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Appendix M

Glossary

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Absorbed dose

The amount of radiation energy absorbed, especially by human tissue; measured in rads.

Absorption

The process of taking in, as when a sponge takes up water. Chemicals can be absorbed through the skin into the bloodstream and then transported to other organs. Chemicals can also be absorbed into the bloodstream after breathing or swallowing.

Acute

Occurring over a short time, usually a few minutes or hours. An acute effect happens within a short time after exposure. An acute exposure can result in short-term or long-term health effects. See Chronic.

ALARA

Acronym for “as low as reasonably achievable,” i.e. making every reasonable effort to maintain exposures to ionizing radiation as far below the dose limits as practical, consistent with the purpose for which the licensed activity is undertaken and taking into account the state of technology, the economics of technological improvements and of the benefits to public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest. See 10 CFR 20.1003.

Alpha particle

A positively charged particle ejected spontaneously from the nuclei of some radioactive elements. It is identical to a helium nucleus that has a mass number of 4 and an electrostatic charge of +2. It has low penetrating power and a short range (a few centimeters in air). The most energetic alpha particle will generally fail to penetrate the dead layers of cells covering the skin and can be easily

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1		stopped by a sheet of paper. Alpha particles are hazardous when an alpha-emitting isotope is inside the body.
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4	Ambient	Surrounding. Ambient air is usually outdoor air (as opposed to indoor air).
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7	Aquifer	An underground source of water geologically contained in a layer of rock, sand, or gravel.
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10	Background level	A typical or average level of a chemical or element in the environment. Background often refers to naturally occurring or uncontaminating levels.
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14	Background radiation	Radiation from cosmic sources; naturally occurring radioactive materials, including radon (except as a decay product of source or special nuclear material) and global fallout as it exists in the environment from the testing of nuclear explosive devices. It does not include radiation from source, by-product, or special nuclear materials regulated by the Nuclear Regulatory Commission (NRC). The typically quoted U.S. average individual exposure from background radiation is 360 mrem per yr.
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24	Becquerel (Bq)	The unit of radioactive decay equal to 1 disintegration per second. 37 billion (3.7×10^{10}) Bq = 1 curie (Ci).
25		
26		
27	Beta particle	A charged particle emitted from a nucleus during radioactive decay, with a mass equal to 1/1837 that of a proton. A negatively charged beta particle is identical to an electron. A positively charged beta particle is called a positron. Large amounts of beta radiation may cause skin burns. Beta-emitters are harmful if they enter the body. Beta particles may be stopped by thin sheets of metal or plastic.
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35	Boiling water reactor (BWR)	A reactor in which water, used as both coolant and moderator, is allowed to boil in the core. The resulting steam can be used directly to drive a turbine and electrical generator, thereby producing electricity.
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1	By-product material	Any radioactive material, tailings or wastes (except special nuclear material) that is 1) yielded in, or made radioactive by, exposure to the radiation incident to the process of producing or using special nuclear material (as in a reactor) and 2) produced by the extraction or concentration of uranium or thorium from ore. See 10 CFR 20.1003.
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8	Calibration	The adjustment, as necessary, of a measuring device such that it responds within the required range and accuracy to known values of input.
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12	Certified fuel-handler	A nonlicensed operator who is qualified in accordance with a fuel-handler training program approved by the NRC.
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15	Chronic	Occurring over an extended period of time, e.g., several weeks, months, or years. See Acute.
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17		
18	Committed dose equivalent (CDE)	This is the dose to some specific organ or tissue that is received from an intake of radioactive material by an individual during the 50-yr period following the intake. See 10 CFR 20.1003.
19		
20		
21		
22		
23	Committed effective dose equivalent (CEDE)	The sum of the committed dose equivalents for a given organ or tissue multiplied by a weighting factor (W_i) expressed in units of sieverts (Sv) or rems. See 10 CFR 20.1003.
24		
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27		
28	Compact	A group of two or more States formed to dispose of low-level radioactive waste on a regional basis. Forty-two States have formed nine compacts.
29		
30		
31		
32	Contamination	Undesired radioactive material or residual radioactivity that is deposited on the surface of or inside structures, areas, objects or people in excess of acceptable levels (e.g., for a release of a site or facility for unrestricted use).
33		
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35		
36		
37	Curie (Ci)	The basic unit used to describe the intensity of radioactivity in a sample of material. The curie is equal to 37-billion (3.7×10^{10}) disintegrations per second, which is approximately the activity of 1 gram of radium. A curie is
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1 also a quantity of any radionuclide that decays at a rate of
2 37-billion disintegrations per second. It is named for Marie
3 and Pierre Curie, who discovered radium in 1898.

