microscopic plant life floating or drifting in a body of water.

Planktivorous: Biota that feed on plankton.

Point Source Dose Distribution (PSDD): An ecological dosimetry model.

Polynya: An area of open water in sea ice.

Rad: An older unit of absorbed dose, equal to 100 ergs per gram.

Radiation Quality Factor: Relative biological effectiveness.

Radioisotope Thermoelectric Generator: A device for producing electricity from the heat produced during radioactive decay of a radionuclide source.

Rem: (Roentgen equivalent man): An older unit of dose equivalent. It is that amount of any type of radiation producing the same biological effect as is obtained from an absorbed dose of 1 rad of 200 KVP X-rays. A **roentgen** is the amount of ionizing radiation that will produce 2.58×10^4 coulomb of electric charge in 1 kg of dry air.

Sievert (Sv): The unit of *dose equivalent*. (1 Sv = 100 rem).

Source Term: The inventory of radionuclides at a given source available for release into the environment.

Weighting Factors (W_T): Factors representing the proportion of the probabilistic risk resulting from irradiation of tissue T to the total risk when the whole body is irradiated uniformly.

Zooplankton: Microscopic animal life swimming or drifting in a body of water.