

Appendix B

Definitions

ABSORBED DOSE - The amount of energy imparted to matter by ionizing radiation per unit mass of irradiated material. The unit of absorbed dose is the rad (or prefixed forms of the unit such as millirad); which is 100 ergs/gram. The SI unit for the rad is the gray. 1 gray = 100 rads.

ACTIVITY - The number of nuclear disintegrations occurring in a given quantity of material per unit time. (See Curie)

ANNUAL LIMIT OF INTAKE (ALI) - Means the derived limit for the amount of radioactive material taken into the body of an adult worker by inhalation or ingestion a year.

BACKGROUND RADIATION - Ionizing radiation arising from radioactive material other than the one directly under consideration. Background radiation due to cosmic rays and natural radioactivity is always present. There may also be background radiation due to the presence of radioactive substances in other parts of the building, in the building material itself, etc. Background radiation includes radiation from fallout, radioactive effluents from other sources, and medical radiation.

COMMITTED DOSE EQUIVALENT (CDE) - ($H_{T,50}$) Means the dose equivalent to organs or tissues of reference (T) that will be received from an intake of radioactive material by an individual during the 50 year period following the intake.

CONTAMINATION, RADIOACTIVE - Deposition of radioactive material in any place where it is not desired, and particularly in any place where the presence may be harmful.

CRITICAL ORGAN - That organ or tissue, the irradiation of which will result in the greatest hazard to the health of the individual or his or her descendants.

CURIE - The quantity of any radioactive material in which the number of disintegrations is 3.700×10^{10} per second. Abbreviated Ci.

Millicurie - One-thousandth of a curie (3.7×10^7 disintegrations per second). Abbreviated mCi.

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Microcurie - One-millionth of a curie (3.7×10^4 disintegrations per second). Abbreviated μCi .

Picocurie - One-millionth of a microcurie (3.7×10^{-2} disintegrations per second or 2.22 disintegrations per minute). Abbreviated pCi .

DECLARED PREGNANT WORKER - Means a women who has voluntarily informed her employer, in writing, of her pregnancy and the estimated date of conception.

DEEP DOSE EQUIVALENT (DDE) - (H_d) Which applies to external whole-body exposure, is the dose equivalent at a tissue depth of 1 cm (1000 mg/cm^2).

DERIVED AIR CONCENTRATIONS (DAC) - Means the concentration of a given radio nuclide in air which, if breathed by the reference man for a working year of 2,000 hours under conditions of light work (inhalation rate $1.2 \text{ m}^3/\text{hr}$), results in an intake of one ALI.

DOSE - A general term denoting the quantity of radiation or energy absorbed in a specified mass. For special purposes, it must be appropriately qualified (e.g., absorbed dose).

DOSE, ABSORBED - The energy imparted to matter by ionizing radiation per unit mass of irradiated material at the place of interest. The unit of absorbed dose is the rad; which is 100 ergs/gram.

DOSE, EQUIVALENT - A quantity used in radiation protection expressing all radiation on a common scale for calculating the effective absorbed dose. The unit of dose equivalent is the rem, which is numerically equal to the absorbed dose in rads multiplied by certain modifying factors such as the quality factor, the distribution factor, etc.

EFFECTIVE DOSE EQUIVALENT (EDE) - (H_E) Is the sum of the products of the dose equivalent to organ or tissue (H_T) and the weighting factors (W_T) applicable to each of the body organs or tissues that are irradiated.

EXPOSURE - A measure of the ionization produced in air by x or gamma radiation. It is the sum of the electrical charges on all ions of one sign produced in air when all electrons liberated by photons in volume element of air are completely stopped in air, divided by the mass of air in the volume element. The special unit of exposure is the roentgen.

EXTREMITY - Means hand, elbow, arm below the elbow, foot, knee, or leg below the knee.

EXTERNAL DOSIMETRY - The use of Thermoluminescent Dosimeters, Film Badges or other exposure measuring devices to determine the radiation dose a person receives from sources outside the body.

EYE DOSE EQUIVALENT (LDE) - Applies to the external exposure of the lens of the eye and is taken as the dose equivalent at a tissue depth of 0.3 centimeter (300 mg/cm²).

HIGH RADIATION AREA - Means an area accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 0.1 rem (1 mSv) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.

INTERNAL DOSIMETRY - Also called Bioassay The use of instruments to measure radiation coming from inside the body or the analysis of urine, or fecal samples to determine the radiation dose a person receives from radiation sources inside the body.

IONIZING RADIATION - Any electromagnetic or particulate radiation capable of producing ions, directly or indirectly, in its passage through matter.

MONITORING - Periodic or continuous determination of the amount of ionizing radiation or radioactive contamination present in an occupied region as a safety measure for purposes of health protection, for example; Area Monitoring: Routine monitoring of the level of radiation or of radioactive contamination of any particular area, building, room or equipment; or Personnel Monitoring: Monitoring any part of an individual, his or her breath, excretions, or any part of his or her clothing (See Radiological Survey).