4
5 **Decommission**
6 **(decommissioning)**

The process of safely removing a facility from service
followed by reducing residual radioactivity to a level that
permits termination of the NRC license. See
10 CFR 20.1003.

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8
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10 **DECON**

An option for decommissioning in which the equipment,
structures, and portions of a facility and site containing
radioactive contaminants are removed or decontaminated
to a level that permits termination of the license shortly
after cessation of operations.

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16 **Decontamination**

The reduction or removal of contaminated radioactive
material from a structure, area, object, or person. See
10 CFR 20.1003 and 20.1402.

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20 **Dermal**

Referring to the skin. For example, dermal absorption
means absorption through the skin.

21
22
23 **Disproportionately high and**
24 **adverse environmental effects**

When determining whether environmental effects are
disproportionately high and adverse, agencies are to con-
sider the following three factors to the extent practicable:
25 (a) whether there is or will be an impact on the natural or
26 physical environment that significantly (as used by NEPA)
27 and adversely affects a minority population, low-income
28 population, or Indian tribe - Such effects may include
29 ecological, cultural, human health, economic, or social
30 impacts on minority communities, low-income communi-
31 ties, or Indian tribes when those impacts are interrelated to
32 impacts on the natural or physical environment,
33 (b) whether environmental effects are significant (as
34 employed by NEPA) and are or may be having an adverse
35 impact on minority populations, low-income populations, or
36 Indian tribes that appreciably exceeds or is likely to appre-
37 ciably exceed those on the general population or other
38 appropriate comparison group, and (c) whether the envi-
39 ronmental effects occur or would occur in a minority
40

1 population, low-income population, or Indian tribe affected
2 by cumulative or multiple adverse exposures from environ-
3 mental hazards.

4
5 **Disproportionately high and**
6 **adverse human health effects**

7 When determining whether human health effects are dis-
8 proportionately high and adverse, agencies are to consider
9 the following three factors to the extent practicable:

10 (a) whether the health effects, which may be measured in
11 risks and rates, are significant (as used by NEPA), or
12 above generally accepted norms (adverse health effects
13 may include bodily impairment, infirmity, illness, or death),
14 (b) whether the risk or rate of hazard exposure by a
15 minority population, low-income population, or Indian tribe
16 to an environmental hazard is significant (as employed by
17 NEPA) and appreciably exceeds or is likely to appreciably
18 exceed the risk or rate to the general population or other
19 appropriate comparison group, and (c) whether health
20 effects occur in a minority population, low-income popula-
21 tion, or Indian tribe affected by cumulative or multiple
22 adverse exposures from environmental hazards.

23 **Dose equivalent (dose)**

24 The product of absorbed dose in tissue multiplied by a
25 quality factor, and then sometimes multiplied by other
26 necessary modifying factors at the location of interest. It is
27 expressed numerically in rems or sieverts. See
28 10 CFR 20.1003.

29 **Dosimeter**

30 A portable instrument (e.g., a film badge, thermolumi-
31 nescent, or pocket dosimeter) worn by plant personnel for
32 measuring and recording the total accumulated dose of
33 ionizing radiation.

34 **Dosimetry**

35 The theory and application of the principles and tech-
36 niques involved in the measurement and recording of
37 ionizing radiation doses.

38 **Effective half-life**

39 The time required for a radionuclide contained in a
40 biological system, such as a human or an animal, to
reduce its activity by one-half as a combined result of
radioactive decay and biological elimination.

1	ENTOMB	A method of decommissioning in which radioactive structures, systems, and components are encased in a structurally long-lived material, such as concrete. The entombed structure is appropriately maintained, and continued surveillance is carried out until the radioactivity decays to a level that permits termination of the license.
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8	Exposure	Contact with a chemical or element by swallowing, breathing, or direct contact (such as through the skin or eyes). Exposure may be either short-term (acute) or long-term (chronic).
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13	External radiation	Exposure to ionizing radiation when the radiation source is located outside the body.
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16	Fissile material	Any material fissionable by thermal (slow) neutrons. The three primary fissile materials are uranium-233, uranium-235, and plutonium-239. Although sometimes used as a synonym for fissionable material, this term has acquired a more restricted meaning.
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21		
22	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.
23		
24		
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26		
27	Fission gases	Those fission products that exist in the gaseous state. In nuclear power reactors, this includes primarily the noble gases, such as krypton and xenon.
28		
29		
30		
31	Fission products	The nuclei (fission fragments) formed by the fission of heavy elements, plus the nuclide formed by the fission fragments' radioactive decay.
32		
33		
34		
35	Fissionable material	Commonly used as a synonym for fissile material, the meaning of this term has been extended to include material that can be fissioned by fast neutrons, such as uranium-238.
36		
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1	Fuel assembly	A cluster of fuel rods (or plates). Also called a fuel element. A reactor core is made up of many fuel assemblies.
2		
3		
4	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 a reactor, 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.
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12	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.
13		
14		
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16		
17	Fusion reaction	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 releases of energy, e.g., in the energy of stars.
18		
19		
20		
21		
22	Gamma radiation	High-energy, short wave-length, electromagnetic radiation emitted from the nucleus. Gamma radiation frequently accompanies alpha and beta emissions and always accompanies fission. Gamma rays are very penetrating and are best stopped or shielded by dense materials, such as lead or depleted uranium. Gamma rays are similar to x-rays.
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30	Graphite	A form of carbon, similar to the lead used in pencils, used as a moderator in some nuclear reactors.
31		
32		
33	Greenfield	An end state of decommissioning in which above-ground structures have been removed and efforts made to revegetate the site. Buildings may have been removed to below-grade and then covered with soil.
34		
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38	Groundwater	The supply of fresh water found beneath the earth's surface (usually in aquifers) that is often used for supplying wells and springs.
39		
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1	Hazardous waste	By-products of society that can pose a substantial or
2		potential hazard to human health or the environment when
3		improperly managed. Possesses at least one of four char-
4		acteristics (ignitability, corrosivity, reactivity, or toxicity), or
5		appears on special EPA lists.
6		
7	High decommissioning	The licensee is actively dismantling, decontaminating, or
8	activity (HDA)	performing activities that contribute to site release or
9		license termination. Includes, but is not limited to,
10		(1) major decommissioning activities or (2) periods of
11		decommissioning in which the aggregate of licensee
12		activities represents a significant change in facility config-
13		uration, increase in occupational dose, curies relocated, or
14		decommissioning cost expenditure.
15		
16	Highly enriched uranium	Uranium enriched to 20 percent or greater in the isotope
17		Uranium-235.
18		
19	High-level waste (HLW)	Consists of (1) irradiated (spent) reactor fuel, (2) liquid
20		waste resulting from the operation of the first cycle solvent
21		extraction system, and the concentrated wastes from sub-
22		sequent extraction cycles, in a facility for reprocessing
23		irradiated reactor fuel, or (3) solids into which such liquid
24		wastes have been converted. Primarily in the form of
25		spent fuel discharged from commercial nuclear power
26		reactors, HLW also includes some reprocessed HLW from
27		defense activities, and a small quantity of reprocessed
28		commercial HLW. See Low-level waste and Radioactive
29		waste.
30		
31	High radiation area	Any area with dose rates greater than 1 mSv (100 mrems)
32		in 1 hour, 30 centimeters from the source or from any
33		surface through which the ionizing radiation penetrates.
34		Areas at licensee facilities must be posted as "high
35		radiation areas" and access into these areas is maintained
36		under strict control.
37		
38	Hot spot	The region in a radiation/contamination area in which the
39		level of radiation/contamination is significantly greater than
40		in neighboring regions in the area.