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OCCUPATIONAL DOSE - The radiation dose a person receives as a result of activities related to their employment, but excluding doses resulting from background and medical radiation.

PLANNED SPECIAL EXPOSURE (PSE) - Means an infrequent exposure to radiation, separate from and in addition to the annual NRC (Tier 1) dose limit.

RADIATION - (1) The emission and propagation of energy through space or through a material medium in the form of waves; for instance, the emission and propagation of electromagnetic waves, or of sound and elastic waves. (2) The energy propagated through a material medium as waves; for example, energy in the form of electromagnetic waves or of elastic waves. The term "radiation" or "radiant energy," when unqualified, usually refers to electromagnetic radiation. Such radiation commonly is classified according to frequency as Hertzian, infrared, visible (light), ultraviolet, x-ray, and gamma ray. (3) By extension, corpuscular emissions, such as alpha and beta radiation, or rays of mixed or unknown type, as cosmic radiation.

RADIATION AREA - Means an area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 0.005 rem (0.05 mSv) in 1 hour at 30 centimeters.

RADIATION GENERATING DEVICE - Any device which generates ionizing radiation. Examples include x-ray machines, x-ray diffraction units, and neutron generators. Radiation from reactors, accelerators, gas chromatographs and x-ray fluorescence devices come from radioactive materials generated or enclosed in the items.

RADIATION PROTECTION COMMITTEE - A committee, required by some NRC licenses to review and approve activities involving radiation within their command. The committee consists of the Commander or his or her deputy (who chairs the committee), the Chief, Safety and Occupational Health Office, the RPO (acting as recorder), the senior medical officer of the Command, and representative Authorized Users.

RADIATION SURVEY - Evaluation of the radiation hazards incident to the production, use or existence of radioactive materials or other sources of radiation under a specific set of conditions. Such evaluation customarily includes a physical survey of the disposition of materials and equipment, measurements or estimates of the levels of radiation that may be involved, and a sufficient knowledge of processes using or affecting these materials to predict hazards resulting from expected or possible changes in materials or equipment.

RADIO NUCLIDE OR RADIOACTIVE MATERIAL - A nuclide with an unstable ratio of neutrons to protons placing the nucleus in a state of stress. In an attempts to reorganize to a more stable state, it may undergo various types of rearrangement that involve the release of radiation.

REM - The special unit of dose equivalent. The dose equivalent in rems is numerically equal to the absorbed dose in rads multiplied by the quality factor, distribution factor, and any other necessary modifying factors.

ROENTGEN (R) - The quantity of x or gamma radiation such that the associated corpuscular emission per 0.001293 grams of dry air produces, in air, ions carrying one electrostatic unit of quantity of electricity of either sign. The roentgen is the special unit of exposure. **MILLIROENTGEN (mR)** - A submultiple of the roentgen equal to one one-thousandth (1/1000th) of a roentgen.

SHALLOW DOSE EQUIVALENT (SDE) - (H_s) Which applies to the external exposure of the skin or an extremity, is taken as the dose equivalent at a tissue depth of 0.007 centimeters (7 mg/cm^2) averaged over an area of 1 square centimeter. Shallow Dose Equivalent, Whole Body (WB) means for purposes of external exposure, head, trunk (including male gonads), arms above the elbow or legs above the knee. Shallow Dose Equivalent, Maximum Extremity (ME) means for purposes of external exposure, arms below the elbow or legs below the knee.

SIEVERT - The SI unit of dose equivalent, 1 sievert (Sv) equals 100 rem.

SIGNS - Radiation signs contain a magenta or black trefoil (radiation symbol) on a yellow background and contain the

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wording: "Caution Radiation Area", "Caution High Radiation Area", "Grave Danger Very High Radiation Area", or "Caution Radioactive Materials" as appropriate.

TOTAL EFFECTIVE DOSE EQUIVALENT (TEDE) - Means the sum of the Deep Dose Equivalent (for external exposures) and the Committed Effective Dose Equivalent (for internal exposures).

THERMOLUMINESCENT DOSIMETER - A dosimeter made of certain crystalline material which is capable of both storing a fraction of absorbed ionizing radiation and releasing this energy in the form of visible photons when heated. The amount of light released can be used as a measure of radiation exposure to these crystals.

VERY HIGH RADIATION AREA - Means an area, accessible to individuals, in which radiation levels could result in an individual receiving an absorbed dose in excess of 500 rads (5 grays) in 1 hour at a meter from a radiation source or from any surface that the radiation penetrates.

WEIGHTING FACTORS (W_T) - For an organ or tissue (T) is the proportion or the risk of stochastic effect resulting from irradiation of that organ or tissue of the total risk of stochastic effect when the whole body is irradiated uniformly.