1	Ingestion	Swallowing (such as eating or drinking). Ingestion of
2		radioactive material or other contaminants can occur via
3		contact with contaminated food, drink, utensils, cigarettes,
4		hands, or other surfaces. After ingestion, chemicals can
5		be absorbed into the blood and distributed throughout the
6		body.
7		
8	Inhalation	Breathing. Exposure may occur from inhaling contami-
9		nants because they can be deposited in the lungs, taken
10		into the blood, or both.
11		
12	Ion	(1) An atom that has too many or too few electrons, caus-
13		ing it to have an electrical charge, and, therefore, be
14		chemically active (2) An electron that is not associated (in
15		orbit) with a nucleus.
16		
17	Ionizing radiation	Any radiation capable of displacing electrons from atoms
18		or molecules, thereby producing ions. Some examples are
19		alpha, beta, gamma, x-rays, neutrons, and ultraviolet light.
20		High doses of ionizing radiation may produce severe skin
21		or tissue damage.
22		
23	Independent spent fuel storage	A complex designed and constructed for the interim
24	installation (ISFSI)	storage of spent nuclear fuel and other radioactive mate-
25		rials associated with spent fuel storage. The most com-
26		mon design for an ISFSI at this time is a concrete pad with
27		dry casks containing spent fuel bundles.
28		
29	Industrial use area	An area that has been designated appropriate for
30		industrial activities.
31		
32	Irradiation	Exposure to radiation.
33		
34	Isotope	One of two or more atoms with the same number of
35		protons, but different numbers of neutrons in their nuclei.
36		Thus, carbon-12, carbon-13, and carbon-14 are isotopes
37		of the element carbon, the numbers denoting the approxi-
38		mate atomic weights. Isotopes have very nearly the same

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1 chemical properties, but often different physical properties
2 (for example, carbon-12 and carbon-13 are stable,
3 whereas carbon-14 is radioactive).

4 5 **Leaching**

6 Residual contamination transported into the subsurface as
7 water trickles through soils or materials that contain the
8 contamination. The water can carry the contamination
9 through the soil and pollute nearby groundwater or surface
10 water.

11 **License termination plan**

12 The license termination plan is a document that is required
13 by 10 CFR 50.82(a)(9). The license termination plan, sub-
14 mitted by the licensee at least 2 yrs before termination of
15 the license, addresses the following items: site characteri-
16 zation, identification of remaining site dismantlement
17 activities, plans for site remediation, detailed plans for final
18 radiation surveys for release of the site, method for
19 demonstrating compliance with the radiological criteria for
20 license termination, updated site-specific estimate of
21 remaining decommissioning costs, and supplement to the
22 environmental report pursuant to 10 CFR 51.53(d). The
23 license termination plan approval process is by license
24 amendment.

25 **Licensing basis**

26 The set of NRC requirements applicable to a specific plant
27 and a licensee's written commitments for ensuring compli-
28 ance with and operation within applicable NRC require-
29 ments and the plant-specific design basis (including all
30 modifications and additions to such commitments over the
31 life of the license) that are docketed and in effect. The
32 licensing basis includes the NRC regulations and appen-
33 dixes, orders, license conditions, exemptions, and techni-
34 cal specifications. It also includes the plant-specific
35 design-basis information defined in 10 CFR 50.2, as docu-
36 mented in the most recent final safety analysis report (as
37 required by 10 CFR 50.71) and the licensee's commit-
38 ments remaining in effect that were made in docketed
licensing correspondence, such as licensee responses to

1 NRC bulletins, generic letters, and enforcement actions,
2 required certifications and submittals, NRC safety
3 evaluations, and licensee event reports.

4
5 **Light water reactor (LWR)**

A term used to describe reactors using ordinary water as
6 coolant, including boiling water reactors (BWRs) and
7 pressurized water reactors (PWRs), the most common
8 types used in the United States.

9
10 **Low decommissioning
11 activity (LDA)**

Periods of decommissioning when a licensee either
12 (1) maintains their facility in a true SAFSTOR configuration
13 or (2) incrementally dismantles, decontaminates, or
14 decommissions structures, systems, or components at
15 such a low rate or small volume that there are only trivial
16 changes to facility configuration, occupational dose, curie
17 relocation, or decommissioning cost expenditure.

18 **Low-income population**

Low-income populations in an affected area should be
19 identified with the annual statistical poverty thresholds
20 from the Bureau of the Census' Current Population
21 Reports, Series P-60 on Income and Poverty. In identi-
22 fying low-income populations, agencies may consider as a
23 community either a group of individuals living in geo-
24 graphic proximity to one another or a set of individuals
25 (e.g., migrant workers or Native Americans), where either
26 type of group experiences common conditions of
27 environmental exposure or effect.

28
29 **Low-level waste (LLW)**

A general term for a wide range of wastes. Industries,
30 hospitals, research institutions, private or government
31 laboratories, and nuclear fuel-cycle facilities (e.g., nuclear
32 power reactors and fuel fabrication plants) using radio-
33 active materials generate LLW as part of their normal
34 operations. These wastes are generated in many physical
35 and chemical forms and levels of contamination. LLW
36 usually comprises the following material contaminated with
37 radionuclides: rags, papers, filters, solidified liquids, ion-
38 exchange resins, tools, equipment, discarded protective
39 clothing, dirt, construction rubble, concrete, or piping. See
40 High-level waste and Radioactive waste.

1	Major decommissioning activity	For a nuclear power facility, any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment (for PWRs, the primary containment; for BWRs, the primary and secondary containments), or results in the dismantling of components or systems for shipment containing “greater than Class C” waste (10 CFR 61.55). The licensee is precluded by regulation from conducting major decommissioning activities until 90 days after the NRC has received the Post-Shutdown Decommissioning Activities Report and the 10 CFR 50.82(a)(1) certifications have been submitted.
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14	Major radioactive component	For a nuclear power plant, this includes the reactor vessel and internals, steam generators, pressurizer, large-bore reactor coolant system piping, and other large components that are radioactive to a comparable degree.
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19	MARSSIM	The Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), which provides detailed guidance for planning, implementing, and evaluating environmental and facility radiological surveys conducted to demonstrate compliance with dose- or risk-based regulation. The MARSSIM guidance focuses on the demonstration of compliance during the final status survey following scoping, characterization, and any necessary remedial actions.
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28	Media	Soil, water, air, plants, animals, or any other parts of the environment that can contain contaminants. Body tissues or fluids such as blood, bone or urine may also be media. The singular of “media” is “medium.”
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33	Minority	Individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic.
34		
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37	Minority population	According to the CEQ, minority populations should be identified where either (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully
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1 greater than the minority population percentage in the
 2 general population or other appropriate unit of geographic
 3 analysis. In identifying minority communities, agencies
 4 may consider as a community either a group of individuals
 5 living in geographic proximity to one another or a geo-
 6 graphically dispersed/transient set of individuals (e.g.,
 7 migrant workers or Native American), where either type of
 8 group experiences common conditions of environmental
 9 exposure or effect. The selection of the appropriate unit of
 10 geographic analysis may be a governing body's juris-
 11 diction, a neighborhood, census tract, or other similar unit
 12 that is to be chosen so as not to artificially dilute or inflate
 13 the affected minority population. A minority population
 14 also exists if there is more than one minority group present
 15 and the minority percentage, as calculated by aggregating
 16 all minority persons, meets one of the above-stated
 17 thresholds. NRR adopted a standard of 20 percentage
 18 points as "meaningfully greater."

19
 20 **Mixed waste**

Mixed radioactive and hazardous waste (mixed waste).
 (EPA, 1997)

21
 22
 23 **Nuclear energy**

The energy liberated by a nuclear reaction (fission or
 fusion) or by radioactive decay.

24
 25
 26 **Nuclear island**

The nuclear island concept is used during decommission-
 ing as a model for reducing the focus of the safeguards
 and security systems to the location where the fuel is
 being stored. For example, if the fuel is being stored in the
 spent fuel pool, the focus of the safeguards are on protec-
 tion of only the spent fuel pool building and not the balance
 of the plant.

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 34 **Nuclear waste**

See High-level waste and Low-level waste.

35
 36 **Partial site release**

The release of a portion of an operating or decommission-
 ing nuclear power reactor facility site for unrestricted use.
 The licensee maintains a license for the remainder of the
 site. At this time there is a proposed rulemaking to change
 the regulations to specifically address the criteria for a
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1 partial site release. The rulemaking ensures that any
2 remaining residual radioactivity from licensed activities in
3 parts of a site released fro unrestricted use will meet the
4 radiological criteria for license termination. For more
5 detail, see the text in Chapter 3.
6

7 **Permanent cessation of**
8 **power operations**

The permanent cessation of power operations is a
licensee determination certified to the NRC in writing in
accordance with 10 CFR 50.82(a)(1)(i). Following this
certification, the licensee would possess the power reactor
structures, systems, and components, site, and related
radioactive material, but be prohibited by regulation from
operating the reactor.

15 **Personnel monitoring**

The use of portable survey meters to determine the
amount of contamination on an individual, or the use of
dosimetry to determine an individual's occupational
radiation dose.

20 **Possession-only license (POL)**

A name for the license retained by a 10 CFR Part 50
licensee that was amended to reflect the permanent
shutdown condition of the facility and the licensee's
continued possession of nuclear fuel.

25 **Post-operational phase**

The interval between the final reactor shutdown and the
licensee's certification that all fuel has been permanently
removed from the reactor vessel. See 10 CFR
50.82(a)(1)(ii). During this phase, the licensee would
establish safe shutdown conditions and could conduct
activities to dismantle and decontaminate structures,
systems, and components or place them in a storage
configuration.

34 **Post-shutdown**
35 **decommissioning activities**
36 **report (PSDAR)**

The PSDAR is required by 10 CFR 50.82(a)(4). The
licensee is required to submit a PSDAR to the NRC within
two yrs after permanent cessation of operations. Includes
a description of the planned decommissioning activities, a
schedule for the completion of these activities, an estimate
of expected costs, and a discussion that provides the
reasons for concluding that the environmental impacts

1 associated with the site-specific decommissioning
2 activities will be bounded by appropriate environmental
3 impact statements previously issued.
4

5 **Pressurized water reactor (PWR)** A power reactor in which heat is transferred from the core
6 to an exchanger by high-temperature water kept under
7 high pressure in the primary system. Steam is generated
8 in a secondary circuit. Many reactors producing electric
9 power are PWRs.
10

11 **Previously disturbed area** An area that has been physically moved, uncovered,
12 destabilized, or otherwise modified from its undisturbed
13 natural condition, thereby increasing the potential for
14 emissions. This definition excludes those areas restored
15 to a natural state, such that vegetative ground cover and
16 soil characteristics are similar to adjacent or nearby natural
17 conditions.
18

19 **Quality assurance and quality control (QA/QC)** A system of procedures, checks, and audits to judge the
20 quality of measurements and reduce the uncertainty of
21 environmental data.
22

23 **Rad** The special unit for radiation absorbed dose, which is the
24 amount of energy from any type of ionizing radiation (e.g.,
25 alpha, beta, gamma, neutrons, etc.) deposited in any
26 medium (e.g., water, tissue, air). A dose of 1 rad means
27 the absorption of 100 ergs (a small but measurable
28 amount of energy) per gram of absorbing tissue.
29 100 rad = 1 gray.
30

31 **Radiation** Particles (alpha, beta, neutrons) or photons (gamma)
32 emitted from the nucleus of unstable radioactive atoms as
33 a result of radioactive decay.
34

35 **Radiation standards** Exposure standards, permissible concentrations, rules for
36 safe handling, regulations for transportation, regulations
37 for industrial control of radiation, and control of radioactive
38 material by legislative means.
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1	Radioactive contamination	Deposition of radioactive material in any place where it may harm persons or equipment.
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4	Radioactive waste	Solid, liquid, and gaseous materials from nuclear operations that are radioactive or become radioactive and for which there is no further use. Wastes are generally classified as high-level (having radioactivity concentrations of hundreds of thousands of curies per gallon or foot), low-level (in the range of 1 microcurie per gallon or foot), or intermediate level (between these extremes). See 10 CFR Parts 60 and 61.
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13	Radioactivity	The spontaneous emission of radiation, generally alpha or beta particles, often accompanied by gamma rays, from the nucleus of an unstable isotope. Also, the rate at which radioactive material emits radiation. Measured in units of becquerels or disintegrations per second.
14		
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19	Radioisotope	An unstable isotope of an element that decays or disintegrates spontaneously, emitting radiation. Approximately 5000 natural and artificial radioisotopes have been identified.
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24	Radiologically non-impacted	Areas that have no reasonable potential for radioactive residual contamination are classified as non-impacted by MARSSIM (NRC 1997).
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28	Radiological waste	See "radioactive waste."
29		
30	Radionuclide	A radioisotope.
31		
32	Reactor	A device in which nuclear fission may be sustained and controlled in a self-supporting nuclear reaction. The varieties are many, but all incorporate features, such as fissionable material or fuel, a moderating material (unless the reactor is operated on fast neutrons), a reflector to conserve escaping neutrons, provisions for removal of heat, measuring and controlling instruments, and protective devices. The reactor is the heart of a nuclear power plant.
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1	Real property	Includes land, improvements on the land, or both, including interests therein. All equipment or fixtures (e.g., plumbing, electrical, heating, built-in cabinets, and elevators) that are installed in a building in more or less permanent manner or that are essential to its primary purpose.
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8	Reference man	A hypothetical person with the anatomical and physiological characteristics of an average individual, used in calculations assessing internal dose (also may be called “standard man”).
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13	rem	A conventional standard unit that measures the effects of ionizing radiation on humans. The international system (SI) equivalent unit is the sievert.
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17	Restricted use	A category of use of the facility after license termination. In restricted use, a licensee has demonstrated that further reductions in residual radioactivity would result in net public or environmental harm or that residual levels are as low as reasonably achievable, and that the licensee has made provisions for legally enforceable institutional controls (e.g., restrictions placed in the deed for the property describing what the land can and cannot be used for) that provide reasonable assurance that the radiological criteria set by the NRC will not be exceeded. In addition, the licensee must have provided sufficient financial assurance to an amenable independent third party to assume and carry out responsibilities for any necessary control and maintenance of the site. There are also regulations relating to the documentation of how the advice of individuals and institutions in the community who may be affected by the decommissioning has been sought and incorporated in the license termination plan related to decommissioning by unrestricted use.
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37	Risk	The probability of harm. For example, for a person who has measles, the risk of death is one in one million.
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Appendix M

1	Roentgen (R)	A unit of exposure to ionizing radiation. It is the amount of
2		gamma or x-rays required to produce ions resulting in a
3		charge of 0.000258 coulombs/kilogram of air under
4		standard conditions. Named after Wilhelm Roentgen, the
5		German scientist who discovered x-rays in 1895.
6		
7	Rubblization	The demolition of onsite concrete structures. Rubblizing
8		these structures could result in material ranging from
9		gravels to large concrete blocks, or a mixture of both.
10		
11	Safety limit	A limit placed upon important process variables that are
12		found to be necessary to reasonably protect the integrity of
13		the physical barriers guarding against the uncontrolled
14		release.
15		
16	Safety-related structures,	Nuclear plant structures, systems, and components that
17	systems, and components	are relied upon to remain functional during and following
18		design-basis events to ensure:
19		
20		• the integrity of the reactor coolant pressure boundary
21		
22		• the capability to shut down the reactor and maintain it
23		in a safe shutdown condition, or
24		
25		• the capability to prevent or mitigate the consequences
26		of accidents that could result in potential offsite expo-
27		sure comparable to the applicable guideline expo-
28		sure set forth in 10 CFR 50.34(a)(1) or
29		10 CFR 100.11.
30		
31	SAFSTOR	A method of decommissioning in which the nuclear facility
32		is placed and maintained in a safe stable condition for a
33		number of years until it is subsequently decontaminated
34		and dismantled to levels that permit license termination.
35		During SAFSTOR, a facility is left intact, but the fuel has
36		been removed from the reactor vessel and radioactive
37		liquids have been drained from systems and components
38		and then processed. Radioactive decay occurs during the

1		SAFSTOR period, thus reducing the quantity of contami-
2		nated and radioactive material that must be disposed of
3		during decontamination and dismantlement.
4		
5	Sewage	The waste and wastewater produced by residential and
6		commercial sources and discharged into sewers.
7		
8	Sewage waste	By-products of society from sewer sources.
9		
10	Sewer sludge	Sludge produces at a Publicly Owned Treatment Works,
11		the disposal of which is regulated under the Clean Water
12		Act.
13		
14	Sievert	An international system (SI) unit that measures the effects
15		of ionizing radiation on humans. The conventional
16		equivalent unit is the rem.
17		
18	Site characterization	One of the final steps before the termination of the license.
19		The site characterization contains a description of (1) the
20		radiological contamination on the site before any cleanup
21		activities associated with decommissioning took place,
22		(2) a historical description of site operations, spills, and
23		accidents, and (3) a map of remaining contamination
24		levels and contamination locations. The purpose of the
25		site characterization is to assist in planning for remedia-
26		tion, selection of remediation techniques, and assessment
27		of radiological impacts and cost estimates.
28		
29	Sludge	A semi-solid residue from any of a number of air or water
30		treatment processes; can be a hazardous waste.
31		
32	Spent nuclear fuel	Depleted fuel that has been removed from a nuclear
33		reactor because it can no longer sustain power production
34		(cannot effectively sustain a chain reaction) for economic
35		or other reasons.
36		
37	Target organ	An organ (such as the liver or kidney) that is specifically
38		affected by a toxic chemical.
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Appendix M

1	Technical specifications (TS)	An appendix to the facility license that contains safety requirements, bases, safety limits, limiting conditions for operation, and administrative requirements to provide assurance that decommissioning can be conducted safely and in accordance with regulatory requirements. Terminology such as “defueled TSs” or “decommissioning TSs” has been used to describe technical specifications that have been amended to reflect the permanent shutdown condition of reactor.
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11	Transfer	Includes all real estate transfers (e.g., donation, exchange, disposal, easement, lease, permit, license).
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14	Transuranic element	An artificially made, radioactive element that has an atomic number higher than uranium in the periodic table of elements, e.g., neptunium, plutonium, americium, and others.
15		
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18	Transuranic waste	Material contaminated with transuranic elements that is produced primarily from reprocessing spent fuel and from use of plutonium in fabrication of nuclear weapons.
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22	Unrestricted area	The area outside the owner-controlled portion of a nuclear facility (usually the site boundary). An area in which a person could not be exposed to radiation levels in excess of 2 mrem in any 1 hour from external sources. See 10 CFR 20.1003.
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28	Unrestricted use	A category of facility use after license termination. Unrestricted use means that there are no restrictions on how the site may be used. The licensee is free to continue to dismantle any remaining buildings or structures, and to use the land or sell the land for any type of application.
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34	Vapor	The gaseous form of substances that are normally in liquid or solid form.
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37	Volatile organic compound (VOC)	An organic chemical that evaporates easily. Petroleum products such as kerosene, gasoline, and mineral spirits contain VOCs.
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1	Weighting factor (W_t)	Multipliers of the equivalent dose to an organ or tissue
2		used for radiation protection purposes to account for differ-
3		ent sensitivities of different organs and tissues to the
4		induction of stochastic effects of radiation. See
5		10 CFR 20.1003.
6		
7	Whole-body counter	A device used to identify and measure the radioactive
8		material in the bodies of human beings and animals. It
9		uses heavy shielding to keep out naturally existing back-
10		ground radiation and measures radiation levels with ultra
11		sensitive radiation detectors and electronic counting
12		equipment.
13		
14	Whole-body exposure	An exposure of the body to radiation, in which the entire
15		body, rather than an isolated part, is irradiated. Where a
16		radioisotope is uniformly distributed throughout the body
17		tissues, rather than being concentrated in certain parts,
18		the irradiation can be considered as whole-body exposure.